The Contribution of Foreign Borrowing to the New Zealand Economy

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Abstract

New Zealand's unrelenting current account deficits, its trade performance and high external debt level remain central to ongoing economic policy debates. However, what has been overlooked in the discussion of New Zealand's economic relations with its trading partners is the positive contribution that foreign capital inflow makes to the nation's economic development. International trade in saving between New Zealand and the rest of the world has potentially contributed more to its economic growth than international trade in goods and services.

This paper views New Zealand's current account deficits as symptomatic of an economic growth process in which the rate of the economy's capital accumulation exceeds its domestic saving rate. Expansion of the domestic capital stock attributable to foreign saving leads to higher national output and national income per head, net of the servicing cost of foreign capital.

We first present a framework for understanding how foreign capital inflow generates national income gains, and then provide evidence of the magnitude of these gains. New Zealand's national income is found to have grown significantly due to the contribution of foreign capital inflow over recent decades. We then construct a stylised national balance sheet that includes New Zealand's assets and foreign liabilities. This places the stock of foreign debt in proper context and reveals that after accounting for net foreign investment, national wealth gains have also been significant.

A necessary condition for long run sustainability of a country's external position is that the foreign savings are invested productively and generate a return at least equal to the cost of acquiring those funds. However, fulfilling this necessary condition is not automatically sufficient to ensure sustainability. We recognise there can be legitimate concerns about an "excessive" level of foreign debt. The paper does not address the broader concern over the sustainability of the current account deficit or the management of risk of precipitous adjustment. Its focus is on the necessary condition that New Zealand must have a net increase in its real income after meeting the costs of borrowing for the foreign capital inflows to be justified. Whether those inflows are at a sustainable level in the long run is a separate matter, and a critical concern for economic policy.

JEL CLASSIFICATION F30 International Finance

KEYWORDS Foreign borrowing; national income; current account deficit; national wealth; New Zealand

Table of Contents

List of Tables

List of Figures

The Contribution of Foreign Borrowing to the New Zealand Economy

1 Introduction

The size and persistence of New Zealand's current account deficit (CAD) and associated foreign debt remain at the centre of ongoing economic debates about the economy's international economic performance. Much of the commentary views the foreign inflows as a cause of concern. The external deficit has averaged over 4.8 per cent of gross domestic product (GDP), since the float of the exchange rate in 1985. Relative to GDP, the associated foreign borrowing and net stock of foreign liabilities reached over 90 per cent by end 2006 making New Zealand, like Australia, one of the largest international borrowers for its size within the OECD group of economies.

The CAD had risen from 2.8 per cent of *GDP* in 2001 to 9.7 per cent in 2006. Media commentary routinely assesses *CAD* outcomes as "improving" if imbalances narrow and "worsening" if they widen. More serious assessments of the economy's external position portray the CADs and associated foreign debt as a source of macroeconomic risk and cause for policy concern[1]. Bollard (2005) argues that "currently standing at 8 per cent of GDP, New Zealand's current account deficit is at levels that cannot be sustained indefinitely" and "that the eventual adjustment of the high current account deficit could make the job of maintaining price stability more difficult". Edwards (2007) estimates that the increase in the current account deficit has raised the probability of an adjustment of 3 per cent of GDP to 20 per cent, although for a 5 per cent adjustment in GDP the probability was only 5 per cent. However he concluded that "the current external imbalances should not be a cause for great concern".[2]

Current account deficits are also often perceived as a problem of trade competitiveness which unfortunately can trigger direct policy "solutions" that are inevitably distorting, such as export subsidies or higher tariffs on imports. However, what these trade-oriented perspectives generally ignore is that deficits on the current account side of the balance of payments are directly related to domestic saving and investment flows and matched by surpluses on the financial and capital account side.

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1 See, for instance, Skilling 2005, Edwards 2007 and Cline 2007.

2 If foreign investors judge that current account deficits are unsustainable, it is to be expected that such deficits would tend to self-correct as the exchange rate depreciates. This has been the experience of Australia in the early 1980s, East Asian countries in the late 199os and the USA at present. The notion of sustainability is explored in Makin (2003, Ch.5).

These financial account surpluses reflect the growth of international capital mobility which has expanded substantially since the worldwide liberalisation of financial markets in the early 1980s. Accordingly, domestic saving and investment rates for individual economies have become more independent, or less correlated, so that capital mobility in the Feldstein-Horioka (1980) sense has increased.

Contrary to popular perception, several theoretical approaches that focus on financial and capital flows rather than trade transactions yield the result that international borrowing confers net macroeconomic welfare gains. For instance, neoclassical foreign investment theory (MacDougall 1960, Grubel 1987) proposes that both creditor and debtor nations reap income gains from international trade in real capital, whenever the marginal product of capital differs across national borders. Viewed in this light, external imbalances reflect differences in investment opportunities rather than necessarily, poor trade competitiveness.

Alternatively, the inter-temporal approach to the external accounts (Sachs 1981, 1982, Frenkel and Razin 1996, Obstfeld and Rogoff 1996, and Makin 2003), based on saving-investment behaviour and well founded expectations about future returns on capital, concludes that capital inflow in the form of borrowing unambiguously raises consumption possibilities and national income if that borrowing facilitates additional domestic capital accumulation. As in the neoclassical foreign investment approach, this macroeconomic welfare improvement results from the tendency of expected rates of return on capital to equalize across borders.

The inter-temporal approach has been applied to New Zealand by Kim, Hall and Buckle (2004 and 2006). Using data from 1982 to 1999 their 2006 paper concluded that there was no evidence that the conditions for solvency had been violated and large deficits were not a cause for concern. Rather these deficits were the result of optimal decisions by economic actors. This finding is consistent with results for New Zealand reported by Makin (2005) using an alternative approach to assess the sustainability of the current account deficits. He shows that it is the quantum of productive domestic investment that sets the feasible limit to the *CAD.* He finds that between 1990 and 2003 (with the exception of 1991-92), the actual deficit was always less than the maximum feasible deficit consistent with long-run sustainability.

The study by Kim, Hall and Buckle (2006) paper did not cover the period since 2000 when the deficits have grown appreciably. Munro and Sethi (2006) revisit this question using an extended data set, and their results concur with Kim, Hall and Buckle (2004). However they note that worsening of the trade account may threaten long term solvency. In subsequent work (Munro and Sethi 2007) they develop a richer model of the current account and find again that the movements in the current account can be explained by the response of economic agents making optimal decisions given the costs of borrowing and the expected returns to investment.[3]

[3] Mercereau and Miniane (2004) demonstrate that the results of present values models should be treated with caution as the estimates can be subject to errors when applied to small samples.

Numerous studies have examined the links between international capital flows, investment and economic growth. Yet, this body of work focuses mainly on emerging economies and yields mixed results. While numerous studies (Bailliu 2000, Haveman, Lei and Netz 2001, Chandra 2005, Klein and Olivei 2006) find that capital inflow does positively influence national income, especially through the foreign direct investment channel, others (Rodrik 1998, Edison, Levine, Ricci and Slok 2002, and Carkovic and Levine 2005) find either a minimal or nil effect. This remains an empirical puzzle. In light of the strong case for increased international trade in saving on theoretical grounds.

When foreigners finance expansion of New Zealand's capital stock, the rise in external liabilities is also matched by an increase in the nation's real assets. In short, foreign investment supplements domestic saving, allowing the economy to accumulate real capital more quickly than it would have otherwise. Without that capital inflow over past decades, the combined saving of the private and public sectors would have implied less investment and hence lower real output growth.[4]

The economic policy significance of *CADs* which necessarily match net capital inflow, critically depends on whether the extra real output made possible by foreign funds exceeds the real servicing cost on that source of finance. As the Reserve Bank notes:

> "New Zealand's level of foreign debt has developed an increasing trend, repeatedly recording new highs and becoming a greater source of risk. Increased foreign debt puts pressure on New Zealand to grow fast enough to meet increased debt servicing obligations – otherwise the debt will not be sustainable" (2007, p.10).

Generating additional income sufficient to meet the debt servicing costs on foreign liabilities is crucial; but it is a necessary, not sufficient, condition to ensure long run sustainability. Since economic theory suggests that net gains from capital inflow should unambiguously be positive, the central question is: To what extent has New Zealand actually benefited, in terms of income and wealth, as a result of capital inflows that have enabled the NZ capital stock to grow faster than otherwise?

This paper estimates the contribution of foreign capital to New Zealand's income growth by deriving rates of return on foreign funded capital and their implications for national income for the period 1988 to 2006. Using national balance sheet analysis it also evaluates New Zealand's foreign debt with reference to counterpart national assets. The paper provides evidence that in fact, the necessary condition for the long-run sustainability of the current account does appear to have been met; ie, that the use of foreign savings has augmented the capital stock and generated additional income more than sufficient to meet the obligations on the foreign liabilities.

This conclusion is consistent with modelling by Makin (2004) in which current account imbalances and national income are determined simultaneously and which shows how the large current account deficits experienced over recent decades by Australia, the United States and New Zealand can coincide with periods of strong economic growth and low saving in those economies.

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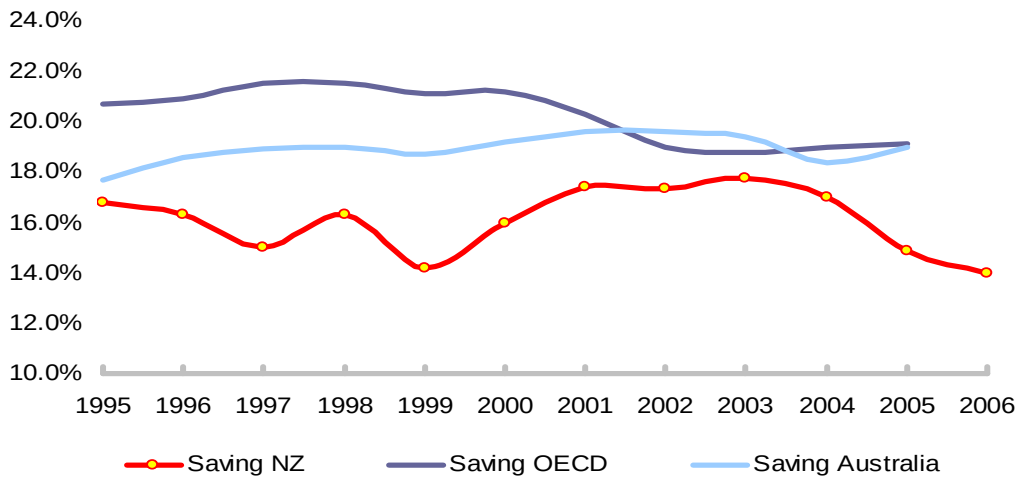
[4] In the absence of access to world capital markets domestic interest rates in New Zealand would rise. This would tend to encourage some additional saving but the rate of capital formation would be unambiguously lower. For an analysis of the relation between saving and the current account deficit in New Zealand see Wilkinson and Le (2008).

The remainder of this paper is structured as follows. Section 2 briefly analyses trends in domestic saving and investment and their implication for the external account. Section 3 proposes a straightforward theoretical framework for interpreting the direct links between saving, investment, capital inflow and national income. Section 4 applies growth accounting principles to data from New Zealand's national and external accounts to estimate the contribution of foreign capital to New Zealand's national income. Section 5 then shifts attention to macroeconomic stock values by presenting a prototypical national balance sheet that offsets New Zealand's foreign liabilities against its national assets to derive a national wealth series. Section 6 concludes the paper by summarising the main findings and highlighting their implications for economic policy.

2 Saving, Investment and the External Imbalance

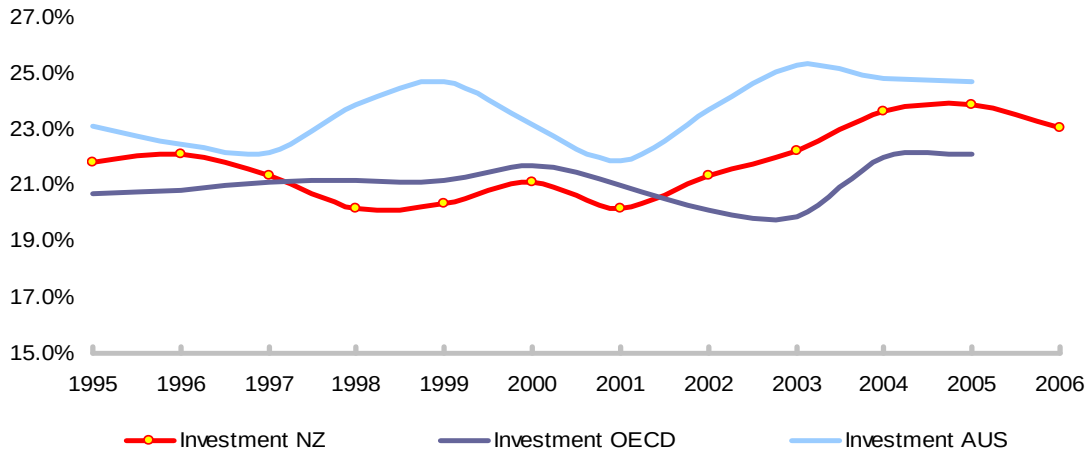
The float of the New Zealand dollar in the late 1980's and subsequent liberalisation of capital controls, significantly enhanced the economy's integration with international capital markets. At the same time New Zealand has had a relatively low saving rate as a proportion of *GDP* compared to average saving rates for the OECD group as a whole (Figure 1). Despite this, New Zealand has more often than not invested more as a share of GDP than the advanced economy average, particularly since the turn of this century. (Figure 2)

Figure 1 – Gross national saving as a share of GDP: New Zealand, OECD and Australia



Source: Statistics New Zealand and OECD

Figure 2 – Gross Investment as a share of GDP: New Zealand, OECD and Australia



Source: Statistics New Zealand, OECD and Department of Statistics Australia

International macroeconomic accounting dictates that an economy's *CAD*, or its use of foreign saving (S^*), through net capital inflow equals its investment-saving gap:

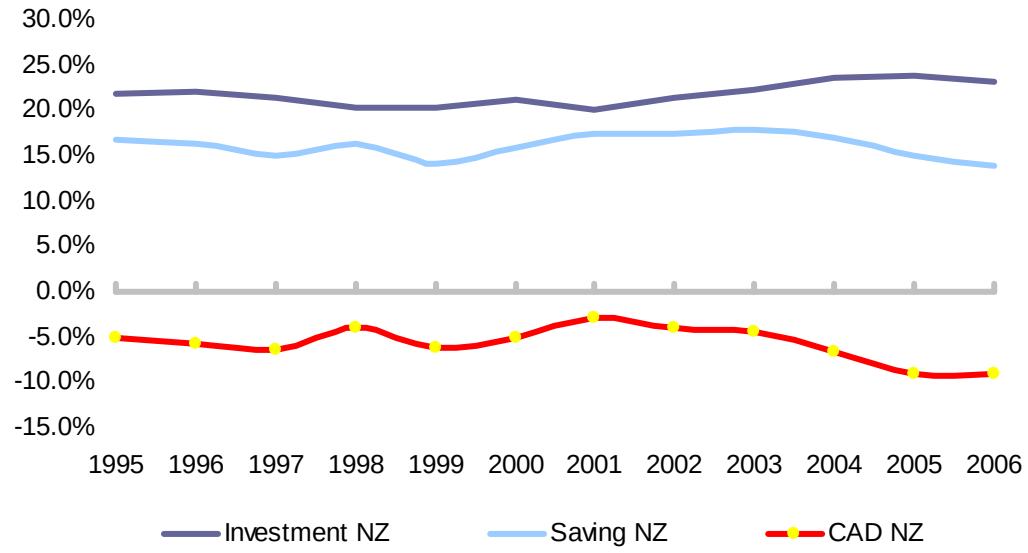
$$CAD = S^* = I - S \tag{2.1}$$

Hence, increases in the domestic real capital stock (ΔK) are partly financed by domestic saving and partly by foreign saving:

$$\Delta K = I = S + S^* \tag{2.2}$$

A CAD therefore signifies the extra domestic investment that capital inflow finances over and above that domestic investment (expenditure on fixed assets including machinery and equipment, dwellings, non-dwellings, roadworks and livestock) which is funded by domestic saving. This is shown in Figure 3.

Figure 3 – Saving – investment imbalance as a share of GDP: New Zealand



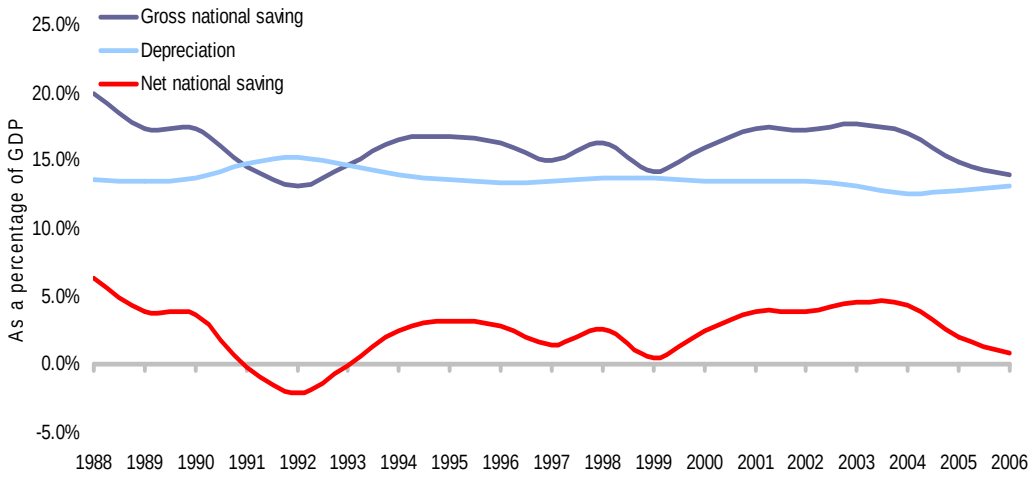
Source: Statistics New Zealand, OECD and Department of Statistics Australia

Depreciation of capital, also known as capital consumption, accounts for a major share of gross domestic saving in New Zealand, in common with other advanced economies that characteristically have large, ageing capital stocks (Figure 4). As a result, net saving has been relatively low, averaging only 2.4 per cent of GDP over the period.

Nonetheless, annual saving-investment gaps still have the same value shown in Figure 3 when capital depreciation is subtracted from the depicted gross saving and investment measures. This is because

$$\textit{Gross I} - \textit{Gross S} = (\textit{Gross I} - \textit{depreciation}) - (\textit{Gross S} - \textit{depreciation}) = \textit{Net I} - \textit{Net S} = \textit{CAD} \quad (2.3)$$

Figure 4 – Gross national saving, net national saving and depreciation as a percentage of New Zealand GDP



Source: Statistics New Zealand
Notes:

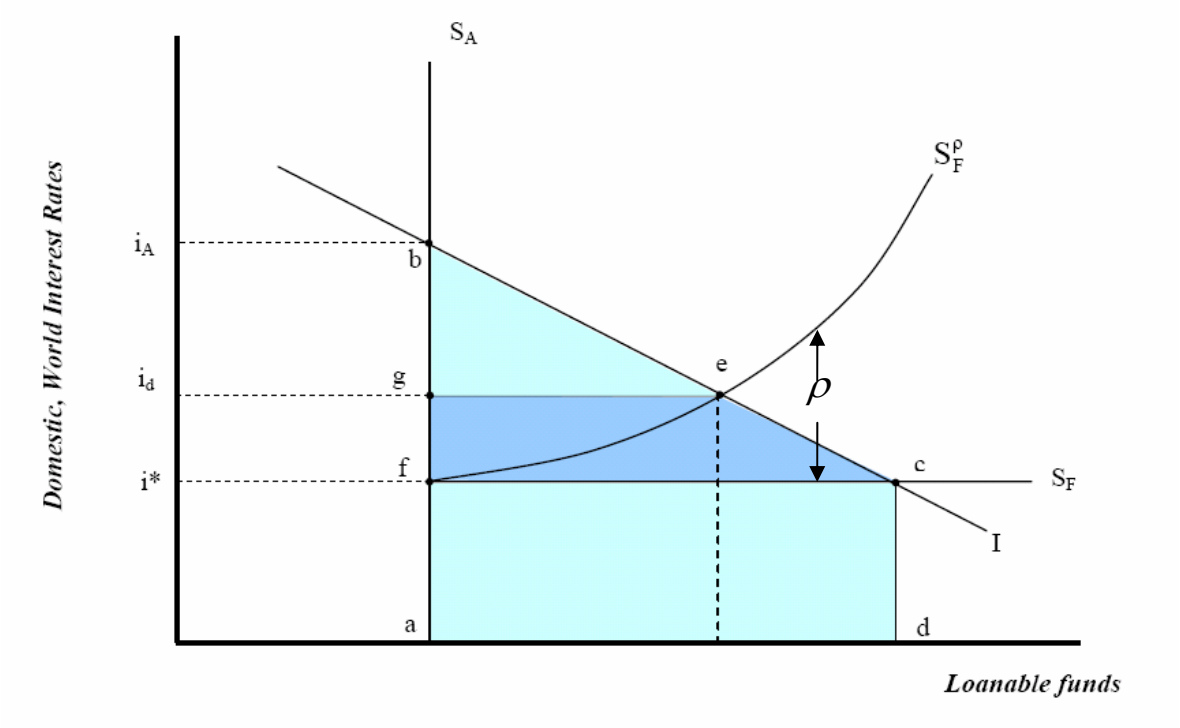
1. *Gross saving is calculated as S= I – CAD*
2. *Net national saving is calculated as Net = Gross – depreciation*

Capital inflow therefore normally funds extra net capital accumulation of the same value as the external imbalance. In other words, foreigners finance that much more domestic investment in New Zealand than reliance on domestic saving alone would permit through intermediated loans to resident firms, equity participation and purchases of real assets from residents. When foreign investors directly purchase real domestic assets like property, the proceeds of the sale of domestic assets also supplements the pool of funds available for domestic investment.

3 Foreign capital and national income: theoretical foundations

This section presents a simple international flow of funds framework that relates saving, investment, rates of return, foreign borrowing and economic growth. Consistent with the intertemporal approach to the open economy, external imbalances and international borrowing are primarily related to domestic saving and investment behaviour and hence we abstract from trade flows and exchange rates.

Figure 5 – Saving, Investment, International Borrowing and National Income



Under autarky conditions, total investment spending must be funded from domestic saving, the residual between domestic output and consumption. Let the demand schedule for loanable funds as a function of the real interest rate be depicted by the schedule I in Figure 5. The market for loanable funds clears at the equilibrium real interest rate, i_A given a fixed supply (S_A). In contrast, with perfect capital mobility, a small economy's domestic borrowing requirement over and above available domestic saving can be satisfied by foreign lenders (investors) lending[5] at the exogenous real world interest rate, *i**.

Domestic investment therefore exceeds domestic saving at i^* to the extent of foreign borrowing. This *ex ante* foreign borrowing requirement is shown by distance *fc* in Figure 5. Hence, if external debt is initially nil, it reaches level *fc* by period end. As the real world interest rate is lower than the real autarky interest rate, investment under autarky is always lower than when international borrowing is permitted.

[5] As a simplification, we restrict attention to foreign borrowing, although foreign capital inflow can of course include foreign purchase of shares issued by resident enterprises. In the estimation the following section we include the interest on borrowing and the returns on equity.

Figure 5 also reveals how foreign borrowing raises national income. The marginal product of capital determines the slope of the investment demand schedule, so that given i^*, the extra units of foreign financed capital, times their marginal product, add to *GDP* to the extent of the area *abcd*. However, of that, the rectangular area *afcd* is paid to foreign lenders, leaving a *net* national income gain equivalent to the triangular area *fbc.* International capital mobility therefore enables lower domestic interest rates and higher national income, provided the productivity of the extra foreign-financed capital exceeds its cost.[6]

If foreign lenders perceive high foreign debt as a sign of heightened country risk and diminished creditworthiness, they may demand an interest premium (ρ), to compensate.[7] This explains the convex foreign lending schedule rising from the world interest rate, i^* in Figure 5. The more averse foreign investors are to rising foreign debt, the steeper the slope of the S_F^{ρ} schedule and the higher the risk premium. At some point, foreigners could judge the level of lending risk prohibitive, equivalent to the foreign lending schedule becoming vertical.

In the presence of a risk premium, the foreign lending schedule is no longer perfectly elastic. The risk premium is the difference between the interest rate foreign lenders demand under imperfect capital mobility and the interest rate *i** under perfect capital mobility. Hence,

$$i_d = i^* + \rho \tag{3.1}$$

where i_d is the equilibrium domestic interest rate and ρ is measured by the distance *gf* in Figure 5.

Foreign debt related risk therefore causes macroeconomic welfare losses since potential national income gains from foreign borrowing are not realised. With reference to Figure 5, the welfare loss is area *fgec*. Note however that foreign borrowing still confers a net welfare gain of *gbe*, provided the equilibrium interest rate allowing for risk is less than the autarky rate. Although interest risk premia limit potential growth, it also follows that the higher the risk premium, the slower foreign debt accumulates, suggesting that rising risk premia act to stabilise foreign debt levels.

The main qualification to the argument about the benefits of allowing unrestricted flows of funds across borders is that reversals of inflows make emerging economies vulnerable to crises. Capital flight in response to new information about exchange rate risk, default risk or deteriorating fiscal and monetary policy settings can impose substantial short term economic, social and political costs on borrower economies. These costs are transmitted in the first instance through higher domestic interest rates and lost output, as well as through large exchange rate depreciations and the associated higher inflation. While we recognise that these are legitimate concerns, the purpose of this paper is to estimate the real income gains from foreign capital flows; we therefore abstract from the broader issues of risk management.

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6 This flow approach is consistent with McDougall's (1960) two region capital stock-oriented foreign investment model. However, this approach focuses on saving and investment flows and assumes the economy is small and hence unable to affect the world interest rate.

7 For estimates of the risk premium in New Zealand see Hawkesby, Smith and Tether (2000).

4 Estimating income gains: A growth accounting approach

To identify the contributions made by specific factors to economic growth, standard growth accounting suggests it is necessary to focus on key factor inputs. Conventionally, the domestic labour force, the capital stock and multifactor productivity, inclusive of technological change, have been identified as the key sources of economic growth. In open economies however, a further distinction can be made between domestic capital accumulation that is funded via domestic saving, and domestic capital accumulation funded via external borrowing. In this section, we use a growth accounting approach to estimate the national income gains attributable to the capital accumulation in New Zealand that is made possible through external borrowing.

Using extended growth accounting, it is possible to estimate the net contribution of foreign capital in real terms for each of the variables in the following expression:

$$(f_{K^*} - r^*)dK^* - dr^* K^* \tag{4.1}$$

where f_{K^*} is the marginal product of foreign capital, r^* is the real foreign interest rate, dK^* is foreign capital inflow, dr^* is the change in the foreign interest rate from the previous period and K^* is that part of the domestic capital stock financed by foreign saving[8].

Since foreign borrowing is largely intermediated through commercial banks, we assume the productivity of capital in use domestically is invariant to the source of its funding. Therefore,

$$f_{K^d} = f_{K^*} \tag{4.2}$$

Next, we assume output is generated by a Cobb-Douglas function[9] of the form

$$Y = AK^{\alpha}L^{1-\alpha} \tag{4.3}$$

where $K = K^d + K^*$ and α is the share of capital in national income.

This form of the production function is appropriate if the division of national income between capital and labour has been relatively stable, as indeed it has been for New Zealand over the past decade. A useful property of the Cobb-Douglas function is that the marginal product of capital is given by the share of capital in national income multiplied by the ratio of national output to capital. The marginal product of capital can therefore be estimated using national accounts data as

$$f_K = \alpha \frac{Y}{K} \tag{4.4}$$

8 See the Appendix for a full derivation of equation (4.1).

9 We relax this assumption in section 5 where we apply time series analysis to a more general specification.

The net marginal product is then simply the difference between the marginal product of capital and the estimated rate of capital stock depreciation (Table 1).

Table 1 – Estimating the marginal product of capital

Year	Real Capital Stock (K) $b NZ (1)	Real GDP (Y) $b NZ (2)	Output/Capital Ratio (Y/K) % (3)=(2)/(1)	Capital Share % (4)	Marginal Product of Capital % (5)=(4)*(3)	Capital Consumption % (6)	Net Marginal Product of Capital % (7)=(5)-(6)
1994-95	313.4	89.9	28.7	51.2	14.7	4.0	10.7
1995-96	321.9	93.4	29.0	51.4	14.9	4.1	10.8
1996-97	331.5	96.4	29.1	50.6	14.7	4.1	10.6
1997-98	339.8	99.2	29.2	50.5	14.7	4.1	10.6
1998-99	348.4	100.4	28.8	50.4	14.5	4.2	10.3
1999-00	357.8	105.6	29.5	52.2	15.4	4.3	11.1
2000-01	366.6	108.2	29.5	52.6	15.5	4.5	11.0
2001-02	376.7	112.1	29.8	52.8	15.7	4.6	11.1
2002-03	387.5	117.6	30.4	51.7	15.7	4.6	11.0
2003-04	401.3	121.6	30.3	51.3	15.5	4.6	10.9
2004-05	416.8	125.8	30.2	51.1	15.4	4.7	10.7
2005-06	433.3	128.6	29.7	50.0	14.8	4.9	10.0

Notes:

(1) Productive capital stock data in 1995-96 prices from nvpcs series nat.bak from Aremos.

(2) Expenditure base GDP data in 1995-96 prices from ngdp series nat.bak from Aremos.

(3) The ratio of the real capital stock to real gross domestic product.

(4) The ratio of gross operating surplus to the sum of compensation of employees (nysc series nat.bak) and gross operating surplus (nosg series nat.bak).

(5) The product of the output-capital ratio and the capital share of income.

(6) Estimated as the ratio of chain volume measures of consumption of fixed capital (ndep series nat.bak) to end-year capital stock.

(7) The difference between the marginal product of capital and the estimated depreciation rate.

Next, using balance of payments flow and stock data it is possible to estimate the real effective cost of foreign capital and the annual national income gain attributable to the first term of equation (4.1), as shown in Table 2.[10]

[10] While it would be of interest to analyse the sectoral distribution of foreign investment, currently available data do not allow this. In the case of Australia, much of the capital inflow is directed to the banking and financial sectors. Where it ultimately is invested however is not recorded.

Table 2 – Net income gains from annual foreign capital inflow

Year	Net Foreign Liabilities $b NZ (1)	Net Income Payment Abroad $b NZ (2)	Real Cost of Foreign Capital % (3)	Net Marginal Product less Real cost % (4)	Real S* $b NZ (5)	Real National Income Gain $b NZ (6)
1994-95	71.1	6.0	5.5	5.2	4.0	0.2
1995-96	70.9	6.0	5.9	4.9	4.9	0.2
1996-97	79.9	7.3	8.3	2.3	5.7	0.1
1997-98	89.3	6.4	6.8	3.8	5.3	0.2
1998-99	87.1	5.0	5.2	5.1	4.2	0.2
1999-00	87.1	6.6	3.6	7.5	6.6	0.5
2000-01	87.5	7.6	6.8	4.2	4.7	0.2
2001-02	97.0	7.1	4.6	6.5	3.5	0.2
2002-03	100.9	7.0	5.4	5.6	4.1	0.2
2003-04	109.6	7.2	3.9	7.0	5.9	0.4
2004-05	121.2	9.7	4.9	5.8	9.1	0.5
2005-06	130.0	11.2	5.8	4.2	12.2	0.5

Notes:

(1) Measure of net foreign liability based on data in current price from tiin.a series (known as Net Investment Position) tra.bak from Aremos.

(2) Current price data recorded in tbii.a series (known as Investment Income Balance) tra.bak from Aremos.

(3) Ex post real cost of foreign capital is the ratio of net income payments to net foreign liabilities less annual inflation rate which is derived from pcpi series pri.bak from Aremos.

(4) The difference between the net marginal product of capital from Table 1 and the real cost of foreign Capital.

(5) Data recorded in tbc.a series tra.bak from Aremos; deflated to 1995-96 prices.

(6) The product of the net marginal product of foreign capital less real servicing cost and the external imbalance in 1995-96 prices.

The fact that the marginal cost of capital is below the estimated marginal product may at first blush be taken as an indication of under investment. However it is more correctly seen as a reflection of a disequilibrium state. It is this disequilibrium that is the driving force behind foreign capital inflow. When the equilibrium point was reached, at which marginal costs and benefits were equated, capital inflows would cease. Here we are concerned with measuring the transitional net income gains as the economy gropes toward (but never reaches) an equilibrium state.

It is now possible to estimate the variation in real national income due to fluctuations in world interest rates that raise or lower the servicing cost of external liabilities as implied in the last term of equation (4.1). This is shown in Table 3 which combines this data with Table 2 results to yield the real cumulative national income gains that have resulted from past capital inflow.

Table 3 – Total national income gains from foreign capital

Year	Change in Implicit foreign interest rate % (1)	Income gain From interest rate movements $b NZ (2)	Real income gain from interest rate movements $b NZ (3)	Total national income gain $b NZ (4)	Cumulative income gain $b NZ (5)	Cumulative income gain per worker $NZ, 95/96 prices (6)
1995-96	0.5	0.3	0.3	0.46	0.5	295
1996-97	0.8	0.5	0.5	0.74	1.2	764
1997-98	1.4	1.0	1.0	1.10	2.3	1478
1998-99	-0.3	-0.2	-0.2	-0.02	2.3	1420
1999-00	-0.1	-0.1	-0.1	0.12	2.4	1458
2000-01	0.6	0.4	0.4	0.88	3.3	1951
2001-02	0.1	0.1	0.1	0.30	3.6	2077
2002-03	0.4	0.4	0.3	0.54	4.1	2326
2003-04	-0.3	-0.2	-0.2	0.03	4.1	2248
2004-05	0.3	0.3	0.2	0.63	4.8	2546
2005-06	-0.3	-0.4	-0.3	0.20	5.0	2612

Notes:

(1) Due to lack of data for net foreign debt and net income payments on foreign debt data before 2000, the proxy for implicit foreign interest rate is derived by equally weighted 10 year government bond rates from Australia, USA and UK. This is justified on the grounds that foreign investments in NZ from these countries account for over 50% of total foreign investments since 1995 and the amount from each is approximately the same.

(2) The product of net foreign debt and the change in the implicit foreign interest rate. As the stock of net foreign debt changes through the year, a weighted value should be used. The Australian Bureau of Statistics recommends a weight of two-thirds for the beginning of year value and a weight of one-third for the end of year value. The net foreign debt and net equity debt data for NZ go back to 2000. Prior to that year, we use estimated values. The net foreign debt before 2000 is estimated by subtracting net equity debt from net foreign liability, where net equity debt from 1995 to 1999 is estimated by its average value from 2000 to 2006. The reason for doing so is that the net equity debt has remained at a relatively constant level ($13 to $18 billion) from 2000 to 2006.

(3) The value of the income gain from interest rate changes deflated by the GDP deflator.

(4) The sum of the real national income gain from annual foreign capital inflow from Table 2 plus the real annual net gain from interest rate movements.

*(5) The number of "Full Time Equivalent" workers in New Zealand in 2006 was 1.9 million, which yildss (5 / 1.9*10^{-3} = $2612) NZ per worker extra accumulated income from the contributions of CAD.*

(6) *Calculated by dividing (5) by number of full time equivalent workers from lhfte.q series.*

Hence New Zealand's cumulative national income gain from net foreign capital inflow over the period was around $5.9 billion. Since the New Zealand workforce on a "full time equivalent" basis was 1.9 million in 2005-06, the extra accumulated income attributable to the use of foreign capital was around $2,600 per worker, or $3,300 when converted to 2007 prices.

However, the annual income gains estimated on this basis most likely understate the total contribution of foreign capital and should be considered minimum values. This is because part of capital inflow is *direct* foreign investment which entails the transfer of technology, work practices and management techniques that boost multifactor productivity. Hence, part of the multifactor productivity improvement over this time would be attributable to foreign capital rather than exclusively to domestic sources as assumed in the estimation method employed.

5 Foreign debt, national assets and national wealth

To this point, we have examined the contribution of foreign capital to the New Zealand economy strictly in flow terms. While inflows of foreign saving obviously add to external indebtness, the additional domestic investment that foreign saving funds also contribute to growth of the economy's capital stock, with implications for national wealth. Hence, we now shift our attention from assessing the impact of foreign capital inflows on national income, to examining the significance of the stock of foreign debt. We do this by constructing a stylised national balance sheet that includes aggregate measures of national assets, external liabilities and national net worth (or national wealth).

National assets are comprised of the capital stocks of the private and public sectors (including dwellings and consumer durables) as well as New Zealand investment abroad. On the other hand, national liabilities include total foreign investment in New Zealand in the form of equity and debt holdings of foreigners.

Estimates of national assets are constructed by following Makin (1993). The series included are: residential buildings, non residential buildings, other constructions, transport equipment, plant machinery and equipment, consumer durables and New Zealand investment abroad.

Statistics New Zealand provides data in real terms (in 1995-96 constant prices) except for investment abroad data. This series is deflated by private consumption deflator as conceptually wealth embodies present and future consumption possibilities available to domestic residents.[11]

Table 4 shows the composition of national assets. Overall, these increased by 46 percent over the past 10 years.

Table 4 – Total national assets

	Residential building (1)	Non residential building (2)	Other construction (3)	Transport equipment (4)	Plant machinery and equipment (5)	Consumer durables (6)	NZ investment abroad (7)	National assets (8)
1996	137.0	73.6	53.0	40.0	13.1	0.9	34.2	351.8
1997	140.6	75.4	53.8	42.4	13.8	1.0	32.0	358.9
1998	144.3	76.5	54.8	44.5	13.8	0.9	32.9	367.7
1999	147.4	78.5	55.8	46.4	13.8	1.0	37.8	380.7
2000	151.4	79.7	57.4	48.2	14.0	1.0	44.6	396.4
2001	154.5	81.2	58.5	51.0	14.0	1.0	76.3	436.5
2002	157.5	82.9	59.6	53.3	15.5	1.3	73.1	443.3
2003	161.8	84.6	60.8	55.6	16.6	1.6	71.2	452.2
2004	167.0	86.2	62.8	58.4	18.5	2.1	77.4	472.3
2005	172.3	88.3	65.5	62.1	20.0	2.3	80.1	490.7
2006	177.2	91.0	68.6	66.0	22.1	2.4	86.9	514.2
Increase	29%	24%	29%	65%	68%	166%	154%	46%

[11] See Makin (1993).

Note: Total national assets are calculated as the sum of Residential Building, non residential building, other construction, transport equipment plant machinery and equipment, consumer durable and NZ investment abroad. All figures in this table are in real terms at 1995-96 prices. More specifically

(1) Residential Building is from nktd series, nat.bak bank

(2) Non residential building is from nktnr series, nat.bak bank

(3) Other construction is from nktoc series, nat.bak bank

(4) Transport equipment is from nktte series, nat.bak bank

(5) Plant machinery and equipment is from nktp series, nat.bak bank

(6) Consumer durable is from ncpd_z series, nat.bak bank

(7) New Zealand investment abroad is from TIIAF series, tra.bak bank

Table 5 – Total external liabilities

	Foreign direct investment (1)	Foreign portfolio investment (2)	Other foreign investment (3)	Total external liabilities (4)
1996	48.4	28.1	27.4	103.9
1997	52.1	28.0	29.0	109.2
1998	59.7	30.1	27.8	117.6
1999	59.5	31.4	29.1	120.0
2000	58.8	25.5	40.5	124.8
2001	51.4	54.5	49.3	155.2
2002	49.5	54.9	54.3	158.7
2003	51.2	57.2	51.4	159.8
2004	59.9	63.6	49.1	172.6
2005	62.6	66.1	54.9	183.6
2006	64.8	69.0	61.0	194.8
Increase	34%	146%	123%	87%

Note: Total external liabilities are computed by summing foreign direct investment, foreign portfolio investment and other foreign investment which is mainly made up of bank deposit and loans. All figures in this table are in real terms at 1995-96 prices. More specifically:

(1) Foreign direct investment is from TIILFD series, tra.bak in Aremos

(2) Foreign portfolio investment is from TIILFP series, tra.bak in Aremos

(3) Other foreign investment is from TIILFO series, tra.bak in Aremos

(4) Total external liabilities can be obtained by either from TIILF series in Aremos or summing (1) to (3)

The total external liabilities include total foreign investment in New Zealand in form of equity and debt holdings of foreigners. Table 5 shows each component of external liability. Foreign portfolio investment in New Zealand is the fastest growing component among others. It has increased 146 percent from $28 billion in 1996 to $69 billion in 2006. Other foreign investment, mainly made up of bank deposits and loans, has been the second fastest growing component. It increased significantly from 1999 to 2000, and grew rapidly from 2004 onward. Compared with those two, foreign direct investment has had a modest growth rate. It has increased 34% from $48 billion in 1996 to $65 billion in 2006. The three components together resulted in an increase of 87 percent in total external liabilities, from $104 billion to $195 billion.

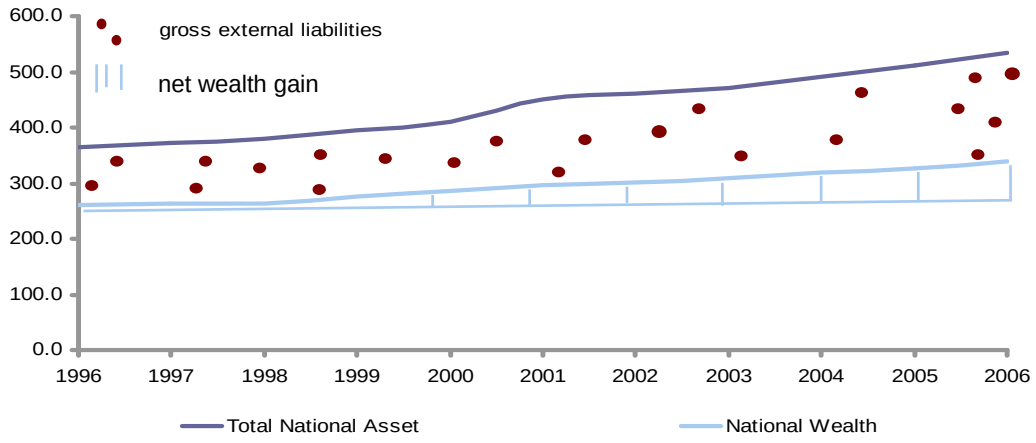
Table 6 – New Zealand: National assets, liabilities and wealth (in $NZ billion at 1995-96 prices)

Year	Total National Assets (1)	Total National Liabilities (2)	National Wealth (3)=(1)-(2)
1996	351.8	103.9	247.8
1997	358.9	109.2	249.7
1998	367.7	117.6	250.1
1999	380.7	120.0	260.8
2000	396.4	124.8	271.6
2001	436.5	155.2	281.3
2002	443.3	158.8	284.5
2003	452.2	160.2	292.4
2004	472.3	173.0	299.7
2005	490.7	183.8	307.1
2006	514.2	194.8	319.3

Note: For (1) and (2), see Table 5 and 6.

Table 6 summarizes the total national assets, total external liabilities and national wealth from 1996 to 2006. The national wealth has been accumulating gradually from 1996 to 2006 at an average annual rate of 2.7 per cent or a total of 30 per cent during the past 10 years. On the other hand, total liabilities grew from $104 billion to $195 billion or an annual growth rate of 6.7 per cent. However, the accumulation in national assets exceeded that of external liabilities in absolute terms, such that there was a significant increase in national wealth from 1996 to 2006 (Figure 6). The vertical distance between the total national assets and national wealth denotes for external liabilities (the dotted area). Below, the vertical line area shows the gain in national wealth. There was a significant increase in national wealth during the period despite the increase in external liabilities.

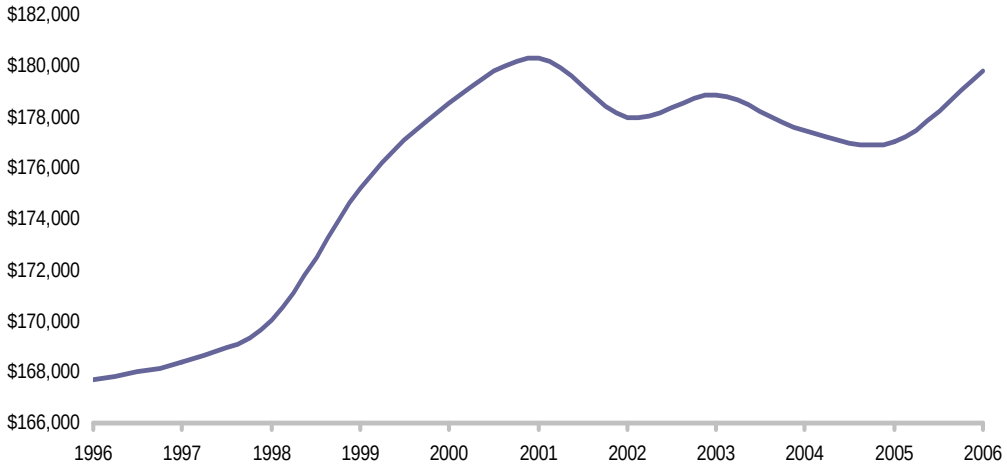
Figure 6 – Total assets and net wealth: $NZ billion in 1995-96 constant prices



Source: Statistics New Zealand

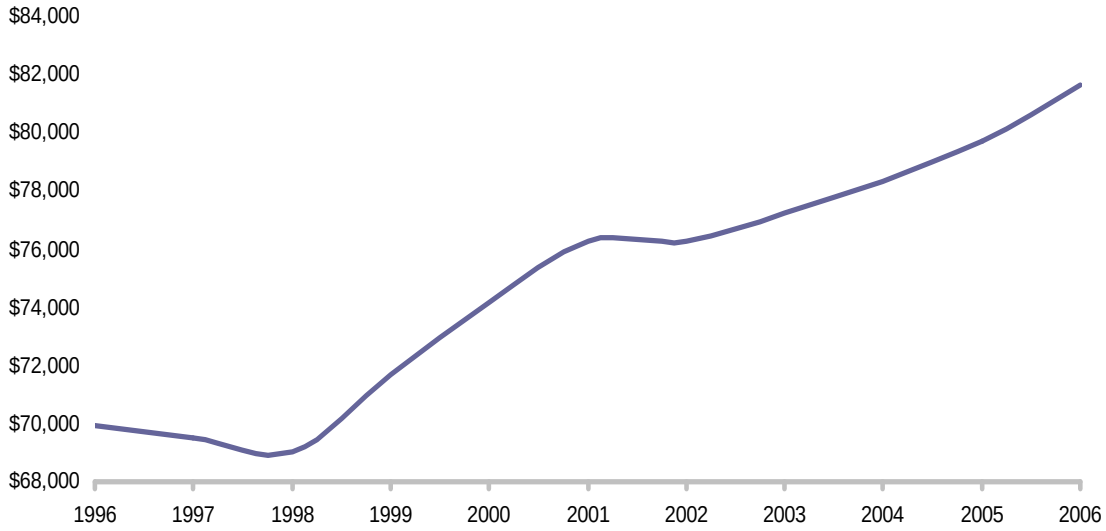
Figure 7 plots the national wealth per worker from 1996 to 2006. A sharp increase in the national wealth per worker occurred in the first half of the period – 1996 to 2001, followed by fluctuations from 2002 to 2006. By 2006 national wealth per worker was again at the 2001 level. The fluctuations from 2002 to 2006 reflect increases in the labour force participation rate. On the other hand, the national wealth per head has increased gradually from 1996 to 2006. The national wealth per worker and per head has increased from $168,000 and $70,000 to $180,000 and $81,000 respectively. This implies that every New Zealander was $11,000 "wealthier" in 2006 than in 1996 (or $14,000 in 2007 prices).

Figure 7 – National wealth per worker: $NZ billion in 1995-96 constant prices



Source: Statistics New Zealand

Figure 8 – National wealth per head: $NZ billion in 1995-96 constant prices



Source: Statistics New Zealand

In summary, despite the increase in external liabilities that has followed from New Zealand's use of foreign capital, net wealth has risen over the last decade both in aggregate and per capita.

6 Concluding comments

Periodically, concern is expressed about New Zealand's external account imbalance. However, what is sometimes neglected in this debate is the positive role that foreign capital inflows make to New Zealand's economic development. When foreign funds finance expansion of the domestic capital stock, the rise in external liabilities is matched by an increase in the level of plant, equipment, buildings and dwellings. In turn, this allows for greater production of output, economy-wide. Extra real capital therefore leads to higher national output per worker and a rise in real incomes.

In this paper we have estimated these national income gains using a growth accounting approach. This yielded average income gains of $2,600 per worker arising on a cumulative basis from capital inflow over the period 1996 - 2006.

Similarly, from a stock perspective, as long as foreign capital inflow contributes to an enlarged domestic capital stock, the increase in external liabilities is matched by higher fixed assets in the national balance sheet. By constructing a prototypical national balance sheet, we estimate that growth in the value of New Zealand's assets has greatly exceeded the rise in external liabilities to the extent that national wealth per head has risen by $14,000 in 2007 prices between 1996 and 2006.

The inference that the rise in external liabilities constitutes a macroeconomic problem implies that resident enterprises that have borrowed offshore to finance the acquisition of real assets have been acting imprudently, and have consequently put the economy at risk. Yet, in the case of foreign borrowing, borrowers, lenders and the institutions channelling the funds should normally be expected to assess whether the income stream generated through the use of foreign capital would be sufficient to meet future repayments.

The evidence presented in this paper is that the contribution of foreign capital has indeed been more than sufficient to meet the cost of borrowing. The contribution of this analysis is to dispel any fears that foreign capital may not have made a positive contribution to real national income. Any intervention which might limit the inflow, other things equal would result in New Zealand foregoing the real income gain that accompanies the use of foreign capital.

Unfortunately there are no available data to indicate the destination of foreign investment; this would add a richness to the analysis in future research. Likewise the currency denomination and maturity structure of foreign borrowing would be a valid area for further work, but lay outside the scope of this paper. In addition, our results are "partial" in the sense they do not develop a full counter-factual position in the absence of foreign capital flows. This would be a much larger undertaking requiring a more general equilibrium model for simulation.

We have abstracted from the explicit identification of the contribution of human capital to economic growth in order to focus on the contribution of foreign and domestic capital. The impact of investment in human capital would be incorporated in the contribution of productivity growth.

The evidence we present meets the necessary condition for long run sustainability; ie, that the additional income generated is more than sufficient to meet the higher debt servicing obligations incurred by the use of foreign savings. However, this does not necessarily constitute sufficient grounds to take a benign position with respect to the level of the foreign debt. Whether the stock of accumulated debt represents a potential problem for the stable evolution of the economy is a different question. Furthermore, these results carry no inference about whether the national savings rate is optimal or not. While recognising the real concerns that might arise from holding an "excessive" level of foreign debt, this paper has focused on the contribution of borrowing. Here the evidence is encouraging.

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Appendix

Domestic and Foreign Sources of Growth in National Income

International macroeconomic accounting dictates that an economy's current account deficit, or its use of foreign saving through net capital inflow or foreign investment, equals its investment- saving gap ($CAD = S^* = I - S$). Hence, increases in the domestic real capital stock are partly financed by domestic saving and partly by foreign saving ($\Delta K = I = S + S^*$).

Accordingly, a macroeconomic production function may be specified following Makin (2006) as

$$Y = f(A, K^d, K^*, L) \tag{1a}$$

where K^d is that part of the total domestic capital stock that has been funded by domestic saving and K^* is that part of the total domestic capital stock has been foreign-financed.

By totally differentiating this open economy production function, the sources of increased gross domestic product in the short run are shown to be

$$dY = f_A dA + f_K dK + f_{K^*} dK^* + f_L dL \tag{2a}$$

where f_i denotes the derivative of *Y* for $i = A, K^d, K^*, L$.

For economies that are net borrowers, national output and national disposable income diverge to the extent of net income paid abroad. Hence,

$$Y_n = Y - r^* K^* \tag{3a}$$

where Y_n is national disposable income and r^* is the effective servicing cost of foreign capital (inclusive of dividends) on external liabilities.

So,

$$dY_n = dY - (r^* dK^* + K^* dr^*) \tag{4a}$$

The effective interest rate paid to foreigners may vary from interval to interval as world interest rates fluctuate or as any risk premium varies through time.

From the above equations, the sources of national income growth can therefore be shown as

$$dY_n = \{f_A dA + f_L dL + f_K dK^d\} + \{f_{K^*} dK^* - (r^* dK^* + K^* dr^*)\} \tag{5a}$$

The first bracketed term includes domestic sources of growth whereas the second bracketed term includes foreign sources. Hence, national income gains can be attributed to domestic sources, dY_n^d, and foreign sources, dY_n^f, such that

$$dY_n = dY_n^d + dY_n^f \tag{6a}$$

Dividing through by national income,

National Income Growth = Domestic Contribution + Foreign Contribution

(%) (%) (%)

To estimate the net contribution of foreign capital, it is necessary from (5a) to derive values in real terms for each of the variables in the expression

$$(f_{K^*} - r^*)dK^* - dr^* K^* \tag{7a}$$