# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF FIGURES</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II. THE GROWTH CONCEPT IN ECONOMICS: A CRITIQUE</td>
<td>6</td>
</tr>
<tr>
<td>Economic Growth as a Biological Analogy</td>
<td>11</td>
</tr>
<tr>
<td>Economic Growth as Quantitative Change</td>
<td>17</td>
</tr>
<tr>
<td>Measurement vs. Appraisal in Growth Economics</td>
<td>26</td>
</tr>
<tr>
<td>Conclusions</td>
<td>45</td>
</tr>
<tr>
<td>III. THE CONCEPT OF ECONOMIC GROWTH:</td>
<td></td>
</tr>
<tr>
<td>A REFORMULATION</td>
<td>47</td>
</tr>
<tr>
<td>The Nature of the Economic Unit</td>
<td>48</td>
</tr>
<tr>
<td>The Concept of Economic Growth</td>
<td>63</td>
</tr>
<tr>
<td>Conceptual Problems in the Application</td>
<td></td>
</tr>
<tr>
<td>of the Concept</td>
<td>64</td>
</tr>
<tr>
<td>The Frontier in the Short-run and the Long-run</td>
<td>67</td>
</tr>
</tbody>
</table>
### The "State of Knowledge" and the "Robinson Effect"

- **The "Robinson Effect"**: Page 71

### The "Stock of Resources"

- **Land**: Page 80
- **Labor**: Page 83
- **Capital**: Page 85

### Empirical Problems in the Application of the Concept

- Page 95

### IV. THE THEORETICAL PROBLEM: THE RELATIONSHIP BETWEEN INTERNATIONAL INVESTMENT AND ECONOMIC GROWTH

- **Economic Theory and the Problem of Economic Development**: Page 105
- **The Problem**: Page 112
- **The Nature of the Study**: Page 115

### V. THE THEORY OF INTERNATIONAL INVESTMENT AND ECONOMIC GROWTH

- **Economic Growth in the Classical Model**: Page 125
- **International Investment in the Classical Model**: Page 131
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Growth in the Neo-Keynesian Model</td>
<td>141</td>
</tr>
<tr>
<td>International Investment in the Neo-Keynesian Model</td>
<td>156</td>
</tr>
<tr>
<td>Summary</td>
<td>158</td>
</tr>
<tr>
<td>VI. DISSENTING VIEWS</td>
<td>160</td>
</tr>
<tr>
<td>The Non-Coincidence of Monetary Investment</td>
<td></td>
</tr>
<tr>
<td>&quot;Real Transfers&quot;</td>
<td>161</td>
</tr>
<tr>
<td>Capital Accumulation vs. Technological Change</td>
<td>171</td>
</tr>
<tr>
<td>The Level of Aggregation Appropriate to Growth Economics</td>
<td>176</td>
</tr>
<tr>
<td>Market Allocation Bias</td>
<td>178</td>
</tr>
<tr>
<td>Summary</td>
<td>208</td>
</tr>
<tr>
<td>VII. SUMMARY OF THEORY AND TENTATIVE HYPOTHESES</td>
<td>210</td>
</tr>
<tr>
<td>Summary of Theory</td>
<td>210</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>214</td>
</tr>
<tr>
<td>VIII. THE PATTERN OF POSTWAR CANADIAN</td>
<td></td>
</tr>
<tr>
<td>ECONOMIC GROWTH</td>
<td>224</td>
</tr>
<tr>
<td>Economic Growth, 1946-1956</td>
<td>226</td>
</tr>
<tr>
<td>Changes in the Structure of the Economy</td>
<td>234</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Summary</td>
<td>273</td>
</tr>
<tr>
<td>IX. PRIVATE INTERNATIONAL INVESTMENT AND ECONOMIC GROWTH IN CANADA, 1946-1956</td>
<td>275</td>
</tr>
<tr>
<td>International Investment, the Balance of Payments and Economic Growth</td>
<td>282</td>
</tr>
<tr>
<td>Magnitude and Composition of the Non-Resident Financial Contribution</td>
<td>295</td>
</tr>
<tr>
<td>Commodity, Trade, Growth and the Non-Resident Financial Contribution</td>
<td>303</td>
</tr>
<tr>
<td>The Use of Foreign Exchange other than to Finance Commodity Imports</td>
<td>316</td>
</tr>
<tr>
<td>Reconciliation of the Estimates</td>
<td>320</td>
</tr>
<tr>
<td>Conclusions</td>
<td>321</td>
</tr>
<tr>
<td>Direct Investment and Growth Stimulation</td>
<td>323</td>
</tr>
<tr>
<td>The Petroleum Industry</td>
<td>326</td>
</tr>
<tr>
<td>Other Resource Extraction</td>
<td>334</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>339</td>
</tr>
<tr>
<td>Conclusions</td>
<td>346</td>
</tr>
<tr>
<td>X. SUMMARY AND CONCLUSIONS</td>
<td>349</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Two Commodity Production Frontier: Short-Run and Long-Run</td>
<td>70</td>
</tr>
<tr>
<td>2.</td>
<td>Two Commodity Production Frontier: &quot;Robinson Effect&quot;</td>
<td>76</td>
</tr>
<tr>
<td>3.</td>
<td>Classical and Neo-Keynesian Aggregate Production Functions</td>
<td>150</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>II. Industrial Production Index, 1935-1955</td>
<td>230</td>
</tr>
<tr>
<td>III. Civilian Labor Force, Average Unemployment and Total Manhours Worked, Canada, Selected Years, 1926-1955</td>
<td>232</td>
</tr>
<tr>
<td>IV. Fuel and Power Consumption, Canada, 1939-1956</td>
<td>233</td>
</tr>
<tr>
<td>V. Industrial Distribution of the Employed Civilian Labor Force, Canada, Selected Years, 1891-1955</td>
<td>254</td>
</tr>
<tr>
<td>VI. Industrial Distribution of Gross Domestic Product, Canada, Selected Years, 1890-1955</td>
<td>255</td>
</tr>
<tr>
<td>VII. Value of Exports of Domestic Produce, by Degree of Manufacture, as a Percentage of 1948 Values, Canada, 1946-1956</td>
<td>267</td>
</tr>
<tr>
<td>Table</td>
<td>Page</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>VIII. Percentage Distribution of the Value of Exports of Canadian Produce, 1953, and Index of the Volume of Exports of Canadian Produce, 1956, Classified by Chief Component Material and Degree of Manufacture</td>
<td>269</td>
</tr>
<tr>
<td>IX. Percentage Distribution of Exports of Canadian Produce, 1953, and Indexes of the Value of Exports of Canadian Produce, 1947-1956, Classified by Purpose</td>
<td>272</td>
</tr>
<tr>
<td>X. Magnitude of the Non-Resident Financial Contribution to Canadian Growth, 1946-1956</td>
<td>301</td>
</tr>
<tr>
<td>XI. Projection of Foreign Exchange Requirements and Earnings in the Absence of Foreign Investment, 1946-1956, Assuming No Change in Export Capacity, Canada</td>
<td>312</td>
</tr>
<tr>
<td>XII. Projection of Foreign Exchange Requirements and Earnings in the Absence of Foreign Investment, 1946-1956, Assuming Full Expansion of Export Capacity, Canada</td>
<td>315</td>
</tr>
</tbody>
</table>
Table | Page
--- | ---
XIII. Canadian Financial Transfers to Non-Residents, 1946-1956 | 319
XIV. Increase in the Book Value of Foreign Investments in Canada, 1946-1956 | 327
XV. Non-Resident Ownership and Control of Investments in the Petroleum Industry, Canada, 1955 | 330
XVI. Increase in the Book Value of Foreign Investments in Various Segments of the Petroleum Industry, Canada, 1946-1956 | 331
XVII. Production and Exports of Selected Metals and Non-Metallic Minerals, Canada, 1946-1956 | 338
XVIII. Non-Resident Ownership and Control in Selected Manufacturing Industries, Canada, 1955 | 343
Chapter I

INTRODUCTION

Economic development has become the subject of widespread popular and academic discussion. This is readily explainable inasmuch as economic development is currently an international political problem of far-reaching ramifications, interrelated with and perhaps basic to the aspirations of nationalist movements throughout the non-western world. The problem provides a major topic for debate in the United Nations, and development aids have become an important element in the intense competition between the U.S.S.R. and the western powers for the ideological allegiance of the so-called underdeveloped areas. Dire consequences for international political stability and perhaps for western democratic institutions have been predicted if the aspirations of these areas are frustrated. If such an appraisal of the situation is correct, there would seem to be an almost categorical imperative for social scientists, including economists, to contribute significant and usable insights into the basic problems and processes of development.
Any survey of the literature of the social sciences reveals that attempts to provide such insights are proceeding on a broad front. However, many analytical and conceptual problems are encountered which tend to retard the advance of basic research and theorizing. It is clear that unanimity does not even exist with respect to the definition of the problem being studied. In almost every context in which the concept of "economic under-development" is used it carries the connotation of poor economic performance. But the specification of poor performance implies some standard of adequate or good performance, and such appraisal criteria are inherently subjective. This is where the contradictions and ambiguities arise. Universal agreement on appropriate criteria for evaluating the results of economic activity cannot be expected on a priori grounds. However, this type of disagreement concerning purposes and objectives need not stop all effective research. Common to almost all analyses of the remedies for the condition of economic under-development, no matter how that condition is defined, is emphasis on the necessity of stimulating economic growth in the sense of an expansion in the aggregate capacity of an economy to produce goods and services.
From an economist's point of view, then, economic development must be analyzed within the context of a general theory of economic growth. Perhaps for this reason, the theory of economic growth has received new emphasis in recent years. Many doubts have been expressed concerning the adequacy of traditional growth theory, particularly in the context of the underdeveloped areas, and a reappraisal of that theory has frequently been called for. The present study is presented as a contribution to that reappraisal.

It is obvious that a process as complex as international investment has many important facets, some of which have been subject to careful and incisive analysis. In the present study attention is focused on one of these facets which has been comparatively neglected: the relationship between private international investment and the process of economic growth in the receiving country. Broadly conceived, it is a study of the role of private international investment in the process of international transmission of economic growth in an essentially market-regulated economy.

The analysis of this process of growth transmission raises conceptual, theoretical and empirical questions. In the first part of the study certain of the conceptual and theoretical issues are considered. The concept of economic
growth most widely used by economic theorists is criticized, and a reformulation is suggested which provides a more direct and more effective approach to the analysis of the growth process. Following this, the classical theory of the relationship between economic growth and international investment is considered in the light of various criticisms of it which appear in the literature. This provides the basis for the tentative hypotheses which are set out in Chapter VII.

In the second part of the study a preliminary attempt is made to test these hypotheses on the basis of Canadian experience since World War II. Clearly, the process of economic growth in Canada must be regarded as distinctly atypical in terms of the problems faced by the so-called underdeveloped areas of the world. For this reason the usefulness of the study can be questioned. However, a study of the Canadian case has certain advantages, at least as a starting point for an empirical reconsideration of the theory of international investment and economic growth. This is one of the few cases for which relatively reliable data is readily available and in which there is a coincidence of a high level of private international investment, substantial economic growth, and relatively little organized interference
with the market mechanism. The nature of the growth impact of private international investment can be seen under the most favorable of circumstances.

The factual conclusions of the study are presented as both tentative and of limited generality. Studies of broader geographic scope and longer historical perspective are necessary. However, it would seem that the Canadian case provides a useful base for comparative studies. It is also argued that the conceptual approach employed in this study is useful and susceptible of much broader application. Indeed, it is suggested that this type of analysis is necessary to the evaluation of the growth impact of foreign investment in any specific national or historical context.
Chapter II

THE CONCEPT OF ECONOMIC GROWTH: A CRITIQUE

It has been said that while we have many acceptable theoretical propositions about economic growth, we do not have an acceptable general theory of economic growth. Such a statement represents an extreme position. However, it does serve to emphasize the existence of widespread uncertainty concerning the applicability of traditional growth theory to the most pressing of contemporary problems. In particular, it is frequently argued that traditional economic theory can make but a minimal contribution to the resolution of the economic problems of the underdeveloped areas of the world. The basis of this thesis is complex and is seldom clearly formulated; however, the essential objection seems to be that economic theory suffers from a narrow cultural relativity. Aspects of human behavior in a social context which have traditionally been relegated to the category of "non-economic" factors, with the implication that they constitute a fixed institutional framework in which "economic" forces can operate, are in this case claimed to
form the crux of the problem. The problem of growth or de-
velopment is presumed to be one of broad social change in
which the "non-economic" factors may be more important than
narrowly defined "economic" factors. This argument will be
considered in more detail in Chapter IV. However, if it is
agreed that there is some (without specifying how much) merit
to it, the dilemma facing economic theory is obvious. How can
we construct a truly general theory of economic growth, which
will include the special problem of economic development
along with the special problems of more classical interest?

This, of course, is a methodological problem. It is a
question of the conceptual framework appropriate to the anal-
ysis of the growth phenomenon. An answer to it presupposes
a clear definition of what it is we are trying to explain,
i.e., of what constitutes economic growth. Indeed, it can
be argued that such a definition will by itself resolve many
of the basic conceptual problems. A failure to agree on
matters of definition appears to be at the root of much of
the current uncertainty concerning the usefulness of economic
theory in this area. In part the economists and their critics
are talking about different problems, or different aspects of
the total problem.
This is not to say that we can dismiss the issue as a simple failure of communication. There is much confusion within economics itself. The concept of economic growth widely employed by economists is actually inappropriate because it focuses attention on aspects of the phenomenon which economic theory cannot be expected to deal with. Economists can be accused of a subtle confusion of two distinct theoretical problems: the problem of explaining and measuring economic growth and the problem of appraising various patterns and processes of growth. Strictly speaking, only the former is within their province as economists.

The implication of this discussion is that there is some uniquely "correct" definition of the concept of economic growth. To argue this way is to leave oneself open to serious criticism. Not only do scientists jealously guard their right to define concepts as they see fit but also grammarians argue that even in popular parlance the meanings of words must be essentially flexible, developing and changing with usage. However, a complete yielding to such an operationalist position,\(^1\) while attractive because of the emphasis

\(^1\)The concept of operationalism is somewhat vague. However, the above approach to the definition of concepts seems broadly implicit in it. G. A. Lundberg, an advocate of operationalism in Sociology, makes this very clear: "...terminology
placed on flexibility in research, invites intellectual an-
archy. It provides no guide to the delimitation of the vari-
ous phenomena to be studied in our attempts to develop an in-
tegrated body of explanatory theory. The development of a
general theory of economic growth presupposes the existence
of some discernible "real" phenomenon or process which we can
agree to unambiguously call economic growth. Thus, it pre-
supposes agreement on a "uniquely correct" definition of eco-
nomic growth. If several inconsistent or overlapping defini-
tions are regarded as equally admissible this must signify
the existence of several different (although perhaps related)
phenomena, each deserving separate study, and each, perhaps,
an appropriate subject for theory. However, for clarity,
each should be distinguished by a different label.

The purpose of this chapter is to analyze and evaluate
the definition of economic growth which has gained widespread
acceptance among economists. The general concept of growth
has applications in many fields of study. As a result, it
has certain firmly entrenched and, from our point of view,

and units are merely convenient delimitations of phenomena
for certain purposes of study, and...as such, a term or a
unit must justify itself purely by its utility." "Questions
about the ultimate nature of these phenomena are regarded as
obsolete and unscientific." Social Research (2nd Edition;
unfortunate connotations. While little of substance is to be gained from considering the broader meanings of the term, it is important that certain of these connotations be firmly dispelled. This is particularly true of any biological overtones which the term may have. Accordingly, the first two sections of this chapter give brief consideration to possible rationales for using the term growth in economic analysis. In the final two sections detailed consideration is given to the particular definition of growth most widely used in economics. The usefulness of this definition in the context of the problems wanting explanation is seriously called into question. These criticisms provide a basis for the alternative formulation presented in the following chapter. This alternative formulation is offered as providing a more direct approach to the construction of the desired general theory of economic growth and hence to the analysis of such problems as the stimulation of growth in the underdeveloped areas of the world. This methodological discussion is regarded as a necessary preliminary to the theoretical and empirical analysis in the rest of the study.
I. ECONOMIC GROWTH AS A BIOLOGICAL ANALOGY

One is inclined to believe that the unmodified term "growth" fits most comfortably into the vocabulary of the biological sciences. If so, this might suggest that the use of the concept in economics is by analogy: a result of treating the economy conceptually as if it were a growing vital organism. Many examples of such analogies, implicit and explicit, can be found in the social sciences. The importance of "Social Darwinism" in the general development of social theory, and the influence of evolutionary concepts on the "wholistic" critics of classical economic theory are well known.² That similar ideas had a profound influence on men firmly in the classical tradition of economic theory is also apparent. Alfred Marshall is a case in point. How else can one explain the organic overtones of certain passages in his works, particularly those relating to the historical long-run? Organicism is clearly reflected in his famous observation that "The Mecca of the economist lies in economic biology rather

²See, for example, R. Hofstader, Social Darwinism in American Thought (revised edition; Boston: The Beacon Press, 1955); D. Hamilton, Newtonian Classicism and Darwinian Institutionalism (University of New Mexico Publications in Economics, No. 1; Albuquerque: The University of New Mexico Press, 1953).
than in economic dynamics." It is even more apparent in the following passage:

"Progress" or "evolution," industrial and social, is not mere increase and decrease. It is organic growth chastened and confined and occasionally reversed by the decay of innumerable factors, each of which influences and is influenced by those around it; and every such mutual influence varies with the stages which the respective factors have already reached in their growth.4

Social Darwinism thus undoubtedly had an important indirect influence on the development of economic thought by tempering the extremely mechanical interpretations of social phenomena which seem to be broadly implicit in the narrow utilitarian tradition. However, it is doubtful whether we can ascribe to such organic-type formulations any important positive significance in the shaping of contemporary economic theories. While Marshall displayed obvious fascination with such ideas, organicism played only a peripheral role in his actual theoretical scheme (at least in that part which has been most widely propagated). This is essentially in the classical utilitarian tradition. Suggestions favoring the extension of the organic analogy and the further development


of its implications are still advanced by professional econo-
mists. However, such suggestions, while receiving widely
varied reactions are generally treated with skepticism.

The balance of opinion would seem to be that the organic
analogy is an interesting but incompletely formulated and
probably unusable hypothesis.

Analogical reasoning itself is justifiably suspect.

Such "as if" formulations, in situations where the similiar-
ties are at best tenuous, can lead to grossly misleading in-
terpretations of events and forces, and hence to dangerous
prescriptions. A literal interpretation of the organic anal-
ogy not uncommonly leads to a social philosophy of determin-
ism, if not of fatalism. This is essentially out of harmony
with the melioristic ambitions of most contemporary econo-
mists and with their belief in the efficacy of economic poli-
cy in providing a rational control over economic developments.

Hence, the organic analogy has been severely criticized, both

5 For example, see H. S. Houthakker, "Economics and
Biology: Specialization and Speciation," Kyklos, Vol. IX
(1956), pp. 181-187; D. Seers, "The Role of National In-
come Estimates in the Statistical Policy of an Underdevel-
oped Area" Review of Economic Studies, Vol. XX (1952-53),
pp. 161-162.

6 For example, see E. T. Penrose, "Biological Analogies
XLII (December 1952), pp. 804-819.
in terms of its broad methodological implications\(^7\) and its specific applications.\(^8\)

When we use the concept of growth in the organic sense we have reference to an organism which exists as a "natural unit." It can be recognized and described in terms of physical dimensions. Each organism is assumed to have a determinate life cycle, from birth to death, which may be longer or shorter, and which will vary in particular cases as external conditions are more or less favorable. Furthermore, all such organisms can be classified into groups displaying essentially similar characteristics. For the members of any given group, the process of change over time will be different in details but essentially similar in broad contours. Hence, in a general sense there is much repetitiveness, making it possible to abstract out of a group of histories a typical life cycle and growth pattern. This repetitiveness makes growth, its pattern and pace, statistically predictable. It also makes it possible to divide the growth process into a sequence of stages of development and maturity, each stage


\(^8\)See, for example, E. T. Penrose, *op. cit.*
having certain rather definite general characteristics.

Growth, then, appears largely as a process of development into some "mature" form. Physical expansion is common, but perhaps not essential.\\footnote{Even in the context of the biological sciences, D'Arcy Thompson tells us that "...growth is a somewhat vague word for a very complex matter." W. D'Arcy Thompson, \textit{On Growth and Form} (2nd edition; Cambridge, The University Press, 1942), p. 15. Presumably expansion in over-all physical dimensions is involved, although exceptions have been suggested. Boulding's example of the butterfly may be a case in point. He notes: "...the growth of the butterfly out of the chrysalis involves an actual decline in over-all dimensions such as weight or volume, but certainly seems to come under the general phenomenon of growth or development." K. E. Boulding, "Toward a General Theory of Growth," \textit{Canadian Journal of Economics and Political Science}, Vol. XIX (August 1953), p. 326. In this case it would appear that growth involves mainly increasing structural complexity, with only negligible (if any) and perhaps negative changes in over-all dimensions. This clearly represents one extreme case in the possible combinations of what Thompson identifies as the two most important manifestations of growth, viz., changes in magnitude and changes in structure. While the former is most widely acknowledged, Thompson argues that the latter is equally fundamental. Indeed, he argues that the most fruitful approach to the analysis of the growth phenomenon is by way of the analysis of structural changes. However, he suggests that the interrelationships between growth and structure are so complex that precise quantitative analysis demands the talents of the "skilled and learned mathematician" rather than "the biologist with an inkling of mathematics." The obvious implication is that even in its "purest" usage, growth cannot be conceived of as a simple process of accretion along a single dimension. This may offer some comfort to economists who are concerned with the apparent ambiguity of the growth concept in economics and with the apparent willingness of many to associate growth with a simple increase in some single, presumably homogeneous, quantitative indicator such as national income.}
A literal application of this concept to social analysis presupposes the existence of society as a distinct "natural unit"—an "organism" or a "super-organism"—with a statistically predictable life cycle. But clearly, society can at best be ascribed only a nominal existence. Patterns of organization, sub-units, and boundaries can be determined, but only through observed regularities in behavior. There is no independent physical existence of society in the same sense that an organism has independent physical existence. More fundamentally, it is difficult to argue, on the basis of available information, that societies have determinate "life-cycles" which are essentially repetitive and hence predictable. Such an hypothesis requires a level of abstraction and an historical perspective which makes it almost impossible to test on the basis of the known history of mankind. However, the observable flexibility in social units, the capacity for disorganization, regrouping, and reorganization, provides an a priori basis for rejecting such quasi-biological determinism.


11 Of course, it could be argued that these changes in social organization are examples of the process of mutation. However, the "new" societies develop without the death of the "old" societies.
For these general reasons it seems safe to conclude that few economists today would seriously entertain prospects of casting economic analysis in an organic conceptual framework. If the use of the growth concept reflects an implicit biological analogy, it is of the loosest type. There are few direct suggestions that economic growth is but an extension of the complex organic process into another dimension.

II. ECONOMIC GROWTH AS QUANTITATIVE CHANGE

There are a number of cases in which terms that have widespread technical use in economics appear to have been consciously or unconsciously borrowed from other disciplines. This may well be the case with respect to the concept of growth. However, while the original introduction of the term (whenever that may have been) may have involved an explicit analogy between organic and economic phenomena, it seems apparent that by and large, current usage involves no such conscious analogy. While it is impossible to attribute motive to what amounts to habitual usage, it can be observed that by using a term which has certain familiar if not commonplace connotations it becomes unnecessary to develop a technical vocabulary of unfamiliar terms, or to employ cumbersome descriptive phrases or value-laden and controversy-
creating terms such as "economic progress." In this case the crucial connotation is that of quantitative change. As it is most widely used as an analytical concept, economic growth implies a process resulting in sustained increase in some "economically relevant" magnitude.

This basis for the use of the concept of growth is implicit in both the form and the content of most of the important contemporary contributions to growth economics. It is consistent with, and perhaps a by-product of, the philosophy of empiricism which dominates present day economic research. Emphasis is increasingly being placed on measurement. "Sound methodology" and "sound theorizing" have come to mean the casting of propositions in terms of concepts which are in principle quantifiable or which have definite quantitative manifestations. Such propositions can be

---

12 The avoidance of esoteric technical language is fully in accord with the principle that as a discipline of practical significance to every citizen, the theorems of economics should be expressed "...in language that is intelligible to the general public." Cf. A. Marshall, Principles of Economics, p. 43. A particularly lucid statement of this thesis is made by E. Cannan in "Capital and the Heritage of Improvement," Economica, New Series, Vol. I (August 1934), p. 386. He concludes:

"We British and American economists would do well to... recognize that the English language understood by over two hundred million persons, is a much more useful instrument than any of the bable of jargons which individual economists have invented apparently each for his own individual use."
subject to empirical verification (assuming that data is available), and their significance as tools for prediction and control can be evaluated on the basis of the stability in the relationships postulated.

The roots of this methodological orientation would be very difficult to untangle. However, it is apparently a reflection of the impact of "science" and the "scientific method" on the development of western civilization. Empiricism represents an attempt to make economics more "scientific" on the model of the physical sciences. Writing at the end of the nineteenth century Alfred Marshall outlined the task facing economists in the twentieth century as "...the perfection of the scientific machinery of economics" through grappling "...at close quarters with the difficulties of quantitative analysis." That this challenge has been accepted is obvious from any survey of contemporary research.

In the context of growth economics, this spirit of empiricism is clearly reflected in Kuznets' suggestions—widely accepted as axiomatic—that "...economic growth is

\[\text{13} \]

essentially a quantitative concept, and that in order to make progress in the analysis of growth "...we must consider the quantitative aspects of economic growth as basic." Research in this area, by economists, commonly involves estimates of the magnitude of various variables over periods of history, and in various geographic areas. The purpose of such estimates is either to discover rates of growth and variations in rates of growth or to identify correlations among variables which might explain (in a quantitative sense) the variations in rates of growth. Correspondingly, the theory of growth consists of a series of models expressing possible interrelations among variables which are in principle quantifiable, including, of course, the rate of growth. While so called "qualitative factors" are admitted as "important," they are either neglected or left to other social scientists for analysis.

While there is widespread agreement, implicit if not explicit, that economic growth has primarily quantitative


manifestations, there is much less agreement as to what magnitude is the relevant measure of growth. It would perhaps be correct to say that a majority tends to favor some measure of per capita output. It is argued that such a measure reflects the degree of success in achieving the "welfare purpose" of economic activity. This argument derives from the assumption that economic activity is purposive activity, and that hence it can be defined and its results measured only with reference to some purpose. If then we are going to define economic growth as "...a sustained increase in... [a nation's] ...magnitude as an economic unit," measurement of economic growth must revolve about a measure of success in attaining this purpose.

It is admitted that many different purposes are possible. However, proponents of this approach argue that the one most commonly assumed in economic analysis and the one with the broadest applicability in terms of the long-run ambitions of most people, is the satisfaction of the felt wants


of the individual members of society. While the link between "output" and "satisfaction of wants" may be considered to be tenuous and uncertain,

...many practical and important purposes are served by regarding...the flows of satisfaction yielding commodities and services...[as]...the true objective counterparts of the subjective state described as welfare.¹⁸

For any nation, abstracting from questions relating to the distribution of income, per capita income is proposed as a usable index of changes in economic welfare. We can refer to this as the aggregate welfare concept of growth.¹⁹

While a majority might be said to favor such an approach to the definition of growth, important exceptions can


¹⁹This, of course, is not the only welfare approach to growth analysis. Note should be made of suggestions for emphasizing specialized (as opposed to comprehensive) welfare indicators, such as the "group I indicators" suggested by N. S. Buchanan and H. S. Ellis, Approaches to Economic Development (New York: The Twentieth Century Fund, 1955), p. 7. Similarly, note should be made of J. Viner's objection to definitions which abstract from the distribution of income, and his suggestion for consideration of the reduction of "crushing" mass poverty as a criterion. J. Viner, International Trade and Economic Development (Glencoe, Illinois: The Free Press, 1952), pp. 126-128.
be noted. There is some debate as to whether total output might not be a more satisfactory measure of growth.\footnote{Cf., Buchanan and Ellis, \textit{op. cit.}; S. Kuznets, "Problems in the Comparison of Economic Trends," \textit{Economic Growth: Brazil, India, Japan}, S. Kuznets, W. E. Moore, and J. J. Spengler, eds. (Durham, N.C.: Duke University Press, 1955), pp. 3-28.} Even accepting some welfare oriented measure, one can still ask which situation represents a greater level of welfare: one in which a given population receives a larger per capita income or one in which a larger population receives a constant per capita income (abstracting, of course, from matters of distribution)?\footnote{Buchanan and Ellis, \textit{op. cit.}, p. 22.} Perhaps in recognition of the dilemma thus posed, Kuznets, in one of his many discussions, has suggested a two-pronged criterion:

\begin{quote}
For purposes of measurement, economic growth of a nation may be defined as a sustained increase in its population and product capita.\footnote{S. Kuznets, "Toward a Theory of Economic Growth," p. 16 [Italics added].}
\end{quote}

This is not simply an alternative formulation of the criterion of an increase in total output, which might occur in the absence of any change in population. The rationale for the two-pronged criterion is not clear, although Kuznets does argue that "a definition of economic growth must reflect common experience" and common experience is that a sustained
increase in per capita product combined with secular stagnation or decline of population "rarely" occurs. While there can be no doubt that Kuznets interprets the increase in per capita product as an indicator of an increase in economic welfare, it is not clear that the same interpretation would be made of the increase in population.

Other arguments have been advanced which reject the welfare measure in favor of a "productivity" measure as the criterion of growth. For example, Colin Clark has suggested

23 Ibid., p. 99.
24 This definition stands in marked contrast to Kuznets' usual emphasis on a single per capita income indicator. For this reason it may not represent his basic position, although it is perhaps indicative of his reservations concerning the per capita income index. However, it is difficult to see how this two-pronged criterion involves an improvement on the per capita income criterion. Kuznets' argument relating to "common experience" is spurious. Theory should not only explain "common experience"; it should provide a basis for projecting possibilities. This requires a sharp separation of what are effectively different phenomena, along with the specification of possible relationships among them. It would seem that by including both population changes and per capita product changes in one indicator of growth he is compounding possible causes with possible effects. It is difficult to see how this facilitates the development of an explanatory theory. Furthermore, if measurement is a prime concern, as it seems to be to Kuznets, such a definition compounds the already complex problems. Unless it can be demonstrated that the two components bear a rigid relationship to each other, or unless a weighting system can be devised as a basis for combining the individual movements in each component series, divergent movements, or widely different rates of change, make specification of the "rate of growth" impossible.
that "the primary measure of economic growth must be real income obtained per hour worked."\textsuperscript{25} It can be argued—indeed many would argue—that a productivity definition in this sense is actually derived from a welfare definition in the above sense inasmuch as some notion of welfare or purpose is necessary to the definition of end product. It is clear from his later works that Clark does not intend to deny such a welfare connection.\textsuperscript{26} Others have virtually denied it, however.\textsuperscript{27}

Alternative formulations notwithstanding, the aggregate welfare concept of economic growth, employing per capita income as the measure of growth, is clearly dominant in contemporary growth economics. It is this concept which is singled out for criticism in the following section.


\textsuperscript{26} See the introduction to \textit{Conditions of Economic Progress} (2nd edition; London: Macmillan and Company, Ltd., 1951).

III. MEASUREMENT VS. APPRAISAL IN GROWTH ECONOMICS

In identifying economic growth as a subject suitable for scientific analysis, economists implicitly assume that growth is an empirically observable property of actual economic units. In further specifying that economic growth has primarily quantitative manifestations they assume that (in principle) it is a phenomenon which can be measured. In this sense growth is an "objective" process. However, it also has a subjective dimension. Inasmuch as growth implies change, it must have some impact on individuals in their capacities as consumers and as producers. And these impacts may be divergent. For this reason, any particular growth process (or its effects) will be a subject of affective evaluation: it will be judged as "good" or "bad," as "desirable" or "undesirable."

Such judgments will normally vary widely from person to person. Each interested individual can be expected to make judgments based on how he is directly affected, how cognizant he is of the broader ramifications of the process, how he interprets these broader ramifications, how he is influenced by the opinions of others, and the value system which he employs to evaluate the actual and expected consequences. In addition, essentially disinterested persons may offer evalu-
tions of the growth process based on various criteria which they assume to reflect desirable and undesirable situations, i.e., notions as to what is "good for" the economy or the people. There is no reason to expect that the judgments of the disinterested parties will be any more unanimous than those of the directly interested parties. They will reflect divergent concepts of what the objectives of economic activity ought to be. These may range from essentially spiritual notions such as the attainment of the "good life," to quasi-quantitative criteria such as the given distribution of national income.

Such judgments, whether made by interested or disinterested parties, involve a different order of analysis than the discovery, description, and measurement of growth. If economic growth is a real property of real economic units, there would seem to exist a "correct" or "objective" measurement of growth in any particular instance. The same cannot be said of the appraisal of the observed growth. It can be simultaneously characterized as "good" and "bad," depending on the evaluative criteria employed, and on the observer; and there is no a priori reason for preferring one judgment over the other. A uniquely objective value judgment is a contradiction in terms. For this reason we must consider observa-
tion and measurement as conceptually distinct from, and, if policy is to "rational," logically prior to appraisal.

To employ a welfare criterion as the basis for the definition of economic growth is to deny the significance of any such distinction. Welfare is an evaluative concept. It implies a judgment as to location along a better-worse continuum. It can be debated whether this continuum must be regarded as dependent on the observer and his values, and hence is relative to time and place, or whether there exists in some sense a universally applicable, timeless, i.e., "objective" scale. While contemporary, welfare theory would seem to suggest the former, the writings of the aggregate welfare school of growth analysis imply the latter. Indeed, inasmuch as the former approach denies the possibility of unambiguous inter-temporal and inter-spatial welfare comparisons, a contrary assumption is essential to the aggregate welfare approach.

A definition of economic growth in terms of changes in "aggregate economic welfare" is the logical by-product of the utilitarian tradition which has long dominated formal economic theory. In many ways economics as separate discipline must be considered the spoiled child of that tradition. Central to utilitarianism is the attribution of "absolute good" to the individual, his freedom of choice, and his wishes or
desires. This is the formula for classical political liberalism. In economic theory it has been formalized in the conceptualization of "utility" as the universal motive to individual action and as the appropriate norm for evaluating the results of activities. If utility can be conceptually identified, then presumably the maximization of utility can be prescribed as the ultimate goal of economic policy. The implication for economic analysis is that normative judgments are possible on the level of pure objectivity. Utility functions can serve to indicate the desirability if not the feasibility of various changes. This aspect of the utilitarian heritage in economic theory has been summarized very succinctly by Hicks in the context of a reconsideration of demand theory:

If the general aim of the economic system is the satisfaction of consumers' wants, and if the satisfaction of individual wants is to be conceived of as a maximizing of Utility, cannot the aim of the system be itself conceived of as a maximizing of Utility, Universal Utility as Edgeworth called it? If this could be done, and some measure of universal utility could be found, the economists' function could be widened out, from the understanding of cause and effect to the judgment of the effects—whether from the point of view of want satisfaction they are to be judged as successful or unsuccessful, good or bad.29

The measure of growth proposed by the aggregate welfare school derives directly from something approximating this concept of "universal utility." It has been argued at length that economic activities can only be identified with reference to "net product"; and "net product" can only be identified with reference to the goal or goals of economic activity.30 A wide variety of actual goals are admitted, but it is argued that the appropriate assumption for economists is that the single over-riding goal is the maximum satisfaction of the felt wants of the individual members of society, "present and future."31

Particular activities can then be appraised in light of their contribution to the maximization of satisfactions. If we postulate relative constancy in the pattern of wants over time, and essential identity of individuals in terms of their wants, then an aggregation of net product can serve as


an indicator of changes in aggregate welfare over time. Thus, aggregate welfare has quantitative manifestations; it is a phenomenon which "...can be brought under the category of greater or less." The quantity which changes in the process of growth is precisely the quantity of aggregate economic welfare.

The measurement of growth on this definition involves a measurement of aggregate net product. In practice this involves an attempt to quantify the neo-classical concept of real income—the flow of goods and services constituting the physical counterpart of the flow of physical want satisfactions, each item valued on the basis of its (marginal) relative contribution to total satisfaction. It is interesting that the major effective stimulus to national income accounting came from attempts to apply the Keynesian analysis of fluctuations in aggregate employment and unemployment. While the Keynesian analysis is also built around the concept of national income, in principle the appropriate concept of income is different from that implied in the aggregate welfare sense. The neo-classical analysis focuses on the net flow of consum-

able goods and services. The Keynesian analysis is concerned with the net flow of money payments in connection with the production and exchange of these goods and services. The significance of the income concept in the former context is normative: as an appraisal of the performance of the economy in terms of aggregate output produced. Its significance in the Keynesian analysis is behavioral: as an important variable, changes in which affect the stability of the system (in the short-run). The two concepts will coincide only in a completely specialized economy, i.e., one in which all product is produced in the "exchange economy," giving rise to reciprocal flows of money payments. Otherwise, the neoclassical concept will be broader by the amount of income derived from non-market sources: the direct consumption of farm products on the farm, the value of rentals on owner occupied homes, etc.\(^3^4\)

\(^3^4\)It is conceivable that non-market income affects behavior within the market economy and hence the stability of the system. In particular, changes in non-market income may induce the substitution of leisure for market-income, and vice versa. In highly specialized economies this may be of minor importance, but in less specialized economies it may be of greater importance. If so, Keynesian-type analysis cannot neglect non-market income. However, it should be included in theoretical models as a separate variable, not subsumed under the general income concept.
The computation of national income implied on the aggregate welfare definition presents many difficulties. Goods are assumed to have significance only insofar as they contribute to the flow of "want-satisfactions." Thus an assumption must be made concerning the relationship between the quantity of each good and the resulting flow of want-satisfactions, and, for purposes of aggregation, the goods must be assigned relative values on this basis. The theory of consumer demand suggests that when goods are actually purchased by consumers, and when these consumers, in full possession of relevant knowledge about all of the alternatives, have made a personally satisfying (or optimum) allocation of their available purchasing power, market prices of the various products serve to indicate their relative significance, at the margin, in terms of want-satisfactions. Market prices, then, are presumed to serve as a suitable basis for valuation and aggregation.

It can be forceably argued that in theory this suppo-

35 But, cognizance should be taken of A. C. Pigou's famous objection, that it may be improper to assume close correspondence between "utility" or "satisfaction" and effective "desires"; and hence between relative prices and relative marginal utilities. See A. C. Pigou, "Some Aspects of Welfare Economics," American Economic Review, Vol. XLI (June 1951), p. 288.
situation is weak. Prices presumably reflect marginal significance at a particular moment in time, whereas welfare (on the utilitarian definition) relates to the total flow of want-satisfaction. Thus an aggregation based on market prices should tend to underestimate the welfare significance of necessities for which the demand tends to be rather inelastic with respect to price and income (and hence whose prices should tend to fall relatively as consumption increases), and perhaps understate the welfare differences between "rich" and "poor" countries.

Further conceptual difficulties arise, of course, where various commodities are not effective alternatives to consumers. Where the prices are arrived at on different markets it is difficult to attribute the same significance to them. They have not resulted from the choices of the same group of consumers among available alternatives, and hence cannot on a priori grounds be taken to represent the real rates of substitution which would result could that choice be made. This

\[ \text{In terms of neo-classical demand theory, the difference is between the total area under the demand curve to the left of the quantity purchased, and the product of price and quantity.} \]

problem may have minor significance for the non-market ac-
tivities which surround a given market economy. Prices can
be imputed from analogous market activities on the assump-
tion that incomes from the market and non-market sources are
equivalent, i.e., that the consumer is indifferent as be-
tween a single unit of each.38 In international comparisons
another problem arises, however.39 Actual prices are deter-
mined in different and partially isolated markets: they do
not reflect the choices of a common body of consumers.

Similar questions arise when the income concept is in-
terpreted to include goods and services which, it is diffi-
cult to demonstrate, satisfy existing consumer wants (e.g.,
investment) and where the decisions to produce are not nec-
essarily responsive to consumer wants (e.g., goods produced

---

38This assumption may also be weak in that the source
of the income may be ascribed some positive satisfaction val-
ue. That is, the consumer may value the independence that
accompanies ownership (e.g., of a house) so that the "real"
marginal rate of substitution between the two diverges from
one. In this case, the equivalent market price of the non-
market income should exceed the existing market price of the
market derived income (for physically equivalent units). It
could be further argued that because of market imperfections,
the two sources of income may not be effective alternatives.
In this case the consumer may not be indifferent as between
the sources, but is prevented from substituting (e.g., by
restrictions on the hours he works), in which case the mar-
ket price may over or understate the marginal significance
of the non-market income.

39Cf., Kravis, op. cit.
in response to government and investment expenditures). With respect to government expenditures, it is perhaps conceivable to develop imputation procedures not unlike those applied to the valuation of non-market income where there is some direct consumer choice. However, again, we have no assurance that the judgment of the statistician accords with what would have been the results of consumer choice, had the consumers the possibility of choice.

The problem of accounting for private investment is somewhat the same as the problem of accounting for government expenditures.


41 In spite of Kuznets' objections, might it not be fruitful to think of this as a case of production with a different purpose than the satisfaction of consumer wants? The Department of Commerce notion of Government as a final consumer—the notion of "collective consumption" (cf. R. T. Bowman and R. Easterlin, *op. cit*)—has much merit. But if so, the unified purpose (the criterion of social welfare and of growth) is declared non-existent, and the meaning of the income statistics rendered ambiguous, especially where substantial shifts occur in the proportion of resources devoted to each sector.
purchases of goods and services. However, there is an additional complication in that not only do consumers not make the effective choices that establish market valuations, but also the goods are not destined for the immediate satisfaction of consumer wants. This, of course, was precisely the point being made by Irving Fisher in his discussion of the income concept. Fisher's solution was to limit the income concept (as a utilitarian welfare concept) to current consumption. Kuznets' solution is to treat as income present contributions to the satisfaction of consumer wants in the future. However, this also involves an assumption of doubtful validity: that the current market price (cost) of investment goods represents an accurate discounting of future consumer satisfactions. Alternatively, it might be assumed that there is some form of want-satisfaction derived now from investment, e.g., satisfaction concerning the provision of well-being for future generations (and perhaps ourselves in the future). However, the analysis still runs afoul of the


43 Another interpretation might be that the cost of present investment represents consumption production foregone. However, this introduces a new concept, viz., production potential, or welfare potential.
lack of effective consumer choice with respect to investments. Given effective choice, a different combination of outputs would probably result, indicating that the existing prices do not accurately reflect the underlying preference rates of substitution for the quantities and items produced.

Two interpretations of the relationship between "economic growth" and changes in "aggregate economic welfare" are possible within the scope of the aggregate welfare approach: (1) that economic growth and changes in aggregate economic welfare are conterminous and hence reducible to a single concept, or (2) that economic growth is but one among many possible contributors to changes in aggregate economic welfare. It is not apparent from the literature precisely which interpretation is to be considered appropriate. However, it will be argued that inasmuch as each involves doubtful assumptions, neither provides a basis for the definition of economic growth.

The first interpretation is open to certain obvious objections. Most social welfare functions include more than one variable. The list may be quite extensive, or quite limited. However, even in the simplest case, a distinction is usually made between the level of income (the production optimum) and the distribution of income (the distribution optimum) as
independent factors affecting the general social optimum. But it seems doubtful whether a favorable (by some yet unspecified criterion) change in the distribution of income would be included as economic growth by the welfare school. Emphasis would seem to be placed on changes in welfare resulting from sustained changes in per capita output only.

It could be argued, of course, that in growth economics we are concerned with sustained changes over relatively long periods of time. The possibilities for changes in welfare as a result of changes in income distribution (and, perhaps, most of the other variables in the more extensive social welfare functions) are definitely limited. The only way in which a sustained improvement could occur would be through an increase in per capita output. Hence, from a long-run point of view the most important mover of economic welfare is economic growth in this sense.

This interpretation implies that growth and changes in welfare are in principle distinct phenomena. It is presumably possible to specify the relationship between them. If growth and changes in welfare are to be considered as in practice synonymous, i.e., if the practical implications of the second interpretation are to be identical with those of the first, then it must be assumed that there is an invariant and
proportional relationship between growth and changes in welfare. This is what Hla Myint has called "welfare analysis at the physical level." 44

Presumably growth and welfare are both quantitative concepts. In principle the relationship between them can be

44 Hla Myint, Theories of Welfare Economics (Cambridge, Mass.: Harvard University Press, 1948). Myint develops this concept to help expose the nature of the welfare assumptions of the classical school and to help reveal the difference between this analysis and that of the neo-classical school (welfare analysis at the subjective level). With respect to the former, he notes:

"Our survey of the classical economists' general outlook towards the nature of the economic problem has brought out their deep-rooted belief that the economic welfare of society can be promoted in a more far-reaching manner by expanding the total volume of its economic activity than by accepting its available resources as given and by trying to allocate them more efficiently among different industries," (p. 70).

"...[This] implicitly assumes that quantities of satisfaction of given wants are roughly proportional to quantities of physical products..." (p. xii).

Of course, in the classical analysis the quantity of physical product was measured by the measuring rod of labor content. In modern analysis it is done by way of "the measuring rod of money"; estimates of national output valued in dollars of "constant purchasing power." In discussing the interpretation of changes in real national income Kuznets poses the main assumptions which Myint attributes to "welfare analysis on the physical level." Cf. "On the Valuation of Social Income—Reflections on Professor Hicks' Article." He explicitly assumes constancy of wants ("It is as realistic to assume constancy of individuals' wants as it is to assume constancy of human nature," p. 119) and technical progress ("change is the essence of conditions of production," p. 119). He implicitly but not explicitly assumes neither diminishing nor increasing "marginal welfare" from increases in total product, and explicitly assumes away significant changes in income distribution (p. 4).
subjected to an empirical test. If in practice this crucial test is not or cannot be completed, then many alternative assumptions concerning the relationship are admissible, e.g., that the relationship is not invariant but depends on the level of per capita output, or that under some circumstances the relationship is inverse.  

A basic issue can be raised, of course, concerning the very significance and meaning of the concept of aggregate economic welfare. Certainly if growth is to be identified with changes in aggregate economic welfare, and if growth is to be characterized as in some sense quantitative change, then aggregate economic welfare must be conceptualized as a quantity. Even if growth is considered but one among a number of possible contributors to changes in economic welfare, it is doubtful if other than a quantitative meaning can be assigned to the welfare concept. Certainly the postulate of an

45 An alternative assumption could be that with respect to all other determinants of aggregate economic welfare, especially the distribution of income, conditions exist such that there is an automatic adjustment to an optimum at every level of income. That is, it could be assumed that the relationship between growth and changes in aggregate welfare is invariant, not in principle but in fact, because of the optimal adjustment within the economy with respect to all other determinants of economic welfare. But there is no more a priori reason for this assumption than for any of the above.
invariant relationship between growth and changes in welfare implies the possibility (in principle) of quantifying welfare. Even if the relationship is not postulated as invariant, the very implication of a quantitative impact (presumably measurable but either positive, negative, or of variable direction) of growth on economic welfare implies a potential quantification of the latter.

This question of the quantifiability of economic welfare has provided material for innumerable methodological debates, and has provided the incentive for various ingenious attempts to devise methods for the measurement of psychic phenomena where a scale of measurement is not clearly evident. In general the debate can be regarded as closed, although periodic outbursts of direct and indirect pertinence suggest that there is still significant discontent with either the analytical or the operational conclusions, or the relationship between them. On the theoretical level, the upshot of the debate is a rejection of the principle of measurability. Of course, this conclusion is not universally accepted, but, in lieu of reviewing the entire issue, it is assumed here that the failure of the cardinal utility school to provide the crucial empirical experiment puts it on the
defensive. If utility is indeed a meaningful concept at all, it must be interpreted in a purely ordinal sense.

It can be further asserted that both interpersonal and intertemporal comparisons, whether the latter should involve the same person or different persons at different stages in time, are on principle impossible. Even following the strict logic of the utility approach, the relationship between a person and a "good" must be regarded as a highly personal relationship. It is affected by all of the phenomena known to psychology as affecting individuals' choices, attitudes, and actions. The wants of individuals reflect a complex of interacting factors, biological, cultural, social, and personal, and are in some sense relative to time and place. Any analysis which assumes away this relativeness is manifestly on shaky grounds. But this is precisely what is involved in the aggregate welfare approach. Growth presumes continuity of

46 Furthermore, there may not even be close correspondence between felt desires and satisfactions. Cf., A. C. Pigou, "Some Aspects of Welfare Economics."

47 Changes in the pattern of consumption are not, of course, denied. However, the pattern of consumption at any time is assumed to be determined by two factors: (1) technology controlling the range of items which can be produced, and (2) wants. A change in either will induce a change in the observed pattern of consumption. It is alleged that the major changes in consumption patterns derive from changes in technology; that human wants are "constant."
change. To achieve such continuity in this approach it is necessary to assume the existence of a universal, timeless economic welfare continuum, along which it is possible to locate different societies at different times. The remark has been attributed to one of the proponents of this approach that to read any purpose into economic activity other than the satisfaction of human wants is Fetishism. The present state of demand theory, and the analysis presented here, suggested that the same can be said of this approach on the sense that it involves an equally Fetishistic notion of economic welfare which really transcends concrete individuals and is irrelevant to time and space.

"By such constancy we mean that the wants of men are sufficiently identical over time and similar in space to assume that they all want food, shelter, clothing, transportation, amusement, intellectual fare and the like; that the specific forms which these wants take differ from time to time and place to place with the technology and complexity of production and social organization, but nevertheless there is essential parallelism residing in the identity of man as a member of the species Homo sapiens.

"This assumption is basic to any concept of economic welfare or progress, or for that matter of any welfare or progress. Unless we are willing to grant this essential identity of man, no comparisons are possible, no results that would relate to comparable identities."

IV. CONCLUSIONS

The conclusions derived from this analysis of the concept of economic growth can be briefly summarized. It was argued that the concept of growth is employed not to connote an organic-type process but rather to connote a distinctly economic process resulting in sustained increase in some economically relevant magnitude. This emphasis on quantitative change is basic. However, the magnitude which is significant in this context is a matter of some debate. By and large, an estimate of per capita output appears to be the most widely accepted criterion. The argument offered in support of this criterion is essentially a welfare argument: that changes in per capita income reflect a movement along a universal economic welfare function. We referred to this as the aggregate welfare concept of growth.

On principle, there would seem to be a difference between the measurement and the appraisal of economic growth. Inasmuch as welfare is an appraisal concept, the aggregate welfare approach serves to obscure (indeed to deny) this distinction. However, the foundations of the welfare approach are at best weak. The very notion of aggregate economic welfare as a quantitative phenomenon is open to serious objections.
Furthermore, if pressed far enough, the approach reveals a distinction between growth and changes in welfare, coupled with an assumption, not necessarily tenable, of an invariant relationship between them. A test of this hypothesis would require independent measure of both growth and aggregate economic welfare. But this implies separate measurement and appraisal of growth.

It has been suggested that measurement of aggregate economic welfare in the classical sense is in principle impossible. This, however, does not deny the existence of various quantitative as well as qualitative appraisal criteria. It remains to be seen in what sense growth can be considered a quantitative phenomenon; and to what extent measurement is feasible. The problem is to reconstruct the concept of economic growth without the use of the welfare concept.

Although it does deny the "objectivity" of such appraisals.
Chapter III

THE CONCEPT OF ECONOMIC GROWTH: A REFORMULATION

It was argued in Chapter II that the development of a systematic and empirically adequate theory of economic growth has been hampered by basic conceptual errors. In particular, the aggregate welfare approach to growth analysis was criticized and rejected. It will be argued in this chapter that an alternative formulation of the concept of economic growth which avoids most of the conceptual problems inherent in the aggregate welfare approach is feasible. While the possibility of identifying "purpose" on some level of generalization is not denied, it is argued that it is unnecessary to attribute a synthetically unified welfare purpose to economic activity based on essentially indefensible assumptions concerning relationships between product and purpose, and purpose and welfare. Because of this, the present formulation is more in accord with sociological theory1 than is the usual formulation. On the basis of these general considerations,

1At least it is in accord with that variant of sociological theory represented by the writings of Talcott Parsons.
the present approach is conceptually superior to the aggregate welfare approach. However, certain very basic problems of application are encountered. Inherent limitations on the type of data available may, in some instances, proscribe unambiguous statements concerning the existence, direction and magnitude of growth. However, it can be argued that such limitations are no more severe and probably less severe than those involved in the aggregate welfare approach. These problems of practical application are considered in the later sections of the chapter.

I. THE NATURE OF THE "ECONOMIC UNIT"

If we are going to define growth in such a way that its primary manifestations are quantitative, and yet if we are going to deny the possibility of constructing a single, unambiguous and universally applicable measure of the results of economic activity (in a welfare sense), then we must be able to identify some entity, an economy, which can be said to have an independent existence and measurable dimensions. Growth can then be defined in terms of a potentially measurable expansion in these "dimensions." In the literature of

Particular reference should be made to T. Parsons and N. J. Smelser, Economy and Society (Glencoe, Ill.: The Free Press, 1956), pp. 1-38.
economic growth little attention has been devoted to the nature of the economic unit. The only extended discussion of the issue is that of Simon Kuznets, and it is unsatisfactory in certain ways. Brief consideration of somewhat related problems is to be found in the continuing discussion of what, in the context of national income accounting, can be considered to constitute "economic activity."  

Kuznets suggests as a general guide to the formulation of the concept of an economic unit the first principle that "All [relevant] units are human aggregates...the social unit must be emphasized." His argument rests on the obvious limitations of the concrete individual qua individual as an object of observation when we are concerned with "persistent" or "sustained" trends over long time periods. For such purposes the limited life span of an individual seems to

2S. Kuznets, "Notes on the Quantitative Approach to Economic Growth" Problems in the Study of Economic Growth, pp. 117-135; and "Problems in Comparisons of Economic Trends." A similar analysis and point of view are to be found in R. A. Easterlin, op. cit.

eliminate him as a singularly meaningful unit. However, Kuznets' welfare approach involves the suggestion that on principle virtually any human aggregate can constitute a unit for growth analysis. Growth, in this sense, occurs completely independently of the unit itself. It is not the unit which is growing. The unit merely has significance as a convenient window through which to observe the forces and changes involved in the growth process; and the unit can be arbitrarily selected on the basis of efficiency for this purpose. Thus, while he lists "Families, firms, industries, cities, regions, nations, religious groups..." as units which could be conceivably used for this purpose, he concluded that from an observational point of view the sovereign


5On a theoretical level this argument is not totally conclusive. It involves the denial of "growth" in the extreme case of an isolated individual—the classical Robinson Crusoe—constituting what is effectively a self-contained economy. But even in this case can we not conceive of an expansion in productive capacities which would come under the general phenomenon of growth? Of course, this is a case which is devoid of practical interest. However, it does suggest
political state is the most efficient (or least inefficient) unit. It serves to focus attention on the forces at work most effectively because it comes closest to satisfying the three criteria for ready and unambiguous observation, viz., recognizability, independence, and irreducibility, and because a "crude theory of determinants of economic growth" suggests that the "concrete social unit," the state, has a direct influence on the growth process through the presumed "cardinal importance of a territorial base and of a state sovereignty...in determining the course of long-term economic development." 9

Kuznets' discussion obviously has great value for the light which it casts on the complex problems of applying statistical analysis to economic phenomena. However, if we interpret his analysis of the economic unit in light of his general approach to growth analysis, the theoretical implication that the really fundamental reason for rejecting the individual as a unit is not his short life span, but rather the fact that normally he does not effectively constitute a potential independent economy.

8Ibid.
tions cannot be accepted. Kuznets' axiom—that "All relevant units are human aggregates"—while acceptable as a starting point, is not limiting enough. An aggregate can be any arbitrary grouping of humans on the basis of any characteristics. If our sole concern is with changes in "aggregate economic welfare," then any aggregate of human beings, provided it can be empirically identified, is theoretically suitable for growth analysis.

This conclusion is not vitiated by Kuznets' emphasis on the casual significance of the nation state in the growth process. The various policy actions of the state which have growth significance can be grouped along with all of the other miscellaneous factors that affect the growth process regardless of the unit which we choose. However, Kuznets' emphasis on production does provide a necessary supplementary clue to the true nature of the unit. The pertinent concept is that of an integrated productive system. Thus, it is difficult to understand how a "religious group" can be a suitable unit for growth analysis, not because it is difficult to identify its boundaries or to obtain data on it, but because it is difficult to demonstrate that a religious group constitutes a potentially independent productive system. It is such a productive system—an economy in the ordinary inter-
pretation of that word—which must be presumed to grow. If growth is to be a meaningful concept in economic analysis, it must be possible to identify an economy as an entity which has an independent existence, measurable dimensions, a definable boundary, and which can be said to grow in the sense of experiencing an overall expansion in its dimensions.

The use of such a concept of the economy involves taking a definite position in an interminable methodological controversy relating to the very foundations of modern social science. The crucial issue in that controversy is whether it is legitimate to say that there "exist" social entities which, "...though they are always composed of individuals, are not, strictly speaking, reducible or dividable into individuals." It has been eloquently argued that while social wholes in the sense of "persistent structures of relationships" can be identified and studied, to attribute any independent existence to these is to accept certain dubious metaphysical assumptions and to commit the "fallacy of misplaced concreteness." In this view, the only "natural

unit" and hence the only unit admissible in scientific analysis is the concrete "natural" person. Social Science is properly only an attempt

...to grasp how the independent action of many men can produce coherent wholes, persistent structures of relationships which serve important human purposes without having been designed for that end.12

In this sense, there can be no independent "social whole"; there is only spontaneous organization. The appropriate characterization of the overall result would seem to be as an "ecologically interdependent aggregate"13 of otherwise independent individuals.

This view has much to commend it. Hayek's criticisms of what he calls "wholism" and "methodological collectivism," viewed in historical perspective, have much validity. Similar approaches have often involved a type of organicism, an evolutionary "moral imperative," and an anthropomorphic interpretation of society as a "superhuman" with a distinct


purpose and ethos. However, that such organicism is not necessary to the treatment of society as a distinct entity composed of functionally distinct component parts which are not "natural persons" is demonstrated by certain theoretical formulations in modern sociology. Indeed, one might say that to the extent that sociologists have been concerned with the development of a systematic general theory of social action, their problem has been to develop a theoretical framework which makes such an interpretation of society possible.

Such a framework must allow for the observable fact that while only individuals can choose and act, such choices and actions are normally constrained within a generally predictable pattern in any given social and cultural situation. And, while such behaviour patterns can change (at times very rapidly and dramatically), the very requirements of collective existence dictate that behavior cannot persistently be random in character. In any interaction situation, there has to be a basic consistency of behavior, involving to some minimum degree a reciprocity of actions, if order is to be preserved. Such patterns of behavior, once established, appear to have remarkable stability, often beyond the lifetime of any particular individual. It is as if an individual is introduced into a system of action, instructed and motivated to perform
certain roles, and then charged with carrying out the duties which are associated with those roles. As it were, there exists a social "mechanism," in the broadest sense of that word, for directing and guiding behavior. Parsons had referred to this analytical approach, which he pictures as emerging almost inevitably as social theorists of the past century have grappled with this most perplexing of methodological problems, as the "voluntaristic theory of action."15

Parsons has undertaken a meticulous systematic exposition of the logical implications of the "voluntaristic theory of action." His analysis is highly esoteric, and is couched in difficult (new) technical language. As a result it has provoked much controversy. Both the validity of the conclusions and the usefulness of the concepts have been questioned. No attempt is made here either to analyze or defend the model. Such a task is far beyond the competence of most economists. However, it is argued that certain of Parsons' formulations, particularly his analysis of the economy in relation to the

14"From a physical point of view, we understand by a 'mechanism' whatsoever checks or controls, and guides into determinate paths, the workings of energy...." D'Arcy Thompson, op. cit., p. 291.

society, are highly suggestive for the analysis of economic growth.

The basic concept is that of the "system." This concept has had widespread use in economic theory. Indeed, except in the simplest of "partial" analyses, it underlies all economic theory. The crucial characteristic of a system is the existence of patterns of interdependence among certain elements or variables. Thus, a system implies a situation in which "... all elements are determined by some at least of the other elements...," so that any variation in one of the elements must result in predictable variations in some or all of the others. But the concept of system implies also a concept of structure. In economic analysis, while structural phenomena are emphasized in certain contexts, by and large the significance of structure has tended to be minimized.

---

16 T. Parsons and N. Smelser, *Economy and Society.*
18 This is a generalization which it is not easy to defend. Fortunately, it is not crucial to the following analysis. Clearly many economists have addressed themselves to questions of structure and structural changes, often in connection with growth analysis. Many of the parameters of economic theory, including technical coefficients and elasticities of demand, are actually abstract specifications of structures. Yet, certainly in the long-run analysis of the neo-classical type and in the short-run macrostatics and macro-dynamics of the Keynesian variety, structural phenomena are minimized. The goals of activity are assumed to be arbitrary
In applying the concept of a system to the analysis of society, Parsons seems to place major emphasis on the phenomenon of structure. Thus, it is assumed that as an integral part of the complex "action system" that is society there must exist certain mechanisms which serve to maintain the existing structure of relationships, in spite of the continuous replacement of older members by new and younger members. Such mechanisms have the essential characteristics of "servomechanisms," tending to correct any tendencies to deviant behavior, and hence to purge disorderly elements. This type of mechanism gives to society the essential character of independence; an existence which is independent of the members of the society, and which usually transcends the life span of any normal individual member.

and random and the pattern of activity freely adjustable to changes in these goals. This is the essence of the distinction between endogeneous and exogeneous variables. Consider, for example, Carl Christ's observations with respect to input-output analysis in which structural phenomena are given utmost importance: that for this very reason, "...input-output analysis must stand condemned from the point of view of accepted economic theory." C. F. Christ, "A Review of Input-Output Analysis," Input-Output Analysis: An Appraisal, Conference on Research in Income and Wealth, Studies in Income and Wealth, Vol. XVIII (New York: The National Bureau of Economic Research, 1955).

19Nadel, op. cit., pp. 50-57.

20The nature of the equilibrating mechanism is not cogent to our analysis. Certain aspects of it deserve brief
In his analysis of society Parsons enumerates a series of "functional prerequisites"; functions which must be performed and performed adequately if the society is to persist as an orderly system. He suggests that we can conceptualize these as being performed as a result of a series of actions organized into distinct "subsystems" of the broader social system. These subsystems are defined in terms of the functional unity of the component activities. That is, on a comment, however. Parsons does not want to imply the necessity of a complete absence of structural change, or that structural change is inconsistent with the maintenance of social order. He relates the concept to "dynamic equilibrium" rather than "static equilibrium" as these concepts are used in economics.

At the same time he does not want to imply that a society must be in any sense isolated.

"It is not essential to the concept of society that it should not be in any way empirically interdependent with other societies, but only that it should contain all the structural and functional fundamentals of an independently subsisting system." The Social System, p. 19.

The list of "functional prerequisites" is also not directly cogent to our argument and hence it is not considered here. For a brief resume, see Economy and Society, pp. 13-38. It is apparent from that discussion that these functional prerequisites involve essentially the development of appropriate motivations and the prevention of major deviant motivations, as well as the provision of all the material and organizational requisites for the attainment of individual and social goals. It is also interesting that this list overlaps Kuznets' list of basic human "wants." Cf. S. Kuznets, "National Income and Economic Welfare," p. 204. The interpretation of significance in each case is widely different, of course. Kuznets provides a normative interpretation, Parsons a behavioral interpretation.
very high level of abstraction, all of the activities which
constitute a given subsystem are directed toward the fulfill-
ment of some basic functional prerequisite for the mainten-
ance of society. Inasmuch as particular persons and particu-
lar institutions may be multifunctional, the various subsys-
tems will probably not be empirically fully differentiated
within any given society.\textsuperscript{22}

Parsons identifies the economy as such a subsystem. It
is a system in the sense of interdependence of parts or vari-
able, but, unlike "society," it is not a potentially self-
subsisting system. The activities that constitute the eco-
nomic system do not potentially exhaust the activities of the
participants. While individuals are "actors" in the economic
system, they cannot be considered as "members" of the system
in the same sense that they are "members" of a society. For
this reason, the economic system must be closely articulated

\textsuperscript{22}This allows for Hagen's observation that "human ac-
tivity is not divided into two such classes [as economic and
non-economic]..., the two classes are not mutually exclusive." E. V. Hagen, "Comment," Problems in the International Compara-
tion of Economic Accounts, pp. 387-388. Compare this with
Prest and Stewart's observation that while "...the distinc-
tion between production and living, the distinction between
working and not working, is something reasonably tangible in
the 'West', it is often nebulous in Nigeria." A. R. Prest
and I. G. Stewart, The National Income of Nigeria, Colonial
Research Studies No. 1 (London: Her Majesty's Stationary Of-

with other functionally distinct subsystems of society. The specific goals, the integration, and the motivation patterns underlying economic activity are derived from these other subsystems.

The function of the economy, in Parsons' framework, is "adaptive": the provision of the "material facilities" or "goods and services" necessary to the achievement of the socially structured goals of behavior. Thus, Parsons admits of purposeful activity, but denies any narrow utilitarian interpretation of purpose. He suggests that we can characterize the "goal" in terms of utility, but to do so we must change this concept substantially:

...utility or the satisfaction of wants should not be defined in relation to the individual but in relation to the society.

...the goal of the economy is not simply the production of income for the utility of an aggregate of individuals. It is the maximization of production relative to the whole complex of institutionalized value-systems and functions of the society and its subsystems. 23

It is this view of the economy which we want to abstract from Parsons' analysis. The economy is conceptualized as a (more or less) complex system of productive activities. It is an "open" or "dependent" system, functionally integrated

23Economy and Society, pp. 21-22.
with the rest of the broader social system. The fact of functional interdependence means that economic activity has a "purpose," and clearly the performance of the economy can be appraised in terms of the adaptability of the resulting production to the specific goals (if these can be specified). However, contrary to usual usage, we must make a sharp distinction between the production of goods (and services) and the uses thereof. We must define the concept of production in a strictly technical sense; that is, as a physical transformation of resources from raw form into finished form regardless of their usefulness. The question of the adaptability of product to an imputed purpose, which often forms the crux of definitions of production, is a question of the appraisal of production not of the existence of production.

---

24 This statement is misleading. There is no intention of denying that the performance of services is a form of productive activity. The point is that production is not defined as the creation of value, but rather the creation of goods or services. Thus it is the performance of services itself which is to be interpreted as productive activity.

There is nothing new in this approach, nor is it inconsistent with the usual view of the economy. What is suggested is a change in emphasis, from the evaluation of results of economic activity to the concrete manifestations of that activity.

II. THE CONCEPT OF ECONOMIC GROWTH

If we view the economy in this way, and define production in a purely physical sense, then we can associate with any economy at any time a definite "production frontier." This Hicks has defined as "...the hypersurface which corresponds, in n dimensions, to the substitution curve between the two commodities in the two commodity world." The production frontier defines the physical production alternatives (in terms of alternative combinations of quantities of goods and services) open to a society at any given time. It would be described by an implicit equation of the general order:

\[ F (x_1, x_2, x_3 \ldots x_n) = 0 \]

from which could be derived n transformation functions, expressing the output of each product in terms of the possible alternatives.

---

26 J. R. Hicks "On The Valuation of Social Income—A Comment on Professor Kuznets' Reflections," p. 166.
alternative combinations of output of all other products, of the order:

\[ x_1 = x_1 (x_2, x_3, x_4 \ldots x_n) \]
\[ x_2 = x_2 (x_1, x_3, x_4 \ldots x_n) \]
\[ \ldots \ldots \ldots \ldots \ldots \]
\[ x_n = x_n (x_1, x_2, x_3 \ldots x_{n-1}) \]

The concept of a "frontier" derives from the presumption that the production function for each product contains some input which is also present in the production function of some other product, and that these inputs are limited in supply. Economic growth can be defined as an outward movement in the production frontier, such that it is possible to produce more of some items without reducing the output of others, or more of all items simultaneously.

III. CONCEPTUAL PROBLEMS IN THE APPLICATION OF THE CONCEPT

This approach provides us with definitions of economic growth which is not dependent on equivocal assumptions concerning the nature of economic welfare and the relationship

---

27 The second condition is not sufficient to establish the existence of a frontier, but alone establishes only a single valued production potential. The first is necessary so that the marginal rates of transformation differ from zero.
between production and welfare. By basing the concept of growth on the concept of a technical production frontier, it is possible to avoid value judgments concerning the normative significance of what is produced while preserving the connotation of quantitative change. However, this concept of growth also poses formidable conceptual and empirical problems which it would be unwise to minimize. They derive mainly from the fact that the concept of a production frontier has explicit reference to a series of alternative production potentials. At any time all points on the frontier except one, the existing combination of outputs, will be hypothetical in the sense that while ceterus paribus each is a possible combination of outputs, only the existing combination of outputs can by definition have become an actuality at any one time. Under certain circumstances, the case of general underemployment of resources, all points on the frontier will be hypothetical. If the existing combination of outputs can be located within the frontier the output of many commodities could be expanded simultaneously without growth in the present sense occurring.

This raises a question of how in fact the frontier can be determined and measured. While the frontier relates to engineering possibilities the available data usually relates
to actual production. It is conceivable that appropriate engineering data could be obtained to establish production functions for certain individual firms, but to collect and process such data for the economy as a whole, taking into account the complex interconnections between firms and the necessity of estimating the basic stocks of resources, seems almost inconceivable. Nevertheless, it may be possible to project data relating to actual output in order to discover changes in the frontier. Such analysis must necessarily be crude, however, because of the ever present possibility that changes in production represent movements along the frontier rather than movements of the frontier.

In addition to the problems involved in the application of the present concept of economic growth in empirical analysis certain more basic conceptual problems arise in connection with the definition of the production frontier. While the general postulates of a limited aggregate supply of usable resources and of the existence of alternative possible uses for these resources give the concept a clear intuitive meaning, careful analysis bares important conceptual ambiguities.

---

Since clarity on the conceptual level is logically prior to empirical application, the conceptual problems are considered first.

**The Frontier in the Short-run and the Long-run**

The shape of the production frontier need not detain us. It is a matter of no consequence in the present context whether the marginal rates of transformation among the various possible products are smaller or greater than one or approximate zero. These pose peculiar problems when we try to analyze the manner in which a competitive market mechanism serves to bring about movements from one point on the frontier to another. However, when we are only concerned with the existence and movements of the frontier, it makes no difference how shifts along a given frontier are induced: whether or not a solution can be yielded by the competitive market.

---

However, a related question is of major importance. Haberler has argued that in the two-commodity case:

The shape of the substitution-curve will vary according to the length of time which is supposed to elapse between the old situation, represented by one point on the curve, and the new situation, represented by another. The longer the time allowed for production to adapt itself, the flatter will be the curve.30

His argument is that in the Marshallian short-run the shape of the substitution function reflects the immobility of factors of production. Resources appear to be specific to the production of one commodity. Given time for readjustment, however, the possibilities for adapting them to the production of other commodities are substantial. Thus, in the Marshallian long-run the substitution curve must appear to be more elastic. The nature of the problem is brought out in Figure 1.

This diagram is drawn on the common assumption of only two products, the production of which requires in part the same resources. The curve $S_1$ represents the short-run production potentials. That is, every point on this curve represents a maximum output of $Y$ consistent with any given output of $X$, and vice versa. At point R (output $oa$ of $X$ and om

---

30Haberler, op. cit., p. 179.
of Y) the curve has a bulge. This represents the current level of output. An expansion in output of either product is made difficult because of the "specificity" of the resources. Thus a reduction in the output of X from oa to ob permits a limited expansion of the output of Y from om to on. However, once output is established at point T (ob of X and on of Y) and considerable time has passed during which factors of production formerly specific to the production of X are adapted to the production of Y, the substitution curve will shift out to the position indicated by $S_2$. In this situation, given an output ob of X, the potential output of Y is now op. In terms of the Marshallian long-run, then, the envelope curve $\xi_1$, would seem to describe the production frontier.

In this case if $\xi_1$ is considered to represent the appropriate concept of the production frontier, a shift outward of $\xi_1$ would represent economic growth. Inasmuch as $S_1$ and $S_2$ intersect a definition of growth based on either of these short-run frontiers will yield ambiguous results. Thus, if we start at R the long-run adjustment to point V would appear as growth inasmuch as V represents a combination of outputs not attainable according to the short-run production frontier, $S_1$. But likewise, moving from V back to R
FIGURE 1

TWO COMMODITY PRODUCTION FRONTIER:
SHORT-RUN AND LONG-RUN
would appear as growth, inasmuch as R represents a combination of outputs not attainable according to the short-run production frontier, $S_1$, on which V occurs. Thus, in both movements, from R to V and from V to R, growth is indicated, and yet, in the end, the physical output potential of the economy is unchanged!

The curve $\mathcal{E}$ embodies a postulate of reversibility. Each point on it represents a possible alternative, under the given circumstances. These circumstances are commonly summarized in two assumptions; that there exists a given "state of knowledge" and a given "stock of resources." Acceptance of $\mathcal{E}$, as descriptive of the "true" production frontier in a two commodity world requires acceptance of both assumptions. It is necessary to consider each of them to discover their implications and their operational significance.

The "State of Knowledge" and the "Robinson-effect"

The assumption of a "given state of knowledge" is implicit in most static market theory where the problem is to determine the factor and product prices which would result from a rational choice among alternatives in a general regime of competition (commonly on the assumption of "perfect knowledge").
...we do not assume in static theory that the technical methods employed remain constant but only that technical knowledge and technical ability remain constant. A distinction must be drawn between a change in the technique employed which is due to an increase in demand... [or a change in product or factor prices]... and one due to an enlargement of our technical knowledge.\textsuperscript{31}

Thus, a distinction is made between the adoption of technical methods which are already known (and tested) but which have not been used because prices of factors were not appropriate or the volume of output was not adequate (in case of economies of scale), and the adoption of methods which "...represent a real increase in knowledge."

This distinction has been much criticized. Thus Joan Robinson has concluded: "A 'change in methods of production in a given state of knowledge' is, strictly speaking, a contradiction in terms."\textsuperscript{32} She notes that essential to the traditional approach is a continuous series of possible alternative combinations of factors of production (alternative "techniques") among which choice is possible—the usual iso-product curve. However, "...there are likely to be many gaps


and twists in any series of known techniques."\(^{33}\) A smooth curve of alternatives is largely a fiction. But even more fundamentally she suggests that the "state of knowledge" cannot be separated from the process of application thereof. In this she agrees with Schumpeter that there is a marked difference between technical knowledge "in the laboratory" and technical knowledge "in the factory." This has two implications:

...technical knowledge has meaning only when it is actually applied, and applications involve learning the 'know how' of using it, and

...the acquisition of technical knowledge is a one-way process.\(^{34}\)

Viewed against the background of attempts to implement technical change in "underdeveloped areas," this argument appears very persuasive. It leads to a rejection of the postulate of reversibility, at least for reorganizations of production that differ significantly from the existing organization. Without the essential characteristic of reversibility the frontier concept is stripped of much of its theoretical significance. However, this argument represents an extreme

\(^{33}\text{Ibid.}, p. 53.\)
\(^{34}\text{Ibid.}, p. 53.\)
position. It seems futile to deny that at any given time there is a range of alternative methods of production, fully understood, but not currently implemented for some reason. This would seem particularly true whenever a recent change has occurred in methods of production. The old methods, at a minimum, are known, in practical detail. They constitute, as it were, the "given state of knowledge." In any case, it is not necessary to reject the concept (vague as it is) of the "state of knowledge" to accept Joan Robinson's proposition that a change in methods of production in itself expands the "state of knowledge." These are not mutually exclusive concepts.

Figure 2 offers an interpretation of Joan Robinson's assumption within the framework of the classical analysis, for the case of a two-commodity world. The basic diagram is similar to Figure 1. Thus, in this diagram $S_1$ and $S_2$ have the same meaning as in Figure 1; viz., short-run frontiers drawn on the assumption of actual production of $oa$ of $X$ with $om$ of $Y$, and $ob$ of $X$ with $op_2$ of $Y$, respectively, with corresponding short-run specificity of inputs. The curve $\xi_1$ however, now represents the long-run frontier drawn on classical assumptions. If we accept Joan Robinson's assumptions, it is completely hypothetical. It cannot be empirically deter-
mined. The point V' represents the output (op₁) of Y which would correspond to the output ob of X if the classical assumptions were valid. In fact, output op₂ of Y can be attained because of the technical knowledge (in the classical sense) acquired in the very process of reorganizing production. Inasmuch as V' is purely hypothetical it cannot be located, except that necessarily op₂ > op₁ > on.

The curve $\mathcal{L}_2'$ likewise represents a production frontier, assuming that the technical changes involved in the reorganization of production to achieve the point V have been implemented and assuming that the classical concept of a "given state of knowledge" is admissible. The curve $\mathcal{L}_2'$ lies everywhere outside the curve $\mathcal{L}_3'$. Again, a reorganization of production back to the production of ob of X will result in further introduction of technical change. Point R₃ will not lie on the frontier $\mathcal{L}_2'$, but outside it. Another frontier ($\mathcal{L}_3'$) can then be drawn on classical assumptions through R₃ so that om₃ > om₂ > om₁: where om₃ represents the maximum output of Y consistent with the output ob of X after both reorganizations of production have occurred; om₂ represents a purely hypothetical maximum output of Y consistent with the output ob of X, on classical assumptions, given only the first actual reorganization of production; and om₁ represents the
FIGURE 2

TWO COMMODITY PRODUCTION FRONTIER:
THE "ROBINSON EFFECT"
maximum output of Y consistent with an output oA of X before any reorganization occurred.

It seems consistent with our general theoretical framework to say that economic growth has occurred during both reorganizations of production, i.e., that as a result of the process of reorganization, the classical production frontier has been shifted outward twice. A return to the production of oA of X results in a maximum output of Y (om\(_3\)) in excess of the maximum (om\(_1\)) prior to the reorganizations. Unlike the case noted above,\(^ {35} \) this result is not paradoxical. The assumptions underlying this analysis can be reiterated:

(1) that the "stock of resources" is unchanged and (2) that changes in the "state of knowledge" (in the classical sense) are a result of any reorganization of production. The nature of the reorganization does not matter insofar as "...the acquisition of knowledge is a one-way process." This is an empirical generalization, which, if valid, has major significance. We can call it the "Robinson effect."\(^ {36} \)

\(^{35}\)See above, pp. 71-72.

\(^{36}\)The usual characterization of economic growth as a "cumulative" or "self-sustaining" process argues for such an effect.
The "Stock of Resources"

While the concept of a given "state of knowledge" poses certain problems of interpretation, it seems to be a useful concept in growth analysis. It is necessary to the concept of a production frontier, and hence to the physical concept of economic growth. The condition of a constant state of knowledge could only be identified if reversibility actually existed, i.e., if after both reorganizations, \( R_3 = R_1 \), assuming a constant stock of resources. The second assumption underlying the production frontier, constancy of the stock of resources, also presents conceptual problems. It must also be analysed to establish an operational meaning.

The problem is that of defining the nature of the inputs—the factors of production conceptualized in purely quantitative terms—in the classical production function. Implicit in the traditional analysis of production is the supposition that the quantity of a factor and its productivity are analytically distinct. Both are involved in the determination of productive capacity, but both are subject to independent variation. A relationship is commonly postulated between quantity and productivity in this context, with respect to variations in both the relative and the absolute quantities of factors. However, it is also postulated that produc-
tivity can vary independently of such quantitative changes, reflecting mainly changes in the "state of knowledge." A change in productive capacity, then, can be the result of either a change in quantities of factors, or in the "state of knowledge," or some combination of both. Constancy in the production frontier must imply constancy in both of these fundamental variables.

It is commonplace that in a physical sense the classical factors of production, land, labor, and capital, are not internally homogeneous. Numerous subfactors can be identified, differing in essential characteristics so that they are not perfectly substitutable in any given production process. Unless it can be argued (as seems implicit in much economic theory) that there exist, in a measurable sense, "ultimate factors" which are internally homogeneous even though their concrete manifestations are not, the statement that the stock of resources is constant contains a substantial element of ambiguity. This is particularly true when production is being reorganized. Only in two cases can obvious and unambiguous judgments be made: (1) where the distinct subfactors are stable in terms of their physical characteristics so that a reorganization of production need have no affect on the inventory of such factors available or
(2) where the distinguishing characteristics of the sub-factors are superficial so that it is possible to eliminate them, revealing an aggregate of essentially identical physical units. In the former case, constancy can be interpreted as constancy of the supply of each of the specific factors. In the latter case we have a classical homogeneous factor, the quantity of which can be directly measured. It will be argued that the first case is applicable to land or natural resources, and, with minor additional assumptions, the second can be made applicable to labor resources. The concept of constancy in the supply of capital, however, is not so readily rationalized. Problems arise because of obscurity and ambiguity in the concept of capital as economists use it, reflected in varying interpretations of the conditions of constancy in the capital supply.

Land. In the case of land or natural resources it is possible to identify a large number of technically distinct types. Each type has a very specific functional significance from the point of view of production. Within any given type of land resource there may be variations in quality. Such variations, however, pose no significant analytical or
computational problems insofar as it is possible to convert quantities of resources of varying qualities into equivalent standard units. Thus, an acre of land of inferior quality can be registered as a fraction of an acre of land of standard fertility.\textsuperscript{37} The various types of resources are given in physically limited quantities as the natural endowment of the society and the economy. Their characteristics derive, so to speak, from nature.

Of course, as production occurs, and as technical knowledge advances, the range of useful resources and the range of available resources (whether presently useful or not) will change, as new uses are found for existing resources, as new resources are discovered, or as resources are depleted. But these events do no violence to the concept of a given (known) stock at any time. Likewise, the technical characteristics of given resources can be consciously altered in various ways. However, such changes (as in the case of land irrigation or

\textsuperscript{37}This statement must be qualified. The quality of resources may be significant in that inferior resources of a given type may require different labor-land ratios, or different complexes of capital equipment for their exploitation. Thus, transition to such resources may significantly alter the production frontier. They might therefore be included as different resources, resulting in a classification of resources for purposes of inventory on the basis of a two-fold criteria of type and quality.
fertilization) can be subsumed under the general category of capital formation—as can be expenses occurred in the discovery of new resources.

The important point is that when the economic significance of a given resource changes, there is no necessary change in its physical characteristics. Thus, a particular resource could lose all economic value when a reorganization of production rendered it redundant, while in terms of its physical characteristics it remained intact, available for future use. Obviously, when the economic value of a resource declines, a temptation may arise to destroy it physically. Thus, many resources have been decimated as a by-product of the process of growth, as a result of exhaustive exploitation, or to clear the way for other developments. However, this fact is essentially irrelevant insofar as there is no necessary connection. While the resource may be destroyed, it may be equally preserved. In a sense, it may retire out of the economic system, but its existence would still be a determinant of production potentials. The notion of an inventory of such resources, whether in current use or not, has obvious commonsense meaning and many applications. Indeed, numerous attempts to make such inventories have established a clear precedent for this interpretation. Few conceptual problems
would seem to arise, then, in applying the constancy assumption in this case.\textsuperscript{38}

\textbf{Labor.} With respect to labor resources, this analysis cannot apply. Again, "subfactors" can be identified, and at any time it should be possible to draw up an inventory of these. However, while in the case of natural resources, the "subfactors" have stability independent of stability in the composition of output and techniques of production, this is not so in the case of labor. When either the composition of output or technology changes, types of labor rendered redundant tend to disappear automatically, and new types tend to come into existence. In what sense, then, can we say that the stock of labor is constant?

\textsuperscript{38}Recognizing that certain of these resources are of an exhaustable type, there may be an element of internal contradiction in the constancy assumption, however. These resources may gradually be depleted by the very process of production. For such resources, constancy cannot be literally interpreted as applying to the basic stock, except insofar as the stock is very large relative to the annual demands on it. Assuming this, the annual changes in the stock are of minor significance, so that for all practical purposes the stock can be assumed to be constant. Otherwise, the assumption must be of a constant (maximum) rate of flow of such resources into productive uses. Clearly, the exhaustion of critical resources may have independent significance for growth. Unless offset by appropriate changes in technology, they may serve to retard
In this case the second alternative is applicable. While we do not have an inventory of independently stable subfactors, we can impute homogeneity to the factor if we analytically distinguish between the labor-force and its skills. The labor force, considered as a pure population, constitutes the quantity of labor. This implies that in some sense all laborers are identical and intersubstitutable in production. To the extent that all of the significant differences between "types" of labor are due to acquired skills, this assumption poses no conceptual problem. The skills can be subsumed under the general category of technology. Indeed, aside from the technical knowledge embodied in capital equipment no other meaning can be attributed to technology. The analysis applied above to the general case of technical change can then be applied to the changing structure of labor subfactors.

39 Differences in acquired skills may not be the only basis for differences in types of labor. Some persons would refer to differences in "native ability" as distinguishing types of labor. This is another of those concepts which are difficult to handle, conceptually and empirically. However, in order to eliminate this as a factor to be considered we

expansion, or force contraction. Cf., J. J. Spengler, "Theories of Socio-Economic Growth," pp. 63-67. It is also conceivable, however, that threat of such resource exhaustion could be growth stimulating, by "forcing" the discovery of new methods of production.
Capital. It is when we attempt to specify the meaning of the assumption of a constant stock of capital that the truly perplexing conceptual problems arise. Traditional theories of economic growth have largely focused on "net capital formation" as the prime mover. Clearly the concept of net capital formation implies the possibility of defining a condition of constancy in the capital stock. Measurement of the former must begin with measurement of the latter. For this reason it is not surprising that a large body of literature, can assume that within any given population "native ability" is normally distributed, and as between populations the mean "native ability" is approximately the same. Then, significant differences in skill among populations are assumed to be acquired differences, viz., differences in technology.

More difficult to assume away are differences in energy output per worker resulting from climatic or nutritional differences. Cultural differences in motivation to work can again be subsumed under differences in technology. However, it may be necessary to distinguish between types of labor, or grades of labor, on the basis of potential energy output per time-unit. Such differences may be significant as between areas of the world, suggesting that even allowing for differences in skill and motivation a given "quality" of labor in the above sense does not represent equal production potentials under all circumstances. However, it may be possible to establish labor-output equivalents, so to speak, homogenizing the labor force by multiplying existing quantities of labor by appropriate energy-output-potential ratios. With respect to the effects of nutrition levels on work potentials, see Harvey Leibenstein, Economic Backwardness and Economic Growth (New York: John Wiley and Sons, Ltd., 1957), pp. 62-76.
both theoretical and empirical, has developed relating to the concept of constancy in the capital stock.\(^0\)

The most striking feature of this literature, aside from, but perhaps explaining, its volume, is its inconclusiveness. Controversy still exists over what is to be included in the concept of capital, as well as over what criteria can be used to define a condition of zero net capital formation. Indeed, Kuznets has concluded that "No standard definition of capital formation exists at present."\(^1\) This is symptomatic of a


\(^1\) S. Kuznets, "International Differences in Capital Formation," p. 20. L. M. Lachmann goes so far as to suggest that a meaningful theory of capital cannot be said to exist. L. M. Lachmann, *Capital and Its Structure* (London: G. Bell and Sons, 1956).
basic malaise, bordering on schizophrenia, evident in economists' attitudes toward the concept of capital. They seem reluctant to specify whether the factor of production is in reality a heterogeneous collection of concrete capital goods, or whether it is actually something else, something more "ultimate," which finds only temporary embodiment and productive expression in the form of these concrete goods.

Clearly, if the latter is accepted as the correct interpretation, homogeneity may be postulated. However, how is one to identify and measure the basic "unit of capital"?

The solution has typically been sought in the concept of value. Thus, just as units of value have been considered as providing a basis for the homogenization and measurement of income, so they have been regarded as providing a basis for the homogenization and measurement of capital. This applies whether the view of capital is of the first type emphasizing physical characteristics or of the second type emphasizing a transcendental phenomenon. However, the literature of capital theory and measurement amply illustrates that even acceptance of the principle of a value measurement does not resolve the conceptual problem. There still exists the question of what measures the value of capital in this context. For example, should we be concerned with the cost of
producing a given capital good or should we be concerned with its exchange value? The latter presumably represents the current value of its future earnings discounted at some appropriate rate of interest and is what is implied in the expression "capital value." In equilibrium these measures should be equal; the stock of capital expanding under generalized conditions of diminishing returns and perfect competition (and foresight?) until the current value of the future earnings discounted at the pure time preference rate of interest (adjusted for risk) equals the costs of production. However, under conditions of disequilibrium or of less than perfect competition these measures can diverge significantly. A choice must be made between them. Commonly, where the object is to separate the quantity of capital from its productivity, the cost measure has been employed. This is done on the presumption that capital value is a product of both the quantity of capital and its productivity. However, even within the scope of this approach, the cost measure is not without serious limitations in terms of providing a distinction between quantity and its productivity, particularly in periods of inflation or when quality changes are significant. 42

42Cf., Denison, op. cit., and Ruggles, op. cit.
As in the case of the measurement of income, the use of value as a measurement of the quantity of capital makes sense only when value is interpreted in an absolute rather than a relative sense. This is true even when costs are used as the measure. The cost represents, in this sense, a measure of either negative value embodied ("real costs" in the form of either disutility plus abstinence or of "standard labor units") or positive value foregone ("opportunity costs"). When such an absolute concept of value is denied, and the process of valuation is regarded solely as an aspect of the mechanism of reorganization of production in a market controlled economy, then this measure of quantity loses its meaning. The only feasible meaning to be accorded the assumption of constancy of the stock of capital would appear to be fixity in a given inventory of physical capital goods.

However, even such a concept, operational as it may be, presents certain difficulties. We have interpreted the production frontier as a series of alternative organizations of production which indicate the present potentials of the economy to produce goods in various combinations. However, as

43 J. Robinson, *op. cit.*
in the case of labor, the specific types of capital are intimately related to the organization of production at any given time. A change in the organization of production would almost automatically involve the disappearance of certain types of capital goods and the emergence of certain new types of capital goods. The inventory of capital goods does not have the strict independence of the production process that can be postulated in the case of land resources. Indeed, given the state of knowledge, we would have to consider the inventory of capital goods to be a function of the existing organization of production.

This poses a dilemma. There does not exist in a physical sense a "raw" unit of capital. Such an approach to measurement, then, is not open to us. Similarly, inasmuch as the concept of a production frontier implies the possibility of effecting various alternative organizations of production, a definition of constancy in the capital stock based on constancy in the inventory of capital goods is not possible. This would seem to virtually deny any physical meaning to the concept of a constant stock of capital, except in the limiting case in which the organization of production and, hence, the inventory of capital goods is unchanged.
There are, however, further complications which serve to question this conclusion. Neglecting the Robinson effect, it would seem theoretically possible, ceterus paribus, for production to be reorganized a number of times, eventually returning to the original combinations and quantities of outputs. Each reorganization would presumably involve changes in the inventory of capital goods. Would not, then, the postulated return to the starting point be indicative of constancy in the quantity of capital in spite of these changes in form? In other words, might this not be evidence of the validity of the classical concept of capital?

One escape from this dilemma would seem to be possible. It may be that the assumption of a constant stock of capital in defining any particular production frontier is redundant. Again, as in the case of labor, the differences between types of capital appear to derive from technology, broadly interpreted. Any change in the inventory of capital goods represents a change in technology applied to industry. Thus capital, in the sense of concrete goods, actually represents embodied technology. Instead of the quantity of capital and technology being two separate elements in the situation, they are actually one. The above situation, then, would appear to depict only the previously specified case of constancy in the
state of knowledge, and can be analyzed in these terms. This interpretation appears to clash with the commonplace observation that the destruction of capital goods (say, as a result of war) can have a serious debilitating effect on production potentials. Is this not a classical case of destruction of capital, in purely quantitative terms? No change in the "state of knowledge" need have occurred. Yet, the problem of reconstruction is not totally different from the problem of original construction in an "underdeveloped economy." Given the destruction of capital goods, the problem then becomes the diversion of resources to re-equip industry; viz., to apply known technology to the production of goods and services, just as the problem of development is to apply new technology to industry. Of course, recent history suggests that there is a significant difference in degree between this case and the case of the developing "underdeveloped economy." In the former case, the existence of a previously tested body of knowledge paves the way for rapid expansion of production potentials. Virtually, the only major question is then one of the rate at which the re-equipment can be consummated. One of the major obstacles facing the newly developing economies does not exist. In this way, reconstruction is a much less formidable problem than is original construction.
And, far from being a constriction on our argument, this case tends to support it. Capital and applied technology are inseparable.

In this sense, then, investment (or capital expenditures) represents expenditures to adapt technology to the production of goods and services. It is not interpreted as capital formation in the classical quantitative sense. In growth, two problems then exist: the availability of technical knowledge and the rate at which this can be applied to industry. The growth limiting effect of small annual investment expenditures lies in the limitations this imposes on the rate at which industry can be equipped (or re-equipped). 44

Such an analysis would appear to put investment in its proper context in the process of economic growth. Instead of considering investment as "capital creating" expenditures (i.e., as causing an addition to the quantity of capital) they can be considered as expenditures to apply technical knowledge to

44 It should be noted that this solves the dilemma posed by the use of depreciation allowances to replace capital goods wearing out by new capital goods of superior productivity (in a physical sense). In the classical analysis some question exists whether to treat this as net capital formation or not—particularly where the costs of the old and new machines are identical. In this case, by dispensing with the notion of net capital formation, the issue is seen in true perspective. Regardless of whether the capital expenditures derive from "net
production. Thus, the crucial significance of investment (gross investment in the classical sense) is continually emphasized, but the independent significance of the "quantity of capital" is denied. This concept, of proven ambiguity and obscurity, is not necessary. In the present framework, the conceptual problems so evident in attempts to measure the 'quantity of capital' did not arise. It has the additional merit of resolving some of the most intractable questions in capital theory. For example, the question of whether "investment in education" constitutes "capital formation" disappears, as does the related problem of the relative importance of capital formation and technical progress in the growth process.

This conclusion has some significance in terms of the theory of the economic growth. It serves to focus attention on the processes and problems of technological change rather than on the "quantity" of capital available. Some would argue that this is but a matter of emphasis and that the present objections are fully covered within the scope of the usual savings" or "capital consumption allowances" the effect is the same; viz., the adaptation of new methods of production. Clearly, in any analysis of the limitations on the rate of introducing technical change, it is the "gross savings" of the society which are pertinent.
analysis. While to some extent this may be true, it is also true that the classical analysis has resulted in an unfortunate concern over what is really a spurious problem; the measurement of the "quantity" of capital and changes in it.

IV. EMPIRICAL PROBLEMS IN THE APPLICATION OF THE CONCEPT

Some of the most perplexing problems in growth analysis relate to the measurement of growth. Rejection of the aggregate welfare definition of growth tends to magnify these difficulties. In the aggregate welfare approach the measurement of growth involves the estimation of successive levels of aggregate income for a given group of people. While significant problems arise in connection with the definition of the scope of activity to be included and the price-weight system to be employed, the concept of income provides a single dimension along which growth can be measured. The rate of growth in any case can be determined by measuring the rate of increase in aggregate (or per capita) income. Once a definition of income has been decided upon, and considerations of availability of data aside, unambiguous quantitative conclusions of this type present few problems. The income concept in effect minimizes the problems of measurement.
In the present approach such a single dimensional measure is not available. In order to measure income it is necessary to agree on a valuation system which permits the identification of what we might call "welfare equivalents"—collections of goods and services which represent identical quantities of welfare. The possibility of arriving at an objective procedure for establishing such equivalents was rejected on methodological grounds. Unless some alternative methodologically acceptable method of valuation can be established, permitting the aggregation of output into a single total, a serious question arises concerning the possibility of detecting and measuring growth in concrete situations. This is particularly true when growth is defined in physical terms as an outward movement of the production frontier.

As it has been defined, the production frontier is multi-dimensional. Each distinct commodity represents a separate dimension, and in some cases the number of such commodities can border on the infinite. Growth, correspondingly, will normally involve multi-dimensional changes: the output of some products expanding, of others contracting or expanding at different rates, new products being added, and old products disappearing. The problem then arises of distinguishing those changes in output which actually represent an
outward movement of the frontier from those which represent only a movement along a given frontier. Presumably, an empirical description of the frontier at any given time would make a distinction between these cases possible. However, even in this instance some ambiguity may arise inasmuch as an expansion of the frontier in some sections is consistent with a contraction in other sections. Furthermore, in the absence of an almost inaccessible type of data relating to production possibilities and resource availabilities, an empirical description of the entire frontier is not conceivable. And, in any case, since growth is multi-dimensional in character, no clear meaning can be given (on a physical level) to the concept of the rate of growth.

While perplexing, such questions may be largely academic. If growth is a process involving a slow but continuous transformation of the productive capacity of a given economy, the behaviour of the sections of the frontier remote from the points actually achieved may be of minor significance. Furthermore, over long periods of sustained growth or where growth is rapid the expansion of productive capacity may be so obvious as to eliminate any possibility of doubt concerning its existence and magnitude. The crucial question involved in determining the existence of growth between any two
dates is: assuming normal levels of exertion and usage of plant capacity, and full knowledge of any new products introduced (but not, of course, of new productive methods), would it have been physically possible to have produced in the first year the same quantities and combinations of outputs as were actually produced in the final year? If the answer is no, growth has occurred. In attempting to answer this question, statistics of national product, valued at market prices and deflated for price changes will normally provide a usable index. If the magnitude of growth has been great, statistics based on relative prices in either the first year or the terminal year will yield similar results.45

Changes in output can occur in the absence of economic growth. If we start from any point on the production frontier,

45Since we are concerned with the productive capacity of the given "economic unit" with appropriate statistical concept in this case would probably be "gross domestic product" rather than "gross national product." In most cases the difference between these will not be great. Gross domestic product, however, adjusts for income received by residents of a nation for productive services performed outside the nation ("net factor incomes received from abroad"). This again suggests the difference between the present approach and the welfare approach. Within the context of the aggregate welfare analysis it would seem to be the concept of gross national product which is pertinent. On the distinction, see United Nations, A System of National Accounts and Supporting Tables, Studies in Method, No. 2 (New York: United Nations, 1953), pp. 7–8, 17.
however, an increase in output in one industry will require a reduction in output in some other industries. This is so because the alteration in output composition requires a reallocation of existing productive resources. The amount by which output increased in the expanding industry and the amount by which output was reduced in the contracting industries can be regarded in this sense as "production alternatives."

The stimulus for such reorganizations, in a market economy, would derive from consumers (including the government, etc.), and would take the form of a reallocation of consumer expenditures. By reducing expenditures on some items and increasing expenditures on others, consumers give producers incentives to alter production in the indicated directions. However, because of the nature of this mechanism, there is no guarantee that the desired change in output will

46 This statement must be qualified. It assumes the "full employment" of the constant stock of at least one resource, e.g., labor. But "full employment" is a flexible condition, at least in the short-run. It is possible that short-run increases in hours worked or in the labor force-population ratio will permit employment and production in excess of the "normal" full employment level. Likewise, natural resources may be depleted at a more than "normal" rate. While permitting flexibility in the production frontier these should probably not be termed growth proper.
occur. If, for some reason, resources are not mobile, then part of the effect will be felt in the form of relative factor and commodity price changes. Prices will fall in the contracting sector and rise in the expanding sector. In the extreme case, no change in actual relative outputs need occur: the rise in prices will drive potential consumers out of the market for the product to which demand originally shifted, and the fall in prices will attract consumers to the market for the product away from which demand originally shifted. Thus, a new equilibrium can be established with no real change in relative outputs, the change in relative prices in effect serving to adjust the pattern of consumption to the existing pattern of production.

The possibility of relative price changes renders estimates of national product valued at current prices unreliable as indexes of alterations in the composition of productive capacity. Only in the case in which relative prices remained unaffected would these statistics be reliable for this purpose. Furthermore, if aggregate purchasing power in the hands of consumers changes, or if cash balance preferences change, all prices may tend to change in the same direction with little or no change in aggregate output. Value statistics may therefore be unreliable as indexes of changes in total output also.
If allowance could be made for price changes, however, national product statistics would be useful as indicators of changes in productive capacity, both in the aggregate and by sector. Ideally, the value data would have to be deflated on an individual commodity basis. An increase in such deflated national product estimates would be a fairly unambiguous indicator of growth even within the definition adopted here. Under conditions of constant costs and an unchanged degree of competition products of equal market value would tend to represent "production alternatives" in the sense defined above. Marginal adjustments in the composition of output (movements along a given frontier) should leave the aggregate unaffected. An increase in the aggregate, under these conditions, would then be evidence of an outward movement of the production frontier, at least in the vicinity of that point on the frontier at which production was occurring. Clearly, such conditions cannot be expected to prevail in large sections of the economy or over substantial periods of time. Nor would the analysis be applicable in the case of major changes in the

composition of output. Thus, the use of such statistics as an accurate measure (in some sense) of the change in aggregate productive capacity is not warranted. However, as an indicator of the presence of growth they are probably reliable, and as an indicator of the general order of magnitude of the changes in productive capacity they are probably the best type of information available.

The practical problems involved in deflating national product estimates are well known. In the case of Canada two broad approaches have been employed: deflation of the national product estimates valued at market prices by applying appropriate prices indexes to the estimates, by sectors; and the combination of indexes of physical production, by sector, into an aggregate production index. Berlinguette


calls these respectively the "deflation approach" and the "direct approach. 50

Two points must be emphasized. In using national product estimates in this connection, it is not suggested that they provide a single measure of growth as is implied in the aggregate welfare approach, but only an indicator of an aggregate change in productive capacity. They cannot be used, strictly speaking, to define the unique rate of growth occurring in the economy at any given time. Secondly, for the present purpose it is the total, not the per capita, national product which is pertinent. Growth must be said to be occurring regardless of whether population is increasing rapidly or not. Indeed, population growth may, in some cases, be one of the important causal variables.


50Berlinguette, op. cit., p. 59.
Chapter IV

THE THEORETICAL PROBLEM: THE RELATIONSHIP BETWEEN INTERNATIONAL INVESTMENT AND ECONOMIC GROWTH

The preceding two chapters were devoted to the analysis of the concept of economic growth. It was argued that the welfare definition in most common use is ill-founded and in rather basic contradiction to the broader methodological predilections of contemporary economists. An alternative definition was proposed and examined. It can be argued that this definition is actually comprehended by the welfare definition. In this view the discussion in Chapters II and III simply serves to shift the emphasis away from the welfare significance of products to the products themselves, resulting in a narrowing of the concept of growth and in an unfortunate loss of measurability. It therefore remains to be demonstrated that the proposed reformulation can contribute significantly to the clarification of basic theoretical and empirical issues in growth economics.

The problem is considered in the first section of this chapter. Much concern has been evidenced over the applicability of existing growth theory to the so-called underdeveloped
areas of the world. It is argued below that the proposed reformulation provides a basis on which it is possible to construct a general theory which will take these objections into consideration and which will be equally applicable to the explanation of economic growth in "developed" and "underdeveloped" areas. No attempt is made to develop such a theory. The more limited objectives of the present study are elaborated and analyzed in the following sections.

I. ECONOMIC THEORY AND THE PROBLEM OF ECONOMIC DEVELOPMENT

The allegation that traditional economic theory is not adequate in the context of the so-called underdeveloped areas of the world has become almost commonplace. Various versions of this thesis have been presented\(^1\) so that any simple statement of the essence of the argument is apt to be unrepresentative of any particular view. Central to each of these analyses, however, is the proposition that economic theorists have systematically neglected relevant dimensions of human behavior,

and particularly the processes by which behavior patterns are formed and changed. In the analysis of the statics and dynamics of equilibrium-type adjustments in a given economic system, and of the process of economic growth in the modern western world, the institutional and behavioral framework of economic activity has been assumed as given data. As a result, economic theory is said to suffer from a narrow cultural relativity. The problem of stimulating economic growth in the underdeveloped areas has been associated with the problem of initiating broad-scale social changes. If, as is alleged, the changes in behavioral patterns and social norms are actually basic to the process of growth, then economic theory based on assumptions of western-type behavior patterns, will yield naive and seriously misleading policy conclusions.

This conclusion has been seriously challenged.\(^2\) It has been argued, in fact, that many of the major errors of development planning derive more from a lack of understanding of "elementary economics"\(^3\) than from the limitations of economic theory.


\(^3\) Hayek, op. cit., p. 89.
theory. Even admitting this possibility, however, the total argument of these critics cannot be summarily dismissed. There is ample evidence that both the explanation of the phenomenon of economic underdevelopment and the prescription of policies appropriate to the elimination of this condition necessitate a range of analysis much wider than that normally essayed by economists.

The very concept of economic underdevelopment is significant of the analytical problem involved. While many definitions of this condition exist (and the range is not inconsequential), the two characteristics most commonly cited are a poor level of performance of the economy as measured by some conventional indicator of "aggregate economic welfare," such as per capita national income, and the existence on a major scale and as a chronic condition of unexploited potentials for usable production. Clearly these characteristics are not unrelated. Equally clearly, at least the former implies some evaluative standard, i.e., some standard of adequate or good performance. Such standards are inherently subjective, a fact which raises the various problems of meaning and measurement discussed at length in Chapter II. On the basis of the second characteristic, however, we can cast the problem in the context of the concept of economic growth
developed in Chapter III. If widespread potentials for the expansion of production exist, then the immediate production frontier, governed by the existing inventory of natural resources and capital goods and the existing labor force, must lie within some potentially obtainable frontier. If there exists no long run tendency for these frontiers to converge, then there must exist significant barriers to economic growth or to the acceleration of economic growth. If economic development implies a greater exploitation of these potentials, then regardless of the standards used for evaluating economic activity, economic development must involve economic growth. From the economist's point of view, economic development falls properly within the scope of the theory of economic growth.

If chronic failure to exploit existing production potentials (among which, perhaps most importantly, would be the potentials opened by technical knowledge which is virtually a "free good" in the rest of the world) is a distinguishing characteristic of underdeveloped areas, then the problems involved in the application of traditional growth theory in this case are evident. It is expected, in economic theory, that given some degree of competition unexploited potentials for usable (in the sense of saleable) production will tend to
attract investment, expanding production capacity in that direction. This presumably is the function and the merit of the profit-and-loss mechanism. But clearly, it is difficult to apply an analysis which assumes the existence of such a mechanism to a situation in which it is either non-existent or only imperfectly operative. This would seem to be the case in the underdeveloped areas.

This is not to say that a quasi-explanatory concept does not exist in economic theory. A survey of the factors most frequently cited as explaining the "structural disequilibrium" present in the state of underdevelopment reveals that these correspond in large part to the "market imperfections" which underlie the theory of imperfect competition. However, resorting to the concept of market imperfections is essentially question begging. While the concept has resulted in greater sophistication in market theory, it is a concept which is largely peripheral to economic theory itself. Market imperfections are external conditions which impinge on the system.

---

and affect the manner in which the market operates in performing its functions of allocating resources and adjusting the pattern of activity. However, in terms of the condition of underdevelopment, "imperfections" appear to be central rather than peripheral. A theory of economic underdevelopment must be in part a theory of the development, impact and stability of market imperfections; and, by implication, the theory of economic development must be in part a theory of the elimination of such imperfections.

The analysis of market imperfections, their causes and cures, takes us far beyond the usual range of economic analysis into what has been called the "sociology of markets." Imperfections are particular characteristics of human behavior and social institutions. However, if our purpose in growth economics is to develop a causal explanation of economic growth, a broadening of the frame of analysis in this direction may be unavoidable. It is undoubtedly true that from the point of view of the underdeveloped economy, economic development is an economic problem, narrowly conceived. It is essentially a problem of expanding the productive capacity

---

5T. Parsons and N. Smelser, Economy and Society, pp. 143-175.
of the society and establishing conditions under which such growth will be self-reinforcing and hence cumulative. However, we cannot regard the economy as an independent inanimate machine; it is a systematic organization of human activities. Economic activity is after all human activity. Expansion in the productive apparatus, and particularly the initiation of a cumulative process of expansion, presupposes appropriate adjustments in motivations, institutions, and behavior patterns. In this sense then, a general theory of economic growth must fall in part within a broader theory of social action and social change.

The definition of economic growth developed in Chapter III supports this conclusion. The connections between the "society" and the "economy," and hence the behavioral basis of economic activity and of economic growth, are emphasized. With important exceptions, such as Schumpeter's analysis of entrepreneurship and innovations, economic theorists have tended to abstract from this aspect of the problem. By assuming a pattern of motivations and a set of social institutions uniquely favorable to the process of growth, emphasis could be placed on such quasi-impersonal variables as the "volume of saving" or the "rate of capital accumulation." In such economic models causal efficacy is imputed to what are actually
necessary conditions or manifestations of the growth process. By assuming appropriate motivations the causal sequence was confused with the required physical adjustments. Such a conclusion would suggest that a broader reformulation of the theory of growth is desirable.

II. THE PROBLEM

The literature of growth economics—indeed, of social science in general—is replete with warnings that theorizing on this grand scale is premature. While the case can be overstated, the very immensity of the task involved would seem to argue in favor of caution. The logical first step may be the development of what R. K. Merton has called "theories of the middle range":

...theories intermediate to the minor working hypotheses involved in abundance during the day-by-day routines of research, and the all inclusive speculations comprising a master conceptual scheme from which it is hoped to derive a very large number of empirically observed uniformities of social behaviour.6

Such theories deal with fragments of the total problem, but presumably fragments of major significance.

One such problem area in growth economics which merits serious consideration is the process of international transmission of economic growth. Even this limited topic becomes very complex, however, encompassing all of the miscellaneous channels by which activities resulting in sustained growth are influenced from abroad. In the classical economic model only the "quantitative" impacts of factor and commodity movements have been systematically allowed for. A complete analysis, however, would have to encompass all the so-called "qualitative" aspects. To incorporate all of the pertinent factors within a single analytical framework would be a herculean task. No such attempt is made here. Rather attention is focused on only one part of this complex mechanism of international growth transmission, private international investment. Again, refuge is taken in Merton's argument for "theories of the middle range."

In this study the concept of private international investment is used in a narrow financial sense. It is assumed to involve the acquisition by individuals or non-government controlled business enterprises of claims (whether in the form of debts or equities) on individuals, business enterprises, government bodies or agencies, or real assets resident
or located in another nation. Thus, a distinction is made between investment and what, in a classical sense, has been called a capital transfer. In the classical analysis a sharp distinction is made between the financial or "monetary transfer" and the "real capital transfer." The former is a preliminary to the latter; but "...capital [in the abstract] can only be transferred from country to country in the form of commodities or services," i.e., as a balance of payments deficit (or surplus). Thus, the present definition relates to only the first half of the classical capital transfer mechanism.

The formulation of an all inclusive definition of private international investment is difficult. The important thing is the commitment of private funds for the acquisition of assets in another nation. This includes the reinvestment of profits earned by firms controlled by non-residents. It is also necessary to include cases in which no actual monetary transfer occurs, as when a company sends physical capital goods to branches and subsidiaries located in other countries. The case of movements of capital funds associated with the migration of businessmen from country to country is more difficult. At times in history this may have been of crucial importance in the growth process. Probably this case should also be included in the definition.

This definition can be justified on the basis of the broad problem to which the study is addressed. The classical emphasis on the balance of payments and the net transfer of resources and goods is misplaced when our concern is with the actual mechanism by which growth is transmitted. A balance of payments deficit, to the extent that it occurs, is a manifestation of the growth process, not a cause. The causal mechanism is related to the basic investment decision, which, quantitatively, is reflected in gross investments in the financial sense. It is argued, therefore, that the present definition identifies the phenomenon which is important in the growth transmission mechanism. Further discussion of this is delayed until Chapter VI.

III. THE NATURE OF THE STUDY

The form of this study is simple. In the following two chapters existing theoretical models and dissenting opinions are analyzed. The purpose of this analysis is to discover the prevalent theoretical conceptions of the nature of the growth impact of international investment and to isolate those critical observations which seem particularly relevant. This provides the basis for the hypotheses tentatively set out in Chapter VII.
The second part of the study involves an analysis of Canadian experience with international investment and economic growth in the period following World War II. The selection of Canada for such a case study is subject to criticism on the grounds that Canada represents a special case. Canada certainly does not qualify as an underdeveloped area in terms of the usual definition of that concept. In particular, no mechanism in the nature of a "low-level equilibrium trap" can be said to exist. By both the conventional indicators and the more rigorous concept developed in Chapter III, Canada experienced vigorous economic growth in this period. Furthermore, Canada attracted an unusually large portion of the total international flow of investment funds. Various explanations for this have been offered: the nature of Canada's resource endowment relative to world resource requirements; the stability of the Canadian political climate; taxation, property and foreign exchange regulations not unfavorable to foreign investors; geographic proximity and social and cultural similarity to the United States, the major source

---

of investment funds in this period; etc. In any case, there can be no doubt that with respect to the attenuated flow of private investment Canada was in a uniquely favorable position.

While undoubtedly severely limiting the generality of the empirical findings these circumstances may render the case significant in other respects. If the general problem is that of the relationship between international investment and economic growth then it would seem to be important to analyze this relationship in a situation in which both occurred in substantial degree, and in which government intervention in the operations of the market mechanism were relatively minor. Analysis of this case should yield insights into the growth impact of international investments under the most favorable circumstances. Such information is significant itself, quite apart from the basis it provides for more extensive comparative analyses. The relative availability of statistical data, permitting a more extensive and more detailed analysis, also tends to lend significance to such a study.

A more penetrating criticism derives not from the observed atypicality of Canada per se, but from the possibility that the impact and significance of international investment may differ significantly between growing and "stagnant" economies.
Such an argument would seem to be broadly implicit in much of the current literature on economic development. Thus, we can read into certain of the writings of A. K. Cairncross the proposition that international capital movements may be growth-attracted (or, less restrictively, growth-permitting) rather than growth stimulating.\textsuperscript{10} In this sense, growth might be considered as an essential precondition to the investment inflow, and the investment inflow as a symptom rather than a cause of the growth process. A parallel conclusion seems inherent in theoretical models which have as their unifying theme a period of critical transformation from self-maintained stagnation to self-propelling growth.\textsuperscript{11}

If these propositions have validity they pose a further limitation on the generalized relevance of the present study. However, if we regard them as a theses yet to be proven, the present study may serve to provide additional evidence of pertinence in their evaluation.


The time period covered in the study also requires justification. It is widely held that for growth analysis time series are required which extend over several decades, or several cycles. The argument is essentially that long time series are necessary if we are to distinguish statistically between the long-run growth processes and shorter-run cyclical and random processes; if we are to identify secular trends and trend correlations. On these grounds restriction of the study to the post-world war period may seem inadequate.

However, this argument is not totally conclusive. If the problem is the analysis of the dynamics of growth transmission, then a relatively short period of time may be adequate. Growth in Canada has occurred in rather well defined "spurts." This means that the active growth stimulation has been concentrated in a few short intervals. While a comparative analysis of each of these intervals would be desirable, the analysis of any one is a useful starting point. A major consideration in such studies must always be the availability and reliability of data. As a general proposition both the availability and the reliability decrease more than proportionately the farther into the past we try to push the analysis. In the case of Canada, the statistical records are
above average over the relevant periods of history. Even in this case, however, truly comprehensive data are available only for the most recent periods, and even these are not fully adequate in terms of what we would like to achieve with the present analysis.¹²

Chapter V

THE THEORY OF INTERNATIONAL INVESTMENT

AND ECONOMIC GROWTH

The current widespread interest in economic growth is not a new development in economic theory. It is true that in the period extending roughly from 1870 through the 1940's economic growth remained on the peripheries of professional discussion. Primary attention was devoted to the equilibrium mechanism in a market economy, its macro and micro stability conditions and its normative implications. To say, however, that economic growth was completely neglected would be a gross overstatement. There were in this period a number of significant contributions to growth economics, arising, for example, out of Schumpeter's attempts to link economic growth and aggregate stability conditions, and out of the numerous discussions of capital theory. Moreover, the apparent lack of explicit emphasis on economic growth probably reflected implicit acceptance of the growth theory of the classical school as well as overriding concern with other theoretical issues.
The growth theme permeates the writings of the classical school. It is reflected in both the policy objectives and the analytical concepts which they developed and employed. Adam Smith's great treatise on the *Nature and Causes of the Wealth of Nations* assumed as a specific objective of economic policy the promotion of "economic progress." While establishing an intellectual movement, Smith's immediate purposes seem to have been political. His great concern was with what we might call institutional impediments to economic growth. Thus, he might have regarded the most important conclusion of his analysis to be the proposition that any governmental system "either of preference or restraint":

...retards, instead of accelerating, the progress of society toward real wealth and greatness; and diminishes, instead of increasing, the real value of the annual produce of its land and labor."¹

The "obvious and simple system of natural liberty," by contrast, releases the growth potential latent in unfettered self-interest, spurred but constrained by "free competition." This theme continued to dominate classical economics and the liberal political movement associated with it.

In terms of analytical concepts, the same emphasis on growth is apparent. The concept of the stationary state occupies a different position in the classical analysis than does the "long-run static equilibrium" in the neo-classical analysis.\(^2\) The former is properly regarded as the logical resultant of a constrained growth process, the major constraint being the limited potential in any "given state of knowledge" for the expansion of agricultural production. The neo-classical concept abstracts from all change. Rather than being designed to indicate the logical tendencies of a given growth process it is designed to demonstrate the logic of the competitive market as a "static" allocative mechanism.

Similar points can be made with respect to the classical and the neo-classical concepts of "free competition." In the latter case, where concern is with the allocation of resources, the purity of competition is defined rigorously in terms of the equilization of market power. In the former case, where concern is with the conditions of economic growth,

purity of competition is defined loosely as a situation in which:

...every man, as long as he does not violate the laws of justice, is left perfectly free to pursue his own way, and to bring both his industry and capital into competition with those of any other man, or order of men.\(^3\)

Rather than merely equalizing bargaining power in a time­less market free competition stimulates initiative and growth. It is interesting that current notions of "workable competition" involve, in part, a return to the classical notion.

Perhaps the most refined part of classical economics was the theory of income distribution. Even this was cast in terms of a growing economy. The classical theory of income distribution is best interpreted as an attempt to expose, on a macro level, the impact of economic growth on relative income shares under the usual assumptions of diminishing returns to agriculture.

\(^3\)Smith, \emph{op. cit.}, p. 651. On this distinction see Hla Myint, \emph{Theories of Welfare Economics} (Cambridge, Mass: Harvard University Press, 1948), pp. 53-69.
I. ECONOMIC GROWTH IN THE CLASSICAL MODEL

Brief specification of the essential nature or central theme of any complex body of thought is always a dangerous and justifiably suspect practice. Not only is there danger of over-simplification, but also there is a tendency to exaggerate aspects of the analysis yielding an interpretation which is at best a half-truth. Thus, in interpreting the classical analysis it is necessary to keep continually in mind their assumptions relating to the broader aspects of economic behavior. However, all these considered, it is possible to characterize the classical growth model in terms of the causal primacy ascribed to capital accumulation.

Thus, Hla Myint has concluded:

Although greater freedom of trade and capital accumulation are complementary instruments of expansion, the latter must be regarded as the senior partner without whose assistance no appreciable addition can be made to the economic welfare of society. Here...we have... the high altar of the classical shrine.4

It is through this emphasis on capital accumulation that the classicists laid the basis for all subsequent "orthodox"

4Myint., op. cit., p. 86.
growth theory. If we make the appropriate assumptions con­
cerning the underlying motivation of human activity (the
utilitarian assumption) and assume a regime of "free compe­
tition," then the process of growth can be characterized in
terms of movement along an aggregative production function. Output is presumed to result from the combination of factors of production. In the simplest case the factors can be grouped into three categories, land, labor, and capital. The supplies of the first two are limited by natural endowment (in the case of land) and by population growth (in the case of labor), while the supply of the latter is potentially infinitely expansible. Aside from the possibility of shifts in the production function as a result of a change in the "state of knowledge," growth occurs in response to the continuous accumulation of capital, i.e., when savings are positive. If we assume that population growth is a function of output, and

\[\text{5The appropriate definition of economic growth in this context is not always clear. The analysis can, of course, be readily interpreted in terms of the concept developed in Chapter III. The classicists themselves, however, had some variant of the aggregate welfare notion in mind: either the aggregate "real value" of the annual output (Smith) or the aggregate "net revenue" allowing for the cost of subsistence (Ricardo). In any case, a single valued measure of income is indicated. This makes possible analysis of rates of growth etc. On this see Myint, loc. cit.}\]
that major technical changes occur infrequently and discontinuously, then capital accumulation appears to be the main continuous growth producing force.⁶

Certain problems inherent in the concept of capital were considered in Chapter III. Further analysis of the peculiarities of the classical concept (or concepts) is not necessary to our immediate purpose. Thus, the early excessive emphasis on capital as a fund of subsistence for the support of labor to the apparent exclusion of equipment which in a sense substitutes for labor, is unimportant, particularly in light of the subsequent development of the doctrine.⁷ In spite of the implicit assumption of a constant capital-labor ratio, capital "deepening" as well as capital

⁶This appears to be the main classical position. It is confused by the implicit assumption that the capital-labor ratio is a constant, and by Malthus' emphasis on population as an important force producing the motives to expansion. On this latter point see E. T. Penrose, "Malthus and the Underdeveloped Areas," Economic Journal, Vol. LXVII (June 1957), pp. 219-239.

"widening" can be allowed for with only minor changes in the classical framework. It has often been noted, however, that:

In everyday speech and in the writings of economists there have been, since before the time of Adam Smith, two broadly marked ways of thinking of capital: one views it as concrete goods, such as tools and machines; the other, as the money expression or market value, of the goods....It is probable that no writer has long kept from the use of the term in both these ways, no matter what his formal definition. Frequency both will be found on the same page.8

This is certainly true of the classical writers. Thus, for example, while John Stuart Mill defines capital as "...a stock, previously accumulated, of the products of former labor," he goes on to argue:

The distinction between Capital and Not-Capital does not lie in the kind of commodities, but in the mind of the capitalist—in his will to employ them for one purpose rather than another....Whether all those values [destined for productive use] are in a shape directly applicable to productive uses, makes no difference. Their shape, whatever it may be, is a temporary accident; but once destined for production they do not fail to find a way of transforming themselves into things capable of being applied to it.9


9Mill, op. cit., pp. 54, 56.
"Capital," in some pure sense, is separable analytically if not in fact from the concrete commodities in which it is temporarily embodied, and, in spite of the inevitable short durability and eventual consumption of the goods themselves, capital is a fund capable of being maintained in perpetuity. On this abstract level, capital is essentially homogeneous. It can be quantified and expressed in units of value. It is this abstract fund which must increase quantitatively if growth is to occur.

This emphasis on aggregate capital accumulation is the crux of the classical theory of economic growth. Harrod has noted that "...in the old (classical) economics accumulation was the motive power."\(^{10}\) This is not to say that the classicalists ignored the problems of motivations and social institutions which have so dominated recent discussions of the growth problem. In their interpretation, however, human nature involved a virtual compulsion to self-improvement, which would govern behavior if all repressive social and political institutions were removed and if ignorance were dispelled. Thus, Adam Smith located the essential growth stimulating motive force in "The uniform constant and uninterrupted effort of

every man to better his condition."¹¹ This natural tendency would automatically generate the parsimonious behavior and hence the savings necessary to capital accumulation, providing the society was not burdened with repressive governmental policies.

Given this optimism, growth becomes an automatic process in the appropriate environment. It is effected through capital accumulation, and its rate is limited by the potential rate of capital accumulation. The causal mechanism is inherent in the model. Investment is attracted by the possibilities for profits. Profits are a sign of disequilibrium in the economy; a sign of imbalance between the various factors employed. Growth is therefore also a sign of disequilibrium, although growth always involves a movement toward equilibrium in the classical stationary state. If the economy is viewed as a disaggregated collection of industries, then this same mechanism will insure that each sector will progress toward stationary equilibrium. Capital will move from industry to industry seeking the best profit possibilities, but, under conditions of diminishing returns to agriculture, ultimately reducing all industries to the same (low) profit rate.

¹¹Smith, op. cit., p. 326
The classical analysis of economic growth is well known. These few brief comments add nothing new to the discussion of it. Their purpose is simply to summarize the essential features of the model and to suggest the nature of the causal mechanism implied in it. Several characteristics have been emphasized. The model is highly aggregative. Growth is defined in terms of a unified measure of output, and is analyzed as a movement along an aggregate production function. It is effected through the accumulation of capital, purging an imbalance in the existing employment of the various factors of production. On the basis of an assumption of uniform utilitarian patterns of motivation, it is concluded that capital accumulation and growth will occur automatically in the absence of arbitrary governmental restraints. The rate of growth may be slow, limited by the annual increment to the stock of capital, however, the direction is always toward a stationary equilibrium.

II. INTERNATIONAL INVESTMENT IN THE CLASSICAL MODEL

In the literature of the classical economics proper, international investment received only minor attention. This probably can be attributed to the bias introduced into the analysis of international economic relations by the assumption
of complete international immobility of factors of production. If one considers the international investment to involve a flow of a "real" factor of production, "capital," a theory of international investment in the classical case is virtually ruled out by assumption. It is not surprising, therefore, that the main discussions of capital movements within the classical school related to the mechanism of balance of payments adjustment—the so-called transfer problem. Likewise, the main empirical studies of international capital movements were mainly attempts to test classical assumptions with respect to this mechanism.\textsuperscript{12} However, while not surprising, this neglect of capital movements was perhaps somewhat anomalous. As Professor Nurkse has pointed out,\textsuperscript{13} it was during the period in which the classical analysis was

\textsuperscript{12}This is true, for example, of the group of studies made by Harvard students under the direction of Professor Taussig, of which the most famous was J. Viner's \textit{Canada's Balance of International Indebtedness, 1900-1913}. However, reference should also be made to early studies of capital flows per se, particularly J. K. Hobson, \textit{The Export of Capital} (New York: The Macmillan Co., 1914) and G. Paish, "The Export of Capital and the Cost of Living," \textit{The Statist}, Supplement, Vol. LXXXIX (February 14, 1914), and "Great Britain's Capital Investment in Other Lands," \textit{Journal of the Royal Statistical Society}, Vol. LXXXII (1909), pp. 465-480.

developed and held dominance that the international capital market emerged and expanded dramatically. International investment attained a significance in terms of world levels of national income never since duplicated. Only after this flow had virtually stopped, and the international capital market was disorganized, was a broad attempt made to integrate factor and commodity movements in international trade theory.14

In this sense a truly classical theory of international investment, was never explicitly formulated. However, such a theory does exist, in rudimentary form, in neoclassical international trade literature. It is apparent

14 Professor Viner does not find the classical omission of factor movements anomalous. Admitting the inappropriateness of the assumption of factor immobility for any analysis of the effects of factor movements, he denies the validity of this as a criticism of trade theory per se. He argues in terms of the appropriate "scope" of trade theory:

"...with the myriad long-run economic effects of the international migration of capital, or of labor, the theory of international trade has not dealt nor pretended to deal."


Such a theory, he suggests, must derive from "the economic theorist, the economic historian, and other specialists..." However, to the extent that the classical trade theorists were also general economic theorists, this still appears as a remarkable gap in the literature. Furthermore, the distinction between commodity trade and factor movements, particularly the "land" factor, is not as clear-cut as Professor Viner would suggest.
that this aspect of neo-classical theory involves only an extension of the classical theories of capital, production, and economic growth. Although the so-called monetary factor was not neglected, classical and neo-classical economic analysis focused primarily on the "real" level of economic activity. Monetary transactions, aside from transitional monetary disturbances, were held to be intrinsically "insignificant," reflecting only temporary difficulties in the control mechanism in the economy. This applied also to the analysis of international investment. Thus, international investment was presumed to involve (and be significant only insofar as it did involve) a transfer of "real" resources: of a quantity of the factor of production, capital. While:

...capital can only be definitely transferred from country to country in the form of commodities or services....

...it is not the capital goods, but something else which moves.\(^{15}\)

This something else is "pure capital"—"capital dispos- al" or "waiting" in some abstract sense. Thus:

...what takes place when capital moves from country to country is that part of the supply of waiting or capital disposal in one country is put at the disposal of people in another.\(^{16}\)

\(^{15}\)Iversen, *op. cit.*., pp. 197, 21.

\(^{16}\)Ibid., p. 23.
"Waiting" or "capital disposal" is an "elementary productive service..."which enables a lengthening of the 'period of production,' i.e., the adoption of more round-about 'capitalistic' methods of production..."\textsuperscript{17} and, hence, a movement along the aggregate production function to a higher level of income. The impact of the foreign investment on the receiving economy is identical with the impact of an increase in domestic savings, and the theory of international investment can be subsumed under the general theory of capital formation. Ohlin notes this explicitly:

"In principle the chief difference between domestic and international capital movements is that the monetary mechanism is somewhat different."\textsuperscript{18}

And, of course, purely monetary phenomena have no intrinsic significance.

In a market economy in which factors of production have some degree of mobility, there would presumably be a tendency for factors to be attracted toward employments offering a higher rate of return to the owners of the factors. The existence of different rates of return for qualitatively

\textsuperscript{17}Ibid.

identical (i.e., perfectly substitutable) productive factors should induce a reallocation of such factors leading to the establishment of equality in the rates of return in the various alternative employments. Where barriers to such substitution exist, relative price differentials can persist, representing, in a sense, the height of the barriers to factor mobility.

These are the familiar conclusions of elementary market theory. The introduction of factor mobility into international trade theory has resulted in a simple extension of these conclusions. Thus, it can be demonstrated that under certain assumptions free international mobility of factors of production will result in a convergence of (per capita) income levels throughout the world and a maximization of world income. The necessary assumptions are: (1) that it is possible to identify a number of independent, qualitatively homogeneous factors of production, and that the geographic or national location of the factors has no bearing on their

19 And, as a corollary, where different factors of production are imperfectly substitutable (qualitatively different, but still partial substitutes in production), the equilibrium mechanism should result in a situation in which the relative rates of return reflect the degree of imperfection in their technical substitutability (the marginal rate of substitution in the Hicksian sense).
quality; (2) that the whole range of pertinent products can be produced in any of the various countries, providing the required factors can be induced to move from their original locations, with the same production functions; (3) that constant returns to scale exist in all industries, so that only factor proportions have significance in determining the marginal product of any one factor, (4) that competition is perfect in all markets. It can be demonstrated also that all factors need not be equally mobile internationally to achieve this result, and, indeed, that given free commodity trade all factors can be geographically specific.

---

20 Ohlin, op. cit., p. 179.
21 Ibid., pp. 168-169. This is an interesting facet of the model. With minor additional assumptions, income convergence will result (a) with perfect factor mobility, and no trade, (b) with perfect factor mobility and barrier-free (no transportation costs) commodity trade, or (c) with barrier-free commodity trade and complete external factor immobility (but perfect internal occupational mobility). To achieve this result in the latter case, complete specialization in any one product by any one country (or region) has to be assumed away, there must be no fewer internationally traded goods than factors of production, and the production functions must be of a particular form such that each commodity is always intensive in one factor no matter what the relative factor prices.

The literature relating to case (c) is rather extensive. In the context of the "modern theory" of trade the basic sources are Eli Heckscher, "The Effect of Foreign Trade on the Distribution of Income," Economisk Tidskrift, Vol. XXI (1919),
In this model international investment induces a process of income convergence by bringing about a reallocation of factors of production. Investment occurs in response to possibilities for higher earnings in the form of higher rates of interest, a phenomenon which is symptomatic of the relative differences in factor endowments. The process of growth transmission is cast within the framework of "given" factor endowments in the various sections of the world, and "given" technology as manifest in "given" production functions for the various goods and services produced—production functions which are identical in all areas of the world. It is an exercise in comparative statics. Because of this singular


Ohlin, op. cit., p. 168.
concern over the "quantitative" aspects of the transmission process the analysis may miss crucial facets of the dynamic process of growth and growth transmission, particularly in terms of the impact of investment on technological change and on the "development" of factors of production.\textsuperscript{23}

\textsuperscript{23}Cf., R. Robinson, "Factor Proportions and Comparative Advantage," \textit{Quarterly Journal of Economics}, Vol. LXX (May and August 1956), pp. 169-192, 346-363. It is interesting to note some of the difficulties created by the rigid dichotomization of international trade into trade in "factors" and trade in "commodities." Throughout the neoclassical literature two statements appear frequently enough to be regarded as fundamental postulates: (1) that capital can only be transferred via commodity trade, in the form of a balance of trade deficit or surplus and (2) that commodity trade and factor trade are substitutes for each other. However, if capital cannot be transferred in the absence of trade, how then can trade be a substitute for capital movements? The answer, of course, is that given constant and identical production functions in all of the countries concerned, continuing trade and a once-over movement of factors are substitutes for each other. While seldom brought out in the typical comparative static equilibrium analysis of this problem, such a qualification is implicit in the reasoning involved.

However, such a qualification does not completely resolve the incongruity of these two postulates unless a supplementary qualification is introduced: that either ownership of the capital becomes relocated in the receiving country, or that private property "rules of the game" do not apply. If it is presumed that investment is made on the basis of a profit motive, presumably a future reverse transfer of income will be involved, and the possibility must be held out of a future return of the principal of the investment. This is necessary, again under the "rules of the game," if the capital flow is to be continuing over any period of time.
The model is thus severely limited as a result of the restrictive assumptions. However, at least in the early neo-classical writings (say pre-World War II), there is a distinct note of optimism concerning the reality if not of its assumptions—these were not carefully analyzed—at least of its implications. Ohlin concludes:

As a matter of fact, labor and capital movements have usually gone to regions with scanty supply of these factors and relatively low sum total of incomes. The migration has considerably increased that sum.24

It can be easily argued that introducing the last qualification is to introduce dynamic propositions into an essentially static analysis. In statics, once-over changes are admissible. However, in any significant sense of the word, capital transfers must be considered as a dynamic process. The above implication, of course, is contained in the typical neo-classical picture of the stage-wise progression of the balance of payments as a country progresses from an immature debtor to a mature creditor. The international debt (or better income-transfer) relationships established by international investments cannot be overlooked in any comprehensive analysis.

24 Ohlin, op. cit., p. 171 (italics added).
III. ECONOMIC GROWTH IN THE NEO-KEYNESIAN MODEL

Current theoretical interest in economic growth centers about a group of models which we can label collectively as "neo-Keynesian." The kinship of these models to Keynesian macro-statics is evident in the method of analysis, in the basic concepts and postulates employed, and in the policy problems to which the models are addressed. Of course, substantial heterogeneity exists within the group, making generalization dangerous. And, it seems apparent that this heterogeneity is increasing as the great number of possible variants on the basic model are explored. Indeed, at the risk of exaggeration, one might say that a distinct cleavage

---

seems to be developing between the early models and the later models. It would be tempting to call the former neo-Keynesian models proper, if it were not that certain more formally Keynesian assumptions, excluded in the early models, are introduced in the later ones. In particular this is true of considerations of strictly monetary factors. However, the primary concern of the early models was quasi-Keynesian instability, of the later ones classical growth.

The original Harrod-Domar model was presented as an attempt to make the General Theory dynamic by eliminating a basic contradiction in Keynes' assumptions. In his exposition of the general theory, Keynes assumed that the stock of capital (in a real sense) remained fixed. As a first approximation, particularly in the case of a severe depression in which excess capacity is the general rule, and in the context of this particular analysis, the assumption of constancy in the capital stock is perhaps not unusable. However, as a general proposition it is not defensible. In a generalized

26See Tobin, op. cit.; Solow, op. cit.
Keynesian system it creates a methodological problem. As Harrod observed:

In the formulation and handling of its subject-matter Keynes's General Theory is essentially static.... [But] positive saving, which plays such a great role in the General Theory is essentially a dynamic concept. 28

By contrast, the basic supposition of the Harrod-Domar model is that net investment (ex post saving) generates not only income but also new productive capacity; that there is both a short-run employment effect and a long-run growth effect, and that the growth effect will have in itself certain implications for the maintenance of full employment. Domar notes:

[Keynes'] approach permits the assumption that employment is a function of national income.... Growth is entirely absent from it because it is not concerned with changes in productive capacity.... But clearly, a full employment level of income five years ago would create considerable unemployment today. We... assume instead that employment is a function of the ratio of national income to productive capacity. 29

---

Thus, the attempt is made to reinterpret Keynes in dynamic terms, where dynamics involve the analysis of rates of change in variables over time. In this way it is hoped that the Keynesian system will be adaptable to the analysis of a broader range of problems.

Aside from this, the basic Keynesian framework is maintained. Keynes' assumption of a constant marginal propensity to save is projected into the long-run, as is his basic proposition that the economy is not automatically adjusting in the classical (Say's Law) sense. However, Keynes' emphasis on the "liquidity trap" and on wage inflexibility is dropped in favor of a new rigidity, the capital-output ratio. The more recent formulations have led in various directions. To some extent they are only elaborations of the

30 The criticism of this implied in Solow's observation that: "A remarkable characteristic of the Harrod-Domar model is that it consistently studies long-run problems with the usual short-run tools," is unjustified (Solow, op. cit., p. 66). The long-run in the neo-classical sense and the long-run in the growth-model sense are different concepts. To the extent that the problem is to explain the instability of the growth path the "short-run tools" are appropriate. Instability arises because of the lack of compatibility of variables at every instant of time—because of short-run rigidities. In the neo-classical analysis of "ultimate tendencies" there is a deliberate abstraction from these short-run rigidities, the process of transition, and hence the problem of instability. As an explanation of "secular stagnation," however, the Harrod-Domar model is on weaker grounds and Solow's criticisms are pertinent.
basic model, but in other cases they involve alterations in scope, assumptions, purpose, and conclusions. Thus, population growth and the complications introduced by the assumption of independent and inconsistent capital-output and labor-output ratios have been examined. Attempts have been made to generalize the model to apply to an international economy and to give explicit consideration to its implications in the case of the "representatives" underdeveloped economy. In some of the more recent models, the more explicitly Keynesian phenomena of the "liquidity trap" and "wage inflexibilities" have been reintroduced.

Perhaps the major deviation involved in recent expositions of the growth model has been a virtual rejection of the non-adjustability assumption. The constant capital-output ratio has been replaced in favor of a neo-classical assumption.


34Cf., Tobin, loc. cit.; Solow, loc. cit.
of automatic competitive marginal factor substitutions. When the assumption of a fixed capital-output ratio is discarded in favor of the more orthodox assumption, the concept of a precariously unstable growth path loses much of its significance. For this reason, the most recent models have a different significance and reflect a different theoretical preoccupation than the original models of this group. Indeed, it can be argued that these changes in assumptions deprive the neo-Keynesian models of their uniqueness, fusing them with the essence of classical dynamics. This shift in emphasis is, of course, closely correlated with other developments in economics. In particular, it involves the adaptation of the models "...to deal with growth as an end in itself," i.e., to provide a theory of growth as opposed to a theory of fluctuations about a growth path. It is contended here, however, that when so adapted the neo-Keynesian models


36E. Domar, Essays in the Theory of Economic Growth, p. 5. For an interesting application of the model to a concrete problem of long-run growth projection see W. Hood and A. D. Scott, Capital, Output and Labour in the Canadian Economy (Ottawa: Queen's Printer, 1957).
contribute little over and above the classical insights. Their real contribution derives from the insights provided into the problem of instability. As a theory of growth the neo-Keynesian model is strictly classical.

Consider briefly the framework of the models. The perspective on the economy is essentially that given by the national economic accounts, but with a time dimension added. Thus, the concept of growth employed corresponds closely to that identified above as the aggregate welfare concept, except that primary attention is devoted to total rather than per capita income. It is assumed, however, that the concept of aggregate income has a simple and obvious meaning on the real level as well as on the monetary level. On this assumption, the concept of the "rate of growth" can be employed consistently. Indeed, when the models are adapted "to deal with growth as an end in itself," the rate of growth becomes the crucial dependent variable. The significance of the models presumably derives from the exposition of conditions which will produce various growth rates.

37Solow, for example, avoids the conceptual problems with the assumption that there is only one commodity ("output as a whole"), usable for consumption and investment purposes. "Thus we can speak unambiguously of the community's real income." Solow, op. cit., p. 66.
The independent variables in the models likewise relate to change over time. Two types of variables are involved: rates of change in certain key (exogeneous) aggregates such as the labor force, and marginal relatives, such as the (marginal) capital-output ratio and the (marginal) propensity to save, which express technological or behavioral relationships between changes in the key aggregates. Each of the broad aggregates (e.g., the stock of capital, the national income, the labor force) is implicitly treated as though the corresponding observable phenomena were homogeneous and, hence, measurable in simple units. They are subject to increase or decrease, but are attributed no analytically significant form. Thus, matters of structure and structural change, are left unanalyzed. If structure is admitted, divergent sectoral movements are assumed to be offset against each other so that only the resultant is registered. Structural leads and lags in the process of change are essentially ignored.

From the present point of view the most significant postulate underlying the neo-Keynesian growth models is that:

Net investment is literally the rate of change of capital per unit of time....As long as net investment is positive, not only will it generate income, but it will
also create additional productive capacity.\(^{38}\)

In the simplest case it is assumed that the aggregate stock of capital and the aggregate flow of output bear a constant, technologically determined,\(^ {39}\) average and marginal relationship to each other. We can interpret this as implying that any investment will increase output (or, more exactly, potential output—productive capacity) in the indicated proportion.\(^ {40}\) Clearly, the assumption of a constant marginal capital-output ratio imputes certain peculiar characteristics to the long-run aggregate production function. This is indicated in Figure 3, in which aggregate output (Y) is measured on the vertical axis, and the aggregate stock of capital (K) on the horizontal axis. The line OP describes the

---

\(^{38}\)Hamberg, Economic Growth and Instability, pp. 23, 28.

\(^{39}\)Some of the models place emphasis on an acceleration relation which is essentially a behavior rather than a technological parameter. This is true of the model of R. F. Harrod, for example. However, underlying the assumed reaction of investors to a change in output is a technological requirement—a "normal" relationship between capital and output.

\(^{40}\)See also E. Domar, op. cit., pp. 89-90, where a distinction is made between the new capacity created by the investment (sI) and the net increase in the productive capacity of the economy (dI) resulting from the investment. In assuming that \(d < s\), allowance is being made for the destruction of capacity by new investment, the misallocation of capacity, and the possibility that cooperating factors may not be available.
Figure 3

Classical and Neo-Keynesian Aggregate Production Functions
historical behavior of output required for the maintenance of a constant capital-output ratio \( \frac{OK_1}{OY_1} \) in the face of continued accumulation of capital. This line is evidently not drawn on conventional production possibility assumptions.

The curve \( OL_1 \) is drawn on the conventional assumptions of constant returns to scale, no technical change, some degree (less than perfect) of substitutability among the factors of production, and a fixed supply of at least one factor, e.g., land. The lines \( OL_1 \) and \( OP \) intersect at point \( R_1 \), corresponding to an output \( OY_1 \) and a capital stock \( OK_1 \). But as capital is accumulated the two lines diverge markedly. On the assumptions of \( OL_1 \) output increases but at a retarded rate. The capital output ratio continually rises and eventually a maximum level of output is reached. This is the simplified classical case.

If the capital-output ratio is to remain constant at \( \frac{OK_1}{OY_1} \) as capital is accumulated then certain of the conventional assumptions (on which \( OL_1 \) is drawn) must be violated. Various possibilities exist. Given constant returns to scale and no

\[41\text{The concept of a constant state of technology is elusive. In this context, the pertinent concept is the classical one, i.e., of a given spectrum of techniques among which choice is possible. See above, pp. 71-78.}\]
technical change (in the conventional sense), it could result if the supplies of all cooperating factors were, in the long-run, perfectly elastic. If the production function includes only two factors, capital and labor, this means that in the historical long-run the effective supply of labor has to increase at the same rate as the stock of capital. In this case, the accumulation of capital has no effect on relative factor supplies, relative factor prices, or the optimum combination of factors. No substitution between capital and labor is induced by the process of growth. In terms of Figure 3 this means that as the capital stock increases from $OK_1$ toward $OK_2$, the labor force increases simultaneously, shifting the (conventional) production function toward $OL_2$. 42

The same result could be achieved with a fixed supply of one factor but a continuous modification of the aggregate production function through appropriate changes in the state of technology. That is, as capital accumulates, tending to increase output along $OL_1$, appropriate changes in technology could simultaneously shift $OL_1$ upward until when capital was

42It also implies certain assumptions with respect to the composition of output. Recognizing that aggregate output is in fact heterogeneous and that the production functions for the various individual items are not identical, constancy in the aggregate technical coefficients requires
OK_2 the production function was coincident with OL_2 (at least in the neighborhood of R_2). Then OP is effectively the long-run production function. This type of technical change has been called "neutral" technical change, being neither capital saving nor capital using in terms of marginal units of output. It might better be called "fully compensating" technical change: neither over- nor under-compensating for any tendency to diminishing returns. Clearly, the same result could be obtained by some combination of an increase in the labor force and compensating changes in technology. But it should be noted that inasmuch as the process of capital accumulation (and perhaps of labor force expansion) is presumed to be a continuous process through time, there must be a continuous stream of (on balance) compensating technical changes. No principle has been offered to suggest why this should be forthcoming.

An alternative possibility, of course, is the assumption of no technical change and a technologically fixed

either no changes in the structure of demand or only such changes as result in offsetting impacts on the various technical coefficients.

43 R. Harrod, Toward a Dynamic Economics, pp. 22-28; D. Hamberg, Economic Growth and Instability, pp. 33-37, 140-146.
capital-output ratio; i.e., of right-angled production isoquants. This can be demonstrated to involve the possibility of chronic unemployment or of a labor supply bottleneck (assuming on two factors in the production function), unless population and capital grow at the same rate.\(^4\) However, the assumption of no factor substitution in the long-run is probably unrealistic. The assumption of a constant capital-output ratio is, of course, not crucial to the argument of the neo-Keynesians. Similar conclusions can be derived from models involving varying capital-output ratios, as long as these ratios do not automatically adjust in the face of changing relative factor supplies. The constancy assumption commends itself because of its simplicity. Furthermore, there seems to be a general presumption that while not a necessary assumption it is not an unrealistic assumption. Various empirical studies have been cited as indicating that as an historical generalization it may be valid.\(^5\) Of course, the evidence cannot be conclusive. Considering the sectoral differences in capital-output ratios and the inevitability of

\(^4\)See D. Hamberg, "Full Capacity vs. Full Employment Growth."

\(^5\)See references in Hamberg, Economic Growth and Instability, p. 36.
structural changes in the process of growth, generalizations derived from the recent historical past of industrialized nations may provide an uncertain basis for projections, particularly in the context of the underdeveloped areas.

The analysis of the process of economic growth implicit in the neo-Keynesian growth models is basically classical. Deviations from the classical formulation of the problem are significant in some respects, but in the present context they must not be overemphasized. They relate primarily to the characteristics imputed to the long-run aggregate production function, which in turn derive from the assumptions made with respect to technical change and long-run factor supplies, and to the assumption made with respect to the reciprocal adjustability of behavioral and technical parameters. The shape imputed to the aggregate production function is only significant in terms of the shape of the growth path.\textsuperscript{46} The nonadjustability assumption is actually irrelevant in terms of the causal process, and has indeed been dropped in several recent formulations. However, it is significant of the distinction made between the "quantity of capital" and its productivity. While in the neo-Keynesian

\textsuperscript{46}Cf., Solow, \textit{loc. cit.}
model technical change is specifically introduced, it is as an exogeneous variable which affects the growth path. As in the classical analysis, the dynamic force is always the accumulation of capital in a quantitative sense.

IV. INTERNATIONAL INVESTMENT IN
THE NEO-KEYNESIAN MODEL

In the above section it was demonstrated that when the neo-Keynesian growth model is interpreted as a theory of economic growth, we have but an elaboration of the classical model. Different, nonclassical, growth-paths are derived by varying the constraints imposed on the growth process, but the concept of growth, the concept of capital, and the implied causal process is strictly classical. It is to be expected, then that the neo-Keynesian analysis of the growth impact of international investment will also be essentially classical. This aspect of the growth process has received slight attention in the neo-Keynesian literature. However, the few available comments on the problem are sufficient to establish this proposition.47

47Cf., Bruton, loc. cit.; Harrod, Toward a Dynamic Economics, pp. 101-115.
In the simple Harrod-Domar model of a closed economy, the potential growth rate \( g_c \) varies directly with the marginal propensity to save \( s \) and inversely with the marginal capital-output ratio \( v \). Expressed as an equation:

\[
g_c = \frac{s}{v}
\]

The impact of a net inflow of foreign investment is the same as an increase in the domestic marginal propensity to save: it serves to increase the potential rate of growth. The net inflow of funds is defined as the net difference between all the debit items and all the credit items in the current account of the balance of payments. If we express the debit balance as a ratio to income \( b \), then the maximum potential growth rate in an open economy \( g_o \) becomes:

\[
g_o = \frac{s + b}{v}
\]

presumably \( g_o \geq g_c \), given \( s \) and \( v \).

Clearly, this is but a reformulation of the classical analysis. The balance on current account is the classical capital inflow; it signifies as a net addition to the capital

\[48\] The ratio of the balance on current account to income \( b \) has been defined so that a positive figure represents a net inflow of funds. This follows Bruton's usage but is the reverse of Harrod's usage.
stock in the receiving economy. Hence, the significance of foreign investment appears to be its effect in relieving any quantity of capital bottleneck which might exist. Thus, in the model, v and b are assumed to be independent of each other. Ad hoc recognition has been given to the possible technological impact of international investments. Thus Harrod observes:

A revival of the international movement of capital may assist the natural rate of growth. It is assumed that the international movement of capital will be accompanied by an international movement of "know-how."\(^{49}\)

However, again, the technological impact and the quantitative impact are assumed to be two distinct and not necessarily related aspects of the process.

V. SUMMARY

This study is concerned with the process by which growth impulses are transmitted from one national economy to another, and, more particularly, with the role of international investment in this process. In this chapter the mechanism of growth

\(^{49}\)Harrod, op. cit., p. 114 (italics added). Harrod defines the natural rate of growth as "...the rate of advance which the increase of population and technological improvements allow." \textit{Ibid.}, p. 87.
transmission implied in the classical and neo-Keynesian growth models was reviewed. It was demonstrated that the theory of growth underlying these models is identical. The analysis of the growth impact of international investment derives directly from that theory. Growth is virtually identified with the accumulation of capital. A sharp distinction is made between the quantity of capital and the productivity of capital as determined by the state of technology and, to a lesser degree, by the quantities of other factors employed. In the modern version of the theory of growth, technological change is introduced explicitly. However, it is not systematically analyzed, but is incorporated into the model as an exogenous variable not intrinsically related to the other variables. Thus, in both the old and the new versions, the importance explicitly assigned to international investment is as a transfer of real resources; as a contribution to the process of capital accumulation in the receiving country.
Chapter VI

THE THEORY OF INTERNATIONAL INVESTMENT AND ECONOMIC GROWTH: DISSENTING VIEWS

Criticisms of the classical analysis of the role of private international investment in growth transmission are scattered throughout the literature relating to economic growth and particularly the economic development of underdeveloped areas. The bulk of these criticisms occur in the writings of those who, for one reason or another, have rejected all or part of the classical theories of growth and trade, particularly as applied to the underdeveloped areas. However, to a significant extent, the essence of such criticisms can be found, partly explicitly and partly implicitly, in the writings of the exponents of the classical analysis as "limitations on the model" or as "other considerations" which are presumably important but not amenable to systematic treatment within the framework of the formal model itself. Thus, the exponents of the classical model do not present it as a complete interpretation of the complexities of reality. The critics have focused attention on those complexities.
which have been omitted, including the nature and impact of imperfections in the international capital market.

In this chapter various of the critical views are reviewed and analyzed. This analysis provides the basis for the hypotheses presented in the following chapter.

I. NON-COINCIDENCE OF MONETARY INVESTMENT AND REAL TRANSFERS

In a recent article¹ John Knapp has questioned the classical assumption that net international investment, in the sense of a net deficit in the current account of the receiving country, always represents a net transfer of real resources (capital) and, hence, a net contribution to capital accumulation and economic growth. Indeed, Knapp argues that in a private enterprise economy there is a general presumption that net international investment will involve a negligible (if positive) contribution to capital accumulation and growth.

Knapp develops his argument around the concept of "excess borrowing." This occurs whenever there are imports of capital:

...which arise otherwise than in connection with a need to finance such supplies of goods and services from abroad as are, in a given state of tastes, techniques and available resources, and of given amount and composition of output and growth, both indispensable and unrequitable.2

The implication is that when excess borrowing exists, its elimination should have no adverse effect on the process of growth. Presumably, domestic savings would be adequate to finance the required level of capital formation, and the exports of goods and services would provide the foreign exchange required to pay for the imports dictated by the pattern of tastes, the availability of resources domestically, and the process of capital formation and income expansion.

The circumstances under which such excess borrowing could unequivocally be said to exist are not immediately obvious. Knapp suggests several cases. He argues that if involuntary unemployment exists any deficit on current account represents (at least in part) excess borrowing.3 Presumably,

2 Ibid., p. 432 (italics added).
3 Ibid., p. 437.
a reorganization of production could permit the displacement of the excess of imported goods by goods produced by the currently unemployed domestic resources. Similarly, excess borrowing may exist "...when domestic productivity is unnecessarily low" or when exports from the capital importing country have declined sharply because of unemployment in the principal export markets. In these cases the capital imports can be attributed to either the abnormally low productivity of domestic industry or the abnormally low level of exports, both of which factors presumably are due to causes which could be eliminated given a change in the capitalistic "rules of the game" without any resort to international borrowing. The flow of capital is necessary not because of the process of growth but because of deficiencies of economic organization. He cites the behavior of British capital exports prior to 1914 as evidence that this type of excess borrowing was historically important. In particular, he finds that failure of such capital movements to fall to zero in a period of declining export and import values to be significant. "In some periods of falling world activity

---

4 Ibid.
5 Ibid., pp. 436-438.
British capital exports actually rose. Knapp also argues that excess borrowing can occur in the absence of short-run employment lapses because of liquidity preference. Thus, he finds inconsistent with the classical growth-contribution hypothesis an apparent secular surplus in the United States' balance of international payments through 1914 if payments on account of interest and dividends are neglected. This surplus he interprets as evidence that no "real transfer" of resources accompanied foreign investment in the United States in this period. Except where interest and dividend payments contain an element of "...necessary and indispensable remuneration for entrepreneurial services rendered..." Knapp considers them to be pure transfer payments made necessary by the "rules of the game" and magnified by the "magic" of compound interest. He argues that the bulk of the capital imported to the United States at this time "...was a reflection of the underdeveloped state of her banking system and capital market." In an aggregative sense, domestic savings were adequate to finance the level of capital formation.

---

achieved providing the financial organization of the economy had been adequate to mobilize it. Capital imports, then, contributed nothing in the aggregate to "real capital formation" and "...may well have reflected nothing more than a costly process of satisfying the financial system's preference for liquidity." If the inflow of capital funds contributed nothing to real capital formation the subsequent payments of interest and dividends did not reflect the productivity of real capital invested. It represents a potentially avoidable net drain on domestic resources.

Knapp's argument is not always clear being hedged with qualifications and exceptions, and the factual basis of it is not totally conclusive. However, even granting the statistical foundations and giving his conclusions the interpretation noted above, the analysis loses some of its interest because it is couched in terms of formal aggregative identities. The fundamental criterion which Knapp proposes as determining whether or not particular capital imports are "excess" is whether the elimination of these capital imports would adversely affect "real investment and consumption." Unless we could assume a frictionless (Say's law) process of

9Ibid., p. 434.
adjustment in the economy involving perfect fluidity of all resources and commodities, it is probable that a cessation of foreign borrowing even in a period of pronounced unemployment would adversely affect "real consumption and investment." In historical reality, frictionless adjustment is non-existent; not only because of the "rules of the game" (on which Knapp seems willing to place all of the blame) but also because of "real" structural rigidities. This applies also to the analysis of excess borrowing for liquidity purposes. Unless the alternative methods of building liquidity were real alternatives, the charge of excess borrowing is difficult to substantiate.

Knapp recognizes this. He notes:

There may well...be an important sense in which any excess borrowings in the nineteenth century, and later, may be regarded as having been necessary in some sense.

...variations in the desire of British and other investors to lend abroad may have had an important causal role in growth, in providing finance which enabled investment to proceed. Conversely, finance could at times be a bottleneck.10

10 Ibid., p. 436.
However, there is a clear suggestion that these are exceptions. And, in any case, the historical causal significance of international investment is in itself a product of the system of economic organization—the "rules of the game."

If no real transfer occurred a different set of rules (i.e., socialist rules) would have made the international investor unnecessary.

Knapp's argument can be interpreted in this respect as a criticism of nineteenth century capitalism in its international aspects. In objecting to the classical assumption that capital imports necessarily involve a transfer of "real resources" and, hence, a contribution to capital formation and growth in the receiving country, he is suggesting that the "rules" of capitalism induced financial transfers which were unnecessary in terms of the growth of the economy. The result was the assumption of external financial burdens which were unnecessary and which tended to increase as additional borrowing occurred, permitting payments of interest on the existing debt but raising the interest burden in the future. However, as in the classical analysis, by focusing attention on ex post statistical or accounting aggregates, Knapp ignores problems of causation. The broader ramifications of the process of international investment are pushed aside and lumped
together as "other factors," including "technology" and "entrepreneurship." 11

In a somewhat different context H. W. Arndt has suggested the necessity of modifying the theory of international investment in light of the Keynesian analysis of the investment decision. 12 In the classical theory, the direction of capital flows is presumably governed by relative factor endowments as reflected in differential rates of interest. However, the rate of interest reflects conditions in financial markets, including a number of considerations besides the basic demand for funds to finance real productive investment. By concentrating on so-called "real" phenomena, characterizing monetary and financial phenomena as a veil obscuring the underlying "real" transactions, the classical analysis deliberately discards consideration of possible aberrations resulting from adjustments in asset positions. In any given case, while the money rate of interest may be very high, the "real" rate of interest in the Wicksell-Hayek sense (Keynes' marginal

11 Ibid., pp. 435-436.

efficiency of capital) may be very low, inducing a low rate of actual capital expenditures. What is significant in the growth process is the volume of such capital expenditures.

On the international as well as the intranational level, securities transaction may occur in great volume, reflecting adjustments made by various persons and institutions in their asset portfolios with no necessary direct connection to any capital expenditures. Such transactions would show up in the balance of payments as a classical capital movement, but if there is any growth significance it is strictly permissive. That is, by relieving any potential balance of payments disequilibrium and by increasing the aggregate of funds available, and hence lowering the interest rate, it may permit a higher level of capital expenditures. However, it may also permit an increase in consumption or, as Knapp argues, only lead to an increase in liquidity. Such security purchases presumably derive from desires for interest income, capital gains, or some combination of the two. As Cairncross has argued, such investments are probably growth-attracted rather than growth-stimulating. Broad based expansion in any

---

economy clearly reduces the default risk associated with particular securities, making them much more attractive assets.

Knapp is far too willing to reject the possibility of a positive growth contribution on the part of the capital flows of the nineteenth century. He is too anxious to condemn the "rules of the game." However, the above analysis suggests that his conclusion that there is no necessary connection between capital movements and real investment is important. In analyzing and assessing the growth impact of international investments it is necessary to distinguish between "portfolio" investments and direct capital expenditures by foreigners or foreign controlled firms.

II. CAPITAL ACCUMULATION
VS.
TECHNOLOGICAL CHANGE

The classical theory has been subjected to much criticism on the grounds that it places excessive emphasis on "real" capital transfers and "real" capital accumulation. This type of criticism is not new. One of the most penetrating (but, of course, not the first) evaluations of the formal classical growth model from this point of view is contained in a 1934 article by E. Cannan. While noting the lack of precise agreement on the meaning of the concept of capital, Cannan accuses the classical economists of a "somewhat excessive glorification of capital" as commonly defined and its role in the growth process, and of a failure to distinguish between capital as a factor of production and what he calls the "heritage of improvement." In this latter concept Cannan comprehends the whole of what is commonly called the industrial and social technology of industrial society:

...the net economic advantage which we and other generations who came late in the history of mankind, possess in consequence of what has been done by mankind in the past,

including:

(1) ...the knowledge and skill produced by research and experience and transmitted from each generation to the next by books and other instruments, by oral instruction and by mere limitation.

(2) ...the organizations of various kinds which enable large numbers of people, practically the whole of mankind alive and adult at the same time, to cooperate in production.

(3) ...such man-made alterations in the arrangement of matter as have made the outer crust of the earth more suitable for our needs, and have given us buildings, machinery, and such other man-made objects as are still useful.15

This is certainly an omnibus concept, comprehending virtually all aspects of human economic action except motivation itself! For this reason its use as an analytical tool is limited. Yet, as a basis for criticism of the formal classical model it has wide appeal. Thus, in a similar vein, 

15 Ibid., pp. 381-382. His analysis of the roots of the classical error is interesting. Its kinship to institutionalist criticism is obvious. "Much of the difficulty of economic science in our day arises from the fact that the 'political economy' of the eighteenth and nineteenth centuries tried to explain the very elusive thing, namely, national economy, and also something wider, namely, the economy of isolated society or mankind at large, by beginning with individuals in the existing conditions and then combining the individuals into the 'nation'
Cairncross has recently noted that assuming a savings-income ratio of 0.1 and a marginal real rate of return on capital of 5%, the maximum possible rate of growth (even assuming absence of any tendency to diminishing returns to capital) attributable to unassisted capital formation is 0.5%. Since the actual rate of growth in advanced countries is normally estimated at 2-3%, other factors must account for growth:

Whatever may be true in the past, it is now technical innovation—the introduction of new and cheaper methods—that dominates economic progress.16

Similar comments are encountered frequently in the literature. At times emphasis is placed on technical change in a narrow sense and at times on broad social changes involving all of the non-material components of Cannan's heritage of improvement.17 This has led to the suggestion that for purposes of studying economic growth we really ought to

or 'society' without ever trying to work backwards from society to the nation and the individual' (p. 381).


"At first sight the problem might appear to be merely one of introducing new methods of production, and the instruments, tools or machines appropriate thereto. But what is really involved is a vast change in social beliefs and practices...." (p. 22).
define the concept of capital so as to encompass a broad range of "human" or "social" capital. Kuznets has expounded this view on a number of occasions, proposing to include in the broad concept of capital

...all goods held by consumers and all resources (e.g., education and training) making for a more efficient labor force—a society capable of grasping the potentialities of technical progress....

...capital invested in human beings and in the whole economic and social structure that conditions the use of plant and equipment.\(^{18}\)

The issue is complicated by the stress placed on the coincidence of capital and technological flows in the case of at least part of the flow of foreign investment. Noting the problems of estimating capital formation (in the classical sense) and rates of growth in output for in many countries for periods far back in history (and for some countries even in relatively recent historical periods), Kuznets suggests that on the basis of available information:

...it seems reasonable to guess that international capital movements even at their height accounted for only a limited

---

fraction of world gross capital formation and a minor fraction of total world output;\textsuperscript{19}

to which Domar replied:

The mere fact that, as Kuznets shows, international capital movements have been relatively small...need not imply that they have been unimportant, particularly for the receiving country. Foreign capital has brought within new techniques and new management....\textsuperscript{20}

Is the major significance of foreign investment then to be found in the technological impact?

Domar adds another consideration: "Foreign capital... has been frequently invested in highly strategic industries."\textsuperscript{21} In this fashion, presumably, they serve to ignite a chain-reaction of development throughout the economy—to start the "cumulative process" of "self-sustaining growth." But again, the emphasis is not placed on the actual impact via capital accumulation, but rather on the broader aspects

\textsuperscript{19}S. Kuznets, "International Differences in Capital Formation and Financing," p. 41. See also C. Wolf and S. Sufrin, Capital Formation and Foreign Investment in Underdeveloped Areas (Syracuse: Syracuse University Press, 1955), p. 54.


\textsuperscript{21}E. D. Domar, \textit{loc. cit.}
of the investment flow. To neglect these would result, according to the testimony, in a neglect of the main significance of international investment in growth transmission.

III. THE LEVEL OF AGGREGATION APPROPRIATE TO GROWTH ANALYSIS

One characteristic of the classical growth model which leaves it open to significant criticism is the level of aggregation involved. It has been suggested that more attention must be paid to structural changes in the economy in the process of growth. Two broad reasons can be advanced in defense of this proposition. On the one hand, it has frequently been argued that all economies undergo a similar pattern of structural evolution in the process of growth. This


suggests a structural "law of growth." While the available evidence is not adequate to establish the existence of any such universal law it is highly suggestive of changing structural patterns. Consideration of such structural sequences must be particularly important to the economic planner.

On the other hand, and of more immediate interest, structural analysis yields important insights into the mechanism and processes of growth and growth transmission. If the economy is viewed as part of a social system which has a tendency to maintain its structure, then an important theoretical and empirical question is obviously the nature and source of the growth generating, equilibrium destroying force. In particular, the question might be posed: To what extent, and under what conditions has international investment served to develop a "leading-sector" in the growth process? It may be that international investment has usually followed growth or has been growth stimulating only under very special circumstances. On the other hand, it may be that it has commonly served to open "highly strategic sectors" in terms of the growth process. These are important questions in any causal analysis of growth transmission. Clearly, their systematic analysis requires a much greater degree of disaggregation than is provided by the classical model.
IV. MARKET ALLOCATION BIAS

Implicit in the classical model is the assumption of a perfect international capital market. In accordance with the emphasis on the flow of "pure capital" in response to interest rate differentials, the market is presumed to involve borrowers and lenders. The assumption of market perfection implies atomistic competition on both sides of the market, and the possession of equal knowledge of alternatives and prospects on the part of all potential borrowers and lenders. Differences in interest rates negotiated at a given time on loans of a given maturity, then, presumably reflect an insurance premium against (insurable) risk; as will the differences between yields on equities and long-term bonds. The borrowers are presumed to be motivated by possibilities of a profitable expansion in production facilities. Hence, the fact that funds go to the highest bidder (risk considered) would be prima facie evidence that capital is allocated in a fashion calculated to make a maximum contribution to world productive capacity.

In general:

...because interest has to be paid for, and can be gained by the use of capital ...those long and roundabout methods,
which involve much locking up of capital, are avoided unless they are more productive than others.\textsuperscript{24}

And:

We are safe in regarding additions to the material equipment of society with complacency as a rule because, barring mistakes, neither individuals nor institutions add things which are not useful, and mistakes, though frequent, are the exceptions rather than the rule.\textsuperscript{25}

That this type of analysis engendered optimism with respect to the efficacy of private international investment in stimulating growth in the underdeveloped areas of the world can hardly be doubted. If the problem of underdevelopment is regarded as essentially a problem of relative scarcity of capital, and if this relative scarcity of capital is presumed to be reflected in high (real and monetary) rates of interest, then a free, relatively perfect international capital market should be an efficient mechanism for eliminating the problem. This optimistic attitude is still prominent in the thinking of many economists. The stimulation of private international investment flows is widely regarded as the most efficient approach to the contemporary problem.\textsuperscript{26}

\textsuperscript{25}E. Cannan, \textit{op. cit.}, p. 390.
\textsuperscript{26}For example, see D. B. Marsh, \textit{World Trade and Invest-}
This position has received significant criticism in the post war period. In discussions of the limitations of private international investment as a vehicle for international growth transmission two distinct lines of argument can be detected. One is rooted in the classical tradition, finding the source of the problem in the disorganization of the market and in the various political and institutional impediments to free transactions on capital account throughout most of the world. The current problem is perceived simply as a product of history: as a result of an unfortunate chain of events. In the other view the problem is more fundamental, an inherent bias in the workings of the market mechanism which, even in the absence of these political and institutional barriers, serves to minimize the growth impact of private investment flows. While our primary interest is in the latter of these arguments, we will first give brief consideration to the former one.

The proposition is widely accepted that in the two or three decades prior to 1913 the international capital market attained as near perfection—in the theoretical sense—as is conceivable.\(^7\) The development of the international capital market was reciprocally related as cause and effect with the development of an integrated international economy. The flow of investments served to "open-up" and promote the development of industry in the then underdeveloped areas of the world, and the integration of these areas into the world economy made the investments secure and profitable, thus insuring a continuation of the flow. International specialization presumably

\(^7\) For an explicit statement of this see M. M. Postan, "Recent Trends in the Accumulation of Capital," The Economic History Review, Vol. VI (October 1935), pp. 1-12. Less extreme, but analogous statements appear in most textbooks in international trade. That this is probably an historically naive supposition seems more and more apparent as the nineteenth century capital market is more closely analyzed. The instances of government pressure, influence and direct channeling of funds were more widespread than a "perfect" market would allow. Nurkse suggests that "...the bulk of international investment in the nineteenth century depended on government action in the borrowing country." "International Investment Today in Light of Nineteenth Century Experience," Economic Journal, Vol. LXIV (December 1954), pp. 744-758. Similar government action occurred in capital exporting countries, especially France and Germany. Furthermore, direct investments in many areas involved extensive monopolistic privileges, limiting the force of competition in developing resources in these areas. Cf., H. Myint, "The Gains from International Trade and the Backward Countries," Review of Economic Studies, Vol. XII (1954-55), p. 132.
followed the pattern of comparative advantage, with both trade and factor (labor and capital) movements contributing to the maximization of world income and the narrowing of international income differentials. The results have often been idealized (rightly or wrongly) as the "golden age of capitalism": as a period of internationally expanding trade and production; of cosmopolitanism and multilateralism in politics; of freedom of enterprise, competition and trade; of a refined, semi-automatic international gold standard mechanism; of maturation in such crucial institutions as the limited liability corporation, conservative international banking houses, and sensitive international financial markets; and above all of rapid technological change and capitalization in industry.

The decline of this supposed "golden age" has been attributed to various factors, all of which are presumed to have had a cumulative destructive effect on the "old order": the economic devastation and disruption that accompanied World War I; the weakening of cosmopolitan ideals in the peace treaty and its aftermath; the emergence of the United States as the world's economic leader and primary creditor before it had time to develop "traditions and institutions"
appropriate to these roles; the severity and duration of the international financial crises and trade depression of the 1930's; the resulting virtually complete repudiation of cosmopolitan ideals and the ascendancy of political nationalism coupled with economic interventionism; the new devastation and dislocation that accompanied World War II; the politics of the cold war stalemate; etc. As a consequence the international flow of private investment, after a resurgence in the 1920's, stopped in the 1930's. The recovery in this flow after World War II was only partial, particularly private investment in the very low income areas. As a result, much emphasis has been placed on the development of governmental and international agencies as alternative sources of funds and related developmental aids.

Partly as a result of this type of development directly reflecting the pattern of exchange controls and political alignments, the post-World War II international capital market displayed a definite pattern of compartmentalization. Certain areas of the world received substantial amounts whereas other areas received scarcely any funds. The not insignificant flow of private and official funds from Western European countries was directed almost exclusively toward their dependencies. The connection between the United States and
parts of Latin America and Canada has often been commented upon. Aside from investments in a few extractive industries, most of the private funds have gone to industrialized or semi-industrialized areas. The so-called "neutral" countries of south and southeast Asia have attracted little investor attention. Furthermore, "traditional" forms of private investment, via fixed interest securities, have become relatively unimportant, and certain "traditional" types of investments, e.g., in public utilities and transportation systems, have virtually ceased. By and large it is agreed that private international investments are not providing the world-wide growth stimulus that is politically desirable and that the prospects for the improvement of this situation are at best uncertain.28

To the general thesis of an historical disintegration in what was once a highly organized international capital market, proponents of the second line of criticism would undoubtedly acquiesce. However, they seem to suggest that this

is not necessarily an unfortunate turn of events. Indeed, their writings reflect cynicism with respect to the growth impulse transmitted to the underdeveloped areas via the free international capital market under the most favorable circumstances. The prototype of this cynicism can be found in the notions of economic imperialism and the "colonial pattern" of development, of which Marxist and neo-Marxist writings contain a large element. The empirical basis of cynicism is clearly revealed by Professor Rosenstein-Rodan in two widely quoted essays. Reflecting on the experience of the past 100 years, he observed that while:

...in the most advanced parts of the world, there was a considerable increase in wealth, and all classes had an equal share in the additional amounts of goods and services produced....

internationally, the disparities in wealth were accentuated. The different results he attributes to the beneficial effects of governmental policies within the advanced countries and the absence of such arrangements between countries.

---

Since the "economic forces," the automatic mechanism of supply and demand, the movement of population and capital between the different parts of the world, failed to achieve over a hundred years what was expected of them, there is no doubt that they must be regarded as having had their chance and that many people have lost patience waiting for a solution by this means.\(^30\)

Underlying the thesis that there has been a cumulative widening of income differentials even in the nineteenth century is the argument that international private investment, while perhaps not retarding growth, certainly did not instigate a cumulative process of economic growth in many areas of the world. These areas included all of the non-western world in which there existed innovation-resistant and non-extermirable indigenous civilizations. These areas were not always natural resource poor: indeed, the volume of investments and the marked expansion of export trade after the "opening-up" is testimony to the fact that resources were in fact rapidly and highly developed.\(^31\) Foreign investment in these areas involved mainly the establishment of foreign


\(^{31}\) Myint, op. cit., p. 129.
controlled businesses. But rather than stimulating a broad based expansion throughout the economy, these investments led to the formation of "economic enclaves": integrated economic units territorially within the indigenous economy but functionally largely distinct from it. The "enclaves" were export oriented based on extractive industries. The main contact with the indigenous economy was via the extensive use of labor drawn from that source and perhaps via sales of imported items. By and large the native labor was unskilled and tended to remain so. Such expansion as was stimulated in the indigenous economy failed to establish a cumulative pattern of economic growth but only an increase in population. Probably little change occurred in conventional standards of living.

In this sense, the foreign investment was resource-attracted and resource developing. The very rapid expansion

in export trade induced little expansion in investment for domestic production. Myint has argued that the exploited resources represented "surplus productive capacity" prior to the foreign investments, i.e., they represented resources which had not been effectively integrated into the domestic economy either because they were not needed given population size and conventional living standards, were not known, or, relative to technology, were not useful. In this case:

...the contributions of Western enterprise to the expansion process are mainly to be found in two spheres: the improvements of transport and communications and the discovery of new mineral resources. Both are methods of increasing the total volume of resources rather than methods of making a given volume of resources more productive.  

On this assumption, Myint has argued that the so-called crude "vent-for-surplus" theory of foreign trade commonly associated with Adam Smith is really more adaptable to the explanation of the development of export trade in these

---

33Hla Myint, "The 'Classical Theory' of International Trade and the Underdeveloped Areas," Economic Journal, Vol. LXVIII (June 1958), p. 325. Myint notes: "...once the opening-up process had got into its stride, the export production of these countries expanded very rapidly, along a typical growth curve...." Ibid., p. 325.
countries than is the more refined but static comparative
advantage theory.\textsuperscript{34} In a different context, Romney Robinson
has also attacked classical explanations of trade in terms
of different factor endowments.\textsuperscript{35} After demonstrating the
inconclusiveness of the Ohlin-Hecksher type of argument
that each country will specialize in the production of goods
which are intensive in factors of production relatively
abundant in that country even on the assumptions that it is
possible to define a group of distinct factors of production
and that the supplies of these are fixed, Robinson goes on
to argue that in a dynamic context such assumptions are
meaningless. The argument hinges on the concept of a fac­
tor of production, which he defines:

\ldots in its production function sense—an
agent ready to furnish a flow of services in co-operation with those of other
agents.

In this sense:

Natural resources are not factors. A
natural resource becomes a factor only

\textsuperscript{34}Ibid.

\textsuperscript{35}R. Robinson, "Factor Proportions and Comparative
after some measure of preliminary investment work has been done upon it.36

Viewed in this way, international trade is important not because of a redistribution of existing factors of production to achieve maximum world production (with given production functions) but because of "...its overwhelming stimulus toward the development of new productive agents through investment, until in time a country may be entirely transformed through the fact of international trade.37 The crucial matter in the determination of conditions of comparative advantage then is the "willingness of entrepreneurs to undertake investment work."38

Applying Robinson's analysis to the present problem, the nature of the bias implied becomes evident: investment has served to develop indigenous natural resources into effective factors of production but have not served to transform indigenous labor into more effective factors of production. For this reason the people have remained "backward" although the natural resources may have been highly developed.39

36 Ibid., pp. 347-348.
37 Ibid., p. 360.
38 Ibid., pp. 362-363.
39 H. Myint, "An Interpretation of Economic Backwardness." Such an interpretation is clearly consistent with the discussion
This distinction may be significant and may cast more light on the problem than the parallel analysis commonly made, e.g., by Nurkse and Ohlin. Nurkse suggests that the difference between capital flows in the nineteenth century and those today is that in the early period capital and labor moved in a complementary fashion to the "semi-empty" areas of the world which were rich in natural resources, whereas today capital movements are expected to substitute for (reverse) labor movements. Unfortunately, however:

...capital is being urged to go out to work with people that have not grown up in a capital minded milieu, and may not be culturally prepared for the use of western equipment, methods, and techniques.

The outlook is, therefore, not too favorable.

This analysis, would seem to imply that the lack of prior development in these areas in response to foreign investments had its roots in this same phenomenon. Only capital moved to such areas, and that to an unfavorable cultural environment. Labor existed as the abundant factor. But this

---

of investment and "capital formation" in the process of economic growth in Chapter III.

41 Nurkse, op. cit., p. 746.
is clearly not always the case. Myint has argued that prior to the "opening up" most of the present underdeveloped areas were actually "semi-empty." The remarkable expansion of production for export he takes as evidence of the abundance of natural resources.\(^{42}\) The opening up was generally followed by a marked rise in the labor-force: partly through a population "explosion," notably China and India.\(^{43}\) Furthermore, there can be no doubt that labor was recruited even in the west; i.e., what Ohlin calls "technical labor."\(^{44}\) This is the essence of the "enclaves" from the social point of view.

Having defined the nature of the bias, explaining it is more difficult. Two elements have to be explained: (1) why all of the developmental investment was oriented toward export (primarily of primary products), and (2) why development of such industries had little growth-stimulating effect on the rest of the domestic economy. In very general terms, this would seem to involve an analysis of the actual mechanism by which the world economy expands, and particularly the

\(^{42}\)H. Myint, "The 'Classical Theory' of International Trade and the Underdeveloped Areas."

\(^{43}\)Ibid.

\(^{44}\)Ohlin, op. cit., p. 350.
relation of this mechanism, its organization and motive power, to conditions existing in the underdeveloped areas. Classical growth theory may seem to suggest a simple explanation in terms of the profit maximizing behavior of private entrepreneurs. Thus, within the classical static framework, if we consider technical and unskilled labor as two distinct "factors of production" and take market conditions as given, we could argue that (historically) such investments were adapted to take maximum advantage of the "existing factor endowments"; the coincidence of abundant exportable resources and unskilled labor. However, such an analysis clearly neglects the dynamics of the problem: why secondary repercussions did not occur; why foreign investment was not attracted to production for the domestic market; why subsequent "upgrading" of labor did not occur; why, when unskilled labor was scarce, additional supplies were imported.

To adequately explain these phenomena surely we must go beyond the typical classical conceptualizations. Various

45Concerning this analysis, Robinson notes: "...if we agree with Hicks that 'the place of economic theory is to be the servant of applied economics,' perhaps it is not unreasonable to express dissatisfaction with a theory so prolific with after-the-event wisdom, and yet so inscrutable toward underdeveloped countries, anxious to learn something of what their future export-import pattern will or should be." R. Robinson, op. cit., p. 174.
empirical generalizations (broadly within the classical framework) relating to the "climate" for investment directed toward the domestic market have been offered to explain these phenomena. It is commonly argued, for example, that the marginal (revenue) productivity of investments in the indigenous sector are so low as to make such investments unprofitable. Indeed, once the exportable resources of the underdeveloped areas have been developed, it has been suggested that capital should tend to flow from the underdeveloped areas to the industrialized part of the world where the marginal efficiency of capital remains high because of rapid technological advance.

The low marginal efficiency of capital in the underdeveloped areas has been attributed to various causes. Nurkse has stressed the limited scope of the domestic market (in


47 Arndt, loc. cit.
terms of purchasing power) which presumably limits the opportu-
tunities for investment in domestic production and prevents
the exploitation of possibilities for increasing returns.48
Others have stressed the lack of "social overhead capital"
—educational facilities, transportation and communication,
systems, financial institutions, etc.—which restrict the
area of profitable private investment. Development of such
social overhead facilities requires extensive investment at
low apparent rates of return and, hence, is not attractive
to private concerns. In part, then, the argument in this
case is essentially the same as in the first case: the
limited market makes such capital intensive projects unfavor­
able from the private investor's point of view, even though
the "social returns" may be potentially great.

This analysis has also been supplemented with the hypo­
thesis that modern western technology is not readily adapt­
able to conditions prevalent in the underdeveloped areas.49

48 Nurkse, loc. cit.
49 For example, see Bruton, op. cit., p. 336; Frankel,
loc. cit.; H. Myint, "An Interpretation of Economic Backward­
ness"; R. Nurkse, "International Investment Today in Light
of Nineteenth Century Experience"; Singer, loc. cit.
Such an argument might be offered on any of a number of grounds. The allegation of cultural resistance to the "discipline of the machine" has already been referred to. This case might be better conceptualized as implying the absence of specific complementary factors of production, using the concept of factors in the sense that Romney Robinson proposes. In terms of the static classical framework the marked differences between factor endowments in the developed and underdeveloped areas implies that the specific industrial techniques\textsuperscript{50} of the former are not appropriate to the latter. However, the arguments do not provide a clear explanation of the export bias in such investments. Again, however, the argument can be supplemented by the hypothesis that it is the limited extent of the market which, by limiting the apparent profitability of applications of mass production techniques, is crucial in restricting the flow of domestically oriented direct investment.

Such assumptions are virtual denials of the theory of production implied in the classical growth model. In particular, they deny the postulates that at any given time, and in

\textsuperscript{50}Actually two arguments may be intertwined here: (1) that in a static sense, factor endowments are such as to make a transfer of techniques impossible and (2) that in a dynamic
any given "state of knowledge," the maximizing entrepreneur is faced with a continuum of alternative production techniques involving different combinations of the factors of production, and that in surveying the field he chooses that technique which is most appropriate to existing relative factor prices (which, of course, reflect existing relative endowments). This suggests that potential investors are really not flexible in the selection of methods to be employed to produce a given product, either because of personal inflexibilities (i.e., "habits" or nonrational behavior patterns) or because of real (technological) inflexibilities in the production process. However, this latter possibility does not seem consistent with the observation that various specific techniques for producing a given product do in fact coexist; and these vary in "relative factor intensity."

Again, the problem may lie in the classical conceptual framework—in the simplifications involved in the concept of a few homogeneous factors of production and in the distinction made between changes in production methods derived from changes sense, cultural patterns prevent the development of essential complementary factors. On the latter, see Hla Myint, "An Interpretation of Economic Backwardness."
in the state of technical knowledge and those derived from changes in factor prices. If Romney Robinson's analysis of investment as a process of developing specific factors of production is accepted, then this latter type of change in productive methods loses its uniqueness. It requires static assumptions of qualitatively unchanged factors. This is essentially the same point made in Joan Robinson's criticisms of classical production theory.\(^{51}\) If we view technical change as a one way process in which the possible adaptations to the environment are virtually unlimited because the process of technical change involves a process of changing the physical characteristics of that environment, then the problem of technological nonadaptability must be rooted in the behavior of investors; in a systematic bias in "entrepreneurship" or "creative imagination" applied to investment decisions.\(^{52}\)

It might also be noted that the hypothesis of the nonadaptability of western technology implies that the scale of production operations involved in such investments is for

\(^{51}\)See above, pp. 71-77

some reason fixed at the level currently applicable to western conditions. But, the significance of the limited extent of the market would not seem to apply with equal force to small marginal additions to productive capacity, unless it is postulated that there exists no margin above subsistence, or that population growth will absorb any income increases that occur. But even in this case, an absolutely expanding market exists. Also, this does not offer an explanation of why the early and dramatic expansion of the export industries did not induce domestic investment, unless either this population growth hypothesis applies, there was no significant increase in income in the indigenous sector as a result of the expansion of the export sector, or all of the increased income was devoted to imported goods (but why then did not import-replacing industries develop) or to goods and services requiring little investment (including "nonproductive" assets).

Such arguments offer clear support for the thesis that some measure of domestic growth stimulation must occur (income per capita must be rising) if foreign investment is to be attracted. They also offer support for the prescription of a massive "balanced-growth" policy. However, the implication that no significant opportunities exist for investment
may be extreme. Much of the discussion of western development suggests that the opportunities are often "made" by the investor. In this sense, investment is made on the basis of creative imagination.

While analysis based on an exploration of the characteristics of the market and of the "climate" for investment in the underdeveloped areas, cast much light on the problem, it is contended here that an adequate explanation of the bias of the free international capital market must also derive from the theory of the firm, and particularly that part of the theory of the firm which deals with its growth and expansion. By the "theory of the firm" is meant the theory of the firm as a "going concern"—as an organization—not, as in orthodox economic analysis, the calculus of profit maximization under given cost and demand conditions for single products. The general problem is how the investment decision is made; what motivates it and what restrains it.

The emphasis on the theory of investment by the firm may seem inappropriate. It is assumed that the growth contribution of portfolio investments will not be crucial in many

---

cases. And even in these instances, where the domestic incentive to invest is strong and foreign financing relieves a potential balance of payments constraint or provides ease in the financial markets, the actual contribution of the foreign funds is permissive. Active growth stimulation from abroad comes through direct investments. Clearly, even given this assumption, international investment could take the form of the organization of new firms by groups of individuals. In some instances, such as those in which the capitalist migrates with his funds, these investments may be important. However, given the legal complexities of international investment and the unusual risks which may be involved, it seems reasonable to assume that the major prospects for growth-stimulating international investment lie mainly in the creation of branches and subsidiaries by existing firms.

To this extent, then, the problem lies within the field of microeconomics. This aspect of economic theory is in a state of flux.\footnote{Cf., J. R. Meyer and B. Kuh, \textit{The Investment Decision} (Cambridge, Mass.: Harvard University Press, 1957), pp. 6-22.} The simple profit maximizing model, implying perfect knowledge of all future developments relevant to the determination of the revenue stream deriving from the investment, is clearly unacceptable. Likewise, inasmuch as the
The crucial fact is that decisions must be made on the basis of expectations of future developments, and, by the nature of things, such expectations must be formed in a condition of uncertainty. In this sense, what the decision makers are doing is to choose among possible courses of action (including inaction), the outcome of which are not, and
cannot be, known, but about which they presumably have several hypotheses—a series of outcomes which they consider to be within the realm of possibility, none of which can be definitely disregarded as irrelevant because impossible, and yet none of which stands out as uniquely "almost certain." It is in this environment that a decision, a commitment to future action, must be taken.

Clearly, the investment decision must involve several elements: an incentive or goal; the perception of an opportunity or series of opportunities; the evaluation of possible alternative outcomes; the decision to act; the formulation of plans; the acquisition of funds; the actual carrying out of the plan; and, of course, possible revisions in plans as the project unfolds. Each of these elements of the total act are significant for the outcome. A complete theory of investment would have to encompass all; it would have to explain the regularities apparent in behavior of "investors" as this bears on each of these elements. From our present

---


56 For a notable attempt to synthesize information bearing on many of these aspects of the investment decision in underdeveloped countries see H. G. Aubrey, "Investment
point of view, such a theory is important for any insights it might provide into why private investment has not been attracted to create facilities for production for the domestic market in underdeveloped areas: insights more profound than those provided by the simple statement that the marginal efficiency of capital is low in these areas. The market bias, if it exists, must derive to a significant extent from the process by which private investment decisions are made.

Such a theory, as a theory of human motivation and behavior, must be most complex, and, in a sense, "noneconomic." It would be presumptuous to even sketch such a theory (particularly as applied to international investment) without much more detailed empirical analysis. However, certain recent empirical findings in the behavior of firms are suggestive of at least the question to be posed.

A major aspect of the investment process is the perception of opportunities. Even assuming the existence of a profit motive or some similar expansion-promoting objective  

---


57 Diversification or "empire building" may supply alternative motives. E. T. Penrose has suggested that by developing suitable "managerical resources" the growth of a
and the existence of opportunities, it may be that for some reason such opportunities are systematically overlooked or ignored. In the absence of detailed information on how investment opportunities are uncovered and assessed, it does not seem improbable that national boundaries do constitute significant barriers to acute perception of opportunities at least on the part of firms without established operations in foreign lands, and that for this reason a systematic oversight may exist.

On the basis of a study of certain United States' direct investments in Australia, E. T. Penrose has observed that:

...the growth of foreign investment through the reinvestment of retained earnings by firms is subject to different influences than those determining the inflow of foreign investments from other sources. Once a firm may have a cumulative internal logic of its own, at least where management is "imaginative, flexible and ambitious." See E. T. Penrose, "Limits to the Growth and Size of Firms," American Economic Review, Papers and Proceedings, Vol. XLV (May 1955), pp. 531-543. On the other hand, essentially conservative goals sometimes attributed to at least established firms would seem to militate against such expansion. See Meyer and Kuh, loc. cit.; and A. G. Papandreou, op. cit., pp. 205-213. However, concern over "market share" might induce investment as a result of prior expansion by rivals.
foreign firm is established its continued growth is actually an increase in foreign investment, but an increase which is more appropriately analyzed in light of a theory of the growth of firms rather than a theory of foreign investment. 58

Clearly, the cost of discovering pertinent market information must be greater in the case of expansion into an unfamiliar market than expansion within a familiar market. The very fact of remoteness, geographical and cultural, would accentuate this in the case of international expansion. Furthermore, Penrose suggests that less confidence tends to be placed on information provided by outsiders (e.g., market consultants) with no immediate experience within the firm than in information provided by insiders. 59 Thus she argues that "experienced managerial services" constitute the really important short-run limit to the expansion of any given firm. Specifically, she has reference to "experience within the firm," but her general argument would seem to extend to experience within a general market context as well. Thus, she argues:


59 E. Penrose, "Limits to the Growth and Size of Firms," pp. 534-535.
There is little doubt that experience in a given environment does increase the ability of individuals to deal effectively with that environment, to anticipate and provide for circumstances they might otherwise have overlooked.\(^{60}\)

This would seem to suggest that market penetration on a commercial level would be a normal preliminary to investment activity, that participation with local businessmen would be useful, and that original penetration would involve largely a duplication of the product lines and production techniques of the parent firm. Once established, however, the foreign subsidiary may begin to assume a character of its own. Furthermore, it suggests why concentration of foreign investments in export-oriented industries has been so frequently observed. The export market is a familiar market. The advantage to be gained by production in foreign locations is a very powerful cost advantage, not a less obvious market-potential.

V. SUMMARY

In this chapter certain criticisms of the classical analysis of the role of private international investment in international growth transmission were reviewed and analyzed. The important conclusions of this analysis can be briefly summarized. If we are interested in the causal process involved in growth transmission, it is necessary to distinguish between international financial transactions in securities and direct capital expenditures by foreigners and foreign-controlled firms. If portfolio investments have growth significance, it is as a permissive factor, i.e., as a source of required foreign exchange. However, direct investments can serve as active or initiating agents in the growth process. The classical analysis, by focusing on the transfer of "pure capital" as a factor of production does not adequately deal with this aspect of the process.

Furthermore, the growth significance of direct international investments may not be quantitative in the sense of creating a major increase in the stock of "capital." The technological and strategic impact may be of much greater importance. While noted by the classical analysts, these aspects of the process were not systematically treated in their
models. The analysis particularly of the strategic impact of the investments requires analysis on a lower level of aggregation than provided by the classical model.

In the last section of the chapter the market-allocation bias hypothesis was briefly analyzed. Historically, heavy concentration of foreign direct investments in export-oriented resource-extraction industries has been observed. In many areas of the world it has been argued that such investments have resulted in little induced expansion in the domestic economy. Several explanatory hypotheses were considered. However, it was noted that a full explanation of such a bias must rest on a fuller development of the theory of investment decisions by firms.
Chapter VII

SUMMARY OF THEORY AND TENTATIVE HYPOTHESES

In the preceding chapters certain conceptual and theoretical aspects of the study of economic growth and the international transmission of economic growth were reviewed and analyzed. This analysis is briefly summarized in this chapter and on the basis of this analysis a number of tentative hypotheses relating to the role of private international investment in international growth transmission are presented. The rest of the study consists of a case study in which certain of these hypotheses are tested in a preliminary fashion.

I. SUMMARY OF THEORY

The concept of economic growth is central to this study. In Chapter II the aggregate welfare concept of growth was analyzed and criticized. It was argued that such a definition of growth is misconceived and, hence, unacceptable inasmuch as it implies the existence of an unambiguous and universally applicable measure of aggregate economic welfare. By employing a welfare indicator as the measure of growth, the problem of measurement is confused with the problem of
appraisal. An alternative definition of economic growth which avoids this confusion was proposed in Chapter III. Growth was defined in terms of an expansion in the technical "production frontier" of the economy viewed as a complex productive apparatus. Such a definition, by avoiding the necessity of applying relative subjective valuations to particular goods and services, is essentially ethically neutral.

In principle it is desirable to adhere rigorously to such a definition of growth. Unfortunately, the very nature of the concept of a technical production frontier creates certain insoluble problems of detection and measurement of growth, particularly on the basis of data relating to actual production. Keeping in mind that the essential criterion of growth must be whether it would have been physically possible at the beginning of a given period of time to have produced the quantities and combinations of goods producible at the end of the period, value statistics for national product can be adapted as an indicator of growth. In this case, it is the aggregate, not the per capita figures, which is relevant. And their usefulness depends not on the assumption that equal values of goods and services represent "welfare equivalents," but rather that they represent marginal physical "production
equivalents." Of course, the value statistics must be de-
flated (by commodity, if possible) to allow for price
changes.

In Chapter V the classical analysis—in both its
original and its modern form—of this mechanism was con-
sidered. In this model, net international investment is
defined as a net international transfer of a quantity of
capital. The growth impact of such capital transfers is
quantitative: by accelerating capital formation in the re-
ceiving country they accelerate the movement along the ag-
gregate production function in the direction of higher in-
come levels. In a very important sense, the analysis is
static. While technological change and other side ramifica-
tions of investments are mentioned in an ad hoc fashion by
the classical theorists, these are never systematically in-
corporated into the model except as "exogeneous" factors
determining the framework in which capital accumulation
occurs.

Many criticisms of this model have been made. Some of
these were reviewed and analyzed in Chapter VI. As an inter-
pretation of the causal process in growth transmission, the
classical model is seriously deficient. This weakness derives
in part from a systematic merging of the physical and the
causal levels of analysis by means of a few simplifying as­
sumptions concerning "entrepreneurship" and "maximizing be­
havior" in a framework of "perfect competition." As a result,
the causal mechanism is pictured as being essentially imper­
sonal and automatic: a matter of quasi-natural equilibrium
adjustments in factor proportions. In part, also, the classi­
cal model suffers from an excessive degree of aggregation
leading to a gross over-simplification of even the physical
adjustments involved. The result is excessive emphasis on
the "supply of capital" in a purely quantitative sense as the
effective limiting factor in growth.

On the basis of this survey of the classical model and
the various dissenting views, certain hypotheses concerning
the role of private international investment in the process
of growth transmission can be offered. These are essentially
speculative conclusions derived from a large body of litera­
ture, some of which has empirical foundations and some of
which is equally speculative. Such hypotheses cannot be ac­
cepted as anything but very tentative suggestions without fur­
ther extensive empirical testing.
II. TENTATIVE HYPOTHESES

1. The simple aggregative concept of capital does not provide a useful approach to the analysis of the growth impact of private international investment. This can only be determined by an analysis of the specific effects of such investments on the production frontier and the strategic significance of the investments.

2. From the point of view of economic growth in the receiving country private international investment can have two types of positive significance: as a permissive factor or as an active, growth-stimulating, factor. In the first instance, the significance is purely financial. International investment adds to the international liquidity of the economy by providing an additional supply of foreign exchange. In this case, foreign investment is a substitute for the expansion of exports. It is significant only insofar as it serves to relieve any balance of payments constraint which might otherwise tend to develop in the process of growth, i.e., where earnings on exports would not be adequate to cover all payments for growth-essential imports of goods and services. In the second instance, international investment may tend to directly initiate expansion in the production frontier. This effect
will be of primary importance if it can be demonstrated that such changes in the frontier are both desirable (in terms of the appraisal criteria employed by the country in evaluating the growth pattern) and unlikely to occur under other circumstances.

The distinction between these two cases is fundamental. In Schumpeterian terms it is a question of where the entrepreneurship function is located. In the former case, foreigners assume only the role of capitalists. In the latter case, they are also the entrepreneurs.

3. We can define portfolio investment as the purchase of financial assets in the form of property rights in existing physical assets or marketable securities, either newly issued or outstanding, and direct investment as the expenditure of foreign owned funds to expand particular productive facilities. The hypothesis is advanced that portfolio investment occurs in response to economic growth in the receiving nation. In this sense, portfolio investment is essentially passive with respect to the growth process. If it has any facilitating role it is by way of relieving potential balance of payments restraints on growth.
4. Direct investment, by contrast, serves to alter the production frontier in a highly specific (and perhaps strategic) fashion. In this sense, direct investment involves active participation by foreigners in the growth process. However, it is not obvious that such investments always play an initiating role in the growth process. Like portfolio investment, direct investment may in many cases be growth-attracted. That is, the attention of the investor may be attracted by the growth of the economy rather than by the raw potentials. However, it is difficult to conceive of conclusive tests which will permit us to distinguish between these cases. In any event, the result is the same—the investment produces a change in the production frontier. The possibility of growth attraction may be important, however, in determining the direction of investment flows.

5. On the basis of the distinctions discussed in paragraphs 2 through 4, the hypothesis is advanced that contrary to the implications of the classical model, the balance on current account is not the significant variable in any analysis of the process of growth transmission. The crucial variable in terms of active growth transmission would appear to be the total volume of direct investment, which need not correspond to the deficit on current account.
Two broad justifications for this hypothesis can be offered: the link between changes in the production frontier and international investment is unquestionable only in the case of direct investment and the net balance on current account may overstate or understate the actual flow of growth generating investment funds. The first point derives directly from the definitions of portfolio and direct investment. Portfolio transactions involve only a “financial circulation.” The appropriate theoretical framework for analyzing such transactions is the theory of portfolio management. The transactions involve the purchase and sale of securities, either new issues or outstanding issues. But clearly, such purchases and sales even of new issues need have no immediate connection with financing expansion of real productive capacity. That is, a large volume of activity in this area does not necessarily reflect a large volume of “real investment.” In the case of transactions involving outstanding issues, this is obvious. It is a matter of portfolio adjustment on the part of asset-holders in both countries, dominated presumably by divergent expectations concerning risk, interest or dividend income, and capital gains, or by changing attitudes toward the desirable balance of risk, liquidity, and yield in their respective portfolios. As long as asset-holders exist in both
countries, there can be no a priori basis for assuming that the balance of transactions will consistently be in one direction or the other. Indeed, in this respect, short-term speculation-inducing changes in governmental policies, exchange rates, market conditions, etc., would appear to be a major consideration. A large volume of transactions in both directions would be a sign of integration of financial markets. This in itself may have growth significance; and the psychological impact of such portfolio transactions may be such as to affect real investment decisions. These, however, are different problems.

Even where a net inflow of funds occurs as a result of such transactions there is no necessary reason why this will increase funds available for business expansion. It may only reflect increased concern for liquidity on the part of domestic asset-holders. Likewise, even where new issues of securities are involved, or where there is a net reduction in the holdings of cash in the financial sector combined with a net inflow of funds on account of security transactions, that such funds will be used for investment in the real sense is not certain. This is particularly the case where governmental agencies are the borrowers. Furthermore, even where a direct connection between such financial transactions and
real investment can be established, the inflow of funds has only permissive significance. That is, if the funds were borrowed by a native business, this business must be regarded as the active agent. This is not a true case of active growth transmission. Also, for such funds to have a crucial permissive significance, it must be demonstrated that the investment would not have occurred in their absence. This is difficult to establish in most cases. It would seem that a large and sustained volume of net sales of old and new securities depends on the integration of domestic and foreign security markets and on successful growth in the economy receiving the funds. The latter provides an aura of optimism and security. In this sense the, rather than activating growth, the inflow of funds reflects growth.

That the net balance on current account may either overstate or understate actual growth stimulating foreign investment is obvious from this discussion of portfolio investment. If an inflow of funds for direct investment is supplemented by a net inflow of funds on portfolio account, the direct growth impact is overstated. If the inflow of funds for direct investment is offset by a net outflow on portfolio account, the growth impact is understated. Additional possibilities can also be suggested. Recognizing that funds not
used for one investment purpose may not be made available for another (e.g., if firms have a preference for investment out of internal or owned funds) then it is the gross inflow of funds for direct investment which is of significance. Any outflow for direct investment reduces the net balance, but may not represent a net loss in terms of domestic investment. Likewise, if the balance of payments accounting procedure neglects the reinvestment of profits by foreign owned and controlled firms, an important type of direct investment will be systematically neglected through exclusive concern with the balance on current account. As a minor point, while part of the total inflow of investment funds may be used to finance the importation of capital equipment, and part to finance imports of consumer goods freeing domestic funds for use in capital expenditures, there is no guarantee that all foreign exchange earned through portfolio transactions particularly will result in a net increase in funds available for investment type expenditures. In this case, the net balance again overstates the growth impact of foreign investments.

6. The hypothesis is advanced that direct investments which have the greatest growth impact will be made by established firms, either through subsidiaries or branches or
through participation with other firms in the organization of a new firm.

7. If the assumption in item 6. is valid, then the theory of growth transmission by way of private international investment must derive from a theory of investment decisions by firms. Several minor hypotheses relating to this and deriving from current discussions in the theory of the firm, can be offered.

a. In making investment decisions, firms are likely to be attracted primarily by cost-saving possibilities. This suggests that the major factor attracting the attention of potential investors will be abundant raw materials. To this extent, international investment will have tendency to integrate the recipient nation into the world economy as a provider of raw materials. However, for a firm with established export markets in foreign nations, tariff barriers and transportation costs might provide an incentive to investment in the creation of facilities to produce for the domestic market (or, at times, for export to nearby markets or markets offering preferential tariff treatment).

b. A significant limitation on investments to create facilities producing for the local market is lack of
experience in that market. For this reason, export penetra-
tion of the market would be a logical preliminary to invest-
ment. Likewise, investment would be most likely to occur
where the structure of demand is not radically different from
that in the firm's existing markets, and would be more attrac-
ted to geographically close rather than geographically remote
markets. Success of rivals or other firms in expanding into
such markets will also provide a major stimulus to invest-
ment.

c. Direct investments of the type considered in
b. will commonly involve establishment of productive facili-
ties to produce products in the same line as that previously
produced by the parent firm. In this sense, the new facili-
ties will duplicate the home plant in whole or in part, im-
plying that the choice of exports or investment are true
alternatives. Subsequent expansion by the subsidiary firm
may take various forms according to market opportunities.
Indeed, innovations on the part of the subsidiary may "feed-
back" to the parent. However, continuous communication with,
and supervision by the parent firm will tend to bring about
close coordination of activities, policies, and production
techniques.
d. Direct investments will, therefore, tend to bring to an economy new products, new techniques, new skills, and new types of equipment. A heavy importation of specific types of capital equipment is to be expected, along with the importation of technicians to operate these (and perhaps to train domestic workers). This may be the truly dynamic aspect of the investments.

In this sense, then, direct investments will tend to shape the recipient economy in the image of the domestic economy of the parent firm. Resistance to such a pattern of development will tend to retard investment flows. The total growth impact of international investments depends on the extent to which such a transformation is possible.

To test all of these hypotheses would require extensive case studies in actual investment decisions. This is not presently feasible. A less ambitious project is essayed in Chapters VII and IX. Canadian experience in the postwar period is examined to partially validate the central thesis that direct investment has tended to stimulate growth while portfolio investment has been essentially growth-attracted. In the process, some light will be cast on the various subsidiary hypotheses.
No matter whether the aggregate welfare or the aggregate production-potential definition of economic growth is employed, it is apparent that rapid economic growth occurred in Canada following World War II. In part this represents a continuation of a long-run trend. Thus W. W. Rostow dates the Canadian "take-off into self-sustained growth" between 1896 and 1914.1 O. J. Firestone estimates that, allowing for price changes, the gross national product in 1953 was about sixteen times as large as that in 1870, and that since 1870, "...the real aggregate national output has been doubling every twenty years."2 We are not dealing with a country in which economic growth is a newly emerging phenomenon, but rather one which has a long record of growth.


While it would be misleading to disregard this long record of growth, it would be equally misleading to suggest that it has been a smooth process. Growth has occurred in spurts, reflecting, by and large, the swings of the international business cycle. In part, also, economic growth has reflected systematic interference with the functioning of the economy by the Canadian government, particularly during both world wars. The effects of war on the economy is always mixed. While in some sectors productive capacity is expanded, in others it is contracted, and in many sectors existing plant is used at much greater than normal rates without adequate repair and replacement expenditures. However, it seems clear that the effect in Canada was, on balance, to expand productive capacity. The period beginning in 1945 or 1946 represents the most recent period of rapid economic growth in Canada with a minimum of such direct governmental intervention.

In analyzing the growth impact of private international investment in this environment, it is necessary to first

---

3 Ibid., pp. 5-6; 38-41.
analyze the pattern of growth which occurred. This is the purpose of the present chapter. It provides background material essential to the interpretation of investment flows and, hence, to the analysis of Chapter IX.

I. ECONOMIC GROWTH, 1945-1956

That very substantial economic growth occurred in Canada following World War II is evident no matter what indicator of changes in aggregate productive capacity is employed. Consider the estimates made of (deflated) aggregate output produced. In Table I two series of such estimates are presented: the official Dominion Bureau of Statistics' estimates of gross national expenditure in constant (1949) dollars, and the estimates made by Hood and Scott of gross domestic product in constant (1949) dollars. Estimates for the years 1929 and 1939 have been included for historical perspective.

Certain problems arise in interpreting statistics of value of output as an indicator of economic growth. These were briefly considered in Chapter III. However, recognizing these limitations, both of these series offer rather

---

5See above, pp. 95-103.
<table>
<thead>
<tr>
<th>Year</th>
<th>(1) Gross National Product</th>
<th>(2) Gross Domestic Product</th>
<th>(3) Unemployed as Percent of the Civilian Labor Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>9,061</td>
<td>8,959</td>
<td>3.0</td>
</tr>
<tr>
<td>1939</td>
<td>9,536</td>
<td>9,517</td>
<td>1.4</td>
</tr>
<tr>
<td>1945</td>
<td>15,552</td>
<td>14,437</td>
<td>1.6</td>
</tr>
<tr>
<td>1946</td>
<td>15,251</td>
<td>13,497</td>
<td>3.0</td>
</tr>
<tr>
<td>1947</td>
<td>15,446</td>
<td>13,935</td>
<td>2.0</td>
</tr>
<tr>
<td>1948</td>
<td>15,735</td>
<td>14,431</td>
<td>2.0</td>
</tr>
<tr>
<td>1949</td>
<td>16,343</td>
<td>14,780</td>
<td>2.6</td>
</tr>
<tr>
<td>1950</td>
<td>17,471</td>
<td>15,719</td>
<td>3.2</td>
</tr>
<tr>
<td>1951</td>
<td>18,547</td>
<td>16,731</td>
<td>2.0</td>
</tr>
<tr>
<td>1952</td>
<td>20,027</td>
<td>17,636</td>
<td>2.4</td>
</tr>
<tr>
<td>1953</td>
<td>20,794</td>
<td>18,314</td>
<td>2.5</td>
</tr>
<tr>
<td>1954</td>
<td>20,186</td>
<td>17,806</td>
<td>4.3</td>
</tr>
<tr>
<td>1955</td>
<td>21,961</td>
<td>19,390</td>
<td>4.1</td>
</tr>
<tr>
<td>1956</td>
<td>23,542</td>
<td>n.a.</td>
<td>3.1</td>
</tr>
</tbody>
</table>

a Estimates for 1929 and 1946-1956 are annual averages. Estimates for 1939 and 1945 are for June.

conclusive evidence that a substantial expansion in the production frontier occurred between 1945 and 1956. It is hardly conceivable that the combinations and quantities of output produced in 1956 could have been produced in 1945, even given abnormal rates of use of industrial capacity.

The possibility of considerable underutilization of productive capacity in any given year or group of years limits the usefulness of output data in growth analysis. While statistics on involuntary unemployment of the labor force do not provide an unambiguous index of underutilization of capacity they do provide a useful indicator of the direction in which the output estimates should be adjusted. Official estimates of persons out of work and seeking work are included in Table I for this purpose.\(^6\) While reducing the

\(^6\)All of the estimates are not fully comparable. The estimates for 1946-52 are annual averages of quarterly data. The estimates from 1953 are annual averages of monthly data. The estimates for 1939 and 1945 are for June. Comparable Junes estimates of the percentage of the labor force unemployed for 1946 through 1956 are as follow: 1946, 2.6%; 1947, 1.9%; 1948, 1.6%; 1949, 2.0%; 1950, 2.7%; 1951, 1.5%; 1952, 2.0%; 1953, 1.8%; 1954, 3.4%; 1955, 2.8%; 1956, 2.0%. These are from various issues of the *Canadian Statistical Review*.

The estimates for 1946 through 1956 are based on D.B.S. sample surveys and, hence, are subject to sampling error. The estimates for 1939 and 1945 were made by the D.B.S. The estimate for 1929 is by O. J. Firestone. See *Canada's Economic Development*, 1867-1953, pp. 58, 309-310.
apparent growth between 1939 and 1945, the adjustment of the output statistics in accordance with the level of unemployment in each year would not alter the postwar picture of growth.

A somewhat more disaggregated (but less comprehensive) view of the growth process can be obtained from the Industrial Production Index. This index, along with its major components, is shown in Table II. The general picture of expansion in productive capacity is evident in both the aggregate index and the major subgroups listed. While in the disaggregated index some series show little expansion over wartime peaks, it must be recognized that the wartime situation involved a short burst of above normal utilization of productive capacity and that probably in a similar exigency an even greater rate of production could now be achieved in many of these lines. When all of the sub-indexes are examined\(^7\) it is clear that production in some industries (e.g., coal mining) has actually declined over the period. This, of course, is to be expected. The declines in these sectors were more than offset by expansions in other sectors.

\(^7\)Cf., Canadian Statistical Review, 1957 Supplement, pp. 19-25.
<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Mining</th>
<th>Manufactures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Metals</td>
<td>Fuels</td>
</tr>
<tr>
<td>1935</td>
<td>85.6</td>
<td>79.5</td>
<td>78.7</td>
</tr>
<tr>
<td>1939</td>
<td>109.7</td>
<td>118.0</td>
<td>118.6</td>
</tr>
<tr>
<td>1941</td>
<td>161.8</td>
<td>132.0</td>
<td>129.7</td>
</tr>
<tr>
<td>1943</td>
<td>208.5</td>
<td>116.1</td>
<td>111.1</td>
</tr>
<tr>
<td>1945</td>
<td>187.2</td>
<td>100.9</td>
<td>91.2</td>
</tr>
<tr>
<td>1947</td>
<td>187.8</td>
<td>106.2</td>
<td>88.7</td>
</tr>
<tr>
<td>1949</td>
<td>199.6</td>
<td>131.7</td>
<td>107.7</td>
</tr>
<tr>
<td>1951</td>
<td>226.5</td>
<td>161.8</td>
<td>113.5</td>
</tr>
<tr>
<td>1953</td>
<td>248.4</td>
<td>185.8</td>
<td>114.1</td>
</tr>
<tr>
<td>1955</td>
<td>265.8</td>
<td>242.0</td>
<td>138.0</td>
</tr>
</tbody>
</table>

An alternative way to view the process of growth is in terms of the volume of resources used as inputs in the production process. Two significant inputs for which data are readily available are the labor force and fuel and power.

Estimates of the labor force are presented in Table III. Of course, the size of the labor force is not the crucial variable. The labor input into the economy must be measured in terms of man-hours. For this reason, Hood and Scott's estimates of annual man-hours of labor input in the private agricultural and nonagricultural sectors have also been included in the table.8

Table IV presents statistics of fuel and power consumption in Canada over this period. Corresponding data relating to natural resource inputs are much more difficult to summarize and interpret. No attempt has been made to present such statistics. However, inspection of the available statistics relating to the production and import and export of such

8Hood and Scott regard these estimates as at best "rough." The data on hours worked per week are very scanty. Drawing on unpublished sources, they were able to construct a series for agriculture extending back to 1926. For the rest of the economy, however, data are only available for the postwar period and for the years 1926-1930. See W. Hood and A. D. Scott, Output, Labour and Capital in the Canadian Economy, (Ottawa: Queen's Printer, 1957), pp. 201-202, 349-356.
### TABLE III

**CIVILIAN LABOR FORCE, AVERAGE UNEMPLOYMENT, AND TOTAL MANHOURS WORKED, CANADA, SELECTED YEARS, 1926–1955**

<table>
<thead>
<tr>
<th></th>
<th>(1) Civilian Labor Force</th>
<th>(2) Unemployment</th>
<th>(3) Man-hours Worked (annual)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Thousands)</td>
<td>(Percent)</td>
<td>(Millions)</td>
<td>(Millions)</td>
</tr>
<tr>
<td>1926</td>
<td>n.a.</td>
<td>n.a.</td>
<td>3941.0</td>
<td>5071.1</td>
</tr>
<tr>
<td>1930</td>
<td>3,719</td>
<td>8.1</td>
<td>3749.9</td>
<td>5717.4</td>
</tr>
<tr>
<td>1936</td>
<td>4,446</td>
<td>12.8</td>
<td>3802.3</td>
<td>n.a.</td>
</tr>
<tr>
<td>1939</td>
<td>4,649</td>
<td>11.4</td>
<td>4004.6</td>
<td>n.a.</td>
</tr>
<tr>
<td>1945</td>
<td>4,520</td>
<td>1.6</td>
<td>3273.4</td>
<td>6601.4</td>
</tr>
<tr>
<td>1947</td>
<td>4,942</td>
<td>2.0</td>
<td>3100.6</td>
<td>7213.5</td>
</tr>
<tr>
<td>1949</td>
<td>5,055</td>
<td>2.6</td>
<td>2959.2</td>
<td>7379.4</td>
</tr>
<tr>
<td>1951</td>
<td>5,217</td>
<td>2.0</td>
<td>2582.9</td>
<td>7940.6</td>
</tr>
<tr>
<td>1953</td>
<td>10,144</td>
<td>2.5</td>
<td>2451.5</td>
<td>8129.3</td>
</tr>
<tr>
<td>1955</td>
<td>10,529</td>
<td>4.1</td>
<td>2355.7</td>
<td>8283.5</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Year</th>
<th>Electric Power Consumed</th>
<th>Coal Consumed</th>
<th>Industrial and Commercial Sales of Gas</th>
<th>Domestic Sales of Refined Petroleum Fuels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Millions of Kilowatt Hours)</td>
<td>(Thousands of Tons)</td>
<td>(Millions of Cubic Feet)</td>
<td>(Thousands of Barrels)</td>
</tr>
<tr>
<td>1939</td>
<td>2,202</td>
<td>2,456</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>1940</td>
<td>2,331</td>
<td>2,809</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>1941</td>
<td>2,580</td>
<td>3,164</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>1942</td>
<td>2,909</td>
<td>3,521</td>
<td>1,062</td>
<td>613</td>
</tr>
<tr>
<td>1943</td>
<td>3,161</td>
<td>3,668</td>
<td>1,299</td>
<td>482</td>
</tr>
<tr>
<td>1944</td>
<td>3,169</td>
<td>3,652</td>
<td>1,219</td>
<td>465</td>
</tr>
<tr>
<td>1945</td>
<td>3,125</td>
<td>3,394</td>
<td>1,388</td>
<td>425</td>
</tr>
<tr>
<td>1946</td>
<td>3,272</td>
<td>3,520</td>
<td>1,296</td>
<td>385</td>
</tr>
<tr>
<td>1947</td>
<td>3,451</td>
<td>3,505</td>
<td>1,377</td>
<td>381</td>
</tr>
<tr>
<td>1948</td>
<td>3,394</td>
<td>3,949</td>
<td>1,888</td>
<td>335</td>
</tr>
<tr>
<td>1949</td>
<td>3,558</td>
<td>3,328</td>
<td>2,078</td>
<td>337</td>
</tr>
<tr>
<td>1950</td>
<td>3,881</td>
<td>3,739</td>
<td>2,618</td>
<td>355</td>
</tr>
<tr>
<td>1951</td>
<td>4,374</td>
<td>3,675</td>
<td>3,060</td>
<td>337</td>
</tr>
<tr>
<td>1952</td>
<td>4,745</td>
<td>3,416</td>
<td>3,134</td>
<td>315</td>
</tr>
<tr>
<td>1953</td>
<td>5,051</td>
<td>3,178</td>
<td>3,358</td>
<td>372</td>
</tr>
<tr>
<td>1954</td>
<td>5,278</td>
<td>2,732</td>
<td>4,173</td>
<td>352</td>
</tr>
<tr>
<td>1955</td>
<td>5,720</td>
<td>2,782</td>
<td>6,002</td>
<td>263</td>
</tr>
</tbody>
</table>

resources suggests similar upward trends. Whether productive capacity is analyzed from the point of view of output produced or inputs consumed, the picture of substantial aggregate expansion is very evident.

II. CHANGES IN THE STRUCTURE OF THE ECONOMY

In order to establish the presence of growth it is necessary to view the economy as an integrated aggregate. The appropriate indicators are thus measures of aggregate performance. However, in analyzing the causal process a much lower degree of aggregation is required. The comparison of relationships between broad statistical aggregates such as the flow of investment expenditures or net capital imports and the value of national product may neglect important facets of the process. A comprehensive causal analysis, of course, would have to probe into many areas beyond the usual scope of economic analysis. Since economic growth depends on particular patterns of economic behavior, causal analysis must involve in part the analysis of motivations and factors affecting behavior. However, significant insights can be obtained by the analysis of structural changes in the economy, and particularly the sequence of structural changes. If a strong correlation can be established between direct international
investment and leading growth sectors, there may be evidence of at least strategic significance of the international investments even though quantitatively they may appear relatively minor. Of course, conclusions based simply on correlations of this type are not conclusive. Much caution must be exerted in interpreting such findings.

The concept of structure as applied to the economy was briefly considered in Chapter III. If the economy is viewed as an "action system"—an integrated system of reciprocally related productive activities—then structure implies a pattern of productive activities which has some temporal stability. For such analysis, however, it is clearly not the individual act which is the pertinent basic unit. In order to focus on the "invariant relational aspect" of activities, it is necessary to abstract from the unique and highly variable details of actual activities and transactions. It is necessary to group the "actors" or producing (transacting) units into "sectors": the equivalent of the sociologists' "roles." Structure, then, implies a relatively stable pattern of interconnectedness among these sectors.

---

9 See above, pp. 57-58.

But even on this definition, the application of the concept of structure to economic analysis raises perplexing problems. This is particularly evident if the purpose is to derive an empirical description of the structure of a complex economy at any given time or of the changes in structure over any given period of time. Just as in sociological analysis the definition and identification of roles which constitute the social structure is fraught with apparently insuperable conceptual and methodological difficulties\textsuperscript{11} so in economics the definition of sectors of the economy which constitute the economic structure pose apparently insuperable conceptual and methodological difficulties. The criteria to be used in defining sectors are far from clear: in most empirical studies they appear to be largely arbitrary. In any case, the appropriate criteria probably vary with purpose of the analysis. In this sense there is no uniquely correct description of the structure of the economy.

The larger the number of sectors specified, the more complex becomes the analysis and the more impossible the problems of data collection and processing. Furthermore, structure is a static concept. In a dynamic economy, the more

\textsuperscript{11} Ibid., pp. 97-159.
sectors that are specified, i.e., the more disaggregated the model, the less the likelihood that temporal stability will exist in the structural relations identified. The problem of data collection is also complicated by the fact that the sectors which would seem to be theoretically meaningful do not always correspond to the actual administrative units (i.e., firms) for which data is most readily available.

These aspects of structural analysis are most clearly revealed by the problems encountered in applying the technique of input-output analysis. Conceptually, this type of analysis derives directly from a concept of structure similar to that discussed above. We are told that: "Input-output analysis is essentially a theory of production, based on a particular type of production function." However, it


involves a much more complex view of the production process than is involved in the usual "theory of production." The starting point is identical with that adopted here: a view of the economy as an integrated production system demonstrating a relatively stable (short-run) pattern of technical interrelationships. It is assumed that it is possible to catalogue all of the effective participants in the economic system into a number of relatively distinct groups. These can be identified as "industries" or "sectors." These industries are functionally interconnected in that the output of each industry becomes partially absorbed (as an input) by some of the other industries or as final product by consumers, the government, foreign countries or firms in their capacity as investors (the "exogeneous sectors" of the "open model" in which "changing human purposes find their most immediate expression"14). The nature of these interconnections is assumed to be given data, determined by "technical and natural conditions of production." Presumably, if we can discover the shape of each of these interrelationship functions we can use this model to explore many complex problems which

involves a much more complex view of the production process than is involved in the usual "theory of production." The starting point is identical with that adopted here: a view of the economy as an integrated production system demonstrating a relatively stable (short-run) pattern of technical interrelationships. It is assumed that it is possible to catalogue all of the effective participants in the economic system into a number of relatively distinct groups. These can be identified as "industries" or "sectors." These industries are functionally interconnected in that the output of each industry becomes partially absorbed (as an input) by some of the other industries or as final product by consumers, the government, foreign countries or firms in their capacity as investors (the "exogeneous sectors" of the "open model" in which "changing human purposes find their most immediate expression"\(^{14}\)). The nature of these interconnections is assumed to be given data, determined by "technical and natural conditions of production." Presumably, if we can discover the shape of each of these interrelationship functions we can use this model to explore many complex problems which

are partially or totally obscured in the more conventional highly aggregative models of the economy.

The nucleus of input-output analysis is a table of coefficients which defines the technical input-output relationships among the various sectors. Ideally, such a table should permit an accurate prediction of the required expansion of output in each sector in order to produce any specified final bill of goods. In some abstract sense, assuming that we have an "ideal" classification of production units, such a table defines the pure structure of the economy at some particular point in time.\textsuperscript{15}

This use of the table of fixed coefficients implies a particular type of production function. "The process (of production) of each industry is one of simple addition; a set of inputs is combined in fixed proportions to produce an amount of the commodity or output of the industry."\textsuperscript{16}

\textsuperscript{15}Cf., S. F. Nadel, \textit{The Theory of Social Structure}, pp. 2-8. "...when describing structure we abstract relational features from the totality of the perceived data, ignoring all that is not 'order' or 'arrangement'; in brief, we define the positions relative to one another of the component parts" (p. 7).

marginal productivity of each input varied independently is zero; of all varied together in the specified combination it is constant and equal to the average productivity. Thus the effective production function is assumed to linear. This constitutes a formal denial of interfactor substitutions, and of economies or diseconomies of scale.

This assumption clearly contradicts certain basic assumptions of traditional economic theory, particularly for "long-run" projections. On these grounds the whole model could be criticized and perhaps (by some) rejected. However, such criticism may be misguided. Use of this particular production function appears to be more a product of necessity than of doctrine. Available statistical information, mainly decennial census data, will support no other generalization and the "uncontrollable limitations of research resources" do not permit a wholesale special purpose collection of pertinent data. While engineering studies may cast valuable light on particular input-output relationships, such studies are necessarily limited in scope. It has also been suggested that because of the poor average quality of the available data, even where a production function is determined to be non-linear, a linear approximation may result in only negligible
additions to the errors involved.\(^{17}\) There is no apparent intention to categorically deny the traditional input-substitution theorems. Alternative formulations are not ruled out by the analytical technique, nor are particular adjustments in particular cases based on supplementary information. However, Leontieff does suggest that as an empirical proposition variability of factor proportions, while certainly a real and not unimportant phenomenon, may not be as general as is commonly supposed. He criticizes certain evidence offered in support of the substitution theorem on the grounds that it is based on excessively and illogically aggregated data. Thus, if two industries with different input structures are grouped together as one (aggregative) industry, what appears to be factor substitution because of changing input composition in this aggregative industry may in reality be but changing relative importance of the two sub-industries.\(^{18}\)

This suggests that perhaps the greatest source of error in such analysis is the injudicious categorization of producing units into "sectors." Too gross a level of aggregation

\(^{17}\) Cf., Evans and Hoffenberg, \textit{loc. cit.}

can lead to solutions which are mathematically feasible but, in fact, impossible. Thus, the aggregation of coal and petroleum producers into a single "fuel" sector might indicate the feasibility of an increase in production of steel which is impossible because of a coal bottleneck. Likewise, when two products with different production functions are produced by firms classified in the same sector, a change in the "product-mix" will appear to change the technical input-output coefficients. Too great a degree of disaggregation can also affect the stability of the system of coefficients because of possible input substitutions, the introduction of new products, etc. Because of the obvious importance of appropriate classification and aggregation a significant proportion of the current effort in input-output analysis is being devoted to this and related problems. 19

It is presumably possible mathematically to specify the criteria for a general purpose "ideal" method of classification and aggregation. To do so in practice, however, it would

be necessary to have available all of the data on production functions for the entire economy or set of industries being studied. Every aggregation of this basic data, involving combinations of nonidentical production functions would obscure certain interrelationships among the components of the aggregates. The ideal consolidation would be one which results in no material loss of such information and, hence, which leads to no significant deviation of the solution of the aggregated system from the "correct" solution.²⁰

Obviously, in large-scale applications it is impossible to obtain the basic data necessary to determine the "correct" solution. Hence, the "ideal" consolidation is but a mathematician's dream. Yet a choice must be made in each case as to what system of classification and what level of aggregation is to be employed. While little success has been achieved in determining practical criteria for consolidation of data, tests have been conducted to determine the effects of different

---

²⁰Cf., Holzmann, op. cit., p. 328; however, technical and product changes over time would mean that the "ideal" consolidation would not be static. The problem of changes in the "product-mix" seems to present insuperable questions of classification. Cf., Leontieff, op. cit., pp. 21-22; J. D. Norton, "Research Required for the Application of Inter-industry Economics," Input-Output Analysis: An Appraisal, pp. 188, 204-207.
consolidations. Such tests have involved comparisons of the solutions of systems of equations derived from different consolidations of the same data. Such tests clearly indicate that different consolidations even with approximately the same level of aggregation, will yield different answers to the same problem, and that different consolidations are appropriate to different problems. 21

These conclusions relate, however, to the use of the data. In terms of the basic collection and presentation of the data a close approximation to the "ideal" system of classification and aggregation is to be desired. From this base any combinations and consolidations of sectors suitable for any particular use can be readily made. The "ideal" could be easily obtained under two different sets of circumstances: if it were possible to identify groups of units which produce perfect substitutes and have the same production functions so that "...the variables have the same effect...upon all of the economic functions under discussion," or if groups of units could be determined whose products were rigidly complementary,

i.e., which "bear an invariant, 'perfectly joint' relation­ship to each other." 22

Thus, Leontieff poses the following as the basis of a functional classification for input-output analysis:

According to the abstract theoretical scheme, all production enterprises should be segregated into several homo­geneous industrial groups, homogeneity being defined in terms of (a) identity of products and (b) qualitative and quantitave similarity of the cost structure of the firms within each group. 23

Eckstein describes, in part, "That hypothetical world which the (open, static) model would describe completely" as follows:

The aim of this hypothetical economy is to produce a number of different commod­ities. Each of these commodities is produced by a different industry. Each industry used only one process of pro­duction; indeed, an industry can be considered as a process of production. 24


24 Eckstein, op. cit., p. 49.
Unfortunately, in the evaluation of the realism and usefulness of this type of analysis the non-mathematician and the non-specialist who is not intimately aware of the nature of the data and the computational problems, suffer from severe handicaps. However, it is clear that attempts to apply the model must consistently run into serious problems, arising in part from the inadequacy of data, the incomplete juxtaposition of the technical and legal structure of production, the non-homogeneity of production within individual "industries," product and input substitutions, and the many technical changes which are occurring. For our present purposes it is not necessary to probe further into these issues. The essential point has been established, viz., that the application of the "pure" concept of structure in dynamic analysis poses virtually insolvable problems, not only of data collection and processing but also of basic methodology. The limitations of the tables are all too evident. Nevertheless, these do represent the most significant attempt at empirical analysis of the "pure" structure of the economy.

Reasonably reliable tables are available only for a few countries and for a few periods of time. The Dominion
Bureau of Statistics has constructed an input-output table for Canada for the year 1949. With no earlier tables any empirical analysis of structure and structural changes must involve more crude conceptualizations, depending largely on the nature of the available statistics.

The basic concept underlying the collection and tabulation of industrial statistics is a product-oriented definition of the industry. However, consistent use of such a concept in developing a set of industrial statistics raises innumerable conceptual and empirical problems. Given the possibility, indeed the probability, that a single legally constituted firm may produce several noncompetitive products simultaneously and may encompass several distinct plants at several separate locations it may be that some other entity than the legal firm must be used as the basic unit to be classified. Various suggestions have been made. Bain has

proposed the concept of the "product"; an approach involving conceptual problems not only because of the problem of defining a product but also because the product is the inanimate result of the production process not the decision making unit. The usual unit is the "establishment," defined as:

...the individual plant—mine, well factory, cokery, generating station, workshop, household,—in which goods and services are produced.

This may make sense for the analysis of technical interconnections in the economy, but it poses problems of data availability. Not uncommonly, the establishment is not a technical unit in this sense but is the smallest unit for which data is available—a reporting unit.

Of course, the admission of imperfect competition with an implied continuum of degrees of substitutability or competitiveness renders any product-oriented classification

ambiguous and unstable. A classification system which identifies, in substantial detail, all of the major breaks in the continuum of substitutability at any given time may reveal substantial instability over short and long periods of time. Such a classification may magnify the significance of the changes which occur in the technical performance or appearance of products, particularly in the retail level, suggesting structural shifts which are negligible in terms of growth. This problem is related to the problems of changes in the "product-mix" and "input-mix" which plague input-output analysis. Clearly, some degree of aggregation is called for in order to eliminate this instability and to lessen the complexity of the picture. In fact, of course, the available statistics do represent a substantially higher degree of aggregation than the theoretical industry concept. This means that more or less arbitrary judgments have been made with respect to the "nature of business activity" in all of the particular firms (or establishments) in the economy, and groupings made accordingly. These groupings are presumably designed to make the statistics "meaningful to users." However, as W. R. Simmons points out: "Fulfillment of this condition is not unique, in view of the widely different specific
desires of specific users, and the subjective nature of the concept.\(^{28}\) Classification systems are not always comparable between countries, and not always uniform within any single country, because of the divergent judgments and interests of the collecting agencies. The Statistical Office of the United Nations has suggested that in the interests of uniformity the International Standard Industrial Classification be adopted by all nations for reporting census data and constructing industrial production indexes, etc., but the particular problems and statistical requirements of various nations limit the degree of acceptance of this recommendation.

To attempt to present industrial statistics in a form adaptable to a multiplicity of specific and widely varied uses, while keeping within a narrow budget constraint, almost inevitably means that internal consistency must be sacrificed. No single principle can be followed. This is evident in Canadian industrial statistics. In these at least four broad classification principles appear to have been used in identifying the major and minor groupings of industries: "level" or "stage" of production, type of production process involved, purpose of the product, and chief component material.

\(^{28}\)W. R. Simmons, op. cit., p. 431.
Our analysis of the changes which have occurred in the structure of the Canadian economy must be based on statistics published in this framework. For this reason, the analysis cannot be highly refined. However, the data do permit identification of certain aspects of the pattern of structural change which have pertinence to the analysis of the growth impact of investment inflows. In particular, it is possible to evaluate the changing relative importance of industries at different "levels" on the production hierarchy, and, by implication, to identify the sectors of the economy (in terms of levels of production) which have been "strong growth sectors." In the following chapter these structural phenomena will be correlated with the investment patterns.

The concept of a hierarch of stages or levels in the process of production is a common one. One important version of it is associated with the "Austrian" theories of capital and production: with the notion of the existence of goods of higher and lower "order" depending on their proximity to ultimate consumption. In this sense, the production of any commodity involves what Hayek has called "vertical or successive division of labor,"29 i.e., a series of transformations by

which raw natural resources are modified so as to become useful goods. Clearly, in practical terms, the specification of the number of stages involved and of the breaking-point between stages is essentially arbitrary. Given the possibilities for varying degrees of vertical integration, there is no reason to suspect that existing firms (or even establishments) will organize neatly into such a hierarchy. Furthermore, a concrete firm, e.g., a farm, can be simultaneously close to the ultimate consumer (e.g., when some of the output is consumed on the farm, or part of it is sold in the immediate vicinity) and very remote from the ultimate consumer (e.g., when part of the produce is sold to food processing firms.

These observations suggest limitations on the application of the Austrian framework. However, the basic concept is useful. More significant, perhaps, is the fact that strictly speaking the analysis relates to the production of a given bill of goods in a "closed economy"—one in which the production process encompasses all stages of fabrication. Where international trade exists any national economy cannot be regarded as a closed economy in this sense. An important aspect of the structure of such an economy then relates to the nature of its integration into the world economy. In particular, there has been much discussion of the dangers of
specialization at lower levels of production, especially when world markets are unstable. Indeed, this question has become one of the themes of economic policy in many nations. In terms of our present study the question can be posed: What is the apparent role of international investment in bringing about, or in modifying, such a pattern of international structural interdependence?

Statistics which reflect shifts in the structure of the Canadian economy in this sense are presented in Tables V and VI. Data for a number of prewar years are included in order to give historical perspective. While the data (for the post-war years) are primarily derived from studies made for the Royal Commission on Canada's economic prospects, the industrial classification system employed by the commission has been altered slightly. The Commission's categories of agriculture and resource industries have been lumped together as resource extraction industries, corresponding to the "lowest" level of production. However, because of the divergent trends in agriculture and the other resource-based industries, the Royal Commission's breakdown has been maintained in the form of two subsectors. This amounts to a cross-classification on the basis of the type of production process involved. The
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resource Extraction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>45.8</td>
<td>34.3</td>
<td>33.1</td>
<td>33.2</td>
<td>22.5</td>
<td>18.6</td>
<td>16.2</td>
</tr>
<tr>
<td>Other (Mining, Forestry, etc)</td>
<td>3.7</td>
<td>5.2</td>
<td>5.1</td>
<td>5.3</td>
<td>3.9</td>
<td>4.2</td>
<td>4.2</td>
</tr>
<tr>
<td>Total</td>
<td>49.5</td>
<td>39.5</td>
<td>38.1</td>
<td>38.5</td>
<td>26.4</td>
<td>22.8</td>
<td>20.4</td>
</tr>
<tr>
<td><strong>Primary Manufacturing</strong></td>
<td>n.a.</td>
<td>n.a.</td>
<td>5.1</td>
<td>4.1</td>
<td>5.8</td>
<td>5.8</td>
<td>5.8</td>
</tr>
<tr>
<td><strong>Intermediate Processing &amp; Services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary Manufacturing</td>
<td>16.7</td>
<td>19.9</td>
<td>15.0</td>
<td>14.2</td>
<td>20.4</td>
<td>20.5</td>
<td>20.0</td>
</tr>
<tr>
<td>Construction</td>
<td>10.1</td>
<td>7.2</td>
<td>4.8</td>
<td>4.9</td>
<td>5.9</td>
<td>6.8</td>
<td>6.7</td>
</tr>
<tr>
<td>Transportation &amp; Business Services</td>
<td>24.2</td>
<td>33.4</td>
<td>11.0</td>
<td>9.3</td>
<td>11.1</td>
<td>11.9</td>
<td>12.1</td>
</tr>
<tr>
<td>Government</td>
<td>n.a.</td>
<td>n.a.</td>
<td>7.2</td>
<td>7.9</td>
<td>9.9</td>
<td>10.9</td>
<td>12.0</td>
</tr>
<tr>
<td>Totala</td>
<td>...</td>
<td>...</td>
<td>38.0</td>
<td>36.3</td>
<td>47.3</td>
<td>50.1</td>
<td>50.8</td>
</tr>
<tr>
<td><strong>Trade and Personal Services</strong></td>
<td>n.a.</td>
<td>n.a.</td>
<td>18.7</td>
<td>22.1</td>
<td>20.4</td>
<td>21.4</td>
<td>23.1</td>
</tr>
</tbody>
</table>

* Detail may not add because of rounding.

### TABLE VI

**INDUSTRIAL DISTRIBUTION OF GROSS DOMESTIC PRODUCT, CANADA, SELECTED YEARS, 1890-1955**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resource Extraction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>27.0</td>
<td>22.8</td>
<td>23.1*</td>
<td>21.6</td>
<td>13.8</td>
<td>14.7</td>
<td>12.7</td>
</tr>
<tr>
<td>Other (Mining, Forestry, etc)</td>
<td>9.6</td>
<td>7.6*</td>
<td>5.8</td>
<td>8.0</td>
<td>6.3</td>
<td>7.0</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td>36.6</td>
<td>30.2</td>
<td>29.2</td>
<td>29.6</td>
<td>20.1</td>
<td>21.7</td>
<td>19.4</td>
</tr>
<tr>
<td><strong>Primary Manufacturing</strong></td>
<td>n.a.</td>
<td>n.a.</td>
<td>5.3</td>
<td>6.4</td>
<td>7.3</td>
<td>7.1</td>
<td>7.2</td>
</tr>
<tr>
<td><strong>Intermediate Processing &amp; Services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary Manufacturing</td>
<td>23.5</td>
<td>22.7</td>
<td>16.5</td>
<td>18.0</td>
<td>22.8</td>
<td>22.4</td>
<td>22.3</td>
</tr>
<tr>
<td>Construction</td>
<td>1.6</td>
<td>5.1</td>
<td>5.7</td>
<td>4.4</td>
<td>5.5</td>
<td>5.7</td>
<td>6.3</td>
</tr>
<tr>
<td>Transportation &amp; Business Services</td>
<td>26.7</td>
<td>33.6</td>
<td>12.5</td>
<td>10.9</td>
<td>12.2</td>
<td>12.1</td>
<td>12.1</td>
</tr>
<tr>
<td>Government</td>
<td>n.a.</td>
<td>n.a.</td>
<td>9.0</td>
<td>10.7</td>
<td>10.3</td>
<td>9.9</td>
<td>10.2</td>
</tr>
<tr>
<td>Total</td>
<td>***</td>
<td>***</td>
<td>14.7</td>
<td>14.0</td>
<td>50.6</td>
<td>50.1</td>
<td>50.9</td>
</tr>
<tr>
<td><strong>Trade and Personal Service</strong></td>
<td>n.a.</td>
<td>n.a.</td>
<td>19.3</td>
<td>17.3</td>
<td>19.3</td>
<td>18.5</td>
<td>18.7</td>
</tr>
</tbody>
</table>

---


only adjustment made in the Royal Commission's estimates relating to the resource extraction sector was to re-classify electric light and power establishments to the intermediate service sector discussed below.

The Commission's distinction between primary and secondary manufacturing\(^{30}\) has been maintained. However, the data on service industries has been rearranged. Certain services are performed for the business community and are functionally ancillary to the production being carried on. For this reason, it does not seem reasonable to classify them together as a separate sector (in the level of production sense). However, since these services cannot be precisely allocated to particular production processes, they must be treated as "social overhead" and allocated to the broad sectors on some arbitrary basis. In the present case, these services have all been allocated to the intermediate sector of the production hierarchy. This obviously leads to an overstatement of

\(^{30}\)The former is one stage removed from resource extraction. It involves such activities as smelting, flour milling, pulp and paper production (except finished paper products), etc., where the final products are industrial raw materials. Secondary manufacturing involves a "higher degree of processing." See Royal Commission on Canada's Economic Prospects. Final Report (Ottawa: Queen's Printer, 1957), pp. 76-77.
the relative size (and probably the growth) of intermediate processing industries, and an understatement of primary level production (and, to a lesser degree, of the "highest" level of production activity). However, the data are not adequate to provide a basis for a more defensible allocation.

The problem of classifying services is further complicated by the fact that certain of these do seem to logically constitute a separate sector which is most proximate to ultimate consumption. This is true, for example, of personal services. Unfortunately, to disaggregate the data on this basis is not completely feasible. The assumption made here is that the Royal Commission's categories of electric power; construction; other public utilities; finance, insurance, and real estate; and transportation, storage and communication roughly corresponding to the first type (i.e., ancillary to intermediate processing) whereas the categories of trade, wholesale and retail; and services, business, personal and recreation roughly correspond to the services rendered at the highest level (i.e., most proximate to ultimate consumption). The limitations of these assumptions are obvious. Government services are shown as a separate category, but placed in the intermediate sector. This also involves an
assumption concerning the ancillary nature of government activity, which is difficult to defend. However, no clear basis exists on which to distinguish between the "ultimate" and "higher level" components of government activities.

The statistics in Table V suggest the changes which have occurred since 1890 in the proportion of the civilian labor force employed in at the various "levels" of production roughly delineated on the basis above.31 Employment statistics of this type are not always an accurate indicator of changes in the structure of production in the economy. If we are concerned with the flow of goods and services, then clearly differential changes in physical productivity (defined simply as either output per employed worker or output

31The estimates for 1927-1955 are from Hood and Scott, op. cit., p. 311, with adjustments to fit our concepts. Hood and Scott give an annual percentage distribution, on p. 499. These estimates are annual averages and relate to the employed civilian labor force. For a discussion of the sources of the estimates, see Ibid., pp. 349-352.

The estimates for 1891 and 1911 are from O. J. Firestone, op. cit., pp. 184-186. These estimates are not fully comparable with those for the later years because of differences in the classification system and the basis of calculation. They are based on the census of 1891 and 1911, and hence refer to "gainfully occupied persons," which on the census definition includes both employed and unemployed, with the latter distributed among the industries "in which they are usually working" (pp. 186-187; 318-319). Firestone makes no estimate of unemployment in these years, but guesses at levels of 5% and 3% for 1890 and 1910, respectively.
per man hour) among the various sectors will not be fully revealed by employment data. The aggregate significance of sectors with rapid productivity change will tend to be understated, whereas the importance of sectors with slight productivity change will be overstated. An alternative measure might be income derived or value added by each sector. However, in this case, changes in relative prices, reflecting either variations in underlying cost conditions or in the degree of monopoly, will show up as structural changes whereas they actually reflect resistance to such structural change. In part, this distortion is avoided by deflation of the value added estimates by sector, although the complications posed by changes in product specifications, "product-mix," and in the definition of the product of service industries cannot be so avoided. Table VI presents deflated estimates of gross domestic product originating in the various sectors over the same period.

32The different impressions given to structural change by each of these measures is illustrated by O. J. Firestone, op. cit., pp. 182-183. The concept of industrial and pre-industrial economics is widely used, the distinguishing feature of the former commonly being something less than 30% of the labor force employed in agriculture or something less than 30% of income derived from agriculture. The precise distinction is, of course, arbitrary. However, Firestone notes that if the income originating criterion is used,
Considering the longer historical perspective, the most noticeable (and most commented upon) development is the apparent lower rate of expansion in the extractive industries considered as a whole as opposed to industries involving a higher level of processing. Extractive level industries appear to be accounting for a smaller portion of total employment, and a smaller portion of total money income earned. These trends have continued in the postwar years and are expected to continue in the near future.33

Closer examination of these statistics suggest that this simple picture hides some important developments. Most of the decline in the resource sector occurred in the agriculture subsector. Relative employment in the nonagricultural resource industries would seem to be lower in the postwar period than in the prewar period, but in both of these periods something of a plateau seems to exist.34 Referring

Canada’s transition to an industrialized economy would appear to date from World War I; if the employment criterion is used from early in World War II. See also Smith, op. cit., pp. 9-18.

34Firestone summarizes the changes that occurred between 1870 and postwar (World War II) thus: "Agriculture... has declined substantially in relative importance, but... forestry operations and fishing have maintained the role they played at Confederation as a factor in employment and income....mining has become a much more significant factor." Firestone, op. cit., p. 183.
explicitly to the postwar period a slight upward trend might be indicated in relative employment in the nonagricultural resource industries. Of course, this period of time is far too short to identify a trend in the usual statistical sense. However, there are grounds—for example, the alleged "untapped potential" of mineral resources which provides certain prophets with the vision that the second half of the twentieth century "belongs to Canada"—on which it could be argued that such a trend may exist, in spite of possible gains in productivity in these industries. At a minimum, the evidence seems consistent with the hypothesis that there is no pronounced downward trend.35

Somewhat the same picture is given by the deflated gross domestic product estimates. The suggestion is clearly of a low rate of expansion in the capacity of the agricultural industries, but of very substantial expansion in the other extractive level industries.

Canada is generally classified as an industrialized
economy on the basis of the high proportion of employment in

---

35Hood and Scott predict an average level of employment in the Resource Industries as they define it (including electric power generation) between 1979-1981 of 5.8%. This compares to 4.6%, 5.1%, and 5.2% in 1947-49, 1950-52 and 1953-55, respectively. Hood and Scott, op. cit., p. 311.
manufacturing industries. The concept of manufacturing includes:

...all manufacturing stages, from processing of raw materials to the fabrication of intricate and made-to-order capital goods and the mass production of standardized consumer articles.36

This concept clearly involves a classification of industries by "type of process" involved, and as such it cuts across the "stage of production" classification. It is interesting and perhaps significant to note the relative importance of "high" and "low" level processing activities within this broad classification.

As a source of employment, primary manufacturing is more significant than nonagricultural resource extraction. Furthermore, if we consider the postwar period, remarkable stability is indicated in the proportion of the labor force in the lower level processing industries. There is no discernible tendency for it to decline.37 Indeed, if we classify

37Historically, the trend would seem to be slightly upward; the Hood and Scott series, however, does not go back beyond 1926 and classification problems make the use of other data (e.g., Firestone's estimates) difficult. Furthermore, the data for the decade of the 1930's must be partially disregarded because of the uneven impact of the depression on the
primary industries together with the nonagricultural resource extraction industries in one aggregate "primary production" sector, there would seem to be a very slight upward trend in the postwar years in the percentage of the labor force employed.\(^{38}\) Again, of course, the time period is too short to determine this. However, in this case also, a defensible conservative position would seem to be that no decline is indicated.\(^{39}\) Corresponding stability is indicated in the proportion of the labor force devoted to secondary manufacturing.

This picture of the strength of the aggregate primary production sector given by the employment statistics is not contradicted by the gross domestic product estimates. Indeed, these statistics suggest a relatively more rapid expansion

various segments of the Canadian economy and the consequent distortions in the apparent employment pattern. On this, see Royal Commission on Dominion-Provincial Relations, Report, Book 1, Canada, 1867-1939 (Ottawa: King's Printer, 1940), pp. 143-150.

\(^{38}\) Averages of annual employment in this aggregate sector (as a percentage of the labor force) for 1947-49, 1950-52, and 1953-55, respectively, are 9.7%, 10.0% and 10.0%. This neglects employment in auxiliary services.

\(^{39}\) Hood and Scott's projection of employment in 1979-81 in their categories of resource industries and primary manufacturing combined is 10.8% of the labor force. Again, this does not fully correspond to the present category. The corresponding figures for 1947-49, 1950-52, and 1953-55 are 10.4%, 10.9% and 11.0%, respectively. Cf., Hood and Scott, op. cit., p. 311.
in the capacity of the primary sector than in the capacity of intermediate processing and of the economy as a whole. This is indicated in Figure IV. By Hood and Scott's estimates, the proportion of gross domestic product derived from primary production (their categories of resource industries and primary manufacturing) increased from 14.9% in 1947-49 to 16.6% in 1953-55. Cross checking such findings with the Industrial Production Index tends to support this general picture of relative rates of expansion. However, this is to be expected inasmuch as Hood and Scott's estimates were derived by projecting a 1949 estimate of gross domestic product backward and forward largely on the basis of the Industrial Production Index.

One possible interpretation of the strength of the non-agricultural primary sectors of the Canadian economy is that they, in fact, played the leading role in the process of economic growth in the postwar period. This hypothesis is supported by the behavior of Canada's export trade in this period. The nonagricultural primary industries are mainly export industries. Thus it can be argued that the development

40Hood and Scott, op. cit., p. 315. The corresponding estimates for 1927-29 and 1937-39 are 11.7% and 15.4%.
FIGURE 4

INDEX OF GROSS DOMESTIC PRODUCT AND GROSS DOMESTIC PRODUCT DERIVED FROM NON-AGRICULTURAL RESOURCE EXTRACTION AND SECONDARY MANUFACTURING, CANADA, 1926-1955
of the productive capacity of these industries in the postwar years has been in response to world markets for these products. In Table VII the value of exports of Canadian produce\(^{41}\) in each calendar year in the postwar period, classified as raw materials, partly manufactured, and chiefly or fully manufactured, are expressed as a percentage of the respective 1948 values. The relatively more rapid expansion in sales of raw materials and partly manufactured goods than in sales of fully manufactured items is clearly indicated.

These statistics, however, must also be interpreted with caution. It is possible that the divergent rates of expansion reflects mainly relative price changes. It is even possible that in physical volume, exports of chiefly or of wholly manufactured goods expanded more rapidly than the volume of exports in the other categories. Unfortunately, price indexes are not available to deflate these series. The categories used in the export price indexes published by the D.B.S. are defined in terms of "chief-component material" and

\(^{41}\) "Exports of Canadian Produce" or "Domestic Exports" are defined as goods wholly produced in Canada plus imported goods which have been "changed in form or increased in value by further processing in Canada." Thus, the category excludes goods which were imported and re-exported "...in the same conditions as when imported." D.B.S., Trade of Canada, 1956, Vol. I, (Ottawa: Queen's Printer, 1958), p. 8.
TABLE VII
VALUE OF EXPORTS OF DOMESTIC PRODUCE, BY DEGREE OF MANUFACTURE, AS A PERCENT OF 1948 VALUES, CANADA, 1946-1956

<table>
<thead>
<tr>
<th>Total Exports</th>
<th>Raw Materials</th>
<th>Partially Manufactured</th>
<th>Raw Materials Plus Partially Manufactured</th>
<th>Fully or Chiefly Manufactured</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1946</td>
<td></td>
<td>71.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1947</td>
<td>90.2</td>
<td>79.4</td>
<td>62.5</td>
<td>68.4</td>
</tr>
<tr>
<td>1948</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1949</td>
<td>97.3</td>
<td>119.6</td>
<td>89.3</td>
<td>104.4</td>
</tr>
<tr>
<td>1950</td>
<td>101.1</td>
<td>107.5</td>
<td>119.4</td>
<td>113.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1948 = 100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1951</td>
<td>127.3</td>
<td>142.6</td>
<td>153.9</td>
<td>118.3</td>
</tr>
<tr>
<td>1952</td>
<td>139.9</td>
<td>172.4</td>
<td>151.7</td>
<td>162.0</td>
</tr>
<tr>
<td>1953</td>
<td>133.9</td>
<td>163.6</td>
<td>145.3</td>
<td>154.4</td>
</tr>
<tr>
<td>1954</td>
<td>126.2</td>
<td>131.8</td>
<td>155.9</td>
<td>113.9</td>
</tr>
<tr>
<td>1955</td>
<td>139.2</td>
<td>142.2</td>
<td>185.2</td>
<td>163.8</td>
</tr>
<tr>
<td>1956</td>
<td>155.7</td>
<td>186.3</td>
<td>189.4</td>
<td>187.9</td>
</tr>
</tbody>
</table>

not "degree of manufacture." However, some indication of volume changes in each category can be obtained by comparing an index of changes in the volume of exports in each of the "chief component material" categories with the proportion of exports at various levels of processing within each of these categories.

This is done in Table VIII. The volume index for each of the "chief component material" categories is that published by the D.B.S. It is derived by deflating each of the value series with an appropriate price index. The relative importance of each sector is suggested by the percentage of the total value of exports in that category in 1953. The estimates of the proportion of exports at each level of processing in each of the categories are also based on D.B.S. statistics.

Among the sectors accounting for 15 percent or more of the value of 1953 output, nonferrous metals and products showed the greatest volume expansion over the period. These exports were predominantly "partially manufactured." Neglecting agriculture, which is of little interest in the present context, the largest sector in terms of the value of exports

\[42\text{Ibid.}, \text{pp. 276-279.}\]
TABLE VIII

PERCENTAGE DISTRIBUTION OF THE VALUE OF EXPORTS OF CANADIAN PRODUCE, 1953, AND INDEX OF THE VOLUME OF EXPORTS OF CANADIAN PRODUCE, 1956, CLASSIFIED BY CHIEF COMPONENT MATERIAL AND DEGREE OF MANUFACTURE

<table>
<thead>
<tr>
<th></th>
<th>Percent of Total Value of Exports 1953</th>
<th>Degree of Manufacture, 1953</th>
<th>Index of Export Volume, 1956</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Raw Materials</td>
<td>Partially Manufactured</td>
<td>Manufactured Part. Manuf.</td>
</tr>
<tr>
<td>Agriculture and Animals Products</td>
<td>32.7</td>
<td>76.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Fibres and Textiles</td>
<td>0.6</td>
<td>6.6</td>
<td>17.3</td>
</tr>
<tr>
<td>Wood Products and Paper</td>
<td>31.5</td>
<td>4.9</td>
<td>12.9</td>
</tr>
<tr>
<td>Iron and Steel Products</td>
<td>8.6</td>
<td>8.6</td>
<td>17.5</td>
</tr>
<tr>
<td>Non-Ferrous Metals and Products</td>
<td>16.6</td>
<td>22.5</td>
<td>68.2</td>
</tr>
<tr>
<td>Non-Metallic Minerals and Products</td>
<td>3.6</td>
<td>34.5</td>
<td>57.4</td>
</tr>
<tr>
<td>Chemicals and Fertilisers</td>
<td>3.4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Miscellaneous Products</td>
<td>3.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0</strong></td>
<td><strong>32.2</strong></td>
<td><strong>28.9</strong></td>
</tr>
</tbody>
</table>

in 1953 was wood products and paper." It also experienced significant growth. In this case, over 50 percent of the exports were classified as "fully or chiefly manufactured." However, it seems clear that many of these "fully manufactured" items are in effect industrial raw materials, so that to use the "fully manufactured" category as equivalent to "secondary manufacturing" in the level of production scale would be misleading. Certain of the important items in this category that the D.B.S. seems to classify as "fully manufactured" fall in the category of primary manufacturers. 43

The other two sectors showing rapid expansion are nonmetallic minerals and products and chemicals and fertilizers. Both are small sectors, in terms of 1953 values, but of increasing significance. 44 The table shows that exports of nonmetallic minerals and products preponderantly involved a low degree of processing. By contrast, all of the chemicals exported are classified as "fully manufactured." Again, however, this is misleading. A significant portion of these

---


44 Of the total value of exports in 1956, nonmetallic minerals accounted for 6.11% and chemicals and fertilizers 3.83%. In the former case, prices are rising; in the latter, falling slightly.
products (e.g., fertilizers, acids, plastics, various salts, etc.) are actually industrial raw materials. They are classified as such, for example, by the Royal Commission on Canada's Economic Prospects. The products showing a contraction in export volume are preponderantly "fully or chiefly manufactured." In this case again, however, problems of interpreting the degree of manufacture concept arise.

The general conclusion, to be derived from this partial and rather imprecise volume evidence, would seem to be that the expansion of Canada's physical export trade in the post-war years has been lead by the expansion of exports of resources, both unprocessed and partly processed. Exports of directly consummable goods have lagged. The relative increase exports classified by purpose, as in Table IX, gives essentially the same picture. Exports of "producers' materials" which accounted for 76 percent of the value of total exports in 1953—and particularly "manufacturers' materials" (79% of the value of producers' materials exports in 1957)46—clearly


46The D.B.S. distinguishes between materials for building and construction, manufacturing, farming, and "other."
<table>
<thead>
<tr>
<th>Year</th>
<th>Total Exports (Index: 1948 = 100)</th>
<th>Producers Materials</th>
<th>Producers Equipment</th>
<th>Fuel Lubricants</th>
<th>Transport Goods</th>
<th>Consumer Goods</th>
<th>Other Goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947</td>
<td>100</td>
<td>90.2</td>
<td>87.4</td>
<td>79.4</td>
<td>70.1</td>
<td>86.0</td>
<td>112.8</td>
</tr>
<tr>
<td>1948</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1949</td>
<td>97.3</td>
<td>106.9</td>
<td>112.8</td>
<td>94.5</td>
<td>60.7</td>
<td>87.5</td>
<td>72.5</td>
</tr>
<tr>
<td>1950</td>
<td>101.4</td>
<td>115.3</td>
<td>116.1</td>
<td>91.5</td>
<td>62.2</td>
<td>48.6</td>
<td>74.9</td>
</tr>
<tr>
<td>1951</td>
<td>127.3</td>
<td>148.7</td>
<td>151.7</td>
<td>120.0</td>
<td>87.3</td>
<td>64.0</td>
<td>82.3</td>
</tr>
<tr>
<td>1952</td>
<td>139.9</td>
<td>167.4</td>
<td>168.9</td>
<td>125.7</td>
<td>87.9</td>
<td>96.9</td>
<td>76.3</td>
</tr>
<tr>
<td>1953</td>
<td>133.9</td>
<td>159.9</td>
<td>161.7</td>
<td>111.6</td>
<td>56.4</td>
<td>80.5</td>
<td>75.6</td>
</tr>
<tr>
<td>1954</td>
<td>126.6</td>
<td>150.5</td>
<td>152.9</td>
<td>106.6</td>
<td>51.8</td>
<td>61.1</td>
<td>74.3</td>
</tr>
<tr>
<td>1955</td>
<td>139.2</td>
<td>173.6</td>
<td>177.4</td>
<td>110.5</td>
<td>82.2</td>
<td>47.9</td>
<td>69.8</td>
</tr>
<tr>
<td>1956</td>
<td>155.7</td>
<td>195.5</td>
<td>208.5</td>
<td>116.2</td>
<td>117.1</td>
<td>65.3</td>
<td>72.1</td>
</tr>
</tbody>
</table>

lead the expansion of export sales. Again, price indexes should be applied to remove the effect of price changes. However, the same problem as encountered above arises in this case also. The classification system used in the official export price indexes does not correspond to the classification system used here. However, on the basis of indirect evidence on price movements (e.g., from wholesale price indexes)\textsuperscript{47} it is clear that the expansion in value of exports of producers' materials also reflects important volume increases.

III. SUMMARY

The analysis of this chapter can be briefly summarized. In the first section certain evidence was presented to support the argument that even on the very restrictive definition employed, economic growth did occur in Canada in the postwar period. Viewed in terms of structural changes involved, this growth has been characterized by remarkable stability in the proportion of labor employed in nonagricultural primary production, and by an apparent rapid expansion in the productive

\textsuperscript{47}Cf., \textit{Canadian Statistical Review}, 1957 Supplement, pp. 50-57.
capacity of these industries. This expansion in production capacity has been largely directed toward world markets rather than the home market. Sales of products with little or no processing have clearly dominated the expansion of Canada's export trade. These empirical conclusions suggest the hypothesis that in a causal sense, the main stimulus to Canadian economic growth in the postwar period has come through the basic natural resource development. These basic industries constitute the most dynamic sector of the economy. By and large, secondary manufacturing industries and other "higher level" activities oriented to the domestic market have tended to follow rather than to lead in the growth process.48

48 The development of secondary manufacturing industries in Canada is a complex picture, reflecting the effects of World War II, proximity of the United States, United States and Canadian tariff policies, the regional fragmentation of the Canadian economy, the "size of the market," etc. See D. H. Fullerton and H. A. Humphson, *Canadian Secondary Manufacturing Industry* (Ottawa: Queen's Printer, 1957).
Chapter IX

PRIVATE INTERNATIONAL INVESTMENT AND ECONOMIC GROWTH IN CANADA, 1946 - 1956

The available quantitative data relating to private international investment are both incomplete and of highly variable reliability. While this is most obvious in the case of data relating to earlier historical periods it is also true, although to a lesser degree, in the case of data relating to very recent periods. This makes precision in the empirical analysis of both historical trends and contemporary patterns very difficult to obtain. For the years 1946 through 1956 detailed and comprehensive estimates have been made by governmental agencies in a few countries, notably the United States and Canada.1 Less detailed and less

1In both cases special census or sample surveys of holdings of foreign assets are made annually. The Canadian estimates are published annually by the Dominion Bureau of Statistics in The Canadian Balance of International Payments and International Investment Position (Ottawa: Queen's Printer, annual). See also, Canada's International Investment Position, 1926-1954 (Ottawa: Queen's Printer, 1956). The United States estimates are published annually in the Survey of Current Business. See also, Foreign Investments of the United States, Survey of Current Business, Supplement, (Washington: U.S. Government Printing Office, 1953).
comprehensive, but probably relatively reliable estimates are also available for a number of the more important net international creditor nations of Western Europe. This provides a wide range of coverage. Estimates made by other governments, usually in conjunction with estimates of the balance of international payments, are also available. These, however, are less detailed and less comprehensive, and are often mutually inconsistent, reflecting in part a lack of agreement on coverage and classifications and in part differences in ability and willingness to collect and publish such data. Less confidence can be placed in these estimates.

The nature of the available data, therefore, severely restricts analysis of the pattern of international investment. The data are sufficient, however, to establish in broad outline the main features of the international flow of investment funds since 1946. In general, it seems apparent that relative to the late nineteenth century there has been

---

a significant restriction in the overall flow of private funds, and the attenuated supply has been strongly attracted to particular areas and particular industries. Traditional forms of investment, i.e., in fixed interest securities, have declined in relative importance whereas direct investments involving some degree of managerial control have increased in relative importance. Also, grants and loans by governments and international agencies have become increasingly significant as substitutes for traditional private investments.

On the basis of the available data it is reasonable to argue that various political and institutional controls coupled with the aftereffects of the economic dislocations which accompanied the depression of the 1930's and World War II have tended to restrict the international flow of private investments below some abstract potential. The amount of such restriction, however, like the potential itself, defies measurement. Commonly a simple projection of the flows occurring in the 1920's or in the three or four decades prior to World War I, adjusted for changes in levels of income, prices, or international trade, is used as a norm. Thus, the United Nations' experts have concluded that while in current dollars

3See above, pp. 178-185.
the annual flow in the period 1946-1955 was about equal to that of the mid-1920's, in constant dollars it was about one-half that of the earlier period. Furthermore, they note that private international investment has failed to increase as rapidly as either the quantum of world trade (up three-fourths over the 1920's) or the volume of world industrial production (up two and one-half times). Similar points can be made concerning the relationships between international investment and the level of national income in the main investing countries, and between international investment and domestic investment in both the lending and receiving countries. In each case, the ratio has declined historically.

Of more immediate interest is the pattern of investment which has characterized the period. According to the United Nations estimates, United States residents and United States-owned businesses have consistently accounted for more than

5Ibid., both figures exclude the Communist bloc countries.
6Cf., S. Kuznets, "International Differences in Capital Formation and Financing," pp. 37-45, 65-73. These figures relate to net capital flows in the balance of payments
one-half and perhaps as much as two-thirds of the annual gross private international investment. This has remained true even though the investment flows from various Western European countries increased significantly toward the end of the period. Canada has equally consistently been quantitatively the single most important absorber of such funds.7

Such aggregate quantitative comparisons obscure an important aspect of the pattern of international investment flows, that is their apparent compartmentalization. This is to some extent (but not solely) a product of exchange controls, and as these are relaxed the pattern is changing. Compartmentalization is most evident with respect to transactions involving corporate securities where there is no intention to control and manage the business concerned. In this regard it has been noted that:

Most portfolio investment... [in corporate securities] ...takes place between the United States and Canada,


7Ibid., pp. 7-8.
Aside from the International Bank, Canadian businesses and governmental agencies have been the only foreign organizations able to consistently raise funds by the flotations of securities in the United States. A similar pattern exists in the flow of direct investment. Thus, aside from investment in petroleum extraction, the bulk of U.S. direct investment has gone to either Canada or Latin America, with some of the countries of Western Europe in recent years obtaining an increasing share. This is particularly noticeable with respect to investment in manufacturing as opposed to resource extraction. Direct investment by Western European countries, have tended to be mainly in their dependencies, although again, liberalization in exchange controls has led to some significant expansion in investment in Canada and the United States.

This survey has been very brief and sketchy. Some of the generalizations must be seriously qualified, and, as time

---

*United Nations, The International Flow of Private Capital, 1953-55,* p. 15. This is attributed to exchange control regulations which generally discriminate against the purchase of securities outside the exchange control area where it cannot be demonstrated that this will add to the potential for earning scarce foreign exchange. *Ibid.*, pp. 67-72.
passes, some of them are becoming increasingly inaccurate. However, the fact remains that in terms of the world picture, Canada was in a remarkably favorable position vis a vis international investment flows throughout the period under consideration. While the total international flow of private investment funds was substantially restricted below some abstract potential, this probably was not true of the flow of such funds to Canada. No doubt, in the absence of the various exchange controls and other restrictive practices on the part of certain governments, more investment in Canada by non-United States residents would have occurred. However, it can be doubted if this would have augmented the total inflow. Freer international investment flows may well have led to less United States' investment in certain lines in Canada. In this connection it should be noted that individuals resident in Canada and businesses incorporated in Canada (many of which were foreign-owned, however) made substantial investments in various foreign countries; indeed, in 1956 the United Nations' estimates indicate that Canada ranked sixth in dollar volume of gross investment outflows.9

I. INTERNATIONAL INVESTMENT, THE BALANCE OF PAYMENTS AND ECONOMIC GROWTH

In accordance with the arguments advanced earlier in this study, it is necessary to distinguish between two aspects of postwar international investment in Canada, both of which may have had some significance in the growth process. On the one hand, investment flows have a balance of payments effect. Historically, there has been a tendency to assume that this is the only effect, and hence that the balance on capital account in the balance of payments correctly measures the contribution of nonresidents to capital formation and growth in the receiving country. This is implicit in the classical aggregate "scarcity of capital" type of analysis. However, only to the extent that it can be demonstrated that balance of payments pressure would otherwise have constrained Canadian growth can we say that this aspect of the investment flows has had positive growth significance, and even then the significance is strictly permissive.

On the other hand, international investment can be associated with direct and active creation of productive capacity. Foreigners can, in this sense, play a dynamic initiating role
in the growth of a particular economy. The demonstration of such an effect, particularly in quantitative terms, is much more difficult than simple balance of payments analysis would suggest.

Clearly, the separation of the two effects in any particular case is not always possible. International investment of a direct capacity creating type will normally automatically involve a balance of payments effect, either through the direct provision of foreign exchange, or, in the case of investment out of undistributed profits, through the elimination of an immediate demand for foreign exchange. An exception might be capital expenditures out of domestically raised funds by foreign-owned firms. More difficult to analyze, but clearly similar in effect, is the situation in which domestic and foreign firms have connections which involve a transfer of technological knowledge and skilled personnel, but no transfer of capital funds and no formal ownership or significant managerial control by the foreign firm.

While international investment which is directly capacity creating will normally involve a balance of payments effect, the reverse is not true. Financial transactions involv-

10 Or, what amounts to the same thing, direct shipments of capital goods.
ing purchases and sales of securities, affect the supply of foreign exchange and, hence, the balance of payments, but need have no direct relation to any specific expansion of productive capacity.\textsuperscript{11} Hence, it is meaningful and perhaps important to distinguish at least in a general way between these two effects. We will briefly consider the balance of payments or financial effect in this section, leaving the more complex problem of analyzing the direct growth stimulation effects of the investment flows to the following section.

That balance of payments problems may be encountered by a country in the process of economic growth is a familiar conclusion of economic theory. Briefly, two aspects of this problem have been identified. The first of these derives from an extension of Keynesian income theory to the growth situation in an "open" economy. The process of growth will normally involve investment expenditures leading to higher aggregate money income payments to various persons. Unless the average marginal propensity to save is in fact one, the increased income payments will lead to certain repercussions

\textsuperscript{11} Again, black and white distinctions are not possible. Certain purely financial transactions of this type may be a preliminary to investments of the first type, e.g., when mineral or property rights, or a controlling interest in an existing domestic corporation are purchased.
in the economy. If the consumption goods are domestically produced, unless the elasticity of supply is very great (approaching infinity), some increase in prices of such goods is to be expected. In an "open economy" free of exchange controls, we would normally expect this to lead to attempts to substitute imported goods for domestically produced goods. If the demand for these goods is not highly elastic, or if fixed exchange rates are maintained, this should lead to a balance of payments problem; the demand for foreign exchange has increased with no (immediate) corresponding increase in the economy's capacity to earn such foreign exchange. Indeed, if previously exported goods are diverted to domestic uses, either because they are employed directly in the creation of capital equipment to expand the production frontier, or are partially absorbed into domestic consumption, the capacity of the economy to earn foreign exchange may actually be reduced. Similarly, if there is an induced rise in the cost of producing export commodities, unless the foreign demand for them is highly inelastic, and alternative sources of supply are insignificant, the capacity to earn foreign exchange may decline.

At the same time, an "income effect" occurs. Even in the absence of a relative rise in the prices of domestically
produced goods, unless the marginal propensity to consume imported commodities is zero, an increased demand for foreign commodities is to be expected. This is most obvious when a significant proportion of domestically consumed "wage goods" is normally imported. It is also obvious when domestically produced "wage goods" have a significant content of imported materials. However, it is also true when neither of these situations exist if foreign produced goods have a high income elasticity of demand. In any case, the analysis of the above paragraph applies, and balance of payments pressure is to be expected.

The other case has been less analyzed in the literature. It is not the Keynesian case, strictly speaking, but its importance is testified to by its prominence in the basic concepts underlying the policies of such international agencies as the International Bank for Reconstruction and Development and such international aid programs as the Colombo Plan.\textsuperscript{12} The process of growth itself may require the extensive importation of foreign produced goods, either industrial

raw materials or capital equipment. These imports may be both indispensible and nonpostponable. Clearly, they are indispensible if they are not potentially producible domestically, or only at high costs relative to costs of importation, and if they are technologically required in terms of the particular extension of the production frontier which is being undertaken (and, of course, if no domestically produced substitute is feasible). In a somewhat different sense, they are indispensible if the persons undertaking the expansion of productive capacity think they are indispensible, or if, because of ownership ties, etc., they are formally or informally committed to using a particular type of equipment, or equipment produced by a particular foreign firm.

The purpose of dwelling on the balance of payments aspect of the investment inflows is to determine whether, in a purely financial sense, foreign funds were necessary to the process of growth. This is a most difficult question to answer conclusively because it involves a projection into the world of the hypothetical. In part, the question is being asked: if we could assume that the impetus to growth would have developed internally in Canada during this period, would Canada have encountered a balance of payments constraint in the absence of substantial inflows of funds on capital
account? In other words, would Canada's foreign exchange earnings on current account, in the context of the postwar world, have been sufficient to pay for such additional specific imports as would have been required as a result of economic growth?

The answer to this cannot be a simple "yes" or "no." It seems unreasonable to assume that the extensions of the production frontier which were actually achieved during this period could have been achieved without some foreign funds, at least under conditions of free foreign exchange markets. If we admit of the possibility of exchange control measures designed to maximize the growth potential of existing foreign exchange earnings, this proposition becomes much less certain, but perhaps not completely indefensible. In the absence of extensive domestic controls over the allocation of resources, the diversion of consumer demand from foreign sources of supply might involve a corresponding diversion of domestic resources into the production of consumer goods. This would have an inhibiting effect on the growth process. In what follows, we assume that such extensive direct controls, the virtual equivalent of growth-oriented total central planning, did not constitute a politically realistic alternative. On this basis, the presumption that the achieved growth required some foreign
exchange in excess of that derived from export earnings seems reasonable.

However, it is unreasonable to argue that the pattern of growth actually achieved was the only one which could have been achieved. If we admit of possible variations in the pattern of growth, the question of the adequacy of foreign exchange earnings becomes very difficult to answer because each potential growth pattern would involve different foreign exchange requirements. Inevitably, in discussions of this type, some implicit assumption must be introduced with respect to the pattern of growth which ought to have been followed. This is a matter of appraisal for which there can be no conclusive and universally acceptable answer. To eliminate this complication we will concern ourselves only with the pattern of growth actually achieved.

In light of this, the question being posed can be slightly modified to: were such international investments as occurred totally necessary (in a financial sense) in view of the process of growth which actually occurred? Even in this softened form, the question is not fully answerable either in theory or in fact. A simple hypothetical example can serve to elucidate the theoretical problem.
Consider the case of an open economy, initially in equilibrium with the rest of the world in the sense that the value of current imports \( (M_o) \) equals the value of current exports \( (X_o) \), with no international investment flows and no investment income transfers (or, alternatively, assume that investment income transfers are given and included in the current payments as payments for "services" currently imported or exported). The authorities in this country exert no discretionary administrative control over international payments. Now assume that a domestically initiated investment project disturbs the situation, leading to a combined direct (capital goods) and indirect (Keynesian) increase in required imports \( (M_g) \) with no corresponding immediate increase in export capacity. The balance of payments is in disequilibrium, in the sense that

\[
M_o + M_g > X_o,
\]

at existing exchange rates and relative commodity prices. Some combination of income and price (including exchange rate) adjustments is necessary to correct the disequilibrium. Except in the situation in which consumer demands for imported goods are very elastic relative to the demand for imported capital goods (or where the supply of exportable goods is very elastic) these adjustments should have a restraining
impact on growth. We can define a permissive inflow of for­
eign investment funds ($I_p$) as one which makes these adjust­
ments unnecessary, i.e.:

$$I_p = M_q - M_o$$

at existing exchange rates. Any investment inflow in excess
of this ($I_e$) would represent "excess borrowing," and any in­
flow less than this ($I_d$) would represent "deficient borrow­
ing." Thus:

$$I_e = I - I_p$$

where $I > I_p$. And,

$$I_d = I_p - I$$

where $I < I_p$.

In a regime of fixed exchange rates, "excess borrowing" would tend to produce an accumulation of foreign exchange in the borrowing country. In a regime of flexible exchange rates it would tend to produce an appreciation of the currency of the borrowing country on foreign exchange markets. Inasmuch as interest rate differentials (actual or expected) are pre­
sumed to have attracted the foreign investors in the first place, security markets are also going to be affected. Given "excess borrowing," security prices in the borrowing country would tend to rise and interest rates to fall, more than
offsetting any opposite effects produced by the original domestic investment. As a result, some asset holders may be induced to shift into cash, and there may be some secondary stimulation of domestic consumption and investment expenditures. The resulting income effects would tend to increase imports and/or reduce exports, depending on relative supply and demand elasticities.

Similar, but opposite, secondary repercussions could be expected to result from "deficient borrowing." Clearly, even if the restricted conditions of this static example could be identified in reality, the direct and indirect repercussions of "excess" and "deficient" borrowing would make any precise measurement of the magnitude of the excess or deficiency virtually impossible. However, the movement of exchange rates, foreign exchange reserves, and interest rates away from what would otherwise have been their equilibrium values would provide a reliable indicator of the presence of "excess" or "deficient" borrowing.

Reliance can only be placed on these indicators, however, if other fundamental conditions do not change. The above analysis was predicated on the usual static ceterus paribus assumptions with respect to basic consumer preference schedules, etc. In this case, the original values for imports
and exports represent equilibrium values which would prevail in the absence of investment activity. In fact, the basic determinants of the theoretical model, of course, cannot be regarded as static. Each of the suggested indicators of "excess" or "deficient" borrowing can therefore change as a result of factors not related to the immediate growth process.

This, of course, is the familiar problem in the concrete application of any static theorems. Even aside from the fact that in the continuing process that is history, any arbitrarily selected period may not reflect static equilibrium conditions, the possibility of such changes in preferences, population, etc., means that any arbitrary "original" values for imports and exports cannot be simply projected as normal or equilibrium values which would again result if present investment activity were to cease.

Furthermore, even in the absence of changes in basic preference patterns (if that is conceivable), the fact of economic growth itself will complicate the interpretation of the basic indicators of "excess" or "deficient" borrowing. By adding to productive capacity, investment will change the fundamental conditions of equilibrium between the growing economy and the rest of the world. This is obviously true if export capacity is directly affected, or if cost conditions
in export industries are altered. It is also true if the whole of the increased productive capacity is oriented to the domestic market, insofar as substitution of domestic products for imports occurs or new demands for imported goods are created. An expansion of export capacity or a reduction of import demands would create a situation in which further growth involving a continuation of about the same rate of investment expenditure and the same requirements for foreign exchange per dollar of investment could be supported financially with less international investment. The very fact of growth, then, necessitates a continuous reappraisal of the criteria used to identify "excess" or "deficient" borrowing.

Admitting the repercussions of growth itself on balance of payments equilibrium conditions, and the probability of spontaneous changes in preferences, etc., affecting the basic equilibrium conditions, no a priori basis for identifying "excess" or "deficient" borrowing can be specified. A large element of judgment must be invoked. In light of this, what can be said of the case of Canada between 1946 and 1956?

13 That is, assuming that the world demand for this country's exports is rather elastic, so that the terms of trade do not move sufficiently in an adverse direction to eliminate any gains due to added export capacity.
Magnitude and Composition of the Financial Contribution

In appraising the purely financial contribution of foreign investors to Canadian economic growth it is necessary to estimate the foreign exchange made available to Canada as a result of transactions not involving the sale of Canadian produce or the disposition of any part of the stock of claims on foreign individuals or organizations (whether in the form of debt instruments or equity in real property or business concerns) which Canadians might have had at the outset of the period under consideration. It is necessary to include in our accounts actual and de facto transfers. That is, we want to measure the inflow of funds resulting from net sales.

This exclusion of sales abroad of foreign assets held by residents of Canada may seem questionable. Clearly, such sales give rise to an inflow of funds not directly related to current exports of goods and services. In this sense, they would seem to represent a financial transfer which permits a growth-induced trade deficit in the same sense as any of the other transfers discussed in the text. However, the purchase of these assets by foreigners does not constitute investment by them in Canada. At any one point in time, the stock of foreign assets, insofar as these assets are in fact salable in foreign markets, represents a resource which Canada has available to finance essential imports without resorting to foreign borrowing. In this sense, then, and viewed simply in terms of its financial significance, such sales constitute a substitute for international investment in Canada. Correspondingly, additions to the stock of such assets represent a drain on the available foreign exchange not strictly dictated by the growth process.
of Canadian securities (new and outstanding issues) abroad, transfers from abroad associated with the operations or expansion of foreign-controlled enterprises in Canada, any increase which might have occurred in short-term credit extended by foreigners to Canadian exporters and in foreign holdings of Canadian dollars (actual transfers), plus such retained earnings of foreign controlled enterprises in Canada as are allocatable to foreign equity in these business (de facto transfers).\footnote{The appropriate treatment of the equity of foreign stockholders in the retained earnings of Canadian-controlled corporations is problematic. However, it seems reasonable to exclude this from the inflow of funds in the present sense. In the case of foreign-controlled corporations, an effective decision has presumably been made by foreigners not to withdraw current earnings. However, in the case of Canadian-controlled corporations with minority foreign ownership, such a decision cannot be attributed to the noncontrolling interests.} It also seems appropriate to add in to the total of foreign financial transfers at least that portion of the depreciation and depletion allowances of foreign-controlled enterprises in Canada which is allocatable to the equity of foreigners in these enterprises. The grounds for this are familiar. Except where depreciation allowances in any given time period correspond to replacement expenditures (interpreting this narrowly to imply replacement of worn out equipment by duplicate equipment), depreciation
allowances have the same effect as retained earnings. They represent a pool of funds out of which expenditures can be made to expand the production frontier. In this sense, they represent a de facto transfer.

Data relating to the first two components and the Canadian dollar balances of nonresidents can be obtained directly from published balance of payments statistics. Short-term investment flows, however, are published on a net basis (inflows less outflows) and as a residual balancing item. Included as a short-term movement is the residual error attributable to differences between the direct estimates of the capital and current accounts. The figure in which we are interested, the net change in aggregate short-term credit extended to Canadian exporters, is not available for the whole period. For this reason, the series has been omitted from the tabulation. This omission, however, is probably not too serious. The various estimates relating to parts of the period suggest that the amount involved is rather small and that it varies significantly and irregularly from year to year.\textsuperscript{16} While the annual fluctuations

are of significance in balance of payments analysis, they are so wide relative to the size of the item that any arbitrarily selected pair of years over which the flow of funds is measured may give a misleading picture of the average movement. 17

The balance of payments statistics are computed on a current payment rather than an accrual basis. Hence, they do not reflect changes in foreign equity in the retained earnings of foreign-controlled corporations. These have to be estimated separately. In a study published in 1954, 18 Safarian and Carty derived estimates of retained earnings in enterprises controlled abroad during the period 1946-53 by deducting from the estimated increases in the book value of such investments those parts which were attributable to other identifiable factors (particularly the inflow of new funds).

17 A slight error is also introduced into the tabulation by the omission of "other long-term capital transactions" which are also reported on a net basis. The exact nature of these transactions is not clear. However, they seem to relate to long-term movements not classified elsewhere. As in the case of short term indebtedness, the magnitude is not great and the series behaves irregularly (although a trend to a net inflow can be detected since 1950).

Inasmuch as they were computed as a residual, these estimates probably include the effects of some revaluation of assets. The D.B.S. has revised and extended these estimates, providing an annual series for the years 1946 through 1956. Aside from the effects of incomplete coverage, these estimates probably overstate the financial contribution of retained earnings because they include not just the earnings accruing to nonresidents, but the total retained earnings in all foreign controlled enterprises. Perhaps this error will compensate for the omission of short-term indebtedness noted above.

In this same study, Safarian and Carty made estimates of depreciation allowances attributable to foreign-controlled enterprises. These estimates were derived by applying the D.B.S. estimates of percentage foreign ownership in the various industrial (including nonagricultural resource extraction) sectors to the corresponding depreciation allowances shown in the national income accounts. The estimates are for

1946 through 1954. They have been crudely projected through 1956 on the assumption that 18 percent of the total reported depreciation allowance in Canadian industry in these years was accounted for by foreign controlled firms.21

These estimates are presented in Table X. Even neglecting the depreciation allowances, it is clear that the bulk of the funds provided have been in connection with direct investments, both from net inflows of funds and the retention of earnings. For the period as a whole, portfolio transactions account for about 18.7% of the inflow of foreign funds net of depreciation, and 10.6% including depreciation. The estimates suggest a significant difference between the two sub-periods selected, however. In the years 1946 through 1949 portfolio transactions actually reduced funds available to finance an import deficit. The inflow derived from sales of new and outstanding issues22 was more than offset by an out-

21 Safarian and Carty's estimates of depreciation allowances in foreign-controlled firms represent 16.9% and 18.1% of total recorded depreciation in the periods 1946-49 and 1950-1954, respectively. Over the whole period the average is 17.8%. Depreciation figures employed for this calculation are from D.B.S., National Accounts, Income and Expenditure, 1926-1956 (Ottawa, Queen's Printer, 1958), pp. 92-93.

22 An inflow of funds is registered in both of these accounts in each year except 1947. In that year trade in outstanding issues resulted in a small outflow ($13 million) but it was more than offset by flotations of new series ($95 million).
<table>
<thead>
<tr>
<th></th>
<th>1946-49</th>
<th>1950-56</th>
<th>1946-56</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Inflow of Funds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net Sales of Canadian Securities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outstanding Issues</td>
<td>192</td>
<td>177</td>
<td>669</td>
</tr>
<tr>
<td>New Issues</td>
<td>568</td>
<td>2,136</td>
<td>3,004</td>
</tr>
<tr>
<td>Retirement</td>
<td>-1,161</td>
<td>-1,231</td>
<td>-2,395</td>
</tr>
<tr>
<td><strong>Net</strong></td>
<td>-404</td>
<td>1,682</td>
<td>1,278</td>
</tr>
<tr>
<td><strong>Direct Investment in Canada (net)</strong></td>
<td>266</td>
<td>2,695</td>
<td>2,961</td>
</tr>
<tr>
<td><strong>Canadian Dollar Balances of Non-Residents</strong></td>
<td>63</td>
<td>56</td>
<td>119</td>
</tr>
<tr>
<td><strong>Total of Above</strong></td>
<td>-75</td>
<td>4,433</td>
<td>4,358</td>
</tr>
<tr>
<td><strong>Retained Earnings of Foreign Controlled Enterprises</strong></td>
<td>560</td>
<td>2,085</td>
<td>2,645</td>
</tr>
<tr>
<td><strong>Total of Above</strong></td>
<td>485</td>
<td>6,518</td>
<td>7,003</td>
</tr>
<tr>
<td><strong>Depreciation Allowances of Foreign Controlled Enterprises</strong></td>
<td>900</td>
<td>3,398</td>
<td>4,298</td>
</tr>
<tr>
<td><strong>Total of Above</strong></td>
<td>1,385</td>
<td>9,916</td>
<td>11,301</td>
</tr>
</tbody>
</table>

flow resulting from retirements. The inflow of new funds associated with direct investments averaged around $665 million. This was not large enough to compensate for the portfolio-account drain. Even allowing for retained earnings, the foreign financial contribution throughout the period was only $422 million net of depreciation, and $1322 gross of depreciation.

A sharp increase in the inflow of funds attributable to all categories is to be noted after 1949. Of the total change in the value of foreign controlled enterprises between 1946 and the end of 1956 (attributable to both net inflows of new funds and retained earnings), 85.6% occurred after 1949. It is also notable that in no year between 1950 and 1956 (inclusive) did portfolio transactions in Canadian securities lead to a net drain of funds. As a result, the inflow of funds from such transactions totaled $1,682 million, or 26.2% of the total inflow net of depreciation and 17.1% including depreciation. This inflow shows a tendency to increase, both in absolute volume and relative to the other components.23

Commodity Trade, Growth and the Nonresident Financial Contribution

Evaluation of the necessity of these actual and de facto financial transfers from abroad involves the estimation of the total foreign exchange required over the period in question, to finance both the basic and the growth-induced imports, and the estimation of the foreign exchange which would have been supplied without resort to foreign borrowing. As noted above, the process involved in determining these sums is not obvious, even in theory. The starting point for any quantitative projection must be the actual record of international payments and receipts. However, inasmuch as the size of the various items was undoubtedly affected by the size of the financial transfers, adjustments must be made in these figures.

Consider first the requirements for foreign exchange. In theory there would seem to be a distinction between those arising out of the original pattern of international specialization and those induced by the growth process, both as a result of direct import requirements for growth and the changes in the pattern of international specialization produced by growth. One approach would seem to be, then, to project the basic equilibrium values, treating the increase in payments
as the growth-induced component. This amounts to treating
the actual international payments over the period as the re­
quired payments.

Aside from the fact that the base year payments prob­
ably did not reflect a basic equilibrium situation in the in­
ternational accounts, this procedure is open to several ob­
jections. These were referred to above. To eliminate the
complications introduced by variations in possible growth
patterns and consumers preferences, we confine our attention
to the actual developments in these respects. However, the
possible impact which the actual international financial
transfers might have on the value of current international
payments cannot be summarily dismissed in this fashion.

The complications arise because we are dealing with a
general equilibrium system. In any balance of payments,
changes in any one item will indirectly affect every other
item, in greater or lesser degree. Thus, if either "excess"
or "deficient" borrowing in fact existed during this period,
appropriate adjustments would have been induced in other cate­
gories in the balance of payments. The actual recorded cur­
rent payments, then, reflect not only the effects of growth
and basic consumer preferences (and, of course, comparative
cost conditions) but also the indirect repercussions of any
excess or deficiency of investment flows. These flows of funds, in this sense, represent an autonomous variable in the system, changes in which necessitate marginal adjustments in some or all of the other variables. Excess borrowing, for example, by affecting exchange availability or exchange rates would tend to stimulate consumption of imported goods for the reasons noted above.

It is apparent that the pattern and level of current payments was affected throughout this period by the mechanism of balance of payments adjustment; by exchange control prior to 1950 (coupled with exchange rate revaluations) and by exchange rate fluctuations after 1950. However, to isolate from the multitude of factors affecting the balance of payments the particular indirect effects of movements of investment funds does not seem feasible. This would presuppose a knowledge of all of the parameters of the general equilibrium model. Even to indicate the direction of the impact requires an answer to the present question, i.e., did "excess" or "deficient" borrowing in fact exist? The safest assumption would then seem to be that if excess or deficient borrowing existed, its indirect effects on current payments were small, and hence that the actual current payments, except investment income, reflect the basic requirements for foreign exchange, in light
of the growth achieved and the autonomous changes in consumer demands.

Investment income poses another set of problems. Such payments are clearly directly affected by actual and de facto investment flows during the period. For this reason, it cannot be assumed that the flow of investment income would have been the same with different amounts of international investment. At the outset of the period being analyzed, foreigners owned a stock of assets in the form of property rights and claims on enterprises in Canada. In order to determine the amount of foreign exchange necessary to service these investments in the absence of further investment inflows, we can tentatively assume that their book value remains constant throughout the period. Part of the assets were in the form of fixed interest securities. We could then assume that for this part, the interest payable in terms of the currency in which the debt is written, remains constant. However, the burden which this places on the available foreign exchange supply in terms of Canadian dollars varies with the exchange rate. Likewise, changes in the average interest rate payable could result in the event of changes in the composition of the debt. However, the magnitude of these effects tends to be small. For this reason, in the present projection, interest
payments for 1946 are assumed to be continued in each of the subsequent years.

In the case of dividend payments, the annual outflow is affected by both variations in profit rates and in dividend policies. In order to eliminate the effect of changes in retained earnings (a form of de facto investment transfer) it is assumed that all earnings on direct investments are withdrawn. To determine the foreign exchange demands thus created, it is assumed that annual earnings on foreign direct investments throughout the period averaged 12 percent. Applying this to the book value of investments in 1946 we arrive at a series of investment income transfers on the assumption that there is no change in total foreign direct investment in Canada, and that all earnings are transferred within the period considered.24

On these assumptions, we can derive a series of requirements for foreign exchange, given the pattern of growth and

---

24The estimate of a 12 percent return on book value is that of the Dominion Bureau of Statistics, *Canada’s International Investment Position, 1926-1954*, p. 61. To the extent that book values were written up in accordance with the inflation that occurred this series will underst ate the requirement for foreign exchange from this source. It should also be noted that no "recovery" of capital is assumed. That is, it is implied that depreciation allowances correspond to replacement expenditures.
consumer demands for imported goods, and given no new foreign investment in Canada, either out of new transfers of funds or out of retained earnings. A similar estimate must be made of earnings of foreign exchange on these assumptions. Again, the same problem is encountered in using the actual figures for current receipts from international transactions—the actual flow of investment funds undoubtedly affected the capacity to earn foreign exchange.

Certain of the credit items in the current account would seem to be largely unrelated to financial transfers from abroad in the current period. We can treat the achieved values of these as a basic supply of foreign exchange which would have been available in any case to finance essential imports. Included in this category would be inheritances and immigrant funds and travel expenditures. "Gold production available for export" might also be classified in this group. However, if excess borrowing did exist, tending to raise the exchange value of the Canadian dollar, the potential returns from this source might be significantly understated. The lower price for the Canadian dollar on the foreign exchange markets which would have occurred in the absence of excess borrowing, would yield a higher effective return to gold miners, perhaps stimulating gold production. In this
way, as a producer of what is effectively international "money," Canada has an advantage not unlike a government able to draw on newly created money to finance current purchases. However, for simplicity, we shall consider that the attained level of gold exports represents the maximum of foreign exchange which would have been derivable from this source.25

The constancy of earnings on account of "freight and shipping" suggest that it should be treated in this fashion also. Such increases as occurred in this category are readily attributable to price rises.26

If these various items are, indeed, relatively unaffected by the inflow of investment funds, then the major analytical problem is associated with the interpretation of the probable course of commodity export earnings in the absence of the foreign financial transfers. These transfers could have various effects on export earnings. To the extent that some

25A similar question might be raised concerning receipts from expenditures by foreign tourists. Excess borrowing, if it affected the exchange rate, should tend to discourage in-tourism. However, it can be realistically assumed, even in the case of travel between Canada and the United States, that tourist expenditures are relatively insensitive to exchange rate fluctuations.

26If anything, these receipts would seem to have been adversely affected during the period, as a result of exchange rate appreciation. The rise in earnings would not seem to be fully in accord with the general rise in prices. For this reason, we may again be understating the foreign exchange earning capacity.
imported goods were necessary for the extension of the production frontier and for the expansion of export capacity over the period, and to the extent that existing earnings of foreign exchange were not adequate, the financial transfers may have permitted the expansion of exports. Except where demand for these goods was both constant (or falling) and relatively price inelastic, this would be reflected in higher earnings of foreign exchange on commodity account. It is impossible to say if this was the case. However, we can project the level of export earnings achieved in some "normal" year, say 1948, corrected for changes in export prices, adding it to the achieved earnings on the factors listed above, to see if this level of earnings would have been adequate to finance growth essential imports.

This provides a crude approximation to what we are attempting to measure. Even a domestically initiated growth process would have some impact on export capacity. If the pattern of growth was not too different from that actually achieved, then, even in the absence of foreign investment, export earnings would have expanded somewhere between the extremes of the rate actually achieved and the present assumption. This, then, is a "pessimistic" projection.
Receipts of investment income could also be affected by the inflow of investment funds. Throughout the period, Canadian investments abroad increased in book value. This represents an alternative use of foreign exchange receipts. However, it also meant that the inflow of investment income increased throughout the period. In order to determine the financial necessity of the inflow of foreign investment funds, we can assume that all available foreign exchange would have been used to finance imports of goods and services (and service outstanding debts to foreigners). Then, we can assume, as above, that the book value of Canadian owned assets abroad remained at the 1946 level. The same method as used above to compute investment income payments can then be used to compute investment income receipts.  

The results of this projection of foreign exchange requirements and earnings in the absence of foreign investment, from 1946 through 1956, are presented in Table XI. The assumptions on which the projection is based can be briefly summarized. They are:

1. That no change in the requirements for foreign

27In this case, an average return of 15% on foreign direct investments is assumed. Ibid., p. 61.
**TABLE XI**

PROJECTION OF FOREIGN EXCHANGE REQUIREMENTS AND EARNINGS IN THE ABSENCE OF FOREIGN INVESTMENT 1946-56, ASSUMING NO CHANGE IN EXPORT CAPACITY

<table>
<thead>
<tr>
<th></th>
<th>1946-49</th>
<th>1949-56</th>
<th>1946-56</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foreign Exchange Requirements</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment Income Payments</td>
<td>1,802</td>
<td>3,154</td>
<td>4,956</td>
</tr>
<tr>
<td>Other Current Payments</td>
<td>12,945</td>
<td>38,560</td>
<td>51,505</td>
</tr>
<tr>
<td>Total</td>
<td>14,747</td>
<td>41,714</td>
<td>56,061</td>
</tr>
<tr>
<td><strong>Foreign Exchange Earnings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment Income Receipts</td>
<td>484</td>
<td>847</td>
<td>1,331</td>
</tr>
<tr>
<td>Non-merchandise Current Receipts</td>
<td>3,927</td>
<td>8,462</td>
<td>12,389</td>
</tr>
<tr>
<td>Export Earnings</td>
<td>11,356</td>
<td>25,031</td>
<td>36,369</td>
</tr>
<tr>
<td>Total</td>
<td>15,767</td>
<td>34,322</td>
<td>50,089</td>
</tr>
<tr>
<td><strong>Total Requirements Less Total Earnings</strong></td>
<td>-1,020</td>
<td>7,392</td>
<td>6,372</td>
</tr>
</tbody>
</table>
exchange to purchase current goods and services would have occurred.

2. That no change occurred in the book value of foreign assets in Canada, the 1946 interest payments continued in each year through 1956, the average return on direct investments was 12%, and all investment income was transferred abroad.

3. That the earnings on nonmerchandise sales would have been unaffected by the absence of foreign borrowing.

4. That export capacity remained fixed at the 1948 level.

5. That Canadian assets abroad remained at the 1946 level, the 1946 interest earnings were perpetuated in each year, the profit rate on direct investments averaged 15% annually, and all investment income was transferred.

The resulting projection is probably conservative with respect to Canada's capacity to earn foreign exchange on physical exports. The bias in the other assumptions is difficult to determine, but on balance the estimates probably overstate the exchange deficit. The conclusions derivable from the calculation are interesting. If the assumptions are not too unrepresentative, there is no suggestion of "excess borrowing" over the period as a whole. Between 1946 and 1949, an excess of earnings over requirements is indicated. This
perhaps reflects the effects of exchange restrictions. However, for the period 1949-1956, the period of most pronounced growth, required exchange not provided by current earnings is indicated to be $7,392 million. According to Table X, the transfer of foreign funds to Canada in this period was only $6,518 million, excluding depreciation allowances. Over the whole period (1946-1956) the indicated exchange deficiency was $6,372 million, and the financial transfer $7,003 million.

Because of the conservative bias in the estimate of export capacity, this conclusion of no "excess borrowing" must be severely qualified. If some expansion in export capacity, and hence some increase in export earnings, is admitted, the picture changes significantly. Table XII duplicates Table XI except that actual earnings on merchandise exports are substituted for the revalued 1948 earnings. The effect of this is to reduce the excess of requirements over earnings over the whole period by $3,444 million, from $6,372 million to $2,928 million. When compared to the total inflow of investment funds over the period, a strong suggestion of "excess borrowing" emerges. Even when some expansion in export capacity between the two extremes is postulated, "excess borrowing" is again clearly indicated. This is even apparent in the period 1950-56, when growth was greatest. In this case,
<table>
<thead>
<tr>
<th></th>
<th>1946-49</th>
<th>1950-56</th>
<th>1956-56</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foreign Exchange Requirements</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment Income Payments</td>
<td>1,802</td>
<td>3,154</td>
<td>4,965</td>
</tr>
<tr>
<td>Other Current Payments</td>
<td>12,945</td>
<td>38,560</td>
<td>51,505</td>
</tr>
<tr>
<td>Total</td>
<td>14,747</td>
<td>41,714</td>
<td>56,461</td>
</tr>
<tr>
<td><strong>Foreign Exchange Earnings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment Income Receipts</td>
<td>484</td>
<td>847</td>
<td>1,331</td>
</tr>
<tr>
<td>Non-Merchandise Current Receipts</td>
<td>3,927</td>
<td>8,462</td>
<td>12,389</td>
</tr>
<tr>
<td>Export Earnings</td>
<td>11,135</td>
<td>28,678</td>
<td>39,613</td>
</tr>
<tr>
<td>Total</td>
<td>15,546</td>
<td>37,987</td>
<td>53,533</td>
</tr>
<tr>
<td><strong>Total Requirements Less Total Earnings</strong></td>
<td>-799</td>
<td>3,727</td>
<td>2,928</td>
</tr>
</tbody>
</table>
substitution of actual export earnings reduces the excess of foreign exchange requirements by $3,665 million to $3,727 million. Investment inflows in this period were $6,518 million.

The crudeness of the estimates prevents us from placing any confidence in these measures of the "excess." However, they do provide clear evidence that it existed. Supporting evidence is provided by the magnitude of Canadian transfers of investment funds to nonresidents.

The Use of Foreign Exchange Other than to Finance Commodity Imports

Throughout the period under consideration individuals and businesses resident in Canada engaged in financial transactions with nonresidents which absorbed a significant portion of available foreign exchange and which were not directly related to the process of growth in Canada itself. These transactions included transfers of funds to firms located in other countries but controlled by firms and individuals resident in Canada, the purchase of foreign securities by residents of Canada, the extension of short-term credit to foreign businesses, official governmental loans to other countries, and accumulations of foreign exchange in Canada. In addition to these actual transfers, significant de facto transfers also
occurred. Allowance should be made for Canadian equity in the retained earnings and perhaps the depreciation allowances of Canadian controlled enterprises located abroad.

The problems of estimation of the magnitudes involved in each of these categories are essentially the same as those noted above in connection with the inflow of funds to Canada, although in this case greater difficulty is encountered in estimating certain of the categories. Reliable estimates of most of the actual flows can be derived from the balance of payments statistics of the D.B.S. These include transactions in foreign securities, direct transfers to Canadian controlled enterprises, and accumulations of foreign exchange and gold in official hoards. However, data on all of the pertinent items is not equally available. In particular, short-term credit extended to foreign businesses has been omitted from the present tabulation for the same reason as noted in the case of short-term credit extended to Canadian businesses by nonresidents.

Following the termination of foreign exchange controls in September of 1950 a significant increase was recorded in bank balances and other private holdings of short-term funds held abroad. See, Bank of Canada, Statistical Summary, Financial Supplement, 1958, p. 4. See also, D.B.S., The Canadian Balance of International Payments and International Investment Position, 1957, p. 27. These have been included with the official exchange reserves for these years.
No direct estimates of the de facto transfers are available. In our present tabulation an estimate of retained earnings has been made by deducting from the reported increase in the book value of Canadian direct investments abroad over the period, that portion of the increase which can be accounted for by the actual transfer of funds to these enterprises. The resulting figures probably exclude certain transfers to the firms (for example, transfers from individuals and firms resident in Canada but not directly related to the firms in question) and probably includes the effects of some revaluation and reclassification of assets. For these reasons, the figures are to be regarded as crude approximations. No basis exists for estimating depreciation allowances in these firms. For this reason, this item is not tabulated.

These estimates of the financial outflow are presented in Table XIII. When the magnitude of the financial outflow is compared with the magnitude of the financial inflow and the requirements for foreign exchange to finance growth, a clear suggestion of "excess borrowing" exists. In light of the transfer of funds out of Canada for the acquisition of financial assets, it cannot be said that the inflow of funds measures the contribution of nonresidents to the financing of Canadian growth. There is evidence, also, that a significant
TABLE XIII

CANADIAN FINANCIAL TRANSFERS TO NON-RESIDENTS, 1946-1956
(A MINUS SIGN INDICATES AN OUTFLOW FROM CANADA)

<table>
<thead>
<tr>
<th></th>
<th>1946-49</th>
<th>1950-56</th>
<th>1946-56</th>
</tr>
</thead>
<tbody>
<tr>
<td>($ Million)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Current Outflow of Funds

Transactions in Foreign Securities
Outstanding Issues
- New Issues
-114
Retirements
24
Net
51

Direct Investment Abroad
20
-383
-363

Foreign Exchange and Gold
389
-1,300
-911

Total of Above
460
-1,628
-1,168

Retained Earnings of Canadian Owned Enterprises
-226
-594
-820

Total
234
-2,222
-1,988

Loans by Gov't. of Canada
(drawings less repayments)
-1,274
445
-829

Total
-1,040
-1,777
-2,817

portion of the inflow of funds was for immediate re-export to foreign subsidiaries of corporations located in Canada but owned abroad. In this sense, the Canadian subsidiaries are essentially financial intermediaries in the international flow of investment funds.

Reconciliation of the Estimates

Because of the fact the balance of payments must always balance, the identity always holds that earnings of foreign exchange equal uses of foreign exchange. Thus, the financial transfers from Canada plus the payments on current account should, in any year, equal the inflow of investment funds (long and short-term) plus current earnings. The present estimates, representing a crude admixture of actual and hypothetical figures, do not reconcile in this fashion. However, this fact is of no consequence inasmuch as the purpose of the estimates is to detect the presence or absence of excess borrowing, not to measure its magnitude. A full reconciliation of the estimates would require a projection of changes in Canadian assets abroad consistent with the other elements, with corresponding adjustments in invest-

ment income receipts. Such a projection is not attempted inasmuch as it adds nothing to the argument.

Conclusions

The implication of the above analysis is that the gross inflow of investment funds to Canada in the period of 1946 through 1956 was more than that required to finance any potential balance of payments deficit resulting from the growth process per se. While no direct measure of the amount of "excess borrowing" is possible, two types of evidence were cited to demonstrate its existence. Crude projection of the foreign exchange required to finance the process of growth was compared to a similar projection of foreign exchange earnings over the period, in the absence of borrowing. The suggested deficit was much less than the gross capital inflow. This conclusion was reinforced by the magnitude of investment outflows throughout the period. The increase in nominally Canadian owned assets abroad resulted in part from a direct re-export by foreign-controlled corporations of investment funds received from abroad, and in part by direct acquisitions of such assets by Canadian firms and individuals.

This is not to say that a balance of payments restraint would not have been encountered in the absence of foreign in-
vestment in Canada. There is clear evidence that the possible earnings of foreign exchange throughout the period would not have covered the exchange requirements of the growth process. For this reason, absence of foreign investment in Canada would have retarded Canadian growth by way of the balance of payments effect, although the retardation might not have been as significant as is commonly suggested. If some conscious mobilization of available resources specifically for this purpose were allowed, by way of exchange controls and internal consumption-depressing measures (e.g., taxation policy), perhaps even less reliance on foreign borrowing would have been necessary.

This conclusion is purely formalistic—it is a matter of financial possibilities. Excessive concentration on this level of analysis neglects the truly dynamic impact of foreign investment on the growth of the Canadian economy. This aspect is considered in the following section.
II. DIRECT INVESTMENT AND GROWTH STIMULATION

The argument of the above section abstracted from the causal aspect of the growth process. It was based on the assumption that the basic forces leading to economic growth were immanent within the economy. The possible restraint on the growth process arising out of deficient earnings of foreign exchange was then considered, and, it was concluded that the total inflow of investment funds was not financially indispensable. It is argued in this section, however, that foreign investors were the major activating force in economic growth in postwar Canada. The expansion of productive capacity in certain of the major "leading growth sectors" resulted to a very important extent from the activities of foreign-controlled enterprises. These "leading sectors" tended to be mainly resource extraction industries and were mainly export oriented. Thus, the effect of this pattern of growth was to strengthen, rather than weaken, the basic interdependence between the Canadian economy and the world economy. To the extent that foreign investors were attracted to secondary manufacturing industries, the effect was to establish in Canada (usually with important tariff protection) large firms producing products requiring complex technology previously developed in the parent firm.
abroad. Within the manufacturing sector, also, the foreign controlled firms were concentrated in the leading growth industries.

The unique effects which foreign controlled businesses can have on economic growth in any country are complex and often quite subtle. To some extent, of course, the effects are specific, obvious, and perhaps, measurable in terms of their immediate results. Thus, expansion of foreign enterprises usually implies an importation of skilled workers and technicians, the training of domestic workers in specific new skills, the introduction of new products, and the discovery and exploitation of new resources; all of which have their focus in a measurable expansion of productive capacity in some specific lines. However, in other respects the impact might be quite general and quite diffuse, affecting the "atmosphere" or "environment" in which economic activity is carried on. As in the case of classic external economies, these effects are more difficult to analyze and measure. It is difficult to segregate the impact of the particular foreign enterprises from the impact of other circumstances which coexist. Thus, while the foreign enterprise, by its success, might have a demonstration effect on domestic businessmen (in addition to any stimulation of activity through direct input-output rela-
tionships), how can we distinguish this from the general impact of other factors bearing on business psychology? These considerations are particularly important in the case of Canada, with its long "southern exposure" to the United States and the virtually free intercourse across the common frontier. There can be no doubt that trends and developments in the economy of the United States are followed closely by Canadian businessmen in planning their activities. The large number of Canadian students enrolled in colleges and universities in the United States attests to the free international flow of technical knowledge quite apart from the activities of United States firms in Canada.

In what follows we are concerned with the obvious and direct impact of foreign controlled firms on Canadian economic growth. Primary attention is devoted to the allocation of foreign investment in Canada. The presumption is that direct investment flows, as indicated by the balance of payments statistics and, more importantly, by the statistics of book value of foreign direct investments in Canada, reflect capital expenditures to expand productive capacity in the

30 The latter is more useful because of the large inflow of funds for re-export to foreign subsidiaries.
various lines. Comparison of the pattern of foreign investment and ownership with the pattern of growth provides a basis for evaluating the apparent growth impact of the foreign enterprises. The method of analysis is crude, and for that reason the findings must be regarded as tentative. A more complete and adequate appraisal of the dynamics of growth stimulation or transmission by way of foreign controlled enterprises must await careful industry case studies.

In Table XIV data is presented on the increase in the book value of foreign direct investments, by industry, between the end of 1945 and the end of 1956. Inasmuch as the increase in book value largely results from funds transferred from abroad and the reinvestment of profits, this provides us with an index of the pattern of foreign direct investment in Canada during the period. Two things stand out clearly: by far the bulk of the investment occurred in mining and manufacturing industries (including petroleum extraction and refining), and among the industrial groups identified, by far the single most important absorber of funds was the petroleum industry.

The Petroleum Industry

The heavy concentration of foreign direct investment in the extraction and refining of petroleum is in accordance
### TABLE XIV

**INCREASE IN THE BOOK VALUE OF FOREIGN INVESTMENT IN CANADA, 1946-1956**

<table>
<thead>
<tr>
<th>Industry</th>
<th>1946</th>
<th>1956</th>
<th>Percentage Increase</th>
<th>Percentage of Total Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable and Animal Products</td>
<td>217</td>
<td>530</td>
<td>114.6</td>
<td>4.6</td>
</tr>
<tr>
<td>Textiles</td>
<td>56</td>
<td>105</td>
<td>87.5</td>
<td>0.8</td>
</tr>
<tr>
<td>Wood and Paper Products</td>
<td>348</td>
<td>875</td>
<td>151.4</td>
<td>8.6</td>
</tr>
<tr>
<td>Iron and Iron Products</td>
<td>277</td>
<td>979</td>
<td>253.4</td>
<td>11.5</td>
</tr>
<tr>
<td>Non-Ferrous Metals</td>
<td>211</td>
<td>726</td>
<td>244.1</td>
<td>8.4</td>
</tr>
<tr>
<td>Non-Metallic Minerals</td>
<td>43</td>
<td>136</td>
<td>216.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Chemicals and Allied Products</td>
<td>144</td>
<td>476</td>
<td>230.6</td>
<td>5.4</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>33</td>
<td>63</td>
<td>90.9</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td>1,359</td>
<td>3,890</td>
<td>186.2</td>
<td>41.4</td>
</tr>
<tr>
<td>Petroleum and Natural Gas</td>
<td>138</td>
<td>2,119</td>
<td>1435.5</td>
<td>32.4</td>
</tr>
<tr>
<td>Other Mining and Smelting</td>
<td>240</td>
<td>908</td>
<td>278.3</td>
<td>10.9</td>
</tr>
<tr>
<td>Utilities (excl. pipelines)</td>
<td>375</td>
<td>291</td>
<td>-22.4</td>
<td></td>
</tr>
<tr>
<td>Merchandising</td>
<td>202</td>
<td>613</td>
<td>203.5</td>
<td>6.7</td>
</tr>
<tr>
<td>Financial Institutions</td>
<td>339</td>
<td>814</td>
<td>140.1</td>
<td>7.8</td>
</tr>
<tr>
<td>Other Enterprises</td>
<td>60</td>
<td>194</td>
<td>223.3</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,713</td>
<td>8,829</td>
<td>225.4</td>
<td></td>
</tr>
</tbody>
</table>

with a world-wide pattern. However, in the present context, it is of major significance inasmuch as petroleum based industries constituted one of the most important "leading growth sectors" in the postwar period. Indeed, in many ways, the spurt of Canadian growth following 1950 must be characterized as a petroleum boom. The index of crude petroleum output rose dramatically, from 183.4 in 1946, to 515.0 in 1949, and to 4,189.1 in 1956 (1939 = 100).\(^{31}\) A corresponding increase is to be noted in the exports of crude and partly refined petroleum. In the early postwar years the value of such exports was insignificant. By 1956 sales amounted to about $104 million, and represented about 2.2% of earnings on merchandise trade. This was sufficient to place crude and partly refined petroleum ninth on the list of leading exports (ranked by value) in that year. Prior to 1954 it does not even appear on the list.\(^{32}\)

\(^{31}\)Canadian Statistical Review, 1957 Supplement, p. 19. The peak production recorded during the war was 250.6 in 1942.

\(^{32}\)Department of Trade and Commerce, Canada Year Book, 1957-58 (Ottawa: Queen's Printer, 1959), p. 1012. Exports of crude petroleum from 1949-1956 were (in millions of gallons):

<table>
<thead>
<tr>
<th>Year</th>
<th>1949</th>
<th>1950</th>
<th>1951</th>
<th>1952</th>
</tr>
</thead>
<tbody>
<tr>
<td>1953</td>
<td>0</td>
<td>0</td>
<td>12.0</td>
<td>49.9</td>
</tr>
<tr>
<td>1954</td>
<td>0</td>
<td>0</td>
<td>87.8</td>
<td>82.1</td>
</tr>
<tr>
<td>1955</td>
<td>0</td>
<td>0</td>
<td>519.2</td>
<td>1,501.8</td>
</tr>
</tbody>
</table>
In order to indicate the significance of foreign controlled enterprises in this industry, estimates of the percentage of the book value of investments in various segments of the petroleum industry owned and controlled outside Canada in 1955 are presented in Table XV. It is striking that in all of the segments listed except the merchandising of petroleum products, nonresident control was exerted over more than 70% of the indicated book value of investment, and direct nonresident ownership represented over 60%. Particularly striking is the nonresident control of approximately 90% of the book value of all investment in refining enterprises. In Table XVI the D.B.S. estimates of the increase in the book value of total investments in segments of the industry are presented. If this is indicative of the pattern of investment and the expansion of productive capacity, it is clear that the one segment to which foreign investment was not attracted was also the segment that experienced the least expansion. This is also the segment apparently requiring less expensive capital equipment and the segment geared most explicitly to the domestic market. The percentage of the book value of total investment in merchandising enterprises owned abroad actually declined over the period, from 24% at the end of 1945 to 16% at the end of 1955. Over the same period, nonresident
TABLE XV

NON-RESIDENT OWNERSHIP AND CONTROL OF INVESTMENTS IN THE PETROLEUM INDUSTRY, CANADA, 1955

<table>
<thead>
<tr>
<th>Estimated Total Investment</th>
<th>Owned Outside Canada</th>
<th>Percentage of Investment</th>
<th>Owned Outside Canada</th>
<th>Controlled Outside Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration and Development</td>
<td>1,300</td>
<td>901</td>
<td>69</td>
<td>74</td>
</tr>
<tr>
<td>Refining</td>
<td>1,195</td>
<td>718</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>Merchandising</td>
<td>56</td>
<td>9</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Transportation</td>
<td>224</td>
<td>150</td>
<td>67</td>
<td>87</td>
</tr>
<tr>
<td>Total</td>
<td>2,775</td>
<td>1,781</td>
<td>64</td>
<td>80</td>
</tr>
</tbody>
</table>

($ Millions) (Percent)

## TABLE XVI
### INCREASE IN BOOK VALUE OF INVESTMENT IN VARIOUS SEGMENTS OF THE PETROLEUM INDUSTRY, 1946-1956

<table>
<thead>
<tr>
<th>Segment</th>
<th>1945 ($ Million)</th>
<th>1955 ($ Million)</th>
<th>Increase ($ Million)</th>
<th>Percentage Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration and Development</td>
<td>58</td>
<td>1,300</td>
<td>1,242</td>
<td>2,138</td>
</tr>
<tr>
<td>Refining</td>
<td>211</td>
<td>1,195</td>
<td>971</td>
<td>398</td>
</tr>
<tr>
<td>Merchandising</td>
<td>25</td>
<td>56</td>
<td>31</td>
<td>124</td>
</tr>
<tr>
<td>Transportation</td>
<td>a</td>
<td>221</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total</td>
<td>307</td>
<td>2,775</td>
<td>2,468</td>
<td>801</td>
</tr>
</tbody>
</table>

* Separate estimate not available. Included in Refining.

Ownership in exploration and development corporations increased from 10% to 69%, and control from 14% to 74%. In refining, the corresponding increases were from 51% to 60% (ownership) and from 72% to 90% (control).

The foreign controlled firms in this industry tend to be very large. Brecher and Reisman have attempted to piece together information relating to the relative sizes of Canadian and foreign controlled firms in Canada. In general, they suggest that:

In almost every sector of Canadian industry where there is a significant degree of nonresident investment, the average size of enterprises controlled outside Canada is considerably larger than their Canadian counterparts.33

In the petroleum industry they found in 1954 that of the six largest producers of crude petroleum, accounting for 68% of the value added by this sector, the five largest were controlled outside Canada.34 Likewise, of the six largest firms in the refining sector, accounting for 93% of the value added by refining firms, four were controlled abroad.35 Unfortun-

34Ibid., p. 279. By 1956 all six were foreign controlled.
35Ibid. By 1956 another of these was foreign controlled, leaving all of the top six except the fifth largest foreign controlled.
ately, records of this type do not exist for the earlier period, preventing a comparison of the relative expansion of firms under domestic and foreign control.

Great caution must be exerted in interpreting the significance of these various facts relating to foreign ownership and control in the petroleum industry. The apparent dominance of large foreign controlled firms in this most dynamic industry cannot be accepted as prima facie evidence that similar growth would not have occurred in the absence of foreign control. The total increase in foreign investment in this industry does not correspond to net additions to productive capacity, but includes the acquisition by foreigners of productive assets of firms formerly controlled in Canada. However, the conclusion seems undeniable that the expansion of foreign controlled firms lead to the expansion of the industry. The elaborate technology of the major oil firms of the United States was thus introduced into Canada. It seems reasonable to assume that this constituted a major boost to Canadian growth which would not have been conceivable under other circumstances. It is also notable that the bulk of this expansion went toward the development of export-oriented production. The attraction was not the expanding Canadian market, but rather the basic resource potential
itself. The effect has been to tie the Canadian economy closer to the world economy, and particularly to the economy of the United States.\textsuperscript{36}

Other Resource Exploitation

It is not as easy to demonstrate that these conclusions, with respect to the leading role of foreign investors in the petroleum industry, can be generalized to other "leading growth sectors." Again the problem is inherent in the method of presentation of the basic statistics. By and large, the industrial breakdown of investment statistics is not sufficiently detailed to yield the necessary information. Furthermore, the classification system used in presenting investment statistics is not fully consistent with the system used in presenting production and export statistics. Of particular importance to the present argument is the difficulty encountered in attempting to allocate investment by levels of

\textsuperscript{36}On the basis of a special study, Pizer and Culter have estimated that in 1952 and 1955 approximately 70% of the crude oil imported by the United States from Canada came from United States controlled firms. In the former year, also, they estimate that 75% of the refined oil products imported from Canada came from such firms. See S. Pizer and F. C. Culter, "Income on United States Foreign Investments," \textit{Survey of Current Business}, Vol. XXXIII (December 1953), pp. 8-14; "Growth of Foreign Investments in the United States and Abroad," \textit{Survey of Current Business}, Vol. XXXVI (August 1956), pp. 14-24.
production. However, from such information as is available, limited support can be implied for the present hypothesis.

One immediately obvious fact, derivable from the data presented in Table XIV, is the importance of "other mining and smelting" as an absorber of foreign direct investment. Of the total increase in the book value of foreign direct investments in Canada in this period, 11% is accounted for by investment in this complex of industries. If we exclude petroleum industries from the total, the increased book value of investments in "other mining and smelting" accounts for 16% of the total increase. Alternatively, if we consolidate petroleum with other mining and smelting, the combined sector accounts for 43% of the increased book value of investments. Considered in light of the conclusion of Chapter VIII that "the main stimulus to Canadian economic growth in the post-war period has come through basic natural resource development," this is suggestive of the importance of foreign controlled firms in stimulating growth.

Again, however, this inference must be treated with great caution. Mining and smelting covers a broad complex of industries. These have been subjected to varying growth rates. Unfortunately, the official statistics do not provide a more detailed industrial breakdown of foreign investment. However,
certain supporting evidence can be derived from other sources. Brecher and Reisman's study of concentration and control in various Canadian industries is particularly useful in this respect. Brecher and Reisman discovered that of the fourteen largest firms in mining and smelting in 1953 (each representing assets valued at $25 million or more, and collectively representing 60% of the total book value of investments in this industry) seven were controlled outside of Canada. While they do not give data on the size of each of these firms relative to their Canadian competitors, the seven controlled assets representing 70% of the book value of the total investment in the largest 14 firms (hence, 52% of the total book value of investment in mining and smelting). These are obviously very large concerns.

Perhaps more significant is the apparent dominance of such firms in particular segments of the mining and smelting category. Brecher and Reisman examined seven such segments: nickel-copper, lead-zine, copper-gold, iron ore, aluminum, asbestos, and gypsum. In each of these except one, lead-zinc, the largest firm was foreign controlled; in aluminum the only producer was foreign controlled, in nickel-copper the three

largest were foreign controlled, and in iron ore and gypsum the two largest were foreign controlled.\footnote{\textit{Ibid.}}

Data relating to the expansion of production in these sectors is presented in Table XVII. In the postwar period, the most spectacular expansion is to be noted in iron ore production. Significantly, this is in a sense a "new" product. Prior to World War II no production of iron ore is recorded.\footnote{\textit{Canadian Statistical Review}, 1957, Supplement, p. 65.} Significantly, this is an industry which is dominated by foreign controlled firms. The other sectors showing the greatest expansion are zinc, gypsum, and aluminum. Again, except for zinc, these are industries heavily dominated by foreign controlled firms. The case of aluminum is interesting inasmuch as this is one of the few export industries in Canada dependent on imported raw materials. The attraction to foreign firms in this case is cheap hydroelectric power.

\begin{center}
\begin{tabular}{|l|l|l|}
\hline
Industry & Foreign controlled & Canadian controlled \\
\hline
nickel-copper & 1, 2, 3 & 4, 5, 6 \\
lead-zinc & 2, 6 & 1, 3, 4, 5 \\
copper-gold & 1, 4 & 2, 3, 5, 6 \\
iron ore & 1, 2, 6 & 3, 4, 5 \\
aluminum & 1 & \\
asbestos & 1, 5, 6 & 2, 3, 4 \\
gypsum & 1, 2, 4, 6 & 3, 5 \\
\hline
\end{tabular}
\end{center}
### TABLE XVII

**Production and Exports of Selected Metals and Non-Metallic Minerals Canada, 1946-56**

<table>
<thead>
<tr>
<th></th>
<th>Pre-War Peak</th>
<th>War Peak</th>
<th>Average 1946-48</th>
<th>Average 1955-56</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Copper</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>47.6</td>
<td>54.6</td>
<td>36.1</td>
<td>56.9</td>
<td>57.6</td>
</tr>
<tr>
<td>Exports</td>
<td></td>
<td></td>
<td>24.8</td>
<td>36.9</td>
<td></td>
</tr>
<tr>
<td><strong>Nickel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>18.7</td>
<td>24.0</td>
<td>19.3</td>
<td>29.5</td>
<td>52.8</td>
</tr>
<tr>
<td>Exports</td>
<td></td>
<td></td>
<td>20.1</td>
<td>29.2</td>
<td></td>
</tr>
<tr>
<td><strong>Lead</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>34.9</td>
<td>42.7</td>
<td>28.1</td>
<td>32.6</td>
<td>13.8</td>
</tr>
<tr>
<td>Exports</td>
<td></td>
<td></td>
<td>19.5</td>
<td>23.3</td>
<td></td>
</tr>
<tr>
<td><strong>Zinc</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>31.8</td>
<td>50.9</td>
<td>37.6</td>
<td>71.0</td>
<td>91.5</td>
</tr>
<tr>
<td>Exports</td>
<td></td>
<td></td>
<td>32.2</td>
<td>65.6</td>
<td></td>
</tr>
<tr>
<td><strong>Aluminum</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imports of Bauxite Ore</td>
<td>62.5</td>
<td>251.9(^a)</td>
<td>261.2</td>
<td>475.3</td>
<td>82.0</td>
</tr>
<tr>
<td><strong>Iron Ore</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Producer's Shipments</td>
<td>...</td>
<td>94.6</td>
<td>133.5</td>
<td>1609.6</td>
<td>1110.1</td>
</tr>
<tr>
<td><strong>Gypsum</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>87.0</td>
<td>133.0</td>
<td>209.0</td>
<td>398.5</td>
<td>91</td>
</tr>
<tr>
<td><strong>Asbestos</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>34.2</td>
<td>38.9</td>
<td>53.8</td>
<td>86.6</td>
<td>61</td>
</tr>
</tbody>
</table>

\(^{a}\) Average of war years, 1940-1944.

*Source: Canadian Statistical Review, 1957 Supplement, pp. 64-66.*
Again, caution must be used in interpreting this miscellaneous data. However, while clearly in certain lines Canadian firms have been important leaders in the growth process, the great importance of foreign controlled enterprises in the most rapidly expanding sectors provides support for the general thesis. Particularly noteworthy is the leading role apparently played by foreign enterprise in developing the new resource industries, iron and aluminum. A more specific testing of the thesis would require a detailed examination of the relative roles of domestic and foreign firms in the actual discovery, development and subsequent exploitation of the new resources.

Manufacturing

The pattern of development of manufacturing in Canada is complex and has been influenced by many factors.40 Our present analysis is at best superficial and is limited to the development of a few broad insights into the relationship between patterns of foreign control and economic growth derivable from available quantitative data.

40See H. Fullerton and H. A. Hampson, Canadian Secondary Manufacturing Industry (Ottawa: Queen's Printer, 1957), and various of the industry studies prepared for the Royal Commission on Canada's Economic Prospects.
Referring again to Table XIV, the statistics on changes in book value of foreign investment by sector between 1946 and 1956 suggest that foreign investment was not equally distributed among all manufacturing industries. Unfortunately, the classification system employed by the D.B.S. in presenting these statistics conceals much crucial information. Sectors are identified only on the basis of chief component materials. However, one fact stands out. Both in terms of the percentage increase in the book value of foreign direct investment and the portion of new direct investment apparently absorbed, "textiles" and "miscellaneous manufacturing" have lagged significantly. Considering the probable revaluation of assets which occurred over these years as a result of the general rise in the price level, it would seem safe to conclude that, on balance, little or no new foreign investment could have occurred in these sectors.

That textiles was not a dynamic growth sector in the Canadian economy is apparent. Over the years 1946-48 the production index for all textile products except clothing averaged 171.6 (1935-39 = 100). In the years 1955 and 1956 it

---

41 Included in the "miscellaneous" category is a wide assortment of small industries, producing minor items for domestic consumption.
averaged 183.8, an increase of 12.2. Over the corresponding period, the index of clothing production showed little change, averaging 152.2 in the earlier years and 152.2 in the later years.42

Both the figures on production trends and on net foreign investment in the industry as a whole conceal significant developments within the complex industry. These developments also tend to give support to the thesis of foreign based entrepreneurial leadership. While the index of total textile production showed little advance, the subindex of synthetic textiles showed significant production increases. In the years 1946 through 1948 it averaged 227.6. In 1955 and 1956 it averaged 319.6, an increase of 92 points.43 While not spectacular in terms of the performance of other sectors of the economy, substantially greater expansion is indicated than in other textile industries. Brecher and Reisman44 estimate that in 1954 six producers of nonsynthetic primary textiles accounted for 90% of the value added in this segment of the industry. All of these were Canadian

43 Ibid.
44 Brecher and Reisman, op. cit., p. 284.
controlled. By contrast, in the synthetic sector there were only four firms, all of which were foreign controlled. This is consistent with the general presumption that non-resident controlled firms tended to lead in the growth process.

The main areas of nonresident control in Canadian manufacturing industries in 1955 is indicated in Table XVIII. Again, the findings are restricted because of the classification system. However, the areas of greatest relative foreign control are indicated to be: automobiles and parts (96%), rubber products (98%), electrical apparatus (82%) and chemicals (77%). Again, foreign direct investment appears to be closely associated with very large firms. Except for the chemicals industry, the increase in production in each of these industries between 1946 and 1956 was above the average for manufacturing as a whole. The increase

45See Brecher and Reisman, op. cit., pp. 281-285. Among the 55 largest firms (assets valued at $25 million or more) in Canadian manufacturing, excluding petroleum refining, 26 were controlled by nonresidents (1954). These 26 accounted for 55% of the book value of total investment in the 55 largest firms. In automobiles, all of the six largest producers were foreign controlled; in rubber goods, five of the six largest, including the five largest; in the "acids, alkalies and salts" section of the chemicals industry, five of the six largest; in electrical apparatus, four of the six largest; and in the fertilizers division of the chemicals industry, three of the six largest.
TABLE IVIII

NON-RESIDENT OWNERSHIP AND CONTROL IN SELECTED MANUFACTURING INDUSTRIES, CANADA, 1955

<table>
<thead>
<tr>
<th>Industry</th>
<th>Owned by Non-Residents</th>
<th>Controlled by Non-Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulp and Paper</td>
<td>51</td>
<td>56</td>
</tr>
<tr>
<td>Textiles</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Chemicals</td>
<td>64</td>
<td>75</td>
</tr>
<tr>
<td>Transportation Equipment n.o.p.</td>
<td>34</td>
<td>36</td>
</tr>
<tr>
<td>Electrical Apparatus</td>
<td>70</td>
<td>78</td>
</tr>
<tr>
<td>Agricultural Machinery</td>
<td>35</td>
<td>33</td>
</tr>
<tr>
<td>Primary Iron and Steel</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Beverages</td>
<td>29</td>
<td>20</td>
</tr>
<tr>
<td>Automobiles and Parts</td>
<td>78</td>
<td>95</td>
</tr>
<tr>
<td>Rubber</td>
<td>78</td>
<td>93</td>
</tr>
<tr>
<td>Other</td>
<td>46</td>
<td>52</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
<td><strong>51</strong></td>
</tr>
</tbody>
</table>

(Percent of Book Value of Investment)

recorded in the industrial production index between 1946-48 and 1955-56 was: manufacturing, 74.4; chemicals, 54.1; rubber products, 102.0; automobiles, 150.1; electrical apparatus, 245.2. 46

Contrary to the general argument presented above, these industries of heavy foreign investment are not export industries. On the basis of the input-output table for 1949, only chemicals and automobiles show any substantial portion of output exported: approximately 13% and 11% of the value of net output in each case. 47 Subsequently, different trends are in evidence. Excluding the period of the Korean War, both the value and the volume of automobile exports declined after 1949, while the value and volume of exports of chemicals increased. 48 However, even though these manufacturing industries are oriented toward the domestic market, they are clearly industries involving very complex technology, and large expenditures for research and development. Furthermore, these are industries which have considerable tariff protection. Rates range between 15% and 25% ad valorem on the

Most Favored Nation Schedule, and 10% and 25% on the British Preferential Schedule. Studies of comparative production costs suggest that in general costs of production per unit are higher in Canada than in parent concerns abroad, at the existing exchange rates. This would seem to imply that the establishment of operations in Canada was an attempt to avoid the additional cost of tariff rates higher than the production cost differential. In the absence of the tariff, less domestic production of these items would occur, unless the resulting change in the exchange rate were sufficient to alter the differential in relative production costs.

Table XVII also indicates more than 50% foreign control in the pulp and paper industries. This is also consistent with the basic hypothesis. A basic natural resource industry, it has experienced notable expansion in the postwar period, both in output and exports. The industrial production index for pulp and paper rose from an average of 187.4 in 1946-48, to 259.4 in 1955-56 (1935-39 = 100). Of the six largest firms in this industry in 1954, two (including the largest producer) were foreign controlled.

---

49Cf., Fullerton and Hampson, op. cit., pp. 243-246.
50Ibid., pp. 94-162.
Conclusions

Evidence was presented in this section to show that the sectors of the Canadian economy which could be identified as the leading growth sectors tended also to be the sectors which absorbed the greatest portion of the inflow of foreign direct investments between 1945 and 1956, and the sectors of most concentrated foreign control. The basic hypothesis being tested is that the most important growth stimulus in this period derived from nonresident controlled firms. We can conclude that the evidence does not contradict this hypothesis.

However, caution must be exerted in reasoning from correlation to causation. That foreign direct investments were the important growth stimulus in a causal sense, or that growth would not have occurred (or would have been seriously retarded) in the absence of these investments, does not necessarily follow. However, qualified support for a softened form of this conclusion has been offered. The foreign controlled firms tend to be larger on the average than their Canadian counterparts, and they tend to dominate the industries in which they are participating. Such dominance can, of course, reflect the results of a deliberate policy of monopolization made possible by the superior financial position
of the parent concerns abroad. In some instances this may be the case, suggesting no real net gain to the Canadian economy that would not have occurred otherwise. The complexity of the technology involved in most instances, and the reliance on technical developments originating in the parent concern would seem to argue against complete acceptance of this alternative hypothesis. However, to distinguish between the element of deliberate monopolization and the element of essential growth stimulation in the activities of these enterprises is not immediately feasible.

By and large, foreign investment has been attracted to Canada by prospects for the development and exploitation of basic natural resources. Foreign investment has resulted in the rapid expansion of important export industries. In the manufacturing sector, foreign investment was associated with industries producing relatively new products, involving complex technology previously developed abroad by the parent concern, and subjected to substantial tariff protection. These also tended to be the leading growth industries within the manufacturing sector. While in one sense based on the potential domestic market for these products, the decision to produce in Canada rather than importing from abroad appears
to have been based mainly on avoidance of the extra cost resulting from the tariff. In this sense, then, the investments in manufacturing for the domestic market, like the resource developing investments, were cost reducing from the point of view of the investor, even though at the existing exchange rates basic costs of production tended to be higher in the Canadian operations.
Chapter X

SUMMARY AND CONCLUSIONS

The conceptual and theoretical analysis which comprised the first part of this study was summarized in Chapter VII. Only a few salient points are reiterated here.

It was argued in Chapter II that the definition of economic growth most widely adopted by economists is misconceived and is actually inconsistent with their general methodological predilections. The interpretation of growth in welfare terms involves a confusion of the objective problem of identifying and measuring growth and the subjective problem of evaluating any particular growth pattern. Such an interpretation injects into the analysis unresolvable controversies concerning evaluative criteria. It was demonstrated in Chapter III that by adopting a narrow technical view of the economy as a complex productive system which is (on a high level of abstraction) a subsystem within the broader social system, such controversial value judgments can be avoided. Economic growth was defined as a process which results in the expansion of the technical "production frontier" of such an economic system.
This definition of economic growth does not preclude consideration of the welfare implications of the growth process. Attention is focused on the most fundamental aspect of the growth process, viz., the expansion of physical production capacity. Such expansion in production capacity is also implied in the aggregate welfare definition. However, unlike the aggregate welfare definition, the usefulness of the present concept does not presuppose the acceptance of any particular criterion of changes in aggregate economic welfare. It focuses on the objective results of economic activity, permitting any of a large number of possible interpretations of the subjective significance thereof.

The present concept also serves to focus attention on the essential connection between economic activity and the general social system. It therefore provides the cornerstone for a conceptual framework which should permit systematic treatment of the various "exogeneous" factors which economic theorists have consistently acknowledged to be "most important" in the process of growth but which they have equally consistently been unable to incorporate into their analyses except in an ad hoc fashion. This definition of economic growth is suggestive of the problems involved in the construction of a truly general causal theory of economic growth.
No attempt has been made in this study to develop such a theory. Indeed, doubt was cast on the possibility of constructing such a theory at present. A much more narrow objective was defined in Chapter IV. Attention was directed to the mechanism by which growth is transmitted internationally in an essentially market-regulated economy, and particularly to the role of private international investment in this process.

In Chapter V the classical and neo-Keynesian theories of international investment and economic growth were analyzed. It was demonstrated that, aside from certain minor assumptions, these models merge into one. In it, foreign investment is identified with an international flow of "capital," resulting in a net addition to the "quantity of capital" employed in the receiving country. No unique significance is formally attributed to the fact that the capital comes from abroad. It serves as a supplement to (or as a substitute for) domestic savings. Capital presumably moves in response to differential rates of return resulting from differential factor endowments. In theory, such factor movements tend to bring about an equalization of factor incomes. International transmission of growth appears in the classical model as a
process of international income equalization through normal market forces.

The formal classical model has been subject to many criticisms. A number of these were considered in Chapter VI. In general, one might conclude that the classical model is inadequate because it neglects the "dynamic" aspects of the investment flows, and because it systematically merges the physical and the causal levels of analysis, tending to obscure the nature and operation of the basic causal mechanism. On the basis of these criticisms, various tentative hypotheses were offered as providing a basis for a more penetrating analysis of the relationship between international investment and economic growth.

It was argued that if we are interested in the causal process, the classical emphasis on capital transfers and aggregate capital accumulation is not very helpful. To identify causation it is necessary to determine the nature and origin of the specific forces tending to expand the production frontier, and to analyze the complex of factors affecting the basic decisions involved in this process. In appraising the significance of international investment in this context, it is necessary to distinguish between situations in which nonresident investors play an active role in the process
by which the production frontier is extended, and those situations in which they play a passive role. What has commonly been referred to as portfolio investment in balance of payments analysis largely reflects activity of the second type. Insofar as nonresidents acquire securities to be held as financial assets with no intention or possibility of exerting control over the actual investment or operating decisions of the relevant firms, their contribution (if any) to the growth process will only be financial. If a balance of payments constraint would otherwise tend to develop as a result of the import demands generated in the growth process, such financial transfers may make an important positive contribution to growth by permitting an otherwise unsustainable pattern of growth. Nevertheless, the role of the foreign investor in the growth process is significantly different in this case than it is in the situation in which he exerts control, over the actual investment and operating decisions of the firm. Rather than stimulating growth, portfolio investments are likely to be growth attracted.

As a first approximation, then, the analysis of the active transmission of growth impulses by way of private international investment should focus on the gross flow of funds for direct investment, i.e., to finance the capital expendi-
tures of nonresident controlled firms. Indeed, the signifi-
cant variable in such analysis is probably the volume of
capital expenditures by nonresident controlled firms, re-
gardless of the source of the funds. Available statistics
usually do not permit precise identification of the volume
of such capital expenditures. A close approximation can be
derived from balance of payments estimates of the inflow of
funds for direct investment, adjusted on the basis of esti-
mates of reinvestments of retained earnings and/or estimates
of changes in the book value of investments owned by non-
residents.

Unfortunately, we do not know enough about how deci-
sions resulting in direct international investment are made
to safely generalize about many of the important aspects of
international growth transmission via this mechanism. It
seems likely that the most important of these investments
will be made by established firms. Completely new firms are
more likely to be established for production for the domestic
market, except in those cases in which a potential business-
man for some reason migrates with his funds. Probably inti-
mate knowledge of the characteristics of the market is cru-
cial in decisions to invest abroad. This would imply that
expansion of firms into foreign markets, particularly where
these markets are remote geographically or culturally, is more likely to occur in response to opportunities to develop new sources of basic resources either to supply the parent firm or for sale in known world markets, or where the investment has been preceded by penetration of the market through commodity trade. In any case, while an established subsidiary of a firm may begin to assume a character of its own reflecting its particular market situation, close coordination between its operations and those of the parent firm is to be expected. The resulting flow of technological and managerial information is one of the most significant long-run contributions of such investments to the growth process.

In the second part of this study a preliminary attempt was made to test certain of these hypotheses on the basis of recent Canadian experience. The pattern of economic growth in Canada between 1945 and 1956 was analyzed in Chapter VIII. In general, it was concluded that the basic resource extraction industries were the leading growth sectors in this period. As a result, there is no evidence of a tendency for the proportion of the labor force employed in these industries or the proportion of total income derived from these industries to decline. This is contrary to the usual experience in growing economies. In addition to being basic resource extraction
industries, the leading growth sectors also tended to be export oriented industries.

In order to evaluate the significance of international investment in Canadian economic growth in this period, separate analyses were made of the balance of payments effects and the direct growth stimulating effects of the investment inflows. On the basis of projections of the foreign exchange requirements and potential foreign exchange earnings during this period, two estimates were made of the deficit on current account which would have resulted given no foreign investment and the same pattern of economic growth. One estimate was based on the pessimistic assumption of no expansion in export capacity above the 1948 level, and the other was based on the optimistic assumption of full expansion of export capacity to the actual 1956 level. In both cases, a significant deficit on current account was indicated. However, particularly in the latter case, it was apparent that the actual inflow of investment funds more than offset the potential deficit. This suggests that "excess borrowing" existed. While some foreign investment funds were financially necessary, the total inflow was not indispensable. Throughout this period there was also a substantial outflow of funds from Canada on capital account. Even allowing for
this outflow, the net inflow of funds on capital account was more than would have been required to finance the potential deficit on current account.

While in financial terms the total investment inflow was not indispensable to the growth process, it cannot be concluded that the contribution of nonresident investors was insignificant. Direct investments by nonresidents appear to have played a uniquely significant role. While it is difficult to demonstrate that equivalent growth would not have occurred in the absence of these direct investments, the evidence does suggest that such investments tended to initiate strategic expansions in the production frontier which would not have occurred otherwise—at least not in the same degree or as rapidly.

The sectors of the Canadian economy in which growth was most evident were also the sectors in which concentrated nonresident ownership occurred and to which a major portion of the inflow of funds for direct investment was allocated. By and large, these sectors tended to be resource-extracting or primary-processing industries, producing for world markets or providing essential raw materials for parent concerns located abroad. This is not to say that substantial foreign investment did not occur in secondary manufacturing
industries producing for the domestic market. Again, foreign investment in secondary manufacturing was heavily concentrated in those industries which showed the most pronounced expansion in productive capacity. These tended to be industries involving elaborate and rapidly changing technology and relatively large initial investments. On the average, nonresident controlled firms tended to be larger than their Canadian counterparts. The development of these subsidiary manufacturing firms in Canada appears to have involved the duplication of the production facilities of the parent concern, or parts thereof, modified somewhat in accordance with the Canadian market. Coupled with this original transfer of technology has been a continuous interchange of information and personnel between parent firms and Canadian subsidiaries. The result has been the introduction into Canada of technological and managerial information developed abroad. While the long-run contribution of this technological interchange to the growth of the Canadian economy is difficult to measure, it undoubtedly has been great.

The conclusions arrived at on the basis of the analysis of international investment in Canada are broadly consistent with the hypotheses developed in Chapter VII. However, this cannot be regarded as even an approximate validation of
these hypotheses. The data surveyed were imperfect and the analytical methods crude. Therefore, the conclusions must be regarded as highly tentative. More penetrating analysis on the level of industry case studies is necessary to fully analyze this aspect of international growth transmission.

This study was narrowly devoted to the analysis of the growth impact of international investment flows. No consideration was given to the problem of appraising the desirability of such flows in terms of their broader economic, political and social implications. Much of the contemporary discussion of international investment, in Canada and elsewhere, is actually concerned with these broader ramifications rather than with the particular aspect of the problem considered here. In spite of an admitted growth impact, particularly of direct investment, many Canadians have expressed extreme apprehension over the inflow of investment funds. While not directly pertinent in terms of the purpose of the present study, brief mention of the various issues raised in these discussions can serve to put the problem in broader perspective.

In part, the objections to investment inflows derive from narrow doctrinaire views on the world and from the process by which popular issues are exploited in political
campaigns. In addition, however, certain questions have been raised concerning the impact of the investment inflows on the evolving structure of the Canadian economy. In particular, it has been argued that direct foreign investment has tended to overdevelop the export oriented, resource-extraction industries, tending to accentuate the "openness" of the economy, and leaving it particularly vulnerable to fluctuations in cyclically sensitive world markets for industrial raw materials.\(^1\) It has also been argued that the very fact of extensive foreign control over firms operating in Canada might tend to make the Canadian economy more cyclically sensitive. This would result if the operating and investment decisions of these firms were made abroad and were sensitive to changes in the business climate abroad, or if the operations of the Canadian subsidiaries tended to be

treated in a marginal fashion such that in a world-wide recession production would be maintained in the parent concerns at the expense of production in subsidiaries. In the judgment of many, governmental policies to reduce the instability of the economy (even at the sacrifice of some potential growth) would be desirable. No real attempt has been made, however, to spell out the alternatives.

The monopoly problem also arises in this connection. It was noted above that the average size of foreign controlled firms in Canada tends to be greater than the average size of their Canadian competitors. This has been attributed to the nature of the technology employed by the foreign controlled firms. Rosenbluth's studies indicate that the Canadian subsidiaries of United States firms tend to have plants of the same size as those of the parent firm. In the context of a smaller Canadian market, and even given the probability of multiplant operations in the United States, this tends to create a higher degree of concentration in

Canada than in the United States. Allegations have been made of systematic discrimination against Canadian workers, investors and suppliers by large foreign controlled firms with quasi-monopoly power.

Evidence on these aspects of international investment in Canada is not conclusive. It has not been demonstrated, for example, that either a less cyclically sensitive economy or a lesser degree of industrial concentration would have resulted in the absence of these investments. And, even if these results could have been achieved, it is not clear what the cost in terms of economic growth would have been. The evaluation of the alternatives raises major problems of fact as well as of values.

Most intractable, however, are the political and social issues which have been injected into the debate. One question is continually raised: how can a nation maintain effective political independence and develop a distinct cultural heritage when a major portion of its basic industries is owned and controlled abroad? Of course, the issue of direct

foreign investment is only one aspect of the total problem involved in the development of cultural and political independence. Indeed, it may be but a minor point, magnified out of proportion by the demagogical value of having tangible cases of "foreign influence" to point to. One can question the meaning of "independence" in a country with such close geographic and social ties to a nation several times its size, in terms of population, productive capacity, and power. The interdependence of the political and social destinies of the United States and Canada is obvious to every observer. However, instances have been noted of unfortunate and crude political influence exerted through United States controlled businesses in Canada. The case in which the United States State Department exerted pressure through the Ford Motor Company forcing Ford of Canada to desist from selling automobiles to Communist China, although the Canadian Government had issued a permit approving such sales, raised considerable resentment in Canada. 4 Again, however, the

demagogic appeal of such apparent abuses of sovereignty may lead to a vast overstatement of both their economic and their political significance.

Nothing has been said in this study concerning the prospects for international investment in Canada in the near or distant future. The purpose of the analysis of investment flows between 1945 and 1956 was to appraise their growth impact, not to develop criteria which could be used as a basis for projecting future trends. It can be noted, however, that there is no real evidence of a significant decline in the magnitude of the annual investment inflow. The recession of 1958-59 was accompanied by some decline in the inflow of funds, both for portfolio and direct investment. This, however, was probably a temporary phenomenon, reflecting a general decline in the level of investment activity in Canada. That vast unexploited reserves of natural resources still exist, has been argued by many observers. These provide the


6Many books and articles have been written recently extolling the growth potential of the Canadian economy from this point of view. Few, if any, negative appraisals have been offered. Representative of the optimism held both inside and outside Canada is H.M.H.A. Van der Valk, *The Economic Future of Canada* (Toronto: McGraw-Hill, 1954).
basis for a prediction of continued inflows of resource developing investments. In addition, a rapidly expanding domestic market, based on both population growth and rising levels of money income, should create additional incentives for the expansion of manufacturing industries oriented to the domestic market. The only negative sign is the possibility of restrictive policies on the part of the Canadian government with respect to the operations of foreign controlled firms in Canada. The recent Royal Commission on Canada's Economic Prospects recommended "moderate" action to reduce the degree of nonresident ownership and control in basic industries. Some legislation relating to this is probable. However, it seems unlikely that extreme measures will be adopted, and, of course, the impact of such actions on the flow of investment funds is difficult to predict. In any case, there is no firm basis for predicting a substantial decline in the existing levels of investment inflows.

7See the appraisal of the political situation in Canada presented by the United States Ambassador to Canada, in Review of Foreign Policy, 1958, Part III, pp. 635-703.
BIBLIOGRAPHY

I. ARTICLES

A. Conceptual and Theoretical


B. Relating to the Canadian Case


III. BOOKS

A. Conceptual and Theoretical


B. Relating to the Canadian Case


III. OFFICIAL PUBLICATIONS

A. Canada


______. *Private and Public Investment in Canada, Outlook*. Ottawa: Queen's Printer, annual report.


______. *Canadian Statistical Review*. Ottawa: Queen's Printer, monthly.


______. *The Canada Year Book*. Ottawa: Queen's Printer, Annual.


_____. Trade of Canada. Ottawa, Queen's Printer, annual report.


Royal Commission on Dominion-Provincial Relations. Report, Book 1, Canada, 1867-1939. Ottawa: King's Printer, 1940.

B. International


C. *United States*


I, Ronald Alexander Shearer, was born in Trail, British Columbia, Canada, June 15, 1932. I received my secondary education in the public schools of Rossland, British Columbia, Canada. During the year 1950-1951 I attended senior matriculation at Trail, British Columbia, entering The University of British Columbia in September 1951. While in residence there, I was a student assistant to Professors J. A. Crumb (1952-1953), A. D. Scott (1953-1954), and S. Jamieson (summer 1954). I received the Bachelor of Arts degree in 1954.

I entered the Graduate School of The Ohio State University in September 1954. During the year 1954-1955 I was an assistant in the Department of Economics, teaching Principles of Economics. I received the Master of Arts degree in 1955 and was granted an Earhart Foundation Fellowship to continue my studies the following year. In 1956 I was appointed Instructor in Economics at The Ohio State University, a position which I held until 1958 when I was appointed Lecturer in Economics at The University of Michigan.