

LONG SWINGS, INVERTSITY AND OTHER EXPLANATIONS
OF OVERSEAS INVESTMENT IN THE NINETEENTH
CENTURY

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This paper is circulated for discussion purposes only and its contents should be considered preliminary.

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I

Variability in British overseas investment in New Zealand between 1870 and 1914 is shown in Figure I from where it can be seen there was an increase in the annual amount and that around the trend there were considerable year to year variations. What lies behind this and the fact that factors influencing foreign investment may have changed in their impact and may have been replaced by a different set of forces in the course of period are the concern of this paper.

Interest in British overseas investment, the reasons behind it and the measure of its impact start in the period itself with C. K. Hobson's study.⁽²⁾ It was another Hobson⁽³⁾ - J. A. - who concluded in his work that the export of capital was determined by the needs of British capitalism to find fresh outlets for its funds, new markets for its finished goods and fresh sources for its raw materials. This too was the line advanced by Lenin; that there would be a greater and greater export of capital and that more and more of this would find its way to the colonies - this is a view which has been much modified more recently with evidence that a greater flow of capital was being directed towards Europe in the last years of this period. But it is only by an examination in detail of the recipient areas of capital that we will be able to lend support to or take it away from such a view. As some writers have stressed recently it is dangerous to generalise too freely about the experience and unless the uniqueness of historical events is constantly held in view there is the danger of losing trace of what actually happened and why (i.e. history) altogether.

Of the volume of capital flowing abroad there is now little debate.

FIGURE I
BRITISH INVESTMENT IN NEW ZEALAND 1871 - 1911.
(with five year moving average)

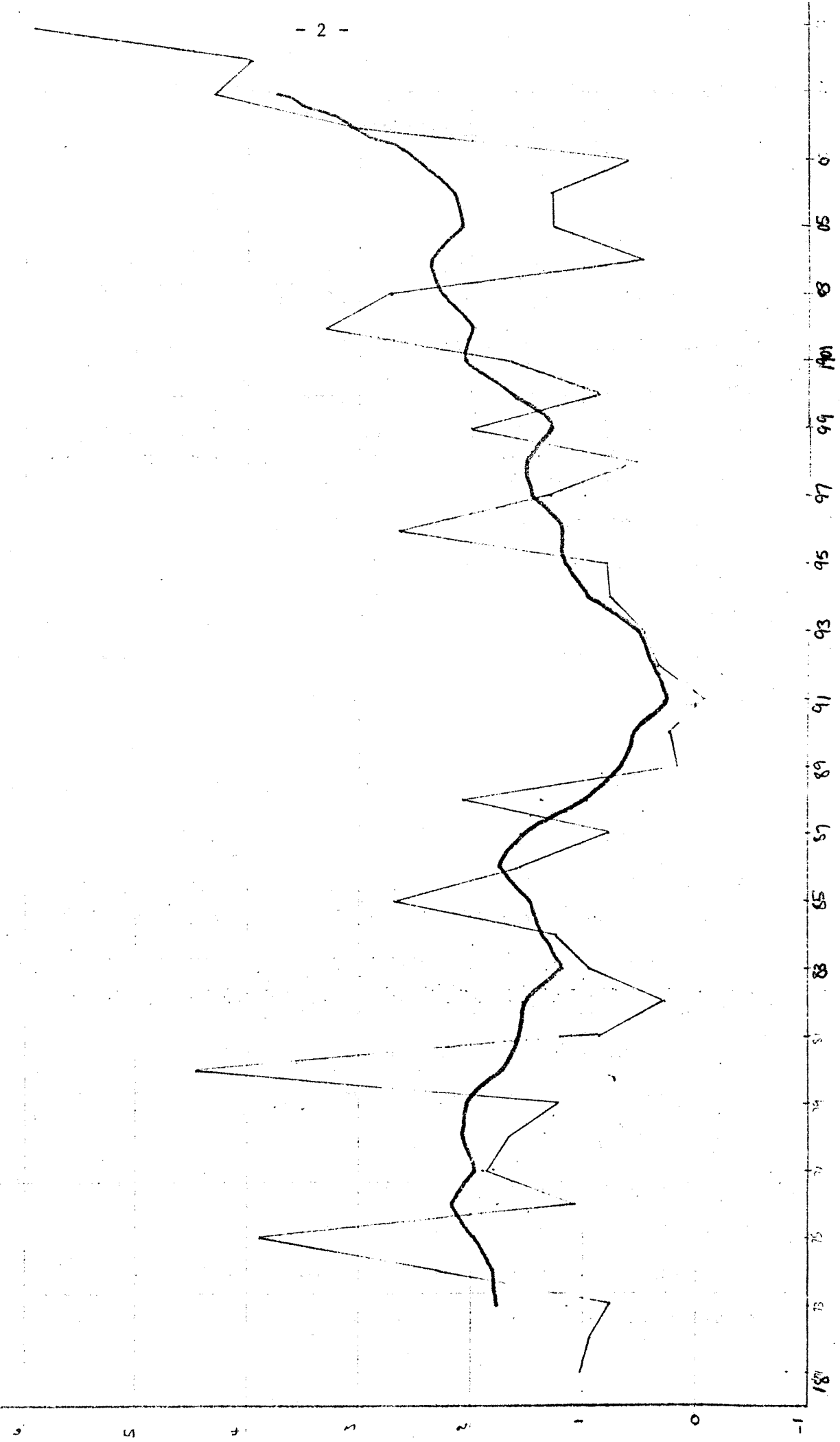
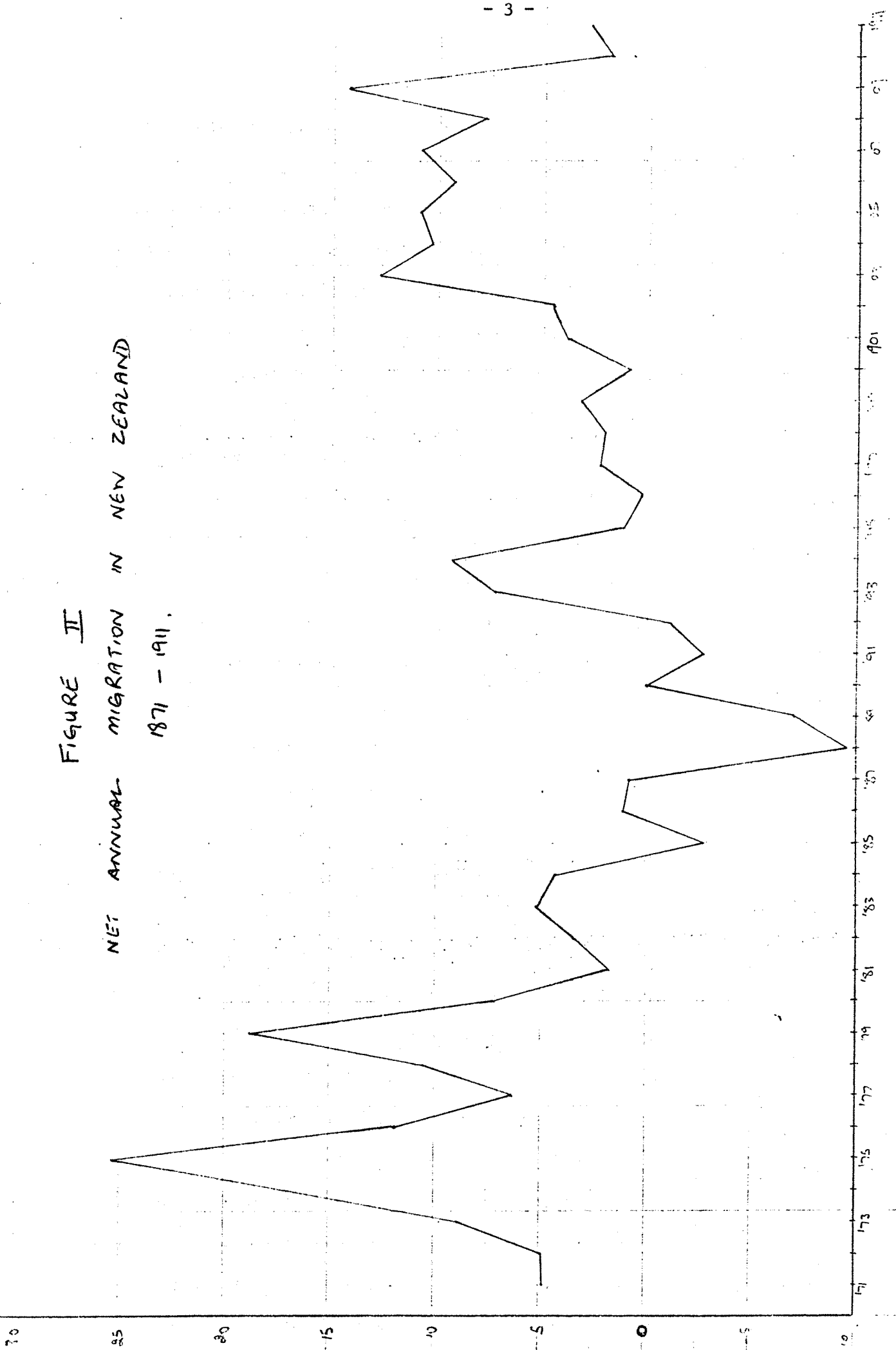


FIGURE II
NET ANNUAL MIGRATION IN NEW ZEALAND
1871 - 1911.



The estimates are that by 1913 Britain had around £4,000m. invested abroad - the annual rate of overseas investment running at about £200m. in the last years, that is 10% of national income. Britain dominated world lending - the £4,000m. represented about 40% of total world lending. This had grown from around £500m. in the 1860s. It may seem that N.Z. was somewhat insignificant in all this with only about £100m. (2½%) of the total by 1913 but it is the variation in the rate of lending that is of interest. (4)

The object then is to explain this flow of capital and the approach used is one which has been tried before for other regions - though never to our knowledge for N.Z. That is, it is primarily a test of the hypothesis that British investment is a function of some variable like railway profitability - this in turn reflecting the opportunities for exploiting some natural resource of the area. But since this appears less than completely satisfactory some other hypotheses are explored. Behind this there is also the question of the long swing; for much interest has settled on the question of the twenty year cycle or some kind of development cycle. Abramovitz and Kuznets provided the framework each giving different weight to different items; the latter gave more emphasis to supply factors and therefore migration and these ideas have been explored by a number of economists and economic historians in recent years. Although Abramovitz in his recent *Economica* paper (5) suggested that the Kuznets cycle has passed away and should be given a decent burial there is still some point in extending the application of it (or something approaching it) further for late nineteenth century economies. Added to the long swing has been the concept of inversivity in investment cycles and particularly that British domestic investment was inverse to her overseas lending: when opportunities dried up at home so attention was directed abroad and then perhaps as a result of disillusionment abroad or as returns at home looked more attractive there was a move back to the domestic economy. This attraction and repulsion idea has been expressed in terms of the push/pull

hypothesis which has been a useful way of describing conditions at home and abroad and is susceptible to more rigorous testing when we can find suitable 'push' and 'pull' variables.

Cairncross⁽⁶⁾ was in fact the first economist to point to the long term inverse movements of British home and foreign investment making a special study of Canada where he emphasised the simultaneous movement of labour and capital abroad. Brinley Thomas's⁽⁷⁾ investigations have perhaps been the most extensive and he concentrated on the Atlantic economy (U.K.-U.S.) although his conclusion was more general : that there was an inverse relation between the long swings in capital formation in the U.K. and in countries of new settlement overseas. Thomas gave great weight to the causal role of migration. Jeffrey Williamson's⁽⁸⁾ work confirms much of Thomas with its focus on migration to the States. The main change of emphasis is that he sees the central role of the U.S. (and this may well be important). Kelley⁽⁹⁾ too offers a theory of migration finding Australian experience reflecting the Kuznets cycle of 20 years. He used unemployment data for Australia and the U.S. and concluded that he had added another observation to the push/pull test. Ford⁽¹¹⁾ looked at Argentina and in view of the lack of population movement to that part of the world he examined the push/pull hypothesis with respect to capital only. Here again we find confirmation of the long swing and in inverse relation to the U.K. Richardson⁽¹¹⁾ is a little at variance but found that the inflow of capital in regions of recent settlement was a function of national income; and of labour that of investment in the region.

II

New Zealand was settled effectively in 1840 (at which time it had a population of 10,000 Europeans). There followed a decade or two of Maori wars, land purchase and the very basic clearing of land and of course a

scramble for gold. Between 1850-70 exports grew quite rapidly although Britain still took only around 40% - mainly wool and gold while Australia was still taking a larger percentage share. Not surprisingly the pattern of exports developed was similar to that of other regions of recent settlement i.e. raw ores, a basic product like wool and then some slightly more sophisticated product. In N.Z.'s case it was gold, wool, meat and later on dairy produce.

By 1870 the population was 1 million. The low credit rating of the country in London of the 1860's (a result of the wars and some reckless finance) was gone, exports were rising and the inflow of British capital was becoming clear. Stable government (at first 6 provincial governments) became centralised in 1876 and under the direction of Vogel large scale borrowing was carried out in the U.K. with a specific view to rapid development particularly via the railways and improved port facilities: "The great wants of the colony are Public works in the form of Roads and Railways ... "(12) with this declaration Vogel announced his financial policy for the 1870s. His argument was that roads and railways would bring the isolated provinces together and make possible real exploitation of their resources. And indeed that is what appears to have happened - steady progress, with the exception of the depression years of the early 1880s - with population and per capita income growing at possibly the fastest rates in the world between 1885-1910. The development of refrigeration in the seventies enabled meat exports to become dominant by the nineties and be overtaken by dairy produce by the early 1900s. Each development in exporting sectors had, superficially at least, more "spread" effects.

The circumstances are such as to lead us to expect some sort of cyclical investment : with profitable opportunities slowly revealing themselves, lenders taking them up, investment projects taking some time before completion,

no profits immediately forthcoming, disillusionment amongst lenders and so on. The picture very briefly for N.Z. is then : Vogel borrowing to provide the infrastructure in the seventies and this in turn given a fillup, after a slight decline in the eighties, by the possibilities of refrigeration. This takes a while to bring to a reasonable level and with a downward price trend investment falls off. Then with ocean freight rates falling and prices stabilising and turning in the mid-nineties, supported further by the possibilities of the dairy industry developing, investment turns up again and remains on an upward trend for the rest of the period.

III

The first problem is in obtaining a figure for British investment in N.Z. Matthew Simon has recently produced some series which are gross figures for new money called up through the British capital market.⁽¹³⁾ This was the main method of raising funds and where the figures suit it can be regarded as a useful proxy though it has to be remembered that there were many other methods of raising funds and places for doing so and of course direct investment is not included. Clearly the nearer it is possible to come to the true figure for British investment for an area the better it is and our dependent variable is N.Z.'s overseas borrowing - a figure compiled by the N.Z. Government. Dowie⁽¹⁴⁾ has compiled a gross capital inflow series by his own methods for the years 1870-1900 though on his admission it has serious defects. But perhaps we can derive some comfort from the fact that for the years available it follows the pattern of our series.⁽¹⁵⁾ The independent variables employed are as follows:

Profit rates : profits on railways were simply calculated from revenue from railways less operating cost and the resultant figure taken as a percentage of capital employed.⁽¹⁶⁾

British domestic investment : the series used is that produced by Feinstein.⁽¹⁷⁾

British overseas investment in total less British investment in New Zealand :

this is used to suggest that N.Z. was in some sense a residual funds receiver. Total British overseas investment is the figure given by Simon while the N.Z. figure is based on our dependent variable.

Annual Cost of Railway Construction : this again is a series produced by N.Z. Government.

British Investment in social overhead capital overseas : this is defined and estimated by Simon. He grouped capital into social overhead, extractive and manufacturing, that is those groups directly relevant to the problems of economic development. He excluded for example, real estate and defence finance.

IV

The first test then was that British overseas investment in N.Z. was a function of the railway profit rate both current and lagged, railway profits reflecting most accurately, profitability of investment in the country. Although N.Z. is small alongside the other regions of recent settlement the railroad when built nevertheless facilitated greatly improved carriage of goods for export - a few main trunk routes and many small connecting lines was the pattern. Railways in N.Z. made up a fairly significant part of all N.Z. capital formation throughout the period, as Table I shows. It averaged something like 20% - in some years it was more than 30%, and was seldom less than 17% in any one year. There appears good reason then for using it as an indicator of investment as a whole and profitability in that sector as

a good proxy for the economy.

The whole period was first of all taken, that is 1870-1914. Secondly, because the seventies were exceptional the period 1878-1911 was taken (though 1880 is another big year for the inflow of funds and perhaps 1881 → would be better). The years 1912 & 1913 were also exceptional years and so they too were truncated. With the period so reduced it was then thought profitable to consider the period of falling prices on its own and then that of rising prices - 1896 is the date that separates. The first equation tested then was that of British investment in New Zealand being a function of the current level of profits

$$\begin{array}{rcl} \text{CDN} = & 1350.12 & + \quad 211.098 \text{ PK} \\ & (2.496) & (1.143) \end{array}$$

$$\bar{R}^2 \quad .0301$$

$$dw \quad 1.0262$$

Clearly when the whole period is taken together, that is 1871-1914 there is little explanation offered by the level of profitability on its own. And this in fact is supported by the results in the other periods and sub-periods. It was only with the introduction of another variable that the level of explanation provided rose to a very high level. The variable was 'OCDN' measuring the funds flowing overseas from Britain minus those flowing to New Zealand. In other words it was hypothesised that New Zealand simply got the residual of funds flowing abroad from the U.K. If the demand for funds was high in, for example, Argentina then New Zealand would suffer. For the whole period the result obtained was

Table I

Investment in New Zealand 1871 - 1900*

	1	2	3	
	Total Investment	Private	Railways	Col. 3 as % of Col. 1
	£000s	%	£000s	
1871	1724	62.5	222	12.9
2	2787	58.2	600	21.5
3	3986	49.0	1050	26.3
4	5672	43.8	1804	31.8
5	6072	46.6	1785	29.4
6	4103	41.3	1220	29.7
7	4279	44.6	906	21.2
8	5930	49.0	1028	17.3
9	5944	45.4	1334	22.4
80	5033	40.8	1187	23.6
1	4634	52.9	680	14.7
2	5305	60.8	624	11.8
3	5417	54.8	889	16.4
4	5329	52.7	982	18.4
5	5135	52.6	962	18.7
6	4410	47.1	782	17.7
7	4207	47.5	739	17.6
8	3570	51.8	617	17.3
9	3514	53.5	584	16.6
90	3562	57.3	546	15.3
1	3667	59.1	518	14.1
2	4036	59.3	607	15.1
3	3590	52.5	564	15.7
4	3513	54.0	580	16.5
5	4138	59.5	594	14.4
6	4876	63.9	638	13.1
7	5410	58.8	812	15.0
8	6346	63.1	882	13.9
9	5984	58.1	1008	16.9
1900	6871	52.0	1319	19.2

* Source. J.A. Dowie, "The Course and Character of Capital Formation in New Zealand 1871-1900", New Zealand Economic Papers, Vol. I No. I 1966

$$\begin{array}{rcccc} \text{CDN} & = & 321.191 & + & 168.912 \text{ PK} & - & 1.109 \text{ OCDN} \\ & & (1.785) & & (2.877) & & (-19.367) \end{array}$$

$$\begin{array}{rcl} \bar{R}^2 & & .9044 \\ \text{dw} & & .4331 \end{array}$$

The signs of the coefficients are all consistent with our theory and are statistically significant. The level of explanation is very high though the doubts about autocorrelation are grave. The same pattern was exhibited in the other three equations for the broken down periods. e.g. for 1878-1911.

$$\begin{array}{rcccc} \text{CDN} & = & -199.476 & + & 314.776 \text{ PK} & - & 1.084 \text{ OCDN} \\ & & (-0.448) & & (2.195) & & (-19.486) \end{array}$$

$$\begin{array}{rcl} \bar{R}^2 & & .9269 \\ \text{dw} & & .5303 \end{array}$$

The only unsettling feature was that for the period 1878-96 the sign on the profit coefficient changed to negative. That is in the period of falling prices and of relatively low rates of return investment on railways is negatively correlated with profitability. When U.K. domestic investment was introduced as a 'push' factor it raises the \bar{R}^2 slightly and has the 'correct' negative sign:

$$\begin{array}{rcccc} 1871-1914 \text{ CDN} & = & 330.985 & - & 0.119 \text{ DI} & + & 170.226 \text{ PK} & - & 1.110 \text{ OCDN} \\ & & (1.320) & & (-0.056) & & (2.667) & & (18.396) \end{array}$$

$$\begin{array}{rcl} \bar{R}^2 & & .9044 \\ \text{dw} & & .4352 \end{array}$$

DI is the U.K. domestic investment variable and although its sign satisfies theory, the coefficient is not statistically significant. It does nevertheless become significant in the other periods, e.g.

$$1897-1911 \text{ CDN} = 1940.720 - 10.190 \text{ DI} + 164.136 \text{ PK} - 1.141 \text{ OCDN}$$

(1.766) (-3.886) (.522) (-15.087)

$$\bar{R}^2 \quad .9723$$

$$dw \quad 1.615$$

This is one of the best results of all with a very high level of explanation and doubts over autocorrelation removed, all signs satisfactory and all but one of the coefficients significant. That is this equation suggests that there was indeed an inversivity between U.K. domestic investment and British investment in New Zealand. And further there is the interesting relationship between funds flowing to New Zealand and to the rest of the world. Unfortunately though we are not much nearer to explaining the flow in terms of profitability in railways with the sign of the coefficient changing and the loss of significance in some equations. Some other tests of this relationship have specified a lag.⁽¹⁸⁾ It is suggested quite reasonably that there is a delay in the flow of information to the investor on the profits being earned and hence a gap between profits earned and the investors decision to invest.⁽¹⁹⁾ Thus if we lagged profit rates by one or two years we may capture this. However this lagging procedure did not improve our results.

In an attempt to go behind profits we further postulated that investment was a function of the annual cost of railway construction. This is much less satisfactory on theoretical grounds looking at costs alone but it is a plausible hypothesis to suggest that the more difficult it was to

construct, the less happy the investor may be about the profit prospects. Stewart said : "New Zealand ... is more of a railroader's nightmare ... some of their artifices for overcoming mountain and gorge, river and swamp made new history in the science of railway engineering."⁽²⁰⁾ The result of this test of the hypothesis was as follows:

$$\text{CDN} = 1043.780 + 1.186 \text{ KR D}$$

(3.340) (3.560)

$$\bar{R}^2 \quad .2318$$

$$dw \quad 1.424$$

Although we set out with the basic hypothesis that railway profits were what attracted British funds and that railways were sufficiently representative of investment in N.Z., a further possibility which we pursued was that the investor may not be particularly attracted by one area as against another but rather by one type of investment and in this case we suggested social overhead capital.⁽²¹⁾ To be precise we took the ratio of social overhead capital flowing abroad to all British capital going abroad. And we also took that portion of British capital going abroad less the N.Z. share to U.K. domestic investment. The result for the years 1878-1911 was :

$$\text{CDN} = -53.003 + 673.501 \text{ PK} - 111.866 \text{ OCDND} - 9435.440 \text{ GSD}$$

(-0.553) (3.171) (-12.451) (-1.074)

$$\bar{R}^2 \quad .8516$$

$$dw \quad .7677$$

Thus when we take this variable which gives us the proportion of social overhead capital in all overseas issues i.e. that directly relevant

to the problems of economic development we have a high level of explanation but the negative sign on GSD.

VI

The conclusion at this early stage is that the results suggest only feeble support for the notion of long swing, inversity and push/pull. The results do not of course deny it in any sense. But with the data used here (and there is no reason to suspect that it is less useful than that used in other studies) we do not at the moment add another observation to the test. Of course N.Z. could be dismissed as being too small a recipient to submit to such a test but if this were done then a number of other areas have to be dismissed including areas in Africa, Peru, Brazil and so on which may constitute in aggregate as much as 40-50% of total British overseas investment.

There is some support in some of our results (e.g. those showing an out-of-phase relationship with other overseas territories) for Dowie's evidence of inversity between Australia and New Zealand, though it would be going too far to suggest that there was a parallel to the Atlantic economy in the South Pacific.

What has to be borne in mind is the peculiar conditions prevailing in any one area at a particular time. For example in N.Z. the particular application of refrigeration, the appearance of Vogel and perhaps the special relationship with England should all be kept in sight. And further we should remember Mark Blaug's caution, "it is clear that non-pecuniary motives have always loomed large in determining the flow of international capital."⁽²²⁾

There are nevertheless many further possibilities which might be examined within the framework we have used. The first indication comes

from the poor d_w statistic we obtained in most equations suggesting an omitted variable and the first direction to look in is probably that of migration. For most regions of recent settlement this has after all proved an important variable and in this paper a casual comparison of Figures I and II certainly shows a close relationship between migration and capital flows. Whether capital followed, accompanied or led migration is something which might be tested. Other possibilities include testing the hypothesis that the cumulative debt (reflected in annual interest payments) was important. (23)

Footnotes

1. I should like to thank members of the Economic History Workshop at Warwick for their helpful comments.
2. C. K. Hobson, The Export of Capital, (London 1914).
3. J. A. Hobson, Imperialism, A Study, (London 1938)
4. Australia took approximately 8%, Argentina 8% and India 8-9%.
5. Moses Abramovitz, "The Passing of the Kuznets Cycle", Economica 1968, p.349.
6. A. K. Cairncross, Home and Foreign Investment 1870-1913, (C.U.P. 1953)
7. Brinley Thomas, Migration and Economic Growth, (C.U.P. 1954)
8. Jeffrey G. Williamson, "The Long Swing : Comparisons and Interactions Between British and American Balance of Payments, 1820-1913", The Journal of Economic History, Vol. XXII, No. 1 1962.
9. Allen C. Kelley, "International Migration and Economic Growth : Australia, 1865-1935", The Journal of Economic History, Vol. XXV, No. 3 1965.
10. A. G. Ford, "British Investment in Argentina and Long Swings, 1880-1914", The Journal of Economic History, Vol. XXXI, No. 3 1971.
11. H. W. Richardson, "British Emigration and Overseas Investment 1870-1914", Economic History Review, February 1972.
12. Appendices to the Journals of the House of Representatives, 1870, Paper B2, p.12, quoted by C. G. F. Simkin, The Instability of a Dependent Economy, (O.U.P., 1951), p.146.
13. Matthew Simon, "The Pattern of New British Portfolio Foreign Investment 1865-1914", in John H. Adler (Ed.), Capital Movements and Economic Development.
14. J. A. Dowie, Studies in New Zealand Investment 1871-1900, unpublished Ph.D. Thesis, (Australian National University 1965).

15. A further test which should be made is that using the Economist new issues for N.Z. as the dependent variable. But in any case the overwhelming amount of borrowing by N.Z. was carried out in the British market.
16. Statistics of New Zealand, (Government Publication) and Dowie op.cit.
17. C. Feinstein, "Income and Investment in the United Kingdom, 1856-1914", Economic Journal, 1961.
18. See for example, Ford, op.cit.
19. A great deal might be gained in this whole area of research if we knew more about who the investors were and what was likely to influence their investment decision but this is an area of research that has still not attracted much attention.
20. G. G. Stewart, The Romance of New Zealand Railways, (Wellington, 1951), p. 10, quoted in Dowie, op.cit.
21. This is as defined by Mathew Simon, op.cit.
22. Mark Blaug, "Lenin and Economic Imperialism Reconsidered," in Robin W. Winks (Ed.), British Imperialism, (1963), p.34.
23. See W. Rosenberg, "Capital Imports and Growth - The Case of New Zealand - Foreign Investment in New Zealand, 1840-1958", Economic Journal, 1961, pp.93-113.

A P P E N D I X

Symbols used in equations:

- CDN : New Zealand overseas borrowing
- PK : Profit rate on New Zealand railways
- OCDN : Total British overseas investment less British overseas investment in New Zealand
- OCDND : The ratio of OCDN to British domestic investment
- DI : British domestic investment
- KRD : Cost of construction of railways in New Zealand
- GSD : The ratio of British overseas investment in 'social overhead capital' to total British overseas investment