

PRINCETON STUDIES IN INTERNATIONAL FINANCE NO. 21

**Patterns of Fluctuation
in International Investment
Before 1914**

Arthur I. Bloomfield

**INTERNATIONAL FINANCE SECTION
DEPARTMENT OF ECONOMICS
PRINCETON UNIVERSITY • 1968**

PRINCETON STUDIES
IN INTERNATIONAL FINANCE

This is the twenty-first number in the series PRINCETON STUDIES IN INTERNATIONAL FINANCE, published from time to time by the International Finance Section of the Department of Economics at Princeton University.

The author, Arthur I. Bloomfield, is Professor of Economics at the University of Pennsylvania. He is well known to our readers, this being his fourth contribution to the publications of the International Finance Section. His first essay, THE BRITISH BALANCE-OF-PAYMENTS PROBLEM, appeared in 1945, when the ESSAY series was in its infancy. In 1954, an issue of the present series discussed SPECULATIVE AND FLIGHT MOVEMENTS OF CAPITAL IN POSTWAR INTERNATIONAL FINANCE, and an issue published in 1963 discussed SHORT-TERM CAPITAL MOVEMENTS UNDER THE PRE-1914 GOLD STANDARD. Professor Bloomfield continues his research of the records prior to 1914 in the present study.

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Princeton University

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PRINCETON UNIVERSITY
PRINCETON, NEW JERSEY
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CONTENTS

	<i>Page</i>
I. CAPITAL MOVEMENTS BEFORE 1914	1
Geographical Patterns, Components, and Purposes	2
The Statistical Series: Methods of Compilation and Constituents	5
What the Charts Reveal	7
Relative "Importance" of Foreign Investment	12
II. CYCLICAL FLUCTUATIONS AND LONG SWINGS IN INTERNATIONAL INVESTMENT	14
Cyclical Fluctuations	14
Long Swings	18
The United States and Great Britain	21
Canada	24
Australia and New Zealand	27
Sweden, Norway, and Italy	30
France, Germany, and Argentina	32
Conclusions on Long Swings	34
III. DETERMINANTS OF INTERNATIONAL INVESTMENT	35
Capital Movements and Domestic Investment	36
International Investment and Relative Rates of Return	38
IV. CONCLUDING OBSERVATIONS	41

TABLES

	<i>Page</i>
1. Correlation Coefficients: Net Capital Movements and Domestic Economic Activity	17

Appendix 1. Net Capital Movements in Millions of Local Currencies	42-45
Appendix 2. Net Capital Movements for Selected Periods, in Millions of Dollars	46
Appendix 3. Ratios of Net Capital Imports or Net Capital Exports (—) to Gross Domestic Capital Formation	46
Appendix 4. Source of Statistics Used (Other than Capital Movements)	47

CHARTS

	<i>Page</i>
1. Net Capital Exports	8
2. Net Capital Imports	9
3. Canada	25
4. Australia	28

PATTERNS OF FLUCTUATION IN INTERNATIONAL INVESTMENT BEFORE 1914

I. CAPITAL MOVEMENTS BEFORE 1914

The strategic role played by international investment before World War I in opening up and developing the newer regions of the world, and in contributing to the expansion of world trade, the diffusion of technology, and the integration of the international economy, has long been recognized and the broad outlines of the story often told.¹ In recent decades, the amount of statistical data relating to the capital movements of that period has been considerably enlarged as a by-product of the heightened interest by economists and economic historians in 19th century processes of growth and fluctuations. Annual series of international capital flows have been compiled for individual countries where none existed before, and pre-existing ones have been revised and extended. This paper proposes, on the basis of these and related series, to make a comparative statistical analysis of the patterns of secular and cyclical fluctuation in foreign investment in the 50 years before World War I and an examination of some of the factors determining them. The assembled data cover the three major net capital exporters before 1914—Great Britain, France, and Germany—and most of the leading net capital-importing countries with the notable exceptions of Russia and Japan.

There is some justification for limiting this study to the period before 1914. Continuous annual series on capital movements for a number of important countries stop in 1913. The complications introduced by two world wars and their aftermaths are avoided. Of more importance, the period roughly from 1870 to 1914 constituted a unique historical episode: the so-called golden age of the international economy. International movements of capital were almost entirely free

The author gratefully acknowledges the assistance of Balwant Singh and Miss A. R. Lokamatha on the statistical work underlying in this study.

¹ See, for example, Herbert Feis, *Europe: The World's Banker, 1870-1914* (New Haven, 1930); Charles K. Hobson, *The Export of Capital* (London, 1914); Leland H. Jenks, *The Migration of British Capital to 1875* (London, 1938); Alec K. Cairncross, *Home and Foreign Investment, 1870-1913* (Cambridge, England, 1953); and Douglass C. North, "International Capital Movements in Historical Perspective," in *U. S. Private and Government Investment Abroad*, ed. by Raymond F. Mikesell (Eugene, Oregon, 1962), pp. 10-43.

of formal restrictions.² Exchange and direct trade controls were virtually unknown. Tariff barriers, while high as compared to earlier levels, were low relative to those which were to prevail after 1914. Stable exchange rates prevailed over a large part of the world, devaluations of gold currencies were highly exceptional, and few countries were forced off the gold standard once adopted. Labor could move freely across national boundaries in search of better job opportunities, and the volume of intercontinental migration reached levels in excess of anything experienced before or since. Capital-exporting countries devoted far larger proportions of their savings to foreign investment than has been the case since 1914, even with the inclusion of foreign aid in the latter after 1945. The volume of world trade grew at a rate not subsequently exceeded until the 1950's. The ratios of international investment and of international trade to world production appear to have been at all-time highs.

Geographical Patterns, Components, and Purposes

Some key facts regarding the geographical distribution and pattern of international investment before 1914 can be quickly summarized. At the outbreak of World War I, the total stock of long-term foreign investments, according to an informed estimate,³ was about \$44 billion, of which \$18 billion was held by Great Britain, \$9 billion by France, almost \$6 billion by Germany, \$5.5 billion by Belgium, the Netherlands, and Switzerland, and the balance mainly by the United

² For political reasons, however, France and Germany exercised some measure of restraint on capital exports through formal controls on the flotation or listing of foreign securities in their markets and especially through a variety of informal pressures on banking and issuing houses. These countries also took a number of steps to encourage the export of capital to particular countries or regions, again for political reasons. For the relations between *haute finance* and *haute politique* in the period before 1914, see Feis, *op.cit.*; A. Eugene Staley, *War and the Private Investor* (New York, 1935); and Jacob Viner, "Political Aspects of International Finance," *Journal of Business*, Vol. 1 (April and July 1928), pp. 153-73, 349-63, and *International Economics* (Glencoe, Ill., 1951), pp. 49-85. Great Britain encouraged capital exports to countries of the British Empire primarily through legislative measures, such as the series of acts, culminating in the Colonial Stock Act of 1900, that regulated the investment of Trust Funds. Cf. also S. Herbert Frankel, *Capital Investment in Africa* (London, 1938), p. 21: "The general atmosphere of optimism engendered by glowing descriptions of, and imperialist propaganda about, the potentialities of the new [British] African possessions had a powerful effect in making not only the loan issues of Colonial Governments, but also the shares of innumerable exploration, mining and financial companies, acceptable to the investor."

³ *International Capital Movements during the Inter-war Period*, United Nations (New York, October 1949), p. 2.

States, Russia, and Japan. (In 1874 the combined total for Britain, France, and Germany had amounted to only \$6 billion.) Of the outstanding total, \$14 billion was invested in Europe—probably to the extent of one-third in Russia—\$10.5 billion in the United States and Canada, \$8.5 billion in Latin America, and the balance mainly in Asia and Africa. Over the period 1870-1913 as a whole, British long-term capital exports flowed predominantly to the United States, Canada, Australia and New Zealand, India, South Africa, and Argentina. As much as 75 per cent of Britain's stock of foreign investments in 1913 was concentrated in these countries (as compared with about 60 per cent in 1870). On the other hand, French and German long-term capital exports went mainly to European countries—in the case of France, about one-third to Russia alone—although after 1900 they went in increasing proportion to other continents. In 1913 some 60 per cent of outstanding French foreign long-term investments, and half of the German, were still in Europe. Among the capital-importing countries to be discussed here, the United States drew some 55-60 per cent of its foreign capital (net) from Britain over the whole period 1870-1914,⁴ and Canada over 70 per cent.⁵ The proportions drawn from Britain were undoubtedly even higher in the cases of Australia, India, New Zealand, South Africa, and (at least up to 1900) Argentina. Italy, Sweden, and Norway obtained their foreign capital largely from France and Germany, with French capital definitely predominating in the case of Sweden.⁶

Portfolio investment was a far more important component of long-term capital movements before 1914 than direct investment;⁷ and it

⁴ Jeffrey G. Williamson, *American Growth and the Balance of Payments, 1820-1913* (Chapel Hill, N.C., 1964), p. 145.

⁵ The figure was 70 per cent for the period 1900-13, according to Jacob Viner, *Canada's Balance of International Indebtedness, 1900-1913* (Cambridge, Mass., 1924), p. 139. It may have been closer to 80 per cent in 1870-99, if one is to infer from data presented in Penelope Hartland, "Canadian Balance of Payments since 1868," in *Trends in the American Economy in the Nineteenth Century*, National Bureau of Economic Research, Studies in Income and Wealth, Vol. 24 (Princeton, 1960), pp. 488-93.

⁶ Rondo Cameron, *France and the Economic Development of Europe, 1800-1914* (Princeton, 1961), pp. 488-93.

⁷ Foreign investment in China provided one exception to this rule. See Chi-ming Hou, *Foreign Investment and Economic Development in China, 1840-1937* (Cambridge, Mass., 1965). The investments abroad of the United States before 1914 also appear to have been primarily direct investments, if one is to judge from estimates of the main categories of American long-term assets abroad on selected dates by Cleona Lewis, *America's Stake in International Investments* (Washington, 1938), p. 442. Before 1914, it might be noted, the concept of direct

consisted much more of transactions in bonds and other debt instruments than in equities. In turn, the flotation of new issues on foreign capital markets appears, with the possible exception of the United States, to have influenced the country totals of portfolio investment flows more than did net international transactions in outstanding securities.⁸ Borrowings on foreign capital markets by governments (national, state, and local) went primarily for railroad construction, utilities, and public works;⁹ and a high proportion of the foreign borrowings of private enterprise was undertaken by privately-owned railroad companies, often with assistance in the form of government guarantees. In 1914 as much as 70 per cent of the outstanding volume of British and of French long-term foreign investments abroad consisted of government and railway bonds; and the corresponding proportion in the case of Germany might have been only somewhat smaller. When allowance is made for the volume of governmental borrowing abroad and for the extent of the assistance provided to private railroad companies in the form of guarantees, land grants, and cash subsidies, one might conclude that the bulk of the international long-term borrowings in the period before 1914 depended directly or indirectly on government action in the capital-importing countries.¹⁰ On the other hand, foreign investment was financed almost entirely from private sources.

investment (in its present-day sense) was not clearly distinguished in the statistics from other (noncontrolling) equity investments in private foreign enterprises.

⁸ This statement is not intended to minimize the importance of international movements of outstanding securities before 1914. There is, on the contrary, reason to believe that such movements were often on a very large scale indeed, although statistical data are almost completely lacking. For evidence of the importance of these movements, see Raphaël G. Levy, "Rôle des Valeurs Mobilières dans le Commerce International et dans les Règlements Financiers Internationaux," *Congrès International des Valeurs Mobilières*, Vol. IV (Paris, 1901); Charles A. Conant, "Securities as a Means of Payment," *Annals of the American Academy of Political and Social Science* (September 1899), pp. 25-47; and Arthur I. Bloomfield, "The Significance of Outstanding Securities in the International Movement of Capital," *Canadian Journal of Economics and Political Science*, Vol. 6 (November 1940), especially pp. 496-503, and the literature cited therein.

⁹ Important government borrowings abroad were also undertaken at times to restore convertibility (Argentina, Italy), to protect convertibility (Russia, Japan, the United States), to finance wars or preparations for wars (Japan, Russia, South Africa), or to make loans to the private sector (Sweden). Foreign borrowings by state or private mortgage banks or building societies were of importance in the cases of Sweden, Norway, Australia, and Argentina.

¹⁰ Ragnar Nurkse, *Equilibrium and Growth in the World Economy* (Cambridge, Mass., 1961), p. 140; and Penelope Hartland, "Private Enterprise and International Capital," *Canadian Journal of Economics and Political Science* Vol. 19 (February 1953), pp. 70-80. But see Matthew Simon, "The Enterprise

A large but indeterminable part of the long-term capital that flowed to the "newer" overseas countries before 1914 was undoubtedly stimulated directly or indirectly by the actual and prospective expansion of demand in the industrial centers for the primary products of these countries. Some foreign capital moved directly into the export sectors of these countries in search of profit, but, of much more importance, capital was borrowed abroad for the construction of transport and other overhead facilities, in part to enlarge the flow of these products to world markets and to support the expansion of domestic activities stimulated directly by export growth. Nurkse has in fact argued that 19th century growth in the "newer" regions of the world was *predominantly* a reflection of the expansion in world demand for their exports and of the foreign investment (and immigration) thereby induced.¹¹ But this generalization seems to be too sweeping. It may apply to some countries (Canada and South Africa), but not to others (the United States). It neglects the powerful domestic forces, on both the demand and supply sides, making for growth. It disregards the fact that the prospect of expanding exports was only one of the factors, and not always the most important one, stimulating the building of railroads and other communications systems which absorbed so large a fraction of the long-term capital imports; political considerations, such as the need to unify the countries concerned, and other purely domestic factors, may have played an equal if not larger part.¹²

The Statistical Series: Methods of Compilation and Constituents

The annual series on capital movements to be examined here, which are plotted in Charts 1 and 2 and given with their sources in Appendix 1, were constructed in nearly all cases on the basis of the so-called indirect method. That is, all of the items in the balance of payments except capital movements were estimated separately, and the residuals needed to balance the totals of payments and receipts were taken to constitute the net flow of long- and short-term capital along with errors and omissions. For a number of the countries concerned, *direct* estimates of the net and/or gross annual flow of *long-term* capital alone

and Industrial Composition of New British Portfolio Foreign Investment, 1865-1914," *Journal of Development Studies*, Vol. 3 (April 1967), pp. 282-3.

¹¹ Nurkse, *op.cit.*, pp. 283-90, and 304-5.

¹² On the substance of this paragraph I have benefitted from discussions with Irving B. Kravis and from a reading, in draft form, of a forthcoming paper of his on trade and growth.

are also available,¹³ but in some of the cases these are incomplete or cover shorter periods than do the corresponding series obtained by the indirect method.¹⁴ For these reasons, and for purposes of consistency among the series, the data derived by the latter method are used wherever possible. Direct estimates are employed only in the few instances (Argentina and New Zealand) where no other exists.

Little or nothing can be said here as to the extent to which net short-term capital movements and errors and omissions distort the accuracy of the various indirect estimates as a measure of the net flow of long-term capital alone. For only two of the series (the Canadian and Swedish) is it possible for the whole periods covered to eliminate the aggregate net flow of short-term capital¹⁵ in view of the avail-

¹³ The most ambitious direct estimates available are for Great Britain. Matthew Simon has compiled monthly totals of new foreign capital issues purchased by British investors from 1865 to 1914 according to the individual borrowing countries, the categories of borrowers, and the broad purposes of the borrowings. Some of his results, though not his data on the borrowings of *individual* countries, are to be found in his articles, "The Pattern of New British Portfolio Foreign Investment, 1865-1914," in *Capital Movements and Economic Development*, ed. by John H. Adler (New York, 1967), pp. 33-60, and *Journal of Development Studies*, Vol. 3 (April 1967), pp. 280-92. While Simon's data cover by far the largest component of gross British long-term capital exports, they do not include direct investments abroad, international transactions in outstanding securities, or private placements of foreign issues in London. In view of these and other considerations, such as the exclusion of short-term capital movements, the Simon series shows substantial differences in many years, in volume or direction of change, from the indirect estimates used here. On the other hand, the broad similarity in the longer-term fluctuations and cumulated totals of the two series is unmistakable.

¹⁴ A comparison of the indirect and direct estimates for those countries, in addition to Great Britain, for which both are available (France, Canada, Australia, and India), likewise reveals that the cumulated totals over a period of years are similar, but that the data in individual years often differ substantially. These differences reflect in part the facts that each of the two sets of estimates do not measure exactly the same thing and that each is subject to errors and omissions. Besides, some differences are to be expected in view of the time lag (often variable) between the act of investing or borrowing abroad and the actual transfer of the capital as reflected in the estimates derived by the indirect method.

¹⁵ At least through banking channels. There are no available data for short-term commercial credits. For some countries, such as Sweden, these may have been relatively large. See Lennart Jörberg, "Structural Change and Economic Growth: Sweden in the 19th Century," *Economy and History*, Vol. VIII (1965), p. 22. For some of the series it would, of course, have been possible to eliminate only *some* components of the net flow of short-term capital through banking channels, notably the changes in official holdings of foreign exchange. For details on 19th century short-term capital flows, see my paper, *Short-Term Capital Movements under the Pre-1914 Gold Standard*, Princeton Studies in International Finance No. 11 (Princeton, 1963).

ability of the relevant data. In these two cases, however (especially the Canadian), the net movement of short-term funds was generally only a minor component of the annual totals; and it may be assumed that this usually held true also for those series for which no such elimination was possible.¹⁶ The relative magnitude of the errors-and-omissions component is, of course, unknown. In many of the series, and for many of the years covered, this item was undoubtedly large, as various of the compilers have themselves cautioned. But the assumption will have to be made that errors and omissions do not seriously impair the usefulness of the individual series as a measure of the net flow of long-term capital.

The various series include, of course, net international movements of both foreign and domestic long-term capital,¹⁷ although the one probably predominated heavily over the other in individual cases. This at least was true for Canada and France, for which there exist direct estimates of each. The net movement of foreign capital to Canada was far in excess of the net outflow of Canadian capital; and the net outflow of French capital was much larger than the net inflow of foreign capital. Even in those years when a predominantly debtor country, such as Italy, was on balance exporting capital, the net outflow undoubtedly reflected mainly a repatriation of foreign capital rather than a movement of domestic capital. The United States, however, might have constituted a possible exception to this general rule, especially in the later years of the period when the net movement of domestic capital might have been roughly of the same order of magnitude as that of foreign capital.

What the Charts Reveal

The various series on capital movements are plotted in Charts 1 and 2.¹⁸ Each series is measured in terms of the currency of the country concerned. It was not possible to convert all the observations into a common unit in view of the fact that several of the currencies, including the dollar, fluctuated in terms of gold during part of the periods covered. The charts, then, are designed to show the behavior and

¹⁶ It held true for the Australian series which, for *part* of the period covered, could be adjusted to exclude net short-term capital movements.

¹⁷ Except for the Argentine and New Zealand series, which are direct estimates of foreign capital flows alone.

¹⁸ The Canadian and Swedish series have been adjusted to eliminate net short-term capital movements through banking channels.

CHART 1

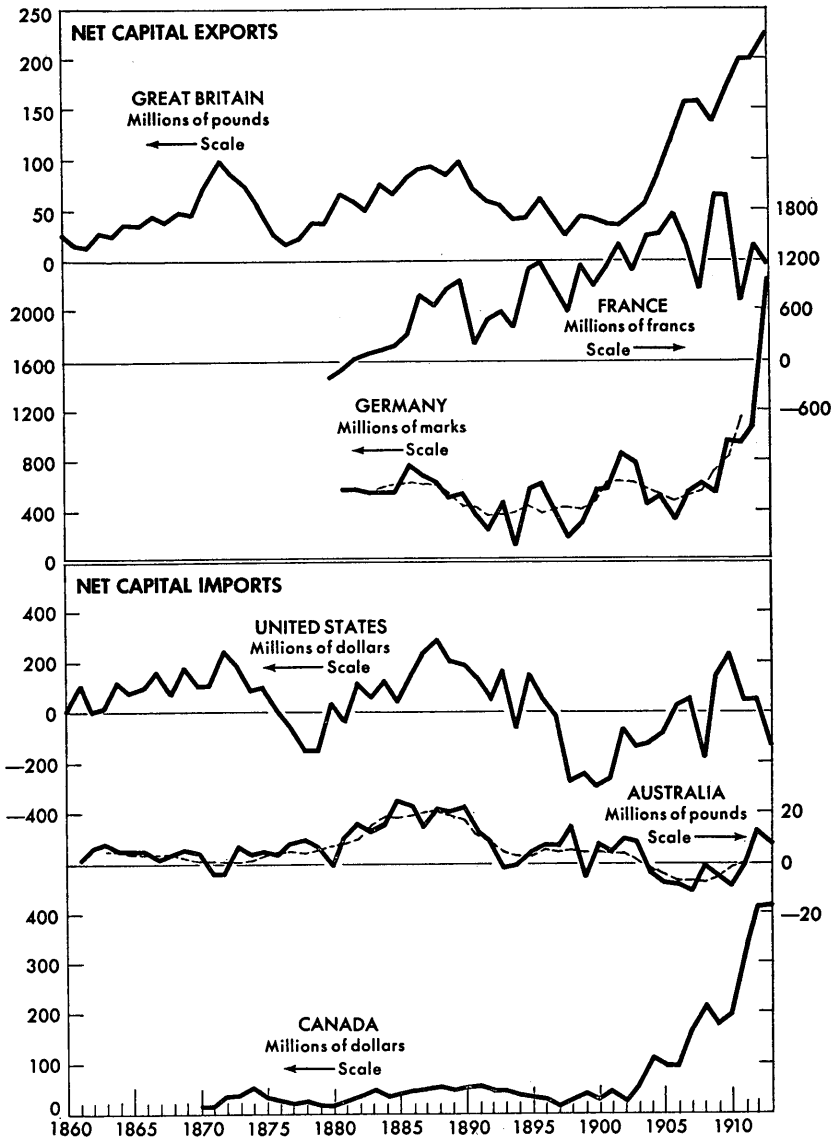
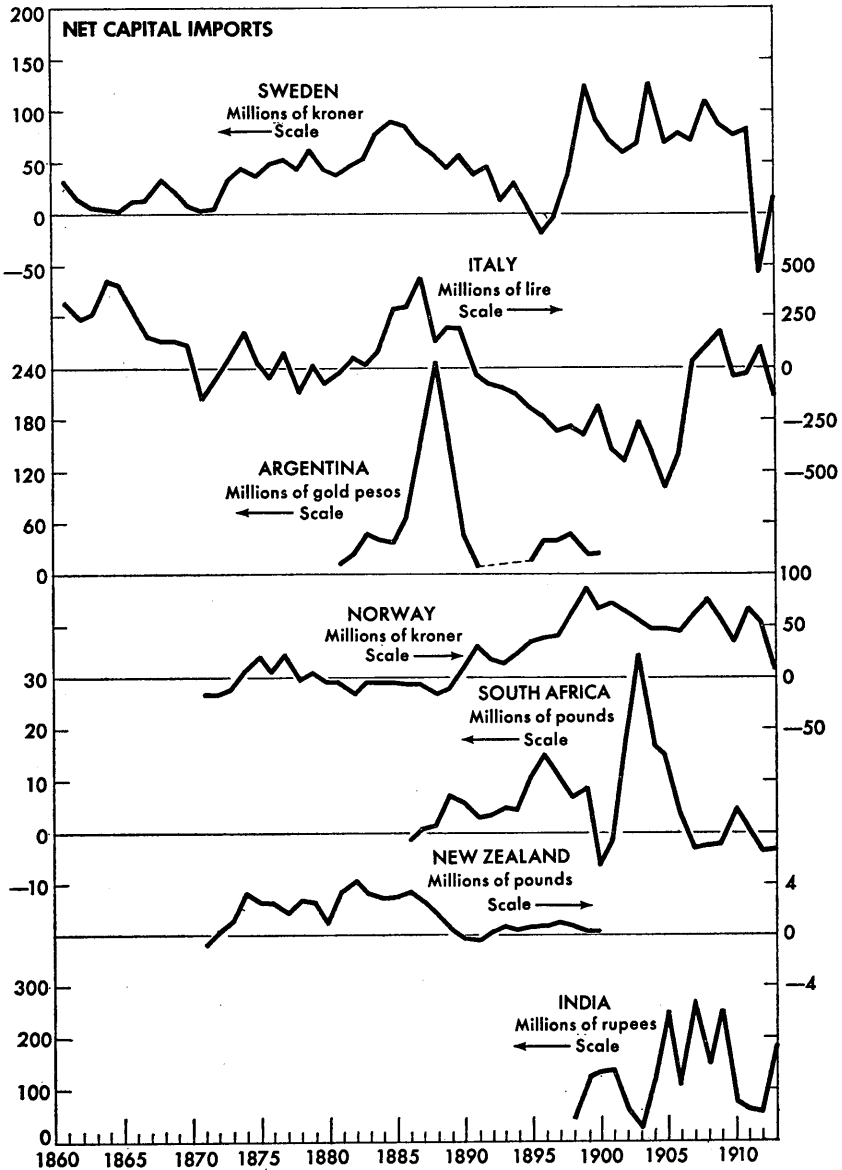


CHART 2



fluctuations of each series individually, not to compare their relative magnitudes.¹⁹

The different periods covered by the series reflect the availability of the annual data. Only the series for Great Britain and the United States could have been carried back farther, in each case to 1820, but 1860 appeared an appropriate starting point in view of the lengths of the other series. France was a substantial net capital exporter for several decades before 1880,²⁰ when the French series starts, as was Germany during part of the 1870's, but annual estimates for these earlier years are not available. The Argentine and New Zealand series end in 1900, but there is evidence of a marked resumption of capital imports into each of these countries after 1905.²¹ India appears to have been a relatively large capital importer before 1898,²² when the series starts, but no comparable annual data are available for the earlier period. On the other hand, South Africa, for which the data start in 1886—the year of the Witwatersrand gold discoveries—does not seem to have imported capital on any substantial scale before that date. An annual series is available for Japan from 1904 to 1913—before then capital imports are believed to have been relatively trifling in size—but the series is too short to be included here.²³ There are no annual estimates

¹⁹ After 1880, however, it is possible to convert all the series except for Italy into dollars. The resulting data for 1881-1913 are shown for quinquennial periods in Appendix 2. They bring out the predominance of Britain among the three capital-exporting countries and the relative importance, among the capital-importing countries, of the United States, Australia, and Argentina in the 1880's and of Canada, India, and South Africa in the 1900's.

²⁰ Cameron, *op.cit.*, p. 79 and *passim*.

²¹ Alec G. Ford, *The Gold Standard, 1880-1914: Great Britain and Argentina* (Oxford, 1962), pp. 155-6; and Wolfgang Rosenberg, "Capital Imports and Growth: Foreign Investment in New Zealand, 1840-1958," *Economic Journal*, Vol. 71 (March 1961), pp. 95-6, 109-10.

²² For example, outstanding British investments in India rose by £110 million between 1870 and 1885, an amount as large as the increase between 1885 and 1913. Changes in outstanding totals are not, of course, an accurate measure of cumulated capital flows.

²³ There are actually two available series for this period: Margaret S. Gordon, "Japan's Balance of International Accounts, 1904-31," in *The Industrialization of Japan and Manchukuo, 1930-1940*, ed. by Elizabeth B. Schumpeter (New York, 1940), pp. 865-72; and Henry Rosovsky, *Capital Formation in Japan, 1868-1940* (Glencoe, Ill., 1961), p. 129. It is not clear if these two series purport to measure exactly the same thing. While they differ substantially on a yearly basis, the cumulated totals for 1904-13 are in each case in the neighborhood of 1 billion yen, or roughly \$500 million on the basis of exchange rates before 1914. Still another annual series, based on direct estimates of net foreign capital flows alone, is to be found in Harold G. Moulton, *Japan: An Economic and Financial Appraisal* (Washington, 1931), p. 379. In this case, the cumulated total for 1904-13 comes

for Russia, one of the largest of the capital-importing nations before 1914.²⁴

The charts reveal that the short-run swings in the net flow of capital tend to be overshadowed, in nearly all the series, by longer-term fluctuations. In many cases, the latter trace out familiar long swings or Kuznets cycles of a duration ranging from about 13 to 30 years. These swings show up most clearly in the series for Britain and the United States, which also reveal a marked similarity in the timing of the swings. The Canadian series, had it been plotted on ratio scale, would also have shown long swings, which moved closely with those of Britain and the United States. Two Kuznets cycles seem to stand out in the Italian series, as they also do, at least after 1870, in the Swedish data. There is the suggestion of a long-swing pattern in the Australian and German series, when each is smoothed by five-year moving averages (see the dashed lines in Chart 1). The remaining series, while dominated in most cases by longer-term fluctuations, do not in their unprocessed form reveal Kuznets cycles.

The charts also indicate that net capital imports into many of the debtor countries tended to be concentrated in a relatively few years of the periods covered. The bulk of the net capital movement to Canada occurred in the last 10 years of the period 1870-1913. Foreign investment in Argentina took place preponderantly in four years (1886-89) of the period covered. Capital imports into Australia were concentrated primarily in the 1880's and were in fact replaced by a net outflow of capital in many of the years that followed. Italy was a net capital importer in the 1860's and 1880's; for most of the other years of the period, especially after 1890, it was a net capital exporter. Norway became an important net importer of capital only after 1890.

to about 1.8 billion yen. The role of capital imports in Japanese economic growth has been ably discussed by Edwin P. Reubens, "Foreign Capital and Domestic Development in Japan," in *Economic Growth: Brazil, India, Japan*, ed. by Simon Kuznets, Wilbert E. Moore, and Joseph J. Spengler (Durham, N.C., 1955), pp. 179-228.

²⁴ From 1898 to 1913, however, the cumulated net inflow of *foreign* capital into Russia has been estimated at as much as 3.9 billion roubles (\$2 billion) by Petr I. Lyashchenko, *History of the National Economy of Russia* (New York, 1949), p. 718. The corresponding estimate for 1881-97 amounted to 1.8 billion roubles. For estimates of *outstanding* foreign investments in Russia by components on selected dates before 1914, see I. F. Gindin, *Russkiye kommercheskiye Banki* (Moscow, 1948), pp. 444-5. For annual estimates (dating back to 1827!) of outstanding foreign investments in Russian joint-stock companies alone, see V. P. Ol', *Inostrnnye kapitaly v narodnom koziastve dovoennoi Rossii* (Leningrad, 1925), pp. 12-3.

Relative "Importance" of Foreign Investment

It would be useful, for comparative purposes, to have some kind of statistical measure of the relative "importance" of capital imports to the individual debtor countries during the periods concerned. In purely aggregative terms, net capital imports add to a country's available real resources and permit it to that extent to invest and consume more than it produces or—what amounts to the same thing—to import more than it exports and to invest in excess of domestic saving, thereby providing it with the opportunity to grow at a faster rate.²⁵ Thus, one crude indicator of a country's relative "dependence" on net capital imports would be provided by the ratio of such imports to gross domestic capital formation, although clearly this would not measure the relative "contribution" of capital inflows to economic growth.²⁶ Such ratios, computed on a quinquennial basis for a number of the debtor countries, are presented in Appendix 3.²⁷

Over the whole periods covered, net capital imports were in all cases of lesser importance than domestic saving (and use of gold reserves) in "financing" domestic investment. But during certain periods the ratios for most of the countries, with the notable exception of the United States, rose to high levels. Thus the ratios were in the neighbor-

²⁵ This could also be expressed in terms of a simple Harrod-Domar model applied to an open economy, with $r = 1/k(s + m - X/Y)$, where r is the equilibrium rate of growth needed to keep capacity fully employed over time; s and m the savings and import ratios and k the capital-output ratio—all assumed constant; and X and Y exports and output. The equilibrium rate of growth will thus be greater, the greater the ratio of the import surplus to output. For this and more elaborate formulas, see Harry G. Johnson, *International Trade and Economic Growth* (London, 1958), pp. 120-49.

²⁶ For an analysis of the various ways in which capital inflows (including foreign aid) can contribute to a higher rate of growth, and of the factors determining the extent of such contribution, see Hollis B. Chenery and Alan M. Strout, "Foreign Assistance and Economic Development," *American Economic Review*, Vol. LVI (September 1966), pp. 679-733. See also Gerald M. Meier, *International Trade and Development* (New York, 1963), pp. 83-115.

²⁷ Similar ratios for a number of countries are to be found in Simon Kuznets, "International Differences in Capital Formation and Financing," in *Capital Formation and Economic Growth*, National Bureau of Economic Research, Special Conference Series No. 6 (Princeton, 1955), pp. 70-3, and "Long-term Trends in Capital Formation Proportions," *Economic Development and Cultural Change*, Vol. 9 (July 1961), supplement, pp. 58, 69, 74, 80, 87, 92, 102, 106, and 114. Kuznets also computed ratios of net capital imports to national product for several countries. Elsewhere he gives the proportions of imports of merchandise and services financed by net capital imports for a number of countries ("Level and Structure of Foreign Trade: Long-term Trends," *Economic Development and Cultural Change*, Vol. 15 [January 1967], supplement, pp. 61-9).

hood of 50 per cent (or more) for Australia in the first half of the 1860's and in the 1880's, for New Zealand in the last half of the 1870's and the first half of the 1880's, and for Sweden in the 1880's. The ratio for Canada, which can be computed only after 1900 and then only for selected periods, rose from 23.5 per cent in 1901-05 to 46.2 per cent in 1911-15.²⁸ For a few quinquennial periods, the ratios for Norway and Italy rose to between 30 and 40 per cent. In the case of the United States, however, the ratios were usually below five per cent and for some periods were, of course, negative. It might be noted that, for most of the countries, the ratios themselves tended to trace out long swings.

As for the three major net-capital-exporting countries, the proportions of their national savings absorbed by net foreign investment varied. About two-fifths of British savings from 1875 to 1914 went to finance the acquisition of foreign assets, and in some years the proportion rose to over a half.²⁹ From 1880 to 1913 one-third to one-half of French savings was invested abroad.³⁰ On the other hand, the fraction in the case of Germany appears to have been less than one-tenth in 1900-14 and above that figure only in certain periods such as the early 1870's and mid-1880's, when it may have amounted to about two-fifths.³¹

²⁸ For the period 1909-14, the ratio has been estimated at 54 per cent by Gideon Rosenbluth, "Changing Structural Factors in Canada's Cyclical Sensitivity, 1903-54," *Canadian Journal of Economics and Political Science*, Vol. 24 (February 1958), p. 36.

²⁹ Alec K. Cairncross, *Factors in Economic Development* (London, 1962), pp. 39-40.

³⁰ Harry D. White, *The French International Accounts, 1880-1913* (Cambridge, Mass., 1933), p. 269. Kuznets (in *Capital Formation and Economic Growth*, *op.cit.*, p. 72), has estimated the ratio of French net capital exports to net domestic savings at 62.5 per cent for the period 1878-1911.

³¹ Herbert Feis, *op.cit.*, pp. 61-2.

II. CYCLICAL FLUCTUATIONS AND LONG SWINGS IN INTERNATIONAL INVESTMENT

As indicated earlier, long-term capital movements in the period before 1914 underwent both short-term fluctuations and pronounced longer-term swings. To what extent were these related to cyclical and secular swings in aggregate economic activity in the individual countries concerned?

Cyclical Fluctuations

With regard to cyclical fluctuations, it has sometimes been stated that international investment as a whole tends to conform positively with the world business cycle, rising in times of world booms and falling off in world recession.³² To test this proposition for the period 1881-1913, we correlated the first differences of the sum (in dollars) of British, French, and German net capital exports—a rough measure of the aggregate net flow of long-term funds from creditor to debtor countries—with the first differences of the Tinbergen-Wagemann index of the value of world trade—which may be taken as an approximation to the level of world economic activity.³³ The correlation coefficient was only 0.30, which was not statistically significant. (To the extent that the underlying data are subject to error, use of first differences would tend to give a downward bias to the correlation coefficient.) On the other hand, when the absolute deviations from fitted trends of the two series were correlated, the coefficient rose to 0.58, which was significant at the one per cent level. From these results it may be concluded that foreign investment as a whole did not conform to short-run cyclical swings in world economic activity, but that the two were correlated in their longer-run movements—as is confirmed by an inspection of the deviations when plotted.

Whether or not net capital flows into or out of *individual* countries might be expected to have conformed to their domestic business cycles

³² Frank W. Taussig, *International Trade* (New York, 1927), pp. 130, 238; Bertil Ohlin, *Interregional and International Trade* (Cambridge, Mass., 1933), p. 337; and Roy F. Harrod, *International Economics* (2nd ed., Cambridge, England, 1939), p. 149.

³³ Jan Tinbergen, *Business Cycles in the United Kingdom, 1870-1914* (Amsterdam, 1951), appendix. The correlation was confined to the period 1881-1913, because annual estimates of German capital exports begin only in 1881.

before 1914 is a question that cannot easily be answered on *a priori* grounds. As for debtor countries normally dependent on foreign capital, there is a presumption that net capital imports and domestic business activity would be positively related in a mutually interacting way. During periods of upswing in these countries, whether sparked by rising exports or other causes, one might expect capital imports to increase because of increased domestic demands for foreign capital, and because of increased willingness by foreigners to invest in these countries in view of the more favorable economic prospects and anticipated rates of return—unless perhaps opportunities happened to be even more favorable in the investing countries themselves. In turn, increased capital imports would be an important element supporting, reinforcing, or even initiating business upturns in the capital-importing countries. Conversely, in time of domestic recession there is a presumption that capital imports would tend to decline.

It is much more difficult to make presumptions as to the likely pattern of capital movements in relation to domestic cycles in the capital-exporting countries. Whether or not a significant correlation is to be expected in any given case, and whether or not such correlation would be positive or negative, would depend on a wide variety of factors, including—perhaps of most importance—the intensity and timing of cyclical fluctuations in the capital-exporting country relative to those of cycles abroad, and the relative importance of the various kinds of capital exports (for example, portfolio and direct) which may behave differently during the course of the cycle.³⁴

To determine whether there was in fact a short-run covariation between capital flows and domestic activity in the case of the individual countries concerned before 1914, a number of simple correlations (including tests with lagged relationships) were made of the first differences of net capital flows and of national income or product at current and constant prices for those countries for which the latter data were available.³⁵ Doubts may legitimately be raised as to whether national income or product provide an appropriate measure of domestic cyclical fluctuations and whether the available data, at least for the

³⁴ I have discussed these matters in some detail in my article, "The Mechanism of Adjustment of the American Balance of Payments, 1919-1929," *Quarterly Journal of Economics*, Vol. LVII (May 1943), pp. 368-75. See also Rudolph R. Rhomberg, "Transmission of Business Fluctuations from Developed to Developing Countries," *International Monetary Fund, Staff Papers*, Vol. XV (March 1968), pp. 12-6.

³⁵ For the sources of the domestic series used here and elsewhere in this study, see Appendix 4.

earlier years of the periods covered, are themselves sufficiently reliable. But there are few alternatives in view of the generally unsatisfactory state of aggregative annual series before 1914. In a few cases, however, it was possible to make use of other domestic series believed to be more sensitive indicators of the business cycle.

Some of the results of the correlations are set forth in the second column of Table I. On the basis of the procedure adopted, net capital flows into or out of the individual countries did not in general conform markedly, or conform at all, to short-run cyclical fluctuations in domestic economic activity. Statistically significant but generally low positive correlation coefficients were obtained for the United States, Great Britain, Canada (when short-term capital flows were included in the series on capital movements), and Italy.³⁶ The results for Sweden are contradictory. A significant result was obtained when Swedish capital movements were correlated with investment in machinery and equipment for manufacturing industries, a series regarded by some authorities as a good measure of Swedish business cycles before 1914.³⁷ But when the first differences of Swedish capital imports and of gross domestic product were correlated, with the latter lagged by one year, the correlation coefficient was significant at the one per cent level but *negative*—a finding for which I am unable to offer any explanation. The results for Australia, Norway, and Germany were not significant.

In order to explore further the relations between fluctuations in net

³⁶ In the cases of France and South Africa, for which no annual aggregative series are available, resort was had to the "indexes of conformity" technique of the National Bureau of Economic Research [Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles* (New York, 1946), pp. 31-3]. French capital exports showed no significant relation to French business cycles, the conformity indexes for 1880-1913 being 0 for reference expansions, -20 for reference contractions, and -20 for full cycles. On the other hand, net capital imports into South Africa from 1886 to 1913 were a well-conforming series, with conformity indexes of +50, +100, and +100, respectively. That capital imports into South Africa followed the cyclical course of domestic activity has also been noted by Donald W. Gilbert, "The Economic Effects of the Gold Discoveries Upon South Africa: 1886-1910," *Quarterly Journal of Economics*, Vol. XLVII (August 1933), pp. 562 ff. [The reference-cycle dates for France are from Burns and Mitchell, *op.cit.*, p. 78, and for South Africa from Willard L. Thorp and Wesley C. Mitchell, *Business Annals* (New York, 1926), p. 95, and Christian G. W. Schumann, *Structural Changes and Business Cycles in South Africa, 1806-1936* (London, 1938), pp. 111-2.]

³⁷ Erik Lindahl, Einar Dahlgren, and Karin Kock, *National Income of Sweden, 1861-1930*, Part I, Stockholm Economic Studies No. 5a (London, 1937), pp. 254-5, 257. The specific cycle turning points of this series agree closely with the Swedish reference-cycle chronology presented in Lennart Jörberg, *Growth and Fluctuations of Swedish Industry, 1869-1912* (Stockholm, 1961), pp. 218-9.

TABLE 1

CORRELATION COEFFICIENTS: NET CAPITAL MOVEMENTS
AND DOMESTIC ECONOMIC ACTIVITY*

Net Capital Movements Correlated With:	Correlation Coefficients	
	Deviations from Trend	First Differences of Unadjusted Data
<i>United States</i> (1861-1913)		
Frickey Index of Industrial and Commercial Production	0.52 (1%)	0.51 (1%)
<i>Great Britain</i> (1860-1913)		
National Income current prices	0.20	0.31 (5%)
National Income current prices lagged by 1 year	0.31 (5%)	0.29 (5%)
<i>Australia</i> (1861-1913)		
Gross Domestic Product current prices	0.57 (1%)	0.11
Gross Domestic Product constant prices	0.59 (1%)	0.10
<i>Canada</i> (1870-1913)		
Gross National Product constant prices: I**	0.32 (5%)	0.12
Gross National Product constant prices: II†	0.40 (1%)	0.36 (5%)
<i>Italy</i> (1861-1913)		
National Income current prices	0.25	0.32 (5%)
National Income constant prices	0.28 (5%)	0.23
<i>Norway</i> (1871-1912)		
Gross Domestic Product current prices	0.41 (1%)	0.10
Gross Domestic Product constant prices	0.43 (1%)	0.09
<i>Germany</i> (1881-1913)		
National Income current prices	0.51 (1%)	0.05
<i>Sweden</i> (1861-1913)‡		
Investment in Manufacturing		0.31 (5%)
Gross Domestic Product current prices lagged by 1 year	-0.06	-0.41 (1%)
Gross Domestic Product constant prices lagged by 1 year	-0.14	-0.56 (1%)

* Figures in parentheses represent levels of significance.

** Net capital movements excluding short-term capital flows.

† Net capital movements including short-term capital flows.

‡ The series on Swedish capital movements used here exclude short-term capital flows; the coefficients derived did not differ appreciably when short-term capital flows were included.

capital movements and domestic activity, trends were fitted to each of the series used above and simple correlations were made of the absolute deviations from trend of each of the relevant pairs of variables. Some of the results are given in the first column of Table 1, permitting

a direct comparison with the corresponding results of the correlations of the first differences shown in the second column. Only those results are shown for which one or both sets of correlations yielded statistically significant coefficients; and the results of correlations involving lagged relationships are given only when they substantially improved the results obtained when the variables were not lagged—which they rarely did.

It is evident from Table 1 that, in the cases of Australia, Germany, Canada (with short-term capital movements excluded), and Norway, the correlations of the deviations from trend yielded markedly better results than the corresponding correlations of the first differences. The former correlation coefficients were generally significant at the one per cent level, whereas the latter were not significant at even the five per cent level. In these cases net capital movements and domestic economic activity were correlated, not in their shorter-run, but, as a plotting of the deviations confirms, in their longer-term, fluctuations. On the other hand, the significant but low correlation coefficient for the deviations from trend of the British series (with national income lagged by one year) was a reflection of the short-term covariation alone, the coefficients in each case being approximately the same. The same conclusion cannot be drawn, however, with regard to the United States, for which the two coefficients were also almost identical: plotting the deviations from trend shows that net capital imports into the United States and domestic activity (as measured by the Frickey index) were correlated in their longer-term swings as well.

What was the nature of the longer-term swings in capital movements and in domestic activity that showed a significant covariation when the deviations from trend were correlated? For the United States, Canada, Australia, and Norway, the deviations when plotted trace out Kuznets cycles. On the other hand, the plotted deviations from trend of the German series on capital movements and national income show similar longer-term fluctuations that do not clearly take the form of Kuznets cycles.

Long Swings

It has been established so far that long swings show up before 1914 in most of the series on capital movements—in unadjusted or processed form or both—and that in some cases these were correlated with similar swings in general business activity in the countries concerned. But long swings usually appear more strikingly in series other than aggregative ones, such as in building, railroad construction, and migra-

tion. To what extent were the long swings in capital movements correlated with these as well?³⁸

One would expect the swings in all these variables to be closely related. For example, net capital imports would be expected to move closely with railway investment in the debtor countries, if only because a very high proportion of the former went to finance the latter and a large fraction of the latter was directly financed by the former. The direct connection between capital imports and building activity, on the other hand, was less close. Except for a few countries, such as Australia and New Zealand, only a small part of the capital inflows went directly to finance building. More broadly, surges in the rate of domestic investment in general, in countries that normally depended upon net capital imports, not only involved increased demands for foreign capital, but could not have been sustained for long if an increased supply were not forthcoming.³⁹ In a few cases, increases in capital inflows might have even been a precondition for expansions in the rate of domestic investment. Conversely, one would expect long-swing contractions in domestic investment and net capital imports to move together, regardless of whether the one was a cause or an effect of the other. On the other hand, no similar presumptions can be made as to the pattern of relationship between the swings in foreign and

³⁸ There is as yet no consensus as to whether the long-swing hypothesis should be formulated in terms of levels, deviations from trend, or rates of growth of an economic or demographic variable. In fact, all three have been used by different investigators. Most of the series to be examined here—in addition to capital movements—tend to show long swings in their unadjusted form, when adjusted for trend, or when smoothed by moving averages. In some cases we have also made use of the processing method associated with the name of Moses Abramovitz. That is, the annual data are averaged over successive business cycles, measured from trough to trough and from peak to peak, and a computation is made of the percentage rates of change per annum between these “average reference cycle standings.” See Moses Abramovitz in *Employment, Growth, and Price Levels*, Hearings before the Joint Economic Committee, U. S. Congress, Part I (Washington, 1959), pp. 411-66. It has been argued that a more accurate smoothing technique for revealing underlying long swings would be to use the turning points of the *specific* cycles of a series rather than the reference cycle’s turning points in determining average cycle standings. See Richard C. Bird, Meghnad J. Desai, Jared J. Enzler, and Paul J. Taubman, “Kuznets Cycles’ in Growth Rates: Their Meaning,” *International Economic Review*, Vol. 6 (May 1965), pp. 229-39.

³⁹ It can be shown, on the basis of a simple open Harrod-Domar model, that if a country is a net importer of capital, its rate of domestic investment must exceed the product of its marginal propensity to save and its marginal output-capital ratio, and that an increased rate of domestic investment, if it is to be maintained, will require increased capital imports (or loss of international reserves). Cf. James C. Ingram, “Growth in Capacity and Canada’s Balance of Payments,” *American Economic Review*, Vol. XLVII (March 1957), pp. 95-7.

domestic investment in the capital-exporting countries. These could have moved positively or inversely or have had no systematic relationship at all.

One might also expect foreign investment and international migration to be related in their long swings. Both were fundamentally a response to common forces: changing economic conditions and prospects—reflected in rates of return on capital and in job opportunities—in the countries of destination of the capital and labor relative to those in the countries of origin. Whether the “pull” or “push” was more important in individual cases would depend on the circumstances. Alternatively, a movement of the one factor would tend to induce a movement of the other by affecting relative factor scarcities and prices in the countries concerned.⁴⁰ In general, then, swings in net capital imports and net immigration, or in net capital exports and net emigration, should be positively correlated. In those countries where net capital imports and net emigration were the rule (Sweden, Italy, and Norway), the long swings in each might be expected to move inversely, unless general long swings in the country to which the migrants mainly went (the United States) were such as to counteract this tendency.

Long swings in population movements and in building activity were also closely related. In the period before 1914, the former were generally dominated by swings in international migration. Thus, a wave of net immigration would tend to increase the demand for housing and related services and provide a stimulus to building and to construction of urban public utilities. (Internal migration, involving population shifts from rural to urban areas, would have the same effect.) While the chain of causation would seem to have run mainly from population movements to building activity, swings in the latter, by their effect on the swings in national-income growth, would be expected to influence swings in the former. In the countries of origin of the migrants, swings in net emigration, when sufficient to affect the rate of population growth appreciably, would tend to influence the demand for housing and the level of building, though inversely.

Finally, swings in transport investment, on the one hand, and in population movements and building, on the other, were linked to-

⁴⁰ Cf. Ohlin, *op.cit.*, pp. 356-7: “If one factor moves, the economic situation, particular as to factor prices, may be so affected, that another factor moves also. Migration to new countries has increased the demand for capital there, while capital investments . . . have stimulated immigration. An increased supply of either capital or labour must enhance the relative scarcity of the other, and encourage its influx.”

gether. Upsurges in railroad construction tended to stimulate building by causing a relocation of productive activity and population and by attracting increased immigration or reducing emigration. In turn, the swings in population movements and building, however generated, tended to influence the demand for transport facilities.

In the period before 1914, therefore, foreign investment, population movements, building activity, and railroad construction might be expected to have interacted with each other, and with other variables including national income, in a cumulative fashion, and to have moved broadly together in their long swings. The larger issue of the *causes* of the long-swing phenomenon itself, it will be noted, is here left open. Only fragments of a generalized theory in this field have as yet been developed. And some disagreement still prevails as to the exact cause and effect relationships in observed long-swing processes in individual historical cases.

Although the foregoing discussion has focused on the expected pattern of relationship between the long swings in foreign investment and in certain disaggregated variables, the broad conclusions might also be applicable to their short-run fluctuations as well. Indeed, correlations of the first differences of foreign investment and external migration for many of the countries concerned yielded high coefficients, indicating a systematic relation between these variables in the short run. Similar results might also have been obtained had the first differences of other pairs of the relevant variables been correlated. But the statistical treatment that follows in the balance of this section will be confined entirely to an examination of the covariation between the long-swing movements of the variables involved. Such covariation may be assumed, if the earlier aggregative analysis provides any guide, to have been generally more pronounced than in the case of the shorter-run fluctuations.

The United States and Great Britain

The long-swing patterns of the American and British economies have already been analyzed in detail by other investigators. With regard to the United States, Kuznets, Abramovitz, and Easterlin,⁴¹ among oth-

⁴¹ Simon Kuznets, *Capital in the American Economy*, National Bureau of Economic Research, Studies in Capital Formation and Financing No. 9 (Princeton, 1961), pp. 316-88; Abramovitz, *op.cit.*; and Richard A. Easterlin, "Economic-Demographic Interactions and Long Swings in Economic Growth," *American Economic Review*, Vol. LVI (December 1966), pp. 1063-1104. The last contains an excellent bibliography on Kuznets cycles.

ers, have demonstrated the pervasiveness and similarity in timing of long swings in a wide range of series; and Williamson has made a study of the swings in United States capital imports and foreign trade.⁴² Of particular relevance here, these studies show that before 1914 the long-swing expansions and contractions in capital imports coincided broadly with those in the domestic series, and that parallel swings were manifested in merchandise imports and immigration—when all were processed by the same method. Merchandise exports, on the other hand, showed no clear long swings after the Civil War.

The picture was more complex in the case of Great Britain.⁴³ Long swings were evident before 1914 not only in net capital exports, but also, at least after 1870, in building and home investment generally. But foreign and home investment moved *inversely* over the long swing.⁴⁴ Since these movements tended to offset each other, British output and income showed no long swings, but only the familiar Juglar cycles. Merchandise imports (deflated) moved together with home investment in their secular fluctuations, while merchandise exports (deflated), the trade balance (deflated), and emigration swung—along with capital exports—in the opposite direction. Long swings in building, in turn, tended to move inversely with the building cycle in the United States, while British net capital exports, merchandise exports (deflated), and emigration tended to move positively with the American long swing.

A common explanation for the inverse behavior of British and American building cycles before 1914 runs in terms of the causal influence of American long swings on the volume of capital exports and emigra-

⁴² Jeffrey G. Williamson, *American Growth and the Balance of Payments, 1820-1913* (Chapel Hill, N.C., 1964). Some of his findings have recently been questioned by J. Ernest Tanner and Vittorio Bonomo, "Gold, Capital Flows, and Long Swings in American Business Activity," *Journal of Political Economy*, Vol. 76 (January/February 1968), pp. 44-52.

⁴³ Alec K. Cairncross, *Home and Foreign Investment, 1870-1913* (Cambridge, England, 1953), pp. 187 ff.; P. J. O'Leary and W. Arthur Lewis, "Secular Swings in Production and Trade, 1870-1914," *The Manchester School*, Vol. 23 (May 1955), pp. 118-25; Robert C. O. Matthews, *The Business Cycle* (Chicago, 1959), pp. 215-26; and Williamson, *op.cit.*, pp. 189-216.

⁴⁴ They also tended to move inversely in the short run. The correlation coefficient of the first differences of net capital exports and gross domestic fixed-capital formation from 1860 to 1913 was -0.32 , significant at the five per cent level. Compare this result with Cairncross' assertion (*Home and Foreign Investment, op.cit.*, pp. 187-8) that in the short run home and foreign investment generally moved together.

tion from Britain and thus on British home investment.⁴⁵ Long-swing upturns in the United States, according to this view, pulled labor and capital from Britain and thus, by reducing the demand for housing and diverting investible funds from the home market, caused long-swing downturns in British building, while simultaneously supporting and reinforcing the construction boom in the United States. (The decline in British domestic investment was in part offset at such times, in its effect on output, by increased merchandise exports to meet the rising demands for imports from the United States and other countries.) Similarly, long-swing downturns in the United States, by reducing the pull on British labor and capital, laid the basis for a long-swing expansion in British building (and decline in merchandise exports). While recognition is usually given to the role that autonomous developments in Britain sometimes played in exerting a "push" to emigration and capital exports, the focus is placed predominantly on the "pull" from the United States.

This explanation is not without some defects. After 1880 changes in British capital exports to the United States over the long swing were too small a fraction of the changes in total British capital exports to have appreciably influenced the pattern of the latter;⁴⁶ and, in 1900-13 at least, changes in British emigration to the United States were only a small part of the changes in total British emigration. (Even so, long swings in economic activity in the United States might have exerted their effect indirectly by helping to promote parallel swings in important primary-producing countries that might in turn have influenced the pull on British labor and capital.) It has also been argued that changes in British emigration rates were too small in relation to the rate of growth of population to have exerted much direct influence on the fluctuations in British building.⁴⁷ Habbakuk has in fact contended that only in the late 1880's were emigration and capital exports

⁴⁵ E. W. Cooney, "Capital Exports and Investment in Building in Britain and the U. S. A., 1856-1914," *Economica*, N. S. Vol. 16 (November 1949), pp. 347-54, and "Long Waves in Building in the British Economy of the Nineteenth Century," *Economic History Review*, II Vol. 13 (December 1960), pp. 257-69; Brinley Thomas, *Migration and Economic Growth* (Cambridge, England, 1954); and Dennis J. Coppock, "The Causes of Business Fluctuations," *Transactions of the Manchester Statistical Society*, 1959-60 (December), pp. 1-42.

⁴⁶ Williamson, *op.cit.*, pp. 146, 211-2.

⁴⁷ Hrothgar J. Habbakuk, "Fluctuations in House-Building in Britain and the United States in the Nineteenth Century," *Journal of Economic History*, Vol. 22 (June 1962), p. 214; and O'Leary and Lewis, *op.cit.*, p. 126.

of decisive importance in affecting the course of British building.⁴⁸ O'Leary and Lewis have in fact suggested that the inverse behavior of British and American building cycles might have been a sheer accident.⁴⁹ It is, in any case, clear that this is a dark corner requiring further exploration in the future.

Canada

When we turn to Canada, we find evidence of a long-swing pattern before 1914 that shows up clearly in many series in their unadjusted form. Net capital imports, for example, when the data are plotted on ratio scale, show clear peaks in 1874, 1891, and 1913 (terminal year), and troughs in 1880 and 1897. The dating of these turning points is very similar to those in the unadjusted series on net capital imports of the United States and of British net capital exports.

Broadly similar swings are found in related Canadian series. Some of these are brought together in Chart 3, which, for graphical convenience, plots the original data, expressed as percentages of log trend values, not only of capital imports, but also of urban building activity, net capital formation in transport and telegraphs, gross immigration,⁵⁰ and gross national product at constant prices. Each series has the same vertical scale except the last which, because of its smaller relative fluctuations, is given a scale five times larger than that of the others.

It will be observed that the five series trace out a similar long-swing pattern, with peaks in the early 1870's, mid-1880's, and at the end of the period, and with troughs generally falling in the late 1870's and late 1890's.⁵¹ There is a tendency for immigration to lead the other

⁴⁸ Habbakuk, *op.cit.*, p. 224.

⁴⁹ O'Leary and Lewis, *op.cit.*, pp. 127, 141-2.

⁵⁰ From 1870 to 1898 there was actually net emigration from Canada in almost every year, with immigrant arrivals (mainly from Britain) being more than offset by emigration (mainly to the United States).

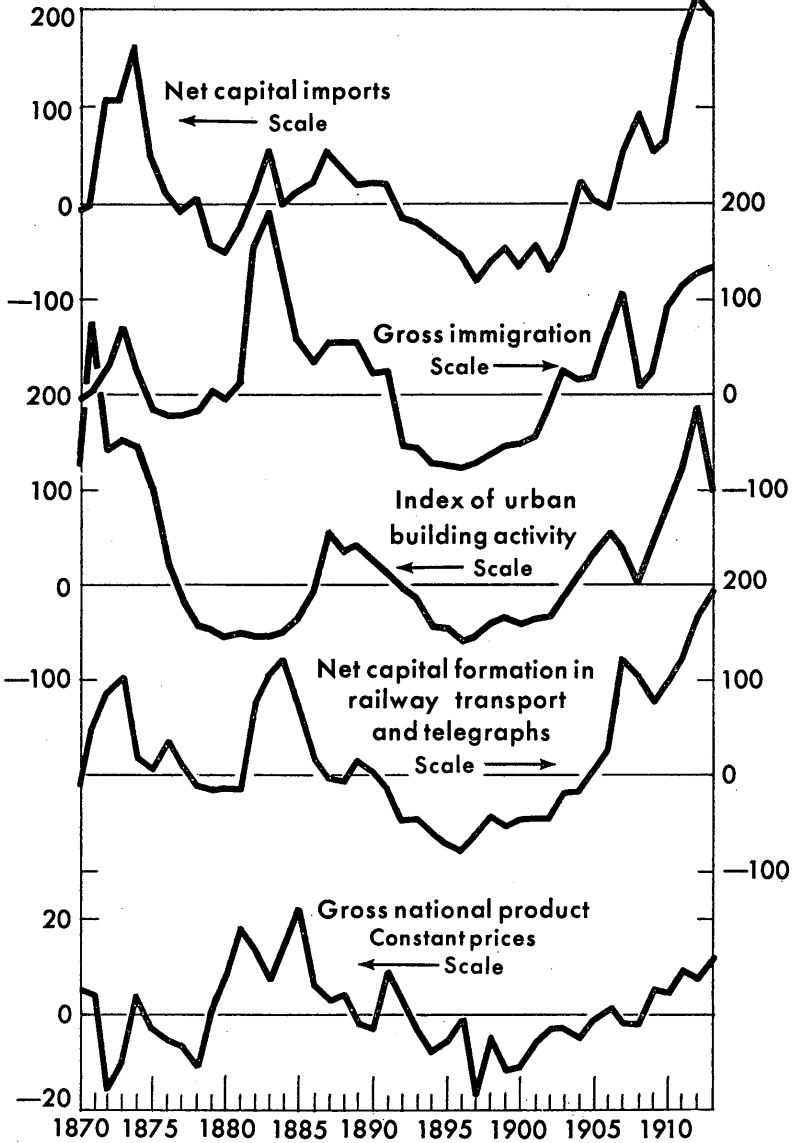
⁵¹ The sharpness of the decline in some of the series in the early years of the period and of the rise in the later years reflects in part our use of deviations from log trends, since the series in question have a higher rate of growth in the second half of the period than in the first. But this method of processing the series does not create the long swings which, except for gross national product, were already apparent in the original data, although in a few cases it does alter the turning points somewhat.

A broad similarity in the timing of the long swings in a variety of Canadian series is likewise evident when the series are processed by computing annual rates of change between "average reference cycle standings." See Kenneth A. H. Buckley, "Population, Labour Force, and Economic Growth, 1867 to 1962" (Banff, Alberta, September 1963). Under this method, the peaks and troughs tend to cluster around dates that differ somewhat from those in Chart 3. Buckley does not make use of the series on net capital imports.

CHART 3: CANADA

Per cent deviations
from trend

Per cent deviations
from trend



series at the turning points, and for capital imports to lag behind. In particular, the last surge in capital imports before 1914 did not really begin until 1904, well after the other series had already begun to turn up.

The timing of long swings in Canada was broadly similar to that in the United States, when both sets of series are processed in the same way.⁵² This similarity, which also applies to the business-cycle turning points, is not surprising in view of the strong influence of the United States on Canadian economic developments and policies and the fact that Canada could be regarded as another frontier of American settlement. By the same token, Canadian long swings tended to move inversely with the swings in British building and home investment. Canada definitely belongs in any hypothesis of the "Atlantic economy" in the years before 1914, although the proponents of that hypothesis usually neglect it. The pull of American long swings on British labor and capital was reinforced by that of Canada. On the other hand, the intensity and duration of Canadian long-swing upturns, especially after 1900, were more intimately dependent on inflows of British capital and emigrants than was the case in the United States.

While the causal relations among key variables in the long-swing mechanism cannot be easily established, it is tempting to argue that changes in exports played a causal role of major importance in the Canadian swings before 1914. Certainly there can be little doubt that a prime moving force in the dramatic upswing from the late 1890's to World War I was the sharp increase in Canadian exports, especially of wheat, as a result of rising world demand and prices and lowered transport costs. The improved position and prospects of Canadian exports in world markets, and the boost that they imparted to the prospects of the Canadian economy, helped—along with the closing of the American frontier—to draw immigrants and foreign capital on a large scale, and stimulated and supported investment in transport, construction, and public utilities and, through the income effect, in a wide range of other activities. Canada's ability to export was in turn greatly enlarged by the capacity effect of the increased investment.⁵³

⁵² Attention has also been called to this fact by D. J. Daly, "Long Cycles and Recent Canadian Experience," *Report of the Royal Commission on Banking and Finance* (Ottawa, 1964), appendix volume, pp. 283-301, where a few Canadian and American series (though not capital imports) are compared after processing by the Abramovitz method. Daly also notes certain differences in long-swing timing in the two countries in the first decade of the 20th century.

⁵³ On the causes and course of the upswing after 1896, see Kenneth A. H. Buckley, *Capital Formation in Canada, 1896-1930* (Toronto, 1955); William T. Easterbrook and Hugh G. J. Aitken, *Canadian Economic History* (Toronto, 1956),

The causal role of exports in the Canadian long-swing mechanism before the turn of the century is not, however, as clear-cut. Government transport and tariff policies appear to have been relatively more important as propulsive forces in long-swing upturns than they were in the decade before 1914.⁵⁴ And from 1870 to 1890 the proportion of exports in national output was not only smaller than in the later period but actually declined.⁵⁵ Nevertheless, it may be significant that even in these earlier years real exports tended to lead the other series in both long-swing upturns and downturns (when the data are processed by the Abramovitz method).

Australia and New Zealand

From 1861 to 1913 a long-swing pattern is suggested in a substantial number of Australian series in their raw form, when smoothed by (arbitrary) five-year moving averages, and/or when converted into deviations from log trends.⁵⁶ Net capital imports (when the data are smoothed) suggest troughs in 1873 and 1908 and a peak in 1887. Similar swings, though with certain marked differences in the timing of the turning points, also show up in three closely related series—residential building, railroad construction, and net immigration.⁵⁷ The broad similarity in the contours of the four series, as smoothed by five-year moving averages, is indicated in Chart 4. It will be observed that capital imports and immigration decline in the latter half of the 1860's and early 1870's, whereas the other two series rise gently. More marked are the differences in timing of the series at the last troughs of the period: in particular, net capital imports lag considerably behind the others, despite a short-lived revival in 1896.⁵⁸

pp. 400 ff.; Gerald M. Meier, "Economic Development and the Transfer Mechanism: Canada, 1895-1913," *Canadian Journal of Economics and Political Science*, Vol. 19 (February 1953), pp. 1-19; Penelope Hartland, "Factors in the Economic Growth of Canada," *Journal of Economic History*, Vol. XV (1955), pp. 13-22; and Richard E. Caves and Richard H. Holton, *The Canadian Economy: Prospect and Retrospect* (Cambridge, Mass., 1959), pp. 94 ff.

⁵⁴ Cf. Buckley, *Capital Formation*, *op.cit.*, pp. 48-50.

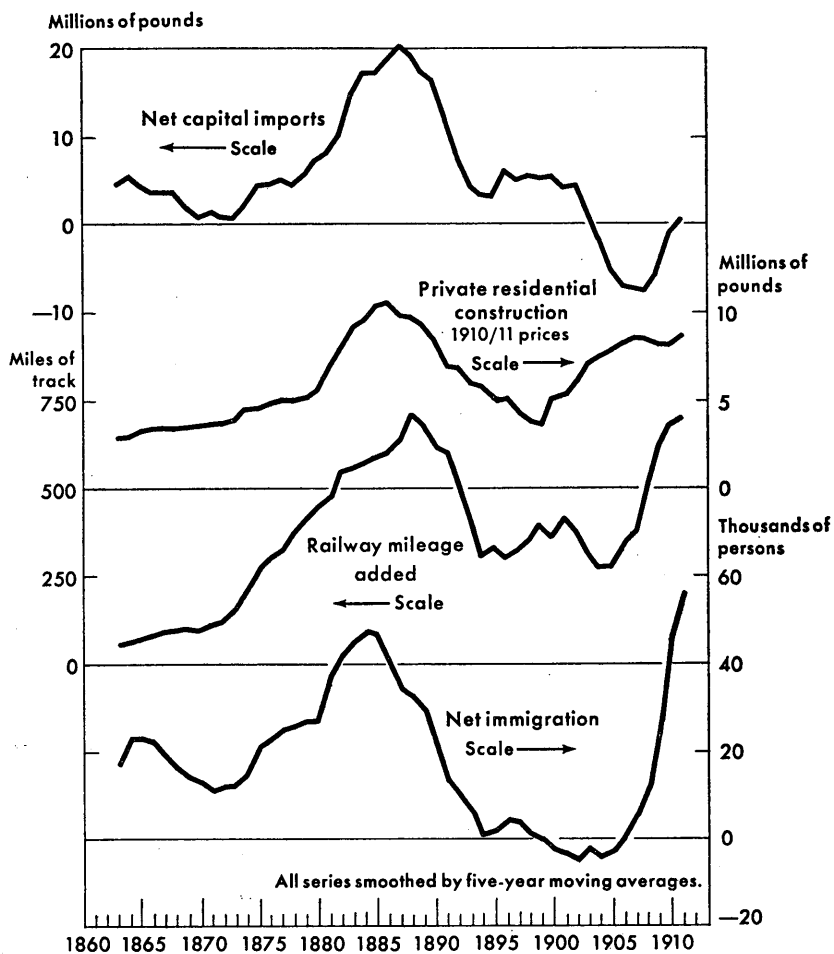
⁵⁵ O. J. Firestone, *Canada's Economic Development, 1867-1953* (London, 1958), pp. 146-7.

⁵⁶ The Abramovitz method was not used because of the absence of a reliable business-cycle chronology for the period in question.

⁵⁷ An essentially similar pattern shows up in the series on gross domestic product in constant and in current prices when the data are adjusted for trend, and in the unadjusted data on additions to total Australian population. The data on gross domestic product and residential construction used for the years 1901-13 are actually for the twelve months ending June 30 of each of those years.

⁵⁸ For a discussion of the reasons for the prolonged downturn in Australian capital imports after 1890, see A. Ross Hall, *The London Capital Market and Australia, 1870-1914* (Canberra, 1963), pp. 136-7, 171-82.

CHART 4: AUSTRALIA



The Australian long-swing pattern differed in some notable respects from that of the United States and Canada, on the one hand, and Great Britain, on the other. Take, for example, the series on capital movements and migration. During the latter half of the 1860's and early 1870's, when capital imports and immigration into Australia declined, the net flow of capital and labor to the United States rose, as did capital exports and emigration from Britain. The opposite pattern occurred during the 1870's: the Australian series rose, whereas

during most of that decade there was a downturn in the corresponding series of the United States, Britain, and Canada.⁵⁹ From the late 1870's to late 1890's, the contours of the series in question in all four countries were broadly similar. But the long-swing upturns in Australian capital imports and immigration that began in the first decade of the 20th century took place some five to ten years later than those of the corresponding series of the other countries. As for building cycles, the turning points in all four countries clustered together after 1880 (with the British cycle moving, of course, inversely), but in the 1870's Australia did not experience the reversal of long-swing phase that occurred in building in the United States and Canada (downwards) and in Great Britain (upwards). Over the period as a whole, the expansion and contraction phases of long swings tended on the average to be longer in Australia, and thus the number of swing movements fewer, than in the other countries.⁶⁰

Australian experience does not seem, therefore, to fit closely into the "Atlantic economy" hypothesis. The Australian economy, despite its heavy dependence on British capital exports and emigrants—although for most of the period 1861-1913 drawing only comparatively small fractions of their aggregates—appears to have followed a relatively independent orbit. The high and sustained rate of growth of the economy up to about 1890, moreover, was not closely tied to the behavior of exports;⁶¹ rather it reflected in large part strong autonomous pressures to provide basic social and productive capital equipment, the need for a communications network to link the vast continent together, and the urge to settle in urban areas.⁶²

⁵⁹ The series in all four countries are processed in the same way.

⁶⁰ In discussing Australian experience in 1860-90, one authority has noted: "Australian borrowing from Great Britain and Australian domestic capital formation follow each other closely in sustained expansion, bearing little resemblance to the movements in British home or foreign investment . . . [and] the flow of migrants into Australia bore little resemblance to the outflow from Great Britain . . . Australian experience until 1890 in relation to Great Britain seems to have been very different from that of other countries, some of which had similar connections with it." Noel G. Butlin, "Colonial Socialism in Australia, 1860-1900," in *The State and Economic Growth*, ed. by Hugh G. J. Aitken (New York, 1959), pp. 32, 34.

⁶¹ Indeed, real exports, when adjusted for trend, appear to have undergone a long-swing contraction from the early 1870's to the mid-1880's, when the other Australian series were in the expansion phase; and the peak in real exports in the mid-1890's came well after the other series had begun to turn down.

⁶² Noel G. Butlin, *Investment in Australian Economic Development, 1861-1900* (Cambridge, England, 1964), pp. 3, 15, and *passim*. Butlin does not use a long-swing approach in his analysis.

During the period 1871-1900 for which the relevant data are available, a number of New Zealand series, including capital imports, railway investment, residential building, and net immigration, show, when smoothed by five-year moving averages, what appears to be one long swing. Troughs fall at the beginning of the period and around 1890, and a peak occurs in the mid-1870's for most of the series but in the early 1880's for capital imports. It is of interest to note that during part of the period some of these series tended to move inversely with the corresponding Australian ones.⁶³

Sweden, Norway, and Italy

Net capital imports into Sweden before 1914 likewise exhibited a long-swing pattern, at least after 1870. In their raw form, the data trace out two long swings, with troughs in 1871, 1896, and 1912, and with peaks in 1885 and 1904 (see Chart 2). These dates were not significantly altered when the series was smoothed by moving averages.

There is evidence of long swings in a number of other Swedish series, including building and construction, gross domestic product, gross domestic investment in fixed capital, and merchandise exports—all in real terms—and in additions to railway track, additions to aggregate population, and migration.⁶⁴ Until the turn of the century, the turning points of these various series tended to cluster together, with most of the troughs falling in 1868-70 and 1891-93 and the peaks in 1874-77 and 1896-97.⁶⁵ But there was a wider dispersion of the turning points thereafter, with some troughs occurring in 1903-04 and others in 1908-09. The long-swing turning points in emigration—which was

⁶³ J. A. Dowie, "Inverse Relations of the Australian and New Zealand Economies, 1871-1900," *Australian Economic Papers*, Vol. 2 (December 1963), pp. 151-79; and "The Course and Character of Capital Formation in New Zealand, 1871-1900," *New Zealand Economic Papers*, Vol. 1 (Spring 1966), pp. 38-58.

⁶⁴ These long swings showed up in a few cases in the unadjusted data, but more often when the series were adjusted for trend. The Abramovitz method was also applied to a number of the series, on the basis of the business-cycle chronology of Jörberg, *Growth and Fluctuations*, *op.cit.*, pp. 218-9, but the results in this case were less conclusive in revealing long swings.

⁶⁵ The turning points derived here are broadly in agreement with those obtained, on the basis of a different method of processing the data, by Maurice Wilkinson, "Evidences of Long Swings in the Growth of Swedish Population and Related Economic Variables," *Journal of Economic History*, Vol. XXVII (March 1967), pp. 17-38. Wilkinson's authoritative article is mainly concerned with demographic variables. He does not make use of the series on capital imports.

much larger than immigration—tended to be inverse to those in other series over the period.⁶⁶

It is clear that the long-swing turning points in the net movement of capital to Sweden lagged behind those of the other series examined, at times markedly. Most pronounced was the lag in capital imports at the peak in 1885. This came almost a decade later than the peaks reached in 1874-77 by nearly all the other series, including railroad construction—which those imports went largely to finance. While Sweden's rate of growth in the 50 years before World War I was substantially dependent on the inflow of foreign capital,⁶⁷ it would appear that the *swings* in the growth rate were not intimately related to swings in capital imports, that the latter reinforced rather than initiated long swings in the Swedish economy, and that they tended to respond only after those swings, whether upward or downward, were already well under way. Of the various countries examined here, Sweden seems to provide the most marked confirmation of Cairncross' assertion that before 1914 foreign investment lagged behind growth rather than ran in front of it.⁶⁸

Little can be said here about long swings in Norway because of the limited number of series available. The net inflow of capital, after the series is adjusted for trend, shows two long swings, with peaks in 1875 and 1899, and troughs in 1886 and at the end of the period. Swings with almost identical turning points are evident in gross domestic product and gross capital formation, when similarly adjusted, except that these series had a trough around 1905, whereas the long-swing contraction in capital imports that began in 1900 seems to have continued to the end of the period. Gross emigration from Norway also shows long swings, which tended to move inversely with those in the other series.

As for Italy, the unadjusted series on net capital movements suggests long swing peaks in 1864, 1887, and 1909, and troughs in 1871

⁶⁶ Although emigration, and thus the growth of population in Sweden, were substantially influenced by the pull of long swings in the United States, there was little evidence of a systematic inversity in the behavior of the two economies, according to a study by John A. Tomaske, "International Migration and Economic Growth: The Swedish Experience," *Journal of Economic History*, Vol. XXV (December 1965), pp. 696-9.

⁶⁷ See, for example, Eli F. Heckscher, *An Economic History of Sweden* (Cambridge, Mass., 1954), pp. 247-8; and Rondo Cameron, *France and the Economic Development of Europe, 1800-1914* (Princeton, 1961), pp. 489-90.

⁶⁸ Alec K. Cairncross, *Factors in Economic Development* (London, 1962), p. 42.

and 1905 (see Chart 2). It is difficult to find any evidence before 1880 of long swings in other Italian variables examined, but the series on railway track added, industrial production, and especially output of engineering industries show Kuznets peaks around 1887 and in 1908-11, with a trough in the middle or late 1890's.⁶⁹ It may be significant that these two peaks coincided with peaks in net capital movements.⁷⁰ Over the period 1861-1913 as a whole, however, swings in the Italian growth rate showed relatively little relation to the net flow of capital. The latter, it might be noted, was heavily influenced by political factors, both domestic and foreign, and by the fluctuating fortunes of the Italian lira, which was a floating currency in 1866-80 and in 1892-1900.⁷¹

France, Germany, and Argentina

With regard to France and Germany, both net capital-exporting countries, the picture is not conclusive for the relatively short periods covered. In the case of France, O'Leary and Lewis found evidence of long swings in a number of series when adjusted for trend, with peaks in the early 1880's, in 1900, and in some instances at the end of the period, but with the long swings in merchandise exports out of phase with the others.⁷² They contend, but without supporting evidence, that the long swing in domestic investment alternated to some extent with the swing in foreign investment, as in the case of Great Britain. The opposite conclusion appears to have been reached—though not on the basis of long-swing analysis—by Cameron⁷³ and Kindleberger,⁷⁴ who argue that high rates of French capital exports tended to coincide with high rates of domestic economic growth. In any case, the series on

⁶⁹ These series were constructed by Stefano Fenoaltea and appear in his unpublished doctoral dissertation, "Public Policy and Italian Industrial Development, 1861-1913" (Harvard University, 1968). See also Alexander Gerschenkron, "Notes on the Rate of Industrial Growth in Italy, 1881-1913," *Journal of Economic History*, Vol. XV (December 1955), pp. 360-75.

⁷⁰ Italian emigration shows clear long-swing movements that tended to have a positive relation to the swings in the domestic variables but to be even more closely related to and influenced by the Kuznets cycle in the United States.

⁷¹ The economic literature on foreign investment in Italy before 1914 appears to be relatively sparse. But see Francesco S. Nitti, *Il Capitale Straniero in Italia* (Bari, 1915).

⁷² O'Leary and Lewis, *op.cit.*, pp. 132-5. No annual aggregative series for France are available for the period before 1914.

⁷³ Cameron, *op.cit.*, pp. 504-5.

⁷⁴ Charles P. Kindleberger, *Economic Growth in France and Britain* (Cambridge, Mass., 1964), pp. 58-9.

French capital exports gives no clear evidence of a long-swing pattern, even when the data are processed in a number of ways.

The various German series examined here show long-swing movements in the period 1881-1913. But the swings are not always clear-cut and do not seem to have moved closely together or, when they did, to have had any consistent lead-lag relationships. German net capital exports, when the raw data or the deviations from trend are smoothed by five-year moving averages, suggest long-swing peaks in 1886-87, 1902, and 1913 (terminal year), and troughs in 1892-93 and 1907.⁷⁵ A German building cycle stands out clearly, but with some of its turning points appearing to be inverted to those of capital movements. Total real domestic investment shows ill-defined swings that are roughly similar in timing to those in building, but with no fixed pattern of lead-lag relationships with the latter. The turning points of the swings in manufacturing output (less building and mining) and in real imports show a broad similarity, but are not closely synchronized with the turning points in building and domestic investment. Real exports of manufactured goods seem to follow, at least for part of the period, a relatively independent long-swing pattern. It is difficult to draw any firm conclusions from this evidence as to the causal relations in the German long-swing mechanism during the short period covered. But little support is given to the O'Leary-Lewis contention that "the periods of heaviest [German] capital export coincided with the periods of heaviest home investment, if the building cycle is a good guide,"⁷⁶ or to Matthews' statement that "the timing of the [German] domestic building cycle was transmitted for the most part to that of fluctuations in general activity."⁷⁷

The statistical data for Argentina available to me are inadequate to establish clear evidence of a long-swing pattern for that country. It may be significant, however, that the broken series on foreign borrowings from 1881 to 1900, when supplemented for the period 1901-13 by annual data on Argentine capital issues in London,⁷⁸ show sharp peaks in 1888 and 1910. These peaks are separated for most of the intervening years by relatively flat country which makes difficult the

⁷⁵ There was a tendency for the long swings in German intercontinental emigration to move inversely with those in net capital exports. The former appear to have been positively related to the long swings in economic activity in the United States.

⁷⁶ *Op.cit.*, p. 142. They give no data or sources for German capital exports.

⁷⁷ Matthews, *op.cit.*, p. 224.

⁷⁸ Alec G. Ford, *The Gold Standard, 1880-1914: Great Britain and Argentina* (Oxford, 1962), p. 195.

identification of an intermediate "long-swing trough." The series on additions to railway track and especially on net immigration have configurations that are similar to that of the series on capital imports.

Conclusions on Long Swings

Some of the conclusions of the foregoing discussion of the relationship of the long swings in foreign investment and certain other variables may be briefly summarized. The swings in net capital imports and in the domestic series examined were positively related in the United States, Canada, Australia, New Zealand, Sweden, and Norway, with capital imports tending in most of these cases to lag markedly behind the other variables. In the first four countries, these series were also related positively to gross (or net) immigration, and in the cases of Sweden and Norway they showed a tendency to move inversely with gross (or net) emigration.⁷⁹ In Canada and Sweden, merchandise exports in real terms showed long swings that tended to lead those in the other variables examined; in Australia they tended to follow a relatively independent path; and in the United States such swings were not apparent at all after the Civil War. The evidence regarding long-swing patterns in Italy and Argentina is not conclusive. As for the creditor countries, the long swings in net capital exports moved inversely with the swings in domestic investment in the British case and tended to do so in the German. Kuznets cycles in capital exports were not evident in the case of France. Net capital exports and net emigration were positively related in their long swings in the case of Britain, but tended to move inversely for Germany. General long-swing movements in the United States and Canada were similar in their turning points and inversely related with the swings in British building and domestic investment generally (Britain showed no Kuznets cycles in output and income), but Australian experience for most of the period cannot readily be fitted into this pattern.

⁷⁹ Easterlin, following Kuznets and Abramovitz, presents good reasons for the position that the long swings in European overseas emigration before 1914 were determined mainly by general long-swing movements in the United States. See Richard A. Easterlin, "Influences in European Overseas Emigration Before World War I," *Economic Development and Cultural Change*, Vol. 9 (April 1961), pp. 331-51. This position has been challenged by Maurice Wilkinson in an unpublished paper ("The Economic Determinants of European Overseas Migration, 1870-1914"), where it is argued that net emigration, at least from northeast Europe, was also heavily influenced by economic conditions in the home countries.

III. DETERMINANTS OF INTERNATIONAL INVESTMENT

Net movements of long-term capital to and from individual countries in the period before 1914 were the result of a wide and complex variety of causes that cannot easily be summarized. The relative importance of these causes differed from country to country and over time depending upon the relative distribution of the totals in each case as among the different components of the capital flows and upon other circumstances peculiar to the countries concerned. Broadly speaking, however, a determinant of key importance was unquestionably changes in relative interest rates and marginal efficiencies of investment in the capital-exporting and -importing countries—after allowance for changing risk premiums—which affected both the willingness to invest abroad and the desire or ability to borrow abroad.⁸⁰ But these changes were themselves the result of the interplay of numerous influences, and they were by no means the only determinants of long-term capital flows. As one writer put it, in his discussion of British foreign investment before 1914: "There were a thousand and one special influences determining the attractiveness of investment at home and abroad: the guarantees and land grants offered to railway builders, the chance projects brought to the notice of financiers, the military ambitions of foreign governments . . . the state of business sentiment, harvest

⁸⁰ Capital movements, while responding to interest-rate differentials, in turn tended to eliminate these differentials, with due allowance for the risk factor. The definite orientation of the Paris and London new-issues markets towards foreign lending, moreover, tended further to keep the average rates of return on foreign fixed-interest securities to French and British investors not much in excess of, and at times apparently even somewhat below, the rates on comparable domestic securities. For some relevant statistical data for selected years, see Harry D. White, *The French International Accounts, 1880-1913* (Cambridge, Mass., 1933), pp. 107-8, 271 ff.; and Robert A. Lehfeldt, "The Rate of Interest on British and Foreign Investments," *Journal of the Royal Statistical Society*, Vol. 76 (January 1913), p. 201; (March 1913), p. 415; and Vol. 77 (March 1914), p. 432. See also Sir Arthur Salter, *Foreign Investment*, Princeton University, Essays in International Finance No. 12 (February 1951), p. 5; Alec K. Cairncross, *Home and Foreign Investment, 1870-1913* (Cambridge, England, 1953), pp. 223-7; and Arthur J. Brown, "Britain in the World Economy, 1870-1914," *Yorkshire Bulletin*, Vol. 17 (May 1965), p. 56. One writer has pointed out that before 1914 the Canadian Government could in some cases have borrowed at home just as cheaply as in London, but (presumably because of institutional preferences) did not. See Ian M. Drummond, "Government Securities on Colonial New Issues Markets, 1895-1914," *Yale Economic Essays*, Vol. 1 (Spring 1961), p. 147.

yields, population movements, and the like."⁸¹ This list could easily be extended.

In an attempt to account statistically for the observed movements of capital, resort was had to regression analysis. The models that underlie the regressions that follow are extremely simple ones,⁸² and the number of explanatory variables used is very limited. To go further would be beyond the scope of this paper. The regressions are also confined to only a few of the countries on our list, specifically, Great Britain, the United States, Australia, and Canada. This choice was dictated in part by the availability of the necessary domestic series, and in part by the facts that a large fraction of the net capital outflow from Britain went to the other three countries concerned and that each of these countries in turn drew well over half of their net capital imports from Britain. As for the other countries on our list, the relevant domestic series were lacking (or too short in duration) and/or the net inflows or outflows of capital were geographically less concentrated.

Capital Movements and Domestic Investment

The first set of regressions attempts nothing more than to relate net capital movements to domestic investment in the four countries and does not offer fundamental "explanations" of the flow of capital. In the case of Great Britain, an important source of the overseas "demand pull" on British savings was provided by combined railway investment in the other three countries, while the "supply push" to British savings into overseas investment depended in part on the competing pull of domestic investment. One would expect British net capital exports to be positively related to the former and inversely related to the latter. Likewise, one might expect net capital imports into each of the three overseas countries to be positively related to railway investment at home⁸³ and inversely related both to British home investment and to the sum of railway investment in the other two countries with which they were competing for British funds. The tests by means of regression equations cover the period 1870-1913.

⁸¹ Cairncross, *op.cit.*, p. 187.

⁸² Compare, for example, the elaborate models of George H. Borts, "A Theory of Long-Run International Capital Movements," *Journal of Political Economy*, Vol. 72 (August 1964), pp. 341-59.

⁸³ Williamson has estimated that almost 70 per cent of the net flow of foreign capital into the United States in 1870-1915 was for railway investment. (Jeffrey G. Williamson, *American Growth and the Balance of Payments, 1820-1913* [Chapel Hill, N.C., 1964], p. 136.) I have no comparable figures for Canada and Australia, but the ratios were undoubtedly somewhat lower than in the case of the United States.

When British net capital exports (*GBC*) were regressed on British gross domestic fixed-capital formation (*GBCF*) and on the sum of net railway investment in the United States, Australia, and Canada (*UACR*),⁸⁴ with a time trend variable (*t*) added—and after transforming the variables to correct for serial correlation in the original equation⁸⁵—the following result, in keeping with expectations, was obtained:⁸⁶

$$GBC = - 0.1665 - 0.3527GBCF + 0.4629UACR + 0.4303t \quad \bar{R}^2 = 0.8951 \\ (1.5998) \quad (2.8575) \quad (1.9628) \quad D.W. = 1.5423$$

In the case of the equations for net capital imports of the United States (*USC*), the best result was obtained when the only explanatory variables were British gross domestic fixed-capital formation and net railway investment in the United States (*USR*):

$$USC = 29.4747 - 5.5123GBCF + 0.2339USR \quad \bar{R}^2 = 0.5281 \\ (6.3067) \quad (2.0939) \quad D.W. = 1.37$$

For Australia, the following significant result was reached when Australian net capital imports (*AUC*) were regressed against British gross domestic fixed-capital formation, Australian net railway investment (*AUR*), and the sum of net railway investment in the United States and Canada (*UCR*):

$$AUC = 1.5911 - 1.0363GBCF + 2.2948AUR - 0.1845UCR \quad \bar{R}^2 = 0.6869 \\ (5.0163) \quad (7.2439) \quad (7.3594) \quad D.W. = 1.5046$$

Similar results did not obtain in the case of Canada. A simple univariate regression between Canadian net capital imports and Canadian net railway investment gave a very high coefficient of determination. Adding in British gross domestic fixed-capital formation and the sum of net railway investment in the United States and Australia as explanatory variables scarcely altered the coefficient of determination but yielded coefficients for these two variables with *t*-ratios well below two. It would thus appear that these variables had no explanatory power. Tests were made for shorter periods and also with Canadian railway

⁸⁴ All in current prices. The Canadian data also include net investment in telegraphs. The Australian railway data for each of the years 1901-13 are simple averages of the annual data ending June 30 of that and the following year.

⁸⁵ The method of transformation was the standard Cochrane-Orcutt first-order autoregressive transformation [i.e., $x_t - \rho x_{t-1} = \Sigma \alpha_i (y_t - \rho y_{t-1})$, where ρ is the autocorrelation coefficient of the untransformed residuals].

⁸⁶ The figures in parentheses below the coefficients in this equation and in those to follow refer to the *t*-ratios. *D.W.* stands for the Durbin-Watson statistic. \bar{R}^2 is the coefficient of determination as corrected by the number of observations.

investment leading the other variables, including net capital imports, by one year. We also experimented with the substitution of total British savings (gross domestic fixed-capital formation plus net capital exports) minus net capital imports into Canada as an explanatory variable in place of British capital formation and the sum of railway investment in the United States and Australia. But there was no improvement in the results as compared with using Canadian railway investment alone.

It might be noted that when a corresponding substitution was made in the equations for the United States and Australia, and transformations of the variables made to correct for serial correlation, better results were obtained for these two countries than in the previous equations. The most significant results were as follows (with *TS-US* and *TS-A* standing for total British savings minus net capital imports into the United States and Australia, respectively):

$$\begin{array}{rcll}
 USC = 28.0561 - 0.5829TS-US + 0.4278USR + 0.9842t & & \bar{R}^2 = 0.7871 & \\
 \quad (7.9206) & (3.0026) & (2.3524) & D.W. = 1.6018 \\
 \\
 AUC = 1.7007 - 0.1138TS-A + 2.4208AUR & & \bar{R}^2 = 0.7372 & \\
 \quad (6.4022) & (5.8090) & & D.W. = 2.0035
 \end{array}$$

International Investment and Relative Rates of Return

In search of more basic "explanations" of the flow of capital, it would be necessary to incorporate into the equations variables that would capture the impact of expected rates of return on investment in Great Britain and in the three capital-importing countries. In view of the importance of international transactions in bonds in capital flows before 1914, an appropriate variable with which to start would be bond yields. For Australia and Canada, however, there are no continuous annual series of representative bond yields during the period in question,⁸⁷ least of all of yields on bonds floated by these countries in London. Nor is there available a series of "world bond yields" with which to compare British yields in an attempted accounting for the aggregate net outflow of British capital. The tests, therefore, had to be confined to capital movements between the United States and Britain. There are annual series on railway-bond yields for the United States; and

⁸⁷ An incomplete series for Australia, based on the prices in the Sydney market of certain State and Commonwealth Government bonds from 1875 on, but with data for the years 1887-94 missing, is to be found in Donald McL. Lamberton, "Some Statistics of Security Prices and Yields in the Sydney Market, 1875-1955," *Economic Record*, Vol. 34 (August 1958), p. 259. Average annual yields on a variety of classes of Canadian securities, but for 1900-13 only, are to be found in Jacob Viner, *Canada's Balance of International Indebtedness, 1900-1913* (Cambridge, Mass., 1924), p. 98.

the yield on British Consols, in the absence of anything better for the period as a whole, was taken as representative of yields on British fixed-interest-bearing securities generally.

A set of regressions was run, for the period 1872-1913, with net capital imports into the United States regressed against American railway-bond yields, yields on British Consols (and, alternatively for these two variables, the excess of the former over the latter), British gross domestic fixed-capital formation (and, alternatively, the excess of total British savings over net capital imports into the United States), and net railway investment in the United States. Distributed lags were applied to the two bond-yield series on the reasonable assumption that capital movements would be influenced not only by current bond yields (or their differentials), but also by their expected movement in the future, which in turn would be related to their actual movement in the recent past.⁸⁸

The results were not significant when American and British bond yields, or their differentials, were used as explanatory variables. In part, this may have reflected the fact that the yield on Consols was not representative of yields on British fixed-interest-bearing securities generally. But a good fit was obtained when American bond yields alone were used with the other above-mentioned explanatory variables, and when the variables were transformed to correct for serial correlation. The best equation was as follows, with *WUSBY* standing for weighted railway-bond yields in the United States:

$$\begin{aligned}
 USC = & -23.0489 - 0.6497TS - US + 0.3467USR + 11.0985WUSBY + 1.8373t \\
 & \quad (9.9604) \quad (2.7834) \quad (2.0811) \quad (4.6166) \\
 \bar{R}^2 = & 0.8444; D.W. = 1.7584
 \end{aligned}$$

We also experimented with regressions for all four countries that incorporated as explanatory variables differences in rates of growth of real national product or income, as proxies for differences in expected rates of return on investment.⁸⁹ In the British regressions, for example, the excess of the growth rate of the combined real products of the United States, Canada, and Australia over the growth rate of real net national income in Great Britain was taken as an explanatory variable. In the equations for the United States, we used the difference between the growth rates in that country and in Britain, as well as

⁸⁸ The system of weights used, following a suggestion of Michael K. Evans, was as follows (where x = yield): $x_t - 1/4(0.7x_{t-1} + 0.5x_{t-2} + 0.3x_{t-3} + 0.1x_{t-4})$.

⁸⁹ The real national products of the three capital-importing countries were first converted to a common base date and currency so that any two or three of them could be added in order to compute combined annual growth rates.

the difference between the growth rate for the United States and that of the combined real product of Canada and Australia. Symmetrical procedures were followed in the Canadian and Australian regressions. A variety of distributed lags was applied to the differences in growth rates on the assumption that the full response of capital movements to differences in expected rates of return would be realized only after a period of time. In another set of regressions with which we experimented, all the variables, including the dependent one, were symmetrically put in ratio form. For example, the ratio of American net capital imports to total British net capital exports (broadly, the share of the latter going to the United States), was regressed against the ratio of American to British growth rates and the ratio of the American growth rate to the growth rate in the combined real product of Canada and Australia, taken with distributed lags and with a time trend variable added. The regressions in all these cases were for the period 1870-1913.⁹⁰

With few exceptions,⁹¹ the results of these various tests proved negative, the growth-rate coefficients being not significant or of the wrong sign. These unsatisfactory results no doubt reflect in part the simple character of the underlying models, which do not take account of the many other influences acting upon capital flows. Besides, a very substantial part of British capital exports did not go to the United States, Canada, and Australia, while these countries in turn drew a not insignificant part of their capital imports from countries other than Britain. The various statistical series, moreover, especially for the earlier years of the period, are subject to a margin of error that could have appreciably affected the results. It should be noted, finally, that the regressions in each case cover the whole period 1870-1913; different results might have been obtained had the tests been made for shorter, selected periods.

⁹⁰ An interregional study for the United States found that in the year 1953 capital moved from regions that had been experiencing low growth rates to regions or states that had been experiencing high growth rates. See J. Thomas Romans, *Capital Exports and Growth Among U. S. Regions* (Middletown, Conn., 1965).

⁹¹ For example, the net inflow of capital into the United States was satisfactorily "explained" by the difference between the American and British growth rates alone (*US-B*), taken with a Koyck distributed lag (*USC-1*):

$$USC = - 1.2506 + 61.5309US-B + 0.7878USC-1 \quad \bar{R}^2 = 0.4810 \\ (2.2071) \quad (6.3777) \quad D.W. = 1.9414$$

IV. CONCLUDING OBSERVATIONS

This paper has focused mainly on the behavior of international investment—especially on its long swings and their relation to the swings in other variables—and on some of its determinants in the period before 1914. To that end, it has assembled and analyzed annual data on international capital movements stretching back into the 19th century for a large number of countries, along with a variety of related series. It would be superfluous to point out that this study has covered only a relatively small part of the range of problems associated with these movements that could have been investigated. Little or nothing has been said here, for example, about the mechanism of adjustment whereby the capital transfers were effected, the interrelations between capital flows and trade flows, or the internal effects of foreign investment upon the economies concerned. Despite a large and growing literature in recent decades, much more work has still to be done on these and related problems, as well as on extending the empirical record and refining the statistical data, if we are to get a more dependable picture of the role of foreign investment in the functioning and pattern of growth in the international economy before World War I. More insight is also needed as to the nature of the interactions of long swings among the various countries, to say nothing of the causes of the long-swing phenomenon itself.

APPENDIX 1

NET CAPITAL MOVEMENTS IN MILLIONS OF LOCAL CURRENCIES

Year	<i>Net Outflows; — = Net Inflows</i>			<i>Net Inflows; — = Net Outflows</i>			
	<i>Great Britain (pounds)</i>	<i>France (francs)</i>	<i>Germany (marks)</i>	<i>United States (dollars)</i>	<i>Canada I* (dollars)</i>	<i>Canada II** (dollars)</i>	<i>Australia (pounds)</i>
1860	23.7			— 7.3			
1	14.4			104.4			0.9
2	11.5			— 1.1			5.6
3	26.5			12.6			6.5
4	22.8			110.6			4.9
5	34.9			68.7			4.5
6	33.0			94.4			5.3
7	42.2			145.6			0.7
8	36.5			72.7			3.0
9	46.7			169.2			5.0
1870	44.1			99.4	14.2	9.7	4.4
1	71.3			100.9	16.2	24.0	— 4.6
2	98.0			242.8	35.2	33.3	— 4.2
3	81.3			182.9	36.9	37.9	5.6
4	70.9			82.2	49.3	44.2	2.7
5	51.3			86.9	28.4	32.2	3.5
6	23.2			1.8	23.2	23.7	2.6
7	13.1			— 57.3	20.0	22.1	7.1
8	16.9			—161.9	24.6	22.8	7.9
9	35.5			—160.2	13.8	12.3	5.5
1880	35.6	— 210		29.4	11.8	10.2	— 1.1
1	65.7	— 122	567	— 40.8	21.0	20.1	9.7
2	58.7	0	567	109.5	32.0	32.7	14.7
3	48.8	55	542	51.1	46.6	41.8	12.8
4	72.3	104	542	105.3	31.1	37.1	14.6
5	62.3	158	538	32.9	36.6	37.1	23.6
6	78.9	298	748	135.9	42.2	40.8	21.8
7	87.7	734	659	230.2	46.5	40.3	14.5
8	91.9	609	622	285.0	53.2	44.9	21.0
9	80.9	831	500	201.6	48.1	49.8	20.3
1890	98.5	943	542	192.6	51.8	50.5	21.1
1	69.4	186	361	134.5	54.4	46.2	11.8
2	59.1	489	239	40.8	39.8	41.5	7.5
3	53.0	563	437	145.4	40.8	38.6	— 2.3
4	38.7	367	122	— 66.0	35.6	34.8	— 0.5
5	40.0	1080	567	137.0	31.3	28.8	4.1
6	56.8	1159	601	39.8	27.9	21.4	6.5
7	41.6	846	403	— 23.1	10.5	10.0	7.0
8	22.9	580	185	—278.5	25.4	23.5	12.9
9	42.4	1125	294	—249.1	36.4	29.8	— 5.9
1900	37.9	869	563	—296.4	23.7	35.8	7.1
1	33.9	1090	567	—273.0	41.7	19.2	4.2
2	33.3	1368	832	— 82.0	24.4	26.4	8.7
3	44.8	1065	786	—154.0	48.5	69.2	6.6
4	51.7	1476	441	—127.0	108.1	90.2	— 4.7

5	81.5	1503	513	- 94.0	94.0	81.8	- 8.6
6	117.5	1748	332	22.0	92.7	109.4	- 9.8
7	154.1	1369	550	35.0	156.9	183.0	-11.9
8	154.7	843	609	-191.0	209.5	122.5	- 1.1
9	135.6	1972	538	143.0	173.4	147.7	- 6.0
1910	167.3	1960	937	229.0	197.2	234.4	- 9.9
1	196.9	785	937	40.0	332.7	337.9	- 0.9
2	197.1	1372	1029	36.0	410.9	418.7	12.3
3	224.3	1149	2243	-142.0	412.7	400.4	7.1

* Excluding net short-term capital flows.

** Including net short-term capital flows.

Net Inflows; - = Net Outflows

Year	Sweden I* (kroner)	Sweden II** (kroner)	Italy (lire)	Norway (kroner)	New Zealand (pounds)	S. Africa (pounds)	Argentina (gold pesos)	India (rupees)
1861	33	28	324					
2	16	15	243					
3	7	7	255					
4	5	6	410					
5	1	2	391					
6	11	13	258					
7	13	14	151					
8	33	29	116					
9	22	22	115					
1870	8	- 5	95					
1	3	- 2	-153	-13	-0.8			
2	4	3	- 45	-14	0.3			
3	35	32	60	-10	1.2			
4	46	50	184	6	3.3			
5	37	35	17	21	2.6			
6	50	39	- 46	4	2.4			
7	51	63	68	22	1.8			
8	42	32	-117	- 1	3.9			
9	60	25	6	5	3.7			
1880	42	25	- 77	- 3	0.9			
1	37	56	- 24	- 4	3.7		14.1	
2	47	40	46	-18	4.2		25.3	
3	52	63	9	- 4	3.2		47.4	
4	78	78	77	- 4	2.9		39.7	
5	89	88	289	- 4	3.0		38.7	
6	85	72	298	- 7	3.3	- 1.9	67.6	
7	66	54	430	- 7	2.6	0.8	153.5	
8	56	44	124	-19	1.4	1.6	247.8	
9	43	66	190	-12	0.2	7.1	153.6	

Net inflows; - = Net Outflows

Year	Sweden I* (kroner)	Sweden II** (kroner)	Italy (lire)	Norway (kroner)	New Zealand (pounds)	S. Africa (pounds)	Argentina (gold pesos)	India (rupees)
1890	57	69	194	7	-0.3	6.1	45.4	
1	39	42	- 35	30	-0.4	2.9	8.2	
2	46	35	- 68	18	0.1	3.3	n.a.	
3	11	- 7	- 90	15	0.6	4.3	n.a.	
4	27	15	-126	23	0.3	4.4	n.a.	
5	4	- 1	-182	35	0.6	10.4	17.2	
6	- 19	- 23	-219	39	0.7	14.7	37.1	
7	- 2	4	-306	40	1.0	10.5	38.3	
8	38	62	-276	64	0.7	6.5	46.1	40.9
9	124	95	-439	86	0.2	8.2	25.0	122.5
1900	90	85	-202	66	0.4	- 6.8	27.5	130.8
1	70	76	-397	71		- 1.8		133.7
2	58	87	-442	63		17.9		57.7
3	69	64	-264	52		34.3		17.9
4	127	123	-407	48		16.6		119.0
5	68	87	-580	48		14.3		249.7
6	76	90	-416	44		3.4		102.9
7	70	94	33	60		- 3.5		266.8
8	109	78	110	73		- 2.9		142.8
9	84	102	181	57		- 2.8		246.5
1910	75	22	- 48	34		4.2		72.8
1	80	- 25	- 35	65		0.5		56.5
2	- 58	- 13	91	52		- 4.0		53.5
3	15	- 27	-154	7		- 3.6		183.1

* Excluding net short-term capital flows.

** Including net short-term capital flows.

n.a. = not available.

Sources and Methods

Great Britain. Albert H. Imlah, *Economic Elements in the Pax Britannica* (Cambridge, Mass., 1958), pp. 72-5. The estimates, made by the indirect method, include net movements of long- and short-term capital (and errors and omissions).

France. Harry D. White, *The French International Accounts, 1880-1913* (Cambridge, Mass., 1933), p. 120, column 29. The series is constructed by the indirect method. White also makes direct estimates of the net export of long-term capital (p. 122, column 11), which is based on direct estimates of net exports of French long-term capital (p. 122, column 7), and net imports of foreign long-term capital into France (p. 121, column 3).

Germany. These estimates were made some years ago by the late Folke Hilgerdt and appear in the unpublished study "Balance of Payments of the United Kingdom, Germany, France, and the United States, 1881-1913," Research Memorandum No. 19 (United Nations, Department of Economic Affairs, March 1951). Hilgerdt cautioned as to the doubtful nature of his estimates for any *individual* year and expressed preference for grouping his estimates into five-year averages. The indirect method was used. Another annual series, which covers only the flotation of foreign securities in Germany and yields much lower figures than Hilgerdt's, is to

be found in Walther G. Hoffmann, *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts* (Berlin, 1965), p. 262.

United States. The data are taken directly from Jeffrey G. Williamson, *American Growth and the Balance of Payments 1820-1913* (Chapel Hill, N.C., 1964), pp. 256-7, who in turn had tabulated the series on the basis of estimates by Douglass C. North (for 1860), by Matthew Simon (for 1861-1900), and by Raymond W. Goldsmith (for 1901-13). For the exact sources, see *ibid.*, p. 258. The series was constructed on the basis of the indirect method.

Canada. The two Canadian series are based directly on estimates made by Penelope Hartland Thunberg in her unpublished study, "The Canadian Balance of Payments Since 1868" (National Bureau of Economic Research, 1954), including some minor revisions that she made of the estimates for 1900-13 of Viner, *Canada's Balance*. Mrs. Thunberg (and Viner) made estimates of all the items in the Canadian balance of payments, including Canadian investments abroad and net short-term capital movements through banking channels, leaving net foreign long-term capital movements into Canada (and errors and omissions) as residuals. I have simply regrouped the data to arrive at the series on total (foreign and domestic) net long-term capital movements alone—Canada I—and total net long- and short-term capital movements—Canada II. Thunberg and Viner also made direct estimates of foreign net long-term capital movements into Canada as a check on the results obtained by the indirect method. I am grateful to Mrs. Thunberg for permission to use her estimates, including her revisions of Viner's estimates for 1900-13. An abbreviated version of her study appears in published form in *Trends in the American Economy in the Nineteenth Century*, National Bureau of Economic Research, Studies in Income and Wealth, Vol. 24 (Princeton, 1960), pp. 717-55.

Australia. Noel G. Butlin, *Australian Domestic Product, Investment, and Foreign Borrowing, 1861-1938/39* (Cambridge, England, 1962), p. 444. The estimates, based in part on earlier estimates of Roland Wilson, were constructed by the indirect method. Butlin also presents data on net short-term capital movements for 1870-1900 (*ibid.*, p. 422) and makes direct estimates of British investments in Australia (excluding direct investments) for the same period (*ibid.*, p. 424).

Sweden. Series II (net movements of long- and short-term capital including errors and omissions) is taken directly from Lindahl, Dahlgren, and Kock (Erik Lindahl, Einar Dahlgren, and Karin Kock, *National Income of Sweden, 1861-1930*, Part I, Stockholm Economic Studies No. 5a [London, 1937]), pp. 268-9, column 3, with the signs reversed. Series I (excluding net movements of short-term capital) is derived from columns 3 and 4, with the appropriate changes in signs. (Column 4 gives the data on net short-term capital movements alone.)

Italy. Series represents net movements of long- and short-term capital (and errors and omissions). Based on estimates of net balance on current account and transfers [from "Indagine Statistica sullo Sviluppo del Reddito Nazionale dell'Italia dal 1861 al 1956," *Annali di Statistica*, Series VIII, Vol. 9, Istituto Centrale di Statistica (Rome, 1957), p. 255, column 5], adjusted for net movements of gold and silver [from *Sommario di Statistiche Storiche Italiane, 1861-1955*, Istituto Centrale di Statistica (Rome, 1958), p. 152].

Norway. Series represents net movements of long- and short-term capital (and errors and omissions). Based on estimates of net balance on current account and transfers for 1871-1900 provided by Dr. Juul Bjerke of the Norwegian Statistisk Sentralbyrå, and for 1900-13 as published in *Nasjonalregnskap, 1900-29*, Statistisk Sentralbyrå (Oslo, 1953), p. 126, column 5. I have in turn adjusted these estimates for the annual changes in the metal holdings of the Norges Bank which I have taken as a rough approximation to the net imports or exports of gold and

silver, in the absence of data for these movements. The figures for changes in metal holdings have been provided by the Norges Bank.

New Zealand. Direct estimates of "gross capital inflow" based on quinquennial estimates originally made by T. A. Coughlan, *Labour and Industry in Australia* (Oxford, 1918). Figures taken directly from J. A. Dowie, *Australian Economic Papers*, Vol. 2 (December 1963), p. 175. For Dowie's method of computation, see pp. 178-9.

South Africa. Estimates (indirect method) made by Acheson J. Duncan in his unpublished Ph.D. thesis "Studies in the Process of Trade Adjustment, with Special Reference to the International Trade of South Africa, 1886-1934" (Princeton, 1936), p. 90. I am grateful to Dr. Duncan for giving me permission to make use of his estimates.

Argentina. Direct estimates of gross foreign capital inflows made by John H. Williams, *Argentine International Trade under Inconvertible Paper Money, 1880-1900* (Cambridge, Mass., 1920), pp. 45, 101, 152.

India. Estimates (indirect method) made by Yeshwant S. Pandit, *India's Balance of Indebtedness, 1898-1913* (London, 1937), p. 103. Pandit also makes direct estimates of foreign capital inflows, *ibid.*, p. 127. The data for each year given above are actually for the year ending the following March 31.

APPENDIX 2

NET CAPITAL MOVEMENTS FOR SELECTED PERIODS

IN MILLIONS OF DOLLARS*

	1881-85	1886-90	1891-95	1896-1900	1901-05	1906-10	1911-13
<i>Creditor Countries</i> (net outflows)							
Great Britain	1,498.1	2,131.2	1,266.5	981.4	1,193.4	3,549.1	3,009.6
France	37.6	659.1	518.2	883.7	1,255.0	1,523.2	638.1
Germany	656.0	731.0	412.0	487.0	747.0	706.0	1,012.0
<i>Debtor Countries</i> (net inflows; — = net outflows)							
United States	258.8	1,045.3	391.7	-807.3	- 730.0	238.0	- 66.0
Canada	167.3	241.8	201.9	123.9	316.7	829.7	1,156.3
Australia	367.0	530.4	100.3	134.4	30.0	- 188.4	90.1
Sweden	81.2	82.3	34.1	61.9	105.0	111.0	9.9
New Zealand	82.7	35.1	5.8	14.7	n.a.	n.a.	n.a.
South Africa	n.a.	66.7	123.1	160.3	395.6	- 7.7	34.6
Argentina	160.6	650.2	n.a.	169.4	n.a.	n.a.	n.a.
India	n.a.	n.a.	n.a.	n.a.	187.9	270.3	95.3
Norway	-9.2	-10.2	32.4	79.2	75.6	71.9	33.2

n.a. = not available

* The underlying data are from Appendix I and are converted into U. S. dollars on the basis of exchange rates before 1914. The Canadian and Swedish data *exclude* short-term capital flows. For the exchange rates used, see Arthur I. Bloomfield, *Short-Term Capital Movements under the Pre-1914 Gold Standard*, Princeton Studies in International Finance No. 11 (Princeton, 1963), p. 95. (The Australian, South African, and New Zealand pounds had the same dollar value as the British pound; and five Argentine gold pesos were equal to one pound).

APPENDIX 3

RATIOS OF NET CAPITAL IMPORTS OR NET CAPITAL EXPORTS (—) TO GROSS DOMESTIC CAPITAL FORMATION*

Period	Italy	Norway	Australia	New Zealand	United States	Sweden**	Canada
1861-65	41.1		56.8			18.4	
1866-70	15.7		40.6			23.5	
1871-75	1.2	-1.7	5.1	32.5	9.4	17.1	
1876-80	- 3.3	4.6	19.6	50.4	-4.0	25.1	
1881-85	6.4	-6.3	49.3	66.1	2.4	48.2	
1886-90	18.8	-6.9	51.7	37.3	8.0	45.7	
1891-95	- 9.9	17.9	18.9	6.3	2.6	12.6	
1896-1900	-24.9	32.0	26.4	10.1	-4.6	17.9	
1901-05	-22.1	31.2	4.2		-2.9	29.2	23.5
1906-10	- 0.9	22.6	-21.7		0.7	20.9	34.3
1911-13	- 0.9	11.7	10.0		-0.3	- 4.9	46.2†

* For the sources of the data underlying the ratios, see Appendixes 1 and 4.

** The capital-movements series used here *include* net short-term capital movements.

† For 1911-15. The ratios in this column are computed directly from data in Kenneth A. H. Buckley, *Capital Formation in Canada, 1896-1930* (Toronto, 1958), p. 135.

APPENDIX 4

SOURCE OF STATISTICS USED (Other than Capital Movements)

Australia (1861-1913)

- Gross domestic product at current and at constant prices. Butlin, *Australian Domestic Product, op.cit.*, pp. 6, 33.
- Gross domestic capital formation at current and constant prices. *Ibid.*, pp. 6, 33.
- Gross private residential construction at constant prices. *Ibid.*, pp. 462-3.
- Net capital formation in railways at current prices. *Ibid.*, p. 350.
- Miles of railway track added. Brinley Thomas, *Migration and Economic Growth* (Cambridge, England, 1954), p. 306.
- Net immigration. Walter F. Willcox, *International Migrations*, Vol. I (New York, 1929), p. 947.
- Exports in constant prices. Value of exports, including gold, from Butlin, *op.cit.*, pp. 410-11, 436, 438, 441, deflated by export price index from Roland Wilson, *Capital Imports and the Terms of Trade* (Melbourne, 1931), p. 89.

Canada (1870-1913)

- Gross national product at constant prices. O. J. Firestone, *Canada's Economic Development, 1867-1953* (London, 1958), p. 276.
- Index of urban building activity. Buckley, *Capital Formation in Canada, op.cit.*, pp. 140-1.
- Net capital formation in railway transport and telegraphs at current prices. *Historical Statistics of Canada*, ed. by M. C. Urquhart and Kenneth Buckley (Toronto, 1965), p. 512.
- Gross immigration. *Ibid.*, p. 23.
- Merchandise exports in constant prices, adjusted to a calendar-year basis. Angus Maddison, "Growth and Fluctuations in the World Economy, 1870-1960," *Banca Nazionale del Lavoro Quarterly Review*, Vol. 15 (June 1962), pp. 185-6.

Great Britain (1860/70-1913)

- Net national income at current and constant prices. Brian R. Mitchell and Phyllis Deane, *Abstract of British Historical Statistics* (Cambridge, England, 1962), pp. 367-8.
- Gross domestic fixed-capital formation at current and constant prices. C. H. Feinstein, "Income and Investment in the United Kingdom, 1856-1914," *Economic Journal*, Vol. 71 (June 1961), p. 374.
- Migration to and from Extra-European Countries. Mitchell and Deane, *op.cit.*, pp. 47-50.
- Volume of residential building. Alec K. Cairncross, *Home and Foreign Investment, 1870-1913* (Cambridge, England, 1953), p. 157.
- Yield on Consols. William J. Fellner, *Trends and Cycles in Economic Activity* (New York, 1956), p. 396.

Germany (1881-1913)

- National income at current prices. Walther G. Hoffmann and Joseph H. Müller, *Das deutsche Volkseinkommen, 1851-1957* (Tübingen, 1959), pp. 39-40.

- Non-farm residential construction at constant prices. Hoffmann, *op.cit.*, pp. 257-8.
- Total domestic investment at constant prices. *Ibid.*
- Manufacturing output (less building and mining) at constant prices. Folke Hilgerdt, *Industrialization and Foreign Trade*, League of Nations (Geneva, 1945), pp. 132, 134.
- Intercontinental emigration of German citizens. Willcox, *op.cit.*, Vol. 1, p. 697.
- Merchandise exports and imports at constant prices. Sources of data given in P. J. O'Leary and W. Arthur Lewis, "Secular Swings in Production and Trade, 1870-1914," *The Manchester School*, Vol. 23 (May 1955), p. 149.
- Italy* (1861-1913)
- National income at current and at constant prices. "Indagine Statistica," *op.cit.*, pp. 251-2, columns 1 and 5.
- Gross domestic capital formation at current and at constant prices. *Ibid.*, pp. 264-5, column 6, and pp. 266-7, column 6.
- Gross emigration. *Sommario di Statistiche, op.cit.*, p. 65.
- Norway* (1871-1913)
- Gross domestic product at current and at constant prices. *Nasjonalregnskap, 1865-1960*, Statistisk Sentralbyrå (Oslo, 1965), pp. 340-2, 348-50.
- Gross domestic capital formation at current and at constant prices. *Ibid.*
- Gross emigration. Willcox, *op.cit.*, Vol. 1, p. 752.
- New Zealand* (1871-1900)
- Gross capital formation. J. A. Dowie, *Australian Economic Papers*, Vol. 2 (December 1963), p. 177.
- Gross residential capital formation. *Ibid.*
- Net immigration. *Ibid.*, p. 175.
- Railway investment. Dowie, *New Zealand Economic Papers*, Vol. 1 (Spring 1966), pp. 54-5.
- Sweden* (1861-1913)
- Gross domestic product at current and at constant prices. Östen Johansson, *The Gross Domestic Product of Sweden and its Composition, 1861-1955*, Stockholm Economic Studies, new series VIII (Uppsala, 1967), pp. 150-3.
- Gross domestic investment in fixed capital at constant prices. *Ibid.*, pp. 156-7.
- Building and construction at constant prices. *Ibid.*, pp. 152-3.
- Gross emigration. Willcox, *op.cit.*, Vol. 1, pp. 757-8.
- Merchandise exports at constant prices. Gunnar Fridlitzius, "Sweden's Exports, 1850-1960," *Economy and History*, Vol. 6 (1963), pp. 89-90.
- Additions to railway track. *Statens Järnvägar* (Stockholm, 1914), pp. 229-30.
- United States* (1860/70-1913)
- Index of industrial and commercial production. Edwin Frickey, *Production in the United States, 1860-1914* (Cambridge, Mass., 1947), p. 127.
- Net capital expenditure in railways (at current prices). Melville J. Ulmer, *Capital in Transportation, Communications, and Public Utilities* (Princeton, 1960), pp. 256-7.
- Yields on railway bonds. *Historical Statistics of the United States*, Bureau of the Census (Washington, 1960), Series X, 332, p. 656.
- Immigration. *Ibid.*, pp. 56-7.
- Index of building. John R. Riggelman, "Building Cycles in the United States, 1830-1935" (unpublished Ph.D. dissertation, The Johns Hopkins University), listed in Brinley Thomas, *op.cit.*, p. 298.

Gross national product at constant prices. Unpublished estimates of Robert E. Gallman underlying his study, "Gross National Product in the United States, 1834-1909," in *Output, Employment and Productivity in the United States after 1800*, National Bureau of Economic Research, Studies in Income and Wealth, Vol. 30 (New York, 1966), pp. 3-76. The data for 1909-13 are based on estimates of John W. Kendrick, *Productivity Trends in the United States*, National Bureau of Economic Research (New York, 1961), pp. 293-4.

Gross capital formation at current prices. Unpublished estimates of Kuznets underlying his book, *Capital in the American Economy* (National Bureau of Economic Research, Studies in Capital Formation and Financing No. 9 [Princeton, 1961]).

Argentina (1881-1913)

Net immigration and additions to railway track. Alec G. Ford, *The Gold Standard, 1880-1914: Great Britain and Argentina* (Oxford, 1962), p. 195.

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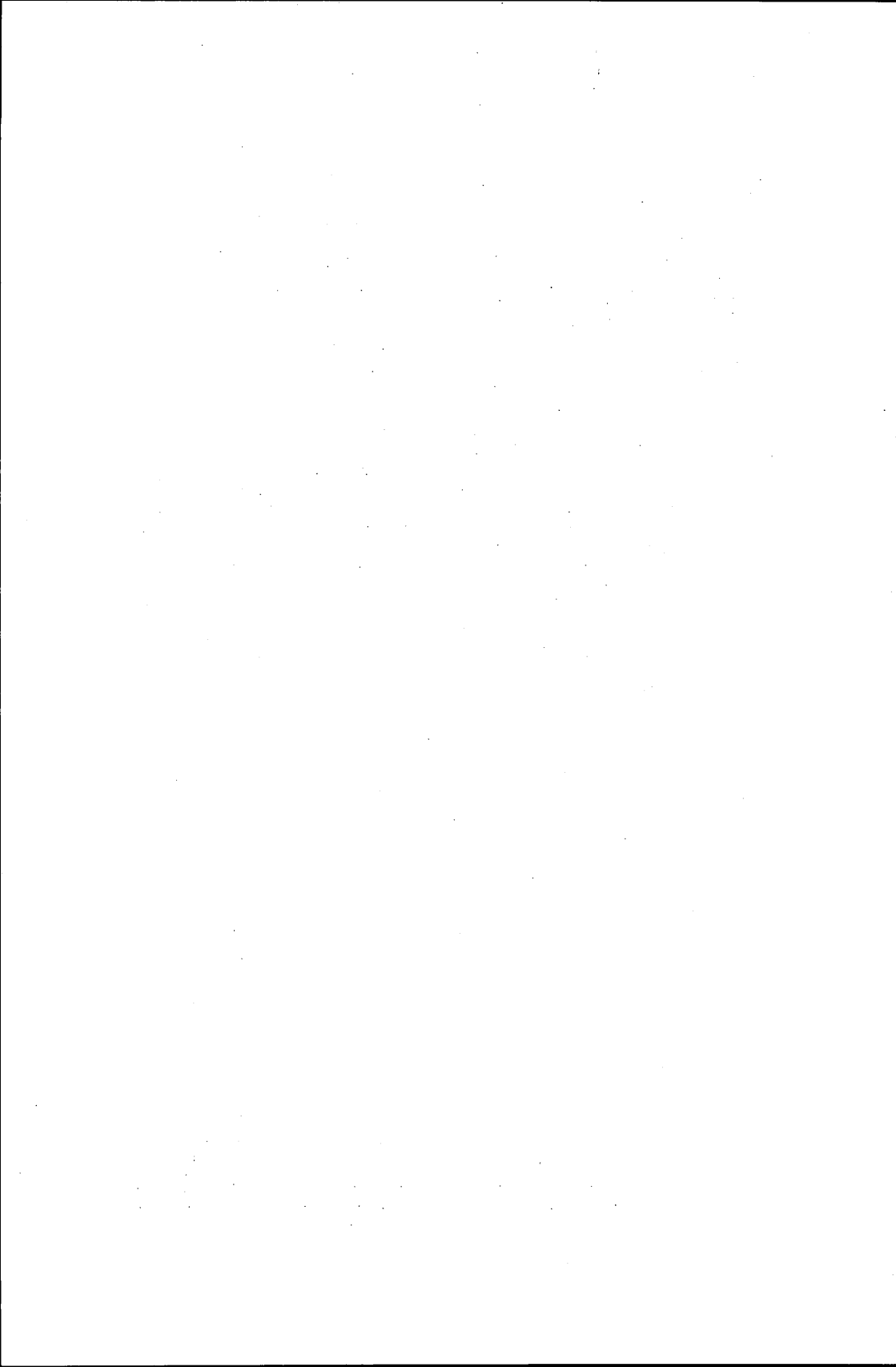
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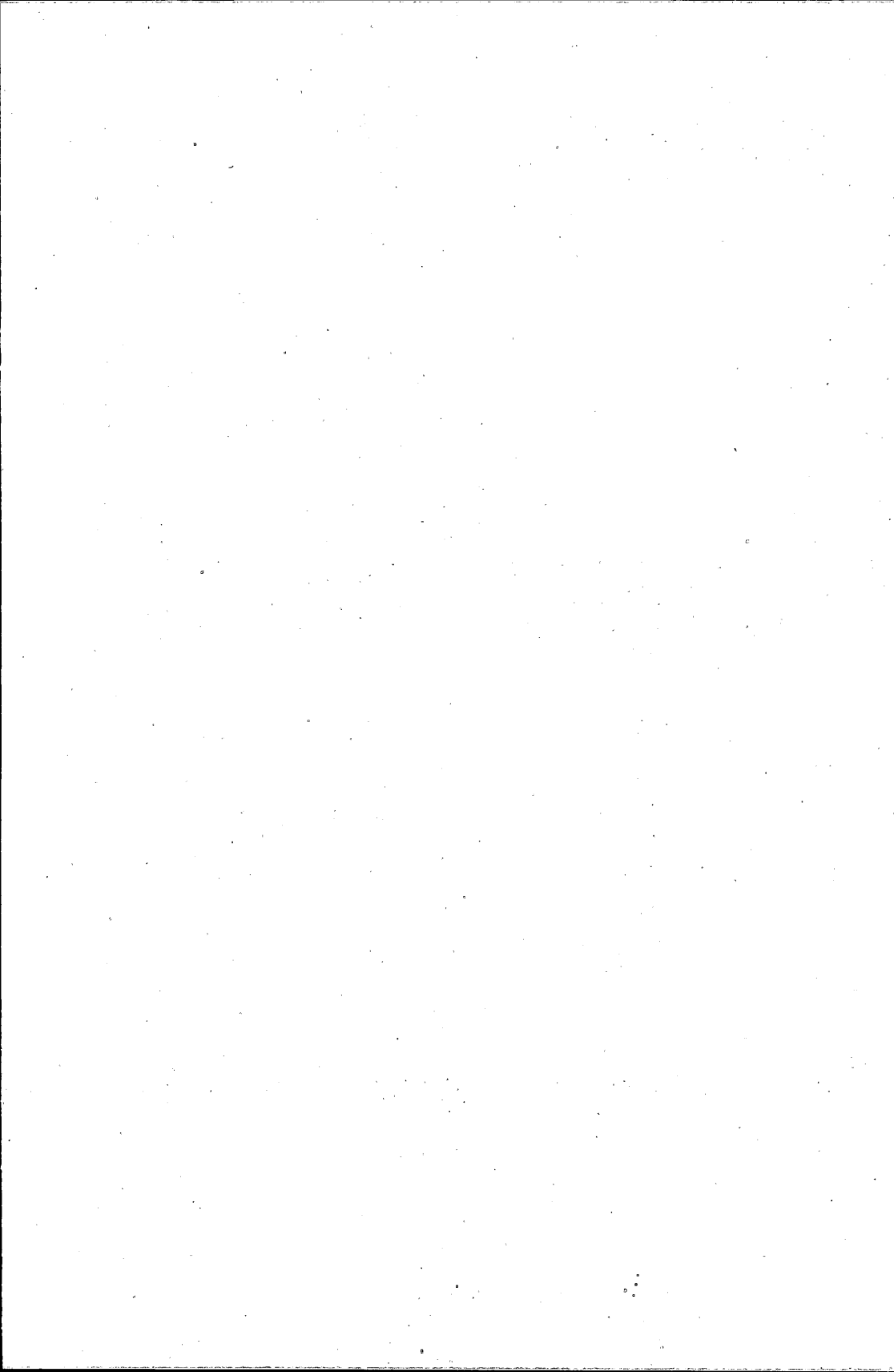
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