

STAFF STUDY No. 17

Business Cycles in Canada

by Derek A. White



*Prepared for the
Economic Council of Canada*



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Derek A. White

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Economic Council of Canada
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TABLE OF CONTENTS

	PAGE
<u>Chapter 1</u>	
INTRODUCTION, SUMMARY AND CONCLUSIONS	1
Introduction	1
Summary ✓	5
Conclusions	12
<u>Chapter 2</u> ✓	
DEFINING, IDENTIFYING AND CLASSIFYING BUSINESS CYCLES	17
<u>Chapter 3</u>	
A BRIEF HISTORICAL SUMMARY OF NORTH AMERICAN BUSINESS CYCLE EXPERIENCE	35
The Main Features of the Historical Record ✓	35
A Comparative Analysis of Business Cycle Durations	39
A Comparative Analysis of Business Cycle Amplitudes	45
<u>Chapter 4</u>	
SOME KEY ELEMENTS IN THE GENERATION AND TRANSMISSION OF BUSINESS CYCLES	51
The Instability of Investment ✓	55

	PAGE
<u>Chapter 4 (cont'd.)</u>	
The Multiplier ✓	58
The Multiplier-Accelerator Mechanism ✓	59
Econometric Models and Business Cycle Analysis	65
Some Significant Findings of the National Bureau of Economic Research	70
Long Swings or Major Cycles in Fixed Investment	78
Business Cycles in an Open Economy	85
 <u>Chapter 5</u>	
SOME MAJOR EMPIRICAL FEATURES OF RECENT NORTH AMERICAN CYCLICAL FLUCTUATIONS	93
Analysis of Gross National Product Changes during Recent Recessions	93
The Roles of Inventory and Fixed Investment Swings	103
(a) Inventory fluctuations	103
(b) Cycles in fixed investment	105
(c) Differences between Canadian and U. S. fixed investment behaviour	109
 <u>Chapter 6</u>	
CANADA-UNITED STATES CYCLICAL INTER- RELATIONS	113

Chapter 6 (cont'd.)

Canada-United States Economic Interrelations	113
Canada-United States Interrelations and the Effects of Major Swings in North American Fixed Investment	135

Chapter 7

FACTORS UNDERLYING THE REDUCED POST-WAR AMPLITUDE OF FLUCTUATIONS IN NORTH AMERICAN ECONOMIC ACTIVITY	151
Introduction	151
✓ 1. Changes in the Importance of the Investment Sector in Relation Both to Other Sectors of Expenditure and to Aggregate Expenditure	153
The growth of the government sector	154
Changes within the investment sector	162
Summary	164
2. Changes in the Degree of Instability of Investment	165
3. Changes in the Extent to Which Variations in Investment Affect Other Expenditure Sectors	170
The theoretical role of stabilizers	170
Business contractions and changes in Canadian and American personal disposable income	173

Chapter 7 (cont'd.)

Transfer payments	190
Corporate profits	191
Personal income taxes	205
4. Changes in the Extent to Which Variations in Investment are Offset by Opposite Variations in Other Expenditure Sectors	207
The consumer sector	209
The government sector	212
Housing	219
Conclusions	227

Appendix 1

SUMMARY TABLES OF U. S. AND CANADIAN CYCLICAL EXPERIENCE	235
---	-----

Appendix 2

A NOTE ON THE COMPARATIVE BEHAVIOUR OF PERSONAL EXPENDITURE IN RELATION TO GROSS NATIONAL PRODUCT IN CANADA AND THE UNITED STATES	241
--	-----

Appendix 3

A COMPARATIVE ANALYSIS OF THE RATIO OF INVESTMENT TO GROSS NATIONAL PRODUCT, BY INDUSTRY, IN CANADA AND THE UNITED STATES	247
--	-----

TABLES

	PAGE
Table 1 Average Durations of Canadian Peacetime Contractions and Expansions, Selected Periods, 1873-1965	37
Table 2 Average Durations of U. S. Peacetime Contractions and Expansions, Selected Periods, 1854-1965	37
Table 3 Average Monthly Percentage Rates of Peacetime Contraction and Expansion in Canadian Industrial Production, Selected Periods, 1919-65	38
Table 4 Average Monthly Percentage Rates of Peacetime Contraction and Expansion in U. S. Industrial Production, Selected Periods, 1892-1965	39
Table 5 Frequency Distribution of Durations of Canadian Business Cycle Expansions, 1873-1961	40
Table 6 Frequency Distribution of Durations of Canadian Business Cycle Contractions, 1873-1961	41
Table 7 Frequency Distribution of Durations of Canadian Business Cycles, 1873-1961	42
Table 8 Canadian Cyclical Phases since 1873 Influenced by Wars and Depressions	43
Table 9 Frequency Distribution of Durations of U. S. Business Cycles, 1854-1961	44

Table 10	U. S. Cyclical Phases since 1854 Influenced by Wars and Depressions	46
Table 11	Amplitudes of Specific Cycle Expansions in Canadian and U. S. Industrial Production Corresponding with Expansion Phases of U. S. Business Cycles	47
Table 12	Amplitudes of Specific Cycle Contractions in Canadian and U. S. Industrial Production Corresponding with Contraction Phases of U. S. Business Cycles	48
Table 13	Changes in Components of Canadian Gross National Expenditure (Excluding Error) during Cyclical Contractions as Percent- ages of Peak GNE (Excluding Error), 1929-61	95
Table 14	Percentage Changes in Components of Canadian Final Demand Expenditures during Cyclical Contractions, 1929-61	96
Table 15	Changes in Components of U. S. Gross National Expenditure during Cyclical Contractions as Percentages of Peak GNE, 1929-61	98
Table 16	Percentage Changes in Components of U. S. Final Demand Expenditures during Cyclical Contractions, 1929-61	99
Table 17	Percentage Declines in U. S. Gross National Product and Investment in Order of the Severity of the GNP Declines, 1929-61	102
Table 18	Values of the Canadian Marginal Propensity to Import during Upswings and Downswings in the Ratio of Business Fixed Investment to Gross National Product	140

Table 19	Selected Components of Canadian Gross National Expenditure as Percentages of the Total, 1926-29, 1954-57, 1965	155
Table 20	Selected Components of U. S. Gross National Expenditure as Percentages of the Total, 1929, 1954-57, 1965	156
Table 21	Sources of the Revenues of U.S. State and Local Governments as Percentages of Total Revenues, 1929, 1957 and 1964	159
Table 22	Sources of Canadian Provincial Government Revenues as Percentages of Total Revenues	160
Table 23	Sources of Canadian Municipal Revenues as Percentages of Total Revenues	161
Table 24	Reconciliation of Changes in Gross National Product and Personal Disposable Income, Pre-War and Post-War Contractions - Canada, 1929-61	176
Table 25	Reconciliation of Changes in National Income and Personal Disposable Income, Pre-War and Post-War Contractions - Canada, 1929-61	180
Table 26	Reconciliation of Changes in Gross National Product and Personal Disposable Income, Pre-War and Post-War Contractions - United States, 1929-61	182
Table 27	Reconciliation of Changes in National Income and Personal Disposable Income, Pre-War and Post-War Contractions - United States, 1929-61	187

	PAGE
Table 28 Changes in Government Transfer Payments over Pre-War and Post-War Contractions - Canada, 1929-61	192
Table 29 Changes in Government Transfer Payments to Persons over Pre-War and Post-War Contractions - United States, 1929-61	194
Table 30 Proportions of Components of Corporate Profits in National Income - Canada, 1926-66	196
Table 31 Changes in Manufacturing Production and Employment during Specific Cycles in Manufacturing Production - Canada, 1921-60	199
Table 32 Elasticity of Changes in Major Components of National Income with Respect to Gross National Product Declines - Canada, 1929-61	200
Table 33 Proportions of Components of Corporate Profits in National Income - United States, 1929-66	202
Table 34 Elasticity of Changes in Major Components of National Income with Respect to Gross National Product Declines - United States 1929-58	204
Table 35 Canadian Federal, Provincial and Municipal Government Capital Expendi- tures as Percentages of Gross National Product, 1949, 1956 and 1964	217
Table 36 U. S. Federal, State and Local Government Spending on Construction as Percentages of Gross National Product, 1929, 1949, 1956 and 1964	217

Table 37	Canadian Federal, Provincial and Municipal Government Capital Expendi- tures as Percentages of Private Non- Residential Fixed Capital Formation, 1949, 1956 and 1964	218
Table 38	U. S. Federal, State and Local Government Spending on Construction as Percentages of Private Non-Residential Fixed Capital Formation, 1929, 1949, 1956 and 1964	218

APPENDIX TABLES

Table A-1.1	U. S. and Canadian Reference Cycle Dates	236
Table A-1.2	Business Cycles in Canada, 1873-1961	237
Table A-1.3	Seventeen Cycles in U. S. Industrial Production since 1892	238
Table A-1.4	Cycles in Canadian Industrial Produc- tion since 1919	239
Table A-2.1	Relative Changes in the Components of the Ratio of Personal Expenditure to Gross National Product over Six Contractions, Canada and United States	244
Table A-2.2	Percentage Changes in Gross National Expenditure (Excluding Error) Less Personal Expenditures during Six Contractions, Canada and United States	245

	PAGE
Table A-3.1 Fixed Investment by Industry as Percentages of Gross National Product, Canada, 1947 to 1964	250
Table A-3.2 Fixed Investment by Industry as Percentages of Gross National Product, United States, 1947 to 1964	252
Table A-3.3 Canadian Fixed Investment by Industry as Percentages of Gross National Product Adjusted for Differences in the Structure of Output in Canada and the United States	258
Table A-3.4 Differences in Industry and Aggregate Percentages of Investment, Canada and United States	260
Table A-3.5 Ratios of Canadian to U. S. Percentages of Investment to Gross National Product	262
Table A-3.6 Fixed Investment in Manufacturing Industries as Percentage of Gross National Product - Canada	264
Table A-3.7 Fixed Investment in Manufacturing Industries as Percentage of Gross National Product - United States	266

CHARTS

	PAGE
Chart 1 Variations in the Pressure of Demand against Supply, Business Cycles and Long Swings in Post-War Canada	32
Chart 2 Changes in Nonfarm Business Inventories as Percentages of GNP, Canada and United States	103
Chart 3 Residential Construction Expenditures as Percentages of GNP, Canada and United States	106
Chart 4 Non-Residential Construction Expenditures as Percentages of GNP, Canada and United States	107
Chart 5 Machinery and Equipment Expenditures as Percentages of GNP, Canada and United States	108
Chart 6 Industrial Production Indexes, Canada and United States	114
Chart 7 Indexes of Nonagricultural Exports to the United States and U.S. Industrial Production	116
Chart 8 Canadian Nonagricultural Exports to the United States and Canadian Industrial Production	117
Chart 9 Long-Term Bond Yields, Canada and United States	122
Chart 10 The Money Supply, Canada and United States	123

	PAGE
Chart 11 Stock Price Indexes, Canada and United States	126
Chart 12 Indexes of Industrial Material Prices, Canada and United States	128
Chart 13 Gross National Product in Current Dollars, Canada and United States	130
Chart 14 Indexes of Nonagricultural Employment, Canada and United States	133
Chart 15 Unemployment Rate, Canada and United States	134
Chart 16 Canadian Non-Residential Fixed Capital Formation and Current Account Deficit as Percentages of Gross National Product	136
Chart 17 Major Components of the Capital Account of the Canadian Balance of Payments as Percentages of Gross National Product	149
Chart 18 Net Purchase of Portfolio Securities and Related Variables	150
Chart 19 Canadian Government Goods and Services Spending, Business Cycles and Unemployment	213
Chart 20 U. S. Government Goods and Services Spending, Business Cycles and Unemployment	214
Chart 21 Canadian Government Fiscal Operations and Unemployment	216
Chart 22 Canadian Residential Construction Investment and Related Series	225

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CHAPTER 1

INTRODUCTION, SUMMARY AND CONCLUSIONS

Introduction

The First Annual Review of the Economic Council of Canada defined the following "basic economic and social goals" for Canada:

- full employment
- a high rate of economic growth
- reasonable stability of prices
- a viable balance of payments, and
- an equitable distribution of rising incomes.^{1/}

This first review also developed measures of economic "potential". The potential of the economy was defined as "a calculated measure of the total volume of production consistent with reasonably full and efficient use of the economic resources available to a nation" or as "essentially a measurement of the supply factors and capabilities of the economy".^{2/}

The notion of medium-term future potential may be given a certain degree of concreteness. Those who will form the bulk of the future labour force are already born, and the size and composition of the labour force may be

^{1/} First Annual Review: Economic Goals for Canada to 1970, Economic Council of Canada, Ottawa, Queen's Printer, 1964, p. 1.

^{2/} Ibid., p. 31. See also B. J. Drabble, Potential Output, 1946 to 1970, Staff Study No. 2, Economic Council of Canada, Ottawa, Queen's Printer, 1965.

projected on the basis of trends in participation rates and assumptions concerning net immigration. Total employment may be calculated from the labour force projections and from an estimate of the minimum achievable level of unemployment (given the existence of a relation between the rate of unemployment and the rate of price change and the imposition of constraints on the degree of price increase). Total output may be calculated from total employment and projections of hours worked and output per man-hour. Variations in the proportion of "potential output" or potential aggregate supply actually realized at any time may then be viewed as arising from fluctuations in aggregate demand.^{1/}

Fluctuations in aggregate demand, reflected in varying degrees of utilization of available resources, have characterized capitalistic industrial societies since their beginnings. The major variations in demand and in economic activity recorded over time in a number of countries by numerous measures of economic performance, after seasonal and short-term irregular influences have been eliminated, have become known as "business cycles". Since business cycle recessions or depressions involve both unemployment and the loss of potential output, sometimes on a very substantial scale, it is clear that their moderation or elimination in Canada would result in more consistent achievement of the country's basic economic and social goals. Similar goals, it may be added, are now accepted as basic policy objectives by the governments of most Western industrial societies. It should be emphasized that the task of fostering the

^{1/} In the longer run, the distinction between supply and demand becomes increasingly blurred. Participation rates and net immigration may vary with the level of demand and productivity with both the composition of demand and its level in relation to the available labour supply. Finally, birth rates are themselves subject to economic influences.

continuous achievement of even one of these goals, namely full employment, is a much more difficult one for policy-makers, in relation to the business cycle, than that of simply pursuing a "contracyclical" policy. The latter could in practice turn out to be merely the taking of steps to limit or counteract further potential declines in demand, following an initial decline, without reference to any quantitatively specified desired level and growth rate of aggregate demand. Sustained achievement of the full employment goal, on the other hand, requires, in principle, the continuous attunement of aggregate demand to the potential level and rate of growth: conceptually, the total dynamic effects -- not just the initial impact -- of any policy change would be evaluated prior to its being implemented.^{1/} The task of attempting to achieve the employment goal concurrently with the other goals in a world of sudden change and considerable uncertainty is thus a very formidable one.

Although, at the present time, the North American economy has enjoyed the unprecedented peacetime experience of over five years of continuous expansion, it would be unwise to conclude on this account alone that business cycles are things of the past. Awareness of the possibility that the circumstances giving rise to past cyclical disturbances could produce them again in the future prompted the Council to enquire explicitly during 1965 into the historical record of business cycles in Canada, and also into possible changes in the North American economic environment bearing on the

^{1/} The complexity of the quantitative relationships in the economy is such that conceptually it is only possible to evaluate the full dynamic effects of a policy change within the framework of a fairly comprehensive, well-specified and carefully estimated model of the structure of the economy. For examples, see Arthur S. Goldberger, Impact Multipliers and Dynamic Properties of the Klein-Goldberger Model, Amsterdam, North-Holland Publishing Company, 1959; and S. J. May, "Dynamic Multipliers and Their Use for Fiscal Decision-Making", Conference on Stabilization Policies, Ottawa, Queen's Printer, 1966, pp. 155-187.

probable future course of such variations. The present paper is in part the outcome of this enquiry. Recognition of the potential role of governments in reducing economic instability also led the Council to undertake, during 1965, a critical examination of the theories and facts concerning the operation of the policy measures traditionally believed to be effective in moderating economic fluctuations. The Conference on Stabilization Policies convened by the Economic Council at the University of Western Ontario in late August, 1965, considered a number of papers dealing with the use of monetary, fiscal and other instruments of stabilization policy.^{1/} Chapter 6 of the Second Annual Review draws upon the consensus of views emerging from this Conference which, in turn, took account of several of the empirical studies conducted by the Royal Commission on Banking and Finance, as well as of a considerable volume of earlier economic literature -- particularly the Report of the Radcliffe Committee on the workings of the monetary system in the United Kingdom and the Report of the Commission on Money and Credit in the United States, together with its associated specialized studies. The Conference volume published by the Economic Council of Canada implicitly supplements the analysis and recommendations relating to economic stabilization incorporated in the First and Second Annual Reviews, although the authors of the papers therein are not necessarily to be associated with the particular policy implications specified and endorsed by the Economic Council.

The general purpose of the present paper is to supplement both the discussions reported in the Conference volume and the factual summaries, analysis and policy recommendations of the two Economic Council Reviews, by providing a summary, not conveniently available elsewhere, of the major characteristics of past business cycle fluctuations in Canada, together with an assessment of the likely form and policy implications of future disturbances. More specifically, the objects may be summarized as:

^{1/} Conference on Stabilization Policies, report of Conference convened by the Economic Council of Canada at the University of Western Ontario, August 30 to September 1, 1965, Ottawa, Queen's Printer, 1966.

first, to assemble a factual record of business cycle fluctuations in Canada; second, to indicate in a general way what are held to be the most important causes of such fluctuations; third, to provide empirical evidence concerning the contributions of the major demand components to the fluctuations in aggregate demand; fourth, to examine the nature and cyclical implications of the interrelations between Canada and the United States; fifth, to document some of the changes occurring in the North American environment over the past 30 years or so which have a bearing upon the probable future course of cyclical variations in aggregate activity and, finally, to indicate the likely form and extent of future instabilities in the economy and thus sketch the probable setting for future stabilization policies. Although the emphasis in the paper is mainly upon description, it is description within a framework of theory. The author has also endeavoured, in assembling the information presented, to take account of the relations between variables indicated by a number of empirical studies. In consequence, it is believed that the variables and relationships discussed represent most of the major elements relevant to a general understanding of the characteristics of cyclical fluctuations in Canada and thus of the setting for current stabilization policies.

Summary

The paper begins, in Chapter 2, by noting the most generally accepted definition of the business cycle in North American economic literature, namely that adopted by A. F. Burns and W. C. Mitchell during the early stages of the work on business cycles undertaken by the National Bureau of Economic Research in the United States. It continues by describing briefly how business cycle turning points have been identified by the NBER from empirical data. Alternative schemes for classifying cyclical experience are mentioned and references are provided to some of the major contributions to the literature on this topic. Attention is

also drawn to the heterogeneity of cyclical experience, related particularly to differences in the behaviour of fixed investment from one "business cycle" to the next.

Chapter 3 initially discusses the historical record of Canadian and U. S. cyclical turning points, as determined by the application of NBER techniques, back to 1873. An important, although hardly surprising, finding is the close similarity in the dates of Canadian and U. S. business cycle "peaks" and "troughs". Also noted and discussed is the existence of trends in both countries towards longer expansions, shorter contractions and diminished amplitudes of cyclical variation.

Chapter 4 provides a summary of some important theoretical and empirical contributions to knowledge of the causes of fluctuations in aggregate economic activity. It also summarizes some of the literature dealing with the particular processes by which business cycles are generated in Canada. Trade, investment, financial and communication links with the United States are found to be of crucial importance. It appears more appropriate to visualize Canadian business cycle experience as an integral feature of common North American experience than to regard it as reflecting the impact upon Canada of business cycles generated exclusively in the United States.

Chapter 5 presents an analysis of the changes taking place over the course of the six contractions since 1929 in the main final expenditure categories of the Canadian and U. S. national accounts. This analysis reveals the marked relative instability of total investment expenditures in both countries. It also indicates the predominance of declines in inventory investment in the minor contractions and the relative unimportance of the declines in inventory investment, compared with the massive declines taking place in fixed investment, during the Depression. The greater stability exhibited by Canadian consumer expenditure is discussed, and the tendency for Canadian total expenditures to decline less than those in the United States during

pronounced declines in fixed investment is noted. A perfect rank correlation is observed, for the United States, between cyclical declines in total investment and the corresponding declines in total Gross National Product. Singled out for further discussion are the key role of inventory changes in most business cycle fluctuations and the importance of longer-term swings in fixed investment in explaining differences among business cycles. An attempt is made to uncover some of the factors underlying the emergence of higher ratios of fixed investment to GNP in Canada during periods of generally high investment. The attention accorded this question arises from two important considerations. First, the tendency for Canada to experience relatively higher and more rapidly rising levels of investment -- particularly construction investment -- during North American expansions is a major feature of difference between Canada and the United States. It is all the more remarkable when contrasted with the high degree of similarity of the two countries in most other facets of dynamic economic experience, as revealed in Chapters 3 and 6. Associated with the relative strength in Canadian fixed investment during North American investment booms is a tendency for demand and output to rise relatively more in Canada at such times. Second, it will be shown in Chapter 6 that the longer-term swings in Canadian fixed investment have been closely related to swings in the current and capital accounts of the Canadian balance of payments. The sensitiveness of fixed investment in Canada appears mainly related (a) to the relative abundance in Canada of resources which may be profitably tapped at times of expanding North American demand and (b) to the capital-intensive nature of the production and distribution of such forms of resource-related output as pulp and paper, hydro-electric power, iron ore, base metals, natural gas, crude and refined petroleum, and primary iron and steel.

The first part of Chapter 6, which deals with Canadian-U. S. interrelations, provides some empirical evidence of linkages between important economic variables in the two countries which tend to bring about similarities in their aggregate cyclical behaviour. The concluding part of the Chapter endeavours to show that, of the various types

of instability, it is the long-term swings in North American fixed investment, rather than the inventory-dominated "short-cycle" fluctuations, which give rise to the major problems of stabilization confronting policy-makers in Canada. As noted above, these fixed investment swings have typically been associated with major changes in the rate of growth of total demand -- and thus with alternating periods of unemployment and inflationary pressure -- and have also given rise to large shifts in the Canadian balance of payments.

Periods of rapidly rising investment in Canada have usually been periods of more rapid Canadian than U. S. growth and there has been a corresponding tendency for Canadian imports to run ahead of exports. A further significant influence on the current account position has been the change in the composition of final demand. Machinery and equipment expenditures and inventory purchases, which tend to expand more rapidly at such times than most other components of demand, have a higher import content. The relative expansion of imports, apart from reflecting these "income" effects, also usually reflects "price" effects resulting from the tendency for prices to increase faster in Canada than in the United States. Both income and price effects raise the marginal propensity to import, thus lowering the value of the multiplier, making possible a sharp rise in the proportion of investment to GNP.

Factors influencing the capital side of the balance of payments at such times are: firstly, an inflow of capital for direct investment, either in existing or newly established subsidiaries or in new acquisitions; secondly, an inflow of portfolio capital arising from net purchases of Canadian securities, especially banks, by foreigners. The bulk of such purchases have been made in recent years by Americans. Foreign purchases of Canadian bonds reflect the development of a greater relative demand for capital funds in Canada than elsewhere during such periods, in turn related to the tendency for Canadian national savings as a percentage of GNP to remain fairly stable, while investment as a percentage of GNP is rising.

Under fixed-exchange-rate, managed-currency conditions, the domestic money supply must be adjusted to maintain a capital inflow which is adequate in relation to the size of the current account deficit; otherwise, reserves will be gained or lost. Such a restriction upon the use of monetary policy may limit its application to the task of promoting domestic stability. Thus, when, for example, excess demand accompanying rising investment threatens the preservation of price stability, the monetary authorities may find it difficult to allow interest rates to rise, since this would result in a large inflow of borrowed capital and a rapid (and perhaps undesired) expansion of the exchange reserves. They may, under these circumstances, allow greater growth of the money supply -- and thus of the demand for goods and services -- than would be the case if balance-of-payments constraints were not operative, and thus help to produce a rise in the domestic price level. The accompanying deterioration in the Canadian balance of payments would relieve the excess demand pressures on the Canadian economy, but at the cost of domestic inflation. In principle, of course, a restraining fiscal policy could prevent the emergence of excess domestic demand pressure. However, since there are political limits to the amount of taxation which may be imposed for the purposes of domestic stabilization, it may not be possible, under certain circumstances, to eliminate excess demand completely, even assuming that the fiscal monetary authorities are technically capable of implementing policy changes which are perfectly timed despite real-world uncertainties.

Under a fluctuating exchange rate system, the monetary authorities would be considerably freer to allow interest rates to rise during periods of rapidly rising investment. The resulting inflow of foreign capital would tend to push up the Canadian exchange rate, with an accompanying deterioration of the current account balance, as in the case of the fixed-exchange-rate system. The deterioration of the current account balance would again be the mechanism whereby the relative excess demand in

Canada was leaked abroad. In this case, however, adjustment would result mainly from an exchange rate correction rather than from inflation in Canada.

In short, the major peacetime stabilization problems facing both Canadian and American policy-makers have usually arisen, in terms of immediate or proximate causes, from long-period variations in the rate of growth of North American fixed investment. In the Canadian case, such variations have been closely linked to major shifts in the capital and current accounts of the balance of payments arising from the extreme openness of the Canadian economy. The task of devising an appropriate stabilization policy has been particularly difficult as a result, since it has involved attempting simultaneously to achieve both domestic and external objectives in a period of rapidly changing domestic and external circumstances. Although the adoption of a fluctuating exchange rate under these conditions would tend to facilitate the simultaneous achievement of equilibrium in the balance of payments and a rate of growth in the domestic money supply appropriate to the promotion of steady growth at stable prices, perhaps the most that could realistically be expected would be some moderation of the effects on Canada of the underlying instability in the North American economy as a whole. Canada's main hope for improved stability lies in the achievement of a smoother future path of expansion in the United States.

Finally, Chapter 7 is devoted to an examination of the factors apparently underlying the reduction in the degree of cyclical instability exhibited by the North American economy in the post-war years and, in particular, to identifying the factors which seem to be working against the re-emergence of a severe depression. In the period since the early 1930's, and particularly in the post-war years, a number of changes favouring improved economic stability have taken place in the North American economy. Of these, the most important appear to have been:

- (i) the strong relative rise in the level of cyclically insensitive government spending and the associated

marked decline in the relative importance of business fixed investment among the more "autonomous" components of expenditure;

- (ii) the recent relative expansion of fairly smoothly growing state and local expenditures within total government spending and the reduced sensitivity of such expenditures to fluctuations in income;
- (iii) the reduced vulnerability of the North American economy to certain adverse consequences of financial panics, attributable to the implementation of a number of important institutional changes following the unfortunate experiences of the Depression years;
- (iv) a reduction in the value of the "multiplier" which magnifies any autonomous expenditure declines which may have taken place as a result of the operation of various automatic stabilizers;
- (v) an associated lessening of the tendency for the economy to generate cumulative downswings;
- (vi) improved monetary management;
- (vii) a tendency, reinforced in recent years by the institutional arrangements governing the granting of government-insured loans, for the flow of funds into house mortgages to vary in contracyclical fashion, in response to cyclical changes in the relative attractiveness of mortgage yields compared with yields on alternative assets;^{1/}

^{1/} The continued operation of this mechanism depends, however, on the demand for funds for housing being sustained during periods of weakening demand for funds for business purposes. Further, in Canada, the contracyclical role of NHA housing will be considerably reduced by recent changes in the procedure for establishing the NHA interest rate and by the change in the Bank Act to permit chartered bank financing of housing at rates above 6 per cent.

(viii) improved international consultation and co-operation;

(ix) last, but certainly not least, the combination of the following developments taking place since the 1930's which together amount to a major breakthrough in the technology of economic management:

an improvement in public knowledge of, and a change in public attitudes towards, problems of stabilization;

an expansion of the body of knowledge available to economic policy-makers and marked growth of their own confidence in their ability to influence the course of economic events;

the expansion and refinement of the network of economic statistics;

improvement of the instruments of stabilization policy;

a marked rise in the political importance of stable economic growth.

Conclusions

The first eight of the changes listed above imply that, even in the absence of discretionary policy action, the economic system has become progressively less likely to generate another depression. However, the increased relative importance of business purchases of machinery and equipment and consumer purchases of durable goods, both of which respond in a highly volatile way to changes in economic conditions, and the continued sensitiveness of inventory investment to varying rates of growth in the final demand sectors, together suggest that some shorter-term cyclical variability may be expected to persist for at least as long as the system is subject either to occasional "shocks"

or to swings in final demand. Minor shocks to the economy could continue to arise from variations in government non-defence spending, sharp shifts in monetary policy, the uneven response of fixed investment to changes in economic conditions, changes in consumer tastes and attitudes, and the economic effects of unusual natural phenomena, such as flood and crop failures. The most likely sources of major shock to the North American economy appear to be the effects of wars, large-scale variations in federal defence expenditures, major changes in trading arrangements and trade disruptions arising from international financial crises. Any of these sources is still potentially capable of producing an expansion or contraction of very considerable dimensions. However, the response of the North American economy to such shocks is likely to be more heavily damped than in the past; in other words, the economy appears today to be considerably less unstable than it was 30 or even 10 years ago. Finally, swings in the rate of growth of total final demand arising, for example, from unevenness in the rate of implementation of new technology, and swings in the rate of growth potential supply, attributable either to the uneven effects on output of new technology or to variations in the flow of available labour resources, may reasonably be expected to continue. Related swings in capital formation may also be expected.

The likely characteristics of developments in Canada may be hypothesized in relation to the expected over-all pattern for North America outlined above. With final demand fairly well maintained, inventory adjustments in the post-war period have been rapidly completed and, as Table 1 indicates, the associated "business cycle" contractions have been completed in about a year. As Table 3 shows, these contractions have been fairly mild, as well as short, by historical standards, although marked by significant declines in output and employment (Charts 6 and 14) and pronounced increases in the percentage of the labour force unemployed (Chart 15). Future inventory swings will probably be accompanied by somewhat similar effects, but they may well tend to become even shorter and milder as the influence upon income and final demand of inventory expenditure cut-backs becomes weaker.

It was noted above that moderate swings in North American fixed investment could be expected to continue. However, even swings in fixed investment which are moderate by historical standards will continue to pose significant problems for Canada, owing to the greater volatility of fixed investment in Canada than in the United States. This has been recently demonstrated both by the experience of the slack 1957-61 years and by the experience of the buoyant 1963-66 period. The variability of Canadian fixed investment is closely related to variations in the North American growth rate and to the structure -- and changes in the structure -- of Canadian production, in turn closely linked to the pattern of Canadian trade, particularly with the United States. The closeness of Canadian trade ties with the United States is increasing. In consequence, Canada cannot hope to escape the effects of instability in U.S. total demand. By the same token, continued improvement in the stability of U.S. growth is the single most important potential source of improvement in the stability of Canadian growth.

To the extent that instability in U.S. growth persists, and Canada wishes to exert an independent moderating influence upon the fluctuations thereby generated in Canadian activity, the problem facing Canadian policy-makers would appear to be that of co-ordinating the use of the major policy instruments available to them in an attempt to reconcile both internal stabilization and external balance-of-payments objectives within the framework of an adequately comprehensive model of the system they are dealing with. In particular, it appears desirable for Canadian stabilization policy to be based on full awareness of:

- (a) the interdependence of Canadian and U.S. economic activity;
- (b) the circumstances underlying major swings in the North American growth rate;
- (c) the volatility of Canadian fixed investment vis-à-vis that in the United States; and

- (d) the current and capital account balance-of-payments implications of these relationships.

Finally, it should be noted that, in addition to being subject to shocks originating elsewhere, particularly in the United States, Canada is potentially capable both of generating its own disturbances and of failing to play its full part in moderating the effects of such disturbances as do emerge, whatever their origin. Recent experience has indicated there is some vulnerability to cumulative collapses of liquidity within the network of Canadian financial institutions. The effects of such financial disruptions upon Canadian output and employment are potentially quite severe. Also, it is not clear, in the current circumstance of increasing decentralization of Canadian fiscal authority, that adequate machinery exists for the development of effective fiscal policies either to promote stable growth directly or to deal with emerging fluctuations in private domestic and international demand.

Although it would be quite imprudent to suggest that the need for "discretionary" stabilization policies has altogether disappeared, the question which arises now -- particularly in the less open economies -- is whether the over-all strategy of economic policy should be considered to be that of reacting to cycles in demand apparently originating in the private sector or whether the purpose of securing stable growth would not be better served by the direct and deliberate promotion of stable growth -- at "potential" levels and rates -- as the strategic policy objective, "discretionary" stabilization policies being pursued more as tactical adjustments within this framework. The notion advanced here is that, in an interrelated dynamic economic system, the greater the number of significant "exogenous" variables which are growing at a stable rate, the greater is the likelihood that the "endogenous" variables will follow a steady growth path. The direct pursuit of stable growth requires government and business demand planning based upon a realistic assessment of the future supply capabilities of the economy rather than upon extrapolation of recent shifts in demand. There is considerable

evidence of a steady shift towards this type of planning by both governments and business, both in Canada and the United States.

To the extent that the achievement of stability requires government action, the willingness of governments to act -- and the appropriateness and decisiveness of their actions -- is evidently of crucial importance. However, the maintenance of improved stability through government action in a democratic society depends to a large degree on the continuance of political support for this objective of policy. If the support is forthcoming and further improvements in reducing instability are achieved in the future, it may be anticipated that, over time, the problems associated in the past with alternating fluctuations in the rate of unemployment and the rate of price advance will become progressively less acute. In these circumstances, problems relating to growth, resource allocation, resource management and the spatial interaction of economic activities will assume ever-increasing importance.

CHAPTER 2

DEFINING, IDENTIFYING AND CLASSIFYING BUSINESS CYCLES

This Chapter discusses the following questions:

- What are "business cycles"?
- How are they identified from the range of economic time series relating to the performance of the economy?
- How should business cycles be classified for analytical purposes?

While it is not unusual in some theoretical literature, as well as in more casual discussion, to assume that "the" business cycle is a clearly and uniquely identifiable phenomenon, with relatively unchanging characteristics, examination of the statistical record of past fluctuations reveals a bewildering variety of actual experience. Further, it becomes evident from study of the empirical record of economic fluctuations that they do not occur in a vacuum; rather, they occur in an environment of continuous interaction between "economic" and "noneconomic" forces and events. Every "business cycle" is associated with a unique historical period and with certain unique events. Further, long-term trends, such as population growth, the exploitation of natural resources, the evolution of our institutions and the irreversible march of science and technology, create, during each cyclical period, an environment that is fundamentally, and not merely superficially, distinct from its predecessors. In order to identify "business cycles" for the purpose of systematic study from the unorganized array of observations which the real world presents for scrutiny, it has therefore appeared necessary

to adopt some definition of the term, the justification for such a definition being its descriptive and analytical usefulness. ^{1/}

The most widely used scheme for organizing empirical material on the fluctuations in various economic activities is that devised by the National Bureau of Economic Research in the United States, ^{2/} which has defined business cycles in the following way:—

^{1/} Much depends on the analytical preconceptions brought to bear upon the study of fluctuations, however. If fluctuations in the measures of aggregate economic activity are regarded as relatively homogeneous phenomena, characterized by certain repetitive features and processes, it is appropriate to chop economic time series up into corresponding "business cycle" segments for study and analysis of these repetitive aspects. On the other hand, if fluctuations in the measures of aggregate activity are believed to represent the results of the operation of a dynamic system of fundamental numerical relationships between component "economic variables", attention is appropriately focused more upon specifying and measuring the numerical structure of these relationships than upon describing and classifying the patterns of aggregate behaviour on the sequences of change in these variables. Despite the differences in emphasis, these methodological approaches may be applied to the same basic data. They may each yield useful insights and should not be regarded as entirely mutually exclusive.

^{2/} See next page.

2/ Among the factors apparently giving rise to the widespread adoption of the National Bureau definition, may be mentioned the following. First, it is a relatively broad definition requiring a minimum degree of prior assumption and inspection of the data and calling for a minimum degree of manipulation of the raw time series. Second, it was shown by Burns and Mitchell in Measuring Business Cycles, New York, NBER, 1947, that certain other more elaborate bases of classification rested on inadequate empirical foundations. Third, the National Bureau itself has acquired considerable stature and acceptance by virtue of its emphasis on business cycle analysis, its nonpolitical, research orientation, the usefulness and calibre of the studies it has sponsored and the quality of its staff and associates. Fourth, the definition and associated research have proved useful in a number of applications. One such notable application has been in the analysis of the timing of "specific cycle" turning points in relation to "reference cycle" turning points and in the identification of time series with typically "leading", "coincident", or "lagging" characteristics. These have proved useful to business and governments in the task of rapidly identifying the current cyclical position of the economy and of forecasting the general characteristics, if not the exact magnitude and timing, of future economic changes. See, for example, Business Cycle Developments, a monthly publication of the Bureau of the Census, U.S. Department of Commerce, and the associated study by Julius Shiskin, Signals of Recession and Recovery, An Experiment with Monthly Reporting, Occasional Paper 77, New York, NBER, 1961. Pioneer studies in this field were W. C. Mitchell and A. F. Burns, Statistical Indicators of Cyclical Revivals, Bulletin 69, New York, NBER, 1938, and G. H. Moore, Statistical Indicators of Cyclical Revivals and Recessions, Occasional Paper 31, New York, NBER, 1961. Both of these studies are reprinted in G. H. Moore, ed., Business Cycle Indicators, Vol. 1, Princeton, Princeton University Press, 1961. Also for Canada, see W. A. Beckett, "Indicators of Cyclical Recessions and Revivals in Canada", Business Cycle Indicators, Vol. 1, p. 294.

Business cycles are a type of fluctuations found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of changes is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character with amplitudes approximating their own.^{1/}

The method adopted by the National Bureau in identifying the month in which a general business cycle turning point has occurred may be described briefly as follows.^{2/}

^{1/} W. C. Mitchell, Business Cycles: The Problem and Its Setting, New York, NBER, 1927, p. 468.

^{2/} For a fuller description of the process of identifying "reference cycles", see A. F. Burns and W. C. Mitchell, Measuring Business Cycles, New York, NBER, 1947, Chapter 4. See, also, A. F. Burns, "New Facts on Business Cycles" in the Thirtieth Annual Report of the National Bureau of Economic Research, May 1950, pp. 3-31, and G. H. Moore, "The Diffusion of Business Cycles" in Economics and the Public Interest, Robert M. Solow, ed., New Brunswick, Rutgers University Press, 1955, pp. 35-38. Both of these articles are reprinted in Business Cycle Indicators, p. 13 and p. 261 respectively.

For detail on the application of NBER techniques to determine Canadian "reference cycles", see E. J. Chambers, "Canadian Business Cycles since 1919", Canadian Journal of Economics and Political Science (hereafter referred to as C.J.E.P.S.), Vol. 24, No. 2, May 1958, p. 166 and "Late Nineteenth Century Business Cycles in Canada", C.J.E.P.S., Vol. 30, No. 3, August 1964, p. 391, and K. A. J. Hay, "Early Twentieth Century Business Cycles in Canada", C.J.E.P.S., Vol. 32, No. 3, August 1966, p. 354.

Original or "raw" monthly data for an economic time series are first adjusted to remove "seasonal" fluctuations.^{1/} "Specific" cycle "peaks" and "troughs" are then identified usually from charts of the adjusted series. The "reference" (or general business) cycle is identified from the consensus of behaviour revealed by the "specific cycle" "peaks" and "troughs" in a very wide range of representative economic time series, as well as from analysis of the performance of certain key aggregate economic series such as total employment, GNP and industrial output. The period between a reference cycle trough, or low point, and the following peak, or upper turning point, is usually termed an expansion. The period between a peak and the following trough is usually referred to as a "contraction". Short and shallow contractions are usually termed "recessions"; long and deep contractions, "depressions".^{2/}

It should be recognized here that alternative classification schemes for empirical material relating to cyclical fluctuations have been used by different analysts. Some have

^{1/} The currently most widely used methods of seasonal adjustment are variants of the ratio-to-moving-average technique. The process of adjustment is usually today carried out on a computer, which can duplicate the results of the best "hand methods" at a fraction of the cost. Ratio-to-moving-average methods of seasonal adjustment are described in most standard statistics textbooks. For a description of the general steps employed in computer applications of the method, see the pioneering article by Julius Shiskin, Electronic Computers and Business Indicators, Occasional Paper 57, New York, NBER, 1957, reprinted in Business Cycle Indicators, p. 517.

^{2/} The terminology used here is that currently employed by business analysts. These terms were defined differently by Burns and Mitchell in the early work of the National Bureau.

pointed to apparent cycles in certain economic activities of longer duration than the "business cycles" identified by the National Bureau of Economic Research. Most notable among these are the apparent 50-year cycles in selected economic time series for various countries, in some cases covering the period back to 1780, associated with the name of Kondratieff,^{1/} and the approximately 20-year cycle in growth rates associated with the name of Kuznets.^{2/}

Others have asserted the existence of systematic and hierarchical relationships between shorter and longer cycles, that is, of "cycles of cycles".^{3/} Still others have distinguished

^{1/} See Nikolai D. Kondratieff, "The Long Waves in Economic Life", The Review of Economic Statistics, Vol. XVII, No. 6, November 1935, pp. 105-115, reprinted in Readings in Business Cycle Theory, Homewood, Illinois, R. D. Irwin, 1951, p. 20. See also A. F. Burns and W. C. Mitchell, Measuring Business Cycles, New York, NBER, 1947, Table 165, p. 432.

^{2/} Simon Kuznets, "Long Swings in the Growth of Population and in Related Economic Variables", Proceedings of the American Philosophical Society, February 1958, p. 7; M. Abramovitz, "The Nature and Significance of Kuznets Cycles", Economic Development and Cultural Change, Vol. IX, No. 3, April 1961, pp. 225-248, and statement to the Joint Economic Committee of the United States Congress, Hearings on Employment, Growth, and Price Levels, Washington, U. S. Government Printing Office, April 1959, pp. 411-466.

^{3/} The best-known of these is the system described by Joseph A. Schumpeter, who argued that each Kondratieff cycle could be subdivided into six "Juglar" cycles of ten years' duration, each divisible, in turn, into three "Kitchin" cycles of roughly 40 months. For a brief discussion of this "three-cycle scheme", see Joseph A. Schumpeter, "The Analysis of Economic Change", The Review of Economic Statistics, Vol. XVII, No. 4, May 1935, reprinted in Readings in Business Cycle Theory, Homewood, Illinois, R. D. Irwin, 1951, pp. 1-19. A critical appraisal of the evidence relating to Juglar cycles in Britain and the United States is contained in R. C. O. Matthews, The Business Cycle, Cambridge Economic Handbooks, Chicago, University of Chicago Press, 1959, Chapter XII.

between cycles of different types identified by particular characteristics, such as the existence of a financial crisis or panic. A common current analytical and theoretical distinction rests upon identifying the predominant element of the demand swing. Reference is thus often made to "inventory" recessions, "fixed investment" booms, "war" booms or post-war readjustment declines, rather than simply to undifferentiated business cycle "expansions" or "contractions".

The simple cyclical hierarchy outlined by Schumpeter was demonstrated by Burns and Mitchell not to fit the facts of U. S. experience.^{1/} Further, Burns and Mitchell showed that the 15-20-year building cycle did not appear to leave a clear imprint on the included, shorter business cycles. There was some relation between the phase of a Kondratieff cycle in prices and the amplitudes of shorter cycles and clearer, although not completely conclusive, evidence of such a relationship with the durations of the shorter cycles. However, the existence of an unambiguous 50-year cycle was itself called into question, as it has been by others.^{2/} Although these findings were damaging to some existing beliefs, Burns and Mitchell took cognizance of cycles in building construction "of remarkably regular duration" (15 to 20 years) and also of the fact that organization of business cycles into periods delineated by "severe depressions"^{3/} partly by definition resulted in systematic differences in their patterns depending on whether they immediately followed, or were

^{1/} Measuring Business Cycles, Chapter 11, Section IV, and especially Table 169, p. 441.

^{2/} George Garvy, "Kondratieff's Theory of Long Cycles", The Review of Economic Statistics, November 1943.

^{3/} The effects of "severe depressions" on economic time series underlie the identification of "long cycles" by Abramovitz and others. This is explicitly recognized by Abramovitz. See his testimony to the Joint Economic Committee of the United States Congress, Hearings on Employment, Growth, and Price Levels, Washington, U.S. G.P.O., 1959, p. 427.

followed by, a depression, or occupied an intermediate position.^{1/} The existence of occasional depressions did not, of course, establish the existence of a "cycle of cycles", and similarities in the patterns and sequences of response in particular activities over the course of both large and small fluctuations led to the adoption by the National Bureau of "the" business cycle as the basic unit of definition in preference to the various alternatives discussed.

While the concept of the business cycle and the framework of reference cycle dates developed by the National Bureau have proved useful in many applications, certain alternative ways of depicting the performance of the economy have also proved of value in both theoretical and policy-oriented applications. Organization of long periods of time into a continuous succession of business cycle periods tends to focus attention upon the similarities among the units so identified rather than upon the differences between them and thus to divert attention from certain highly important features of the historical performance of the economy. Even the most casual reference to the National Bureau's record of economic fluctuations establishes that complete cycles, and phases of expansion or contraction, vary quite widely in duration. Study of the magnitudes of the swings in various activities over these periods indicates a correspondingly wide variation in the amplitudes of cycles. While some of the fluctuations identified as complete cycles represent only minor ripples in the time-paths of the major economic aggregates such as total real output and employment, others represent massive variations in over-all levels of activity. When certain statistical devices are used to smooth long time series to eliminate the influence of the repetitive elements in NBER cycles, the differences between cycles are emphasized and major fluctuations in growth rates, lasting around 20 years and usually culminating in depressions, are readily observable. It has been shown that these major swings are closely related to long cycles in construction activity and to waves of population growth, immigration, internal

^{1/} Footnote 3 on previous page.

migration and international capital movements, as well as in the degree of utilization of potentially available economic resources. Acceptance of the historical evidence on the persistence and pervasiveness of "long swings" does not necessarily involve endorsement of the view that such fluctuations are endogenous (that is, the product of the lagged structural relationships of the economic system) nor does it necessarily imply that long cycles of fairly fixed period will persist into the future. It does, however, draw attention to the historical pattern of alternating rhythms to the path of growth both as a phenomenon meriting explanation in its own right and as a general guide to possibilities and potential problems in the future.

An alternative and equally valid way of looking at the question of "long swings" is to recognize that, although "business cycles", as defined by the National Bureau, exhibit many similarities, they also reveal some profoundly important differences. Because of this, analysis and policy must be as much concerned with the phenomena giving rise to these differences as with the tasks of understanding or coping with the so-called "business cycle" itself. This is tantamount to saying that the process of dividing up the record of aggregate economic performance into business cycle segments does not yield units of an entirely adequate degree of homogeneity for either analytical or policy purposes.

A feature common to both the short- and long-cycle schemes for describing and analyzing cyclical behaviour discussed above is that they attempt to depict certain aspects of actual experience, as opposed to relating such experience to a standard. However, from the standpoint of evaluating economic performance or of devising or appraising economic policy, to know that a period is one of expansion or contraction is insufficient. While, in earlier periods, a number of contractions were so severe that the mere avoidance of the human and material loss accompanying them, had it been possible at the time, would have been considered a major triumph of performance and policy, much higher standards

are now demanded of the economy and of policy if the goal of maintaining full employment is to be fulfilled. The achievement of economic expansion is not, of itself, enough. The policy-maker must now ask whether the rate of expansion and the level of activity achieved are adequate, or whether, on the one hand, the levels and rates of growth of demand are excessive and pose inflationary threats or, on the other, are inadequate to utilize existing and forthcoming resources. Additional constraints on policy are imposed by demands that the potential growth path of the system itself be raised and that the distribution of income meet certain conditions. The over-all policy problem is therefore one of attempting to achieve simultaneously a number of quite specific quantitative objectives, rather than simply that of "off-setting" cyclical contractions in demand in a non-specific way.^{1/}

The dimension that is explicitly added to the question of stabilization in this context is that of supply -- specifically the notion of the "potential" current and future supply

^{1/} The nature and solution of certain aspects of the over-all policy problem in a dynamic economic environment are considered in S. J. May, "Dynamic Multipliers and Their Use for Fiscal Decision-Making" in Conference on Stabilization Policies, Ottawa, Queen's Printer, 1966. Professor May considers the problem of maximizing aggregate employment, subject to a number of specific numerical constraints on economic policy, within the framework of a large-scale econometric model of the Canadian economy, and in relation to specified time-horizons for the operation of the policy instruments and for the achievement of the policy objective.

capacity of the economy^{1/} -- and the stabilization problem has now become that of accurately adjusting the rise in demand to the growing supply potential of the economy, in order that the problems associated with either inadequate or excessive calls upon the economy's capabilities may be avoided. Although the effects of the business cycle, as traditionally defined, are reflected in variations in the degree of utilization of potential, the elimination of business cycles is no longer a satisfactory definition of the objective of stabilization policy.

In commenting upon the change in the emphasis of U. S. economic policy implied in the U. S. government's adoption of the criterion of achieving potential GNP in place of the criterion of leaning against the (cyclical) wind, a former member of the Council of Economic Advisers, Professor James Tobin, observes:

In addition to its analytical usefulness, this apparatus served several purposes in the intellectual battle. Contrast it with the cyclical model. Steady growth at full employment, rather than the path of cyclical mid-points, is the normal and desired equilibrium. The damping of fluctuations is not an end in itself; instead departures from full employment are to be minimized. If the state of the economy is to be appraised by reference to its full employment potential, it is a contradiction to speak of high unemployment in the midst of prosperity. If the gap is large, it is neither a consolation nor an excuse for inaction that activity is increasing and that new statistical records are being set. Indeed the model makes clear that total demand must run ahead, at a rate of 3 1/2 per cent per year in real terms, just to keep unemployment the same. Finally the (potential) analysis indicated more dramatically than the unemployment statistic alone

^{1/} See B. J. Drabble, Potential Output, 1946 to 1970, Staff Study No. 2, Economic Council of Canada, Ottawa, Queen's Printer, 1965, for discussion of this concept and the development of measures of potential output for Canada.

the many dimensions and large size of the national loss due to underutilization -- in jobs, labour force, production, profits and other incomes, and even government revenues.^{1/}

The relationships between measures giving concrete expression to the concepts of "short" and "long" cycles and "variations in the degree of utilization of potential" over the post-war period are portrayed graphically in Chart 1.

Careful examination of Chart 1 reveals both the differences between the various approaches to the depiction of cyclical behaviour and some of the difficulties associated with each. The top panel compares the relation between actual and potential output with a general price change indicator and the unemployment rate. The concept of potential, while intuitively appealing, is somewhat elusive, however, and difficult to measure with complete precision. The path of potential is influenced by the numerous factors determining productivity, participation rates and hours of work. Productivity, as well as being responsive to longer-run influences, including government policy measures, is sensitive to short-run variations in both the level and composition of output.^{2/} Thus "potential" may vary with the composition of demand. The period immediately following the war involved the unique process of reconversion to peacetime levels, standards and composition of output, and poses the problem whether the potential of the economy during this time can appropriately be measured by the techniques applied in the case of the more normal subsequent years.

It might be thought that corroboration of the correctness of the measures of actual and potential output could be obtained by associating periods in which actual output exceeds estimated potential with evidence of inflationary pressures and those in which demand is apparently inadequate with

^{1/} The Intellectual Revolution in U. S. Economic Policy-Making, The University of Essex Noel Buxton Lecture, 1966, London, Longmans, Green & Co. Ltd., 1966, p. 13.

^{2/} See Chapter 4, pp. 75-78 for further discussion of this point.

evidence of unemployed resources. However, to the extent that actual output exceeds "potential" estimated supply, it is evident that real supply has been -- at least temporarily -- expanded to accommodate demand. This might again suggest that the extent of inflation alone be taken as the indicator of the extent of excess demand pressure. Use of the change in a given price index for this purpose would, however, be quite unsuitable. Apart from the question of which price index would most appropriately depict the presence of excess aggregate demand and apart from the usual problems of bias in such indexes, objections may be raised on a number of more fundamental grounds. First, and particularly in an open economy such as the Canadian, foreign price changes and associated domestic price adjustments represent a significant source of price variation not related to the level of domestic demand. Second, inflationary pressures may occasionally arise from the exercise of market power. Such pressures may be "fed" by the monetary authorities if they prefer inflation to the cost, in terms of unemployment, of suppressing it. Third, the process of achieving new equilibrium price and cost relationships following significant price changes in particular economic sectors is not instantaneous. Thus, the price increases being recorded by any general price index at a point in time may reflect the dynamic process of adjustment to an initial disturbance: that is, it may reflect past rather than present excess demand. The rate of unemployment is a less ambiguous measure and does indicate the existence, or virtual absence, of unutilized resources. In addition to its obvious use as an indicator of unused resources, the unemployment rate may be superior to any given general price index as an indicator of excess demand pressure, since, as was noted above, such price indexes reflect influences other than current demand pressures, and are difficult to construct and interpret. A decline in the unemployment rate below an appropriately defined "full employment" level which takes explicit account

of structural, normal, frictional and seasonal unemployment, on the other hand, is fairly clear evidence of excessive current aggregate demand pressure.^{1/}

The middle panel of Chart 1 compares the deviations of actual from potential demand with the periods of business cycle expansion and contraction identified by NBER methods. It clearly reveals the different emphasis and timing of the two concepts; these in turn could well lead to differences in the emphasis of stabilization policy. Two illustrative examples may be cited. First, if economic expansion had been taken to be unqualifiedly desirable, warranting no policy response -- a still not altogether uncommon view -- the period 1954-57 inclusive would have been considered satisfactory, even though actual output was below measured potential during the recovery from the 1953-54 recession, apparently excessive during 1956, and accompanied by inflation, and substantially below measured potential in 1957. Second, if the performance of the economy is judged to be adequate as long as production and employment are rising, however slowly, the expansion between 1958 and 1960 would have been considered satisfactory even though the gap between actual output and measured potential output was growing, particularly in 1959. It may, of course, be argued that the identification of business cycles was not intended to provide the sole basis for initiating policy or for evaluating economic performance. However, it may be observed that the notion that government stabilization policy should be essentially countercyclical still has wide currency, both in economic literature and in public discussion. As was noted earlier, empirical material pertaining to economic fluctuations may be organized in many ways and there is no reason, apart from its usefulness, for preferring one definition of "the cycle" to any other. Thus, if, by defining "cycles" in terms of deviations from potential, one may

^{1/} There may, of course, be a secular decline in this "full employment" value of the unemployment rate, as the "trade-off" between the level of the unemployment rate and the pace of wage and price advance is gradually improved through the elimination of structural, and the retention of frictional, unemployment.

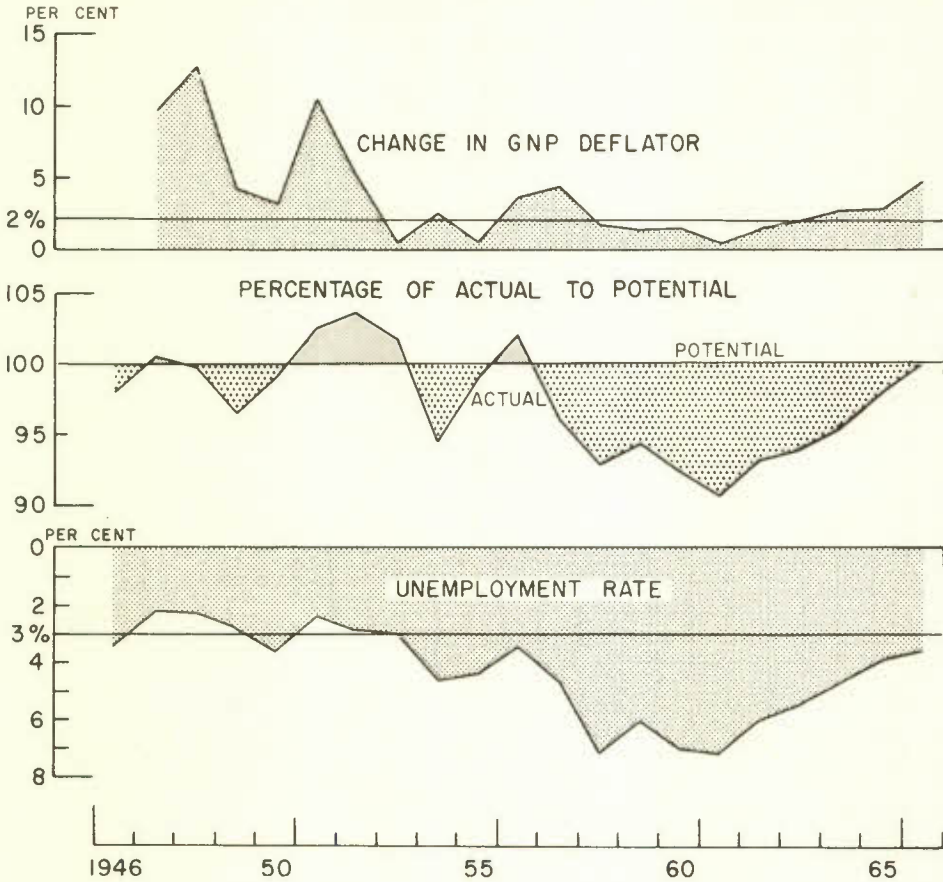
derive a preferred basis for the evaluation of policy, it appears appropriate to adopt such a definition for this purpose. To know the current stage of the cycle in demand is a necessary, but not sufficient, condition for the appropriate formulation of policy.

In the bottom panel of Chart 1, the "long swing" in the rate of GNP growth -- that is, the change in the growth rate of GNP smoothed to remove the influence of short (NBER) business cycles in so far as they are identical -- is presented. This long-swing concept does not yield a depiction of aggregate fluctuations of immediate relevance for current policy decisions. Further, the method of smoothing is such that current values may only be determined retrospectively sometime in the future. In addition, as was noted earlier, the long cycle is an abstraction in the sense that it does not depict actual experience but data manipulated to eliminate certain facets of experience. Again, it only attempts to describe certain aspects of actual experience without reference to standards of performance. Its use and significance appear to lie in its indication of the fact that, after eliminating the repetitive features of NBER cycles, underlying demand growth rates are not uniform but tend to fluctuate over longer periods than that of the NBER cycle and in its demonstration of the past and recent magnitudes of these fluctuations. Its relation to the concept of fluctuations in the proportion of potential output achieved may be clarified by noting that variations in the percentage utilization of potential or in the unemployment rate may be thought of as reflecting the existence partly of certain repetitive short-term demand fluctuations and partly of more fundamental demand swings described by the long-cycle measures. If policy is to be concerned with modifying the causes of variations in the proportion of potential achieved, and not merely confined to alleviating or counter-acting the effects of these variations, the origins of "long swings" (or differences between cycles) warrant enquiry.

Chart 1

VARIATIONS IN THE PRESSURE OF DEMAND
AGAINST SUPPLY, BUSINESS CYCLES
AND LONG SWINGS IN POST-WAR CANADA

VARIATIONS IN THE PRESSURE OF DEMAND AGAINST SUPPLY



"BUSINESS CYCLE" EXPANSIONS AND CONTRACTIONS
(COMPARED WITH ACTUAL AND POTENTIAL GNP)

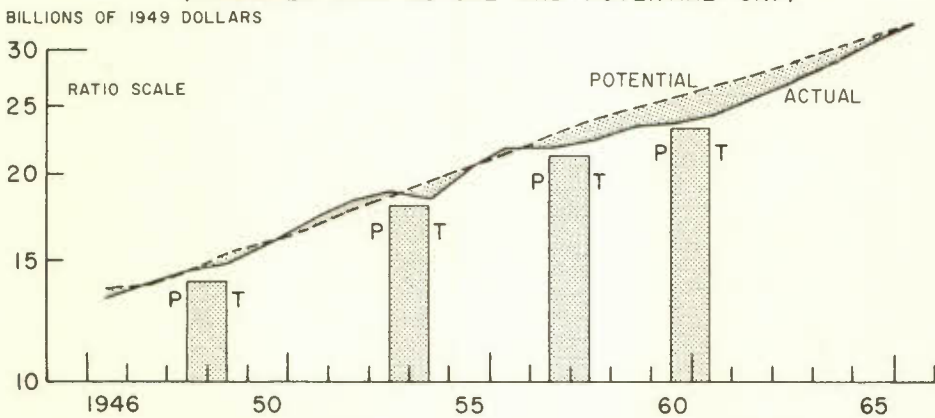
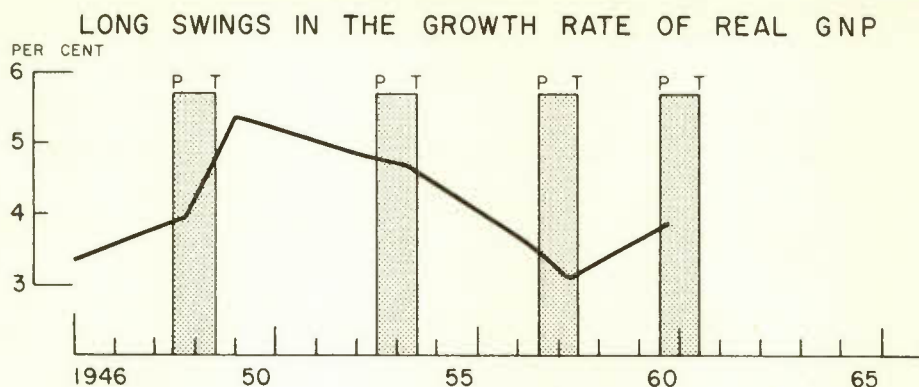


Chart 1 (Cont'd.)



Source: Implicit Price Deflator -- National Accounts,
Dominion Bureau of Statistics.

Percentage of Actual to Potential -- B. J. Drabble,
Potential Output, 1946 to 1970, Staff Study No. 2,
Economic Council of Canada, Ottawa, Queen's
Printer, 1965.

Unemployment Rate -- Canadian Statistical Review,
Historical Summary, 1963, and monthly issues.

Actual and Potential GNP -- B. J. Drabble, op. cit.

Smoothed Growth Rate of Real GNP -- Estimated by
Economic Council of Canada from GNP data, National
Accounts, Dominion Bureau of Statistics, using
techniques developed by M. Abramovitz. See his
Statement at Hearings on Employment, Growth, and
Price Levels, Washington, U. S. G. P. O., 1959,
pp. 414-16.

A perhaps rather crude, practical use for long-cycle measures can be found in the formulation of qualitative assessments of the current economic situation and in the preparation of qualitative forecasts. The tendency for the downswings and upswings of long cycles to last for several years may be used to set current conditions and short-term prospects in better perspective. For example, a contraction occurring during the course of what is believed to be a long-cycle upswing may be expected to be fairly short and not too severe.

In this study it has been found useful to employ the definitions and the chronology of business cycle turning points developed by the National Bureau in summarizing the history of economic fluctuations in Canada and in comparing certain features of U. S. and Canadian experience. However, it has also been found convenient, in analyzing that experience, to draw a distinction between recessions and depressions and, in places, to set aside the NBER framework and look at the question of fluctuations in other ways.

CHAPTER 3

A BRIEF HISTORICAL SUMMARY OF NORTH AMERICAN BUSINESS CYCLE EXPERIENCE

The Main Features of the Historical Record

The full record of business cycle turning points since 1873 revealed by the application of National Bureau of Economic Research techniques to U. S. and Canadian data is set out in Appendix Table A-1.1.^{1/} It is apparent from this Table that turning points in Canadian activity correspond closely with those in the United States. During the period of almost a century over which comparisons may now be made, on only three occasions did the Canadian turning point diverge from the corresponding U. S. turning point by more than six months. In 29 of the 40 pairs of matched turning points shown in Table A-1.1, the divergence in timing was one quarter or less. The timing similarity appears to be just as clear in the years following Confederation, when trade ties with Britain were relatively stronger, and those with the United States relatively weaker, as in the present century. A student of early Canadian business cycle history summarizes his findings relating to 1875-1900 as follows:

The principal findings of this study lend support to a view of the Canadian economy as being peripheral, more nearly attached to the United States than to Western Europe. The evidence is similarity in the timing of cyclical expansions and contractions in Canada and the United States. There was also, apparently, rough correspondence in the amplitude of cyclical changes.... Nothing in the study contradicts

^{1/} Page 236.

the analytical usefulness of treating Canada as a regional unit within a large and expanding North American economy.^{1/}

A further significant fact emerging from Table A-1.1 is that since the Second World War, North American cyclical contractions have been, on average, shorter, and expansions longer, than in earlier historical periods. This finding is summarized in Tables 1 and 2.

Although this record appears to constitute prima facie evidence of a significant change in the incidence of business cycles, the post-war averages reflect to an important extent the absence of a major contraction or "depression" during the post-war period. The sequence of three minor cycles in a row is not unique. Similar sequences occurred in the United States between 1854-69 and 1894-1904.^{2/} Further, although post-war contractions have been shorter, on average, than previously, each was within the range of previous experience. This is also true of the expansions. The over-all amplitudes of expansions and contractions also lie within the range of previous experience. In fact, the contraction of 1957-58 was among the more severe of the minor cycles.

^{1/} E. J. Chambers, "Late Nineteenth Century Business Cycles in Canada", C.J.E.P.S., Vol. 30, No. 3, August 1964, pp. 409-410. The lack of close correspondence between cycles in Canada and Britain is equally apparent. See K. A. J. Hay, "Early Twentieth Century Business Cycles in Canada", C.J.E.P.S., Vol. 32, No. 3, August 1966, Tables 3 and 4. The predominance of the U. S. influence justifies the emphasis in the balance of this study upon comparative analysis of Canadian and U. S. experience and upon Canada-U. S. economic interrelations.

^{2/} Bert G. Hickman, Growth and Stability of the Post-War Economy, Washington, The Brookings Institution, 1960, p. 27.

Table 1

Average Durations of Canadian Peacetime Contractions and Expansions,

Selected Periods, 1873-1965

Period	Contractions		Expansions	
	Number	Average	Number	Average
		Duration (In months)		Duration (In months)
1873-96	6	24	5	26
1919-38	4	23	4	36 ⁽¹⁾
1946-65 ⁽²⁾	3	12	4	39 ⁽³⁾

(1) Canada is regarded as having had a long uninterrupted business expansion from 1924 to 1929. The United States, on the other hand, is regarded as having had a cyclical peak in 1926 and a trough in 1927. This difference in historical experience is an important factor in the relatively longer duration of expansions in Canada than in the United States prior to the Second World War (see Table 2).

(2) Excludes Korean War expansion and following contraction.

(3) Includes, as of December 1966, 69 months of the current continuing expansion.

Source: Appendix Table A-1.2.

Table 2

Average Durations of U. S. Peacetime Contractions and Expansions,

Selected Periods, 1854-1965

Period	Contractions		Expansions	
	Number	Average	Number	Average
		Duration (In months)		Duration (In months)
1854-1900 ⁽¹⁾	9	23	10	25
1900-1939 ⁽²⁾	10	20	9	24
1945-1965 ⁽³⁾	3	10	4	42 ⁽⁴⁾

(1) Excludes Civil War and following contraction.

(2) Excludes First World War and following contraction.

(3) Excludes Korean War and following contraction.

(4) Includes, as of December 1966, 70 months of the current continuing expansion.

Source: Business Cycle Developments, U. S. Department of Commerce.

However, in the post-war period, there has been a reduction in average monthly rates of change in industrial production in the United States and Canada, during both expansions and contractions, as summarized in Tables 3 and 4. The indexes of industrial production cover the major parts of the volatile goods-producing sectors in Canada and the United States. More detailed information on the behaviour of these indexes in the two countries is provided in Appendix Tables A-1.2 and A-1.3. The diminished post-war average rates of change presented in Tables 3 and 4 partly reflect the avoidance of a major depression during this period. However, examination of Appendix Tables A-1.2 and A-1.3 reveals that the rates of change experienced during some of the post-war expansions and contractions have been well below the ranges recorded prior to the Second World War. Thus, there is evidence here that the cyclical record of the post-war period differs from that of earlier periods by more than the fact that a depression has been avoided.

Table 3
Average Monthly Percentage Rates of Peacetime Contraction and Expansion
in Canadian Industrial Production,
Selected Periods, 1919-65

Period	Contractions	Expansions
1919-38	-0.85	+1.02
1946-65*	-0.11	+0.55

* Includes Korean War.

Note: Somewhat different techniques have been employed in computing the Canadian rates of change in this Table and the U.S. rates of change in Table 4. Precise comparisons should therefore not be made on the basis of the data in these two Tables.

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

Table 4
Average Monthly Percentage Rates of Peacetime Contraction and Expansion
in U. S. Industrial Production,
Selected Periods, 1892-1965

Period	Contractions	Expansions
1892-1914	-1.35	+0.95
1919-1938	-1.84	+1.37
1948-1965*	-0.72	+0.73

* Includes Korean War.

Note: Somewhat different techniques have been employed in computing the U.S. rates of change in this Table and the Canadian rates of change in Table 3. Precise comparisons should therefore not be made on the basis of the data in these two Tables.

Source: Julius Shiskin, "The Current Expansion in Historical Perspective", Business Cycle Developments, Bureau of the Census, U.S. Department of Commerce, January 1965.

A Comparative Analysis of Business Cycle Durations

Information on the distribution of the various durations of expansions, contractions and full cycles is set forth in respect of Canada in Tables 5, 6 and 7. In preparing the distribution shown on the right-hand side of each of these tables, it has been assumed that the durations of the corresponding Canadian business cycle phases were significantly influenced by U. S. depressions. These phases are therefore excluded from the distributions concerned. The dates of U. S. depressions since 1870 are given in Table 10 below. Also excluded from the distributions were the wartime expansions and the following contractions. Table 8 identifies all the excluded Canadian phases. It will be observed from Table 5 that, while there has been a moderate concentration of expansions in the 21-25-month interval, the dispersion of

durations is quite wide. By contrast, the concentration of contractions in the 11-15-month interval (Table 6) is quite striking. With the single exception of the Depression, no contraction in the past 50 years has lasted longer than 15 months. Table 7 shows that, excluding the cycles covering war- or depression-influenced phases, about three-quarters of complete Canadian cycles have lasted between 30 and 50 months.

Table 5
Frequency Distribution of

Durations of Canadian Business Cycle Expansions, 1873-1961

Duration in Months	All Expansions, Including Those Influenced by Wars and Depressions		Expansions, Excluding Those Influenced by Wars and Depressions	
	Number of Observations	Per Cent	Number of Observations	Per Cent
11-15	1	5.3	1	8.3
16-20	3	15.8	1	8.3
21-25	5	26.3	4	33.3
26-30	2	10.5	2	16.7
31-35	2	10.5	2	16.7
36-40	2	10.5	--	--
41-45	2	10.5	1	8.3
46-50	--	--	--	--
51-55	1	5.3	--	--
56-60	1	5.3	1	8.3
Total	19	100.0	12	100.0

Note: "Expansions influenced by wars and depressions" comprise: (a) the expansions which include the wartime periods of expansion; and (b) the expansions which followed depressions.

Source: Appendix Table A-1.2.

Table 6
Frequency Distribution of
Durations of Canadian Business Cycle Contractions, 1873-1961

Duration in Months	All Contractions, Including Those Influenced by Depressions		Contractions, Excluding Those Influenced by Depressions	
	Number of Observations	Per Cent	Number of Observations	Per Cent
6-10	2	10.0	2	13.3
11-15	11	55.0	9	60.0
16-20	3	15.0	2	13.3
21-25	--	--	--	--
26-30	1	5.0	1	6.7
31-35	1	5.0	1	6.7
36-40	--	--	--	--
41-45	--	--	--	--
46-50	1	5.0	--	--
51-55	--	--	--	--
56-60	--	--	--	--
61-65	--	--	--	--
66-70	1	5.0	--	--
Total	20	100.0	15	100.0

Note: "Contractions influenced by wars and depressions" comprise the Canadian contractions corresponding with the contractions identified as depressions in the United States (see Table 10).

Source: Appendix Table A-1.2.

Table 7
Frequency Distribution of
Durations of Canadian Business Cycles, 1873-1961

Duration in Months	All Cycles, Including Those Covering Phases Influenced by Wars and Depressions		Cycles, Excluding Those Covering Phases Influenced by Wars and Depressions	
	Number of Observations	Per Cent	Number of Observations	Per Cent
23-29	3	7.9	1	5.3
30-36	11	28.9	6	31.6
37-43	6	15.8	5	26.3
44-50	4	10.5	3	15.8
51-57	6	15.8	3	15.8
58-64	1	2.6	--	
65-71	3	7.9	1	5.3
72-78	--	--		
79-85	--	--		
86-92	1	2.6		
93-99	1	2.6		
100-106	2	5.3		
Total	38	100.0	19	100.0

Note: An "observation" is a complete cycle measured either from peak to peak or from trough to trough. "Phases influenced by wars and depressions" are: (a) the expansion phase associated with a war; and (b) the contraction associated with a depression and the immediately following period of expansion. Cf. Burns and Mitchell, Measuring Business Cycles, Table 168, p. 441. It has been assumed, for lack of alternative evidence, that Canadian cyclical phases, corresponding with U.S. cyclical phases known to have been influenced by depression, would have been similarly affected. See Tables 8 and A-1.2 for phases so identified.

Source: Table A-1.2.

Table 8

Canadian Cyclical Phases since 1873 Influenced by Wars and Depressions

Depressions					Wars		
Peak	Trough	Peak	Duration of		Trough	Peak	Duration of Expansion
			Contraction	Expansion			
(In months)							
Nov. 1873	May 1879	July 1882	66	38	Jan. 1915	Jan. 1918	36
Feb. 1893	Mar. 1894	Aug. 1895	13	17	Oct. 1938	n. a.	n. a.
Dec. 1906	July 1908	Mar. 1910	19	20	Sept. 1949	May 1953	44
June 1920	Sept. 1921	June 1923	15	21			
Apr. 1929	Mar. 1933	July 1937	47	52			

Source: Table A-1.2.

Table 9 presents distributions in respect of the durations of U. S. business cycles covering the more extended period 1854-1961. The tendency for complete cycles to cluster around a mean of roughly 40 months is also apparent in these U. S. data.

Table 9
Frequency Distribution of
Durations of U.S. Business Cycles, 1854-1961

Duration in Months	All Cycles, Including Those Covering Phases Influenced by Wars and Depressions		Cycles, Excluding Those Covering Phases Influenced by Wars and Depressions	
	Number of Observations	Per Cent	Number of Observations	Per Cent
16-22	1	1.96	1	3.57
23-29	1	1.96	0	--
30-36	13	25.49	9	32.14
37-43	11	21.57	8	28.57
44-50	8	15.69	7	25.00
51-57	5	9.80	2	7.14
58-64	4	7.84	1	3.57
65-71	1	1.96	0	--
72-78	2	3.92	0	--
79-85	0	0.00	0	--
86-92	1	1.92	0	--
93-99	3	5.88	0	--
100-106	1	1.92	0	--
Total	51	100.00	28	100.00

Note: This Table represents an up-dated and expanded version of part of Table 168 of Burns and Mitchell Measuring Business Cycles, p. 441. Cycles have been measured on both a peak-to-peak and trough-to-trough basis. "Phases influenced by wars and depressions" are the expansion phase associated with a war, and both the contraction associated with a depression and the immediately following period of expansion.

Source: Measuring Business Cycles, loc. cit., and Business Cycle Developments, U.S. Department of Commerce (monthly), December 1965, Appendix A.

Table 10 identifies the phases of war and depression, the effects of which have been eliminated in preparing the right-hand side of Table 9. It will be noted that three of the "depression cycles", on a peak-to-peak basis, were also within the two-and-a-half to four-year range. Of the five expansions (excluding the current one) lasting longer than three years, four included periods of war and the fifth was the period of recovery from the Great Depression.

A Comparative Analysis of Business Cycle Amplitudes

The amplitudes of North American business cycles are less well catalogued than their durations. Burns and Mitchell in Measuring Business Cycles noted that "unfortunately, we lack at present reliable measures of the amplitude of successive business cycles".^{1/} The major problem at that time was the lack of adequate measures of aggregate output, especially in relation to the period prior to the First World War.^{2/} However,

^{1/} Op. cit., p. 402. However, Burns and Mitchell did rank the expansions and contractions occurring from 1879-1933 on the basis of the ranks of three indexes of business activity (see Table 156, p. 403). Also, G. H. Moore lists the U. S. business contractions of 1920-54 in an "order of severity" based upon a number of measures. See "Measuring Recessions" in Business Cycle Indicators, a Study by the National Bureau of Economic Research, Princeton, Princeton University Press, 1961, Table 5.2, p. 122.

^{2/} The problem, in so far as it relates to the lack of annual data, has been partly overcome since The Office of Business Economics of the U. S. Department of Commerce has now published annual estimates of constant dollar GNP back to 1909 and J. Kendrick has prepared annual constant dollar GNP estimates for the NBER going back to 1889. See Long Term Economic Growth, 1860-1965, Bureau of the Census, U. S. Department of Commerce, Washington, U. S. G. P. O., October 1966. However, annual data are still an unsuitable basis for deriving estimates of amplitude, particularly as related to short and mild contractions and expansions. Ideally, the amplitudes of the latter would be determined from monthly data.

Table 10

U.S. Cyclical Phases since 1854 Influenced by Wars and Depressions

Depressions				Wars			
Peak	Trough	Peak	Duration of		Trough	Peak	Duration of Expansion
			Contraction	Expansion			
(In months)							
Oct. 1873	Mar. 1879	Mar. 1882	65	36	June 1861	Apr. 1865	46
Jan. 1893	June 1894	Dec. 1895	17	18	Dec. 1914	Aug. 1918	44
May 1907	June 1908	Jan. 1910	13	19	June 1938	Feb. 1945	80
Jan. 1920	July 1921	May 1923	18	22	Oct. 1949	July 1953	45
Aug. 1929	Mar. 1933	May 1937	43	50			

Source: Burns and Mitchell, Measuring Business Cycles, pp. 455-8 and Business Cycle Developments, December 1965, Appendix A.

seasonally adjusted industrial production indexes for the two countries are available in respect of the period from 1919 to date and the following two tables set out measures of the amplitudes of business cycle expansions and contractions in Canada and the United States based upon them. The expansions and contractions are also ranked on the basis of these amplitude estimates.

Table 11
Amplitudes of Specific Cycle Expansions
in Canadian and U. S. Industrial Production
Corresponding with Expansion Phases of U. S. Business Cycles

U. S. Business Cycle Expansion Phase	Canadian Amplitude		U. S. Amplitude	
	Per Cent	Rank	Per Cent	Rank
Mar. 1919 - Jan. 1920	5.3	1	9.9	2
July 1921 - May 1923	20.7	8	24.1	8
July 1924 - Oct. 1926	12.8	7	12.2	6
Nov. 1927 - Aug. 1929	10.8	4	10.7	3
Mar. 1933 - May 1937	34.3	10	37.8	9
June 1938 - Feb. 1945	31.5	9	49.4	10
Oct. 1945 - Nov. 1948	8.9	3	11.0	4
Oct. 1949 - July 1953	12.4	6	18.7	7
Aug. 1954 - July 1957	11.2	5	9.4	1
Apr. 1958 - May 1960	6.2	2	11.1	5

Note: Computed from seasonally adjusted monthly data. Amplitude is measure as $100 \frac{(P-T)}{(P+T)}$, where P and T are three-month averages centred on specific cycle peak and trough values of the respective indexes of industrial production. Specific cycle peaks and troughs in industrial production corresponding with reference cycle peaks and troughs are those closest in time to the reference cycle turning points. Where no turn in industrial production corresponding with a U. S. reference cycle turning point took place (as in Canada in 1948 and 1949) the peak and trough of the reference cycle has been substituted in computing the amplitude of the change in production.

Source: Industrial production data from Historical Monthly Statistics and Canadian Statistical Review, Dominion Bureau of Statistics (Canada); and Federal Reserve Bulletin, Board of Governors of the Federal Reserve System (United States).

Table 12

Amplitudes of Specific Cycle Contractionsin Canadian and U. S. Industrial ProductionCorresponding with Contraction Phases of U. S. Business Cycles

U. S. Business Cycle Contraction Phase	Canadian Amplitude		U. S. Amplitude	
	Per Cent	Rank	Per Cent	Rank
Jan. 1920 - July 1921	14.3	9	18.7	7
May 1923 - July 1924	2.9	6	8.7	6
Oct. 1926 - Nov. 1927	1.2	3	2.7	1
Aug. 1929 - Mar. 1933	26.8	10	35.5	10
May 1937 - June 1938	3.3	7	18.8	8
Feb. 1945 - Oct. 1945	9.5	8	20.9	9
Nov. 1948 - Oct. 1949	-1.1	1	4.1	3
July 1953 - Aug. 1954	1.1	2	4.8	4
July 1957 - Apr. 1958	2.5	5	7.2	5
May 1960 - Feb. 1961	1.5	4	3.3	2

Note: See Table 11.

Source: Industrial production data from Historical Monthly Statistics and Canadian Statistical Review, Dominion Bureau of Statistics (Canada); and Federal Reserve Bulletin, Board of Governors of the Federal Reserve System (United States).

It will be observed that, with only two exceptions -- and those occurred during expansions -- the amplitudes of the Canadian phases are smaller than the corresponding U. S. phases. However, there is a strong correlation in the rankings of the amplitudes of expansions and contractions

in the two countries.^{1/} It is also worth drawing attention to the lack of uniformity in the amplitudes of both contractions and expansions. Apart from the Great Depression of 1929-33, and the short but severe (in the United States) collapse of 1937-38, the most pronounced contractions in output were those following the two world wars. In the case of the period following the Second World War, at least, the sharp decline in the volume of output was related to the problems of conversion to peacetime production and was not accompanied by large-scale unemployment. The middle 1920's and most of the post-war period were characterized by quite modest contractions. However, as is shown in Chart 1, the period after 1957 was one of slow growth of output and the gap between actual and potential output widened appreciably.

One may perhaps conclude from this brief examination of the historical record of North American business cycles that two of the most significant questions arising for theory and policy are, first, the causes of cycles averaging roughly 40 months in duration and, second, the reasons why, occasionally, periods of contraction have turned out to be abnormally severe and/or protracted.

^{1/} The Spearman coefficient of rank correlation measuring the degree of similarity in the rankings of the amplitudes of expansions and contractions in the two countries is .806 in the case of expansions and .867 in the case of contractions. Both these values are significant at the 1 per cent level. A significant association between the amplitudes of certain proxy measures of total output in Canada and the United States is found by G. Rosenbluth for the longer period 1903-54. See "Changes in Canadian Sensitivity to United States Business Fluctuations", C. J. E. P. S., November 1957, Tables III and IV. Regression of Canadian manufacturing production cyclical phase amplitudes on the corresponding U.S. cyclical phase amplitudes yielded regression coefficients of .89 for contractions and .68 for expansions. The corresponding correlation coefficients were .92 and .74. Rosenbluth's results again indicate a close relationship between Canadian and U.S. output swings, smaller amplitudes of fluctuation in Canada than in the United States, and a closer relationship between Canadian and U.S. contractions than between expansions in the two countries.

CHAPTER 4

SOME KEY ELEMENTS IN THE GENERATION AND TRANSMISSION OF BUSINESS CYCLES

In this Chapter, an attempt is made to summarize some important theoretical and empirical contributions to the literature concerning the causes of economic fluctuations -- particularly those observed in North America. This is desirable because the remaining chapters present further aspects of Canadian and U. S. cyclical experience but the way in which the data are presented and analyzed cannot help but reflect certain views about the manner in which the economic system generates and transmits disturbances and about the most important variables and relationships involved. The reader will be better able to appreciate the significance of the facts presented later if it is initially made clear why these are considered to be important. It should be emphasized, however, that what follows presents the bare bones only of a number of important concepts and findings, shorn of many of the qualifications which would surround them in a more comprehensive account. The justification for presenting the ideas in this way is that the main purpose of this study is to illuminate some important relationships rather than to attempt either a comprehensive explanation of business cycles or a survey of the very extensive literature on the subject.

It is perhaps worth noting at the outset that there is no simple, widely accepted theory of business cycles. Even attempts to explain what typically occurs in the course of a business cycle run into difficulties because the economic environment is continuously changing and events which are unique to a particular period are woven into the fabric of recorded economic performance. A further difficulty is that only imperfect statistics are available to measure this performance. Fortunately, a number of fundamental theoretical relationships have

evolved which provide deep insights into the forces at work in the course of economic fluctuations, and empirical data reveal that certain significant characteristics of these fluctuations have prevailed over a fairly long period of time. Such uniformities provide some basis for understanding and prediction, but it should be borne in mind that the behaviour over time of an economic system is the end result of the actions of millions of individual human beings, whose actions are linked to one another by numerous technical production relations and by the network of financial flows, all operating within a complex framework of domestic and international institutions. Any theoretical formulation or empirical description of the characteristics of the over-all system must necessarily involve a high degree of abstraction from the complexity of reality.

Theories vary in the extent to which they provide explanations of observable changes in the entire real-world array of cyclically sensitive economic variables. Most theories have focused attention on the relations between a few variables only. They may provide useful and important insights into the nature of the forces at work in the economy, but inevitably fall far short of comprehending the entire system of real-world dynamic relationships. The methods and objectives of cyclical analysis also vary. A useful indication of the possible character of some output fluctuations may be obtained by considering the conditions under which simple, but formally specified, economic models of aggregate demand embodying certain fixed "lagged" relationships will produce oscillations in output.^{1/} An alternative (or

^{1/} See, for example, L. A. Metzler, "The Nature and Stability of Inventory Cycles", The Review of Economic Statistics, Vol. XXIII, August 1941, reprinted in Gordon and Klein, eds., Readings in Business Cycles, Homewood, Illinois, R. D. Irwin, 1965, p. 100; P. A. Samuelson, "Interactions Between the Multiplier Analysis and the Principle of Acceleration", The Review of Economic Statistics, Vol. XXI, No. 2, May 1939, reprinted in Readings in Business Cycle Theory, Homewood, Illinois, R. D. Irwin, 1951, p. 261.

complementary) approach to that of considering the dynamic characteristics of formally specified simple models is to attempt to describe the sequences and patterns of change in cyclically sensitive economic variables which have been typical of past "business cycles".^{1/} A further approach which has been followed is that of examining the dynamic responses of large, multiple-equation econometric models of the economy to various assumed disturbances.^{2/}

Each of these methodological approaches offers advantages and disadvantages for various purposes and they may all to some extent be reconciled with one another. For example, a simple theoretical "macro-model" may, by abstracting from the complexities inherent in a more realistic simulation of the economy, clearly expose the most essential features of the mechanism by which certain types of demand fluctuation are produced, although it would not be directly useful for "predicting" the future course of the real-world economy and thus could not be refuted by empirical testing. Some demand-oriented econometric models of the economy, on the other hand,

^{1/} See W. C. Mitchell, What Happens During Business Cycles, New York, NBER, 1951; A. F. Burns, "New Facts on Business Cycles", Thirtieth Annual Report of the National Bureau of Economic Research, May 1950, reprinted in Business Cycle Indicators, Princeton, Princeton University Press, 1961, Vol. 1, p. 13; and G. H. Moore, "Tested Knowledge of Business Cycles", Readings in Business Cycles, p. 488.

^{2/} Examples are Arthur S. Goldberger, Impact Multipliers and Dynamic Properties of the Klein-Goldberger Model, Amsterdam, North-Holland Publishing Company, 1959; I. and F. L. Adelman, "The Dynamic Properties of the Klein-Goldberger Model", Econometrica, Vol. XXVII, October 1959, reprinted in Readings in Business Cycles, p. 278; R. R. Rhomberg, "A Model of the Canadian Economy under Fixed and Fluctuating Exchange Rates", Journal of Political Economy, Vol. LXXII, No. 1, February 1964, p. 1.

may serve as useful frameworks within which quantitatively to simulate the effects of alternative discretionary policy adjustments, or to forecast certain economic variables, yet inadequately serve to expose the essential character of cyclical disturbances partly because of their dependence on the input of certain "exogenous" variables^{1/} which could themselves play a key role in the production of cycles, and partly because of their failure, in certain sectors, to depict causal, as opposed to purely associative, relationships.^{2/} It is a common practice, in the pursuit of both these two approaches, to focus attention mainly upon fluctuations in demand as the causes of variations in aggregate output.^{3/} However, at any given moment of time, potential constraints exist on the side of supply. These constraints may take the form of rising interest rates, costs, and prices if the further expansion of aggregate demand is at any stage restricted by a growing shortage of money, investible funds, raw materials, investment goods or labour. Any model which ignores the role of the growing constraints which may occasionally be imposed by restricted supplies of goods, factors or money may be limited in explanatory or predictive value. Any model which emphasizes only supply and demand interactions, to the neglect of potentially significant independent influences on demand, will possibly be similarly limited. Finally, an approach which describes typical past "business cycle" sequences and patterns may

^{1/} "Exogenous" variables are variables the values of which are determined outside the model.

^{2/} This should not be construed to suggest that, in principle, econometric models are necessarily more prone to such shortcomings than any other approach to the analysis of cyclical behaviour.

^{3/} In principle, however, there is no reason why either theoretical or econometric models should be solely demand-oriented and some models do incorporate the influence of certain supply factors.

offer advantages in specifying most of the important cyclical variables and in depicting their usual patterns of cyclical response, but may suffer from disadvantages arising partly from the attempt to compress all dynamic experience with a wide range of economic variables into a necessarily somewhat arbitrarily defined framework of "business cycles", partly from the implicit assumption of homogeneity, over time, in the variables, sequences and processes producing these "business cycles", and partly from the fact that such an approach takes no explicit account of the quantitative relations between variables.

In the light of the foregoing discussion, and bearing in mind the complexity of the interactions between the supply and demand forces at work in the economy, it may be concluded that no simple, single model will serve as an entirely adequate background to discussion of the processes by which instability is generated and transmitted in North America. Nonetheless, a number of theoretical concepts and empirical findings do throw a great deal of light upon these processes and underlie most informed discussion about them. Thus they cannot be ignored. Several of these more important relationships and findings are discussed below in a general way without, however, attempting the very large task of trying to unify them within the framework of a formally specified comprehensive model.

The Instability of Investment

Until comparatively recently, the two major components of expenditure in the North American economy were personal consumption and business investment.^{1/} It is generally agreed that fluctuations in the level of economic activity have arisen mainly from variations in aggregate expenditure and that the volatility of investment, in turn, has been the central feature of these variations.

^{1/} It is shown later (Table 20, Chapter 7) that total government expenditure now exceeds private investment expenditure in the United States.

A noted authority on business cycles expresses these ideas as follows:

The most general, all-inclusive statement of the essential character of cyclical movements is that they consist in an increase, or decline, as the case may be, in the purchase of real investment goods and of durable consumers' goods.... But these fluctuations induce a rise and fall of general consumption expenditures, and so income rises and falls by a magnified amount. While the role of durable consumers' goods plays an increasingly important part, it is nevertheless true that the causes of business fluctuations are to be found mainly in the factors which bring about a rise and fall in the rate of real investment.^{1/}

In support of these views may be cited the fact that the historical appearance of cycles coincided with the development of capital-intensive methods of production. Fluctuations in investment are also usually proportionately far larger than those in consumption. Again, investment expenditures have usually been partly financed by borrowings and past savings whereas personal consumption can be shown to depend principally on income received, although it is somewhat unresponsive to shorter-term income changes.^{2/}

^{1/} Alvin H. Hansen, Business Cycles and National Income, Expanded Edition, New York, W. W. Norton Company, 1964, p. 18.

^{2/} See M. Friedman, A Theory of the Consumption Function, A Study by the National Bureau of Economic Research, Princeton, Princeton University Press, 1957, and J. S. Duesenberry, Income, Saving and the Theory of Consumer Behaviour, Cambridge, Mass., Harvard University Press, 1949.

In any event, corporate gross income is far more variable than personal income. Thus investment expenditures are far more sensitive than those on consumption goods and services and there is widespread agreement that the task of business cycle analysis is to provide an explanation of changes in investment and their relationship to changes in total demand within the framework of the over-all economic system.

There is also fairly wide recognition of the fact that the major components of business investment -- housing, other construction, machinery and equipment purchases, and nonfarm business inventories -- do not exhibit fully synchronous fluctuations, and also of the fact that their components do not participate to the same relative extent during both short and long periods of expansion and contraction. Hansen, for example, observes:

When an upsurge in real investment occurs, it is not unusual for the spurt in inventory accumulation to run ahead of the normal requirements indicated by the rising tide. When this is the case, sooner or later a temporary situation in inventory accumulation develops, leading to an inventory recession. Not infrequently the minor setbacks experienced in the major upswings may be characterized as inventory recessions. But sometimes other situations may initiate or aggravate these minor recessions.... Apart from ... special circumstances, one can regularly look for inventory movements to play an important role in the minor cycle.^{1/}

Matthews expresses the theoretical possibilities arising from the assumption of differences in the behaviour of different classes of investment as follows:

Suppose that instead of treating investment as a single whole, the model distinguishes two or more classes of investment which differ to a greater

^{1/} Alvin H. Hansen, op. cit., pp. 19-20.

or lesser extent in their characteristics. Thus a distinction may be made between inventory investment and fixed investment, and within fixed investment between house-building and the rest. For reasons indicated in earlier chapters, inventory investment, taken by itself, is likely to have relatively short cycles, and house-building relatively long ones. What will thus be the pattern of fluctuation in total investment and national income?... At one extreme there may still be a single unified cycle of more or less constant periodicity.... At the other extreme the different classes of investment may pursue their different individual cyclical paths and thereby bring about multiple cycles in total investment and national income.^{1/}

The Multiplier

In essence, the multiplier concept popularized by J. M. Keynes^{1/} stated that some portion of any increase in income received by consumers would be saved, the rest being spent on consumers' goods. Since this spending created further income, part of which, again, would be saved and part spent, it was clear that any initial rise in investment spending gave rise to successive rounds of consumption spending which became smaller in each round by the amount "leaked away" in the form of savings. The original increment to spending was multiplied by an amount which depended upon the savings leakage at each stage: the higher the savings rate, the lower the multiplier, and vice versa. Attempts to raise the rate of saving during periods of low investment and high unemployment merely lowered the value of the multiplier and reduced total

^{1/} R. C. O. Matthews, The Business Cycle, Cambridge Economic Handbooks, Chicago, University of Chicago Press, 1959 (1962), pp. 203-204.

^{2/} J. M. Keynes, The General Theory of Employment, Interest and Money, London, Macmillan & Co. Ltd., 1939, Chapter 10. Keynes acknowledged the origin of the multiplier concept to be R. F. Kahn's, "The Relation of Home Investment to Unemployment", Economic Journal, June 1931.

spending still further. Conversely, lowering the rate of saving under such circumstances raised total expenditures, output and employment. 1/

The multiplier thus provides the linkage by which fluctuations in investment are transmitted to aggregate expenditure. The latter reflects in magnified form any underlying variations in investment.

The Multiplier-Accelerator Mechanism

In addition to determining the level of aggregate income and expenditure via the multiplier, investment is itself related to aggregate income in another way. Except during periods of general excess capacity, at least a part of investment taking place at any time is induced by the need to expand capital facilities in order to accommodate expected future increases in the demand

1/ If $C + I = Y$ (4.1)
 (where C = aggregate consumption, I = aggregate investment, Y = aggregate income) and $C = a + bY$,
 (where a is a constant and b is the marginal propensity to consume) then $Y = a + bY + I$
 $Y - bY = a + I$
 $Y = \frac{a + I}{1 - b}$
 $\Delta Y = \frac{\Delta I}{1 - b} = \frac{\Delta I}{s}$ (4.2)

where s is the marginal propensity to save. If $s = 1/2$, the value of the multiplier is 2 for a unit change in I .

This formulation of the multiplier gives the simplest comparative static case. Consumption is assumed to be a linear function of income and to reach the equilibrium level in relation to income in time period (t), i. e., without lags. For a formulation of the dynamic multiplier, see R. G. D. Allen, Mathematical Economics, London, Macmillan & Co. Ltd., Second Edition, 1959, p. 48ff.

for output. If firms' expectations about future demand are based upon recent demand trends, however, such induced investment may be regarded as related to the rate of change of total income and expenditure in a recent past period. The relation between recent changes in income and the level of current induced investment is usually referred to as the accelerator relation. A rise in investment will generate a rise in total expenditure equal to the increment of investment times the multiplier. This rise in expenditure will give rise to further induced investment in a subsequent period and so on.

The relation between current income and the income of the previous period (or periods) via the accelerator means that, given an initial income value (or values) it is possible to calculate the implied time-path of income over subsequent periods. This time-path would not be oscillatory in the case of a simple single variable model in which the income of the current period was positively related to the income of the previous period only.^{1/} Unless the system by chance established the unique constant equilibrium value, it would tend either to grow or to contract, without oscillating. For cycles to occur, additional assumptions must be made about the system: for example, that real income and output growth will encounter a ceiling established by the limited availability of resources at a certain level of income, or that there is a floor to the level of disinvestment imposed by the fact that gross investment can only fall to zero and thus the maximum rate of disinvestment is the rate at which the stock of capital depreciates.^{2/}

^{1/} See next page.

^{2/} The assumptions, characteristics and limitations of a number of simple multiplier-accelerator models are discussed in R. C. O. Matthews, The Business Cycle, Cambridge Economic Handbooks, Chicago, University of Chicago Press, 1959 (1962), Chapter 2.

^{1/} In these dynamic models, the periods to which variables relate must be specified. The subscripts (t) and (t-1) may be used to denote the current and previous periods respectively. The identity for income (Y) can then be written

$$Y_t = a + b Y_t + I_t \quad (4.3)$$

If $I_t = c (Y_t - Y_{t-1})$

where c is the marginal capital-output ratio, then

$$Y_t = a + b Y_t + c (Y_t - Y_{t-1})$$

$$\begin{aligned} cY_{t-1} - a &= bY_t + cY_t - Y_t \\ &= Y_t (b + c - 1) \end{aligned}$$

$$Y_t = \frac{cY_{t-1} - a}{b + c - 1} \quad (4.4)$$

Since $b = 1 - s$

equation (4.4) may be written

$$Y_t = \frac{c}{c-s} Y_{t-1} - \frac{a}{c-s} \quad (4.5)$$

(If $c = 3$ and $s = \frac{1}{5}$, $\frac{c}{c-s} = \frac{15}{14} = 1.07$)

Y_t will thus be equal to Y_{t-1} plus 7 per cent less the constant amount $(\frac{a}{c-s})$. The condition under which

$Y_t = Y_{t-1}$ may be found by substituting Y_t for Y_{t-1}

in equation (4.5)

$$Y_t = \frac{c}{c-s} Y_t - \frac{a}{c-s} \quad (4.6)$$

$$\frac{c}{c-s} Y_t - Y_t = \frac{a}{c-s}$$

$$Y_t \frac{s}{c-s} = \frac{a}{c-s}$$

$$Y_t = \frac{a}{s} \quad (4.7)$$

Thus, in this simple case, income will grow if the initial value of Y, $(Y_0) > \frac{a}{s}$, will remain stable if the initial value of $Y_0 = \frac{a}{s}$ and will decline if $Y_0 < \frac{a}{s}$.

In the case of multiplier-accelerator models in which current income is related to the income of two or more earlier periods, it is possible, given certain values for the marginal propensity to consume and the accelerator coefficient, for fluctuations to be generated within the model, without the introduction of "nonlinearities" in the form of a floor and ceiling.^{1/} Essentially similar developments of this form of the multiplier-accelerator mechanism were applied to the analysis of cycles in fixed investment and inventories many years ago by P. A. Samuelson and L. A. Metzler.^{2/} Their models will generate cycles for certain ranges of values of the multiplier and the accelerator coefficient. Only at unique values will they generate cycles which are neither "explosive" nor "damped", however. If the cycles generated by these models are explosive, they cannot provide a complete explanation of real world cycles without the incorporation of additional assumptions concerning nonlinearities in the system. Neither can they do so if the cycles which are generated are damped, although it can be shown that a damped system continuously subjected to random shocks will produce a succession of irregular (undamped) cycles.^{3/}

^{1/} Technically, the condition for oscillation to be induced in a model in which income is related to its value in two previous periods is that the roots of the difference equation embodying these relationships be complex. This condition is satisfied when $b^2 < 4c$ in the second order difference equation $Y_t + bY_{t-1} + cY_{t-2} = a \text{ constant}$.

^{2/} See next two pages.

^{3/} R. Frisch, "Propagation Problems and Impulse Problems in Dynamic Economics" from *Economic Essays in Honour of Gustav Cassel*, London, George Allen & Unwin, Ltd., 1933, reprinted in Readings in Business Cycles, p. 155.

2/ See the article cited earlier.

Both Samuelson and Metzler were elaborating concepts developed by E. Lundberg. In Samuelson's model,

$$Y_t = g_t + C_t + I_t \quad (4.8)$$

where g_t = government expenditure in period (t)
 C_t = consumer expenditure in period (t)
 I_t = investment expenditure in period (t)

Consumption spending in period (t) was related by the marginal propensity to consume (b) to total income in the previous period, i. e. ,

$$C_t = bY_{t-1} \quad (4.9)$$

Investment spending in period (t) was related by the accelerator coefficient (c) to the change in consumer spending between the previous period and the current period, i. e. ,

$$I_t = c (C_t - C_{t-1}) \quad (4.10)$$

Substitution into (4.8) and setting $g_t = 1$ gives

$$Y_t = 1 + b(1+c)Y_{t-1} - bcY_{t-2} \quad (4.11)$$

(4.11) yields cycles when $[b(1+c)]^2 < 4bc$

Whether these cycles will be damped or explosive depends upon the values taken by b and c. These determine the values of the two roots of the quadratic auxiliary function employed in the solution of (4.11). For analysis of the regions of values of b and c yielding either damped or explosive oscillatory time-paths, see P. A. Samuelson, op. cit. and R. G. D. Allen, op. cit., Chapter 7.

Metzler introduces, in addition to the accelerator and multiplier relations, an inventory stock replacement equation and an allowance for production in anticipation of sales based upon actual sales in the previous period and the change in sales between the previous two periods. The latter is converted into expected sales by a coefficient of expectations (e) which may take the values $-1 < e < 1$

2/ continued

$$\text{In Metzler's model, } Y_t = u_t + s_t' + s_t'' + v_o \quad (4.12)$$

where u_t = production for sale in period (+)

s_t' = inventory replacement demand

s_t'' = inventory accelerator demand

v_o = noninduced net investment

$$\begin{aligned} u_t &= bY_{t-1} + e(bY_{t-1} - bY_{t-2}) \\ &= (1 + e)bY_{t-1} - ebY_{t-2} \end{aligned} \quad (4.13)$$

where b is the marginal propensity to consume and e is the "coefficient of expectation" relating the change in consumption to the expected change. Inventory replacement demand (s_t') depends upon the difference between actual and expected sales in the previous period.

$$\begin{aligned} s_t' &= bY_{t-1} - u_{t-1} \\ &= bY_{t-1} - bY_{t-2} - e(bY_{t-2} - bY_{t-3}) \\ &\quad - bY_{t-1} - (1 + e)bY_{t-2} + ebY_{t-3} \end{aligned} \quad (4.14)$$

Inventory accelerator demand (s_t'') depends upon the difference between expected sales in the current period and the previous period.

$$\begin{aligned} s_t'' &= c'(u_t - u_{t-1}) \\ &= c'[(1 + e)bY_{t-1} - (1 + 2e)bY_{t-2} + ebY_{t-3}] \\ Y_t &= [(1 + e)(1 + c') + 1]bY_{t-1} - [(1 + 2e)(1 + c')]bY_{t-2} \\ &\quad + (1 + c')ebY_{t-3} + v_o \end{aligned} \quad (4.15)$$

The third order difference equation (4.16) yields cyclical fluctuations for relatively low values of b and c' when the coefficient of expectations (e) is set at unity. (See L. A. Metzler, Readings in Business Cycles, Chart 9, p. 128).

While providing highly revealing insights into the nature and consequences of certain forms of dynamic interaction these models do not, of course, "explain" reality. Their applicability to the analysis of real-world phenomena depends upon how closely the assumptions regarding the nature of the lagged relations and the form and values of the various coefficients embodied in them are satisfied in the real world. There are, of course, additional problems, such as whether the model correctly specifies the significant real-world relationships or whether it is adequately comprehensive.

In both empirical work on the determinants of investment and in theoretical business cycle literature, the essential concept underlying the formulation of the acceleration principle, namely, that an expected need for additional output will tend to call forth a proportional expansion of the capital stock, is widely preserved, but the relationship is usually modified to take account of possibilities such as the existence of excess capacity at certain stages of the cycle. Investment is thus often considered to be positively related to output and negatively related to the existing capital stock or -- what amounts to the same thing -- positively related to desired capital stock as a function of expected output and negatively related to the capital stock actually in existence.^{1/} Since, in addition to the accelerator relation, theoretical literature has emphasized the role of the rate of interest, the marginal efficiency of capital (or expectations) and the supply price of capital goods compared with the prices of output and other inputs as other major determinants of investment, it is clear that, even in terms of traditional macro-economic theory, the forces bearing upon the level of investment at any given time are considerably more complex than is suggested by the simple accelerator effect.

Econometric Models and Business Cycle Analysis

In difference equations models such as those developed by Samuelson and Metzler, the tendency of the system to produce explosive or damped growth, or to give

^{1/} See next page.

1/ See, for examples, Bert G. Hickman, Investment Demand and U. S. Economic Growth, Washington, The Brookings Institution, 1965, the investment equation in the Klein-Goldberger model (Arthur S. Goldberger, op. cit., p. 4) and R. M. Goodwin, "Econometrics in Business Cycle Analysis" in Alvin H. Hansen, op. cit., Chapter 22, p. 417ff.

The relationship may be expressed as follows:

$$I_t = a Y_{t-1} - b K_{t-1} \quad (4.17)$$

where K_{t-1} is the capital stock at the beginning of period (t) ($I_t = K_t - K_{t-1}$)

Alternatively, if

$$I_t = c (K_{t-1}^* - K_{t-1}) \quad (4.18)$$

where K_{t-1}^* = desired capital stock and K_{t-1} = actual capital stock at the beginning of period (t), and $K_{t-1} = k Y_{t-1}$ where k is the desired capital-output ratio,

then $I_t = c (k Y_{t-1} - K_{t-1})$

which may be written

$$I_t = a Y_{t-1} - b K_{t-1} \text{ as in (4.17).}$$

If $K_{t-1} = k Y_{t-2}$ (4.17) may be written

$$I_t = a Y_{t-1} - b k Y_{t-2}$$

If $a = k$ and $b = 1$

$I_t = k (Y_{t-1} - Y_{t-2})$, which is the accelerator relation. Thus, the accelerator relation is a special case of the general relation expressed in (4.17).

(4.17) may also be expressed as a second order difference equation in K , yielding cycles, as in the case of the Samuelson model, for certain ranges of values of the coefficients of the lagged variables.

rise to explosive or damped oscillations, depended upon the parameters of the system, i. e. , upon the values assumed for the accelerator coefficient, the multiplier, the coefficient of expectations and so on. Further, the characteristics of the time-path of the variables in the system depended upon the form and duration of the lags assumed. All of these magnitudes could in principle be estimated empirically by econometric methods and were thus early targets for statisticians and econometricians. With the rapid development over the post-war years of comprehensive and integrated frameworks of economic statistics in the advanced industrial countries, such estimation and testing has become increasingly sophisticated. In addition, the harnessing of electronic technology to the task of computation has greatly expanded the possible scope of econometric work. The development of fairly large macro-economic models comprising large equation systems and the estimation of their structural parameters of these equations has made it possible to examine the dynamic behaviour of all the endogenous variables in such a system under a variety of assumptions, thus greatly increasing the potential generality, precision and scope of cyclical analysis.^{1/} A significant part of recent business cycle literature has been devoted to such analysis of large macro-economic models. Most of these models have been dynamic ones, requiring, among the "predetermined" variable inputs, lagged values of some of the endogenous variables. Several of these models have been simplified or reduced to difference equations in a single variable, and their dynamic characteristics ascertained.^{2/}

^{1/} For a discussion and comparison of five such models, see Carl Christ, "Aggregate Econometric Models", American Economic Review, Vol. XLVI, June 1956, reprinted in Readings in Business Cycles, p. 307. For a simplified exposition of the methods and purposes of econometric analysis see T. M. Brown, "Some Recent Econometric Developments", C.J.E.P.S., Vol. XXV, No. 1, February 1959.

Another interesting introduction is that by D. B. Suits, "Forecasting and Analysis with an Econometric Model", A.E.R., Vol. LII, March 1962, reprinted in Readings in Business Cycles, p. 597.

^{2/} See Arthur S. Goldberger, op. cit., pp. 104-105.

In such cases, the coefficients of the lagged variables have been estimated from empirical data. Thus, there is no need, as in theoretical models of the type discussed earlier, to analyze the dynamic responses of the system to a range of assumed values for these coefficients. An alternative approach is to solve the model iteratively, using such of this year's estimates of the values of the endogenous variables as are required as lagged inputs in deriving next year's values, and so on. This approach requires that either constant or growth trend values be assigned to the exogenous variables. The resulting solution may be scrutinized for evidence of oscillatory tendencies.

During the past few years a number of econometric enquiries with differing orientations appear to have established the conclusion that the structure of the U. S. and Canadian economies is such as to give rise to damped cycles only, with eventual convergence of the system to a stable path.^{1/} Were it not for the fact that the system is being continuously subjected to "shocks" of varying orders of magnitude, it would eventually settle down to this smooth path of growth. Of course, it may be argued that the model structures which have been estimated exclude economic relationships which play a key role in bringing about business fluctuations. While it is probably true that some of the models which have been tested exclude relationships which are highly significant in the real-world

^{1/} I. and F. L. Adelman, "The Dynamic Properties of the Klein-Goldberger Model", loc. cit., pp. 283-288; Arthur S. Goldberger, Impact Multipliers, p. 134, also references to Tinbergen & Klein models, pp. 104-105; M. Kalecki, Theory of Economic Dynamics, London, George Allen & Unwin, Ltd., 1954; R. R. Rhomberg, "A Model of the Canadian Economy under Fixed and Fluctuating Exchange Rates", loc. cit., p. 25; S. J. May, "Dynamic Multipliers and Their Use for Fiscal Decision-Making", loc. cit., Appendix A, p. 175; D. J. Coppock, "The Post-War Short Cycle in the U. S. A.", The Manchester School, Vol. 33, No. 1, January 1965, Tables III and IV, pp. 36 and 39. It may be noted that the Rhomberg and Coppock models were based on quarterly data and both generated strongly damped cycles.

processes by which fluctuations are produced, it must be recognized that many phenomena which influence economic conditions are themselves largely noneconomic. Examples are wars, international tensions and related fluctuations in defence expenditures, technological revolutions, weather fluctuations, natural disasters, major strikes and so on. It is hardly to be expected that economic models should provide explanations for such phenomena. However, most large-scale macro-economic econometric models contain equations "explaining" the level of investment. Fluctuations in investment are, in turn, central to the generation of business cycles.

Two interesting features of an analysis conducted by Irma and Frank Adelman^{1/} were: first, the reintroduction of random shocks of realistic size into the exogenous variables which had initially been projected at trend values to permit the analysis of the internal dynamic characteristics of the Klein-Goldberger model; second, the reintroduction of random shocks of realistic magnitude, equation by equation, into the structural equations of the system. The introduction of shocks into the exogenous variables induced oscillations in most of the endogenous variables, but the amplitudes of these fluctuations did not approximate those experienced in the actual data. However, the reintroduction into each equation of the type of random component eliminated in the process of estimating the systematic, or structural, relations produced fluctuations of realistic amplitude in the "endogenous" variables when the model was solved iteratively to yield their time-paths. These results appear to provide empirical confirmation of the view that observed business cycles arise from the combination of: (1) the initial conditions; (2) the structure of the system; (3) imposed shocks. Without shocks, the system would eventually converge to a non-oscillatory equilibrium. By way of qualification, it should be noted that, despite its 25 equations, the Klein-Goldberger model comprised a highly aggregated set of relationships which were estimated from annual data.

^{1/} See footnote on preceding page.

The investment sector was not subdivided into fixed and inventory components. Thus, the ability of the model to capture the short-term dynamic interrelationships characteristic of inventory swings was limited. However, D. J. Coppock, who estimated the parameters of a Metzler-type inventory model using quarterly data, also found the system to be oscillatory but highly damped. These results tend to confirm earlier findings by Kalecki.

Some Significant Findings of the National Bureau of Economic Research

As was mentioned earlier, another approach to unravelling the causes of business cycles is to undertake a systematic analysis of the entire range of possibly relevant available economic time series in order to establish typical sequences of behaviour and typical patterns of performance. The study of sequences may reveal possible causal relations -- for example, between a downturn in profits or profit margins and the subsequent declines in investment and production -- or the different stages of a process -- for example, the stages at which houses are started, at which expenditure on them reaches a maximum and at which they are completed. Early concentration of effort by research workers at the National Bureau of Economic Research on seasonally adjusting and analyzing monthly time-series data has materially added to our knowledge of the shorter-term interrelationships among economic processes.

An important early finding of the National Bureau was that turns in cyclically sensitive series were not simultaneous, but spread over a long period, with gradual swings occurring as, first, expansive and, later, contractive forces slowly gained ascendancy.^{1/} Study of the distribution of turns in individual series at upper and lower turning points of the reference cycle established that certain series

^{1/} See, for example, W. C. Mitchell, Business Cycles, Berkeley, 1913, Part III; A. F. Burns, "New Facts on Business Cycles", Business Cycle Indicators, p. 13; and G. H. Moore, "The Diffusion of Business Cycles", Business Cycle Indicators, p. 261.

typically led at such times, others coincided with the reference turns, while others lagged. This finding turned out to have important applications to the problem of securing early recognition of cyclical turning points, a matter of some importance for short-term forecasting and policy purposes. The National Bureau leading, coincident and lagging indicators of business activity are now widely studied by business and government agencies. The gradual spread of expansions and contractions was also apparent among essentially similar component series of certain major aggregates, for example, among the component series of aggregate industrial production. The maximum rate of participation in expansion by these component series, as measured by diffusion indexes,^{1/} is invariably reached before the aggregate itself reaches a peak. Similarly, the minimum rate is reached prior to the corresponding aggregate's reaching a trough. In fact, the maximum degree of participation tends to be reached when the aggregate reaches a maximum positive or negative rate of change, rather than when the aggregate reaches a minimum or maximum level. These findings have also been useful for both analytical and forecasting purposes.

^{1/} Diffusion indexes record the percentage of series expanding. Since an aggregate will tend to be rising as long as over 50 per cent of its component series are rising (assuming that these components are approximately equally weighted and that the absolute rates of change among components do not differ, on average, as between contracting and expanding series), turns in the aggregate tend to correspond to the points at which the diffusion index crosses the 50 per cent expanding line. This will be some time after the peak and trough values have been recorded by the diffusion index. See A. Broida, "Diffusion Indexes", The American Statistician, June 1955, pp. 7-16, and G. H. Moore, "Diffusion Indexes, Rates of Change and Forecasting", The American Statistician, October 1955, reprinted in Business Cycle Indicators, p. 282.

As might be expected, the National Bureau discovered a close relation between turns in investment and those in general business activity. Fixed investment expenditures have tended to lag behind turns in general business, but inventory investment has tended to lead.^{1/} Orders and contracts for fixed investment goods also usually show a clear lead. At 18 turning points in the United States, the value of combined orders and contracts for investment goods led by one to six months on 14 occasions and by more than six months on three other occasions.^{2/}

Although the National Bureau has not put together a complete model of the process of business cycle generation, elements of such a comprehensive model are to be found in many of the research studies prepared by its staff. In the present context, what is particularly relevant is an explanation of fluctuations in the value of fixed investment decisions and in the value of realized investment. Milton Friedman, in commenting on W. C. Mitchell's early work, observed:

As I read Mitchell, he considered the chief determinants of the amount of investment that business enterprises decide to undertake to be prospective profits, costs of construction, and the availability of, and rates of interest on, loans. Prospective profits, in turn, he considered closely related to current profits and their distribution, and current profits, to the current profit margin and the physical volume of sales. The behaviour of some of these

^{1/} G. H. Moore, "Leading and Confirming Indicators of General Business Changes", Business Cycle Indicators, Table 3.2, pp. 56-57.

^{2/} G. H. Moore, "Tested Knowledge of Business Cycles", Readings in Business Cycles, Table 1, p. 499.

determinants of investment has already been discussed: the differential movements of prices widen the profit margin during the early stages of an expansion and thus reinforce the direct effect on profits of the expansion in the physical volume of sales; the expansion in the physical volume of sales also tends to produce a distribution of profits unfavourable to further expansion of investment; it also brings higher costs at fixed prices that tend to inhibit the further widening of the profit margin and the further increase of profits or to produce declines. As to the other determinants, the same factor that tends to make unit costs rise in all expanding industries -- essentially, a rising cost curve -- operates with special force in investment goods industries because of the wider fluctuations in output. In this way, rising cost curves serve as a double deterrent to the continued expansion of investment -- by inhibiting the widening of the profit margin and by raising construction costs. Finally, for reasons to be discussed in connection with monetary forces, after expansion has proceeded for a while, interest rates tend to rise sharply and loans to become less readily available.

Similar forces operate in a contraction. The differential response of selling prices and wages would by itself lead to a narrowing of the profit margin in a contraction, though with a lag, and thus reinforce the direct effect on profits of the decline in the volume of business. But the reduction of the level of output reduces unit costs, including construction costs, at fixed prices;

interest rates fall; and loans become more readily available -- all factors that tend to encourage investment.^{1/}

The factors bearing upon the determination of profits have been a subject of continuing research at the National Bureau, as attempts have been made to reformulate tentative hypotheses in the light of new empirical findings. In this connection, Solomon Fabricant writes:

If I had the time I could illustrate this process of construction and reconstruction with our studies of one of the elements of what is popularly referred to as the "cost-price squeeze". I would start with the account Mitchell gave in 1913 of how prosperity breeds depression and recall his hypothesis that "the very conditions that make business profitable gradually evolve conditions that threaten a reduction in profits"; that among these conditions were rising prime costs per unit of product, and counting heavily in prime costs -- though more in some industries than in others -- were unit labor costs; and that unit labor costs could be expected to rise, especially in the later stages of business expansion, first as a result of the characteristic cyclical behavior of wage rates, and second because of the probable cyclical behavior of the quantity of labor used per unit of product. I would then go on to show how Mitchell's conjectures guided our work when we began the study of business cycles; what questions were raised about labor costs when Hultgren came to grips with the matter, in so far as it

^{1/} See M. Friedman, "The Economic Theorist" in W. C. Mitchell, The Economic Scientist, New York, NBER, 1952, p. 264. The Appendix to Section III of this article constitutes a concise mathematical statement of the business cycle theory implicit in Mitchell's work.

could be analyzed in the records of American railroads; how Mitchell revised his hypothesis in the light of this work and also of the Bureau's studies of labor productivity, Creamer's analysis of cyclical fluctuations in wage rates, and his own preliminary analysis of the figures for manufacturing; what Moore found when he carried the analysis of the manufacturing data a step forward; how the results obtained for the interwar period compare with the recent behavior of wage cost per unit; and what Hultgren is doing to advance the analysis of his current studies of costs in individual industries. Let me merely mention that our studies do show that in manufacturing as a whole, at least, labor cost per unit typically turns upward in the final stages of business expansion. While Mitchell's original hypothesis about unit labor cost requires alteration in certain significant details, its main point is consistent with the facts for certain important industries as we have been able to observe them.^{1/}

This theme has found recent expression in the Forty-Second Annual Report of the National Bureau published in 1962.^{2/} In brief, the cyclical volatility of corporate profits is attributed (at least for manufacturing) mainly to fluctuations in profits per unit rather than to fluctuations in the number of units sold. The variation in unit profits is found to be a reflection mainly of changes in price-cost ratios, produced by pronounced cyclical variations in unit costs -- especially unit labour costs.

^{1/} S. Fabricant, "Basic Research and the Analysis of Current Business Conditions", Business Cycle Indicators, pp. 11-12.

^{2/} G. H. Moore, "Tested Knowledge of Business Cycles", loc. cit., Section 4.

Product price changes do not contribute materially to cyclical variations in profit margins. Variations in unit labour costs arise from cyclical variations in output per man-hour and from less-pronounced cyclical variations in average hourly compensation. In the early stages of an expansion, for example, output per man-hour advances rapidly. Advances in average hourly compensation are proportionately smaller and unit labour costs thus fall.^{1/} Unit profits expand sharply as a result. Later on in the expansion, the rise in output per man-hour becomes smaller and the rise in average hourly remuneration larger.^{2/} Unit labour costs rise and unit profits fall. This simplified account ignores the role of costs other than wage costs, but this is justified, for manufacturing as a whole, because wage costs constitute by far the most important cost component, and profits tend to be a residual income category. That the average hourly remuneration of labour tends to vary inversely with the cyclically sensitive unemployment rate (the "Phillips curve" relation) is well established empirically. Why output per man-hour should fluctuate so markedly over the course of the business cycle appears at least partly related to the overhead nature of many forms of labour in relation to short-period fluctuations in output. Output is far more volatile than final demand over the course of the short cycle, the divergences between the two reflecting the role played by inventories.

The proportional contribution of inventory changes to the level of total investment varies very considerably at different stages of the business cycle, being particularly important during the course of the recession and in the

^{1/} G. H. Moore, op. cit., Chart 4, p. 498.

^{2/} Ibid., Chart 4. For a fuller discussion, see Thor Hultgren, Changes in Labour Costs During Cycles in Production and Business, Occasional Paper 74, New York, NBER, 1960.

early stages of expansion. In the post-war years, in the United States, declines in inventories have accounted for 70 per cent of the declines in GNP during recessions, and increases in inventories have accounted for 25 per cent of the increases in GNP during the first year of expansions. Over all, the contribution of inventories to GNP during expansions has been 13 per cent.^{1/} Thus, there is a significant diminution in the contribution made by inventories as an expansion matures and, as Moore observes, "not only did the contribution of inventory investment to the rate of expansion in GNP become smaller as the expansions proceeded, but it accounted for a large part of the reduction in the rate of expansion itself".^{2/}

It would appear, then, from these National Bureau findings, that inventory swings, themselves reflecting, with a lag, changes in final sales^{3/} strongly influence the volume of output and thus productivity, unit costs and unit profits over the course of the cycle. Unit profits, in turn, influence, with some lags, investment and realized capital expenditures. From this series of lagged relationships, based on monthly or, at most, quarterly data, it appears possible to construct an endogenous cyclical mechanism. This could, however, again turn out to be quite highly damped.

^{1/} The Role of Inventory Changes During Expansion and Contraction, Report of the Task Force appointed by the subcommittee on Economic Stabilization, Automation and Energy Resources, Joint Economic Committee, Washington, U.S. G. P. O., 1962, p. 1. See also T. M. Stanback, Postwar Cycles in Manufacturers' Inventories, New York, NBER, 1962, Table 3, p. 10. Changes in manufacturing inventory investment are quantitatively predominant within the total of nonfarm business inventory investment.

^{2/} G. H. Moore, op. cit., p. 510. This statement takes on added significance when account is taken of the multiplier effects of changes in the rate of inventory investment.

^{3/} The Role of Inventory Changes, pp. 4-5.

The implicit NBER cyclical model set out here does not yet appear to have been subjected to econometric testing. It offers advantages over certain other approaches, however, in incorporating and relating the most cyclically volatile components of the income and expenditure sides of the National Accounts, namely corporate profits and inventory investment, and appears potentially capable of providing an explanation of the interrelated, but differently phased, movements of fixed and inventory investment. It would also seem to be consistent with the modest effect on investment found for "residual funds" or "cash flow" variables in empirical work on the determinants of investment. The dominant effects usually discovered for sales and capital stock variables would be relevant mainly to the explanation of the longer-term fluctuations observed in fixed investment -- particularly non-residential construction. The implicit NBER model described here appears to provide an explanation primarily of the endogenous mechanism of the typical "inventory cycle", which, in reality, also usually entails some prior dip in the level, or at least the growth rate, of final demand in response to changes in fixed investment. It does not appear to provide an explanation of the major long-term swings in fixed investment.

Long Swings or Major Cycles in Fixed Investment

Evidence of the existence of longer-term swings in building construction and in aggregate activity is presented in a number of NBER studies. As noted in Chapter 2, Burns and Mitchell were keenly aware of the existence of fairly regular long swings on building construction and of their effects upon total economic activity.^{1/} Renewed interest in the influence of such swings is

^{1/}

A. F. Burns and W. C. Mitchell, Measuring Business Cycles, Chapter 11, especially pp. 418-427.

apparent in several recent studies by Abramovitz.^{1/} A study by D. J. Daly employing similar techniques to those used by Abramovitz reveals the existence of long swings in Canadian data, of similar timing and duration to those occurring in the United States.^{2/} Whether long swings are isolated by the particular technique used by Abramovitz -- broadly that of measuring the rates of change in a number of aggregate economic time series after smoothing out the influence of typical inventory cycles -- or by some other device, such as Kuznets' measurement of decadal changes between five-year moving averages of population, labour force, capital formation and GNP data, or by simply observing the evidence of expansions and contractions of exceptional amplitude in unsmoothed (seasonally adjusted) time series,^{3/} the existence of longer-term fluctuations in building construction and in total real output is widely recognized.^{4/}

It is neither possible nor necessary, in this study, to attempt to provide a comprehensive explanation of these longer-term fluctuations in fixed investment, particularly those not associated with the long swing in building construction. However, one may conclude that the available theoretical and empirical evidence does not provide much support for an explanation of such fluctuations as the product solely of an endogenous cyclical mechanism, although the multiplier-accelerator process provides an important part of the explanation of the tendency for cumulative movements to develop, as well as of the tendency of the system to oscillate in damped fashion when subjected to shocks.

^{1/} See next page.

^{2/} See next page.

^{3/} See next page.

^{4/} See next page.

- 1/ M. Abramovitz, Evidences of Long Swings in Aggregate Construction Since the Civil War, Occasional Paper 90, New York, NBER, 1964; "The Nature and Significance of Kuznets Cycles" in Economic Development and Cultural Change, Vol. IX, No. 3, April 1961; Statement at Hearings on Employment, Growth, and Price Levels, Para. 2, pp. 411-466. Also, see S. Kuznets, Capital in the American Economy, No. 9 in NBER studies in Capital Formation and Financing, Princeton, Princeton University Press, 1961, Chapter 7.
- 2/ D. J. Daly, "Long Cycles and Recent Canadian Experience", Royal Commission on Banking and Finance, Appendix Volume, Ottawa, Queen's Printer, 1965, Appendix K.
- 3/ Alvin H. Hansen, by inspection mainly of series pertaining to durable goods output, identifies, between 1865 and 1938, seven "major" and 11 "minor" cycles. In each of the contractions following the major cycle peaks, durable goods output fell by 25 per cent or more. The average duration of the seven major cycles (trough to trough) was about 10 1/2 years. The range was from six to 13 years. Exceptionally severe contractions, or "super-depressions", were associated with the downswing of the building cycle, of which there were four in the United States between 1864 and 1934, with an average duration of between 17 and 18 years. See Business Cycles and National Income, Chapters 2 and 3. Somewhat different durations are observed if the major cycles are identified from total manufacturing output data instead of durables output data. The range increases to from four to 13 years. On the grounds of poor periodicity and the apparent causal influence of quite diverse events upon the more moderate major contractions, Matthews rejects the hypothesis that a systematic major cycle exists. See R. C. O. Matthews, op. cit., Chapter 12.
- 4/ See, in addition to the previously noted references, Alvin H. Hansen, op. cit., Chapter 3, pp. 39-52, R. C. O. Matthews, op. cit., Chapter VI, pp. 98-112 and Bert G. Hickman, op. cit., pp. 306-323.

These shocks may arise in a number of different ways. Further, contractions and expansions may be significantly reinforced by certain other influences discussed below.

Some of the various types of shock were mentioned earlier. The examples given were: wars, fluctuations in defence expenditures, the implementation of revolutionary changes in technology, major fluctuations in the weather, natural disasters and major strikes. To these may be added: major natural resource discoveries, variations in government spending related to the implementation of new domestic policies, major changes in the money supply, major changes in tariffs, and crises in international liquidity and domestic credit. Although it is convenient, for certain theoretical purposes, to consider such events as random shocks imposed on the economic system, it is evident that, in fact, they may interact in different ways and may not be entirely independent of the systematic dynamic forces at work in the economy.^{1/} It is also likely that, at times, two or more such disturbances will reinforce one another, while at others they may be partially offsetting.

A number of additional factors appear to reinforce the cumulative upward and downward movements in total demand associated with the operation of the multiplier-accelerator mechanism and may contribute, on occasion, to the establishment of a turning point. For example, in practice, it is often difficult to distinguish whether an investment is being undertaken primarily to expand capacity, to replace worn-out facilities or to incorporate technical changes. When demand is expanding strongly, cash flows are high, borrowing costs low and capital goods prices relatively depressed, there will be strong inducements to

^{1/} The treatment of certain influences as exogenous or as random shocks in an econometric model is partly a matter of choice and convenience. Such influences may in the real world be systematically related to the generation of fluctuations, yet be excluded from the relationships formally specified in the model.

business firms to implement investment projects of all sorts. Conversely, when the opposite conditions prevail, business firms are reluctant to undertake any but the most necessary or most profitable projects. Both capital replacement and capital deepening investment will often be postponed at such times.

Reinforcement of cumulative tendencies may also arise from the "bunching" of investment in oligopolistic or competitive industries. In the case of oligopolies, rounds of plant and equipment expansion are sometimes undertaken because each firm wishes to preserve its share of the market, even though each knows that the overall effect will be periodically to produce substantial excess capacity lasting for a number of years. Competitive firms may in total overshoot the appropriate increase in capacity because they are all acting more or less independently on the basis of price guides relating to past conditions. These guides may, however, be quite misleading as indicators of future conditions.

A partly intangible, but nonetheless significant, role in exaggerating expansions and contractions is played by the state of expectations, or the general climate of business confidence and optimism, strengthened, in turn, by the forces of speculation. Speculation is usually particularly prevalent in the areas of finance and real estate. Burns and Mitchell compared the behaviour revealed by time series representing physical activity and those representing financial activities over the extended period 1879 to 1933. They found that some apparently systematic differences showed up between the two types of series in the course of the successive short cycles experienced during the longer periods marked off by severe depressions. Referring to "a provocative feature of the evidence" they observe:

This feature is that the series representing industrial activity seem to behave in a different way within the provisional long-cycle periods than do the series representing interest rates and speculation. While the average rise is

largest in the first and smallest in the last group of specific cycles in both iron production and deflated clearings, it is smallest in the first and largest in the last group in bond yields, call money rates, and shares traded. In the last group of cycles the average rise is nearly the same as the average fall in shares traded and bond yields, not much smaller in call money rates, but considerably smaller in iron production. These differences suggest a hypothesis along the following lines. After a severe depression industrial activity rebounds sharply, but speculation does not. The following contraction in business is mild, which leads people to be less cautious. Consequently, in the next two or three cycles, while the cyclical advances become progressively smaller in industrial activity, they become progressively larger in speculative activity. Finally, the speculative boom collapses and drastic liquidation follows, which ends this cycle of cycles and brings us back to the starting point. This hypothesis will repay exploration and may turn out to have substance; but what the cycle-by-cycle measures in Table 174 show is that the rises and falls of different activities do not follow invariably the above or any other simple pattern.^{1/}

The tendency for the quality of credit to decline over the course of long periods of expansion is another manifestation of the gradual growth of confidence and abandonment of caution accompanying continued prosperity. An eventual collapse of excessively speculative investments has in the past often led to a liquidity crisis. In these circumstances, attempts by individuals to increase their liquidity by decreasing their expenditures in relation to their incomes serve to emphasize declines in aggregate demand arising from other causes.

^{1/}

Measuring Business Cycles, p. 460.

Overoptimism, lack of caution and speculation during long periods of expansion, and collapses of confidence and excessive conservatism during major contractions thus appear to play a dual role. In general, these attitudes tend to reinforce cumulative multiplier-accelerator forces in either an upward or downward direction; however, a general collapse of confidence, with an ensuing scramble for liquidity, a sharp jump in the number of business failures and a decline in the money stock constitutes a major shock in its own right. Of the six severe U. S. contractions occurring between 1867 and 1960, four featured major banking or monetary crises and in all six the stock of money declined appreciably.^{1/} The severest decline was associated with the great 1929-33 Depression. Over the course of the 1929-33 contraction, the U. S. stock of money declined by a third, one-fifth of the U. S. commercial banks "suspended operations because of financial difficulties" and the total number of banks declined by a third.^{2/} Friedman and Schwartz, while agreeing that, "as events unfolded, the decline in the stock of money and the near-collapse of the banking system can be regarded as the consequence of nonmonetary forces in the rest of the world", nonetheless maintain that "it is hardly conceivable that money income could have declined by over one-half and prices by over one-third in the course of four years if there had been no decline in the stock of money".^{3/}

In summary, it may be concluded that the causes of "long swings" (or variations over time in the amplitudes of "short" cycles) are not yet fully understood. However, they have been associated with long-period expansions and contractions in fixed investment, in which the incorporation of new technology has undoubtedly at times played a highly significant role. The cumulative effects of the operation of the capital stock adjustment mechanism appear

^{1/} M. Friedman and A. J. Schwartz, A Monetary History of the United States, 1867-1960, A Study by the National Bureau of Economic Research, Princeton, Princeton University Press, 1963, p. 677.

^{2/} Ibid., p. 299.

^{3/} Ibid., pp. 300-301.

unquestionably to have contributed to these long swings, and the severity of the contractions has been usually greatly intensified by an accompanying contraction of the supply of money and by the development of collapses of confidence, scrambles for liquidity and financial crises and panics.

Business Cycles in an Open Economy

The discussion so far has concentrated upon what happens in an economy to produce fluctuations, without taking into account the economic effects of interrelations between countries. In other words, the discussion has been based on the assumption of a "closed" economy. However, this assumption is obviously unrealistic in the Canadian case. The most obvious way in which conditions in one country may influence developments in another is via the trade connections between the two.^{1/}

In the Canadian case, roughly 40 per cent of commodity production is exported in total and about 25 per cent flows to the United States. Newsprint, pulp, paper, iron ore, nonferrous metals, natural gas and electric power, all of which require relatively large capital inputs for their efficient and competitive production, bulk large in total Canadian exports to the United States. As a result, Canadian investment in commodity-producing industries is far more sensitive to American influences than even the large figure for the absorption of our commodity production by the United States quoted above would suggest. When account is taken of the connections via both trade and investment, it will be apparent that a very strong link exists whereby disturbances originating in the United States are transmitted to Canada (and vice versa).

The strength of the Canadian-American connection, and the nature of the fundamental cumulative forces underlying the generation of business cycles have long been recognized in Canada. Thus, R. B. Bryce, writing in 1939, observed:

^{1/} See next two pages.

1/ The simple model of (4.1) may be expanded to illustrate the effects of trade between two countries upon the values of the multiplier in each country as follows:

$$\text{Define } Y^a = G^a + C^a + I^a + E^a - M^a \quad (4.19)$$

where G = government expenditure,

E = exports,

M = imports, and the

superscript (a) denotes country A.

This may be written

$$Y^a = G^a + a^a + b^a Y^a + I^a + E^a - m^a Y^a$$

where m is the marginal propensity to import

$$Y^a - b^a Y^a + m^a Y^a = G^a + a^a + I^a + E^a$$

$$Y^a = \frac{G^a + a^a + I^a + E^a}{1 - b^a + m^a} = \frac{G^a + a^a + I^a + E^a}{s^a + m^a}$$

$$\text{but } E^a = m^b Y^b \text{ and } E^b = m^a Y^a$$

$$\text{Thus } Y^a = \frac{G^a + a^a + I^a}{s^a + m^a} + \left[\frac{m^b}{s^a + m^a} \right] \left[\frac{(G^b + a^b + I^b + m^a Y^a)}{s^b + m^b} \right]$$

which after manipulation yields

$$Y^a = \frac{m^b (G^b + a^b + I^b) + (G^a + a^a + I^a) (s^b + m^b)}{s^a s^b + m^a s^b + m^b s^a} \quad (4.20)$$

$$Y^b = \frac{m^a (G^a + a^a + I^a) + (G^b + a^b + I^b) (s^a + m^a)}{s^a s^b + m^a s^b + m^b s^a} \quad (4.21)$$

$$\text{If } s^a = s^b = s$$

$$Y^a + Y^b = \frac{(G^a + G^b) + (a^a + a^b) + (I^a + I^b)}{s} \quad (4.22)$$

$$\text{Where } G^a + G^b = \text{a constant, } \Delta (Y^a + Y^b) = \Delta \left(\frac{I^a + I^b}{s} \right)$$

which is directly analogous to the simple closed economy case given in (4.2).

Comparison of equations (4.20) and (4.21) reveals that the relative stimulus to income in country A arising from, say, an additional \$100 million of government expenditure in A depends upon the marginal savings and import propensities in B compared with those in A.

If $s^a \approx s^b$ and $m^a > m^b$, a given amount of increased government expenditure will increase income more in B than in A. This result has significance for the analysis of Canada-U.S. relationships. About 60 per cent of Canadian exports go to the United States and the United States, in turn, supplies about 70 per cent of Canadian imports. The bilateral trade between Canada and the United States is the major element in each country's total trade. The far higher Canadian than American marginal propensity to import implies that the United States receives a greater total stimulus to income from an additional expenditure of \$100 million than does Canada. This is also true of total investment. The relatively lower value of the multiplier in Canada helps to explain the higher proportion of investment to total GNP in Canada. This approach is a useful one since it focuses attention on the determinants of the marginal propensities to import in the two countries. In this simple static model, the marginal propensity to import is considered to be a fixed proportion of income in each country. This unrealistic assumption is relaxed later (see Chapter 6).

It is essentially this dependence of investment on current incomes, and thus to some degree on itself, that provides the basis for many of the cumulative forces which enter into the business cycle. Once the rate of investment begins to move in one direction or the other, it affects income in such a way as to justify to some degree that initial movement and to induce a further change in the same direction.

An important consequence of this is that in Canada our well-being is even more dependent on exports than at first appears to be the case. Current international receipts constitute the chief direct determinant of our national income. They not only have secondary effects by way of the multiplier, thus increasing domestic consumption expenditure, but their influence being already so great means that they are the major element in determining investment itself.^{1/}

Strong as the trade and trade-induced investment relations between Canada and the United States are, they by no means exhaust the channels through which fluctuations are transmitted. Bryce drew attention to the important role played by the state of business expectations and the sympathetic movements of Canadian and American security markets. After commenting on certain technical connections between the Canadian and American markets, he added:

More significant, probably, in the long run is the contagious nature of American business and financial opinion, to which we are continually exposed. British observers claim that American business opinion is always far too unanimous, and that more divergence of interpretation of events is to be found in Britain and Europe.

^{1/} "The Effects on Canada of Industrial Fluctuations in the United States", C. J. E. P. S., Vol. V, No. 3, August 1939, p. 382.

The relatively wider short-period swings in American security prices necessary to find holders for all of them is cited as presumptive evidence for this view. Perhaps Canada is only too ready to share in this unanimity. It is easy to do so now that statistical services are so widely used, now that the same general information is available to most traders and businessmen, and the methods and possibilities of analysis are fairly uniform. Apart from the information itself, we are constantly in touch with American sentiment by way of newspapers, radio, periodicals, and personal contacts. It is very difficult for us to avoid feeling optimistic when they do, and depressed when they feel depressed.

This contagion of spirit works on a wider field than just the stock market. Direct investment by corporations and by small businesses is affected by it. These are also affected by the experience of both Canadians and Americans in the American markets.... We are dependent in one way or another on the United States for a good deal of our "venture capital" in the industrial field. If capital in that country is on the defensive, we suffer too.^{1/}

The study of Canadian-American relations prepared for the Royal Commission on Canada's Economic Prospects by Brecher and Reisman also stressed the importance of factors additional to the investment and trade connections between Canada and the United States. This study concluded as follows:

So interwoven are their patterns of technology, corporate decision-making, business confidence, and consumer behaviour that cycle transmission has been far more complex and effective than

^{1/} Ibid., pp. 383-384.

would appear from exclusive concern with the more direct and tangible links....^{1/}

An important question arising in this context is whether there has been any significant change over time in the extent of Canada's dependence upon cyclical conditions in the United States. This question was carefully considered in two articles by G. Rosenbluth^{2/} appearing in 1957-58. Rosenbluth concluded:

In summary, the study of amplitudes shows a significant decline in Canadian sensitivity to fluctuations in United States production from the twenties to the thirties and the post-war period. No conclusion is possible as to the change between the latter two periods. An appreciable decline in relative Canadian amplitudes is also evident between the period 1903-14 and the twenties, but it is possible that this might have been due to random factors.

While the decline from the twenties was significant, that is to say, large in relation to possible chance variations, it was not large in any absolute sense. The change in relative amplitudes could hardly be detected with the naked eye (on charts, for example) and it has been necessary to use the equivalent of a

^{1/} I. Brecher and S. S. Reisman, Canada-United States Economic Relations, Ottawa, Queen's Printer, 1957, pp. 63-64. It should be pointed out that Brecher and Reisman feel that these factors present an "incomplete picture of causation in Canadian cycle experience". They draw attention to a number of differences in Canadian and U. S. cyclical behaviour.

^{2/} G. Rosenbluth, "Changes in Canadian Sensitivity to United States Business Fluctuations", C.J.E.P.S., Vol. 23, No. 4, November 1957, pp. 480-503 and "Changing Structural Factors in Canada's Cyclical Sensitivity", C.J.E.P.S., Vol. 24, No. 1, February 1958, pp. 21-43.

microscope in order to see it. From the point of view of economic policy, it is of interest that the changes in Canadian fluctuations relative to those in the United States have been so very small, in spite of impressive changes in the industrial structure and in the economic role and importance of government. 1/

... the structural changes to be expected in the near future are not great, and if past experience is a guide, any resulting changes in Canada's cyclical sensitivity will be very slight indeed. The basic fact of dependence on United States business conditions will remain the major feature of Canadian fluctuations. 2/

1/ "Changes in Canadian Sensitivity", loc. cit., p. 494.

2/ "Changing Structural Factors", loc. cit., p. 42.

CHAPTER 5

SOME MAJOR EMPIRICAL FEATURES OF RECENT NORTH AMERICAN CYCLICAL FLUCTUATIONS

Analysis of Gross National Product Changes during Recent Recessions

From Chart 13^{1/} it will be observed that Gross National Product, which measures the current dollar gross value of all final output plus the current value of net changes in the physical volume of intermediate goods inventories, records the impact of business cycles either in alternating rises and declines or in fluctuating rates of growth. GNP is apparently less sensitive to business cycles than a goods production series such as industrial production, mainly because it reflects the behaviour of the over-all level of prices, which has in recent years usually trended upwards, and because it covers expenditures on services, as well as goods, and the former are usually far more stable than the latter.

Examination of cyclical changes in the components of Gross National Expenditure and Gross National Product is interesting and useful, since any findings may readily be related to the implications of a considerable body of modern economic theory, some of which has been discussed in the previous Chapter. Official GNP estimates for Canada are available on an annual basis in respect of the years from 1926 on. For the post-war period since 1947, the data are available on a quarterly basis in both raw and seasonally adjusted form. Similarly, detailed official U. S. GNP estimates are available on an annual basis in respect of the years from 1929 on, and, on a quarterly basis, seasonally adjusted, they are available for the period from 1946 on. It is thus possible

^{1/} See p. 130 below.

to study the changes occurring during the 1929-33 Depression and the severe 1937-38 contraction from Canadian and American annual data and to observe the changes taking place in the two countries over the course of the milder post-war recessions from more sensitive quarterly data. Table 13 presents an analysis of the demand changes occurring in Canadian GNE in the course of the six contractions since 1929, expressed as percentages of the initial peak levels of GNE.

A number of interesting facts are revealed by Table 13. Note may be taken, first of all, of the remarkably small amplitudes of the post-war contractions compared either with the declines occurring at the time of the Depression or during the 1937-38 contraction. Secondly, it will be observed that all of the contractions (except 1948-49)^{1/} featured declines in some or all components of total investment. However, declines in inventory investment -- defined as the value of the physical change in non-farm business inventories -- which predominated in the total demand shifts over the post-war and 1937-38 recessions were of minor relative importance in the Depression. The Depression was unique in recent experience in that massive reductions in all other components of expenditure -- including personal expenditure -- took place. Even so, personal expenditure rose as a proportion of total expenditure because the decreases occurring in all other areas of expenditure combined were proportionately far greater. This is indicated by Table 14, which shows the percentage declines occurring in the components of final demand.

^{1/} Although 1948-49 has been identified as a period of cyclical contraction in Canada, further examination of the appropriateness of this conclusion appears desirable in the light of the strength apparent in all demand components except exports, in total GNP, and in total industrial production, over the period in question.

Table 13

Changes in Components of Canadian Gross National Expenditure (Excluding Error) during Cyclical Contractions

as Percentages of Peak GNE (Excluding Error)

(Current dollars)

	1929 to 1933	1937 to 1938	IVQ 1948 to IIIQ 1949	IIQ 1953 to IIQ 1954	IIQ 1957 to IIQ 1958	IQ 1960 to IQ 1961
1. Personal expenditure	-26.57	0.24	3.83	2.21	3.40	1.90
2. Government expenditure	- 2.89	0.88	2.05	0.40	1.52	0.87
3. Residential construction	- 2.56	-0.30	0.35	0.03	1.25	-0.51
4. Non-residential construction	- 6.69	-0.34	0.20	-0.11	-0.79	-0.29
5. Machinery and equipment	- 5.79	-0.13	--	-0.42	-1.70	-0.64
6. Change in nonfarm inventories	- 3.47	-2.52	0.51	-2.69	-1.47	-1.67
7. Change in total inventories	- 2.32	0.90	1.19	-3.09	-1.86	-2.72
8. Exports	(-13.08)	(-4.41)	(-1.98)	(-1.68)	(0.50)	(0.09)
9. Imports	(18.13)	(2.85)	(0.28)	(1.64)	(2.00)	(0.11)
10. Net exports	5.05	-1.56	-1.70	-0.04	2.50	0.20
Total (equals change in total GNE excluding error)	-41.78	-0.30	5.93	-1.02	4.32	-1.20
Total GNE change in current dollars	-42.78	0.40	4.91	-1.25	3.45	-1.06
Total GNE change in constant dollars	-29.82	0.58	3.68	-3.93	1.24	-2.14

Note: For pre-war period annual data were used; for post-war period quarterly data were used. In this Table, the change in each component is expressed as a percentage of the peak level of GNE excluding error. The result is, for each component, its percentage point contribution to the total percentage change in GNE excluding error.

Source: National Accounts, Dominion Bureau of Statistics.

Table 14

Percentage Changes in Components of Canadian Final Demand Expenditures

during Cyclical Contractions

(Current dollars)

	1929 to 1933	1937 to 1938	IVQ 1948 to IVQ 1949	IIIQ 1953 to IIIQ 1954	IIIQ 1957 to IIIQ 1958	IIQ 1960 to IQ 1961
1. Personal expenditure	-35.43	0.34	5.75	3.53	5.41	3.01
2. Government expenditure	-27.81	7.59	16.95	2.28	8.45	4.80
3. Residential construction	-68.70	-9.69	7.69	0.70	29.03	-11.81
4. Non-residential construction	-84.08	-9.58	3.59	-1.67	-8.07	-4.09
5. Machinery and equipment	-80.95	-2.69	--	-4.95	-18.57	-8.56
6. Exports	-49.39	-14.77	-7.33	-7.53	2.55	0.44
7. Imports	57.43	10.79	1.15	6.78	8.02	0.48
Total Final Demand (equals GNE excluding error and inventory change)	-39.79	-1.20	4.75	2.12	6.25	1.56

Note: (See Table 13).

Source: National Accounts, Dominion Bureau of Statistics.

This Table shows the truly staggering extent of the reduction during the Depression in fixed investment, particularly business fixed investment, which dropped by 1933 to under a fifth of its 1929 peak value. In the post-war period, some significant declines in non-residential construction and machinery and equipment spending have occurred, especially between 1957 and 1958, but strength in other final demand sectors has helped to maintain the level of total expenditure.

An examination of U. S. experience reveals somewhat similar patterns of performance. Tables 15 and 16 present U. S. data comparable with those shown in respect of Canada in Tables 13 and 14. With the exception of the 1953-54 contraction, in which cut-backs in government military expenditures were the major source of demand weakness, the post-war recessions were, as in the Canadian case, dominated by swings in inventory investment. The "shift" in inventories was also a major contributor to the 1937-38 recession. In the Depression, however, although the inventory shift was larger, relative to the initial peak level of GNP, than in the most recent three post-war recessions, it represented only a small fraction of the over-all decline in demand. Precipitous declines in the components of final demand were the predominant feature of the mammoth drop in total expenditures. The cut-backs in business fixed investment, while less severe than in Canada, were nonetheless drastic. The reduction in residential construction -- to about one-seventh of its peak value at the 1933 trough -- was even greater than in Canada.

The differences between Canada and the United States are also of interest. A comparison of Tables 13 and 15 shows that the declines in U. S. total expenditures were very considerably greater than those in Canadian total expenditures during the two pre-war contractions. In the post-war period, the two more severe U. S. recessions -- 1948-49 and 1957-58, in terms of declines in GNE -- was also more severe than in Canada, where GNE were rising strongly under the stimulus of expanding personal and government expenditures.

Table 15

Changes in Components of U. S. Gross National Expenditure during Cyclical Contractions

as Percentages of Peak GNE

(Current dollars)

	1929 to 1933	1937 to 1938	IVQ 1948 to IVQ 1949	IIIQ 1953 to IIIQ 1954	IIIQ 1957 to IIQ 1958	IIQ 1960 to IQ 1961
1. Personal expenditures	-30.48	- 2.86	0.83	1.72	0.81	0.42
2. Government expenditures	- 0.44	1.24	1.14	- 2.05	1.39	1.09
3. Residential construction	- 3.29	0.10	0.57	0.68	- 0.11	- 0.28
4. Non-residential construction	- 3.91	- 0.60	- 0.53	0.08	- 0.31	0.10
5. Machinery and equipment	- 4.01	- 1.55	- 1.17	- 0.33	- 1.03	- 0.71
6. Change in inventories	- 3.18	- 3.82	- 3.64	- 0.79	- 1.86	- 1.47
7. Exports	(- 4.49)	(- 0.24)	(- 0.98)	(- 0.11)	(- 0.72)	(- 0.22)
8. Imports	(3.73)	(1.34)	(0.38)	(0.30)	(0.02)	(0.36)
9. Net exports	- 0.76	1.10	- 0.60	- 0.41	- 0.70	0.58
Total (equals change in total GNE)	-46.07	- 6.39	- 3.41	- 0.27	- 1.81	- 0.28
Total GNE change in constant dollars	-30.50	- 5.07	- 1.64	- 1.57	- 3.45	- 1.45

Note: For pre-war period annual data were used; for post-war period quarterly data were used. In this Table, the change in each component is expressed as a percentage of the peak level of GNE. The result is, for each component, its percentage point contribution to the total percentage change in GNE.

Source: Survey of Current Business, August 1975, U. S. Department of Commerce.

Table 16

Percentage Changes in Components of U. S. Final Demand Expenditures

during Cyclical Contractions

(Current dollars)

	1929 to 1933	1937 to 1938	IVQ 1948 to IVQ 1949	IIIQ 1953 to IIIQ 1954	IIIQ 1957 to IIQ 1958	IIQ 1960 to IQ 1961
1. Personal expenditures	-40.70	- 3.89	1.25	2.73	1.27	0.64
2. Government expenditures	- 5.30	9.49	8.43	- 9.24	7.16	5.57
3. Residential construction	-85.76	4.71	10.87	14.04	- 2.50	- 6.06
4. Non-residential construction	-81.23	-22.32	-14.89	2.34	- 7.73	2.79
5. Machinery and equipment	-73.74	-28.73	-16.50	- 5.48	-15.81	-11.54
6. Exports	-65.85	- 4.77	-16.35	2.33	-12.21	4.01
7. Imports	65.27	28.45	9.63	6.51	0.48	7.56
Total Final Demand (equals GNE excluding inventory change)	-43.61	- 2.64	+ 0.23	+ 0.52	+ 0.05	+ 1.19

Note: (See Table 15)

Source: Survey of Current Business, August 1965, U. S. Department of Commerce.

In the case of the two milder post-war U. S. recessions -- 1953-54 and 1960-61 -- the Canadian declines were more pronounced, and the shift in inventories relatively much larger, than in the United States. Although total inventory investment in Canada appears just as volatile in the post-war years as before the war, this is attributable to the fact that changes in farm inventory investment offset those in business inventory investment during the pre-war period but tended to reinforce the latter in the post-war period. Business inventory investment in both Canada and the United States has revealed relatively smaller variations in the post-war years.

A further interesting difference between the Canadian experience and the U. S. experience summarized in Tables 11 to 14 is the consistently stronger performance of personal expenditures in Canada. Since personal expenditures are the largest single component of demand in the two countries, it might initially appear possible that the apparent tendency for Canadian total expenditures to decline less than those in the United States during the more severe contractions could be attributable to systematic differences between the two countries in the behaviour of personal expenditure in relation to total income and expenditure. However, this does not appear to be so. No single factor seems capable of explaining the consistently better performance of Canadian personal expenditure, but the greater strength during contractions in all other components of final demand combined has been one important factor. So also has been the tendency for personal income to show greater resistance to declines in GNP in Canada than in the United States.^{1/}

The factors tending to promote stability in Canadian personal disposable income relative to GNP will be examined more intensively in Chapter 7, but it is

^{1/} See Appendix 2 for a brief further discussion of differences in the behaviour of personal expenditure in relation to GNP in Canada and the United States.

convenient here to consider the reasons why the components of final demand other than personal expenditure should decline to a greater extent in the United States than in Canada. A prevalent belief is that Canadian imports are more volatile than Canadian exports and that during a period of cyclical weakening, Canada tends to ship abroad some of the burden of contracting demand. A glance at Table 13 shows that net exports were a depressive influence in three of the six contractions considered and, in a fourth, the improvement in net exports was negligible. This is not the whole story, however. Closer examination of Table 13 indicates that on the two occasions when net exports did contribute to a strengthening in total expenditures, the contribution was substantial and associated with significant declines in fixed investment and imports. Thus, while the Canadian net export position tended to deteriorate in the course of recessions dominated by inventory fluctuations, a noteworthy improvement occurred during periods of decline in business fixed investment and particularly over the course of the Depression. The significance of this finding is amplified in Chapter 6.

A general finding of considerable importance emerges when the U. S. contractions are ranked in order of the severity of the declines in GNP and the respective declines in investment are compared. This is done in Table 17.

The Table shows the same ranking for GNP declines as for declines in total investment. The components of investment also reveal a close rank correlation. However, the magnitude of the decline in fixed investment compared with that in inventory investment during the Depression indicates that the major fall in fixed investment was the distinctive feature of the Depression as compared with the less severe contractions.

This analysis of GNP changes during contractions may be concluded with a brief reference to the role of governments. A drop in government expenditure was a

serious source of weakness in Canada during the Depression. Such expenditures fell by about 28 per cent in Canada compared with just over 5 per cent in the United States. These severe Depression declines in Canada occurred at all levels of government. Federal goods and services expenditures fell by 28 per cent, provincial spending dropped by 29 per cent and municipal by 27 per cent. Over the first three post-war recessions, however, government expenditures were relatively stronger in Canada than in the United States.

Table 17

Percentage Declines in U.S. Gross National Product and Investment
in Order of the Severity of the GNP Declines

(Current dollars)

	Percentage Change in GNP	Percentage Change in Total Investment	Percentage Change in Fixed Investment	Percentage Change in Inventory Investment
1929-33	-46.07	-14.40	-11.21	-3.19
1937-38	- 6.39	- 5.87	- 2.05	-3.82
1948-49	- 3.41	- 4.77	- 1.13	-3.64
1957-58	- 1.81	- 3.31	- 1.45	-1.86
1960-61	- 0.28	- 2.36	- 0.89	-1.47
1953-54	- 0.27	- 0.36	+ 0.43	-0.79

Source: Survey of Current Business, U. S. Department of Commerce.

The Roles of Inventory and Fixed Investment Swings

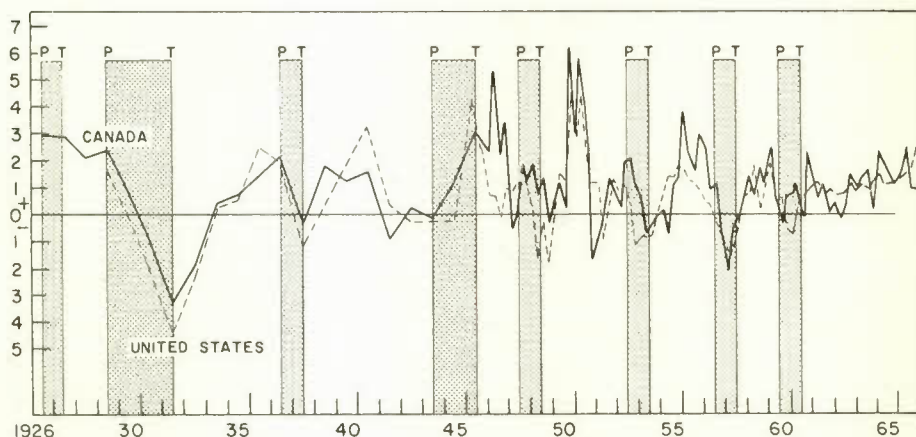
(a) Inventory fluctuations

The major role of inventory fluctuations in recent North American cyclical swings is depicted visually in Chart 2, which compares nonfarm business inventory spending as a percentage of GNP in Canada and the United States. The close correspondence between the periods of declining inventory investment and most of the periods identified as U. S. cyclical contractions is clearly apparent.

Chart 2

CHANGES IN NONFARM BUSINESS INVENTORIES AS PERCENTAGES OF GNP, CANADA AND UNITED STATES

(Current dollars)



Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: National Accounts, Dominion Bureau of Statistics and Survey of Current Business, U. S. Department of Commerce.

An obvious exception is the period of inventory reduction between 1950 and 1951, following the speculative inventory boom occurring during the early part of the Korean war. The inventory reduction between 1951 and 1952 represented a marked weakening in the demand for goods and is in fact reflected in a significant dip in Canadian and U. S. industrial production (Chart 6).^{1/} Other components of demand -- particularly U. S. federal military spending -- were very strong at this time, however, and the decline in inventory demand was thus not reflected in a decline in GNP (Chart 13).^{2/} It will be noted that Canadian business inventory expenditures have been slightly more volatile than those in the United States since the war. The reasons for this are not readily apparent. Swings in manufacturing inventories are the dominant component of the variations in total business inventory investment and the manufacturing sector in Canada is somewhat smaller than that in the United States. One would have expected, on this account, to observe relatively somewhat smaller fluctuations in Canada. However, the structure of production in the manufacturing complexes in the two countries differs, with a greater relative emphasis on primary forms of production in Canada and there may, of course, be some differences in the closeness of the inventory control exercised in the two countries.

Summing up the material presented above, it may be concluded that recent recessions have been dominated by business inventory investment declines and, conversely, that major fluctuations in inventories have been associated with cyclical contractions, except where other components of demand have exerted an exceptionally strong counterbalancing influence on aggregate demand. Unless reinforced by marked declines in fixed investment, such recessions have tended to be short, not lasting much more than a year.

^{1/} See p. 114.

^{2/} See p. 130.

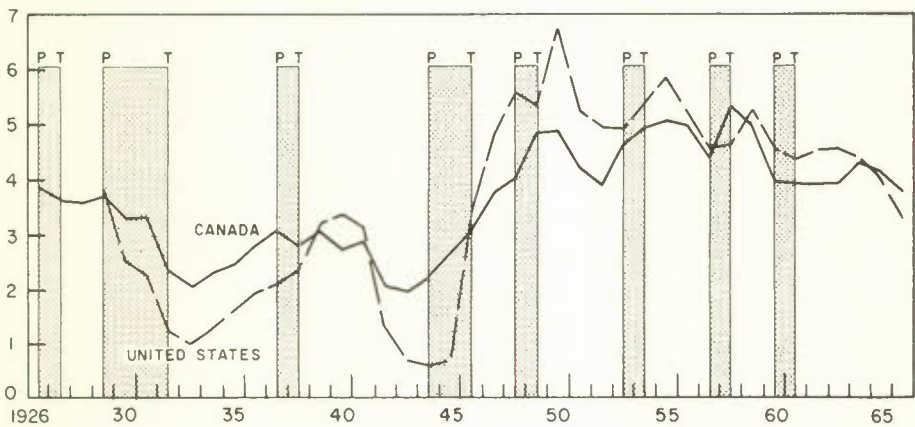
(b) Cycles in fixed investment

The evident connection between the catastrophic declines in fixed investment and the severity of the Depression suggests that it is worthwhile examining the performance of fixed investment in further detail. It is convenient to consider the fixed investment performance of Canada and the United States together, in order to note similarities and differences in the behaviour of the components of the total. Charts 3 to 5 picture the annual values of residential construction, non-residential construction and machinery and equipment purchases relative to GNP in the two countries over most of the last four decades. The operation of the fixed investment capital stock adjustment mechanism and the emergence of excess capacity during the course of the Depression seem to offer a plausible explanation of the failure of the economy to generate a rapid return to the full employment level during the upswing of 1933-37. Further, the effects of moderation in the growth or the levels of "autonomous" investment, the accompanying reduction of the rate of growth of income and output, and the reduced growth of "induced" investment appear to provide at least a partial explanation of the poor growth of income and output and rising levels of unemployment experienced in Canada and the United States for several years after 1957. Certain broad movements are common to all of the series depicted. These include sharp declines during the Depression years, partial recovery from 1933 to 1937, depressed wartime performance related to the enormous growth of government military expenditures and the postponement of replacement investment, strong growth in the early post-war years and significant declines after 1957. Fixed investment does not reveal the close correspondence with business cycles shown by investment in inventories. Indeed, the contrast in this respect between Charts 3, 4 and 5, showing the components of fixed investment, and Chart 2, showing inventory investment, is quite striking. However, fluctuations in fixed investment may be associated with the more massive developments underlying the surface fluctuations described by most of the identified cycles.

Chart 3

RESIDENTIAL CONSTRUCTION EXPENDITURES
AS PERCENTAGES OF GNP,
CANADA AND UNITED STATES

(Current dollars)



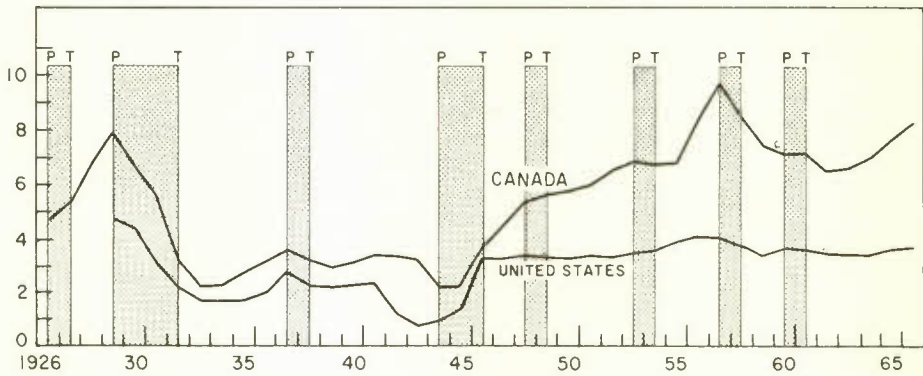
Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: National Accounts, Dominion Bureau of Statistics and Survey of Current Business, U. S. Department of Commerce.

Chart 4

NON-RESIDENTIAL CONSTRUCTION EXPENDITURES
AS PERCENTAGES OF GNP,
CANADA AND UNITED STATES

(Current dollars)



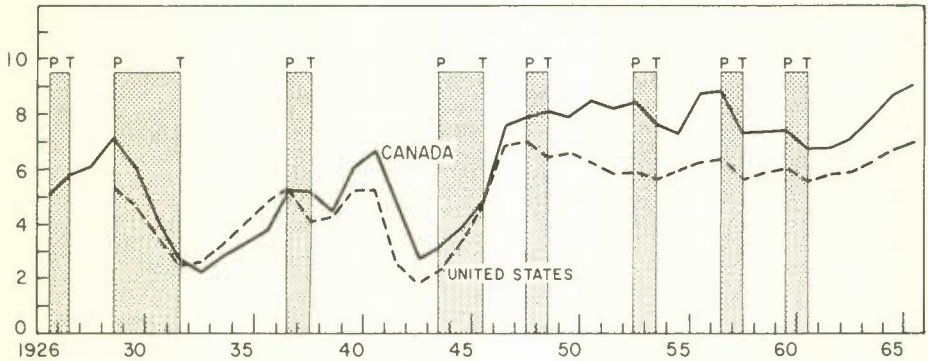
Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: National Accounts, Dominion Bureau of Statistics and Survey of Current Business, U. S. Department of Commerce.

Chart 5

MACHINERY AND EQUIPMENT EXPENDITURES
AS PERCENTAGES OF GNP,
CANADA AND UNITED STATES

(Current dollars)



Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: National Accounts, Dominion Bureau of Statistics and Survey of Current Business, U. S. Department of Commerce.

Apart from the Depression, to which adequate reference has already been made, declining proportions of investment were associated with the generally rising level of unemployment and increased slack following 1957. Sharply rising relative levels of investment were associated with the 1926-29 boom and with the early post-war inflation and sustained high levels of investment with the over-all post-war expansion to 1957.^{1/}

(c) Differences between Canadian and U. S.
fixed investment behaviour

One of the most striking aspects of the comparison of Canadian and U. S. business investment presented in Charts 4 and 5 is the markedly higher level of such spending relative to GNP in the Canadian case -- especially during the post-war years. This difference is all the more noteworthy when contrasted with the high degree of similarity in the dynamic performance of most other aggregate economic time series pertaining to the two countries presented in the first part of Chapter 6. There appears to be a distinct tendency for Canadian fixed investment to run ahead of American -- in terms of percentages of GNP -- during periods of rising investment and general prosperity in North America as a whole. The significance for economic policy of these relatively high levels of Canadian investment is discussed in the final part of Chapter 6. Before proceeding to this discussion, however, it is worthwhile considering some evidence on the forces at work upon the relative level of Canadian investment during general up-swings in fixed capital formation.

It was pointed out in a footnote to Chapter 4^{2/} that the marginal propensity to import is considerably higher in

^{1/} Close association between the rate of change in construction investment and the extent of inflationary pressure in the economy is noted in Chapter 4 of the Third Annual Review of the Economic Council of Canada, Ottawa, Queen's Printer, 1966. See, especially, Chart 4-12, p. 110.

^{2/} Footnote 1, pp. 86-87.

Canada than in the United States. With approximately similar rates of savings in the two countries, the value of the multiplier is thus lower in Canada than in the United States. An additional reduction in the value of the Canadian multiplier tends to occur during upswings in fixed investment as a result of the influence of changes in the composition of expenditure and in Canadian relative prices in raising the Canadian marginal propensity to import.^{1/} The decline in the value of the multiplier permits a rise to occur in the proportion of investment to GNP in Canada. The rise in the proportion of investment to GNP in Canada is not automatically matched by a corresponding rise in Canadian national saving, normally the major component of the supply of investible funds. The relative shortage of capital which results usually drives Canadian borrowers into U.S. markets. An inflow of borrowed funds in consequence usually augments the inflow of direct investment funds at such times.^{2/} Thus, an upswing in North American fixed investment tends to be accompanied by the simultaneous emergence of a Canadian current account merchandise trade deficit and an inflow of capital, which together permit a relative rise to occur in the ratio of Canadian investment to GNP. The reverse sequence of events tends to occur in the course of downswings.

The operation of the mechanism described above depends upon a number of essential, interrelated factors: upon the behaviour of savers in the United States and Canada; upon free access by Canadians to U.S. money markets and upon the free flow of borrowed capital into Canada; and upon a high degree of international specialization in goods production, giving rise at certain times to profitable opportunities for large-scale investment in Canada, especially in resource development, on the

^{1/} This mechanism is discussed further in Chapter 6 below, pp. 138 and 141.

^{2/} See discussion in Chapter 6, pp. 137-138.

one hand, and making it advantageous for Canada to import certain manufactured goods, rather than produce them domestically, on the other. Underlying the nature and extent of international specialization in goods production, in turn, are the complex factors giving each country a comparative advantage in the production of certain forms of output.

While the mechanism outlined above explains (in simplified but nonetheless reasonably realistic terms) how Canada raises its proportion of investment to GNP, it throws little light on the question why. A relatively high ratio of investment to output in Canada could reflect (a) higher relative prices for investment goods in Canada; (b) the existence of a comparative advantage to Canada in the production of certain types of goods which, however, require large inputs of capital in relation to output; (c) higher rates of growth in Canada than in the United States; (d) a greater shift towards capital-intensive industries in Canada than in the United States (or a smaller shift away from such industries); or (e) an earlier stage of development in Canada, requiring an initially large input of investment, which will "pay off" over the course of time.

These questions are of fundamental importance to the investigation of Canadian growth, as well as business fluctuations. Evidence may be adduced from various sources that virtually all of the influences noted above have had some effect on the relative level of investment in Canada. Appendix 3 to this paper provides some analysis of the proportion of investment in major industries in relation to GNP in Canada and the United States. It indicates a very high relative concentration of Canadian investment in mining, transportation, communication and public utilities,^{1/} especially during the fixed capital boom of 1956-58. This suggests that the comparatively early stage of Canadian development in these industries was a very important contributory factor to the relatively high over-all levels of investment in Canada.

^{1/} Table A-3.5, Appendix 3, p. 262.

CHAPTER 6

CANADA-UNITED STATES CYCLICAL INTERRELATIONS

Canada-United States Economic Interrelations

The summary record of Canadian and U. S. cyclical experience provided in Chapter 3 confirms the impression which most people have from casual observation that levels of economic activity in the two countries tend to move up and down together. Some of the major reasons why this should be the case were briefly discussed at the end of Chapter 4. In this Chapter, some of the evidence on which the views as to the nature of Canada-United States cyclical interrelationships reported in Chapter 4 rest is presented and discussed. In addition, attention is drawn to certain common features of cyclical experience in the two countries.

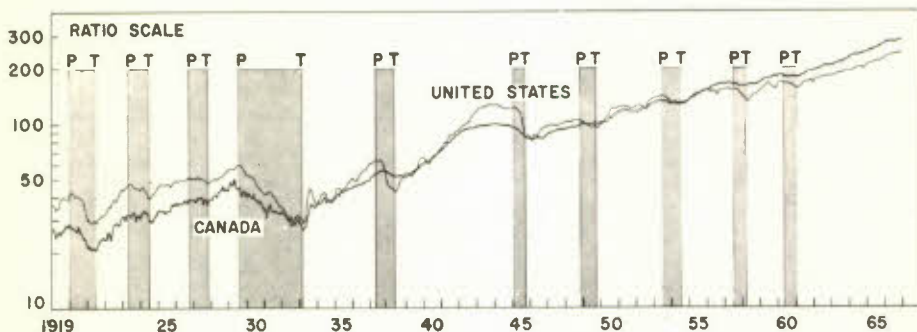
First, Chart 6, which depicts seasonally adjusted monthly data, provides a visual illustration of some of the characteristics of Canadian and U. S. industrial production which were summarized in tabular form in Chapter 3. The Chart reveals the similar time-paths of goods production in the two countries, the declining average duration of contractions and the reduced average rates of change during both the upswings and downswings of the post-war years. Particularly worth noting, in addition, is the greater relative volatility of U. S. production. In addition to the similarities in goods production in the two countries, certain significant differences should also be noted. For example, in 1937-38, goods production in Canada declined only moderately in comparison with that in the United States. The Empire trading arrangements adopted in 1932 undoubtedly contributed to this exceptional divergence in behaviour. More generally, although Canadian and U. S. fluctuations tended to coincide, a number of independent factors, and particularly the impact of overseas trade, ensured that the path of aggregate activity in Canada was not completely identical to that in the United States. The relative importance assumed by

such independent factors when U. S. recessions are mild as the post-war ones have been, appears to be the main reason why there is only a low degree of rank correlation between the amplitudes of recent Canadian and U. S. contractions.

Chart 6

INDUSTRIAL PRODUCTION INDEXES, CANADA AND UNITED STATES

(Canadian Index 1949 = 100, U. S. Index 1947-49 = 100)



Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: Historical Monthly Statistics and Canadian Statistical Review, Dominion Bureau of Statistics (Canada); and Federal Reserve Bulletin, Board of Governors of the Federal Reserve System (United States).

The general interdependence of industrial production in the two countries reflected by Chart 6 arises most obviously from the importance of both countries of Canada-United States goods trade. As noted earlier, about 25 per

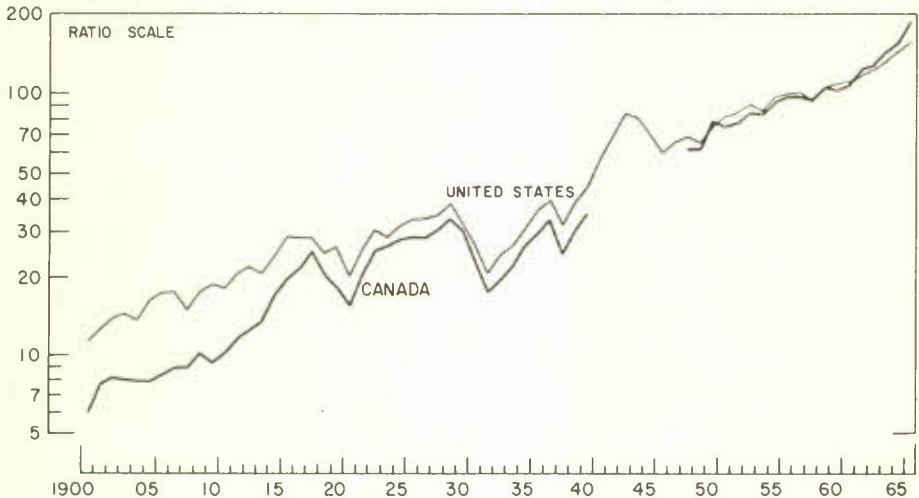
cent of Canadian goods output goes to the United States. Goods imports from the United States amount to close to a third of the value of Canadian goods production. These proportions indicate both a high degree of Canadian sensitiveness to fluctuations in the United States arising from the strong call of U. S. import demands on Canadian goods production and a high rate of "leakage" to the United States (and elsewhere), via rising imports, of any relative strengthening or weakening in Canadian demand. Although there is a high degree of economic interdependence between Canada and the United States, Canada is proportionately more sensitive to fluctuations in U. S. demand than vice versa. This is because any given volume of trade between the two countries looms much larger in relation to the volume of Canadian output than in relation to the volume of U. S. output, which is about 13 times as large. A 10 per cent decline in U. S. imports from Canada, for example, would be of (roughly) the same dollar order of magnitude as a 10 per cent decline in Canadian imports from the United States, but the proportional impact on Canada of this decline in U. S. imports would be about 13 times as great as that of the decline in Canadian imports on the United States. This is equivalent to saying that it is the U. S. dog which wags the Canadian tail, even though dependence is mutual.

The long-term relation between U. S. industrial production and Canadian nonagricultural exports to the United States, on an annual basis, is depicted in Chart 7. It will be seen that real Canadian nonagricultural exports to the United States have risen somewhat more, over the long term, than U. S. industrial production. The closeness of the relation between the two series is clear and it implies, in the light of the strong relation between Canadian and U. S. production apparent in Chart 6, that Canadian industrial production and nonagricultural exports to the United States also follow similar time-paths. This is shown in Chart 8.

Chart 7

INDEXES OF NONAGRICULTURAL EXPORTS
TO THE UNITED STATES
AND U. S. INDUSTRIAL PRODUCTION

(1957-59 = 100)

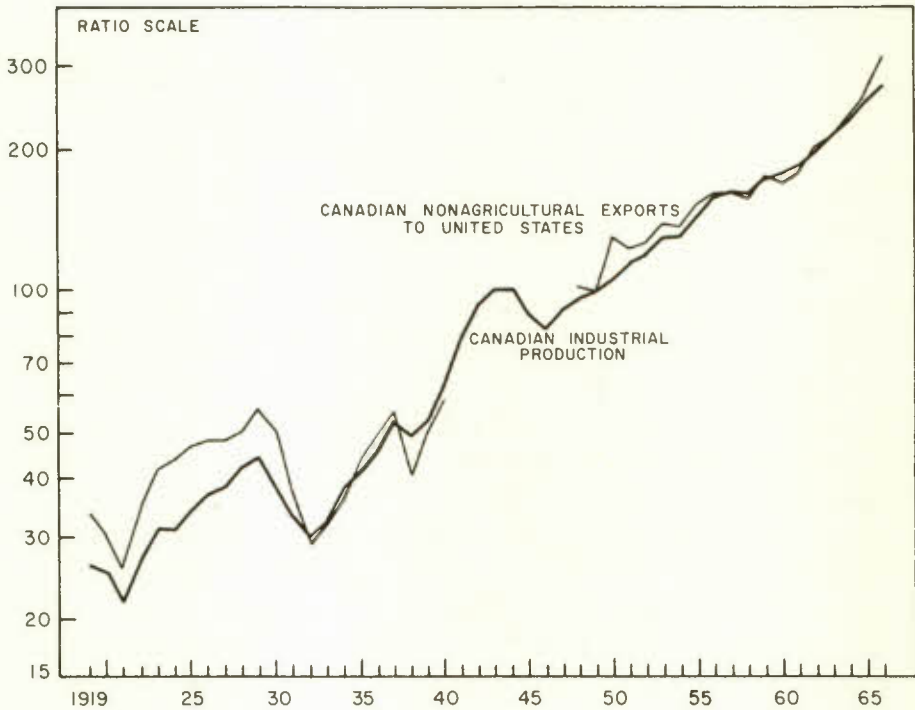


Source: Trade of Canada, Dominion Bureau of Statistics. Export value data centred and deflated by price indexes from M. C. Urquhart and K. A. H. Buckley, Historical Statistics of Canada, Cambridge, Cambridge University Press, 1965, and from The Review of Foreign Trade, DBS; U. S. industrial production data from Long Term Economic Trends, U. S. Department of Commerce, November 1965 and Economic Indicators, publication of Joint Economic Committee, U. S. Congress and Council of Economic Advisers, U. S. G. P. O.

Chart 8

CANADIAN NONAGRICULTURAL EXPORTS
TO THE UNITED STATES AND CANADIAN
INDUSTRIAL PRODUCTION

(1949 = 100)



Source: Trade of Canada, Dominion Bureau of Statistics. Export value data centred and deflated by price indexes from M. C. Urquhart and K. A. H. Buckley, Historical Statistics of Canada, Cambridge, Cambridge University Press, 1965, and from The Review of Foreign Trade, DBS; Canadian industrial production data from Historical Monthly Statistics, DBS, and Canadian Statistical Review (Historical Summary and monthly releases).

It will be recalled from Chapter 4 that a second powerful Canadian economic link with the United States lies in fixed investment. A substantial part of such investment, it was held, was directly related to current and anticipated goods exports to the United States. In addition, Bryce argued that similarities in the terms and conditions of financing, reflected in similar trends in the securities markets in the two countries, and in expectations, as reflected in parallel stock market movements, were highly significant supplementary influences.

The money markets of Canada and the United States are very closely connected. These connections tend to give rise to equalizing flows of capital through the currency exchange markets whenever credit conditions in the two countries start to diverge. For example, a tightening of credit conditions in Canada tends to drive Canadian borrowers into the U. S. market, producing an inflow of borrowed U. S. capital into Canada. By influencing credit conditions, the monetary authorities in either country can influence these international capital movements and are thus able, by monetary means, to maintain, under normal circumstances, a desired over-all balance-of-payments position. Balance-of-payments objectives (including restriction of the range of variation of the exchange rate under a floating rate regime) may by the same token impose limitations on the freedom of the monetary authorities to pursue independent domestic stabilization objectives, and may thus limit the scope for divergences between the two countries in the rate of growth of the money supply credit conditions, interest rates and aggregate economic performance.

The Bank of Canada has stated the matter as follows:

A country's deficit or surplus on international transactions in goods and services must, of course, be matched by a net inflow or outflow on capital account or by changes in official reserves. Within limits, foreign exchange

reserves can play an important part in cushioning disturbances in the external balance, but subject to this, external financial balance is dependent upon appropriate domestic policies. Among these, the degree of emphasis on monetary policy can vary in accordance with the nature and timing of changes in other policies. Because of its flexibility monetary policy can be used, for example, to try to achieve a relationship between interest rates in internal and external markets which is consistent with the flow of capital needed in the circumstances while changes in other policies are being made with a view to altering the underlying balance of payments situation.^{1/}

Elsewhere, the Bank observes that "changes in credit conditions in Canada relative to those abroad, especially in the United States, can give rise to substantial shifts in the international trade in portfolio securities and in similar capital movements".^{2/}

The Royal Commission on Banking and Finance was rather more explicit:

Canada is more than most countries closely integrated into capital markets abroad. There can be, and have been, short periods in which the short- and long-term yield differentials

^{1/} Submissions by the Bank of Canada to the Royal Commission on Banking and Finance, Ottawa, Bank of Canada, May 31, 1962, para. 6, p. 10. As written, this paragraph implies the curious view that monetary policy should only be used to influence the balance-of-payments situation in a temporary way, until "other policies" can produce desired changes.

^{2/} Ibid., para. 6, p. 56.

(in interest rates) between Canada and the United States have increased or decreased without consequential short-term effects on the exchange rate and on exchange reserves. However, attempts to widen the range of variation of interest rates far outside the range of variation prevailing in other capital markets, particularly in the United States, are likely to promote large-scale movements of capital. The authorities in this country can attempt to raise the interest rates to be paid by provinces, large municipalities and large corporations, but if rates in the United States and other external capital markets are significantly lower, they cannot succeed in making most major borrowers pay the Canadian rates. In the absence of other measures, very high rates will likely lead to a massive resort to external borrowing and, depending upon the exchange rate system in use, either to an appreciation of the exchange rate or the large-scale accumulation of exchange reserves. Any attempt to achieve very low rates will tend to lead to the opposite result -- exchange rate depreciation or loss of reserves. On occasion, these may be precisely the results which are desired, but it is clear that domestic changes in credit conditions can never be considered in isolation from their likely effects on international capital movements.^{1/}

As an illustration of the technical connections between Canadian and U. S. money markets, it is interesting to observe, in Charts 9 and 10 below, the relation between the two periods of credit restraint in Canada relative to the United States beginning in late 1955 and early 1959 and the concomitant expansion of the differentials between

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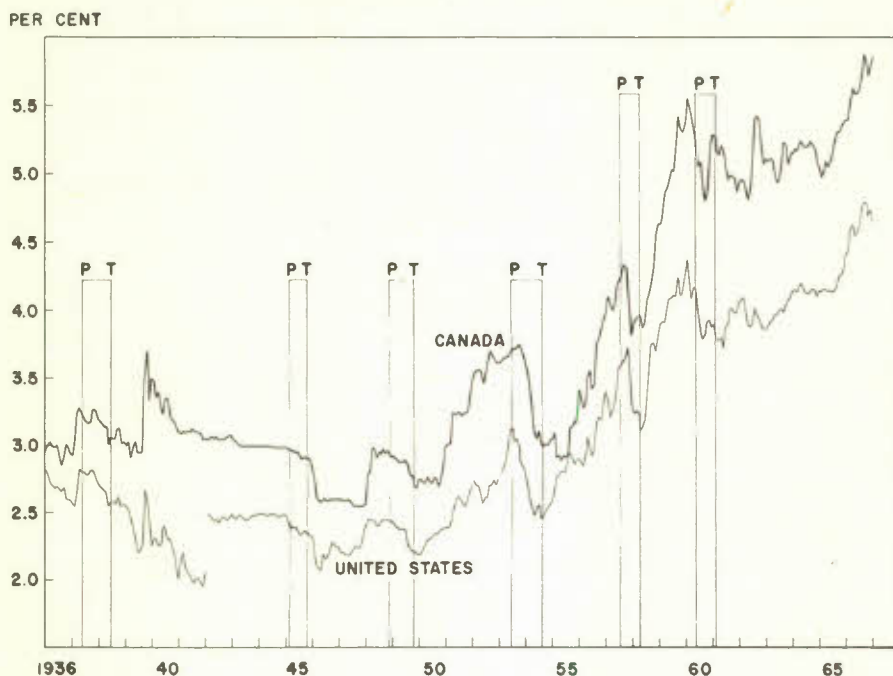
Report of the Royal Commission on Banking and Finance,
Ottawa, Queen's Printer, 1964, pp. 472-473.

Canadian and U. S. long-term bond yields. Chart 18 below establishes that these periods were featured either by accelerated portfolio capital inflows or by decreased rates of decline in these flows. It is apparent, too, that, whereas there has been a longer-term tendency for the Canadian money supply to rise more strongly than that in the United States, there has been virtually no difference in the growth rates of the money supply in the two countries over the past decade and the bond yield differential has remained quite high.

An important contrast between Charts 9 and 10 is observable in respect of the degree of sensitiveness to recessions exhibited by bond yields and the money supply. In fact, in recent years, it is difficult to observe responses in either the U. S. or Canadian money supply which could be described as either systematically procyclical or contracyclical. Neither does there appear to have been any systematic relation between the level of unemployment (Chart 15) and the rate of monetary expansion. The sharp drop in bond yields during recessions has usually reflected the combined effects of a rising supply of money, moderating demands for loans and the resulting bidding up of securities prices in the two countries. As is indicated later in this study and elsewhere,^{1/} the sharply increased availability of funds seeking higher returns during recessions has constituted a contracyclical supply of house mortgage financing in each country over much of the post-war period. For institutional reasons, these flows have been particularly marked in Canada.

^{1/} See J. V. Poapst, The Residential Mortgage Market, working paper prepared for the Royal Commission on Banking and Finance, Ottawa, mimeo., November 1962, and W. W. Alberts, "Business Cycles, Residential Construction Cycles and the Mortgage Market", Journal of Political Economy, Vol. LXX, No. 3, June 1962.

Chart 9
LONG-TERM BOND YIELDS,
CANADA AND UNITED STATES

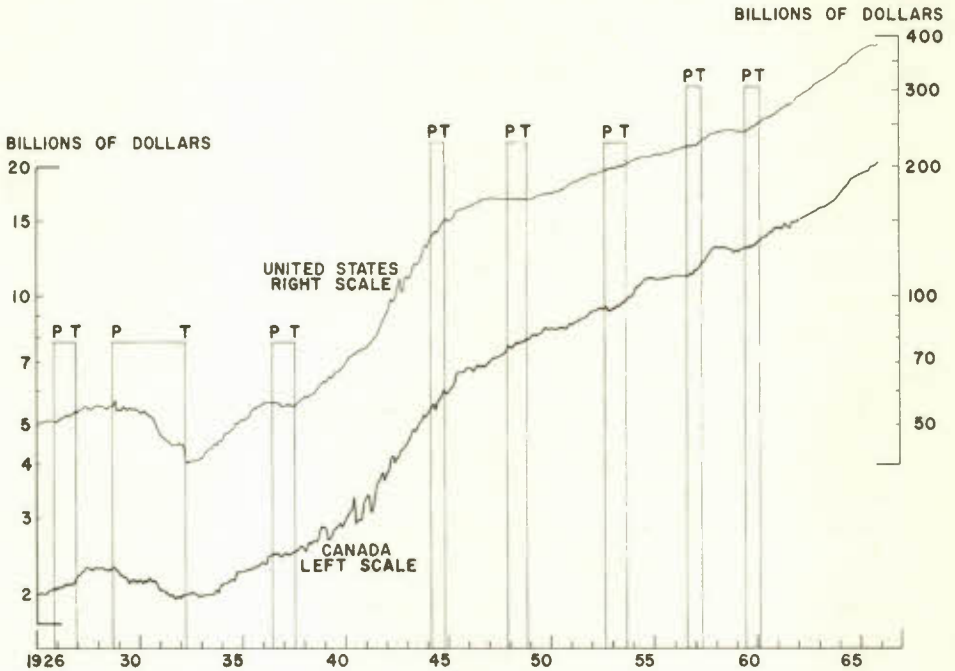


Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: Statistical Summary, Bank of Canada (Canada) and Federal Reserve Bulletin, Board of Governors of the Federal Reserve System (United States). Canadian data for 1936-56 are theoretical 15-year bond yields, either mid-month figures or estimated mid-month figures derived by interpolation between end-of-month data. Data for 1957-66 are monthly averages of the average Wednesday yield on all outstanding issues with earliest payment date of 10 years or more. U.S. data for 1936-41 relate to yields on partially tax-exempt bonds with a term of 15 years and over. From 1942 on, the data relate to fully taxable bonds. From January 1942 to March 1952 bonds due or callable in 15 years were included in the averages; from April 1952 to March 1953, bonds due or callable in 12 years were included and from April 1953 to date, bonds due or callable in 10 years have been included.

Chart 10

THE MONEY SUPPLY, CANADA AND UNITED STATES



Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: Canadian currency and chartered bank deposits excluding Government of Canada deposits, Historical Monthly Statistics, Dominion Bureau of Statistics (1926-62 inclusive), and currency outside banks and chartered bank deposits held by the general public, Statistical Summary, Bank of Canada (1963-66 inclusive) (Canada); currency, demand and time deposits, Mutual Savings Banks and Postal Savings System deposits, M. Friedman and A. J. Schwartz, A Monetary History of the United States, 1867-1960, NBER, Princeton, Princeton University Press, 1963 (1926-60 inclusive); and Federal Reserve Bulletin, Board of Governors of the Federal Reserve System (1961-66 inclusive) (United States).

Apart from the very powerful technical considerations tending to induce similarities in monetary developments in the two countries, the monetary authorities have, of course, usually faced similar dynamic changes in economic conditions arising, in part, from the strong trade and investment links discussed earlier. In so far as monetary policy was directed towards accommodating economic expansion in both countries, a similar pattern of money supply growth (see Chart 10) was a natural outcome. In deciding upon deliberately restrictive or stimulative action, the central banks in Canada and the United States were facing comparable problems over much of the period depicted and considerable similarity of response would not have been surprising even without the obvious reinforcement arising from each bank's continuing awareness of the other's actions and from the technical factors mentioned above.

Stock prices, in addition to exerting a direct influence on the cost of equity-financing new investment projects, also constitute, to some extent, an index of the state of business profits and business expectations. Stock price variables are often found in empirical work to be significantly related to the level of investment.^{1/} Chart 11 shows that, historically, stock market prices in Canada and the United States have experienced broadly similar fluctuations. Both general economic factors and certain more specific influences appear to have been responsible for producing this record. The general economic factors may be indicated by considering the nature and purpose of stock market dealings. For analytical purposes, stock markets may be viewed as markets in which claims to participation in the future earnings of public corporations are traded. After allowances for risks, the current prices

^{1/} See, for example, S. J. May, "Dynamic Multipliers and Their Use for Fiscal Decision-Making", loc. cit., Appendix C, p. 185. Private investment in plant and machinery (IPM), is shown to depend partly upon the lagged change in the index of common stock prices.

of such claims might be expected to approximate the stream of future expected earnings discounted by market rates of interest.^{1/} Many factors impinge on expectations concerning future earnings, of course: recent economic performance; economic analyses and forecasts; miscellaneous news items of presumed significance for future economic developments; available economic and business statistical information; information concerning long-term population changes and economic growth potential; expected price and cost changes; war fears and a host of nonrational beliefs. In general, it would appear that expectations concerning the short-term future are implicitly given heavier weight than rational longer-term expectations so that stock prices fluctuate more than would be expected on the basis of the simple application of investment criteria to longer-term earnings expectations. There are also, of course, technical reasons why market corrections occasionally generate cumulative upswings and downswings.

As is indicated in Chart 6 and Charts 12 and 13, the background of recent changes in the volume of output, prices and the total value of output tends to be similar in the two countries. There thus tend to be common changes in the state of expectations on this account. Other general factors producing a concurrence of expectations are the influence of U. S. news media on Canadian opinion and the prevalence of close business connections, especially between Canadian subsidiaries and U. S. parent companies.^{2/}

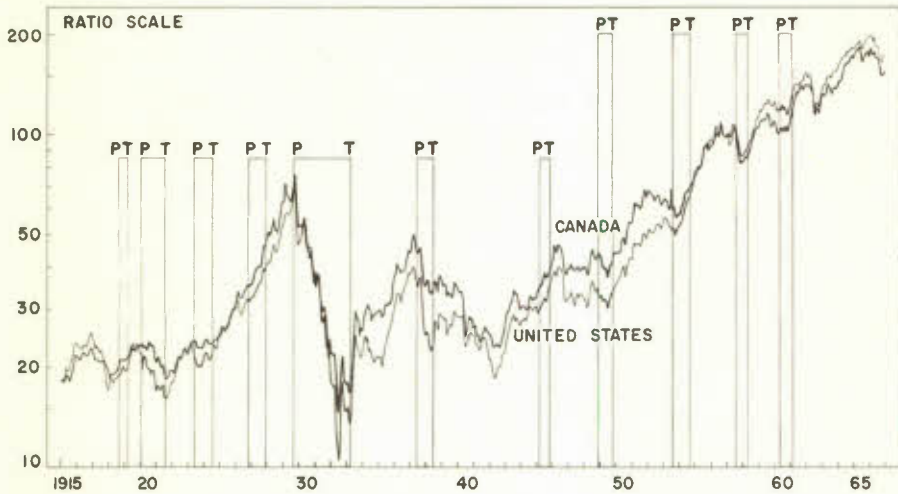
^{1/} This statement requires modification to the extent that speculators predominate over investors at various times and thus produce market variations out of line with those indicated by investment criteria.

^{2/} See R. B. Bryce's comments quoted on pp. 88-89 (Chapter 4) above.

Chart 11

STOCK PRICE INDEXES,
CANADA AND UNITED STATES

(1956 = 100)



Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: Investors' Index of Common Stock Prices, Historical Monthly Statistics and Canadian Statistical Review, Dominion Bureau of Statistics (Canada); Standard and Poor's Index of Common Stock Prices, Business Cycle Indicators, NBER, Princeton, Princeton University Press, 1961, Vol. II, p. 108; and Business Cycle Developments, U.S. Department of Commerce (United States).

In addition, there are usually similar patterns of change in profits^{1/} and in financial conditions (Charts 9 and 10), which affect the relative valuation of stocks compared with fixed-interest-bearing securities and other types of assets.^{2/} Factors strengthening these underlying forces generating similar stock market reactions are the extent of U. S. institutional and private investment in Canadian stocks and vice versa, and the "demonstration" effects of fluctuations in the value of interlisted stocks.

On these points, Bryce observed:

The extensive holding by Americans of Canadian securities and by Canadians of American securities and the readiness of investors to shift from one to the other, help to explain the similarity in market behaviour.... Furthermore it may often be necessary to sell Canadian securities in order to protect one's position in American securities.^{3/}

^{1/} Both corporate profits and indexes of stock market values are classified as leading indicators in the United States. See G. H. Moore, "Leading and Confirming Indicators of General Business Changes", Business Cycle Indicators, Table 3.2, pp. 56-57. Although W. A. Beckett, in "Indicators of Cyclical Recessions and Revivals in Canada", Business Cycle Indicators, p. 302, tentatively classifies corporate profits as a coincident indicator in accordance with the initial classification adopted by G. H. Moore ("Statistical Indicators of Cyclical Revivals and Recessions", Business Cycle Indicators, Table 7.11, pp. 244-245), it is interesting to note that the supporting data provided by Beckett show a clear lead at both the peak and trough of the 1953-54 recession, the only period for which data were then available.

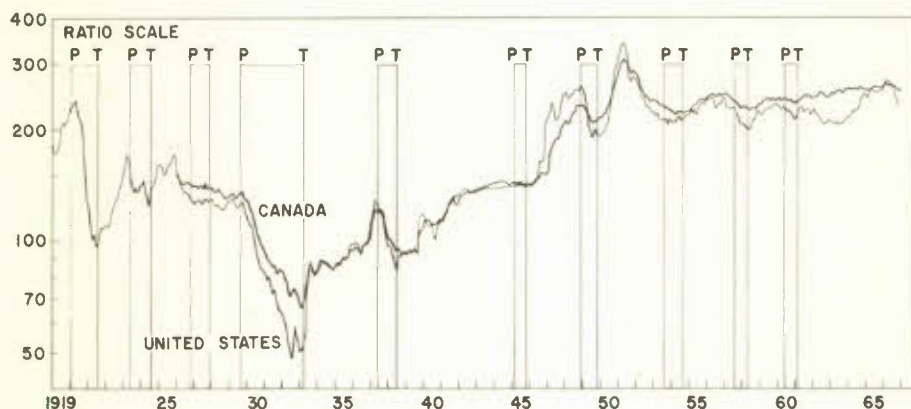
^{2/} Changes in interest rates alter the opportunity cost of holding stocks, given the state of expectations as to future corporate earnings.

^{3/} R. B. Bryce, "The Effects on Canada of Industrial Fluctuations in the United States and Canada", loc. cit., p. 383.

Chart 12

INDEXES OF INDUSTRIAL MATERIAL PRICES, CANADA AND UNITED STATES

(1935-39 = 100)



Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: Wholesale Price Index of Thirty Industrial Materials, Historical Monthly Statistics and Canadian Statistical Review, Dominion Bureau of Statistics (Canada); Mack Industrial Raw Materials Spot Market Price Index, Business Cycle Indicators, NBER, Princeton, Princeton University Press, 1961; and Business Cycle Developments, U.S. Department of Commerce (United States).

In view of the close trade and financial connections between Canada and the United States, and taking account of similar fluctuations in output, it is perhaps only to be expected that price and cost variations should also follow similar paths. That this is indeed the case is clearly apparent in Chart 12, which compares the performance of Canadian and U.S. indexes of sensitive industrial material prices. The greater volatility of the U.S. index is in line with that shown by industrial production. However, the

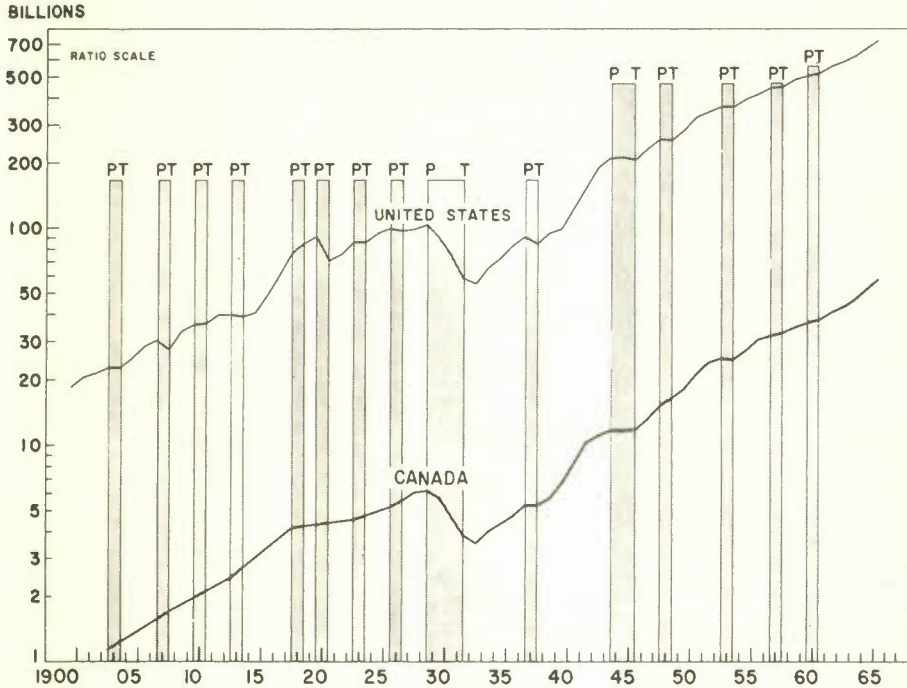
coverage of the indexes is different in the two countries and it is therefore not clear to what extent the more marked variability of the U.S. measure may be regarded as typical of price behaviour in general. Industrial material prices are highly sensitive to inventory swings, which, as has been shown, figure prominently in the aggregate demand fluctuations occurring over the course of the short cycle, and they therefore exhibit similar variations during these periods. However, these prices also reflect the broader inflationary and deflationary forces operating over time in the two countries.

In so far as the major inflationary and deflationary waves originate, respectively, in situations of excessive or inadequate demand, they reflect the forces giving rise to total expenditure fluctuations. These tend to follow parallel courses in the United States and Canada for the reasons already elaborated earlier in this Chapter and in Chapter 4. The indirect influence upon general price levels of similar expenditure fluctuations is, of course, powerfully reinforced by the direct effects upon the Canadian price level of variations in the prices of Canadian imports from the United States and of Canadian exports to the United States. In a number of product markets, Canadian domestic prices tend to be set at the level of competing import prices. Similarly, in many export markets, Canada sells at the going price. Some tendency towards parallel price variations may also result from the horizontal bonds of business and labour across the political boundary between the two countries.

Although industrial material price comparisons have been made here because of the exceptional cyclical sensitivity of such prices, it can be shown that other comparable general price indexes in the two countries also reveal similar, although by no means identical, patterns of fluctuation. This implies, in the light of the similarity in the performance of industrial production, that fluctuations in the value of total final goods and services output, or GNP, in Canada also generally parallel those in the United States.

Chart 13

GROSS NATIONAL PRODUCT IN CURRENT DOLLARS,
CANADA AND UNITED STATES



Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: National Accounts, Dominion Bureau of Statistics and Survey of Current Business, U. S. Department of Commerce.

Chart 13 shows that Canadian GNP, although rising more rapidly over time than U. S. GNP, has recorded variations of generally comparable timing and relative magnitude to

those in the United States,^{1/} although there have also been occasional divergences between the amplitudes of the Canadian and U. S. fluctuations. The stronger trend in Canadian GNP has meant that actual declines in current dollar GNP have been fewer and less pronounced than in the United States. In interpreting the Chart, it should be noted that the estimates of GNP for Canada for the years prior to 1926 are interpolations between centred quinquennial averages.

To complete this brief comparative survey of the dynamic performance of the major economic variables in the United States and Canada, it is necessary to take into account how employment and unemployment were affected by the fluctuations taking place during the years covered by the available data. From Chart 14 it will be noted that, since the 1920's, Canadian nonagricultural employment has grown more rapidly than that in the United States. This is in line with the observed higher growth in Canadian industrial production. In contrast with the recorded performance of industrial production, however, Canadian nonagricultural employment over short cycles has been about as variable as that in the United States. The decline in Canada associated with the Depression was, in fact, more severe than the fall in the United States. The full reasons for the dissimilarity are not clear, but some role was probably played by the larger percentage decline in non-residential construction in Canada, bearing in mind, too, its greater initial relative importance.^{2/} Construction has in the

^{1/} Post-war contractions show up more strongly in constant dollar than in current dollar GNP, partly because of the upward post-war trend in prices, but also because of the tendency for the GNP deflator and its major components to continue to rise for some time after a decline in physical activity has begun. Also, because of the shortness of most recessions, annual data tend to average out the changes in GNP. Because of these two considerations, short contractions are more readily identified in constant dollar quarterly (seasonally adjusted) GNP data.

^{2/} See Chart 4 above.

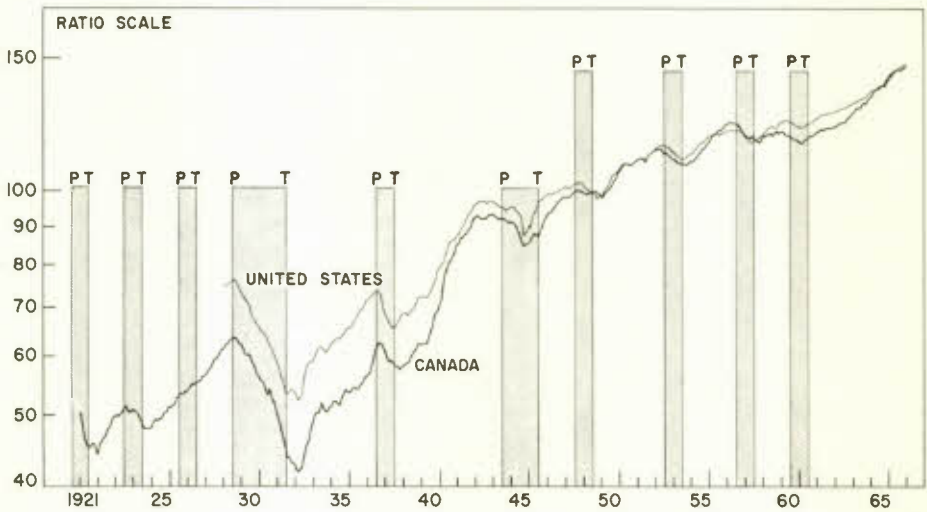
past been a fairly labour-intensive industry. It is of some interest, too, in the current situation, to observe both the greater relative decline in the Canadian employment series after 1957 and the more buoyant upsurge since 1961. As might be expected, these fluctuations in employment were reflected in the rate of unemployment. Thus, the Canadian rate in the period after 1957 rose above that in the United States but fell more rapidly during the early stages of the current upswing and declined below the U.S. ratio in 1964. The pre-war period -- especially the Depression years -- raises questions, however. Chart 14 indicates that between 1929 and 1933 Canadian nonagricultural employment fell more than that in the United States but the unemployment rate in the United States apparently rose much more markedly than the rate in Canada. Part of the discrepancy may be explained by the fact that a return to the farm was possible to a greater extent in Canada than in the United States. Many of those on farms would not have been seeking employment, knowing it to be unavailable, and thus would not have been considered technically to be unemployed. However, the Canada data for the years prior to 1946 are interpolations based on census bench-marks, and their reliability is of a considerably lower order than that of subsequent data based upon the labour force sample surveys.

A significant feature of Chart 15 is the lack of over-all conformity of the unemployment rate to the state of the business cycle. While the unemployment rate has invariably risen sharply in both countries during cyclical contractions, there have been five major phases of movement: firstly, a sharp rise accompanying the Depression; secondly, a slow decline until the early war years; thirdly, a plateau from the early war years until 1953; fourthly, a further slow rise until 1961 and, finally, a slow decline since then. Such usually slow but major shifts in the degree of utilization of resources pose far more serious stabilization problems than the shorter, shallower and more frequent shifts featuring the short cycle.

Chart 14

INDEXES OF NONAGRICULTURAL EMPLOYMENT,
CANADA AND UNITED STATES

(1949 = 100)

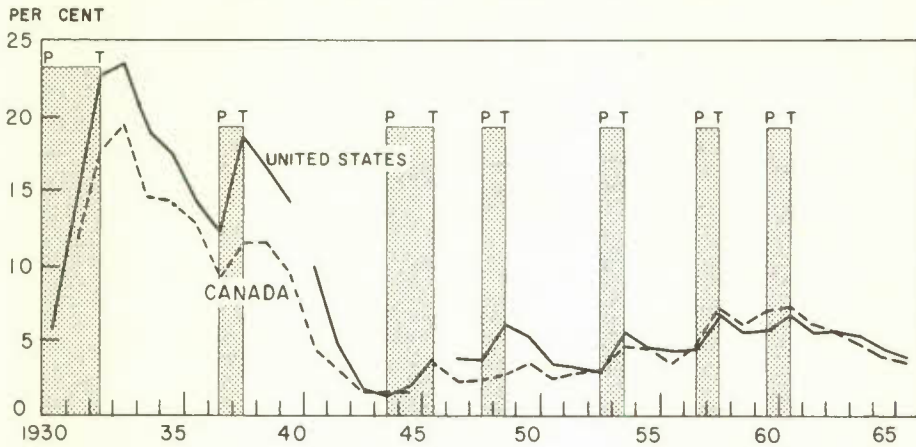


Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: Historical Monthly Statistics and Canadian Statistical Review, Dominion Bureau of Statistics (Canada); Business Cycle Indicators, NBER, Princeton, Princeton University Press, 1961; and Business Cycle Developments, U. S. Department of Commerce (monthly) (United States).

Chart 15

UNEMPLOYMENT RATE, CANADA AND UNITED STATES



Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: Canadian Statistical Review (Historical Summary and current issues) (Canada); Business Cycle Indicators, NBER, Princeton, Princeton University Press, 1961; and Economic Indicators, publication of Joint Economic Committee, U. S. Congress and Council of Economic Advisers, U. S. G. P. O. (United States).

By way of summarizing this part of the Chapter, it may be observed that the intention has been to demonstrate the strength of Canada-U. S. cyclical interrelationships as manifested in the similar dynamic behaviour over a long period of time of economic time series representing virtually all the major facets of economic activity in the two countries. The main links are the extensive trade, investment and financial ties discussed and the subsidiary or branch plant status of much of the industry located in Canada. However, these basic links are reinforced by numerous additional or subsidiary connections and cross-connections to form an almost organic over-all relationship between the two countries. Awareness of the nature, extent and complexity of this economic interdependence is important in arriving at a realistic assessment of the scope for, as well as the limitations upon, the pursuit of independent Canadian economic policies.

Canada-United States Interrelations and the Effects of Major Swings in North American Fixed Investment

At this point, it is convenient to draw together a number of findings from the preceding sections. An important conclusion is that, disruptive and wasteful of resources and potential output though they may have been, the "business cycle" contractions occurring between 1948-49, 1953-54, 1957-58 and 1960-61, were short, fairly shallow and largely dominated by inventory shifts. The associated declines in employment -- or increases in unemployment -- were relatively small and promptly reversed. On time series charts, the post-war short-cycle responses of the unemployment rate show up as only fairly minor fluctuations. They are, however, superimposed upon far more massive longer-term movements. These longer-term movements were related to major shifts in total final demand, in which variations in fixed investment played a conspicuous role.

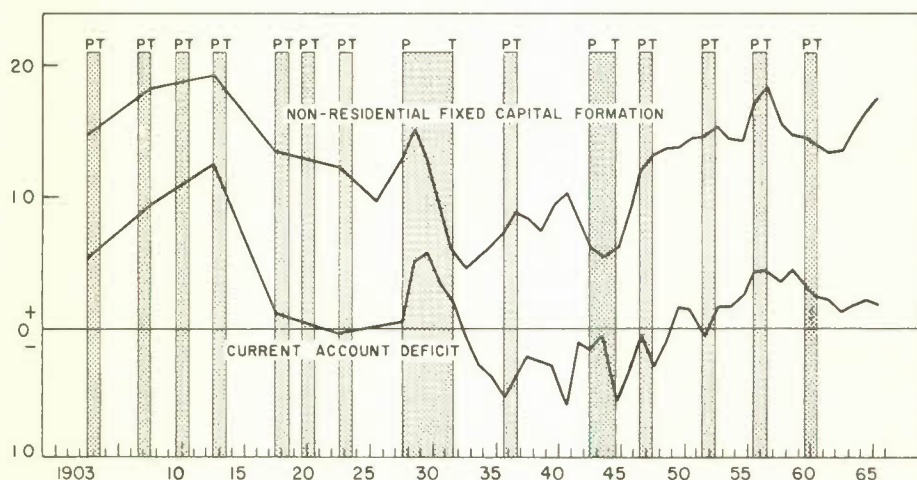
It was further shown in Chapter 5 that, in the course of these major swings, business fixed investment is more volatile in Canada than in the United States (see Charts 4 and 5). During the period of weakness following the peaks established in 1956-57, for example, business fixed investment fell more, as a percentage of GNP, in Canada than in the United States. In Canada, the percentage declined from 18.6 in 1957 to 13.3 in 1962, a drop of 5.3 percentage points, whereas, in the United States, the decline was only from 10.8 per cent in 1956 to 8.8 per cent in 1961, a decline of 2.0 percentage points. Although both countries experienced slack, the direct and indirect effects of the investment cut-back were more severe in Canada. As is indicated by Chart 15, the Canadian unemployment rate rose above that in the United States during this period.

In addition to producing variations in the degree of utilization of available human and capital resources, major swings in fixed investment have been associated with

fundamental shifts in the Canadian balance-of-payments position. The correspondence between long-term changes in business fixed capital formation and the balance on current account is clearly indicated in Chart 16. The pre-dominance of the effects of the "fixed capital cycle" over those of the "business cycle" will also be apparent. It is worth noting, in passing, that the current account deficit -- or the capital inflow -- relative to GNP has clearly been declining, but the proportion of investment to GNP has not declined to a comparable extent. Over time, a rising proportion of the high levels of investment associated with prosperity has been domestically financed.

Chart 16

CANADIAN NON-RESIDENTIAL FIXED CAPITAL FORMATION
AND CURRENT ACCOUNT DEFICIT
AS PERCENTAGES OF GROSS NATIONAL PRODUCT



Note: Shaded bars represent periods of cyclical contraction in the United States.

Source: National Accounts, Canadian Statistical Review (Historical Summary) and The Canadian Balance of International Payments, Dominion Bureau of Statistics.

Although the inflow of capital and the current account deficit are definitionally identical, it is initially convenient to consider the forces acting on the capital and current accounts separately. During a period of rapid North American growth, featured -- particularly in its later stages -- by rising levels of investment, a considerable quantity of capital tends to flow from the United States into Canada for direct investment, largely in resource development and subsidiary manufacturing operations. In addition, very large needs for capital arise within Canada, partly from attempts to expand the output of a resource-oriented -- and thus capital-intensive -- productive system and partly for other reasons. Current savings -- an important part of the supply of investment funds -- run at somewhat higher levels in Canada than in the United States, but, during upswings, Canadian investment, together with the demand for investment funds, runs (in relative terms) considerably higher than the U. S. average. In the absence of capital inflows, the stronger Canadian demand for, relative to the supply of, investment funds would be reflected in the emergence of markedly higher interest rates and more credit rationing than in the United States, with the effect of discouraging capital-intensive forms of production.

With few barriers to capital movements, however, a tightening of credit conditions in Canada has tended to induce rising capital inflows from the United States, associated with increased Canadian borrowing in U. S. money markets. The inflow of all forms of capital combined has on occasion substantially exceeded the current account deficit, giving rise to an increase (as in 1950) in Canadian exchange reserves and to eventual appreciation of the Canadian dollar. Continuing excess capital inflows over and above the amounts required to finance the current account deficit may, in such circumstances, give rise to successive rounds of appreciation or, if a fluctuating rate is adopted, to continuous increases in the external value of the Canadian dollar. This was the case in the early and middle 1950's in Canada. Despite the emergence

of a large current account deficit, the Canadian exchange rate appreciated from an average of U. S. \$91.8 in 1950 to U. S. \$104.3 in 1957.

On the current account side, a critical influence has been the volatility of Canadian import demand. In the course of upswings in fixed investment, a higher than normal proportion of total expenditure is devoted to purchases of machinery and equipment. Investment in inventories tends to rise and fall in sympathy with fluctuations in fixed investment, although, as has been shown earlier, they also exhibit independent variations. In addition, the induced increase in total income is reflected both in higher consumer income and in the allocation of a higher proportion of such income to the acquisition of consumer durable goods. Since machinery and equipment purchases, inventory purchases, and consumer durable goods expenditures all have a high import content, the shift in the proportion of total expenditure in favour of these categories of expenditure tends to bring about a significant rise in the marginal propensity to import, as indicated in Table 18. ^{1/}

In addition to raising the marginal propensity to import in this way, strong upswings in Canadian fixed investment have historically tended to induce some expansion in imports by raising the relative level of Canadian demand in relation to supply and thus raising prices compared with those elsewhere, particularly in the United States. ^{2/}

^{1/} See next page.

^{2/} The higher import content of machinery and equipment, consumer durables and monetary purchases is, of course, a reflection of the basic price and cost factors (including tariffs) giving rise to a higher comparative disadvantage to Canadian production of these categories of goods and services than to the remaining categories of Gross National Expenditure. These basic price and cost disadvantages tend to be reinforced by the relative price increases emerging in Canada during upswings, but slightly modified by any relative price decreases emerging during downswings, particularly if these price changes are reinforced by swings in the exchange rate.

^{1/} The econometric model of the Canadian economy developed in the Departments of Trade and Commerce and Finance contains the following equation for imports of goods and services:

$$F1(t) = .043 + .641 CD(t) + .283 CND(t) + .353 \Delta H19(t) + .797 IM(t) - .287 P1/P - .034t + u6$$

where CD = Personal Expenditure on Consumer Durable Goods

CND = Personal Expenditure on Consumer Non-durable Goods

H19 = Nonfarm Business Inventories

IM = Private Investment in New Machinery and Equipment

PI = Price Deflator CND (1957 = 1.0)

P = Price Index of Net National Expenditure

t = Time -- Number of years since 1926

u6 = Stochastic disturbance term.

Note the very high coefficient for investment in machinery and the low coefficient for personal expenditure on non-durable goods.

See S. J. May, "Dynamic Multipliers", loc. cit., Appendix C, p. 185. R. R. Rhomberg's quarterly model of the Canadian economy contained the following equation for imports of goods and services:

$$M = 0.16Y_d + 0.60(I_{cr} + I_{cb} + I_m + H) - 1440(P_m/rP_c) - 92Q_1 - 81Q_3 + 1490$$

Where Y_d = Disposable personal income in millions of 1949 dollars, not seasonally adjusted.

I_{cr} = New Residential Construction

I_{cb} = New Non-Residential Construction

I_m = New Machinery and Equipment

H = Change in Nonfarm Business Inventories

P_m = Implicit Price Deflator, Imports of Goods and Services Mult. by Exchange Rate, r

r = Exchange Rate, U. S. dollars per Canadian \$1.00

P_c = Implicit Price Deflator, GNP ex. change in Farm Inventories, and Q_1 and Q_3 are seasonal dummy variables.

Here, again, note the high coefficient for all categories of investment combined.

Table 18

Values of the Canadian Marginal Propensity to Import
during Upswings and Downswings in
the Ratio of Business Fixed Investment to Gross National Product⁽¹⁾

	<u>Initial Ratio</u> <u>Investment/GNP</u>	<u>Terminal Ratio</u> <u>Investment/GNP</u>	<u>Marginal Propensity</u> <u>to Import</u> ⁽²⁾
<u>Upswings</u>			
1903-13 ⁽³⁾	14.9 ⁽³⁾	19.3 ⁽³⁾	.323
1923-29	12.1	15.2	.432
1933-41	4.6	10.2	.219
1946-57	8.6	18.6	.266
1962-66	13.3	17.4	.320
<u>Downswings</u>			
1913-23 ⁽³⁾	19.3 ⁽³⁾	12.1 ⁽³⁾	.023
1929-33	15.2	4.6	.431 ⁽⁴⁾
1941-44	10.2	5.3	.049
1957-62	18.6	13.3	.088

(Mean average propensity to import over
67 years 1900-66 inclusive: .171)

(1) The ratio of business fixed investment to GNP is calculated in current dollars.

(2) The marginal propensity to import is computed from the change between the initial and terminal values, for the period specified, in imports and GNP, both expressed in 1949 dollars.

(3) Determined from quinquennial data.

(4) Based on negative values for the change in both imports and GNP. All other values for the marginal propensity to import are based on positive changes in both imports and GNP.

Source: 1901-25 investment and GNP data from K. A. H. Buckley, Capital Formation in Canada, 1896-1930; 1926-66 investment and GNP data from National Accounts, Dominion Bureau of Statistics; 1900-66 import data from Trade of Canada, Dominion Bureau of Statistics, with adjustments to calendar-year basis by Economic Council of Canada.

Indeed, Viner's classic study of the 1900-13 boom and the associated balance-of-payments adjustments emphasized the emergence of significant price differentials between Canadian and foreign goods as the predominant feature of the mechanism by which Canada developed a balance-of-payments deficit and thus effected the real transfers associated with capital inflows.^{1/} Since the level of Canadian prices is linked to the level of foreign prices by the exchange rate, the behaviour of the latter must be regarded as an integral feature of the relative performance of Canadian prices during long-term swings in fixed investment. For example, during the early and middle 1950's, when the fluctuating exchange rate system was in effect, the appreciation of the Canadian exchange rate reinforced the effect of the relative rise in Canadian prices in enlarging the growth of imports.

So far, the factors influencing the current and capital accounts of the balance of payments have been considered separately. However, in reality, they are closely related, the exact form of the relationship depending upon whether a fixed or fluctuating exchange rate system is being operated. In the case of a fluctuating exchange rate system, movements of the exchange rate play a significant role in the achievement of a balance between the forces operating on the current and capital account sides. Thus, a long-term appreciation of the exchange rate, by raising Canadian prices relatively to foreign prices, encourages imports and discourages exports. Such a long-term appreciation of the exchange rate will result from a tendency for the long-term net inflow of capital to exceed the current account deficit. The net inflow of capital may, in turn, reflect the scarcity of funds in Canada, apparent in the emergence of higher interest rates and more credit rationing than elsewhere, particularly the United States. The

^{1/} J. Viner, Canada's Balance of International Indebtedness, 1900-1913, Cambridge, Harvard University Press, 1924. See also G. M. Meier, "Economic Development and the Transfer Mechanism: Canada, 1895-1913", C. J. E. P. S., Vol. XIX, No. 1, February 1953.

relative scarcity of funds in Canada would reflect both the more rapidly rising demand for investible funds in Canada and the induced rise in the transactions demand for money, on the demand side, and the existence of constraints on the rate of expansion of the Canadian money stock, on the supply side, arising from the need to discourage the emergence of an inflationary level of domestic demand for goods and services. Given the size of the capital inflow from abroad, the exchange rate would continue to appreciate until the current account deficit was expanded to the level at which the net demand for foreign funds arising therefrom equalled the excess supply of foreign funds arising from the inflow of capital. Short-run balance-of-payments disturbances in Canada tending to produce exchange rate changes under the fluctuating rate system in operation from 1950 to 1962 were often offset by speculative private capital movements in the opposite direction which thus helped to limit the extent of instability in the rate. The exchange fund account also played a role in the smoothing of short-run exchange rate movements.

Under a fixed exchange rate system, with no import or exchange controls in effect, the balance of payments is brought into equilibrium by policies influencing the level of the net capital inflow. Here, again, changes in the level of the official exchange reserves may form part of the adjustment process, particularly to short-term disturbances. In addition, the inflow of capital may be either augmented or reduced, respectively, by floating government loans on foreign markets or by repatriating outstanding foreign-held securities. Although some flexibility in Canadian monetary policy is permitted by these policy options, changes in domestic credit conditions, as was pointed out earlier,^{1/} cannot be initiated without regard to their effects on capital flows and the balance of payments.

^{1/} See quotation from Report of Royal Commission on Banking and Finance on pp. 119-120.

In summary, then, the upswing phase of the fixed capital cycle tends to feature rising imports relative to exports on the current account side and rising inflows of direct investment and borrowed funds on the capital side. Canadian output and the Canadian price level tend to rise more rapidly than in the United States and Canadian relative prices tend to be raised still further (under fluctuating exchange rate conditions) by the appreciation of the Canadian exchange rate resulting from the tendency for the capital inflow to outrun the current account deficit. Rhomberg, in reporting the estimated effects of a \$100 million rise in Canadian government expenditure upon a number of the variables included in his model of the Canadian economy (under the assumption of a fluctuating exchange rate) describes the process outlined above as follows:

GNP rises to a peak in period 6, when it exceeds its initial equilibrium level by \$360 million. This rise is supported in the first place by the increase in government expenditure itself and by its effect on consumption, from period 3 on also by a positive level of investment in inventories and residential construction, and from periods 4 and 5 on by an increase in business investment induced by the rise in GNP above its initial level. The factor which chiefly limits the rise in GNP is the adverse trade balance. For one thing, the rise in disposable income and in domestic investment induces an increase in imports. Second, interest rates rise, as a result of the higher transactions demand for money with a given money supply, and attract an amount of long-term and short-term capital which exceeds the income induced rise in imports. The Canadian dollar appreciates by 1 per cent soon after the increase in government expenditure, and by 1.5 per cent toward the end of the second year. There is thus a further increase

in imports as well as a slight reduction in exports. Finally, the rise in the domestic price level is a third influence expanding imports.^{1/}

During a period of declining fixed investment, the reverse of the events typifying the upswing tends to emerge. Declining demands for investment funds in relation to supply in Canada are reflected in a decline in domestic interest rates and in the extent of borrowing from foreign sources and thus in a reduction of the portfolio capital inflow. This is usually matched by a decline in the inflow of capital for direct investment.^{2/} On the current side of the balance of payments, declining levels of investment are reflected directly in reduced imports of machinery and equipment and indirectly in reduced growth in the total purchases of all other imported goods, as the rise in total income is checked. Pressure upon the relative level of Canadian prices is also relieved. If credit conditions in Canada are eased to such an extent that the capital inflow declines to a greater extent than the current account deficit, Canada tends to lose reserves or, if the reserves are held fairly constant and the exchange rate is permitted to fluctuate, market forces tend to push the rate downwards. To the extent that a downward rate adjustment serves to reduce the current account deficit, activity in Canada is stimulated, not merely as a consequence of any initial reduction of imports or expansion of exports, but also as a consequence of multiplier effects arising from

^{1/} R. R. Rhomberg, "A Model of the Canadian Economy under Fixed and Fluctuating Exchange Rates", loc. cit., p. 27. Rhomberg's model and results both repay careful study. The major exogenous variables in the model, which is quarterly, are Canadian government expenditures and the supply of money, world industrial production, world export prices, U. S. monetary conditions, fluctuations from trend of U. S. GNP, U. S. net foreign investment and other long-term capital movements. Canadian GNP consumption, investment, exports, imports, prices and the exchange rate are endogenously determined.

^{2/} See Chart 17 below.

the expansion of domestic income.^{1/} In so far as marginal import-competing and export industries are stimulated by exchange depreciation, however, they may be subject to renewed pressures when a new cycle finally begins, capital inflows again tend to drive up the Canadian exchange rate, costs rise in the rapidly expanding sectors and profit margins are squeezed in the weaker sectors.

Under fixed exchange rate conditions, a reduction of the import leakage (i. e., an expansion in the Canadian multiplier) in this way is not possible. Limits are also placed upon the extent to which credit can be eased in Canada because of the need to maintain an inward flow of capital adequate to cover the current account deficit without incurring significant losses of gold and foreign exchange reserves. Without the stimulus afforded by depreciation of the exchange rate and the resulting current account adjustments, output and employment would tend to be lower than under a flexible rate system. However, during the following upswing in capital formation, the extent of readjustment would likely be less, since an extension of the range of production dependent upon depreciated exchange conditions would not have become established during the period of depressed capital formation.

As a qualification to the foregoing analysis, it should be noted that, although the general pattern of events affecting the current and capital accounts of the balance of payments during the course of variations in fixed investment appears to have been broadly as described, the movements of the gold and foreign exchange reserves and of the exchange rate depend upon the relative strengths of foreign demand for Canadian currency and Canadian demand for foreign currency, which have historically been

^{1/} This follows if a reduction of the current account deficit is regarded as negative net foreign disinvestment, which is analagous to (positive) net foreign investment subject to the usual multiplier effects. Alternatively, it may be regarded as a reduction in gross savings, which raises the value of the multiplier associated with a given level of investment.

affected by many special influences in addition to the broad forces described here. Chart 17 shows the behaviour of the Canadian dollar in U.S. funds since 1927 and indicates the main components of the capital account as percentages of GNP. Chart 18 shows the portfolio capital inflow in relation to variations in business fixed capital formation as a percentage of GNP and the differentials between Canadian and American bond yields. It has unfortunately not been possible to obtain a continuously comparable series of bond yield differentials covering the entire period. Although there seems to have been a tendency in the period 1950-62, when Canada was on a fluctuating exchange rate, for movements to be roughly correlated with variations in the capital inflow, the range of observations is too small for a very solid basis for generalization to exist. Also, partly fortuitous events, such as large fluctuations in wheat sales, may temporarily obscure the relationships described. Again, a close relation between swings in Canadian fixed capital formation and the inflow of capital may not always be in evidence. In particular, Canadian and American monetary policies may diverge. Continuance of relatively restrictive credit conditions in Canada during a period of downswing in fixed investment may, as in the late 1950's and very early 1960's, sustain the capital inflow and prevent a significant downward adjustment of the exchange rate. Other factors, such as variations in the domestic savings rate, may also affect the extent of the capital inflow, and special influences may affect the volume of exports. Thus, it cannot be assumed that exchange rate swings strictly synchronous with those in fixed investment will always emerge.^{1/} There will, however, be a tendency for them to emerge under conditions in which a policy to achieve internal stability, as opposed to one geared to the preservation of the exchange value of the Canadian dollar, is vigorously pursued. The reason is that the actions taken, particularly by the monetary authorities, in achieving this objective apparently tend to produce an expansion of capital inflows in excess of the increase in the current account deficit during the upswings and a reduction of capital inflows in excess of the decline in the current account deficit during the downswings of waves of fixed investment expenditure.^{2/}

^{1/} See next page.

^{2/} See next page.

1/ Exchange depreciation in Canada has not always accompanied a period of downswing in North American fixed investment. The depreciation of the Canadian dollar (vis-à-vis the U. S. dollar) in 1931 was closely related to Britain's abandonment of the gold standard. The subsequent restoration of parity in late 1933 was related to the revaluation of the U. S. dollar. See F. A. Knox, Dominion Monetary Policy 1929-34, a study prepared for the Royal Commission on Dominion-Provincial Relations, Ottawa, mimeo., 1939. At the pit of the Depression, Canada, as is well known, enjoyed a trade surplus and was a net exporter of capital. A number of influences, including tariff changes and the application of anti-dumping laws, contributed to these developments, but a major factor was the collapse of fixed investment and the related severe contraction of imports relative to exports. The analysis presented in the text implicitly assumes that such a collapse of fixed investment and imports was virtually unique and is unlikely to be repeated but that considerable potential volatility in the flow of capital is likely to be a continuing accompaniment to moderate swings in fixed investment.

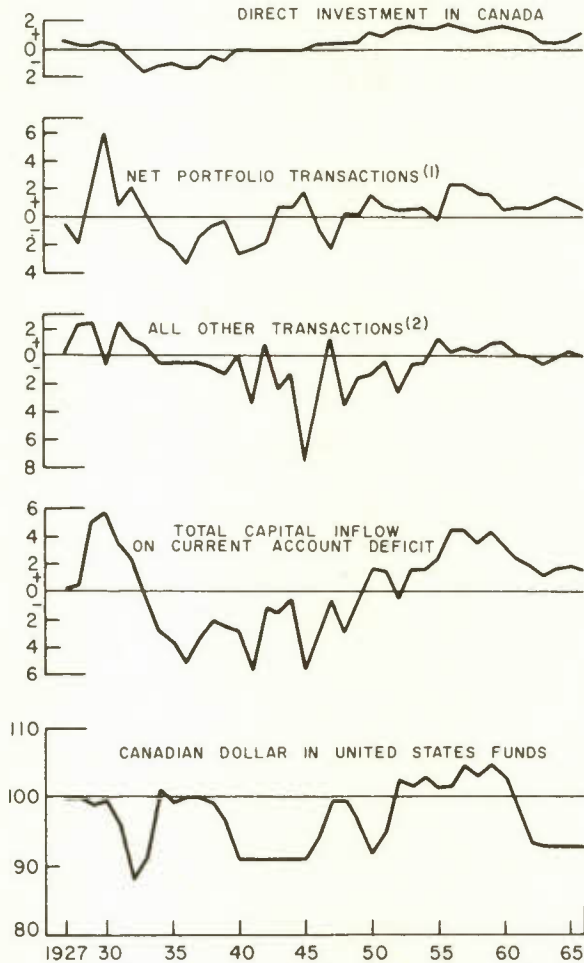
2/ It is implicitly assumed here, for expositional purposes, that significant fixed investment swings are likely in the future. However, this cannot be taken entirely for granted, as is indicated by the discussion in Chapter 7.

The resulting appreciation or depreciation of the rate in turn tends to expand or contract the current account deficit to equal the changed net capital inflow. Such opening and closing of the economic safety valve which the current account deficit constitutes appears moreover to be the most effective way of achieving improved domestic stability under these conditions. ^{1/}

^{1/} This could be true even if Canada were nominally on a fixed exchange rate. The changes in Canada's balance of payments which accompany the major expansions and contractions in fixed investment are sufficiently massive that they would appear to represent alternating swings to positions of "fundamental disequilibrium" possibly justifying revaluation of the Canadian dollar in accordance with International Monetary Fund rules.

Chart 17

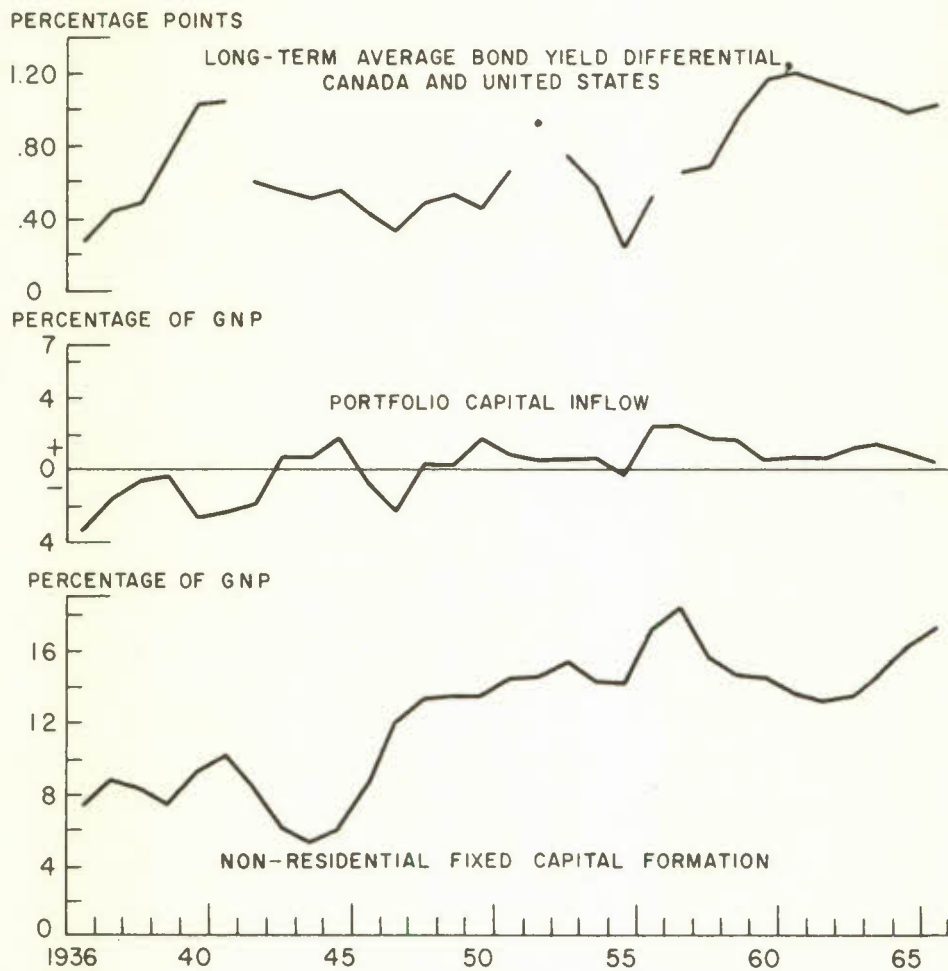
MAJOR COMPONENTS OF THE CAPITAL ACCOUNT OF
THE CANADIAN BALANCE OF PAYMENTS
AS PERCENTAGES OF GROSS NATIONAL PRODUCT



- (1) Trade-in, and new issues and retirements, of Canadian and foreign securities.
- (2) Includes Canadian direct investment abroad, changes in official holdings of gold and foreign exchange, changes in net I. M. F. position, other special financial assistance and all other transactions n. e. s.

Source: National Accounts, Canadian Statistical Review (Historical Summary) and The Canadian Balance of International Payments, Dominion Bureau of Statistics; and Statistical Summary, Bank of Canada.

Chart 18
NET PURCHASE OF PORTFOLIO SECURITIES
AND RELATED VARIABLES



Source: Canada-United States bond yield differentials, see source notes relating to Chart 9; also National Accounts and Canadian Statistical Review (Historical Summary), Dominion Bureau of Statistics.

CHAPTER 7

FACTORS UNDERLYING THE REDUCED POST-WAR AMPLITUDE OF FLUCTUATIONS IN NORTH AMERICAN ECONOMIC ACTIVITY

Introduction

It will be recalled from the discussion in Chapter 3 that the outstanding distinction between earlier North American cyclical experience and that of the post-war years has been the avoidance of a major contraction or depression in the latter period. Thus, an important part of the discussion in this section must be devoted to consideration of the factors responsible for the shift which has taken place in the vulnerability of the economy to severe declines. By comparison with the 1920's, a number of significant changes have occurred in the North American economic environment which suggest that the reduction of economic instability in the post-war years is not merely attributable to a fortunate conjunction of random events, but is to an important degree related to secular changes in both the structure and the management of the economy.

A fully comprehensive discussion of this topic is beyond the scope of this Study. The subject is a difficult one, since the weight to be attached to various developments depends on how important they are believed to be in the processes or mechanisms by which fluctuations are generated. Our lack of a simple and generally accepted theory of business cycles means that the significance of any given development cannot be unequivocally determined. Further, since economic fluctuations are manifest in quantitative changes in economic variables which are themselves dependent upon numerous other quantitative relationships, a purely qualitative assessment

of the factors underlying the changed dynamic performance of the system is somewhat unsatisfactory. Ideally, one would like to observe the changes in the economy since, say, the 1920's by altering one "exogenous variable" or one "parameter" at a time, holding all others constant. Even this prospect raises conceptual difficulties, since it may not have been possible, in the real world, to alter certain exogenous variables or structural parameters without affecting others.

While conceptual limitations to the usefulness of a largely qualitative discussion are recognized, it may nonetheless be contended that the effects of a number of key developments in the North American economy are sufficiently clear-cut, and in the same direction, as to permit certain broad conclusions to be drawn regarding changes over time in the degree of vulnerability of the economy to severe fluctuations. These developments are considered below under the following headings:

1. Changes in the importance of the investment sector in relation both to other sectors of expenditure and to aggregate expenditure.
2. Changes in the degree of instability of investment.
3. Changes in the extent to which variations in investment affect other expenditure sectors.
4. Changes in the extent to which variations in investment are offset by opposite variations in other expenditure sectors.

The choice of these headings reflects the fact that investment has been the most cyclically volatile component of expenditure in the past and also the fact that fluctuations in investment are widely recognized to have been the main engine of instability in the economic system.

1. Changes in the Importance of the Investment Sector
in Relation Both to Other Sectors of Expenditure
and to Aggregate Expenditure

The predominant role of investment in past aggregate economic fluctuations suggests that, if an explanation for the apparently reduced instability of the North American economy during the post-war years is being sought, a useful starting point would be to enquire into changes in the importance of the investment sector -- in relation to other nonconsumption expenditures and in relation to total expenditures. The major expenditure changes occurring in Canada and the United States since the 1920's are summarized in Tables 19 and 20.

Comparison of the two Tables reveals some interesting similarities and differences. Outstanding in both Canada and the United States is the very large rise of the government sector since the 1920's and the relative decline of the consumer sector. Another important similarity is the halving of the relative importance of inventory investment in the two countries. However, whereas total fixed investment declined slightly, as a proportion of total spending, from the 1920's to the post-war period, in the United States, the reverse occurred in Canada. ^{1/}

^{1/} Although, in Canada, the proportion of business fixed investment rose from the late 1920's to the late 1950's, reference to Chart 16 establishes that the latter proportions were not exceptional by the standards of the period prior to the First World War, which featured the heavy railway investment associated with the settlement of the West and the rapid growth of manufacturing in Central Canada. See Easterbrooke and Aitken, Canadian Economic History, Toronto, Macmillan Co. of Canada, Ltd., 1956, pp. 435-444 and 476-486. Also, see W. A. Mackintosh, The Economic Background of Dominion-Provincial Relations, a Study prepared for the Royal Commission on Dominion-Provincial Relations, Ottawa, King's Printer, 1939, Chapter 4, pp. 24-30 and Book 1 of the Report of the Royal Commission on Dominion-Provincial Relations, Ottawa, King's Printer, 1940, Chapter 3, pp. 66-79.

The major differences lie in the construction sector, particularly non-residential construction. Expenditures on machinery and equipment rose considerably, in relation to total expenditures, in both Canada and the United States. Also noteworthy is the rise in the relative importance of consumer durables expenditure in both countries. To the extent that durables purchases are readily postponable, the rise in their relative importance increases the sensitiveness of consumer demand to shifts in confidence or to changes originating in other demand sectors.

The growth of the government sector

In analyzing the growth of government expenditures, it is convenient to consider changes in federal government and local government expenditures separately. As is indicated by Tables 19 and 20, until fairly recently, the bulk of the increase in the proportion of government to total expenditure was attributable to enlarged federal spending. In the past few years, however, local governments have raised their expenditures significantly and the longer-term upward shift in the role of combined government spending is now heavily influenced by the substantial increases occurring at the local government level. U.S. federal government expenditures, dominated by defence spending, tend to be quite volatile. In fact, an "index of instability" indicates that such expenditures were the least stable major demand component by a considerable margin over most of the post-war period.^{1/} Federal government expenditures have also been a volatile component of demand in Canada (see Chart 19 below).

^{1/}

Bert G. Hickman, Growth and Stability of the Post-War Economy, Washington, The Brookings Institution, 1960, Table 34, p. 212. The index referred to measures the average percentage deviation of a series from a fitted exponential trend.

Table 19
Selected Components of Canadian Gross National Expenditure
as Percentages of the Total,
1926-29, 1954-57, 1965

	Current Dollars		
	1926-29	1954-57	1965
	(Per cent)		
Personal expenditure			
Durables	6.2	7.9	7.7
Nondurables	39.1	32.9	29.7
Services	27.1	22.5	24.3
Total	72.4	63.3	61.8
Government expenditure on goods and services			
Federal (defence and nondefence)	2.4	9.1	6.3
Provincial	1.9	3.3	4.3
Municipal	5.4	5.4	7.9
Total	9.7	17.8	18.5
Nongovernment investment			
New residential construction	3.8	4.8	4.1
New non-residential construction	6.4	8.0	7.6
Machinery and equipment	6.2	8.2	8.4
Total fixed investment	16.4	21.0	20.1
Nonfarm inventory change	2.6	1.0	1.7
Farm inventory change	--	.3	.1
Total inventory change	2.6	1.3	1.8
Total nongovernment investment	19.0	22.3	21.9
Net foreign investment	-1.0	-3.4	-2.2
Total Gross National Expenditure	100.0	100.0	100.0

Source: National Accounts, Dominion Bureau of Statistics.

Table 20
Selected Components of U.S. Gross National Expenditure
as Percentages of the Total,
1929, 1954-57, 1965

	Current Dollars		
	1929	1954-57	1965
	(Per cent)		
Personal expenditure			
Durables	8.9	9.4	9.6
Nondurables	36.6	31.2	27.9
Services	<u>29.4</u>	<u>23.4</u>	<u>25.8</u>
Total	74.9	64.0	63.4
Government expenditure on goods and services			
Federal (defence)	(1.2 ⁽¹⁾)	10.1	7.4
(nondefence)	(1.4	2.5
State and local	<u>7.0</u>	<u>7.8</u>	<u>10.1</u>
Total	8.2	19.3	19.9
Nongovernment investment			
New residential construction	3.8	5.2	3.6
New non-residential construction	4.8	3.9	4.1
Machinery and equipment	<u>5.4</u>	<u>6.1</u>	<u>6.7</u>
Total fixed investment	14.1	15.2	14.4
Nonfarm inventory change	1.8	.6	1.2
Farm inventory change	<u>-.1</u>	<u>.1</u>	<u>0.0</u>
Total inventory change	1.7	.7	1.2
Total nongovernment investment	15.8	15.8	15.6
Net foreign investment	1.1	.8	1.0
Total Gross National Expenditure	100.0	100.0	100.0

(1) Data on the defence, nondefence breakdown are available for the first time in respect of 1939; 1939 figures were 1.4 per cent defence, 4.3 per cent nondefence.

Note: Detail may not add to totals because of rounding.

Source: Survey of Current Business, U.S. Department of Commerce.

However, to the extent that federal government spending may be regarded as "autonomous", i. e. , uninfluenced by variations in other categories of demand, its growth may be regarded as a factor conducive to improved stability in aggregate final demand in the sense that, while such spending has tended to be unstable in itself, only coincidentally have its movements reinforced fluctuations in investment in the private sector.^{1/} However, it should be noted that fluctuations in government demand (and the secondary effects of these fluctuations) have probably played a significant role in generating the observed instability in investment expenditure.

By contrast with federal government expenditures, state or provincial and municipal government disbursements have not fluctuated widely around their trends and have shown little response to post-war fluctuations in aggregate demand. Thus, the increased importance of such disbursements must be regarded as a factor tending to produce greater stability in the economy, at least as long as declines in the other demand sectors remain short and mild. Local government expenditures in both Canada and the United States were, of course, severely curtailed during the depression years. As was noted earlier, the declines in Canada were 29 per cent and 27 per cent, respectively, at the provincial and municipal levels. In the United States, the combined state and local government decline was about 16 per cent.

^{1/} This comment relates to the role of such spending in relation to the minor business fluctuations of the post-war years. Between 1929 and 1933 U. S. federal expenditures on goods and services were raised contra-cyclically by nearly 60 per cent and further large increases occurred in subsequent years. In Canada, as was noted earlier, federal expenditures on goods and services declined by 28 per cent from 1929 to 1933.

Since the 1930's, however, the ability of state or provincial and local governments to withstand the effects of general business contractions has improved considerably, both as a result of the development of more diversified tax bases at these government levels and also as a result of the increasing importance of flows of revenues from federal to state and local governments (in the United States), of flows from federal to provincial governments (in Canada) and of flows to municipal governments from state or provincial sources in both countries. The major changes in combined U. S. state and local government revenue sources since the late 1920's are summarized in Table 21. The dominant shifts have been the halving of the proportion of indirect business property taxes in total revenues (from 60 per cent to 32 per cent), the rise in federal transfers from 2 per cent to 15 per cent of total revenues and the rise in sales taxes from 6 per cent to 21 per cent.

Shifts in the relative importance of the various sources of Canadian provincial and municipal revenues are summarized in Tables 22 and 23. As was indicated in Table 19, Canadian provincial and municipal goods and services expenditure in 1965 comprised about two-thirds of total government goods and services expenditure, compared with under one-half as recently as in the 1954-57 period. The same Table indicates that municipal goods and services purchases are almost double those of the provinces. A number of important shifts have occurred in the sources of provincial revenues. Among the most striking since the late 1920's are the well-known rise in the importance of provincial personal and corporate income taxation, the rise in retail sales taxes, the rise in federal transfers, and relative declines in the importance of succession duties, taxes on corporations other than profit taxes, and investment income. At the municipal level, the most outstanding changes have been the decline in the importance of property taxes and investment income and the rise in the importance of provincial-municipal transfers.

Table 21
Sources of the Revenues of U.S. State and Local Governments
as Percentages of Total Revenues,
1929, 1957 and 1964

	1929	1957	1964
Personal tax and nontax receipts	18.23	13.54	15.41
Income taxes	1.84	4.52	5.80
Death and gift taxes	2.18	0.94	0.97
Motor vehicle licences	2.47	1.67	1.44
Property taxes ⁽¹⁾	1.95	0.74	1.06
Other taxes	0.62	0.44	0.35
Nontaxes	9.17	5.25	5.80
Corporate profits tax accruals	1.92	2.67	2.33
Indirect business tax and nontax accruals	76.74	66.83	61.13
Sales tax	5.80	22.51	20.75
State	5.47	19.81	18.25
General	*	9.20	9.27
Gasoline	5.47	7.58	6.19
Liquor	*	1.49	1.25
Tobacco	*	1.54	1.53
Local	0.33	2.70	2.50
Motor vehicle licences	2.02	2.00	1.37
Property taxes ⁽¹⁾	60.01	33.05	31.53
Other taxes	6.17	7.47	5.95
Nontaxes	2.75	1.80	1.53
Contributions for social insurance	1.57	5.93	5.92
Federal grants-in-aid	1.55	11.03	15.21
Total receipts	100.00	100.00	100.00

* Small amounts included in "other taxes".

(1) Property taxes levied on houses of owner-occupants are classified as indirect business taxes.

Source: Survey of Current Business, U.S. Department of Commerce, August 1965.

Table 22
Sources of Canadian Provincial Government Revenues
as Percentages of Total Revenues

	1929	1957	1964
Direct taxes - persons	14.73	7.30	15.10
Income	0.89	1.70	8.61
Motor vehicle licences and permits	4.91	2.07	1.61
Succession duties	7.14	2.37	1.74
Hospital	--	0.41	2.68
Miscellaneous	1.79	0.75	0.46
Direct taxes - corporations	1.79	8.51	9.38
Income	1.34	7.63	8.75
Tax on mining and logging profits	0.45	0.87	0.63
Indirect taxes	37.05	38.88	35.98
Amusement	2.23	0.87	0.57
Corporation tax (not on profits)	5.80	1.00	0.50
Gasoline	8.04	14.07	10.99
Licences, fees and permits	4.02	1.08	0.74
Motor vehicle licences and permits	4.46	3.24	2.39
Miscellaneous taxes on natural resources	6.70	5.19	3.42
Real and personal property	2.68	0.33	0.20
Retail sales tax (including liquor and tobacco)	--	8.46	13.34
Miscellaneous	3.13	4.65	3.81
Investment income	26.79	15.23	11.49
Interest on government-held public funds	2.23	1.95	1.85
Interest on loans, advances and investments	9.38	2.49	2.11
Net profits of government business enterprises	15.18	10.79	7.53
Social insurance and pension fund contributions	8.93	7.97	5.52
Transfers	10.71	22.12	22.52
from Canada	7.59	20.95	22.17
from municipalities	3.13	1.16	0.35
Total	100.00	100.00	100.00

Source: National Accounts, Dominion Bureau of Statistics.

Table 23
Sources of Canadian Municipal Revenues
as Percentages of Total Revenues

	1929	1957	1964
Direct taxes - persons	1.51	1.03	0.92
Income	1.01	--	--
Miscellaneous	0.51	1.03	0.92
Indirect taxes	73.23	59.79	51.67
Amusement	0.25	0.11	0.06
Licences, fees and permits	2.78	1.65	1.03
Real and personal property	64.90	49.03	44.18
Retail sales tax	--	3.02	0.56
Miscellaneous	5.30	5.98	5.84
Investment income	17.17	11.73	9.77
Interest on government-held public funds	2.78	0.51	0.70
Interest on loans, advances and investments	4.29	1.59	1.73
Net profits of government business enterprises	10.10	9.62	7.35
Social insurance and pensions contributions	0.51	0.80	1.00
Transfers from other levels of government	7.58	26.65	36.64
from Canada	--	0.91	1.56
from provinces	7.58	25.74	35.09
Total	100.00	100.00	100.00

Source: National Accounts, Dominion Bureau of Statistics.

Changes within the investment sector

In assessing the significance for future economic stability of the shifts which have occurred in the relative importance of business fixed investment, it is necessary to consider the implications of the different movements of the totals and the components in Canada and the United States. In the United States, a small increase in the relative importance of total business fixed investment arises from a drop in non-residential fixed investment and a marked rise in expenditures on producers' durable equipment. Tables 14 and 16 above indicate that, during the Depression, expenditures on non-residential construction declined to a greater extent than machinery and equipment expenditures, in both Canada and the United States. On the other hand, during the milder cycles, machinery and equipment expenditures fluctuated considerably more than non-residential construction spending in both countries. From these observations, from the apparent secular decline in the relative importance of non-residential construction and from the apparent secular rise in the relative importance of machinery and equipment purchases, one might well infer a tendency for longer-term instability in the United States to diminish and for shorter-term instability to intensify. Other developments to be discussed in this section tend to work in the direction of moderating all types of fluctuation, so that apparent declines in the amplitudes of even short cycles in the post-war period^{1/} would not necessarily invalidate such an inference. These other factors would, of course, reinforce the effects of the diminished importance of non-residential business construction in moderating the impact of the long construction cycle still further.

Table 19 shows that, in Canada, all forms of fixed investment have increased in relative importance since the late 1920's. Thus, one would expect from this evidence considered in isolation to observe an increase in both the shorter- and longer-term variability of Canadian aggregate

^{1/} See page 48 above and Appendix Tables A-1.3 and A-1.4.

economic activity. However, the percentage of GNP represented by the rise in Canadian government expenditure since the late 1920's has been about double that represented by the rise in fixed investment. Further, the degree of instability of Canadian fixed investment has undoubtedly markedly diminished with the improvement in stability exhibited by total spending in the United States. Finally, a tendency for variations in fixed investment to be partly offset by opposite variations in net exports was noted earlier.^{1/} The improved stability now apparent in the United States would contribute to a more rapid compensatory adjustment of net exports to a decline in Canadian fixed investment (because exports would be maintained at a high level while imports were declining) than would formerly have been the case. While it may be concluded on the basis of these considerations that fluctuations in Canadian activity accompanying fixed investment swings will be less severe than in the past, despite the growth in the relative importance of fixed investment in Canada, it should also be observed that significant variations in the Canadian current account and over-all balance-of-payments positions appear likely to continue to accompany even moderate swings.

Two categories of investment remain to be considered, namely, residential construction and the value of the physical change in business inventories. Of investment in housing, little may be said in the present context because there is no evidence of any trend in the proportion of such spending to the totals in Canada and the United States. The long-term decline in the relative importance of business inventories would appear initially to be a development conducive to improved economic stability over the course of the short cycle. However, the decline in the relative importance of inventories, in the case of the United States, has been accompanied by an increase in the proportion of durable stocks to total

^{1/} This tendency arises from shifts in the Canadian marginal propensity to import as fixed investment fluctuates. See discussion in Chapter 6, pp. 138 and 141.

stocks^{1/} and durable goods inventories are more demand-sensitive than nondurables.^{2/} Thus, in most of the post-war cyclical phases, manufacturers' inventory investment has been dominated by durable goods inventory investment.^{3/} Manufacturers' inventory stocks are, in turn, more volatile than nonmanufacturing stocks and, as was noted earlier, have constituted a rising proportion of nonfarm inventories in the United States. Thus, changes in these stocks have dominated the changes in total nonfarm inventories. The rise in the relative importance of durables provides some explanation of the fact that, in the post-war years, despite very substantial declines in inventory stock to output ratios since the 1920's, the relation between changes in total business inventories and changes in GNP has shown no clear-cut shift compared with the pre-war years, although the changes in GNP have themselves been much less pronounced in the latter period.^{4/}

Summary

In weighing up the various issues relating to the changing importance of the investment sector in relation to other sectors and total expenditure discussed above, it may be concluded that the single most important development is the growth of the government sector in the United States to the point where it is quantitatively larger than the private investment sector. Thus, whereas in the 1920's U. S. nongovernment investment (in current dollars) was about twice the value of government expenditures on goods and services, by 1954-57 it had fallen (relatively) to about four-fifths of the amount of such government spending.

^{1/} T. M. Stanback, op. cit., Table 10, p. 26.

^{2/} Ibid., p. 24.

^{3/} Ibid., Table 10, p. 26.

^{4/} Ibid., Table 7, p. 15.

Similarly, in Canada, nongovernment investment was double the size of government spending in 1926-29 but only one-fourth larger in 1954-57. Within the government sector, the strong relative expansion of smoothly growing state, provincial and local expenditures, in particular, appears to have favoured improved shorter-term economic stability, despite the continued volatility of inventories and the larger role of machinery and equipment spending. The relative decline in the over-all importance of construction expenditure in North America, coupled with this expansion of the government sector, suggests a substantially diminished likelihood that severe depressions -- associated in the past with large declines in construction expenditure -- will be experienced for as long as these circumstances continue to prevail.

2. Changes in the Degree of Instability of Investment

A significant theoretical issue in this context is the extent to which fluctuations in investment are either "endogenous", i. e. , arise mainly from the existence of dynamic relationships between investment and income, or arise from "shocks" or autonomous disturbances in either investment or the variables to which it is related. If fluctuations were primarily "endogenous" in character, a reduction in the degree of sensitivity of incomes and other expenditure to an initial investment fluctuation would, in turn, limit the extent of further "induced" variations in investment. Thus, in the absence of offsetting changes, a decrease in the sensitivity of consumer incomes to investment spending variations or an expansion of income-invariant government spending will necessarily produce a decline in the volatility of investment. Since it is widely accepted that the investment actually being undertaken at any point in time does, in fact, include a significant "induced" component, it may be concluded that the influences producing a decline in the sensitivity of total noninvestment expenditure to variations in investment spending^{1/} have also reduced the instability of investment itself.

^{1/} See Section 3 of this Chapter.

Among "autonomous" influences (apart from government actions) upon spending decisions, it is usual to recognize demographic changes, wars and their after-effects (including the economic effects of the improved liquidity of consumers), technological changes, the development of new products, changes in tastes, resource discoveries, changes in trading arrangements, foreign trade developments, factors affecting international capital and labour flows, exchange rate changes, domestic and international political developments, factors affecting business confidence or expectations concerning the future, and the rate of change of the supply of money. In relation to the latter, to the extent to which the supply of money is now continuously manipulated with the object of achieving stabilization and balance-of-payments objectives, it is perhaps no longer appropriate to regard it as "autonomous" in the sense in which this term is applied to the other influences mentioned above.

It would obviously be a highly speculative and rather futile exercise to attempt to assess the likely impact in the years ahead of each of the potential sources of disturbance listed. In the recent past, variations in federal spending associated with war or defence requirements have been the major form of autonomous disturbance. The Second World War and its effects constituted the largest single disturbance of the last quarter of a century. As the war recedes in time, its surviving influence on current dynamic developments would appear to be quite small, although diminishing demographic echoes of the post-war "baby boom" are likely to be felt for some time, perhaps even for another generation or two.

Something can be said, however, about the climate in which business investment decisions will be taken in the future. It is generally accepted that the declines in many aspects of economic activity featuring the Depression were sharply accentuated by the collapse in confidence which occurred and also by a number of financial and monetary

developments.^{1/} The extent of the wave of speculative activity preceding the stock market crash and the gigantic dimensions of the crash itself^{2/} are generally well known and have been extensively discussed. Between 1929 and 1933, the stock of money in the United States fell by more than one-third,^{3/} one-fifth of U. S. banks were forced out of business and voluntary mergers and liquidations brought the total decline in the number of banks to one-third. Banking "holidays" were widespread in 1933.^{4/} Runs on banks were common. Inability to renegotiate maturing unamortized mortgages was general.

Most of the major institutional shortcomings leading to the vulnerability in the U. S. economy revealed by the Depression have given rise to corrective action.^{5/} Among the latter, insurance of the deposits of almost all commercial banks (up to \$10,000 for each deposit) since 1933 has been a crucial development, leading to the virtual elimination of bank failures. Also of paramount importance is current recognition, both by the monetary authorities and the public, of the dangers of "perverse" monetary policy and the need to move quickly to deal with incipient liquidity crises. Further important changes relate to more stringent control of stock markets and securities issues and the establishment of discretionary powers by which the Federal Reserve Board may restrict stock market trading on margin.

^{1/} For a detailed discussion of some of these developments, see M. Friedman and A. J. Schwartz, A Monetary History of the United States, 1867-1960, NBER Studies in Business Cycles No. 12, Princeton, Princeton University Press, 1963. See also, Chapter 4 above, p. 84.

^{2/} See Chart 11, p. 126.

^{3/} See Chart 10, p. 123.

^{4/} M. Friedman and A. J. Schwartz, op. cit., p. 299.

^{5/} For a brief discussion, see Bert G. Hickman, op. cit., pp. 177-78.

Apart from the effects of these changes, mention should also be made of the much greater current willingness on the part of the responsible authorities to use discretionary monetary policy changes for stabilization purposes. The theoretical background to the shift in the emphasis of monetary policy between the pre-war and post-war periods is very well known and requires little further discussion in the present context. However, in recent years, considerable doubt has arisen concerning the rapidity and magnitude of the response of business investment to changes in credit conditions.^{1/} While it is highly doubtful that the effects of monetary policy changes are sufficiently large, rapid, discriminating and highly damped for monetary policy to serve adequately as the major instrument of short-term stabilization, discretionary changes in monetary conditions appear likely to be effective in alleviating potential longer-term weakness or excessive strength in total demand. To the extent that monetary policy is used in this way, it may be expected that some further moderation of potential longer-term swings in fixed investment will be a likely outcome.^{2/}

In the Canadian case, a crucial influence on the volatility of investment will be the nature and extent of economic instability in the United States. If Canadian exports to the United States (realized or expected) become less variable, Canadian fixed investment will also probably become far less volatile. Apart from the influence of improved American economic stability upon Canadian exports to the United States and thus upon export-related

^{1/} See J. H. Young and J. F. Helliwell, assisted by W. A. McKay, "The Effects of Monetary Policy on Corporations", Appendix Volume, Royal Commission on Banking and Finance, Ottawa, Queen's Printer, 1964. Also, D. J. Daly, "The Scope for Monetary Policy -- A Synthesis" in Conference on Stabilization Policies, Ottawa, Queen's Printer, 1966.

^{2/} Whether monetary policy should be used in this way, is a much debated question upon which no judgment is expressed here.

investment, however, it will be apparent from the discussion in the previous Chapter that Canadian investment will also respond to the effects of such improved stability in the United States upon the money and stock markets in both countries and upon the general climate of business opinion.

A factor affecting the variability of investment which may be of growing significance is the degree of confidence which businessmen have in the ability and willingness of monetary managers and governments effectively to counteract substantial deviations of output and employment from their potential paths. There is evidence that, to an increasing extent, businesses are making investment plans on a longer-term basis.^{1/} While the mere formulation of longer-term plans is not a guarantee that they will be carried out irrespective of economic conditions, the growth of the practice suggests (a) a presumption on the part of many businessmen that such planning is both practical and realistic, which in turn reflects increased confidence in the achievement of future economic stability; (b) that there is an increasing commitment to longer-term objectives, with some corresponding shift away from preoccupation with immediate and short-term developments; (c) that there may well, as a result, be a gradual reduction in the proportion of business investment which is highly sensitive to product demand fluctuations. The creditable post-war employment performance (by comparison with the pre-war record) suggests that it may have been more realistic (and more profitable) for many businesses to base substantial investment decisions upon the potential output growth path of the economy, coupled with an assumption concerning the rate of unemployment, than to attempt to forecast demand on the basis of preceding short-term changes in output.

^{1/}

See, for Canada, B. A. Keys, Special Survey of Longer Range Investment Outlook and Planning in Business, Staff Study No. 6, Economic Council of Canada, Ottawa, Queen's Printer, 1965.

A further factor of considerable potential importance in the Canadian context is the gradual spread of longer-term planning of construction outlays among government-owned business enterprises and government-financed institutions, as well as among government departments. In 1966, roughly a third of total non-residential construction constituted direct government outlays. Of the balance, 36 per cent represented spending by utilities, which are mostly government-owned or influenced, and over 10 per cent represented spending by institutions, such as universities and hospitals, which are again strongly government-influenced. Thus, governments exert a quite substantial influence over "non-government" non-residential construction. The volatile manufacturing and mining sectors, in which government influence is minimal, accounted for only just over 20 per cent of total non-residential construction and for only just over 30 per cent of nongovernment non-residential construction.

Finally, mention should also be made of government fiscal instruments, such as accelerated depreciation allowances and tax holidays, which have been used in both Canada and the United States, during the past few years, to influence the level of private investment decisions, particularly in slack times. To the extent that the use of such devices becomes a permanent feature of stabilization policy, some moderate direct effect in reducing the variability of investment may be anticipated in the future.

3. Changes in the Extent to Which Variations in Investment Affect Other Expenditure Sectors

The theoretical role of stabilizers

As was indicated in Chapter 4, an initial reduction in investment (or any "autonomous" reduction in spending) tends to produce a decline in income which in turn leads to a fall in the personal expenditures of income recipients. The drop in such expenditures tends to bring about a further round of declines in income and expenditure and this process

continues until a new "equilibrium" set of values of income and expenditure is reached. In the simplest representations of the theoretical scheme of Keynesian economics, the value of the income "multiplier" associated with a given change in investment depends solely upon the marginal propensity to consume. When the assumption of a closed economy is relaxed, the value of the multiplier becomes a function of the marginal propensity to consume and the marginal propensity to import. ^{1/}

When stabilizers such as unemployment insurance payments or reductions in the average proportion of taxes collected out of income interpose a cushion between declines in expenditure and the income received by consumers, the effect is to reduce the value of the multiplier (for cut-backs in expenditure only) and thus to limit the degree to which the induced sequence of income and expenditure declines

$$\frac{1}{-} \text{ If } Y = C + I + (E - M) + G, \quad \dots\dots\dots I$$

Where Y is total income; C, consumption; I, investment; E, exports; M, imports and G, government spending;

$$C = a + bY, \quad \dots\dots\dots II$$

Where a is a constant; b, the marginal propensity to consume;

$$\text{and } M = c + mY \quad \dots\dots\dots III$$

Where c is a constant and d, the marginal propensity to import;

then, substituting III and II in I,

$$Y = a + bY + I + E - c - mY + G$$

$$Y (1 - b + m) = a + I + E - c + G$$

$$\Delta Y = \frac{\Delta (I + E + G)}{1 - b + m} \quad \dots\dots\dots IV$$

If $b = .8$ and $m = 0$, the value of the multiplier, $\frac{1}{1 - b + m}$, is 5. If $m = .5$, the value of the multiplier is reduced to 1.4. Since m is markedly higher for Canada than for the United States, attempts to expand incomes in Canada by raising, e. g., government expenditures, will be relatively less effective than those in the United States.

magnifies an initial drop in expenditure. In other words, personal consumption, being based on personal disposable income, rather than upon total income, or GNP, $\frac{1}{1}$ becomes less responsive to changes in GNP when such changes are partly offset by the operation of the various stabilizers. $\frac{2}{1}$

$\frac{1}{1}$ Gross National Expenditure = Gross National Product

Gross National Product

Minus indirect taxes less subsidies

Minus capital consumption allowances

Minus residual error

Equals Net National Income at factor cost

Net National Income

Plus transfer payments (excl. interest on the public debt)

Plus interest on the public debt

Minus earnings not paid out to persons

Equals Personal Income

Personal Income

Minus personal direct taxes

Equals Personal Disposable Income

$\frac{2}{1}$

The effect of stabilizers is to reduce the dependence of consumption on total income.

Thus, incorporating the effect of stabilizers, II may be rewritten

$C = \bar{C} + b^1 Y$ where \bar{C} is "autonomous" consumption and $b^1 < b$.

The value of the multiplier is smaller, the smaller is b^1 .

Note, however, that, even when $b^1 \rightarrow 0$, GNP is still reduced by $\frac{\Delta (I + E + G)}{1 + m}$

Thus, the built-in stabilizers cushion the effects of a drop in autonomous expenditure, but do not counteract it.

Further, since, as was indicated in the previous section, a significant proportion of the investment being undertaken at any given time is related either to previous or expected levels of income and expenditure, any lessening of the volatility of consumer incomes and expenditure will also reduce the volatility of this "induced" investment. Clearly, then, stabilizers play a key role in limiting the magnitudes of fluctuations in aggregate activity arising from the interaction of investment and income. The discussion of Chapter 6 established the existence of strong connections between American and Canadian activity. These imply that both American and Canadian stabilizers exert a significant influence on the level of activity in Canada. Canadian stabilizers, in turn, have a modest effect on levels of activity in the United States. Canadian overseas exports which do not fluctuate in synchronism with total activity in the United States also contribute to over-all Canadian stability.^{1/}

Business contractions and changes in Canadian and American personal disposable income

It is not feasible, in this brief study, to attempt a detailed comparative analysis of the past and prospective operation of the entire range of Canadian and American stabilizers. However, Tables 24 and 26 detail, for Canada and the United States, respectively, the manner in which personal disposable income has varied in relation to GNP during the course of the contractions since the late 1920's, thereby throwing light upon the past roles and changing importance of the main types of stabilizer.

^{1/} Equation IV (footnote 1, p. 171) may be rewritten

$$\Delta Y = \frac{\Delta (I + E_O + E_{U.S.} + G)}{1 - b + m}$$

where $E_O + E_{U.S.}$ are overseas exports and exports to the United States respectively. Exports to the United States are considerably larger than those to overseas countries and, as noted earlier, I and $E_{U.S.}$ tend to move together. The apparent stabilizing role of E_O is reduced by the import leakage represented by m .

The Canadian experience

Table 24 shows that Canadian national income has been rather more volatile than GNP during contractions, rising more when GNP has been rising and falling more when GNP has been falling. In the 1929-33 contraction, national income declined proportionately more than GNP, because capital consumption allowances and net indirect taxes were less flexible in a downward direction than were total expenditures. Despite this, the items reconciling national income with personal income exerted such a strong influence in the opposite direction that the percentage decline in personal income was significantly less than that in GNP. Although almost all of these items worked in the same direction, the most important contributions, in quantitative terms, were made by undistributed profits, which fell from \$231 million in 1929 to \$35 million in 1933 -- a total swing of over a quarter of a billion dollars; transfer payments, which rose by \$88 million; and government investment income, which fell by over \$70 million. Finally, the average propensity to consume rose to a value of almost 1.1 in 1933. Personal net savings were in fact negative over the entire period from 1929 to 1937. These negative personal savings helped to offset certain positive components of total national saving, such as capital consumption allowances, thus playing a role in bringing total net saving to equality with the very low level of investment, thereby preventing further contraction of expenditure and income.^{1/} It will be noted that, in Canada, personal income taxes remained essentially stable during the Depression, thus contributing nothing towards counteracting the declines in income.

^{1/} Put in a slightly different way, the rise in the ratio of spending to personal disposable income raises the marginal propensity to consume out of total income (GNP), thus raising the value of the GNP multiplier associated with any given level of investment spending.

A significant contracyclical role was also played by undistributed corporate profits during the 1937-38 contraction. The contraction in undistributed profits in fact exceeded the decline in total profits. Since taxes also declined, there was an implicit substantial expansion of dividend payments. Again, personal direct taxes did not vary in a contracyclical way. Finally, while the average propensity to save remained low, it rose somewhat between 1937 and 1938, thus tending to accentuate the moderate degree of cyclical weakness.

During the post-war years, undistributed corporate profits have continued to serve as an important buffer between declines in after-tax profits and the level of dividend payments. However, declines in corporate tax liabilities and increased transfer payments have assumed much greater relative importance in reducing the variability of personal income. These developments are clearly shown in Table 25, which summarizes the changes in the income categories reconciling national income with personal disposable income. An interesting revelation of this Table is that undistributed profits cushioned a substantial fraction of the drop in national income between 1929 and 1930 but that their effectiveness in this respect declined as the Depression wore on. There does not appear to have been any clear-cut change over time in the role of undistributed profits if the 1929-30 performance is examined in relation to that of subsequent periods of recession. The rise in the importance of changes in tax liabilities stands out quite clearly, however, and so does the growing contracyclical impact of transfer payments. Not all of the increased transfer payments have represented the operation of built-in stabilizers. Even the transfers which are not primarily contracyclical in character have exerted a moderating influence on recent fluctuations by virtue of the fact that they constitute a sizeable component of personal income which is virtually impervious to business fluctuations. Whereas total government transfers to persons (excluding interest) were a mere 1.9 per cent of personal income in 1926-29, by 1954-57,^{1/} they represented 8.7 per cent.

^{1/} 1926-29 and 1954-57 are roughly comparable periods of high-level investment and employment preceding the emergence of a substantial weakness in fixed investment.

Table 24
Reconciliation of Changes in
Gross National Product and Personal Disposable Income,
Pre-War and Post-War Contractions - Canada
(Millions of current dollars)

	1929	1930	Absolute Δ	% Δ
Gross National Product	6,134	5,728	-406	- 6.6
less Indirect Taxes less Subsidies	681	593	- 88	- 12.9
less Capital Consumption Allowances	717	711	- 6	- .8
less Residual Error	28	25	- 3	- 10.7
equals <u>Net National Income at Factor Cost</u>	4,708	4,399	-309	- 6.6
plus Transfer Payments	93	112	+ 19	+ 20.4
plus Interest on Public Debt	235	244	+ 9	+ 3.8
less Undistributed Corporation Profits	231	2	-229	- 99.1
less Corporate Tax Liabilities	48	40	- 8	- 16.7
less Withholding Taxes	--	--	--	--
less Government Investment Income	136	103	- 33	- 24.3
less Adjustment on Grain Transactions	1	4	+ 3	300.0
less Inventory Valuation Adjustment	- 15	239	+254	--
less Contributions to Pension Funds	27	29	+ 2	7.4
equals <u>Personal Income</u>	4,608	4,338	-270	- 5.9
less Personal Direct Taxes	68	71	+ 3	+ 4.4
equals <u>Personal Disposable Income</u>	4,540	4,267	-273	- 6.0
Personal Expenditure	4,621	4,367	-254	- 5.5
Personal Expenditure as Percentage of Personal Disposable Income	101.8			

Table 24 (Cont'd.)

1929	1933	Absolute Δ	% Δ	1937	1938	Absolute Δ	% Δ
6,134	3,510	-2,624	- <u>42.8</u>	5,257	5,278	+ 21	+ <u>0.4</u>
681	537	- 144	- 21.2	705	639	- 66	- 9.4
717	528	- 189	- 26.4	594	604	+ 10	+ 1.7
28	77	+ 49	--	71	34	- 37	--
4,708	2,368	-2,340	- <u>49.7</u>	3,887	4,001	+114	+ <u>2.9</u>
93	181	+ 88	+ 94.6	237	226	- 11	- 4.6
235	283	+ 48	+ 20.4	273	266	- 7	- 2.6
231	- 35	- 266	-115.2	223	115	-108	-48.4
48	37	- 11	- 22.9	101	94	- 7	- 6.9
--	5	+ 5	--	10	10		
136	65	- 71	- 52.2	116	101	- 15	-12.9
1	- 29	- 30	--	- 7	5	+ 12	--
- 15	- 22	- 7	--	- 87	67	154	--
27	21	- 6	- 22.2	34	33	- 1	- 2.9
4,608	2,790	-1,818	- <u>39.5</u>	4,007	4,068	+ 61	+ <u>1.5</u>
68	69	+ 1	+ 1.47	112	115	+ 3	+ 2.7
4,540	2,721	-1,819	- <u>40.1</u>	3,895	3,953	+ 58	+ <u>1.5</u>
4,621	2,984			3,884	3,897		
101.8	109.7			99.7	98.6		

Continued. .

Table 24 (Cont'd.)

Reconciliation of Changes in

Gross National Product and Personal Disposable Income,

Pre-War and Post-War Contractions - Canada

(Millions of current dollars)

	IIQ 1953	IIQ 1954	Absolute Δ	% Δ
Gross National Product	24,900	24,588	-312	- 1.25
less Indirect Taxes less Subsidies	2,928	2,952	+ 24	+ 0.82
less Capital Consumption Allowances	2,660	2,872	+212	+ 7.97
less Residual Error	- 76	- 16	+ 60	--
equals <u>Net National Income at Factor Cost</u>	19,388	18,780	-608	- 3.14
plus Transfer Payments	1,428	1,588	+160	+11.20
plus Interest on Public Debt	636	692	+ 56	+ 8.81
less Undistributed Corporation Profits	756	604	-152	-20.11
less Corporate Tax Liabilities	1,248	1,036	-212	-16.99
less Withholding Taxes	48	60	+ 12	+25.00
less Government Investment Income	672	676	+ 4	+ 0.60
less Adjustment on Grain Transactions	- 68	- 12	+ 56	--
less Inventory Valuation Adjustment	- 16	60	+ 76	--
less Contributions to Pension Funds	408	420	+ 12	+ 2.94
equals <u>Personal Income</u>	18,404	18,216	-188	- 1.02
less Personal Direct Taxes	1,440	1,440	--	--
equals <u>Personal Disposable Income</u>	16,964	16,776	-188	- 1.11
Personal Expenditure	15,508	16,056		
Personal Expenditure as Percentage of Personal Disposable Income	91.4	95.7		

Table 24 (Cont'd.)

IIQ 1957	IIQ 1958	Absolute Δ	% Δ	IQ 1960	IQ 1961	Absolute Δ	% Δ
31,776	32,872	+1,096	+ <u>3.45</u>	36,524	36,136	-388	- <u>1.06</u>
3,868	3,852	- 16	- 0.41	4,456	4,604	+148	+ 3.32
4,020	3,892	- 128	- 3.18	4,492	4,448	- 44	- 0.98
- 12	260	+ 272	--	156	104	- 52	--
23,900	24,868	+ 968	+ <u>4.05</u>	27,420	26,980	-440	- <u>1.60</u>
1,868	2,520	+ 652	+34.90	3,032	3,424	+392	+12.93
764	768	+ 4	+ 0.52	1,068	1,124	+ 56	+ 5.24
844	764	- 80	- 9.48	1,064	424	-640	-60.15
1,384	1,260	- 124	- 8.96	1,620	1,424	-196	-12.10
84	24	- 60	-71.43	76	120	+ 44	+57.89
872	892	+ 20	+ 2.29	1,060	1,044	- 16	- 1.51
- 16	32	+ 48	--	24	40	+ 16	--
- 124	104	+ 228	--	- 148	- 40	+108	--
580	612	+ 32	+ 5.52	756	784	+ 28	+ 3.70
22,908	24,468	+1,560	+ <u>6.81</u>	27,068	27,732	+664	+ <u>2.45</u>
1,908	1,616	- 292	-15.30	2,340	2,412	+ 72	+ 3.08
21,000	22,852	+1,852	+ <u>8.82</u>	24,728	25,320	+592	+ <u>2.39</u>
19,976	21,056			23,132	23,828		
95.1	92.1			93.5	94.1		

Note: Gross National Product data relating to the 1948-49 "recession" are not presented in this Table because Gross National Product rose by 4.9 per cent between the "peak" and "trough" quarters.

Source: National Accounts, Dominion Bureau of Statistics.

Table 25

Reconciliation of Changes in National Incomeand Personal Disposable Income,Pre-War and Post-War Contractions - Canada

(Millions of current dollars)

Changes in:	1929 to 1930	1929 to 1933	1937 to 1938	IIQ 1953 to IIQ 1954	IIQ 1957 to IIQ 1958	IQ 1960 to IQ 1961
Net National Income at Factor Cost	-563	-2,333	-40	-684	740	-548
Minus I. V. A.						
Transfer Payments	19	88	-11	160	652	392
Interest on Public Debt	9	48	-7	56	4	56
Undistributed Corporation Profits	229	266	108	152	80	640
Corporate Tax Liabilities	8	11	7	212	124	196
Withholding Taxes	--	5	--	-12	60	-44
Government Investment Income	33	71	15	-4	-20	16
Adjustment on Grain Transactions	-3	30	-12	-56	-48	-16
Contributions to Pension Funds	-2	6	1	-12	-32	-28
Personal Income	-270	-1,818	61	-188	1,560	664
Personal Direct Taxes	-3	1	-3	--	292	-72
Personal Disposable Income	-273	-1,819	58	-188	1,852	592

Percentages of Net National Income Change

National Income	-100.0	-100.0	-100.0	-100.0	100.0	-100.0
Transfer Payments	3.4	3.8	-27.5	23.4	88.1	71.5
Interest on Public Debt	1.6	2.1	-17.5	8.2	.5	10.2
Undistributed Corporation Profits	40.7	11.4	270.0	22.2	10.8	116.8
Corporate Tax Liabilities	1.4	.5	17.5	31.0	16.8	35.8
Withholding Taxes	--	.2	--	-1.8	8.1	-8.0
Government Investment Income	5.9	3.0	37.5	-.6	-2.7	2.9
Adjustment on Grain Transactions	-.5	1.3	-30.0	-8.2	-6.5	-2.9
Contributions to Pension Funds	-.4	.3	2.5	-1.8	-4.3	-5.1
Personal Income	-48.0	-77.9	152.5	-27.5	210.8	121.2
Personal Direct Taxes	-.5	--	-7.5	--	39.5	-13.1
Personal Disposable Income	-48.5	-78.0	145.0	-27.5	250.3	108.0

Source: Table 24.

Military pay and allowances rose over the same period from under 0.2 per cent of personal income to 2.0 per cent. Counterpart to this growth in transfer payments and military expenditures there has, of course, been a rise in government revenues and payments into government-operated accounts. Ultimately, therefore, the efficacy of transfers in sustaining income rests to an important degree upon the willingness of governments to tolerate deficits.^{1/} Finally, it will be observed from Tables 24 and 25 that personal direct taxes declined over the period between the peak quarter and the trough quarter of a contraction in only one case during the post-war years. In this case (second quarter 1957 to second quarter 1958) the decline in personal tax collections was substantial (15 per cent) and reinforced a sizeable increase (6.8 per cent) in personal income.

The American experience

Table 26 indicates that, in the United States, during the Depression, the percentage declines in personal income and personal disposable income were almost as large as those in GNP. The percentage decline in net national income was in excess of that in GNP, as capital consumption allowances fell only moderately and indirect business taxes actually rose. As in Canada, a predominant role in the stabilization of personal income was played by undistributed corporate profits, which swung between 1929 and 1933 by over \$4 billion and were strongly negative in the latter year. Profits tax liabilities fell sharply, particularly during the early stages of the decline, and thus contributed more strongly than in Canada to the maintenance of personal income. However, despite their volatility, the level of tax liabilities was too small at that time for declines in liabilities to have much stabilizing effect on personal income (see Table 27).

^{1/} It should be recognized, too, for completeness, that government borrowings to cover the cash requirements resulting from the pursuit of stabilization objectives compete with other demand for funds and will therefore tend to produce tighter credit conditions than would otherwise be the case, with adverse repercussions on some private spending decisions. This partial offset to the impact of government deficit spending may be either counteracted or intensified by monetary policy action.

Table 26
Reconciliation of Changes in
Gross National Product and Personal Disposable Income,
Pre-War and Post-War Contractions - United States

	1929	1930	Absolute Δ	% Δ
	(Millions of dollars)			
Gross National Product	103,095	90,367	-12,728	- 12.3
less Capital Consumption Allowances	7,868	7,973	+ 105	+ 1.3
less Indirect Business Tax and Nontax Liability	7,003	7,155	+ 152	+ 2.2
less Business Transfer Payments	587	534	- 53	- 9.0
less Statistical Discrepancy	695	- 800	- 1,495	
plus Subsidies less Account Surplus of Government Enterprises	- 147	- 123	+ 24	
equals <u>National Income</u>	86,795	75,382	-11,413	- 13.1
less Profits Tax Liabilities	1,369	842	- 527	- 38.5
less Undistributed Profits	2,820	- 2,613	- 5,433	
less I.V.A.	472	3,260	+ 2,788	+590.7
less Social Insurance Contributions	243	253	+ 10	+ 4.1
less Wage Accounts less Disbursements	--	--	--	--
plus Government Transfers to Persons	909	999	+ 90	9.9
plus Interest Paid by Government (Ontario) and by Consumers	2,518	1,842	- 676	- 26.8
plus Business Transfers	587	534	- 53	- 9.0
equals <u>Personal Income</u>	85,905	77,015	- 8,890	- 10.3
less Personal Tax and Nontax Payments	2,643	2,507	- 136	- 5.1
equals <u>Personal Disposable Income</u>	83,262	74,508	8,754	- 10.5
Personal Consumption Expenditures	77,222	69,880	7,342	- 9.5
Ratio PE/PDI	92.7	93.8		

Table 26 (Cont'd.)

1929	1933	Absolute Δ	% Δ	1937	1938	Absolute Δ	% Δ
(Millions of dollars)				(Millions of dollars)			
103,095	55,601	-47,494	- 46.07	90,446	84,670	-5,776	- 6.39
7,868	6,953	- 915	- 11.63	7,157	7,291	+ 134	+ 1.87
7,003	7,055	+ 52	+ 0.74	9,157	9,154	- 3	- 0.03
587	659	+ 72	+ 12.27	567	429	- 138	- 24.34
695	640	- 55		- 25	600	+ 625	
- 147	18	+ 165		60	176	+ 116	+193.33
86,795	40,312	-46,483	- 53.56	73,650	67,372	-6,278	- 8.52
1,369	521	- 848	- 61.94	1,502	1,029	- 473	- 31.49
2,820	- 1,603	- 4,423	-156.84	623	- 225	- 848	-136.12
472	- 2,143	- 2,615		- 31	963	+ 994	
243	285	+ 42	+ 17.28	1,800	1,977	+ 177	+ 9.83
--	--	--	--	--	--	--	--
909	1,457	+ 548	+ 60.29	1,851	2,405	+ 554	+ 29.93
2,518	1,636	- 882	- 35.03	1,944	1,884	- 60	- 3.09
587	659	+ 72	+ 12.27	567	429	- 138	- 24.34
85,905	47,004	-38,901	- 45.28	74,118	-68,346	-5,772	- 7.79
2,643	1,464	- 1,179	- 44.61	2,921	2,862	- 59	- 2.02
83,262	45,540	-37,722	- 45.31	71,197	65,484	-5,713	- 8.02
77,222	45,795	-31,427	- 40.7	66,507	63,920	-2,587	- 3.9
92.7	100.6	+ 7.9		93.4	97.6	+ 4.2	

Continued. .

Table 26 (Cont'd.)

Reconciliation of Changes in
Gross National Product and Personal Disposable Income,
Pre-War and Post-War Contractions - United States

	IVQ 1948	IVQ 1949	Absolute Δ	% Δ
	(Billions of dollars)			
Gross National Product	263.9	255.0	- 8.9	- 3.37
less Capital Consumption Allowances	15.2	17.4	+ 2.2	+14.47
less Indirect Business Tax and Nontax Liability	20.6	21.6	+ 1.0	+ 4.85
less Business Transfer Payments	.7	.8	+ .1	+14.29
less Statistical Discrepancy	- 2.2	1.2	+ 3.4	
plus Subsidies less Account Surplus of Government Enterprises	.2	- .1	- .3	
equals <u>National Income</u>	<u>229.8</u>	<u>214.0</u>	<u>-15.8</u>	<u>- 6.88</u>
less Profits Tax Liabilities	12.3	10.1	- 2.2	-17.9
less Undistributed Profits	14.8	10.7	- 4.1	-27.7
less I.V.A.	- .1	.2	+ .3	
less Social Insurance Contributions	5.3	5.7	+ .4	+ 5.56
less Wage Accounts less Disbursements	.1	--	--	--
plus Government Transfers to Persons	10.1	12.3	+ 2.2	+21.78
plus Interest Paid by Government (Ontario) and by Consumers	6.2	6.8	+ .6	+ 9.68
plus Business Transfers	.7	.8	+ .1	+14.29
equals <u>Personal Income</u>	<u>214.5</u>	<u>207.1</u>	<u>- 7.4</u>	<u>- 3.45</u>
less Personal Tax and Nontax Payments	20.3	17.7	- 2.6	-12.81
equals <u>Personal Disposable Income</u>	<u>194.2</u>	<u>189.4</u>	<u>- 4.8</u>	<u>- 2.47</u>
Personal Consumption Expenditures	176.6	178.8	+ 2.2	+ 1.2
Ratio PE/PDI	90.9	94.4	+ 3.5	

Table 26 (Cont'd.)

IIIQ 1953	IIIQ 1954	Absolute		IIIQ 1957	IIIQ 1958	Absolute	
		Δ	% Δ			Δ	% Δ
(Billions of dollars)				(Billions of dollars)			
365.8	364.7	-1.1	- 0.30	446.3	438.3	- 8.0	- 1.79
26.1	28.2	+2.1	+ 8.05	37.6	38.6	+ 1.0	+ 2.66
29.8	29.3	- .5	- 1.68	37.7	38.1	+ 0.4	+ 1.06
1.2	1.0	- .2	-16.67	1.5	1.6	+ .1	+ 6.67
2.0	3.1	+1.1		.7	1.7	+ 1.0	
- .2	- .2			.7	.9	+ .2	+28.57
306.4	302.9	-3.5	- 1.14	369.5	359.3	-10.2	- 2.76
21.2	18.0	-3.2	-15.09	21.2	17.3	- 3.9	-18.40
12.2	11.7	- .5	- 4.10	13.9	8.6	- 5.3	-38.13
- 2.0	- .7	+1.3		- 1.3	.3	+ 1.6	
8.8	9.8	+1.0	+11.36	14.7	14.6	- .1	- 0.68
- .1	--	+ .1	--	--	.6	+ .6	--
12.8	15.2	+2.4	+18.75	20.0	24.5	+ 4.5	+22.50
9.1	9.5	+ .4	+ 4.40	12.2	12.0	- .2	- 1.64
1.2	1.0	- .2	-16.67	1.5	1.6	+ .1	+ 6.67
289.4	289.8	+ .4	+ 0.14	354.7	356.0	+ 1.3	+ 0.37
35.5	32.5	-3.0	- 8.45	43.0	41.5	- 1.5	- 3.49
253.8	257.3	+3.5	+ 1.38	311.6	314.5	+ 2.9	+ 0.93
231.0	237.3	+6.3	+ 2.7	283.8	287.4	+ 3.6	+ 1.3
91.0	92.2	+1.2		91.1	91.4	+ .3	

Continued. .

Table 26 (Cont'd.)

Reconciliation of Changes inGross National Product and Personal Disposable Income,Pre-War and Post-War Contractions - United States

	IIQ 1960	IQ 1961	Absolute Δ	% Δ
(Billions of dollars)				
Gross National Product	504.7	503.6	-1.1	- 0.22
less Capital Consumption Allowances	43.4	44.1	+ .7	+ 1.61
less Indirect Business Tax and Nontax Liability	45.0	46.1	+1.1	+ 2.44
less Business Transfer Payments	1.9	2.0	+ .1	+ 5.26
less Statistical Discrepancy	- 2.7	.3	+3.0	--
plus Subsidies less Account Surplus of Government Enterprises	--	1.2	+1.2	--
equals <u>National Income</u>	-417.1	412.2	-4.9	- 1.17
less Profits Tax Liabilities	24.0	20.7	-3.3	-13.75
less Undistributed Profits	14.3	10.9	-3.4	-23.78
less I.V.A.	- .2	- .1	+ .1	--
less Social Insurance Contributions	20.7	20.9	+ .2	+ 0.97
less Wage Accounts less Disbursements	--	--	--	--
plus Government Transfers to Persons	26.1	29.8	+3.7	+14.18
plus Interest Paid by Government (Ontario) and by Consumers	15.1	15.0	- .1	- 0.66
plus Business Transfers	1.9	2.0	+ .1	+ 5.26
equals <u>Personal Income</u>	401.3	406.6	+5.3	+ 1.32
less Personal Tax and Nontax Payments	50.8	51.8	+1.0	+ 1.97
equals <u>Personal Disposable Income</u>	350.4	354.8	+4.4	+ 1.26
Personal Consumption Expenditures	326.3	328.4	+2.1	+ 0.6
Ratio PE/PDI	93.1	92.6	- .5	

Note: Detail may not add to totals because of rounding.

Source: Survey of Current Business, August 1965.

Table 27

Reconciliation of Changes in National Income

and Personal Disposable Income,

Pre-War and Post-War Contractions - United States

Changes in:	1929 to 1930	1929 to 1933	1937 to 1938	IVQ 1948 to IVQ 1949	IIIQ 1953 to IIIQ 1954	IIIQ 1957 to IIIQ 1958	IIQ 1960 to IQ 1961
	(Millions of current dollars)				(Billions of current dollars)		
National Income	-14,201	-43,868	-7,272	-16.1	-4.8	-11.8	-5.0
Minus I, V, A.							
Profits Tax Liability	527	848	473	2.2	3.2	3.9	3.3
Undistributed Profits	5,433	4,423	848	4.1	.5	5.3	3.4
Social Insurance							
Contributions	- 10	- 42	- 177	- .4	-1.0	.1	- .2
Net Wage Accounts					- .1	- .6	
Government Transfers to Persons	90	548	554	2.2	2.4	4.5	3.7
Interest Paid by Government and Consumers	- 676	- 882	- 60	.6	.4	- .2	- .1
Business Transfers	- 53	72	- 138	.1	- .2	.1	.1
Personal Income	- 8,890	-38,901	-5,772	- 7.4	.4	1.3	5.3
Personal Tax and Nontax Payments	136	1,179	59	2.6	3.0	1.5	-1.0
Personal Disposable Income	- 8,754	-37,722	-5,713	- 4.8	3.5	2.9	4.4
<u>Percentages</u>							
National Income	-100.0	-100.0	-100.0	-100.0	-100.0	-100.0	-100.0
Profits Tax Liability	3.7	1.9	6.5	13.7	66.7	33.1	66.0
Undistributed Profits	38.3	10.1	11.7	25.5	10.4	44.9	68.0
Social Insurance							
Contributions	- .1	- .1	- 2.4	- 2.5	- 20.8	.9	- 4.0
Net Wage Accounts					- 2.1	- 5.1	
Government Transfers to Persons	.6	1.3	7.6	13.7	50.0	38.1	74.0
Interest Paid by Government and Consumers	- 4.8	- 2.0	- .8	3.7	8.3	- 1.7	- 2.0
Business Transfers	- .4	.2	- 1.9	.6	- 4.2	.9	2.0
Personal Income	- 62.6	- 88.7	- 79.4	- 46.0	8.3	11.0	106.0
Personal Tax and Nontax Payments	1.0	2.7	.8	16.2	62.5	12.7	- 20.0
Personal Disposable Income	- 61.6	- 86.0	- 78.6	- 29.8	72.9	22.6	88.0

Source: Table 26.

Transfer payments also made an important contribution, especially in the later stages of the Depression, but the percentage increase was far below the Canadian percentage. Also in contrast with Canadian experience, American income tax payments dropped by about the same proportion as personal income. Thus, although these payments declined insufficiently to produce a reduction in the percentage decline in personal disposable income compared with that in personal income, they were not noticeably destabilizing, as they were in Canada. Finally, the average propensity to consume was above unity in 1933 and personal net savings were slightly negative.

A very considerable part of the apparent difference between the decline in U. S. GNP and national income in the 1937-38 contraction is related to the large size of the shift in the statistical discrepancy. Decreases in profits tax liabilities and undistributed profits and increased government transfer payments again constituted the important props to personal income. Even so, with only a minor drop in personal tax payments, personal disposable income declined proportionately more than GNP.

During the post-war years, declines in GNP have not produced comparable declines in personal disposable income. In fact, during the last three contractions, personal disposable income has risen while GNP has declined. Again, as in Canada, rising government transfers and declining corporate tax liabilities have assumed considerably greater importance as stabilizers, although declines in the level of undistributed profits continue to exert a powerful influence in sustaining the level of income flows to persons. During the post-war years (with the exception of 1960-61) declines in personal direct taxes have been greater than those in personal income so that personal disposable income has declined less (or risen more) than personal income. The rise in the average propensity to consume played a significant role in preventing further declines in income and expenditure during the Depression and the 1937-38 contraction but the relative decline in income required to produce a significant shift in the ratio was so large that it constituted a

very poor income stabilizer. The relative extent of the shift in the propensity to consume during contractions has become steadily smaller through time and it will be noted that, in the 1960-61 contraction, the shift was, in fact, negative.

A development giving rise to improved potential for the maintenance of U.S. consumer expenditures, despite short-term variability in income, is the substantially improved liquidity position of American consumers, vis-à-vis the 1920's, reflected in enlarged holdings of money, as well as of less liquid assets, in relation to expenditure on goods. Friedman relates the decline in the over-all velocity of circulation of money in the United States to the improved liquidity of consumers as follows:

Secular changes in the real stock of money per capita are highly correlated with secular changes in real income per capita A one per cent increase in real income per capita has, therefore, been associated with a 1.8 per cent increase in real cash balances per capita and hence with 0.8 decrease in income velocity. If we interpret these results as reflecting movements along a stable demand relation, they imply that money is a "luxury" in the terminology of consumption theory. 1/

A sectoral analysis of money holdings by Selden^{2/} indicates that the general increase in liquidity was also apparent in data pertaining to the consumer sector.

While this improvement in U.S. liquidity may be construed as a stabilizing influence upon the North American economy as a whole, and thus upon Canada as well, Canadian data reveal a secular rise in Canadian liquidity compared

1/ M. Friedman, The Demand for Money: Some Theoretical and Empirical Results, Occasional Paper 68, New York, NBER, 1959, pp. 2-3.

2/ R. T. Selden, The Postwar Rise in the Velocity of Money: A Sectoral Analysis, Occasional Paper 78, New York, NBER, 1962.

with the secular decline manifest in the United States. The reasons for this divergent behaviour of velocity in the two countries are not readily apparent.^{1/}

Transfer payments

Table 28 sets out the role of transfer payments in Canada over the contractions occurring since the late 1920's. The major current forms of federal transfer payment -- unemployment insurance disbursements, family allowances and old age pensions -- did not exist in the pre-war period. The changes in total transfer payments occurring over the course of the Depression were insignificant in comparison with the decline in national income. In the post-war years, as previously noted and as indicated by the bottom line of the Table, increased transfers represented a significant proportion of changes in national income.

Some detail of transfer payments in the United States is presented in Table 29. The relative effect of such transfers over the first year and over the total duration of the Depression was negligible. In the post-war recessions, unemployment insurance payments have been a major component of the total increase in transfers, but others, particularly the steadily growing payments in the form of old age and survivors' insurance benefits, have also assumed considerable importance. As noted earlier, total transfers in the United States now constitute a significant offset to declines in national income during recessions (see Table 29 (bottom line) and Table 27).

^{1/}

For some discussion of this question, see D. J. Daly, Some Notes on Canadian Post-War Financial and Monetary Developments, Talk to Workshop in Money and Banking, University of Chicago, May 1964, Ottawa, mimeo., 1964.

Corporate profits

Table 30 indicates the percentage share in Canadian national income of before-tax corporate profits and the disposition of these profits over the peacetime years since 1926. Total before-tax profits have risen somewhat in the post-war years, compared with the pre-war era. Undistributed profits have become less important, in relation both to national income and total profits, and this is also true of dividends. Corporate tax liabilities, however, now take up over half of before-tax profits compared with only around 10 per cent in the late 1920's and are now relatively about six times as important as in the 1920's.

In the present context, it is necessary to consider the effects of these changes upon the stability of the economy. The personal sector is insulated from fluctuations in total spending to the degree that dividend payments remain stable or continue to grow, despite fluctuations in total profits. The ability of business firms to maintain dividends, despite profits fluctuations, depends to an important extent on the average level of dividends in relation to the average level of undistributed profits. The smaller the relative importance of dividends, the easier it should be to maintain them in the face of variations in income. On this account, there appears to have been a very slight improvement in the stabilizing potential of Canadian undistributed profits in the post-war period since the average ratio of undistributed profits to dividends appears to have risen moderately.

The relative growth in corporate profits and the strong rise in the proportion subject to taxation will enhance stability provided that declines in governmental tax receipts do not give rise to expenditure cuts, or, more generally, provided that government expenditures are independent of receipts to the extent required to achieve stabilization objectives. Since it is essentially a flat type of tax, the corporation income tax is not highly elastic with respect to profits changes. Its stabilizing power arises from the high elasticity of total profits changes with respect to changes in expenditure.

Table 28
Changes in Government Transfer Payments
over Pre-War and Post-War Contractions - Canada
(Millions of current dollars)

	1929	1930	Change	1933	Change	1937	1938	Change
Federal	--	--	--	--	--	--	--	--
Unemployment insurance	--	--	--	--	--	--	--	--
Family allowances	--	--	--	--	--	--	--	--
Old age security	--	--	--	--	--	--	--	--
Other ⁽¹⁾	43	49	6	46	3	55	53	- 2
Provincial and Municipal	50	63	13	135	85 ⁽²⁾	182	173	- 9
Adjusting entry	--	--	--	--	--	--	--	--
Total	93	112	19	181	88	237	226	-11
Absolute change in national income			-563		-2,333			-40
Total changes as percentage of absolute change in national income	--	--	3.4	--	3.8	--	--	-27.5

Table 28 (Cont'd.)

IIQ 1953	IIQ 1954	Change	IIQ 1957	IIQ 1958	Change	IQ 1960	IQ 1961	Change
1,020	1,140	+120	1,324	1,860	+536	1,940	2,012	+ 72
140	224	+ 84	252	508	+256	420	528	+108
344	360	+ 16	408	468	+ 60	496	512	+ 16
336	348	+ 12	388	556	+168	576	588	+ 12
200	208	+ 8	276	328	+ 52	448	384	- 64
416	448	+ 32	544	660	+116	1,092	1,412	+320
- 8	--	--	--	--	--	--	--	--
1,428	1,588	+160	1,868	2,520	+652	3,032	3,424	+392
		-684			740			-548
--	--	23.4	--	--	88.1 ⁽³⁾	--	--	71.5

(1)

The bulk of "other" transfer payments comprises pensions (World Wars I and II), war veterans' allowances, and pensions to government employees.

(2)

Increases in provincial and municipal direct relief payments (\$57 million and \$17 million respectively) constituted the main changes in provincial-municipal transfers between 1929 and 1933.

(3)

It will be noted that, in this case only, the change in national income was positive.

Source: National Accounts, Table 44, Dominion Bureau of Statistics.

Table 29

Changes in Government Transfer Payments to Persons
over Pre-War and Post-War Contractions - United States

(Pre-war - Millions of current dollars;
 Post-war - Billions of current dollars,
 seasonally adjusted at annual rates)

	1929	1930	Change	1933	Change	1937	1938	Change
Old age and survivors' insurance benefits	--	--	--	--	--	1	10	9
State unemployment insurance benefits	--	--	--	--	--	2	393	391
Veterans' benefits	560	601	41	545 ⁽¹⁾	-15	593	531	-62
Other	349	398	49	912	563	1,255	1,471	216
Total	909	999	90	1,457	548	1,851	2,405	554
Absolute change in national income			-14.201		-43.868			-7,272
Total changes as percentage of absolute change in national income			.6		1.2			7.6

Table 29 (Cont'd.)

IVQ 1948	IVQ 1949	Change	IIIQ 1953	IIIQ 1954	Change	IIIQ 1957	IIQ 1958	Change	IIQ 1960	IQ 1961	Change
.6	.7	.1	3.1	3.6	.5	7.5	8.4	.9	11.0	11.9	.9
.9	2.3	1.4	.9	2.2	1.3	1.7	4.2	2.5	2.5	3.8	1.3
5.0	4.9	-.1	3.8	3.9	.1	4.4	4.6	.2	4.5	4.7	.2
3.7	4.4	.7	5.0	5.5	.5	6.5	7.2	.7	8.0	9.3	1.3
10.1	12.3	+ 2.2	12.8	15.2	2.4	20.0	24.5	4.5	26.0	29.7	3.7
		-16.1			-4.8			-11.8			-5.0
		13.7			50.0			38.1			74.0

(1)

Veterans' benefits rose to \$1,574 million in 1931 and then declined.

Note: Components may not add to totals because of rounding.

Source: Survey of Current Business, August 1965.

Table 30
Proportions of Components of Corporate Profits
in National Income - Canada
(Percentages of national income - Current dollars)

	1926	1927	1928	1929
Profit tax liabilities	.8	.9	.9	1.0
Dividends paid to Canadians	2.3	2.2	2.2	2.4
Charitable contributions	.1	.1	.1	.1
Undistributed profits (ex. dividends abroad)	4.7	5.3	5.8	4.9
Corporation profits before taxes	7.9	8.4	9.1	8.4
	1938	1939	1945	1946
Profit tax liabilities	2.3	2.7	6.2	6.8
Dividends paid to Canadians	3.0	3.0	1.2	1.2
Charitable contributions	.1	.1	.1	.1
Undistributed profits (ex. dividends abroad)	2.9	6.5	3.9	5.1
Corporation profits before taxes	8.3	12.3	11.4	13.3
	1955	1956	1957	1958
Profit tax liabilities	6.1	6.1	5.6	5.3
Dividends paid to Canadians	1.5	1.4	1.5	1.5
Charitable contributions	.1	.1	.1	.2
Undistributed profits (ex. dividends abroad)	4.6	4.9	3.6	3.5
Corporation profits before taxes	12.4	12.6	10.7	10.4

Table 30 (Cont'd.)

1930	1931	1932	1933	1934	1935	1936	1937
.9	1.0	1.2	1.6	1.9	2.1	2.5	2.6
2.3	2.9	1.0	2.9	3.1	2.7	2.4	2.6
.1	.1	.1	.1	.1	.1	.1	.1
.04	-3.5	-6.0	-1.5	1.9	2.7	4.3	5.7
3.3	.4	-3.7	3.1	6.9	7.6	9.3	11.1
1947	1948	1949	1950	1951	1952	1953	1954
6.8	5.7	5.6	6.9	8.5	7.4	6.3	5.7
2.1	1.8	1.8	2.5	2.1	1.8	1.6	1.5
.2	.2	.2	.2	.2	.1	.1	.1
6.1	6.6	4.5	5.3	4.0	3.3	3.8	3.0
15.1	14.3	12.1	15.0	14.8	12.7	11.9	10.3
1959	1960	1961	1962	1963	1964	1965	1966
6.0	5.6	5.7	5.6	5.6	5.6	5.6	5.1
1.5	1.7	1.5	1.8	1.9	1.9	2.1	2.1
.2	.1	.1	.1	.1	.1	.1	.1
3.7	3.1	2.8	3.1	3.2	3.9	3.7	2.9
11.3	10.5	10.1	10.6	10.9	11.6	11.5	10.2

Note: Detail may not add to totals because of rounding.

Source: National Accounts, Tables 1, 16 and 50.

It is sometimes suggested that the growth of salaried employment, as opposed to hourly paid employment, increased investment by firms in the skills and qualifications of employees, and the difficulties involved in reassembling a qualified work force, once it has been disbanded, all tend to make firms currently much more reluctant than several decades ago to dismiss employees in response to fluctuations in demand and output.^{1/} Some corroborative evidence of a decline over time in the elasticity of employment reductions with respect to production declines is presented in Table 31. As might be expected, the crude total elasticities are much higher for contractions than for expansions, because rising productivity tends continuously to reduce the demand for labour, given the level of output. When production is expanding, rising labour productivity reduces the need for additional workers; when it is contracting, rising productivity reinforces the reduction in the demand for labour. Table 31 shows that, with the exception of the experience of the 1953-54 contraction, there has been a continuing decline in the elasticity of response of Canadian manufacturing employment to declines in production.

If manufacturers (and possibly other groups of employers) are less likely than heretofore to discharge workers when demand slackens, and if hours worked and paid for are not sufficiently reduced to offset the resulting "hidden unemployment", then one would expect such policies to result in greater relative fluctuations in corporate profits for a given reduction in output than was previously the case (provided prices remained stable). This result would buttress the factors tending to stabilize personal income since, as was shown above, fluctuations in corporate profits (in the short run, at least) show up mainly in variations in corporate income tax collections and undistributed profits.

^{1/} See, for example, A. F. Burns, "Progress Towards Economic Stability", Presidential address delivered at the Seventy-second Annual Meeting of the American Economic Association, American Economic Review, Vol. I, No. 1, March 1960, pp. 7-8.

Table 31

Changes in Manufacturing Production and Employment
during Specific Cycles in Manufacturing Production - Canada

Dates of Specific Cycle Turns in Manufacturing Production		Manufacturing Production	% Δ	Manufacturing Employment	% Δ	Elasticity
Trough	June 1921	21.2		42.6		
Peak	July 1923	34.5		49.2	+15.5	.25
Trough	Aug. 1924	30.5	+ 62.7	44.8	- 8.9	.80
Peak	Apr. 1929	51.9	- 11.6	59.3	+32.4	.46
Trough	Feb. 1933	24.3	+ 70.2	38.7	-34.7	.74
Peak	July 1937	51.1	- 46.8	58.7	+51.7	.47
Trough	Dec. 1938	45.3	+110.3	54.4	- 7.3	.64
			- 11.4			
Trough	Jan. 1946	83.3		90.0		
Peak	Mar. 1953	128.5	+ 54.3	114.1	+26.8	.49
Trough	July 1954	121.1	- 5.8	106.7	- 6.5	1.12
Peak	Dec. 1956	148.9	+ 23.0	117.8	+10.4	.45
Trough	Dec. 1957	134.5	- 9.7	112.0	- 4.9	.51
Peak	Jan. 1960	155.1	+ 15.3	111.7	- 0.3	-.02
Trough	June 1960	146.1	- 5.8	109.6	- 1.9	.33

Source: Historical Monthly Statistics, Dominion Bureau of Statistics.

It would be useful and revealing, both as an aid to understanding the past and in the interests of improving the efficacy of the instruments of stabilization, to examine secular changes in the initial incidence, by income category, of income declines during contractions. Such an investigation lies outside the scope of this study, but it is of some interest to note, in Table 32, the elasticity of changes in the main income categories with respect to declines in GNP. The 1937-38 and 1957-58 contractions have been excluded because GNP did not decline between the respective business cycle peaks and troughs. The rather crude comparison provided in Table 32 appears to lend some support to the hypothesis that more of the brunt of declines has been borne by profits in the recent contractions. The elasticity of profits with respect to total national income changes has been increasing through time, whereas the elasticity of labour income has become negative in the years since the war. It will be observed that, during the Depression, the longer-term elasticity of labour income was greater than that relating to the first year and that the reverse was true in the case of profits.

Table 32

Elasticity of Changes in Major Components of National Income
with Respect to Gross National Product Declines - Canada

	1929 to 1930	1929 to 1933	IIQ 1953 to IIQ 1954	IQ 1960 to IQ 1961
Wages, salaries and supplementary labour income	.78	.92	-1.52	-2.24
Corporate profits before taxes	9.64	1.91	14.32	25.64

It will be observed from Table 33 that total before-tax profits in the United States, as a proportion of national income, run at somewhat higher levels than in Canada, the difference being largely reflected in a higher level of dividends in the United States. Undistributed profits also run a little higher than in Canada. The ratio of distributed to undistributed profits is also higher in the United States, although markedly lower now than it was in the late 1920's. Corporate tax liabilities have in the post-war years been at roughly similar levels in the two countries. While the increase since the late 1920's has been somewhat less than in Canada, because the level was initially relatively higher, tax liabilities are now more than three times as large (as a percentage of national income) as in the late 1920's. As was shown in Table 27, swings in tax liabilities have offset between a third and two-thirds of the national income decline occurring over the course of the past three U. S. business contractions. Thus, as in the Canadian case, the changes occurring since the 1920's appear to have been in the direction of improving the stability of personal income in relation to GNP declines.

Table 33

Proportions of Components of Corporate Profits

in National Income - United States

(Percentages of national income)

	1929	1930	1931	1932
Profits tax liability	1.6	1.1	.8	.9
Dividends	6.7	7.3	6.8	5.9
Undistributed profits	3.2	-3.5	-8.3	-12.2
Profits before taxes	11.5	4.9	- .6	- 5.4
	1945	1946	1947	1948
Profits tax liability	5.9	5.0	5.7	5.6
Dividends	2.5	3.1	3.2	3.1
Undistributed profits	2.4	5.4	7.0	7.0
Profits before taxes	10.9	13.5	15.8	15.7
	1957	1958	1959	1960
Profits tax liability	5.8	5.2	5.9	5.6
Dividends	3.2	3.1	3.1	3.2
Undistributed profits	3.9	2.9	4.0	3.2
Profits before taxes	12.9	11.2	13.0	12.0

Table 33 (Cont'd.)

1933	1934	1935	1936	1937	1938	1939	1940
1.3	1.5	1.7	2.2	2.0	1.5	2.0	3.5
5.1	5.2	5.0	7.0	6.3	4.7	5.2	5.0
-4.0	-1.9	- .3	.6	.8	- .3	2.5	3.9
2.4	4.7	6.3	9.8	9.2	5.9	9.7	12.3
1949	1950	1951	1952	1953	1954	1955	1956
4.8	7.4	8.0	6.6	6.7	5.8	6.5	6.2
3.3	3.7	3.1	2.9	2.9	3.1	3.2	3.2
5.2	6.6	4.7	3.8	3.8	3.7	5.0	4.5
13.3	17.7	15.8	13.4	13.3	12.6	14.7	13.9
1961	1962	1963	1964	1965	1966		
5.4	5.3	5.4	5.5	5.6	5.6		
3.2	3.3	3.3	3.3	3.4	3.4		
3.2	3.5	3.5	4.1	4.5	4.5		
11.8	12.1	12.2	13.0	13.5	13.5		

Note: Detail may not add to totals because of rounding.

Source: Survey of Current Business.

The crude elasticities of the responses of the major income categories with respect to GNP declines do not indicate a clear shift in the responsiveness of profits compared with the pre-war period. Thus, at the level of aggregation of Table 34, it is not apparent that the rise in the proportion of salaried and highly trained workers has had any impact on the relative elasticities of labour income and corporate profits in response to declines in GNP. The 1953-54 and 1960-61 recessions have been excluded from the comparisons of Table 34, since the declines in GNP were less than 1 per cent in each case. It will be noted that, as in Canada, the longer-term elasticity of labour income in relation to GNP declines was greater than the corresponding short-term elasticity during the Depression, the opposite being the case for corporate profits.

Table 34

Elasticity of Changes in Major Components of National Income
with Respect to Gross National Product Declines - United States

	1929 to 1930	1929 to 1933	1937 to 1938	IVQ 1948 to IVQ 1949	IIIQ 1957 to IIIQ 1958
Wages, salaries and supplementary labour income	.68	.92	.97	1.15	-.17
Corporate profits before taxes	5.12	1.96	6.48	5.38	5.78

Personal income taxes

From Table 27 above, it will be noted that, in the United States, personal tax payments have declined during contractions (except during 1960-61), thus tending either to offset some of the decline, or to augment the increase, in personal income. Nonetheless, the declines which took place in personal tax and nontax payments during the 1929-30, 1929-33 and 1937-38 periods of contraction were proportionately smaller than those in personal income, so that personal disposable income declined relatively more than personal income.^{1/} During the post-war contractions, however, any decline in U. S. personal collections has either been proportionately greater than that in personal income, so that personal disposable income has declined less than has personal income, or it has added to the modest increase in personal income which has taken place, so that personal disposable income has risen more than has personal income (see Table 26).

Personal tax schedules in both Canada and the United States have been subjected, for either strictly budgetary or stabilization purposes, to numerous adjustments during the period covered by Tables 24 to 27. It is evident that personal income tax schedules will continue to be particularly subject to adjustment for stabilization purposes and it is thus not entirely appropriate to treat personal taxes simply as "built-in" stabilizers. However, to the extent that schedules are left unchanged, the structure of personal taxes does constitute a built-in stabilizing apparatus and it may perhaps be assumed, from the direction of changes in economic philosophy and practice relating to matters of stabilization taking place during the past 20 years or so, that future discretionary tax changes will be designed to augment, rather than to offset, the effects of the built-in stabilizing properties of the tax structure.

^{1/} Personal tax rates in the United States were raised in the course of both the 1929-33 and 1937-38 contractions.

Despite the fact that only once during the course of the six periods of contraction covered by Table 21 did Canadian personal tax collections decline, it can be shown that the structure of Canadian personal direct taxes is such as to contribute significantly to the stabilization of income.^{1/} It has previously been pointed out that the high elasticity of corporate tax collections with respect to changes in total Canadian national income arises from the high elasticity of profits with respect to total income rather than from the elasticity of corporate income tax collections with respect to profits. In the case of the personal income tax, its fairly high elasticity with respect to short-term GNP changes arises from the tendency for the latter to reflect to a significant degree changes in income per capita. Tax collections, in turn, tend to be quite highly elastic with respect to per capita income changes. This sensitiveness of tax collections to per capita income changes arises not so much from the progressivity of the tax as from the effects of personal exemptions on the rates of tax at different income levels.^{2/}

Although the elasticity of total tax collections with respect to GNP did not change appreciably between 1929 and 1962, the proportion of federal taxes, including personal taxes, to GNP rose very considerably (from 6.5 per cent in 1929 to 17.0 per cent in 1962) and the marginal rate of taxation from 13 per cent to 34 per cent.^{3/} Thus, in Canada about a third of any short-term decline in income

^{1/} In Canada, the elasticity of total taxes in relation to GNP in 1962 has been calculated at approximately 2.0 -- about the same as in 1929. The high elasticity in 1929 was largely attributable to the importance of indirect taxes on imports and to the high elasticity of imports with respect to changes in GNP. See D. J. Daly, Federal Tax Revenues at Potential Output, 1960 and 1970, Staff Study No. 9, Economic Council of Canada, Ottawa, Queen's Printer, 1965, Appendix, Table 5, p. 335.

^{2/} Ibid., pp. 331-333.

^{3/} Ibid., Table 5, p. 335.

in 1962 tended to fall on federal taxes and to produce a federal fiscal deficit. The variability of personal taxes was a major factor in producing these results. The stabilizing properties of fluctuations in personal taxes appear to be frequently underestimated because of a common failure to distinguish cyclical changes in per capita income, with respect to which tax collections are highly elastic, from other cyclical and secular influences on incomes, with respect to which tax collections are considerably less elastic.^{1/}

4. Changes in the Extent to Which Variations in Investment are Offset by Opposite Variations in Other Expenditure Sectors

The task of stabilization policy in a growing economy, with a continuously rising labour force, may, as was noted earlier, be regarded as that of maintaining smooth expansion of aggregate demand at a rate which is adequate to sustain a consistently high rate of utilization of the growing supply of human resources. From this perspective, it is not enough that any declines occurring in real investment (or any other category of expenditure) fail to produce declines in real GNP. What is required is that any potential slowdown or decline in expenditures be positively offset in such a way that aggregate demand continue to grow in line with potential output. As was shown in the preceding subsection, built-in stabilizers cushion personal disposable income against declines in total expenditure and may even approach the complete insulation of personal disposable income from short-term expenditure reductions. These stabilizers do not, however, counteract such expenditure cut-backs.

A further distinction is called for at this point. It is sometimes suggested that the strong growth in government expenditures during the post-war period (as distinct from the larger size of the government sector compared with

^{1/}

The author is indebted to Dr. D. J. Daly for clarifying these points.

before the war and the decreased sensitivity of government spending to income changes induced by fluctuations in investment expenditures) has imparted greater stability to the economy by maintaining a strong upward trend in total spending, thereby mitigating the impact of recessions. While strong growth in government spending may have indirect effects on stability by, e. g., inducing more stable expectations concerning the future, thus decreasing the volatility of investment spending, stronger growth in government spending may only be considered to produce improved stability directly if certain rather special interpretations are placed on the concept of "improved stability". Thus, if there were a tendency for the economy to fall short of the attainment of its potential output to a growing extent with the passage of time (in the absence of governmental stimulation), the emergence of a stronger upward trend in government than in private spending could be regarded as promoting improved "economic stability" if the latter is defined as continuously full utilization of the economy's potential. If, on the other hand, the long-term trend in demand in the private sector were for growth in line with potential, the emergence of a stronger trend in government spending, while helping to offset weakness in private demand during recessions, would tend to be destabilizing and inflationary during periods of expansion. To regard the rise in government expenditures in these circumstances as a factor producing improved stability is implicitly to favour the objective of countering recessions over the objective of preventing inflation. While the makers of economic policy may be justified in placing a heavy weight on the avoidance of unemployment and losses of output, it must be recognized that the definition of "improved stability" becomes somewhat equivocal if some such weighting is implicit in the notion. In the present context, therefore, the existence of strong growth trends in expenditure will not be regarded as an independent source of improved stability. Only offsetting fluctuations in the spending of sectors other than the private investment sector will be so considered. The major sectors of expenditure outside the area of business investment spending are, of course, consumer expenditure, government expenditure, housing investment and the foreign sector.

The consumer sector

It was indicated earlier that, during the Depression, the rise in the average propensity to consume as income fell played a major role in the prevention of further GNP declines. It was noted, however, that, over time, changes in the average propensity to consume had played a smaller role during contractions because disposable income had been sustained by the operation of the various income stabilizers. In recent years, it has been increasingly recognized that, in addition to its potential, passive role in limiting the extent of expenditure and income declines during contractions, the consumer sector may be stimulated to play an active part in the task of economic stabilization. Both the U. S. and Canadian governments have in the past few years introduced tax cuts to stimulate consumer expenditure and thus raise total expenditure closer to the potential level. More recently, the Canadian government has, in effect, rescinded the tax cuts in an attempt to restrain the potentially inflationary growth of demand.

The application of either stimuli to or restrictions upon consumer spending will usually be conceived as part of the over-all fiscal and monetary policies of the Canadian and U. S. governments, and the relative emphasis placed upon influencing consumer spending, as against other forms of expenditure, will evidently change as underlying conditions vary. However, in general, it would seem that increasingly sophisticated and active use of fiscal policy instruments, including those influencing consumer spending, will take place in the future. In the United States, a former Chairman of the Council of Economic Advisors under a Republican administration, A. F. Burns, expressed the view, in 1959, that "governmental efforts to promote a high and expanding level of economic activity are not likely to weaken".^{1/} In 1965, a former Chairman of the Council of Economic Advisers under the succeeding Democratic administration, Walter W. Heller, concluded:

^{1/} "Progress Towards Economic Stability", presidential address to the Seventy-second Annual Meeting of the American Economic Association, Washington, D. C., December 28, 1959, A. E. R., Vol. L, No. 1, March 1960, p. 17.

... in the four years since 1960 we have seen a demonstration that for policies to serve different economic goals, they need not work at cross-purposes -- that with a proper mix of consumption and investment stimulus an expansionary fiscal policy can move us toward full employment and faster growth and at the same time further the ends of price stability and payments equilibrium.

Second, we have the demonstrated success of a tax cut which symbolizes the shift from an anti-recession, shock-absorbing fiscal policy to a gap-closing, economic propulsion policy....

Third, we have a general growth of confidence in the ability of economists to estimate the U. S. economy's potential and its performance gap, its growth rate, its income-consumption and demand-unemployment relations, matched, in part, by a growth in economists' confidence in themselves. We see this confidence increasingly founded on the test of performance on the policy firing line....

Fourth, we have a growing acceptance of the essential role of government in influencing the level of demand through positive fiscal and monetary policies, a recognition that this can be done without destroying, endangering, or in any way limiting individual freedom of choice -- and we have the resulting development of a closer government-business partnership.

Fifth, we have seen an ebbing of the fears that so often in the past caused our economic policy "to be sicklied o'er with the pale cast of inaction": the fear that budget deficits necessarily spell inflation, insolvency, and irresponsibility; the fear that a growing national debt would burden our children and grandchildren and bring on national bankruptcy (even though it has shrunk from 116 per cent of GNP in 1947 to under 50

per cent today); the fear that fiscal planning, however prudent, necessarily spells growing centralization of power in Washington. ^{1/}

It is possible, also, that monetary policy exerts a partly contracyclical influence on the pattern of consumer spending. There is considerable evidence to support the view that some forms of consumer spending are quite sensitive to credit conditions but, unfortunately, the quantitative effects over time of changes in monetary conditions are not easily and clearly established. It has been suggested that lags in the response of monetary policy to changes in aggregate demand and lags between policy changes and their effects on spending are sufficiently long and uncertain that monetary policy is a crude instrument of short-term stabilization which may sometimes even serve to intensify variations in aggregate demand. ^{2/} Such suggested limitations to the effectiveness of monetary policy relate primarily to its use to attempt to counteract the effects of short-term "inventory fluctuations". The problem of lags becomes less acute the longer the upswing or downswing is expected to continue. Thus, monetary policy may be able to play a significant role in limiting longer-term variations in the percentage utilization of potential. Compared with the 1920's, the monetary authorities in Canada and the United States have in the post-war period been far readier to use monetary policy instruments to counteract fluctuations in demand, and, in recent years, the positive objective of promoting stable growth has assumed increasing importance.

^{1/} "The Future of Our Fiscal System", The Journal of Business, Vol. XXXVIII, No. 3, July 1965. Also, see J. Tobin, The Intellectual Revolution in U.S. Policy-Making, The University of Essex, Noel Buxton Lecture, 1966, London, Longmans, Green and Co. Ltd., 1966.

^{2/} D. J. Daly, "The Scope for Monetary Policy -- A Synthesis" in Conference on Stabilization Policies, Ottawa, Queen's Printer, 1966.

Despite the lack of evidence on the quantitative impact of these changes on consumer spending, and making full allowance for the possibility that, because of lags, the effects of monetary policy changes have been poorly timed or even sometimes destabilizing in relation to the objectives of counteracting the "short cycle", it appears reasonable to conclude that they have at least (with one notable Canadian exception) worked in the direction of reducing the vulnerability of the economy to longer-term cumulative down-swings in consumer and other forms of spending. Whether monetary policy changes are the most efficient instruments of domestic stabilization -- especially in a world of fixed exchange rates and interest-sensitive capital movements -- is a matter of continuing debate which it would not be appropriate to enter here.

The government sector

Theoretically, variations in government spending -- particularly federal government spending -- can constitute a powerful offset to fluctuations in private investment, but, in practice, they have not generally fulfilled this role in the post-war years. As was noted earlier, federal spending has been the least stable of final demand components in the United States since the war. Fluctuations in federal spending have been sometimes stabilizing and sometimes destabilizing in relation to major swings in the private sector. As Table 15 above indicates, the decline in U. S. government expenditures was the major factor in the weakening of demand during the 1953-54 contraction. Charts 19 and 20 show the recent performance, respectively, of Canadian and U. S. federal, state or provincial and municipal spending on goods and services in relation both to "business cycle" expansions and contractions and the unemployment rate, the excess of which above the "full employment" level may be regarded as a rough indicator of the percentage of potential output being lost because of inadequate demand.^{1/}

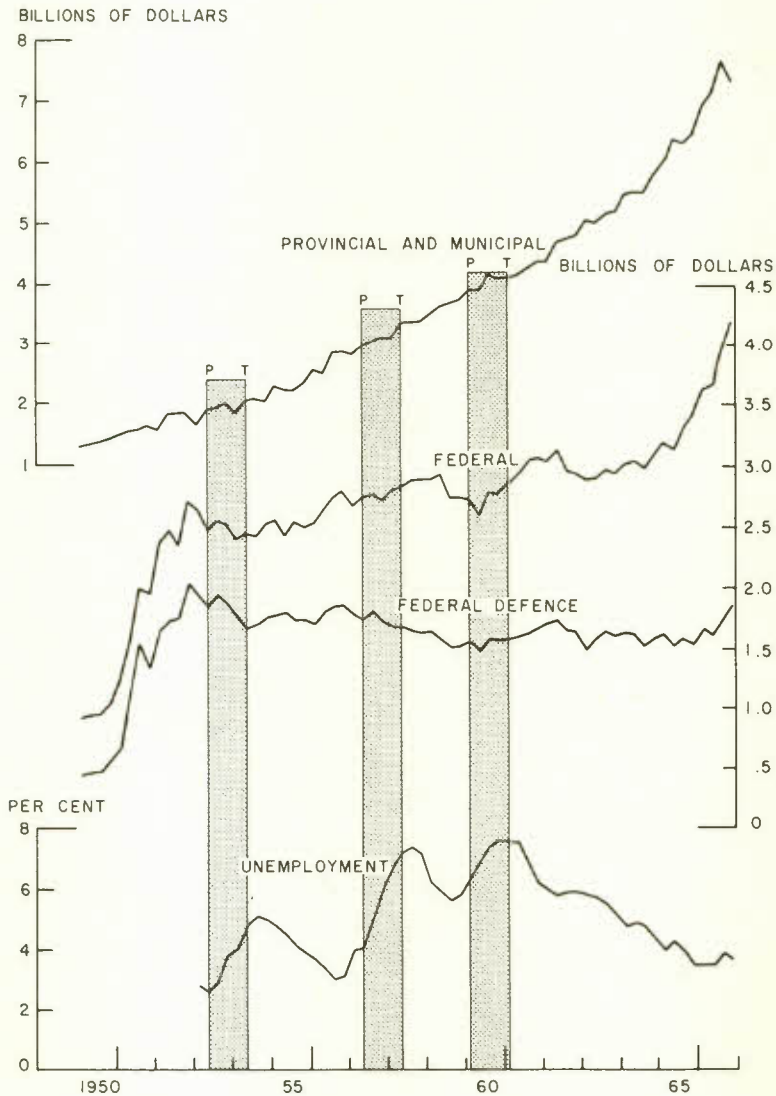
^{1/}

See Chart 1, pp. 32-33.

Chart 19

CANADIAN GOVERNMENT GOODS AND SERVICES SPENDING,
BUSINESS CYCLES AND UNEMPLOYMENT

(Seasonally adjusted data; expenditures at annual rates)

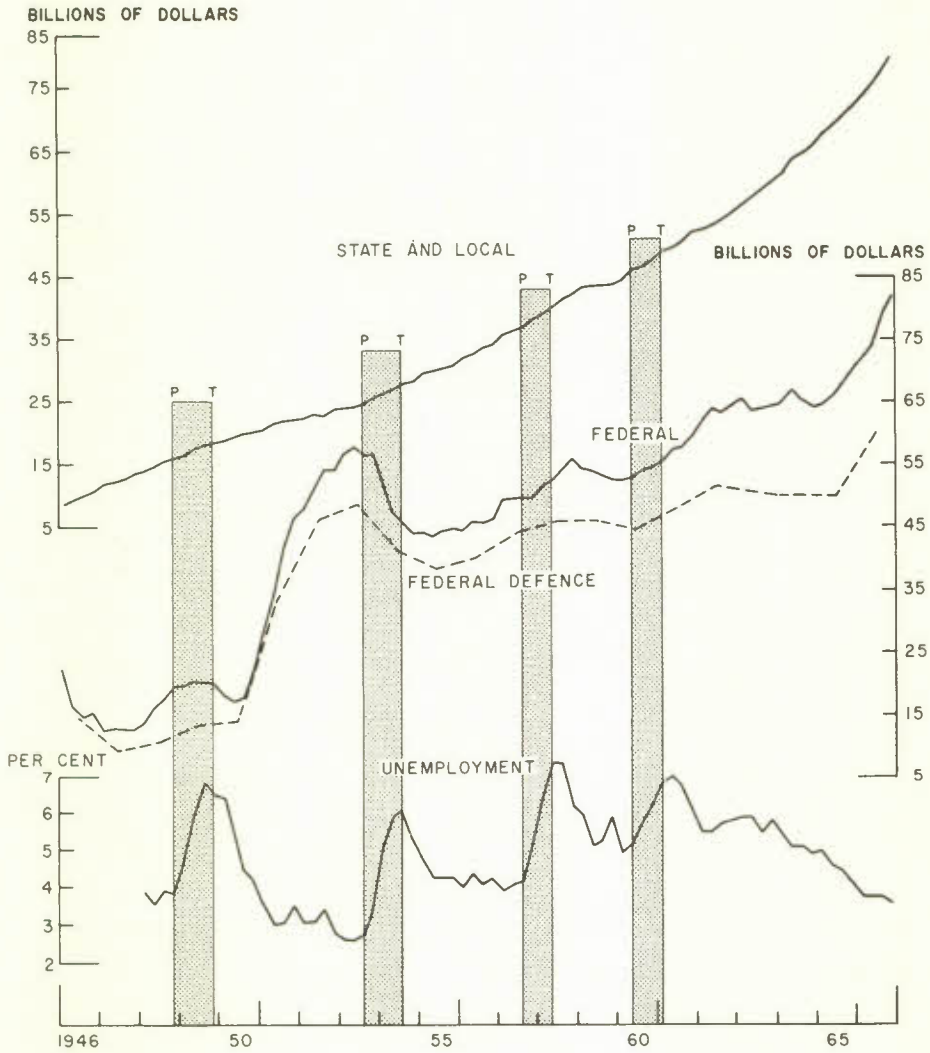


Source: National Accounts and Annual Supplement to the Canadian Statistical Review.

Chart 20

U. S. GOVERNMENT GOODS AND SERVICES SPENDING,
BUSINESS CYCLES AND UNEMPLOYMENT

(Seasonally adjusted data (except defence spending);
expenditures at annual rates)



Source: Survey of Current Business and Business Cycle Developments.

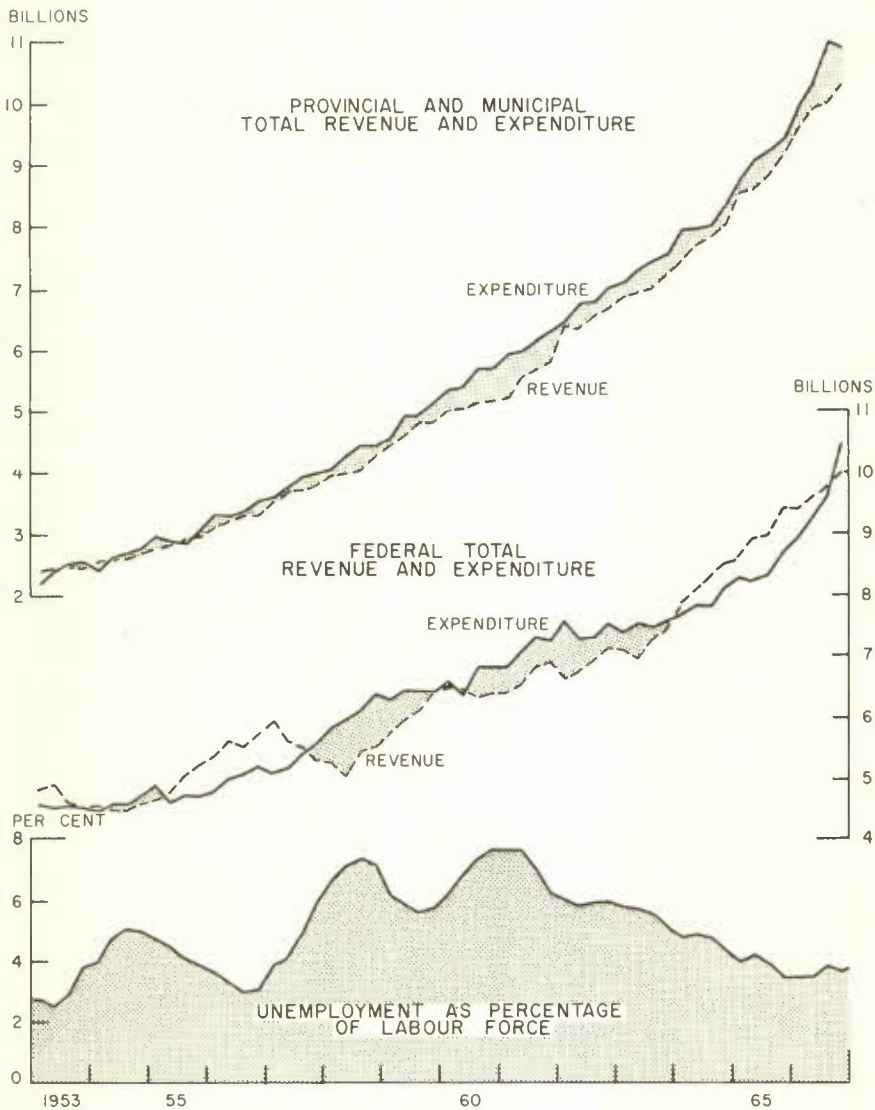
It is apparent that, in both Canada and the United States, variations in federal spending have borne little systematic relation to either measure. The emergence of government deficits during contractions has been mainly the result, not of contracyclical variations in expenditures on goods and services, but of declines in revenues and increases in transfer payments. This is illustrated by Chart 21 which depicts the over-all fiscal positions of the Canadian federal government and the combined provincial and municipal governments.

Despite the apparent lack of compensatory government spending in the post-war years, it will be recalled that U. S. federal government expenditures on goods and services were raised by 60 per cent during the Depression, indicating considerable scope for variation to achieve stabilization objectives under certain extreme circumstances. Under more normal circumstances, the scope for varying government expenditures is subject to important limitations. Although, as Tables 19 and 20 show, the bulk of the rise in total government goods and services expenditures since the 1920's has been at the federal level, it is also apparent that a reversal of this trend has emerged during the past decade with expenditures by state, provincial and local governments assuming much greater relative importance. It must be recognized that formidable obstacles lie in the way of attempts to co-ordinate provincial or state and local expenditures effectively in the pursuit of a flexible countercyclical or "full use of potential" policy, although increasing use of shared-cost programmes designed to stimulate capital expenditures has been made by the Canadian government during the past few years. However, much of the capital expenditure undertaken by states, provinces and municipalities is on roads, highways, educational plant and services to real estate and is not very readily accelerated or postponed in relation to private sector spending variations -- particularly short-term variations.

Chart 21

CANADIAN GOVERNMENT FISCAL OPERATIONS
AND UNEMPLOYMENT

(Seasonally adjusted data; expenditures at annual rates)



Source: National Accounts and Annual Supplement to the Canadian Statistical Review.

Traditionally, it has been assumed that variations in federal public works spending could be used to stimulate or retard the economy as required, but, as Tables 35 and 36 show, federal capital expenditures (Canada) or construction expenditures (United States) are normally only a small proportion of GNP.

Table 35

Canadian Federal, Provincial and Municipal Government Capital Expenditures⁽¹⁾

as Percentages of Gross National Product,

1949, 1956 and 1964

	1949	1956	1964
Federal	1.05	1.24	0.67
Provincial	1.09	1.50	1.68
Municipal	1.05	1.38	1.61
Total	3.19	4.12	3.96

(1) Excludes capital expenditures of government-owned enterprises.

Source: National Accounts, Dominion Bureau of Statistics, Table 2 and footnote to Table 43.

Table 36

U.S. Federal, State and Local Government Spending on Construction

as Percentages of Gross National Product,

1929, 1949, 1956 and 1964

	1929	1949	1956	1964
Federal	0.15	0.54	0.65	0.61
State and local	2.34	1.91	2.47	2.66
Total	2.49	2.45	3.12	3.27

Source: Survey of Current Business, August 1965.

At the same time, it should be noted that, over time, government capital spending in Canada and the United States has risen a little in relation to private fixed capital spending (Tables 37 and 38). Thus, the "leverage" of offsetting variations in government capital spending has increased somewhat, although it remains fairly weak.

Table 37

Canadian Federal, Provincial and Municipal Government Capital Expenditures

as Percentages of Private Non-Residential Fixed Capital Formation,

1949, 1956 and 1964

	1949	1956	1964
Federal	7.0	7.2	4.5
Provincial	8.0	8.8	11.4
Municipal	7.7	8.0	10.9
Total	22.7	24.0	26.8

Table 38

U.S. Federal, State and Local Government Spending on Construction

as Percentages of Private Non-Residential Fixed Capital Formation,

1929, 1949, 1956 and 1964

	1929	1949	1956	1964
Federal	1.47	5.52	6.24	6.34
State and local	22.85	19.48	23.72	27.66
Total	24.32	25.00	29.96	34.00

Finally, it appears unlikely that even federal government spending can very readily be varied to achieve the objective of offsetting short-term expenditure variations in other sectors. It is argued that, in practice, rigidities in the present institutional procedures surrounding the determination of the level of federal government expenditure make it extremely difficult to achieve the required degree of flexibility.^{1/}

To be realistic, it appears more appropriate to stress the possible direct and indirect destabilizing effects of federal expenditure variations -- particularly those related to defence -- than to emphasize their potential stabilizing role. Whereas, in 1929, total U.S. federal spending was just over 1 per cent of GNP, by 1949, federal defence spending alone was over 5 per cent of GNP. The latter averaged more than 10 per cent of GNP during the 1950's and averaged about 8.4 per cent during the early 1960's. U.S. federal defence expenditures in 1964, at about \$50 billion, substantially exceeded private non-residential construction expenditures (\$21 billion) and producers' durable equipment spending (\$39 billion). Such expenditures are clearly subject to a great deal of variation, with strong direct and indirect effects and both immediate and lagged repercussions on other sectors and upon total spending, output and employment. As can be seen in Charts 19 and 20, defence spending has been the largest component of, and the major source of instability in, U.S. and Canadian federal spending.

Housing

From Tables 13 to 16 above, it will be noted that residential construction fell drastically during the Depression in both Canada and the United States. Over the course of the contractions occurring since the war, changes in residential construction expenditure have sometimes, but not invariably, been contracyclical.

^{1/} R. M. Will, "The Time Lags in Fiscal Policy", Conference on Stabilization Policies, Ottawa, Queen's Printer, 1966.

Residential construction in Canada rose during the first three post-war cycles (though by an insignificant amount between 1953 and 1954) but fell considerably in 1960-61. In the United States, residential construction rose significantly during the first two post-war contractions, but declined moderately during the last two. However, despite this apparently inconclusive performance, there is evidence that, in both countries, over much of the post-war period, there were factors operating to bring about offsetting increases in housing expenditure during periods of cyclical weakness and decreases in such expenditure in times of strength.

Thus, in Canada, in relation to the turning points of the reference cycle, housing starts moved contracyclically over every expansion and contraction from 1953 on.^{1/} This performance is partly a reflection of the fact that a high proportion of starts was dependent on the prior availability of mortgage financing on the preferential terms available to borrowers under the provisions of the National Housing Act. The availability of NHA mortgages from institutional lenders depended, in turn, mainly on the supply of funds available to these lenders and on the relative attractiveness of the fixed NHA mortgage interest rate compared with yields on alternative forms of investment. Periods of monetary ease and weak corporate and other business demands for funds, accompanied by an expansion of the differential between, e. g., corporate bond yields and the NHA interest rate, stimulated the flow of funds into NHA mortgages. This contracyclical variation in the supply of NHA mortgages was reinforced, particularly after the second quarter of 1956, by changes in loan terms, nearly all of which were contracyclical and most of which were introduced during business cycle downswings.^{2/}

^{1/} J. V. Poapst, The Residential Mortgage Market, working paper prepared for the Royal Commission on Banking and Finance, Ottawa, mimeo., November 1962, Table 4-3, p. 117.

^{2/} Ibid., p. 130 and Appendix Table C1, p. 167.

The supply of non-NHA or "conventional" mortgage funds did not vary to a comparable extent, as the rates charged by lenders tended to move "procyclically", particularly after 1956,^{1/} thus remaining more competitive with alternative investments than the fixed-interest NHA mortgages. However, even conventional mortgage interest rates are considerably less volatile than corporate bond yields, so that the conventional-mortgage-rate/corporate-bond-yield differential has tended to vary contracyclically, inducing a contracyclical flow of funds into conventionally financed housing during much of the period prior to 1959.^{2/} After 1959, however, the backlog of demand for single-family dwellings appeared to ease considerably and the response of the demand for single-family housing to various forms of stimulation was quite sluggish. The withdrawal of the chartered banks from NHA lending following the raising of the NHA rate to over 6 per cent in 1959 was a contributing factor. Increases in starts were mainly in apartment units, which are largely conventionally financed. Further, the advantages of NHA financing, compared with conventional financing, have been reduced over time. The slowness with which the maximum NHA loan amount was raised after 1960 was important in reducing the relative advantage of NHA mortgages over the subsequent period. Again, while family household formation and family household "undoubling" together gave rise to strong growth in the demand for housing units during the early post-war years, they constituted a relatively less important source of demand subsequently. Nonfamily household formation and demolition replacement (which is probably more closely geared to general economic conditions than other sources of demand) rose in relative importance to the

^{1/} Ibid., p. 127.

^{2/} Similar contracyclical shifts in conventional mortgage fund flows have been observed in the United States. See W. W. Alberts, "Business Cycles, Residential Construction Cycles and the Mortgage Market", Journal of Political Economy, Vol. LXX, No. 3, June 1962, pp. 263-281.

point where they accounted for almost half of total housing demand. Similar trends were present in the United States.^{1/} Thus, it appeared probable that housing starts would be somewhat less closely geared to variations in the availability of mortgage funds than in the past and that the contracyclical performance of housing starts would be somewhat less pronounced in the future than during the late 1950's. In this connection, J. V. Poapst, in his study of the residential mortgage market for the Royal Commission on Banking and Finance, concluded:

... the weaker the demand for housing the smaller are the fluctuations that can be induced in housebuilding through the medium of the mortgage market. As noted earlier, housing demand over most of the postwar period was strong, but that condition appears to have passed. The much heralded rise in family formation of the late 1960's is in the offing, but at the outset of the so-called "population explosion" however, the housing stock will be better adjusted to demand than it was in the early postwar years. Also, there is the question of whether permanent real disposable personal income will rise at rates as high as in the first 10-12 postwar years. (If a long-cycle downswing in interest rates is at hand, housebuilding would receive support from this source.) Second, changes in the terms of conventional first and second mortgage loans have reduced the advantage to the borrower of the NHA loan. The advantage is still substantial, but it is less than in earlier postwar years. NHA lending has had an impact upon the loan-to-value ratio, term and amortization periods of conventional institutional first mortgage loans.

^{1/} L. Jay Atkinson, "Long-Term Influences Affecting the Volume of New Housing Units", Survey of Current Business, November 1963.

Practitioners also report a marked easing of the terms of second mortgages, including the rate of interest in recent years. This may continue if more large finance companies enter the field. Third, the absence of the chartered banks means a weaker connection between general monetary policy and housebuilding. Variations in the loanable funds of banks may alter their willingness to make current loans to builders, but not their lending to buyers of new houses. Because of their extensive branch system this weakening of general monetary policy applies to a wide geographical area.^{1/}

However, as events during 1965 and 1966 have demonstrated, even though housing may have become somewhat less acutely sensitive to the terms and availability of NHA financing, it remains highly responsive to general credit conditions and can be severely affected when the degree of credit restraint is extreme. Moreover, there is recent and current evidence of a renewal of the backlog of demand for new housing.^{2/}

Chart 22 portrays some of the Canadian time series pertaining to the role of housing during business cycles since either 1950, or 1954, when insured mortgages were first introduced under the terms of the new Housing Act and an amendment to the Bank Act permitted chartered banks to hold NHA-insured mortgages. The close correlation between the corporate-bond/NHA-interest-rate differential and the number of "approved lender" requests for the insurance of mortgages is readily apparent. The active role of Central Mortgage and Housing Corporation "direct" lending in stimulating winter construction during both the 1957-58 and 1960-61 recessions and throughout the slack 1957-61 period is also clear. Total loan approvals varied in a broadly contracyclical way from late 1954 to 1961, but, in view of the slack existing after

^{1/} Op. cit., pp. 148-149.

^{2/} Very recent developments in the house mortgage market are discussed in the conclusions to this Chapter, p. 227.

1957 (see Chart 1), it could be argued that the contraction in starts taking place during 1959, although coinciding with a period of "business expansion", was inappropriate in relation to the goal of maintaining "full employment". Charts 10 and 22 indicate that the 1959 decline in loan approvals coincided with a contraction of the money supply and with progressive elimination of the bond-yield/NHA-interest-rate differential. A coincident expansion of CMHC direct lending suggests the existence at that time of a conflict between monetary and fiscal policy objectives. Chart 22 shows that the failure of residential construction expenditure to rise contracyclically in 1960-61 was attributable to the delayed effect of the steep 1959 decline in starts upon 1960 completions. Actual construction investment may be regarded as reflecting a weighted average of starts and completions.

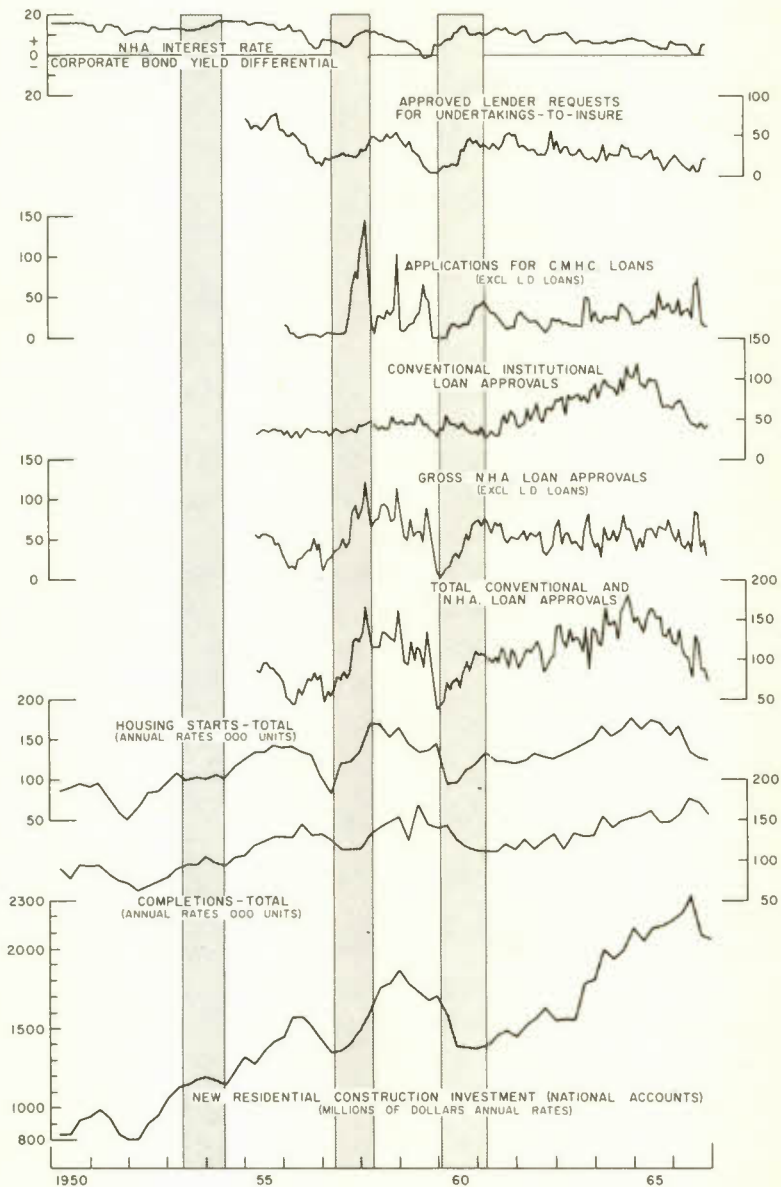
Finally, in the present context, some cognizance should be taken of the fact that very severe depressions have, in the past, been associated with long downswings in building construction, especially residential construction. Such major economic variables as population growth, rates of household formation, residential construction expenditure and national income have over a long period revealed similarly timed long-term fluctuations in Canada and the United States.^{1/} This record of performance suggests that circumstances could possibly rise in which housing demand would not behave contracyclically, but would reinforce the contractive tendencies emerging in other final demand sectors.

^{1/} For Canada, see D. J. Daly, "Long Cycles and Recent Canadian Experience", Royal Commission on Banking and Finance, Appendix Volume, Ottawa, Queen's Printer, 1965. For the United States, see M. Abramovitz, Evidences of Long Swings in Aggregate Construction Since the Civil War, Occasional Paper 90, New York, NBER, 1964; "The Nature and Significance of Kuznets Cycles", in Economic Development and Cultural Change, Vol. IX, No. 3, April 1961; Statement at Hearings on Employment, Growth, and Price Levels, Part 2, pp. 411-466.

Chart 22

CANADIAN RESIDENTIAL CONSTRUCTION INVESTMENT AND RELATED SERIES

(Seasonally adjusted data)



Source: Central Mortgage and Housing Corporation (Economic Research Department); Department of Trade and Commerce (Economics Branch); Canadian Statistical Review (Annual Supplement and current issues) and National Accounts, Dominion Bureau of Statistics.

It has been suggested, for example, that long cycles in residential construction could occur in response primarily to variations in the growth rate of the total population. This explanation implies a potentially less docile role for housing than that of adjusting, via changes in the volume of mortgage financing, to disturbances originating elsewhere. The causes of long cycles in residential construction cannot be considered in any detail here, but one observation may perhaps be ventured. While the rate of population growth places physical limits on the future expansion of output, and while current and prospective rates of population growth may exert some influence upon current investment decisions, it cannot realistically be argued that the predominant lines of causation run in any simple way from current rates of population growth, via variations in the volume of construction expenditure, to current output and income. A broader, more plausible explanation would cover the connections between changes in total demand and many other variables, such as various forms of non-residential construction, in addition to residential construction as influenced by demographic changes.^{1/} The latter may well, of course, themselves be more influenced by general economic conditions than vice versa.

On this question of the causes of long cycles in the various branches of construction, Abramovitz concludes as follows:

Manifestly, even the general lines of an explanation of the long swings in aggregate construction can only be dimly perceived at the present time. One feature of such an explanation, however, seems clear enough. The very existence of long swings in aggregate construction means that they are part of a wider phenomenon. An explanation must, therefore, envisage an interaction between

^{1/} For a selective review of the literature pertaining to the long cycles in residential construction, see Bert G. Hickman, op. cit., pp. 306-323.

construction activity and the economy at large in which long swings appear in many facets of economic and demographic change; and these feed back, each in its own fashion, to impose something of a common pattern on the otherwise divergent geographical and sectoral branches of construction.

To the extent that the value of residential construction may be assumed to be a currently determined endogenous variable within the economic system, scope for the emergence of future major fluctuations in residential construction will evidently depend, in large measure, upon the effectiveness of all the various factors tending to limit the current and likely future extent of instability in aggregate demand and, more specifically, in total personal disposable income, which have been discussed in this Chapter. Long-term variations in the level of demand for housing related to such influences as the delayed effects of earlier birth rate fluctuations upon family household formation will, of course, still continue to be felt, but they would, under these assumptions, simply be one of the forces at work in the system and not the predominant cause of medium-term fluctuations in housing expenditure.

Conclusions

While it is not unlikely that severe shocks, especially shocks originating outside the system of "economic" relationships, will continue to be felt in the future, producing dynamic instability in aggregate demand, it may be contended that the quite far-reaching changes which have taken place since the 1920's have significantly altered the dynamic behaviour of the North American economy. Whereas, in the 1920's, volatile private business investment was the main engine of dynamic demand change, today, an even more powerful engine is that of government expenditure. Government expenditure is largely independent of the fluctuations taking place in other sectors, even though, at federal levels, it is itself subject to pronounced -- though noncyclical and noncumulative

fluctuations. Coupled with this curbing of the volatility of the combined "autonomous" forces in the system has been a marked strengthening of the shock absorbers between expenditure cut-backs and declines in consumers' disposable incomes which has damped the response (including the induced investment response) of the system to investment fluctuations. In addition, some of the previously weak institutional links in the system have been greatly strengthened. A factor of increasing significance is the growing tendency for business investment decisions to be based upon estimates of the growth of economic potential rather than upon extrapolation of the most recent short-term changes in demand. Also of importance is the gradual extension of longer-range planning at the various levels of government. Finally, there is a continuing -- although not necessarily smooth -- evolution in the ability and willingness of governments to employ effective fiscal and monetary measures in timely and discriminating fashion.

The nature of these developments and the post-war pattern of North American economic performance both suggest that, while moderate "inventory recessions" may recur from time to time and aggregate demand may tend occasionally either to fall away from potential or attempt to exceed it, with inflationary consequences and subsequent fixed investment and inventory corrections, major cumulative downswings in North America, arising primarily from domestic economic causes, are, in the immediately foreseeable future, at least, highly unlikely. If this economic environment is maintained, emphasis upon questions of stabilization is likely gradually to give way to emphasis upon the factors underlying economic growth, upon questions relating to the efficient functioning of the economy, upon the optimum management of economic resources (including reduction of the degree of pollution of natural resources) and upon such wider issues as the management of world demand in relation to potential long-term world supply and the devising of satisfactory long-term solutions to persistent world liquidity, balance of payments, and trade problems.

Nonetheless, it is as well to take into account the fact that, despite the considerable improvements which have been made, some areas of vulnerability remain in the world trading economy, in the United States and in Canada. Also, although, in certain circumstances, it may be possible for effective discretionary action to be taken to prevent a sizeable departure of demand from the potential rate of growth -- either in an upward or downward direction -- there is no guarantee that such action will always, in fact, be taken when required. Discretionary fiscal action to stabilize the economy requires legislative approval in both Canada and the United States. When political expediency and the requirements of economic stabilization come into conflict, the outcome is not yet a foregone conclusion. Although certain developments referred to above are highly promising for the future effectiveness of discretionary policy action, it should be stressed that continued progress depends upon the continuance of effective political support for the major stabilization objectives. In this connection it may be recalled that, despite the preparation, immediately after the Second World War, of a White Paper in Canada^{1/} and an Employment Act in the United States expressing the intentions of both the Canadian and U. S. federal governments to pursue full employment policies, unemployment was later permitted in both countries to rise to, and remain at, levels which were quite obviously far short of the "full employment" level by any reasonable definition of the term "full employment". As is shown in Chart 1 in this paper, Canadian economic potential was substantially underutilized from 1957 to 1965. Similar underutilization was also tolerated in the United States.

In a world which is still evolving new form and patterns of organization, it is also possible for new

^{1/} See W. A. Mackintosh, "The White Paper on Employment and Income in Its 1945 Setting", in Canadian Economic Policy Since the War, Canadian Trade Committee, 1966, for discussion of the background to the preparation of the White Paper on Employment.

stabilization problems to arise. Although, with the development and expansion of the I. M. F. arrangements for providing standby foreign currency reserves, improved co-operation among central banks, and the formulation of national economic policies against a background of international economic consultation, major international currency crises have been avoided, the key reserve currencies have been under pressure for extended periods over the past decade and no agreed solution to the world liquidity problem has yet emerged. Until the liquidity problem has been satisfactorily solved, however, one cannot rule out the possibility of quite serious and widespread disruption resulting from some breakdown in the existing arrangements.

Within Canada, a number of additional potential sources of vulnerability may be discerned. In other countries, major declines have in the past often been associated with collapses in the structure of liquidity. In the United States, defences against a cumulative collapse in confidence were strongly buttressed following the Depression by the introduction of the insurance of bank deposits. Comparable legislation does not exist in Canada, although it is under consideration at federal and provincial levels. For as long as it is lacking, and particularly when account is taken of the growth of "near banks", the financial system appears at least vulnerable to quite significant cumulative collapses of credit. However, on the positive side, cognizance must also be taken of the alertness of the monetary authorities to the possibility that financial crises may spread and of their concern to prevent any such ramification. This concern was in evidence following the recent collapse of a number of financial institutions in Canada.

Additional potential problems arise from the relative rise in provincial expenditures and the relative decline in federal spending. While it is true that provincial and municipal spending -- particularly the latter -- is less volatile than federal spending and that the relative growth

in the importance of these expenditure sectors thus enhances the short-term stability of aggregate expenditure, note should also be taken of certain potentially adverse consequences of these developments. First is the additional difficulty in co-ordinating discretionary policy changes. This in turn involves three major issues: first, securing a consensus on the objectives and strategy of policy; second, securing agreement on the need for, and form of, policy action; third, co-ordinating the implementation of the agreed policy action. Prerequisite to establishing the need for, and form of, policy action would be an agreed analysis of economic conditions and prospects, in turn necessitating the compilation of data on the current expenditures and short-term expenditure plans of all levels of government. Currently, there are no arrangements for the continuous collection of such data pertaining to the expenditures of provincial and municipal governments; thus, the information basis for discretionary variation of the level of combined government spending is quite inadequate and inferior to the situation prevailing immediately after the Second World War. Federal expenditures were then dominant and the capital expenditures and plans of the various federal departments were compiled centrally to provide a basis for stabilizing action.

Within the federal government, however, continued improvement has taken place in the compilation of short-term departmental spending plans, covering not merely capital expenditures but expenditure in all forms, and progress has also been made in presenting such compilations in forms facilitating economic analysis and forecasting. Cognizance should also be taken in the present context of the fact that machinery exists in the Tax Structure Committee for the preparation and up-dating of long-term federal and provincial expenditure projections. The work of the Committee has encouraged the preparation of long-term investment plans by all levels of government, which should itself result in some improvement in the phasing of realized expenditures and thus contribute to improved over-all stability in the growth rate of combined government expenditures.

Finally, it should be noted that there is growing recognition of the difficulties involved in pursuing a stabilization policy involving the contracyclical variation of capital expenditures, particularly at the provincial and municipal levels of government, and apparently growing recognition of the usefulness for stabilization purposes of discretionary tax changes -- particularly changes in the volume of personal income taxation. To the extent that tax changes supplement or replace variations in government spending as an instrument of stabilization policy, the increased difficulty of co-ordinating such spending variations arising from the diminished federal share in combined government expenditures becomes a less critical issue. However, if federal gross revenues were to decline in relative importance commensurately with the decline in federal expenditures, the federal government could find it necessary to incur deficits (or surpluses) for stabilization purposes at various times which were very large in relation to the size of its revenues. This would be particularly so, to the extent that, as a result of their growing dependence upon more volatile revenue sources, provinces curtailed expenditures during periods of general economic weakening.

A related issue concerns the facility of access to capital markets enjoyed by the federal government, on the one hand, and provincial and municipal governments, on the other. In the event of a substantial decline in economic activity, particularly one associated with financial disturbances, access by provincial and municipal governments to the borrowed funds required to support deficit financing could be seriously limited. That substantial deficits could now quickly emerge during periods of moderate weakening -- even without tax cuts -- is apparent when account is taken of the increases which have recently occurred in the proportion of provincial revenues provided by cyclically volatile corporation and personal income taxes. However, to keep this matter in perspective, it should be pointed out that, even in 1965, only 27 per cent of provincial revenues were accounted for by income taxes, and, as is noted elsewhere in the study, the over-all ability of provincial and municipal governments to withstand severe declines has probably improved since the 1930's.

Another Canadian expenditure sector in which very recent developments with important implications for stabilization have occurred is that of housing. Two recent changes suggest that, in future, the behaviour of housing expenditure may be less contracyclical than in the past. As of March 31, 1967, the maximum NHA rate will be established quarterly at 1 1/2 per cent above the long-term government bond yield. Thus, the NHA-rate/bond-yield differential will fluctuate over a smaller range than in the past. As has been indicated earlier, the experience of the past few years has been that an expansion of this differential has attracted funds into NHA mortgages, while a contraction has reduced the flow of such funds. Since the NHA-rate/bond-yield differential usually rose when bond yields were declining in the course of a cyclical contraction in demand, the flow of funds into housing tended to exhibit a contracyclical variation. This contracyclical variation in NHA housing financed through approved lenders is likely to be diminished under the new arrangements. A further influence on the supply of funds to housing has arisen from the prohibition in effect, until recently, of bank lending at interest rates above 6 per cent. The result of this prohibition was that the chartered banks ceased to provide any funds for housing when, in the course of a general rise in interest rates, the NHA rate rose above 6 per cent. The removal of the interest rate ceiling on chartered bank loans will prevent such a sharp cut-off in bank mortgage lending in the future.

The effects of these two measures will undoubtedly improve the over-all stability of housing construction (although measuring the extent of very short-term fluctuations) with many advantages to the industry, but the "built-in" stabilizing property in relation to the total economy exhibited by housing over the business cycles of the past decade will be diminished. It will not be eliminated entirely, however. U.S. studies and recent experience indicate that the demand for "conventional" (nongovernment-insured) housing funds, compared with competing demands, is quite interest-elastic. The flow of conventional mortgage funds into housing thus tends on this account to rise

appreciably when the supply of funds is increased and to contract significantly when the supply of funds is reduced. This phenomenon is a characteristic of the demand for residential mortgage funds, compared with competing demands for funds, and is thus independent of changes in institutional arrangements affecting the supply of such funds. It is, however, reinforced by the reluctance of institutions to approve the drawing up of mortgages bearing rates of interest which are considered to be abnormally high and therefore subject to early repayment. Finally, cognizance should be taken of the fact that, although the "built-in" economic stabilization arising from the previous institutional arrangements pertaining to NHA housing has been modified, discretionary direct lending by CMHC may potentially still be used on an extensive scale for stabilization purposes.

APPENDIX 1

SUMMARY TABLES OF

U. S. AND CANADIAN CYCLICAL EXPERIENCE

Table A-1. 1

U. S. and Canadian Reference Cycle Dates

	U. S.	Canadian	Lead (-) or Lag (+)
Peak	Oct. 1873	Nov. 1873	+ 1
Trough	Mar. 1879	May 1879	+ 2
Peak	Mar. 1882	July 1882	+ 4
Trough	May 1885	Mar. 1885	- 2
Peak	Mar. 1887	Feb. 1887	- 1
Trough	Apr. 1888	Feb. 1888	- 2
Peak	July 1890	July 1890	0
Trough	May 1891	Mar. 1891	- 2
Peak	Jan. 1893	Feb. 1893	+ 1
Trough	June 1894	Mar. 1894	- 3
Peak	Dec. 1895	Aug. 1895	- 4
Trough	June 1897	Aug. 1896	-10
Peak	June 1899	Apr. 1900	+10
Trough	Dec. 1900	Feb. 1901	+ 2
Peak	Sept. 1902	Dec. 1902	+ 3
Trough	Aug. 1904	June 1904	- 2
Peak	May 1907	Dec. 1906	- 5
Trough	June 1908	July 1908	+ 1
Peak	Jan. 1910	Mar. 1910	+ 2
Trough	Jan. 1912	July 1911	- 6
Peak	Jan. 1913	Nov. 1912	- 2
Trough	Dec. 1914	Jan. 1915	+ 1
Peak	Aug. 1918	Jan. 1918	- 7
Trough	Mar. 1919	Apr. 1919	+ 1
Peak	Jan. 1920	June 1920	+ 5
Trough	July 1921	Sept. 1921	+ 2
Peak	May 1923	June 1923	+ 1
Trough	July 1924	Aug. 1924	+ 1
Peak	Oct. 1926	*	
Trough	Nov. 1927	*	
Peak	Aug. 1929	Apr. 1929	- 4
Trough	Mar. 1933	Mar. 1933	0
Peak	May 1937	July 1937	+ 2
Trough	June 1938	Oct. 1938	+ 4
Peak	Feb. 1945	n. a.	n. a.
Trough	Oct. 1945	Feb. 1946	+ 4
Peak	Nov. 1948	Oct. 1948	- 1
Trough	Oct. 1949	Sept. 1949	- 1
Peak	July 1953	May 1953	- 2
Trough	Aug. 1954	June 1954	- 2
Peak	July 1957	Apr. 1957	- 3
Trough	Apr. 1958	Apr. 1958	0
Peak	May 1960	Jan. 1960	- 4
Trough	Feb. 1961	Mar. 1961	+ 1

* No comparable turning point.

Source: U. S. dates: National Bureau of Economic Research. Canadian dates: E. J. Chambers, "Canadian Business Cycles since 1919", *C. J. E. P. S.*, Vol. 24, No. 2, May 1958, p. 166; E. J. Chambers, "Late Nineteenth Century Business Cycles in Canada", *C. J. E. P. S.*, Vol. 30, No. 3, August 1964, p. 391 and K. A. J. Hay, "Early Twentieth Century Business Cycles in Canada", *C. J. E. P. S.*, Vol. 32, No. 3, August 1966, p. 354. Canadian dates since 1954 are tentative estimates by the Economics Branch, Department of Trade and Commerce.

Table A-1.2
Business Cycles in Canada, 1873-1961

<u>Business Cycle Reference Dates</u>		<u>Duration in Months</u>			
		<u>Contractions</u>	<u>Expansions</u>	<u>Full Cycle</u>	
<u>Trough</u>	<u>Peak</u>	<u>Peak to Trough</u>	<u>Trough to Peak</u>	<u>Trough to Trough</u>	<u>Peak to Peak</u>
	Nov. 1873	--	--	--	--
May 1879	July 1882	66 ^d	38 ^d	--	104 ^d
Mar. 1885	Feb. 1887	32	23	70 ^d	55
Feb. 1888	July 1890	12	29	35	41
Mar. 1891	Feb. 1893	8	23	37	31
Mar. 1894	Aug. 1895	13 ^d	17 ^d	36 ^d	30 ^d
Aug. 1896	Apr. 1900	12	44	29 ^d	56
Feb. 1901	Dec. 1902	10	22	54	32
June 1904	Dec. 1906	18	30	40	48
July 1908	Mar. 1910	19 ^d	20 ^d	49 ^d	39 ^d
July 1911	Nov. 1912	16	16	36 ^d	32
Jan. 1915	Jan. 1918	26	36	42	62
Apr. 1919	June 1920	15	14	51	29
Sept. 1921	June 1923	15 ^d	21 ^d	29 ^d	36 ^d
Aug. 1924	Apr. 1929	14	56	35 ^d	70
Mar. 1933	July 1937	47 ^d	52 ^d	103 ^d	99 ^d
Oct. 1938	n. a.	15	n. a.	67 ^d	n. a.
Feb. 1946	Oct. 1948	n. a.	32	88	n. a.
Sept. 1949	May 1953	11	44	43	55
June 1954	Apr. 1957	13	34	57	47
Apr. 1958	Jan. 1960	12	21	46	33
Mar. 1961	(Dec. 1966)*	14	(69)	35	(83)

* December 1966, although not identified as a business cycle peak, is treated as a peak in this Table to permit comparison of the present durations of the current expansion and over-all cycle with those of earlier cycles.

Note: Underlined figures are the wartime expansions and the full cycles which include the wartime expansions.

^d Phases or cycles influenced by depressions. Phases influenced by depression include both the contraction and the ensuing expansion. These phases have been selected by taking the Canadian phases corresponding with U. S. phases known to be influenced by depression.

Source: Table A-1.1. Cf., Business Cycle Developments, Appendix A, U. S. Department of Commerce.

Table A-1. 3

Seventeen Cycles in U. S. Industrial Production since 1892

(Durations and average per-month rates of change)

Specific Cycle Dates		Contraction (trough from previous peak)		Expansion (trough to peak)		Contraction and Expansion (peak from previous peak)	
		Duration (months)	Average per-month change	Duration (months)	Average per-month change	Duration (months)	Average per-month change ⁽¹⁾
Trough	Peak						
	Mar. 1892						
Oct. 1893	Nov. 1895	19	-1.53	25	+1.08	44	+1.27
Sept. 1896	June 1900	10	-1.21	45	+0.77	55	+0.85
Oct. 1900	July 1903	4	-1.67	33	+0.92	37	+1.00
Dec. 1903	May 1907	5	-2.42	41	+0.88	46	+1.05
May 1908	Mar. 1910	12	-2.32	22	+1.45	34	+1.76
Jan. 1911	Jan. 1913	10	-0.74	24	+0.82	34	+0.80
Nov. 1914	May 1917	22	-0.69	30	+1.36	52	+1.08
Mar. 1919	Jan. 1920	22	-0.80	10	+2.44	32	+1.31
	Feb. 1920						
Apr. 1921	May 1923	14	-2.59	25	+2.01	39	+2.21
July 1924	Mar. 1927	14	-1.16	32	+0.75	46	+0.87
Nov. 1927	July 1929	8	-0.64	20	+1.09	28	+0.96
July 1932	May 1937	36	-1.97	58	+1.35	94	+1.59
May 1938	Nov. 1943	12	-2.14	66	+1.65	78	+1.72
	July 1948						
Oct. 1949	July 1953	15	-0.48	45	+0.85	60	+0.75
Apr. 1954	Feb. 1957	9	-1.01	34	+0.55	43	+0.64
Apr. 1958	Jan. 1960	14	-0.98	21	+1.05	35	+1.02
Feb. 1961	Sept. 1964 ⁽²⁾	13	-0.45	43	+0.59	56	+0.56

(1) Computed without regard to sign.

(2) Most recent business cycle high; not a specific peak.

Note: The cycles from March 1892 to January 1920 are based on the Babson index of physical volume of business activity; the cycles from February 1920 to the present are based on the Federal Reserve Board's index of industrial production. The cycle between November 1943 and July 1948 has been omitted from this Table.

Source: Julius Shiskin, "The Current Expansion in Historical Perspective", *Business Cycle Developments*, Bureau of the Census, U. S. Department of Commerce, January 1965.

Table A-1.4

Cycles in Canadian Industrial Production since 1919

Trough	Peak	Contractions		Expansions	
		Duration (months)	Average* per-month change	Duration (months)	Average* per-month change
Apr. 1919	June 1920	--	--	14	+0.87
Sept. 1921	June 1923	15	-0.70	21	+1.28
Aug. 1924	Apr. 1929	14	-0.39	56	+0.87
Mar. 1933	July 1937	47	-1.19	52	+1.13
Oct. 1938		15	-0.39	--	--
Feb. 1946	Oct. 1948	--	--	32	+0.53
Sept. 1949	May 1953	11	+0.21	44	+0.54
June 1954	Apr. 1957	13	-0.20	34	+0.62
Apr. 1958	Jan. 1960	12	-0.26	21	+0.50
Mar. 1961		14	-0.16		

* To conform with NBER practice, these average percentage rates of change are computed with respect to a base comprising an estimate of the average trough-to-trough value of the index.

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

APPENDIX 2

A NOTE ON THE COMPARATIVE BEHAVIOUR OF
PERSONAL EXPENDITURE IN RELATION TO
GROSS NATIONAL PRODUCT IN
CANADA AND THE UNITED STATES

APPENDIX 2

A Note on the Comparative Behaviour of Personal Expenditure in Relation to Gross National Product in Canada and the United States

The ratio of personal to total expenditure may be thought of as the product of the ratio of personal expenditure to personal disposable income and the ratio of personal disposable income to GNP.^{1/} The relative changes in the two ratios and in the over-all ratio of personal expenditure to GNP over the six contractions, for Canada and the United States, are presented in Table A-2. 1. Although there appears to be some tendency for the ratio of personal disposable income to GNP to strengthen more in Canada than in the United States during contractions, a major feature of the comparison is the apparent tendency (except during the Depression) for the ratio of personal expenditure to personal disposable income to rise more in the country experiencing the more severe decline. Thus, the 1937-38, 1948-49 and 1957-58 declines were more severe (in terms of the GNP decline) in the United States than in Canada. In each case, the U. S. ratio was stronger than the Canadian. In the case of the 1953-54 and 1960-61 recessions, which were more severe in Canada than in the United States, the reverse occurred. This performance is consistent with theoretical expectations based on the assumption that the marginal propensity to consume is significantly lower than the average propensity.

^{1/} I. e. , $\frac{PE}{GNE} = \frac{PE}{PDI} \cdot \frac{PDI}{GNP}$ (GNE = GNP)

Table A-2. 1

Relative Changes in the Components of the Ratio of Personal Expenditure
to Gross National Product over Six Contractions,
Canada and United States

(Peak ratios = 100)

	<u>Ratio PE/PDI</u>		<u>Ratio PDI/GNP</u>		<u>Ratio PE/GNP</u>	
	Canada	United States	Canada	United States	Canada	United States
1929-33	107.8	108.6	103.0	101.3	111.0	110.0
1937-38	98.9	104.5	101.1	98.3	99.9	102.6
1948-49	101.1	102.1	99.7	100.2	100.8	102.3
1953-54	104.7	100.9	100.5	101.9	105.2	102.8
1957-58	96.9	99.8	105.2	101.9	101.9	101.7
1960-61	100.6	99.0	103.5	100.8	104.1	99.9

Source: National Accounts, Dominion Bureau of Statistics, Survey of Current Business,
U.S. Department of Commerce and estimates by Economic Council of Canada.

The apparently persistent differences between the performance of personal expenditure in Canada and the United States thus do not seem to be simply the result of systematic differences in the two ratios considered but appear to depend to an important degree upon the other areas of demand which largely determine the levels of personal disposable income. The question may be pursued further by comparing the declines in GNE (ex. error) excluding personal expenditure in the two countries over the six contractions. Table A-2. 2 presents this comparison.

Except for the 1953-54 and 1960-61 contractions, final demand excluding personal expenditure was weaker in the United States than in Canada. In 1960-61, the strengthening of the personal disposable income to GNP ratio strongly reinforced the rise in the personal expenditure to personal disposable income ratio. In 1953-54, however, an exceptionally strong rise in the ratio of personal expenditure to personal disposable income in Canada is the only factor to explain the differing Canadian and U. S. personal expenditure performance. One may thus conclude that there is no single explanation for the consistently better performance of personal expenditures in Canada, although the resistance of personal disposable income to GNP declines appears to have been greater and the declines in other demand areas which largely determine personal disposable income levels have tended to be smaller, than in the United States.

Table A-2.2

Percentage Changes in Gross National Expenditure (Excluding Error)

Less Personal Expenditures during Six Contractions,

Canada and United States

	Canada	United States
1929-33	-60.8	-62.4
1937-38	- 2.0	-12.5
1948-49	+ 6.3	-14.2
1953-54	- 8.6	- 7.2
1957-58	+ 2.5	- 8.3
1960-61	- 8.4	- 2.1

Source: National Accounts, Dominion Bureau of Statistics, Survey of Current Business, U. S. Department of Commerce and estimates by Economic Council of Canada.

APPENDIX 3

A COMPARATIVE ANALYSIS OF THE RATIO OF INVESTMENT TO GROSS NATIONAL PRODUCT, BY INDUSTRY, IN CANADA AND THE UNITED STATES

APPENDIX 3

A Comparative Analysis of the Ratio of Investment to Gross National Product, by Industry, in Canada and the United States

Parts of Chapters 4, 5 and 6 above refer to the relatively higher proportion of fixed investment to GNP emerging in Canada during periods of rising North American fixed investment. It is contended that this phenomenon arises from certain basic economic conditions leading to significant specialization in goods production in Canada and to relatively unimpeded inflow of foreign, and especially American, capital. Why the relative level of investment in Canada should be high was briefly discussed in Chapter 5. In this note, an attempt is made to see what light may be thrown on the question by considering the comparative behaviour of investment industry by industry.

It would be useful if, for this purpose, the relative levels of machinery and equipment, by industry, could be examined separately from the relative levels of non-residential construction. Unfortunately, published data covering machinery and equipment and plant expenditures separately, by industry, are not available in respect of the United States. However, the joint Surveys of the Department of Commerce and the Securities and Exchange Commission report total plant and equipment expenditures, and these are available broken down into major industry groups and the three-digit industries within manufacturing. The Commerce-SEC Survey does not cover investment in agriculture and real estate, nor does it cover investment carried out by institutions and professional persons. Also excluded is business investment charged to operating expenses. However, it is possible to adjust the Private and Public Investment in Canada figures published jointly by the Canadian Department of Trade and Commerce and the Dominion Bureau of Statistics to yield roughly comparable data for Canada. To facilitate comparison, the figures for each country are expressed as percentages of GNP in Tables A-3.1 and A-3.2 below.

Table A-3.1
Fixed Investment by Industry
as Percentages of Gross National Product,
Canada,
1947 to 1964

	1947	1948	1949	1950	1951	1952	1953
Trade, commercial services, construction and other industries ⁽¹⁾	2.20	2.41	2.26	2.66	2.42	1.90	2.50
Mining	0.32	0.46	0.59	0.63	0.77	0.85	1.01
Manufacturing	3.59	3.38	2.91	2.45	3.37	3.68	3.50
Transportation	1.38	1.32	1.29	1.23	1.38	1.72	1.88
Communications	0.65	0.71	0.72	0.63	0.60	0.60	0.68
Public utilities	1.04	1.69	2.17	2.33	2.41	2.61	2.41
Sub-total	9.18	9.97	9.94	9.93	10.95	11.36	11.98
Residual ⁽²⁾	2.91	3.32	3.75	3.76	3.52	3.30	3.34
Total plant and equipment expenditure per national accounts ⁽³⁾	12.09	13.29	13.69	13.69	14.47	14.66	15.32

Table A-3.1 (Cont'd.)

1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
2.72	2.72	2.65	2.56	2.35	2.35	2.36	2.16	2.04	2.19	2.18
1.12	1.24	1.77	1.90	1.04	0.98	1.10	1.20	1.18	1.21	1.35
2.97	3.15	4.15	4.22	3.01	2.94	2.90	2.56	2.79	2.79	3.42
1.71	1.39	2.32	3.22	2.88	2.06	1.88	1.66	1.15	1.27	1.56
0.78	0.82	0.84	0.99	1.03	0.94	1.05	0.91	0.95	1.01	0.89
2.15	1.93	2.55	2.98	2.59	2.23	1.92	1.93	1.82	1.79	1.87
11.45	11.25	14.28	15.87	12.90	11.50	11.21	10.42	9.93	10.26	11.27
2.83	2.87	2.88	2.70	2.94	3.28	3.26	3.40	3.34	3.37	3.51
14.28	14.12	17.16	18.57	15.84	14.78	14.47	13.82	13.27	13.63	14.78

(1)

"Other industries" include Fishing, Forestry, Finance and Insurance.

(2)

Investment in agriculture and real estate, investment by institutions and professional persons and investment charged to operating expenses.

(3)

Detail may not add to totals because of rounding.

Table A-3.2
Fixed Investment by Industry
as Percentages of Gross National Product,
United States,
1947 to 1964

	1947	1948	1949	1950	1951	1952	1953
Trade, commercial services, construction and other industries ⁽¹⁾	2.64	2.02	1.83	2.00	1.80	1.62	1.73
Mining	0.30	0.35	0.31	0.25	0.27	0.29	0.27
Manufacturing	3.76	3.53	2.77	2.63	3.32	3.36	3.26
Transportation	0.95	1.00	0.90	0.81	0.92	0.84	0.80
Communications	0.61	0.66	0.51	0.39	0.40	0.43	0.47
Public utilities	0.65	0.97	1.21	1.16	1.13	1.13	1.26
Sub-total	8.91	8.53	7.53	7.24	7.83	7.67	7.79
Residual ⁽²⁾	1.64	2.46	2.76	2.98	2.40	2.17	2.11
Total plant and equipment as percentage of GNP ⁽³⁾	10.55	10.99	10.29	10.22	10.23	9.84	9.90

Table A-3.2 (Cont'd.)

1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
1.78	1.88	2.00	1.68	1.61	1.70	1.67	1.63	1.70	1.70	1.72
0.27	0.25	0.29	0.27	0.22	0.21	0.20	0.19	0.20	0.17	0.19
3.02	2.86	3.58	3.63	2.55	2.50	2.88	2.63	2.62	2.66	2.96
0.66	0.63	0.70	0.73	0.52	0.60	0.58	0.50	0.53	0.51	0.60
0.47	0.50	0.64	0.68	0.58	0.56	0.62	0.62	0.64	0.64	0.68
1.15	1.08	1.17	1.41	1.36	1.18	1.13	1.06	0.98	0.97	0.99
7.35	7.20	8.38	8.39	6.84	6.74	7.07	6.63	6.67	6.65	7.14
2.27	2.67	2.38	2.33	2.24	2.32	2.30	2.18	2.56	2.57	2.48
9.62	9.87	10.76	10.72	9.08	9.06	9.37	8.81	9.23	9.22	9.62

(1)

"Other industries" include Forestry, Finance and Insurance.

(2)

Investment in agriculture and real estate, investment by institutions and professional persons and investment charged to operating expenses.

(3)

Detail may not add to totals because of rounding.

Source: Our own worksheet on Fixed Investment by Industry as percentages of Gross National Product.

At the 1957 peak, business fixed investment in Canada was over 18 1/2 per cent of GNP, compared with slightly less than 11 per cent in the United States. While Canadian relative investment exceeded that in the United States in every major industry classification, the differences were particularly striking in the mining, transportation and public utilities sectors. A similar pattern prevailed in 1964, when the over-all proportions stood at roughly 15 per cent for Canada and 10 per cent for the United States. Although some part of these differences may be explained by differences in the structure of prices in the two countries, machinery and equipment prices in particular tending to be higher in relation to other prices in Canada than in the United States, it is clear that investment is relatively far larger in Canada.^{1/}

Why Canadian investment should be relatively so high is an intriguing question. Canada's growth over the post-war period has been higher than that of the United States, but this has been estimated to account for only just over one percentage point (or 8 per cent) of the Canadian percentage of investment to GNP.^{2/} It has also

^{1/} The stock of capital per worker in the nonagricultural sector -- especially in the area outside manufacturing -- also appears to be higher in Canada than in the United States. See Second Annual Review: Towards Sustained and Balanced Economic Growth, Economic Council of Canada, Ottawa, Queen's Printer, December 1965, Table 3-5, p. 60.

^{2/} In 1954 dollars, the cumulative 1949-63 proportion of investment to GNP in Canada was 14.3 per cent. It is estimated that, had the rate of growth been the same as in the United States, the proportion would have been 13.2 per cent. See Derek A. White, Business Investment to 1970, Staff Study No. 5, Economic Council of Canada, Ottawa, Queen's Printer, pp. 33 and 36.

been shown that the structure of Canadian industry is tilted towards industries consuming and requiring relatively large quantities of capital.^{1/} It is evident that the proportion of GNP constituted by the investment of a particular industry is also related to the relative importance of that industry in total output. One would expect Canadian relative investment in mining, for example, to be larger than in the United States because Canadian Gross Domestic Product at factor cost in mining (in current dollars) is a higher proportion of total GDP in Canada than in the United States. A rough correction to eliminate differences attributable to industrial structure may be made by dividing each Canadian investment percentage by the weight of the industry's output in total output and then multiplying the result by the weight of the U. S. industry's output in total output. The results are presented in Table A-3.3. Application of the U. S. industry weights does have a modest effect in reducing the total proportion of investment to GNP. Thus, for the sub-total of industries covered by the Commerce-SEC Survey, the proportion is reduced in 1957 to 14.4 per cent compared with 15.9 per cent (Table A-3.1) when Canadian weights are used. However, since, in the United States (Table A-3.2), the proportion was only 8.4 per cent, it would seem that factors other than industrial structure, as identified in this exercise were responsible for most of the differences between the Canadian and U. S. investment programmes. It is general knowledge, of course, that, in recent years, the United States has been looking to Canada for an increasing proportion of its mineral, fuel and power needs. This is inevitably reflected in a tendency towards lower U. S. and higher Canadian investment in relation to current output in these sectors and in the closely related transportation sector.

Some of the implications of Tables A-3.2 and A-3.3 are brought out more fully in Tables A-3.4 and A-3.5. Table A-3.4 records the differences between Canadian and U. S. investment as percentages of GNP, by industry, for the group of industries covered by the Commerce-SEC Survey.

^{1/} Ibid., pp. 33-34.

This immediately establishes the rather remarkable fact that, except in the year 1947, the relative level of Canadian investment was higher in every industry and in every year. No one industry dominated the difference between the aggregate U. S. and Canadian percentages. Manufacturing, for example, where a considerable part of the difference between aggregate Canadian and U. S. investment might be hypothesized to originate, has seldom accounted for more than a quarter of the total difference and has often accounted for very much less. All industrial sectors indicate considerable volatility in the rise over the U. S. level at different points in time. The transportation sector is especially noteworthy.

Table A-3.5 expresses the Canadian investment percentages, by industry and years, as ratios of the corresponding American percentages.^{1/} This way of presenting the data draws attention to the relative concentration of Canadian investment, by industry sectors. The influence of the relative size of the industry in each country has already been eliminated by standardizing the Canadian percentages by the application of U. S. GDP weights. The Table shows very heavy relative concentration in the mining sector in recent years and high concentrations in the transportation sector, particularly in the late 1950's, when the St. Lawrence Seaway and oil and gas pipeline expenditures were running at high levels in Canada. Differences in the degree of concentration have been lowest in the manufacturing and trade, services and other industry categories.

Both the Commerce-SEC and PPI data provide breakdowns of expenditures within manufacturing which, with some manipulation, may be made to yield roughly comparable estimates for the two countries. These data are presented in Tables A-3.6 and A-3.7. Canadian investment runs higher in both nondurables and durables, but the greatest differences occur in the former category.

^{1/}

Tables A-3.4 and A-3.5 are derived from Tables A-3.2 and A-3.3.

The most striking difference within nondurables is, not surprisingly, in the paper products group. Substantially higher relative investment in Canada is also apparent in foods and beverages. In products of petroleum and coal, however, American investment has tended, in relative terms, to exceed Canadian investment by a significant margin. Relative differences in aggregate durables expenditure are not large. Transportation equipment investment has been somewhat higher in the United States, but Canadian investment has usually been relatively slightly higher in most other groups and significantly higher in the nonmetallic mineral products group.

In interpreting Tables A-3.6 and A-3.7 it should be borne in mind that the investment percentages by industry have in this case not been adjusted for differences between Canada and the United States in the relative importance of the industries concerned.^{1/} However, it will be apparent from a comparison of Tables A-3.1 and A-3.3 that standardization for relative importance raises the Canadian investment percentages applicable to total manufacturing by about 18 per cent in recent years.

^{1/}

This is because GNP or GDP estimates in current dollars for the industries within manufacturing have not been available.

Table A-3.3
Canadian Fixed Investment by Industry
as Percentages of Gross National Product
Adjusted for Differences in the Structure of Output
in Canada and the United States

	1947	1948	1949	1950	1951	1952	1953
Trade, commercial services, construction and other industries ⁽¹⁾	2.22	2.47	2.33	2.64	2.45	1.89	2.44
Mining	0.25	0.41	0.49	0.51	0.58	0.68	0.82
Manufacturing	3.92	3.56	2.98	2.66	3.70	4.00	3.93
Transportation	1.15	1.10	1.15	1.08	1.12	1.47	1.55
Communications	0.58	0.67	0.76	0.63	0.54	0.60	0.68
Public utilities	0.70	1.14	1.75	1.75	1.81	2.04	1.84
Total ⁽²⁾	8.82	9.35	9.46	9.27	10.20	10.68	11.26

Table A-3.3 (Cont'd.)

1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
2.69	2.67	2.80	2.53	2.33	2.69	2.35	2.14	2.02	2.15
0.82	0.84	1.16	1.27	0.69	0.63	0.60	0.68	0.61	0.64
3.33	3.67	4.53	4.90	3.46	2.59	3.42	3.03	3.31	3.32
1.39	1.05	1.63	2.45	2.26	1.75	1.44	1.25	0.89	0.99
0.75	0.78	0.80	0.99	1.03	1.05	1.01	0.88	0.88	0.94
1.78	1.50	1.90	2.24	2.02	1.96	1.47	1.49	1.47	1.41
10.76	10.51	12.82	14.38	11.79	10.67	10.29	9.47	9.18	9.45

(1)

"Other industries" include Forestry, Finance and Insurance.

(2)

Detail may not add to totals because of rounding.

Table A-3.4
Differences in Industry
and Aggregate Percentages of Investment,
Canada and United States⁽¹⁾

	1947	1948	1949	1950	1951	1952	1953
Trade, commercial services, construction and other industries ⁽²⁾	-0.42	0.45	0.50	0.64	0.65	0.27	0.71
Mining	-0.05	0.06	0.18	0.26	0.31	0.39	0.55
Manufacturing	0.16	0.03	0.21	0.03	0.38	0.64	0.67
Transportation	0.20	0.10	0.25	0.27	0.20	0.63	0.75
Communications	-0.03	0.01	0.25	0.24	0.14	0.17	0.21
Public utilities	0.05	0.17	0.54	0.59	0.68	0.91	0.58
Total ⁽³⁾	-0.09	0.82	1.93	2.03	2.37	3.01	3.47

Table A-3.4 (Cont'd.)

1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
0.91	0.79	0.80	0.85	0.72	0.99	0.68	0.51	0.32	0.45
0.55	0.59	0.87	1.00	0.47	0.42	0.40	0.49	0.41	0.47
0.31	0.81	0.95	1.27	0.91	0.09	0.54	0.40	0.69	0.66
0.73	0.42	0.93	1.72	1.74	1.15	0.86	0.75	0.36	0.48
0.28	0.28	0.16	0.31	0.45	0.49	0.39	0.26	0.24	0.30
0.63	0.42	0.73	0.83	0.66	0.78	0.34	0.43	0.49	0.44
3.41	3.31	4.44	5.99	4.95	3.93	3.22	2.84	2.51	2.80

(1)

The Canadian percentages used are those given in Table A-3.3, which are adjusted for differences in the relative importance of comparable industries in Canada and the United States. This Table is derived by subtracting each entry in Table A-3.2 from the corresponding entry in Table A-3.3.

(2)

"Other industries" include Forestry, Finance and Insurance.

(3)

Detail may not add to totals because of rounding.

Source: Tables A-3.2 and A-3.3.

Table A-3.5
Ratios of Canadian to U.S. Percentages of Investment
to Gross National Product ⁽¹⁾

	1947	1948	1949	1950	1951	1952	1953
Trade, commercial services, construction and other industries ⁽²⁾	0.841	1.223	1.273	1.320	1.361	1.167	1.410
Mining	0.833	1.171	1.581	2.040	2.148	2.345	3.037
Manufacturing	1.043	1.008	1.076	1.011	1.114	1.190	1.206
Transportation	1.211	1.100	1.278	1.333	1.217	1.750	1.938
Communications	0.951	1.015	1.490	1.615	1.350	1.395	1.447
Public utilities	1.077	1.175	1.446	1.509	1.602	1.805	1.460
Total	0.990	1.096	1.256	1.280	1.303	1.392	1.445

Table A-3.5 (Cont'd.)

1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
1.511	1.420	1.400	1.506	1.447	1.582	1.407	1.313	1.188	1.265
3.037	3.360	4.000	4.704	3.136	3.000	3.000	3.579	3.050	3.765
1.103	1.283	1.265	1.350	1.357	1.036	1.188	1.152	1.263	1.248
2.106	1.667	2.329	3.356	4.346	2.917	2.483	2.500	1.679	1.941
1.596	1.560	1.250	1.456	1.776	1.875	1.629	1.419	1.375	1.469
1.548	1.389	1.624	1.589	1.485	1.661	1.301	1.406	1.500	1.454
1.464	1.460	1.530	1.714	1.724	1.583	1.455	1.428	1.376	1.421

(1)

The Canadian percentages used are those given in Table A-3.3 which are adjusted for differences in the relative importance of comparable industries in Canada and the United States. This Table is derived by dividing each entry in Table A-3.3 by the corresponding entry in Table A-3.2.

(2)

"Other industries" include Forestry, Finance and Insurance.

Source: Tables A-3.2 and A-3.3.

Table A-3.6

Fixed Investment in Manufacturing Industries
as Percentage of Gross National Product - Canada

	1946	1947	1948	1949	1950	1951
<u>Nondurables</u>						
1. Food and beverages	.45	.63	.59	.48	.42	.37
2. Textile products	.21	.28	.24	.20	.15	.19
3. Paper products	.46	.62	.59	.50	.44	.59
4. Chemical products	.17	.26	.28	.23	.15	.27
5. Petrol and coal products	.08	.26	.28	.17	.18	.28
6. Rubber	.06	.08	.04	.04	.03	.04
7. Other nondurables	.18	.26	.25	.24	.20	.20
Tobacco	.02	.02	.02	.01	.01	.01
Leather	.03	.02	.02	.02	.01	.01
Clothing	.07	.11	.08	.08	.07	.06
Printing and publishing	.06	.11	.13	.12	.11	.12
Sub-total	1.61	2.37	2.26	1.85	1.56	1.94
<u>Durables</u>						
1. Machinery and primary metals	.31	.44	.41	.40	.30	.56
2. Electrical apparatus and supplies	.10	.11	.11	.10	.08	.15
3. Transportation equipment	.13	.11	.10	.14	.15	.23
4. Nonmetal mineral products	.07	.17	.19	.12	.09	.14
5. Miscellaneous manufacturing	.29	.39	.31	.29	.27	.35
Sub-total	.89	1.21	1.12	1.05	.89	1.43
Total manufacturing	2.50	3.58	3.38	2.91	2.45	3.37

Table A-3.6 (Cont'd.)

1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
.32	.34	.42	.38	.36	.37	.38	.38	.42	.44	.42	.37	.38
.13	.11	.12	.10	.13	.12	.07	.07	.08	.07	.09	.12	.20
.54	.42	.35	.51	.84	.84	.39	.36	.46	.43	.43	.48	.70
.59	.49	.16	.21	.47	.47	.35	.23	.30	.34	.25	.27	.29
.32	.33	.38	.40	.30	.41	.44	.35	.17	.09	.16	.11	.05
.04	.06	.06	.06	.05	.05	.03	.04	.07	.04	.04	.04	.05
.13	.15	.19	.15	.16	.20	.17	.18	.14	.15	.15	.17	.16
.01	.01	.01	.02	.03	.03	.04	.02	.02	.02	.02	.02	.02
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.05	.06	.04	.03	.03	.03	.03	.04	.03	.04	.03	.04	.03
.06	.07	.13	.09	.08	.13	.10	.12	.08	.08	.09	.11	.10
2.08	1.89	1.67	1.81	2.30	2.45	1.83	1.61	1.62	1.56	1.54	1.55	1.82
.70	.63	.47	.54	.75	.83	.55	.53	.60	.40	.60	.51	.65
.17	.14	.13	.11	.14	.14	.09	.09	.09	.08	.10	.10	.11
.26	.39	.26	.20	.20	.20	.17	.19	.13	.13	.12	.18	.29
.14	.13	.17	.18	.39	.25	.12	.21	.14	.12	.13	.12	.16
.33	.32	.27	.32	.38	.36	.26	.31	.32	.29	.31	.33	.39
1.60	1.61	1.30	1.34	1.85	1.77	1.18	1.33	1.28	1.01	1.25	1.24	1.61
3.68	3.50	2.97	3.15	4.15	4.22	3.01	2.94	2.90	2.56	2.79	2.79	3.42

Source: Private and Public Investment in Canada (Department of Trade and Commerce and Dominion Bureau of Statistics) and National Accounts (Dominion Bureau of Statistics).

Table A-3.7
Fixed Investment in Manufacturing Industries
as Percentage of Gross National Product - United States

	1946	1947	1948	1949	1950	1951
<u>Nondurables</u>						
1. Food and beverages	.34	.39	.43	.35	.28	.27
2. Textile-mill products	.14	.22	.23	.19	.18	.15
3. Paper and allied products	.10	.17	.16	.12	.11	.12
4. Chemical and allied products	.38	.48	.35	.27	.28	.37
5. Petroleum and coal products	.53	.73	.82	.70	.56	.64
6. Rubber products	.05	.04	.04	.04	.04	.06
7. Other nondurable products (includes: apparel, tobacco, leather, leather products, printing and publishing)	.19	.22	.19	.16	.14	.12
Sub-total	1.77	2.29	2.21	1.79	1.54	1.74
<u>Durables</u>						
1. Machinery and primary metals	.53	.56	.58	.43	.39	.67
2. Electrical machinery and equipment	.14	.13	.12	.08	.07	.12
3. Transportation equipment	.34	.26	.23	.16	.21	.33
4. Nonmetal mineral products	.10	.13	.12	.08	.11	.12
5. Miscellaneous manufacturing and other durable goods	.38	.35	.35	.23	.32	.33
Sub-total	1.49	1.47	1.36	1.01	1.09	1.58
Total	3.26	3.76	3.57	2.80	2.63	3.32
Gross National Product (billions of current dollars)	208.5	231.3	257.6	256.5	284.8	328.4

Table A-3,7 (Cont'd.)

1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
.23	.22	.22	.18	.19	.20	.16	.17	.18	.19	.18	.17	.17
.12	.11	.08	.10	.12	.09	.07	.08	.10	.10	.11	.10	.13
.12	.11	.14	.13	.19	.18	.13	.12	.16	.13	.12	.12	.14
.41	.38	.30	.25	.36	.39	.29	.25	.32	.31	.29	.27	.32
.72	.74	.74	.70	.74	.79	.54	.52	.52	.54	.52	.49	.54
.06	.05	.03	.05	.05	.05	.02	.04	.04	.04	.04	.03	.05
.12	.11	.11	.10	.12	.11	.11	.10	.12	.12	.12	.12	.13
1.74	1.73	1.62	1.51	1.74	1.79	1.34	1.30	1.45	1.42	1.37	1.32	1.46
.78	.66	.47	.48	.67	.86	.56	.48	.60	.48	.48	.49	.60
.12	.14	.11	.10	.14	.14	.11	.10	.14	.13	.12	.12	.11
.32	.33	.41	.35	.50	.36	.20	.21	.26	.21	.23	.27	.32
.09	.08	.11	.13	.17	.14	.09	.10	.12	.10	.11	.10	.11
.32	.33	.30	.30	.33	.32	.25	.29	.32	.29	.32	.36	.37
1.62	1.53	1.40	1.36	1.81	1.81	1.23	1.20	1.43	1.21	1.25	1.34	1.50
3.36	3.26	3.02	2.87	3.55	3.60	2.57	2.50	1.88	2.63	2.62	2.66	2.96
345.5	364.6	364.8	398.0	419.2	441.1	447.3	483.7	503.8	520.1	560.3	587.2	628.7

Source: Supplement to Survey of Current Business, November 1958 and Survey of Current Business, various issues.

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