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New Zealand's Economic Growth

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ABSTRACT

This paper forms part of the Treasury's ongoing work programme investigating New Zealand's economic performance. It represents one approach to understanding New Zealand's economic performance, that of reviewing theoretical and empirical literature on economic growth. Other research approaches the Treasury is adopting to shed light on these issues include: monitoring New Zealand's total factor productivity performance; learning from overseas experience; and reviewing linkages between specific policy issues and economic growth.

The paper seeks to provide a synthesis of recent thinking about New Zealand's economic growth performance by reviewing international growth literature, and the views of commentators analysing New Zealand's economic performance.

The synthesis suggests that there are no obvious policy options that will dramatically improve New Zealand's growth performance, and this is consistent with international findings on the growth experience of industrialised economies. Growth is influenced by much more than Government policy, even if well formulated. Current policy settings seem broadly consistent with the literature's general conclusions on requirements for growth.

An important conclusion is that there are many potential contributors to growth. Typically, a small proportion of firms and industries contribute disproportionately to growth. The contribution of individual firms and sectors can change quite rapidly. Policy formation needs to take such a vision into account.

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Executive Summary

"What is the main thing Governments must do to spur economic growth? Ah, well, that remains a mystery."

The Economist (1999a)

The factors most likely to lead to higher rates of growth are not well understood internationally. In New Zealand's case, an assessment of our past growth record requires judgements about the counterfactual- the alternative growth paths that might have occurred under different policy scenarios. Looking to the future, judgements about New Zealand's potential growth performance involve identifying remaining constraints to raising performance (whether they be cultural, geographical, institutional, or historical), and determining which of these constraints may be influenced by government policy.

This paper is part of the Treasury's ongoing work programme investigating New Zealand's economic performance. It seeks to provide a synthesis of recent thinking about New Zealand's economic growth performance. It represents one approach to understanding New Zealand's economic performance, that of reviewing theoretical and empirical literature on economic growth. The Treasury is adopting other research approaches to shed light on these issues, including:

- monitoring New Zealand's total factor productivity performance [for example, refer Treasury Working Paper 99/3 'Measuring NZ's Productivity Performance by Denis Lawrence and Erwin Diewert']
- learning from overseas experience through country case studies [for example, refer Treasury Working Paper 98/1 The Irish Economy: Lessons for New Zealand? By Sarah Box and 00/1 Finland and New Zealand: A Cross Country Comparison of Economic Performance]
- reviewing the significance for economic performance of specific policy areas or issues. This review work is incorporated into Treasury's standard policy advice, but also includes more in-depth consideration of specific issues [for example, refer 99/6 Economic Integration and Currency Union].

The Treasury's current work programme to address economic performance includes the following topics:

- The relationship between New Zealand's national saving rate and economic growth;
- The relationship between macroeconomic policy and economic growth;
- The implications for economic performance of New Zealand's small size and geographical distance from overseas markets; and
- Business dynamics.

Purpose of this paper

The purpose of this paper is to help assess the effectiveness of the broad New Zealand strategy for growth, including understanding why economic growth has been less than was hoped for at the outset of the major reform process in 1984 and drawing tentative conclusions from this material about future policy priorities.

The approach taken is to first review international theoretical and empirical growth literature to help determine what factors might explain New Zealand's performance. The performance is then reviewed. This material is used to draw conclusions about what has been driving New Zealand's growth, by reviewing the work of analysts who have been in a position to take a continuous overview of developments. Policy actions that might improve New Zealand's growth are considered and further possible areas of research are suggested.

In this paper, growth normally refers to the rate of growth of per capita GDP, a measure associated with our underlying concern, welfare.[1] If incomes can grow through one-off growth in income levels over time, that can also contribute to welfare. In practice, the distinction between one-off growth in income levels and ongoing growth is difficult to draw and not always important

Findings from International Growth Literature

There is no international consensus about appropriate theoretical models. Neoclassical growth models suggest that accumulating factors, such as capital, labour and human capital, should raise output levels over time but with diminishing returns which in the long term mean that any burst in growth from additional factor accumulation will be temporary, even if leading to a higher income level. Growth can be boosted persistently through exogenous factors such as improvements in technology.

Endogenous growth models suggest that growth may be able to continue indefinitely, with contributions from phenomena such as technical change being embodied in the capital stock; human capital investments; R&D spillovers; economies of scale or increased specialisation in intermediate inputs.

Other theorists suggest that the nature of the institutions and culture in a society, the role and size of Government; openness to trade; the extent of competition; geographical factors; macroeconomic conditions and many other matters may contribute to growth performance.

Empirical research sheds some light on these matters. It comes from a variety of sources, including case studies, historical work and particularly cross-country studies. The latter suffer from data problems, omitted variables, instability in results with minor model variations; comparison of non-comparable countries;

[1] Definitions of key terms used in the paper are provided in section 2.

undue influence of outliers, difficulties in determining the direction of causality when relationships are found and other problems. Despite these difficulties and despite a lack of overall consensus in empirical work, there are areas where most researchers tend to agree on the conditions associated with growth. Although uncertainty remains high and there is no such thing as an off the shelf growth formula, the following factors emerge:

- Theoretically, growth in savings and capital investment and human capital, should boost growth in per capita income.
- The role of education is somewhat ambiguous in empirical studies but it can make a positive contribution.
- Innovation, in areas such as marketing and organisation and the diffusion of technology, as well as R&D, is particularly important.
- Institutions such as the rule of law and established property rights are important.
- Cultural factors can make a difference, although they are not well understood.
- Trade openness and domestic competition appear to help growth.
- Geographical factors including national location and scale of population are important. Being isolated from large population masses and having small cities does not help.
- Macroeconomic stability helps, although maintaining very low rates of inflation, under say 2% to 3% is not critical.
- The balance of studies tends to suggest lower Government expenditure and tax to GDP ratios help economic performance. However, increases or decreases in the size of government within the range in which New Zealand currently stands (ie 30 – 40 percent of GDP) is unlikely to be particularly important. The quality of government expenditure and effectiveness of government regulation is more likely to influence performance.
- Some factors that help growth in developing countries are probably not particularly relevant to understanding New Zealand's performance, given New Zealand conditions. These include levels of inequality, financial intermediation and democracy.

New Zealand's Growth Performance

New Zealand's per capita GDP growth since 1987 has not been high, at 0.67% per annum on a peak to peak basis. The GDP boost after 1992 was accompanied by high population growth.[2] Some of that growth in per capita terms was simply making up lost ground from the 1990 to 1992 recession.

[2] OECD (1999) contains a fold-out table comparing statistics for various OECD members. Leaving aside an anomalous German figure, this shows only Mexico, Turkey, Luxembourg, Australia and Canada exceeded New Zealand's annual population growth rate of 1.1% in the 10 years to 1996. Although New Zealand enjoyed amongst the higher GDP volume growth rates over the five years to 1996 at 3.7%, countries such as Ireland, Korea and Norway enjoyed high GDP growth and lower population growth rates than New Zealand.

Allowing for increased factor payments abroad, with a measure such as GNI (Gross National Income), would reduce the growth further, although leaving it positive.

The evidence of low growth may understate New Zealand's achievements in welfare terms. Welfare improvements arising from lower prices, increased choice, better product quality and services growth are not fully picked up in GDP statistics. Measured value added before the reforms was probably boosted by price distortions caused by protection from foreign competition. Given that New Zealand has tended to have more reforms than most OECD countries since the 1980s, and that the benefits of reforms may tend to be understated in GDP measures, New Zealand's performance may be slightly better than measured in its growth rate.

Growth and output levels at the start of the 1980's were boosted by unsustainable policies, such as Government borrowing, now mostly unwound.

Encouragingly, total factor productivity and growth did improve in the 1990's. However, OECD and Treasury projections do not suggest that New Zealand is likely to close the gap with average per capita OECD incomes. Of course, matching OECD growth rates would be a worthwhile achievement and better than New Zealand's historic performance.

Reasons for Moderate Post Reform Performance and Major Policy Points

There is little reason to have expected New Zealand's recent growth performance to be outstandingly high, at least compared with other OECD countries. The reasons are given below. Significant, but tentative, policy points are included in Italics.

- Any tendency for New Zealand to converge to higher incomes could be expected to be weak given New Zealand incomes are still around 80% of OECD levels. There is no obvious, large technology gap able to be bridged with the transfer of technology from wealthier countries, little unproductive labour to transfer to a high productivity sector and no large, adjacent high-income area for New Zealand to integrate into.

- Distance from markets makes it more difficult to develop business relationships and participate in innovative activity.

- Having a small, isolated population makes it difficult to achieve economies of scale in many areas. This may impact more upon New Zealand's ability to close the income gap with wealthier countries than on the growth rate itself.

- We should be cautious in following industry policies or development approaches that appear to work overseas but in very different geographical or scale settings.

- Isolation, coupled with existing industry strengths, increases the chances that resource based development will be an important part of a successful growth strategy for New Zealand. Resource based industries are generally less affected by distance from major markets.

- Isolation raises the possible pay-off of policies that help overcome the effects of distance and scale.

- Research and consideration should be given to policies that might reduce the effects of national boundaries, reducing isolation and scale effects.

- If economic growth is given a high weighting in the policy mix, supportive policies towards urban development could be appropriate.

- The full results of reforms are often seen as slow to emerge, given the deep-seated changes required in structures, attitudes and responses.

- The full benefits of New Zealand's economic reforms since the mid-1980s are still probably coming through.

- New Zealand's population growth has been fast compared to OECD countries in the post-war period and still relatively fast in the 1990s. Faster population growth tends to be associated with somewhat slower per capita income growth, possibly through a diminishing returns effect.

- While the proportion of people in tertiary training has increased substantially, skill levels are still not high by OECD standards and any pay-off could reasonably be expected to be longer term.

- Human capital investment, including through education, seems likely to be a contributor to output levels and growth although the precise contribution is uncertain. The pay-off may not be dramatic, may vary and there may be diminishing returns. Careful assessment of specific human capital investment opportunities is desirable.

- New Zealand generally has the sorts of institutions seen as most important to growth, including property rights; Courts and a developed finance sector.
- Lifestyle considerations may limit some New Zealanders' ambition.

- Cultural issues could usefully be investigated further to see if there are implications for growth or opportunities for measures to promote growth here.

- New Zealand seems to have been investing in line with the OECD average. Capital has not been accumulated at a rate that would suggest high growth should be expected, say on the historic scale of East Asian

countries. Much capital investment has been foreign sourced, with positive benefits to GDP, but a lower proportionate return to New Zealand income levels. Improved returns to capital since 1992 are more promising for growth, being consistent with improved investment quality in the post reform period.

- Savings have not been high, either in the past with large Government deficits, or more recently with low household savings.

- Increasing savings and investment rates may boost per capita income growth, provided average rates of return were achieved through generating an environment that secures suitable investment quality.

- Macroeconomic policy changes since the reforms and current settings and achievements have been broadly positive for growth.

- It seems plausible that several large, sustained appreciations in the real exchange rate have inhibited exports and import substitution. However, monetary policy is a difficult policy instrument to manage and inflationary expectations have been persistent.

- Minimising sharp real exchange rate peaks looks to be important and now possibly more feasible, given current inflation expectations. Avoiding net fiscal stimulation when the economy is strong could help this.

- New Zealand does not seem to be exceptional in its total tax take or expenditure. There is no clear evidence that these have a substantial effect on growth at present levels.

- The overall weight of analysis seems to indicate that a slightly smaller proportion of Government expenditure or taxation to GDP would be beneficial for growth, but this is not a strong conclusion.

- The predominant view amongst New Zealand analysts appears to be that microeconomic reforms have improved New Zealand's growth prospects. A small market however produces less pressure for improvement than larger overseas markets. New Zealand's competition law may have imposed a lesser degree of restraint on restrictive practices than some overseas regimes.

- Innovation is agreed to be a particularly important driver of growth.

- There is little clear evidence on industry policies. Much of Porter's advice looks realistic: improve infrastructure; focus Government research programs on opportunities; encourage successful clusters; and facilitate new business formation. These approaches reinforce success within a

well-developed set of economy wide policies, to be distinguished from selective interventions.

- Microeconomic reform should continue in areas where probable benefits to growth and static benefits can be identified.

- Investing in the "right" sectors, viewed retrospectively, does seem to be important. However, we should be very wary of following models that suggest quick, easy pay-offs from selecting sectors likely to prosper.

- Policies towards innovation should focus on innovation its widest sense, not just on R&D.

- There is still much promise in resource based development as part of market led development. Resource based development can involve sophisticated products, not just unmodified commodities moving towards the end of their product life cycle. It has a good productivity track record, there are opportunities to apply sophisticated knowledge, and New Zealand has strengths in the area.

- Measurement issues bedevil analysis of New Zealand's growth performance. GDP does not represent national income well, does not reflect the per capita position and nor does it represent welfare. Services output is not well measured. Reforms may have resulted in output being understated

- Improvements in national accounts and growth measurement should continue.

General Conclusions

This synthesis has not suggested that there is much new, low-hanging fruit to be plucked in bolstering New Zealand's growth performance. Such a result should probably not be expected. Intense policy analysis has been put into the reforms undertaken over the last 15 years, which have been broadly in line with the firmer conclusions about what sorts of conditions are most likely to generate growth in mainstream economic literature.

An important conclusion is that there are many potential contributors to growth. These include investment in physical capital, human capital and innovation. Typically, a small proportion of firms and industries contribute disproportionately to growth in a large variety of ways. The players involved can change quite rapidly. Policy formation needs to take such a vision into account.

Even if all the basic conditions seem right, growth is not guaranteed.

In many areas, policies now being followed seem broadly consistent with the requirements for growth, including both macroeconomic policy settings and microeconomic decision making.

However, growth is influenced by much more than Government policy, even if that policy is well formulated. Many choices important to growth are largely in the hands of individuals and firms rather than Government. For example, the extent of entrepreneurial risk-taking depends on individual business decisions. Governments may help to create a more certain business environment, but are limited in their ability to influence individual firm behaviour.

1. Introduction and Conclusions

This paper seeks to provide a synthesis of recent thinking about New Zealand's economic growth performance. It considers what that performance is, its key drivers, why the growth performance has been moderate and possible policy actions that might improve it. The New Zealand material considered is mainly limited to authors who have examined broad aspects of New Zealand's growth over a period of time. These views are examined within the context of international theoretical and empirical literature on growth.

Purpose

The purpose of the paper is to help assess the effectiveness of the broad New Zealand strategy for economic growth[3] by:

- Reviewing the theoretical and empirical literature on growth, with particular emphasis on New Zealand writings
- Reviewing the growth outcomes achieved in New Zealand since the period of major reforms commenced in the early 1980s, both at an aggregate level and in terms of the main factors identified as contributors to growth performance in the international growth literature
- Understanding why economic growth has been less than was hoped for at the outset of the major reform process[4]
- Drawing tentative conclusions from this material where possible about policy implications.[5]

Motivation

With some justification, commentaries on New Zealand's economic performance have long expressed concern about New Zealand's economic growth rate. Before the foreign exchange crisis of 1984 heightened New Zealand perceptions, Olson (1982) included a table in his analysis showing New Zealand to have the third lowest per capita GDP growth rate of 18 high income countries in the 1950s and lowest growth rate in the 1960s. It is clear that per capita income has slipped relative to other OECD countries over the last half century.[6]

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[3] Growth and other key terms such as National Income, technology and productivity are defined in section 2.

[4] Lawrence and Diewert (1999) for instance ask "Why has New Zealand's recent measured productivity been lower than anticipated by many?"

[5] It should be noted that any conclusions drawn are incidental to the earlier analysis. In every case, further work is likely to be necessary, preferably within a framework specifically designed to test the tentative ideas suggested here.

[6] See Figure 3. Figures and Tables are placed near the back of the paper, ahead of the bibliography.

Achieving higher per capita incomes is important for a raft of reasons. These relate to levels of income rather than growth per se. Higher real incomes are more likely to:

- satisfy New Zealanders' aspirations
- meet demands for publicly provided services such as health and welfare support
- support initiatives to improve the broader New Zealand living environment
- allow greater scope for a more equal income distribution[7]
- provide incentives for highly skilled individuals to remain in New Zealand

Sustained, modest, compounding increments to the growth rate can potentially lift future income levels substantially. A 0.5% lift in the growth rate could lift income levels by 10.5% after 20 years or 28.3% over 50 years. This suggests the desirability of focussing policy attention on factors that influence growth rather than on one-off, static improvements to income levels, although these are undoubtedly still worth pursuing. Thus, this paper is mainly concerned with New Zealand's growth rate performance rather than its performance across a wider range of indicators. The vexed question of growth rates versus changes in levels of income is discussed further below in Part 2.

This is not to say that indicators other than growth are unimportant. Traditionally, accounts of economic performance have been concerned with at least four such variables: inflation, the current account, unemployment and income distribution. A reasonable case can be made that at least the first two of these are subsidiary targets in the pursuit of growth. A substantial lift in growth is likely to bring some improvement in the latter two and at minimum, more opportunity to address them through Government policy.

Methodology

The methodology of this paper involves the following steps:

- *Reviewing briefly recent international writings on economic growth, with a view to identifying the most widely agreed elements within those views about what drives economic growth*

The literature is vast and has certainly not all been reviewed. Rather, the approach has been to identify reasonably comprehensive surveys written over the 1990s. This included material by earlier Treasury officers concerned with growth, to avoid duplication as well as more current material in economic

[7] Higher overall New Zealand incomes can be seen to support greater equality in several ways. Top New Zealand incomes are likely to be less strongly pulled up above lower incomes by high paying foreign job opportunities. Governments are probably in a stronger position to implement redistribution policies with a higher income base, rather than one where international competitiveness depends more strongly on low relative wage levels. Income growth also appears to be associated with lower unemployment, based on New Zealand's 1990's experience.

journals. Both theoretical and empirical literature are covered, but with a greater emphasis on empirical literature, in an effort to identify elements of consensus which relate to the international experience of growth. Particularly useful surveys have included Gorringe (1990), Janssen (1995), Temple (1999) and Poot (1999). There is of course no complete consensus in any area and many unresolved debates remain. The judgements about consensus are largely those of the survey authors cited in the paper, but in unattributed cases represent the author's judgement about concensus.

Some limitations were made to contain the scope of the material reviewed and keep the size of the paper manageable. Specific areas with only limited caverage for this reason include:

- Alternative approaches to measuring welfare
- The microeconomic foundations of growth models
- The effects of specific regulatory interventions on growth
- The effects of taxation on growth

- *Identifying New Zealand material written on economic growth since 1990*

A limited amount of material has been written about growth directly. Much more has been written about wider aspects of New Zealand's economy, particularly about the details and success or otherwise of the reforms collectively or individually. This material has included a great deal on New Zealand's growth performance, but it is only that material, not material on the reforms themselves that has been the focus of this report. Wider economic histories such as that of Gould (1982) and Easton (1997) are also useful in dealing with growth while dealing with many other issues. Again, it is their comments on growth that are of interest.

The subject of growth itself is so large that limitations are required on the paper's scope to keep it manageable. The boundaries for this paper exclude most writings prior to 1990, on the grounds that important aspects are likely to be summarised in writings reviewed later. New Zealand writings with an overseas focus are generally excluded. Writers who take a broad view of the economy, rather than analysing particular industries or aspects of performance such as monetary, fiscal or competition policy, are the main focus. Their views are summarised in Appendix A. Overseas authors without regular contact with New Zealand, lobby groups and non-economists are generally excluded. Institutional views, where the authors remain anonymous, are generally given less weight than the views of individuals who may be seen to have some independence.[8] This approach risks excluding important analysis that touches on growth, but equally helps by focusing on well considered, independent views, formed by authors with a depth of experience.

[8] An exception is made for Treasury post-election briefings.

Inevitably, the approach has been relaxed where analysts have made important points, or conducted research, which New Zealand economists have barely touched upon. The approach was also relaxed to include several key documents written around 1984, to identify thinking about growth at the outset of the period of major economic reforms. These included Gould (1982), Treasury (1984), Blyth, Hawke and Smythe (1984) and Franklin (1985).

Even with all these limitations, the material reviewed was further limited by concentrating on more recent, wide ranging surveys or works that could be expected to summarise many more narrowly focused studies. Potential source material was selected from the New Zealand Economic Papers, including lists of working papers; the NZIER's web site; EconLit; and major overseas journal articles. Searches have focused on the word "growth" and inevitably, some material that did not refer to growth directly in its title will have been missed. A useful, comprehensive bibliography of New Zealand material is contained in Dalziel and Lattimore (1999), which served as a check on whether significant literature had been identified.

- *Summarising the approach and findings of the authors concerned*

The summaries of writers' views are brief, as might be expected given the large amount of material traversed in the paper. It is acknowledged that to be fair, analysts' arguments need to be seen in their entirety. Sometimes, in dealing with New Zealand's growth in a broad way, the analysts themselves are likely to have summarised their conclusions, risking elements of their arguments being overlooked. The risk should be small, as it is in the analysts' interests to present the essential elements of their arguments.

- *Offering comment and assessment of the arguments, with a view to identifying elements contributing significantly to New Zealand's growth performance.*

The framework for assessing the arguments put forward about New Zealand's growth has been to examine:

- the consistency of the views put forward with any wider international consensus which may be available
- the degree of consistency of analysis offered within New Zealand by New Zealand analysts. Sometimes, however, there may be only a few analysts dealing with specific issues, given New Zealand's size. Meaningful comment is then not possible on consistency with the New Zealand literature.
- any obvious inconsistency with New Zealand data
- any obvious questions about the soundness of the analytical frameworks used.

The examination of the last two points is necessarily limited because of the amount of literature reviewed for this paper. The trade-off between depth and

bread has been moved towards breadth. Comments made within the New Zealand literature about papers reviewed have been drawn upon where these are available.

Evaluating the many arguments encountered has required care to ensure different arguments, drawn from different contexts, were dealt with within the frameworks envisaged by the many different authors concerned. It may help readers to point out that the analysis of New Zealand performance by different authors variously canvases the following:

- How should the outturn New Zealand experienced be measured?
  - What is the appropriate welfare indicator?
  - How well is any available indicator actually measured?
  - What counterfactual should any results be measured against? (Some arguments revolve around what New Zealand would have achieved if particular policies had not been undertaken, but it is difficult to agree on what the alternative path would have been.)
- What influences drove the actual result experienced?
- What policies should have been followed?

This paper attempts to ensure that the framework used is clear in each section of the paper, but readers should also be aware of the need to distinguish the different frameworks used by different authors.

2 Definitions

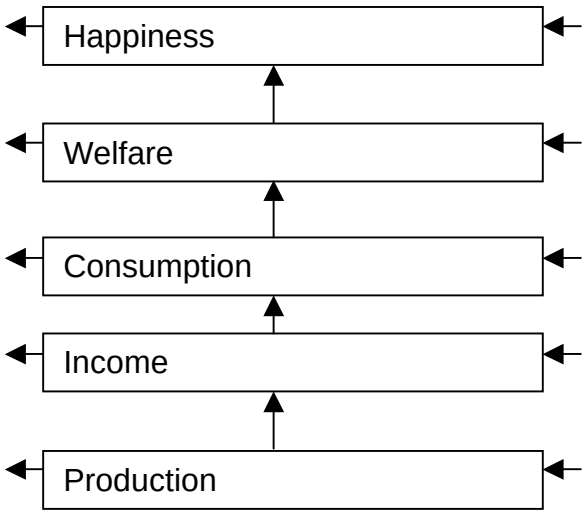
Several key terms are used through out the paper. These include growth, national output measures such as GDP and GNI, welfare, technology and productivity. Their use in the paper is clarified below.

Welfare

At the heart of the paper is a concern with the welfare of New Zealanders. This is a somewhat elusive concept, often left undefined in papers about economic growth. In economic dictionaries, where it is also hard to find a straightforward definition, welfare is typically said to relate the utility of a population, with possible extension to include the concept of happiness (Pearce 1992). For the purposes of this paper, welfare should be taken as the well-being or utility derived from consumption of economically valuable goods and services. These need not be traded in markets. Services provided to household members within the household are unlikely to be traded but add greatly to welfare. Services may also be economically valuable without having a positive, explicit price. For example, a Government may provide free access to parks or a reduction in pollution levels, which contribute to welfare. Such services could have a shadow price imputed to them but have no explicit, positive market price.

A simple diagram representing economy-wide aggregates may help to show the connections between welfare and various economic aggregates:

Links Between Welfare and Economic Aggregates



The vertical arrows show the movement from more tangible concepts to less tangible. Production generates income after deducting elements such as factor payments abroad, discussed further below. Income in turn produces

consumption, with a deduction of savings. Consumption leads to welfare, which is then one influence on happiness. At each level, however, other influences affect the relationship, shown by additional horizontal arrows pointing to and from each box. This makes the vertical linkages somewhat murky, especially with the two more intangible concepts at the top of the diagram.

The diagram also illustrates the analytical steps required to evaluate economic performance at several levels. Several different issues emerge, including:

- Choosing a measure, in this case, one that gets conceptually closer to welfare, with better measures being towards the top of the diagram
- Practical difficulties in attaching numbers to the definition chosen, with increasing difficulty in moving towards the top of the diagram. These can involve both the methodology of measurement and difficulties with implementing the methodology.

There is room for extended normative debate at this point. Just what should be included in a definition of welfare? Can we aggregate the welfare of individuals and households in a satisfactory manner to derive a concept of national welfare? What criteria should be used to judge whether welfare has been increased if there is a change in policies?

To keep an already lengthy paper manageable in size, these issues will simply be left aside, by making some key assumptions. First, the links from production to welfare are at least strong enough to be able to analyse effects on welfare on the assumption that production changes will influence welfare. Secondly, at least in principle, growth in consumption over time is at least capable of being shared by all New Zealanders, through both market mechanisms and income redistribution policies. Distributional aspects of welfare, although important in Government policy, will accordingly be left outside the scope of this paper.

Economic Growth

For this paper, economic growth means the rate of increase of a national income aggregate, usually GDP, as measured in national accounts between any two points in time. In some instances, it might be preferable to refer to a trend rate of change in output, as either of the two points in time might depart from the trend, because of cyclical factors or one off influences such as droughts. References to economic growth in this paper will normally be abbreviated to “growth”.

Growth should preferably be measured on a per capita rather than a total basis to capture the effect on welfare, the ultimate concern. For New Zealand since 1991, however, the distinction is not always crucial, as the two have been sufficiently correlated to for movements to have the same sign each year.

It is important to clarify the distinction between changes in income levels, which might be a one-off effect and ongoing changes in the rate of increase in national

income. The distinction is clearly important for theoretical modelling and may potentially have implications when drawing conclusions from empirical work. If policy measures aimed at raising the growth rate have the effect of raising only the income level achievable, then in theory, it might be possible for the policies followed by a Government to raise welfare less than expected. For example, in the Solow-Swan model discussed in Part 3, raising the rate of savings may simply raise the steady-state level of income achievable, because of diminishing returns to capital accumulation. After a prolonged period of saving, the additional saving is matched by a higher amount of depreciation. A temporarily higher growth rate while the saving exceeded depreciation gradually diminishes until there is a "steady state" level of income, consistent with the increased, but no longer growing stock of capital now available.

For the most part, the paper will be concerned with changes in the economic growth rate, not a one-off change in levels. However, as the ultimate concern of the paper is with welfare, one-off rises in income levels are also of interest as they can also make a large contribution to welfare. The approach taken here will be to identify specifically when one-off changes to income levels are being referred to. Otherwise, references to growth are to growth rates.

In empirical work, the distinction may be very difficult to draw. A theoretical one-off rise in levels caused by a particular policy may well take years to have full effect while changes in the structure of the economy over time may completely alter a theoretical growth rate that is otherwise expected to be ongoing. Temple (1999), in summarising the conclusions from a review of recent empirical work, ultimately provides a useful perspective for policy work:

> "Either growth is endogenous or it is exogenous[9] and level effects are large. Given the presence of large level effects, distinguishing between exogenous and endogenous growth models is not as pressing as it might seem. The important point is that policy can have a major impact on a country's level of welfare. As pointed out earlier, the debate on whether policy affects the long-run growth rate or just the steady state level of income is almost impossible to resolve, and not much of practical importance will turn on it."

The main focus of the paper is on sustained growth in national income levels over long periods, typically twenty years or more. This generally excludes from analysis the spurt of growth typically achieved in the trough to peak growth phase of a business cycle, although growth achieved over a whole cycle is of interest. It also excludes a medium term, unsustainable boost to demand, even if it lasts over several business cycles. It is quite possible sustain income levels through overseas borrowing or government guarantees to fund consumption and low return investments, as New Zealand did over several business cycles from the mid 1970's to mid 1980's. Ongoing accumulation of debt for such

[9] See Part 3 for the meaning of these terms.

purposes is plainly not sustainable and the resulting growth is of little interest in this context.

The long-term focus of the paper makes it appropriate to ignore quarterly trends. In fact, examining these could be positively harmful in a long term analysis, as it is easy to succumb to the temptation of attributing long term characteristics to short term fluctuations.[10]

National Income Measures

The definition of national income also requires comment. Almost all New Zealand growth analysis has focused on GDP, the most readily available statistic from Statistics New Zealand (SNZ) and the focus of most international work on growth. GDP measures the production of final goods and services in the economy and is conceptually equal to GNE, the sum of all final expenditures by New Zealand residents if trade is balanced. However, it does not measure income available to New Zealanders, which is conceptually more relevant to the concerns motivating this paper. Gross National income (GNI), formerly labelled as Gross National Product (GNP), is probably a better fit with the concepts of this paper.[11] It measures net income earned by New Zealand residents from the ownership of resources, whether in New Zealand or abroad.

As New Zealand's GNI has slipped significantly compared to GDP in recent years, with an increase in factor payments abroad, the choice of measure is a significant issue.[12] SNZ however does not produce real GNI data, limiting the usefulness of the concept. It does produce real gross national disposable income (RGNDI) data, having first released the measure in December 1998 in SNZ (1998). This measures the real purchasing power of national disposable income, taking into account changes in the terms of trade and net transfers received from abroad. It is certainly a better measure of welfare, as it comes closer to capturing the income available for consumption purposes and is conceptually suitable for this paper. However, it suffers from being little used in previous studies. Its use here would add further complexity to an already complex analysis, by including trends in transfers and the terms of trade. The best approach appears to be to use GDP and acknowledge that the adjustments to get to RGNDI concepts also need to be taken into account in considering welfare.

Recent trends in real GDP per capita and RGNDI per capita are shown in Figure 1 to illustrate the differences in the measures and that different measures can evolve quite differently over time.

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[10] Bayliss (1994) for instance suggests that higher terms of trade have often been taken as permanent and attributed to Government policy.

[11] The new terminology was adopted after a revised international standard for National Accounts, SNA93, was adopted, to better reflect the concept as an income measure.

[12] While use of GNI produces a lower income result for New Zealand than GDP, the reverse is true for net creditor nations. Use of GDP for international comparisons thus doubly understates the income gap between such countries and New Zealand.

There is clearly a close relationship between per capita RGNDI and per capita GDP, with significant growth in both from 1992 to 1998. The gap between them widened from 1993 to 1998, driven by a net increase in factor payments abroad from $3064 billion to $6839 billion and a 3.8% decline in the terms of trade. Transfers, which are net payments to New Zealand over the period, are relatively small although they have grown over the period.

Having settled on GDP as the primary measure of economic performance, further limitations on its use as a measure of welfare must be acknowledged:

- GDP measurement errors[13]
- excluding the value of unpriced activity from GDP
- excluding various aspects of welfare, such as the value of human interactions or happiness.[14]

These limitations are sufficient to raise questions over whether welfare is at all well measured by GDP or GNI. The limitations are particularly severe in comparisons across long periods of time or across national borders. However, such measures are for most analyses the best measure likely to be available. Results derived from GDP comparisons also seem to be correlated with a wide range of other intuitively appealing indicators, including consumer goods ownership, infant mortality and life expectancy.[15]

Technology

Technology in this paper refers to the whole set of processes used to convert raw materials and factor inputs, such as capital, labour and human capital into outputs, which are then aggregated to constitute National Income. This economic concept refers to management and organisational practices as well as the engineering transformation of raw materials into outputs more commonly seen as constituting technology in everyday usage of the term.

Innovation is a term closely linked to technology. In the paper it refers to any improvement in technology that produces more output with the same amount of inputs.

Productivity

Productivity is a relative concept, referring to the to the change over time in the amount of output produced from a given volume of inputs. Alternatively, a productivity index can be seen as the ratio of an index of output growth divided

[13] Lawrence and Diewert (1999) list a large number of measurement problems in chapter 7. These measurement difficulties are also discussed in more detail in Appendix B.

[14] Hazledine (1998) argues that ignoring these social capital factors has lead to a major misdirection of New Zealand economic policy, ultimately depressing GDP as well as welfare.

[15] World Bank (1998/99), pp 186-248 contains many indicators grouped according to country income levels.

by an index of input growth. The most straightforward concepts involve partial productivity indicators that relate output to just one input, such as labour. An example of a labour productivity measure could be GDP divided by employment measured in hours. Total factor productivity, the measure most often referred to in this paper, in contrast relates output to all inputs being used. In this case, the concept requires an assumption to be made about the functional form of production within the economy.[16]

[16] Lawrence and Diewert (1999) provide a detailed survey of productivity measurement techniques.

3 Theoretical Frameworks and International Empirical Work

Many theoretical frameworks underpin the various analyses of New Zealand's growth performance that will be considered in this synthesis. Before moving to consider these writings, it is worth providing a sketch of some of the major analytical frameworks influencing analysis of growth and what appears to emerge from international empirical studies of what generates growth.

This brief sketch can hardly do justice to the vast theoretical growth literature. However, it can alert us to the sorts of factors we should be looking for in seeking an explanation of New Zealand's growth performance.

Neoclassical Model

The starting point for much theory and empirical work on growth in developed economies is still often the neoclassical model first developed by Swan (1956) and Solow (1956).[17]

Profit maximising firms are typically assumed to use publicly available technical knowledge, in competitive markets to convert inputs usually labour and capital into output with a production function. Often this takes the Cobb Douglas form:

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

where Y = output, A is the level of technology, K = capital, L = labour and α is the capital share of factor income.

The key concepts associated with this model are:

- Accumulating inputs such as capital or labour should raise output levels
- Accumulating inputs such as capital through saving does not benefit the long run growth rate of output, because of diminishing returns to input factors.
- Growth following a lift in factor accumulation, such as a lift in saving, occurs only during the transition towards the next equilibrium, although under plausible assumptions, it might take many years to complete.
- Achieving higher growth permanently requires an increase in the level of technology, determined exogenously. Much empirical work has attempted to measure or explain the factors that might contribute to "technology", including growth accounting work, which decomposes growth into contributions from factor growth and a residual, taken to represent growth

[17] Gorringe (1990) provides a useful summary of the key assumptions. Janssen (1995) also provides a good summary of the properties of this and other growth models.

in technology. The relative importance of these in New Zealand is illustrated in the work of Treasury (1996a).[18]

- Assuming the same level of technology is available across countries, then other things equal, income levels across countries should converge over time. Most researchers expect such convergence to be 'conditional' only i.e. found only with a model taking account of the contributions of a large number of other influences.
- The model provides little guidance as to how Governments might influence the long run growth rate.

The major shortcoming seen with the model is that technology as the key contributor to growth is exogenous rather than explained within the model. Poot (1999) suggests that the Solow-Swan model continues to play a prominent role in thinking about growth and indeed starts his own synthesis of empirical research on the impact of Government on long run growth by referring to the model.

The attractions of the model have probably been reinforced by empirical analysis suggesting that it still has some explanatory power. For example, Mankiw, Romer and Weil (1992) suggest that when human capital is added as a factor in the model, it performs well in explaining cross-country variations in growth rates. Temple (1999) suggests it provides a simple theoretical framework for growth regressions but performs less well with more comprehensive measures of human capital than the years of secondary schooling originally used by its authors. He also suggests that the models assumption that investment rates are exogenous is an unsatisfactory feature.

For New Zealand, for the model to perform well, it would need to be extended to provide for external economic relationships, including possible balance of payments effects and terms of trade effects.

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[18] For illustrative purposes, Treasury (1996a) suggests that as of March 1996, potential New Zealand growth could be around 3.3% pa, derived from the growth accounting equation and taking the following values:

GDP growth rate = 0.6 x 1.4% + 0.4 x 2.4% + 1.5% = 3.3%
(labour) (capital) (TFP)

Here, the capital share of income (α) is 0.4. Current Treasury thinking is that these projections are too high, with GDP growth of 2.5%, TFP growth of around 1% and labour growth of around 1% per annum being more appropriate. This reflects both recent experience and coming closer to the period where demographics produce a slower labour force growth rate.

Endogenous Growth Models

Gorringe (1990) and Janssen (1995) provide summaries of these models.[19] In essence, these were developed in the 1980's, given dissatisfaction with the assumption that factors influencing growth were exogenous (outside the model) and hence not well explained in neoclassical models. In contrast to neoclassical models, endogenous growth models tend to imply that various influences can impact upon the growth rate, not just income levels.

There is tremendous variety in these models. Many insights are offered into growth processes, which are undoubtedly mirrored in instances of real world experience. A valuable feature is often the emphasis on underlying microeconomic features, such as firm behaviour, providing some linkages between macroeconomic and microeconomic features. It is beyond the scope of this paper to fully describe these models. It is important to acknowledge, however, that microeconomic level behaviour is always a critical component of growth experience, at both the levels of industries, firms and individuals.

It is also important to recognise that the dynamics of behaviour at microeconomic levels can be critical to growth. This point is made forcefully by Harberger (1998). He points out that within industries and firms, typically only a small proportion of players contribute a large proportion of the growth experienced at any given time, while the industries contributing most strongly to growth frequently change within relatively short time frames. Modelling and understanding these features in any sort of comprehensive and convincing way is a challenging task, given the diversity of activities constituting real economies.

The features included in endogenous growth models, singly or in combination, according to Gorringe (1990) include:

- The embodiment of much technical change in the capital stock. New generations of capital may embody superior technology. Hence, increasing the amount of capital in proportion with Labour force growth may boost productivity.

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[19] There is a vast literature on economic growth models. It includes the following:

- Quarterly Journal of Economics, May 1991
- Oxford Review of Economic Policy (OXREP), Winter 1992
- Scandinavian Journal of Economics, December 1993
- Journal of Monetary Economics, December 1993 (National Policies and Economic Growth: A World Bank Conference)
- Journal of Economic Perspectives, Winter 1994.
- Greg Mankiw, "The Growth of Nations", Brookings papers, Macroeconomics, 1995
- Nick Crafts, "Post-Neoclassical Endogenous Growth Theory: What are its Policy Implications?", OXREP, Summer, 1996.

- The accumulation of human capital. Human capital investments, such as "learning by doing" or education may increase productivity in the labour force, just as embodied technical change can for capital, and permanently raise the output level.
- R&D spillovers may exist. R&D within the firm may contribute more to the economy wide stock of knowledge than to the firm alone. Output levels may be permanently lifted through ongoing R&D investment.
- Increased specialisation in intermediate inputs can improve growth
- Factors contributing to growth may interact strongly and add to growth. Capital accumulation and education may together contribute more to growth than they would alone.

Implications from these types of models include:

- There may be constant or even increasing returns to scale from the accumulation of particular factors. For example, in a simple model considered by Poot (1999), there may be constant returns to reproducible capital, which is assumed to include both human capital and physical capital. (Physical labour or land in contrast can not be deliberately accumulated.) Thus, increasing capital accumulation may increase long run growth. The insights from theories that emphasise economies of scale might well be particularly important to New Zealand, given that it is often difficult to achieve large-scale production here. This is not always the case, as demonstrated by dairy production and processing.
- Appropriate Government policies may be able to boost growth. For instance, encouraging R&D may have such an effect. Needless to say, it is one thing to create a model and quite another to test the model successfully, let alone draw policy implications from it.
- One important implication from the diversity of models and underlying experience they represent is that at a microeconomic level, there may be many different types of activities contributing to growth, in varying ways over time. For policy purposes, allowing opportunities for different activities to make their contributions is clearly important, as is avoiding ruling out the likelihood of some activities contributing.

According to Barro (1997), despite the early appeal of endogenous growth models, later analysis suggested ongoing technological progress is the only way to avoid diminishing returns to investment long term. Extensions to neo-classical frameworks to include human capital accumulation, Government policies, fertility decisions and diffusion of technology produce models that perform acceptably in explaining growth.

Other Models and Theories

A number of other theorists attempt to explain growth or income levels, sometimes with one main driving force in their models.

Institutional Approaches

Amongst these are:

- Olson (1982), who thought growth patterns reflect the development of entrenched interest groups over time. In stable societies, these groups indulge in rent seeking and come to impede innovation as an important driver of growth. Olson (1996) has also argued that differences in institutional structures and economic policies are critical to explaining differences in income levels between countries. Well defined property rights, third party enforcement and social cooperation are needed to support high income levels. Olson sees learning and knowledge accumulation as both the bottom line of growth and having roots deep in the ethos and history of a society.

- Hall and Jones (1997) and (1999), who also emphasise institutional differences as explaining differences in income levels between countries. While technological progress may drive growth, persistent differences in levels of income may reflect differences in laws, institutions and policies. Diversion of activity away from production through theft, corruption, litigation and expropriation will hold production back. The effects are pervasive and negative, potentially affecting capital accumulation, skill acquisition, invention and technology transfer, not just production activities. Gorringe (1990) describes other work emphasising the importance of institutions, including for example the institutions surrounding R&D, social norms and culture, and legal and political institutions.

- Professor Michael Porter, whose views are summarised in Crocombe, Enright and Porter (1991). Porter argues that countries can create and need to continuously upgrade their “competitive advantage”, as distinct from inherited comparative advantage, which then leads to growth. Competitive advantage in an industry and ultimately at national level is generated by

    - factor conditions: having specialised pools of skills, technology and infrastructure
    - home demand conditions: having sophisticated and demanding local clients
    - related and supporting industries: having a critical mass of local suppliers of specialised inputs, such as found in specialised industrial clusters

- firm strategy, structure and rivalry: having capable, committed, competing local rivals.

The Porter framework is heavily microeconomic. It has been criticised as having little macroeconomic content and not being rigorously derived, having been drawn more from the discipline of management research rather than using traditional economic methods, including by Philpott (1991) and Burnell and Sheppard (1992). It has however had some influence in New Zealand, having been promoted by the New Zealand Trade Development Board in particular. Porter's work is discussed in more detail in section 5.13 and Appendix A of this paper.

- Authors who argue that Government has a major role in the economy. Poot (1999) for instance provides a survey of significant peer reviewed material. He reports the views of the balance of authors on the role of Government in growth, depending upon the Government function involved. Government delivery of education is most likely to be seen as positive for growth, while provision of public infrastructure such as roads and sewerage is also likely to be found to be positive for growth to varying degrees. Defence spending, higher taxes and higher consumption are more likely to be found to have a negative influence on growth. Poot comments on the robustness of this work as noted in section 5.11 of this paper.

One illustrative example which finds negative effects from Government spending is Gwartney, Lawson and Holcombe (1998). They suggest that Government can make a positive contribution to growth through spending to secure property rights, enforce contracts, provide for a stable money regime, basic public infrastructure and perhaps eduction.

The negative effects of big government are suggested to arise from:

- workers' incentives to invest and take risks[20] being diminished through the provision of welfare measures and Government opportunities;
- private investment being crowded out;
- diminishing returns to Government expenditure, especially in the provision of private goods; and
- Government slowing discovery and wealth creation processes, through taking longer to weed out mistakes and being slower to adjust to new technologies.

[20] There may be offsetting effects from larger Government eg social insurance arrangements may allow increased risk taking. This may be true for business too, as for example suggested by Rodrik (1998), where in more open economies, Government tends to be larger, to act as insurer of domestic firms against external or terms of trade risk.

Dalziel (1999) states that arguments for small Government do not represent a consensus amongst economists. Interestingly, one of the authorities he quotes for this proposition, Tanzi and Schuknecht (1997), argue on the basis of a simple comparison of the economic performance of OECD countries, that public spending beyond the level of small Governments does not contribute much to welfare.[21]

Trade

Some authors have emphasised the role of trade openness as important to growth. Krueger (1997) provides one example. A number of mechanisms are suggested, including the stimulation of competition for innovation, the transfer of technology more readily in an open economy, the promotion of market mechanisms and constraints on harmful policies, according to Gorringe (1990).

Such thinking appears to have reasonably wide, but not universal acceptance.[22]

Disequilibrium Phenomena

Gorringe (1990) in his survey of theory suggests disequilibrium phenomena, factors which move the economy away from some sort of steady state growth pattern, are also important in growth theory. Examples include the effects of technology, disinflation, growing budget deficits, or deficiencies of demand. These may exert influence over more than one business cycle, and thus might be seen as long term phenomena in some cases. A possible example is Greenwood and Jovanovich (1998). They suggest that the adoption of major innovations such as new information technologies is a slow and costly process, taking decades, contributing to a drop in productivity growth until the new technologies are mastered, with major effects in labour and capital markets meanwhile. The economy may depart from any kind of steady state for decades as a new technology is absorbed. They suggest that this phenomenon can explain much of the US productivity slowdown since the 1970's.

Geographical Factors

A number of theorists suggest that geographical factors may have a significant influence on growth. The mechanisms are numerous and a full review is outside the scope of this paper. However, some are particularly relevant. The disadvantage of distance from large markets is a recurring theme in

[21] "Small" Governments spend less than 40% of GDP on transfers and public consumption in this study.

[22] Bruton (1998) for example suggests that a new development orthodoxy, of export orientation combined with a removal of distortions, arose in the 1980's. He argues however that this work ignored deep difficulties in transferring technology across boundaries; the need for searching and learning by Governments and firms; the necessary role of agriculture; the critical role of initial conditions and need for effective implementation of policies. Consequently, trade openness in his view was overemphasised.

New Zealand writings and opinions.[23] Another is the suggestion that there are substantial economies of scale in the operations of large cities or populations, likely to outweigh the higher costs involved. This might be seen as an overlap with one branch of endogenous growth theory.

Quigley (1998) suggests that there are several mechanisms for urban scale effects. Plain scale economies may assist through the ability to operate larger sized plants and attract people through the provision of public goods such as parks and sports stadiums. The use of shared inputs may be an advantage in both production and consumption. Shared use of legal services and cultural activities are examples. Transactions costs in production may be reduced through better labour market matching in larger cities. There may be economies in production and consumption through the development of resale markets for assets. Quigley refers to studies suggesting that doubling city size may increase productivity between 3% and 27% and another study suggesting that productivity in cities larger than 2 million people may be 8% higher than in smaller cities.

Similarly, Ingram (1998) suggests urban areas are attractive for industry because of economies of scale in production; lower transport costs through clustering; modest use of land inputs; externalities between firms such as in information sharing; linkages such as provision of intermediate inputs; and agglomeration economies. These arise through large clusters of activities using specialised resources more efficiently.

Glaeser (1998) suggests that cities of more than 1 million population are sharply increasing their share of population and that incomes are significantly higher in cities of more than 500,000 populations. Moreover, 96% of US product innovations occur in metropolitan areas and 45% in just 4 areas, New York, Boston, Los Angeles and San Francisco. The advantages of large urban areas stem from the costs of moving people and ideas, not transport costs per se. There are however also costs to population increasing within cities too. These arise in areas such as commuting costs, pollution, crime, poverty and local Government tending to invest in excessive infrastructure.

As a general comment, the theoretical mechanisms for size to contribute to higher productivity are plausible, but as usual, it is difficult to be certain whether the empirical evidence supports the view about causality. Unusually productive cities may attract population rather than larger population simply generating higher productivity.

Innovation

Innovation or changes in technology feature strongly in both the neoclassical and endogenous growth models and have already been mentioned. However,

[23] Alex Sundakov (New Zealand Institute of Economic Research) for instance has suggested to PCD staff that New Zealand's sheer physical distance from overseas markets is a major constraint on marketing and service delivery for business services exporters.

a few additional points from international research are worth making. Bassols (1998) provides a useful summary of OECD thinking. He notes that R&D is only one part of innovation – it can occur on a broad front of activities including in marketing and product design. Moreover, firms tend to under-invest in R&D as an inappropriable public good. Adoption of imported innovations may be particularly important for many countries relative to domestic R&D. Olson (1996) for instance notes that imported R&D was important to Korean development.

Summary of Theoretical Contributions

The material outlined above, while not exhaustive, suggests that there are a large number of factors impinging upon both growth rates and income levels across countries. It provides a reminder that growth is a complex phenomenon and not well understood at a theoretical level.

Matters are further complicated by the likelihood that relationships are unstable over time, often non-linear and possibly driven by a few critical, but idiosyncratic factors, which must be included for accurate research on smaller economies. Imagine an account of New Zealand's economic growth around 1900, which excluded refrigeration! Understanding growth also seems likely to require a high level of integration of macroeconomic and microeconomic factors, still a challenging task.

Despite the difficulties, it seems clear that any plausible work on long-term growth rates must take into account at least the following factors:

- The level and growth rate of employment
- The level and growth rate of the capital stock
- Human capital, including knowledge and skill acquisition
- Changes in technology, including through innovation
- Institutions and cultural conditions
- Government roles in regulation, taxation and expenditure
- Trade conditions
- Geographical factors, including location and scale of population
- Macroeconomic conditions

Empirical Work

The theoretical work referred to so far inevitably included some references to empirical work, although it was work which focussed on particular aspects of growth theory. A large body of work has emerged in the last decade which has sought to test growth theory comprehensively, largely in cross-country studies. This part of the report briefly reviews several of the more important contributions, with a view to determining whether the results support the theoretical work. It also refers to summaries of international experience. Plainly, there is much more empirical work than that reviewed here, which can

be seen at most as representative of a wider literature – all that can be included within the bounds of the present project.

Barro

Barro (1997) provides a useful summary of results from his cross-country analysis. His analysis may be seen as a representative example. The primary inspiration for this work is the neo-classical framework, with extensions to include Government policy, human capital, and diffusion of technology from more developed to less developed countries.

Per capita income growth is expected to depend upon the gap between current per capita income and steady state per capita income. This in turn is expected to depend upon:

- Private sector saving rates and capital accumulation
- Labour supply
- Fertility
- Government spending
- Tax rates
- The extent of market distortions
- Maintenance of law and property rights
- The degree of political freedom
- The terms of trade

To illustrate the model's operation, an implication is that if the Government reduces the burden of regulation, growth will be boosted for a period until ultimately it becomes constrained again by improvements in technology. Such transitions may be very lengthy.

Barro tests the model for approximately 100 countries, including New Zealand, for the period 1965 to 1990. Key findings include:

- Initial GDP per capita is highly significant. Low income countries grow faster, implying that income convergence occurs at a rate of 2.5% per annum, provided other variables influencing growth are included in the model.[24] This means that it could take 89 years to close 90% of the gap between current per capita income and steady state per capita income, or 27 years to close 50 % of the gap, underlining the slow nature of adjustment.

[24] Barro acknowledges that convergence is conditional on measuring the influence of other variables. He does not argue that absolute convergence occurs. On the other hand, some more recent research argues that there is a tendency to absolute divergence on a world scale with richer countries getting richer and poorer countries getting poorer, with the effect being more pronounced in the last decade, using more recent data than Barro. Pritchett (1998) is an example as is Temple (1999).

- Initial human capital is also highly significant. One extra year of male secondary or higher education may raise the growth rate by 1.2% per annum. Female education is not found to have a positive effect.[25]
- Higher fertility reduces per capita GDP growth with a significantly negative contribution. Barro suggests the effect being captured is a simple dilution of capital available per worker.
- Higher levels of Government consumption are found to reduce per capita income.
- A higher respect for the rule of law improves growth, using a subjective indicator prepared by a New York consultancy for fee-paying clients. With this variable included, political stability and corruption do not show up as significant.
- Improvements in the terms of trade are associated with improved growth.[26]
- Regional variables for sub-Saharan Africa, Latin America and East Asia are individually not significant, as the main explanatory variables explain exceptional performance in these areas.
- Investment is not significant, in Barro's view. Apparent relationships between investment and growth may be caused instead by growth opportunities stimulating investment.
- Very high inflation – above 20% per annum is negative for growth. For rates below this, there is no statistically significant relationship. However, there is no sign that inflation at any level assists growth.

Barro also examines what growth projections based on the model might look like. The average growth rate for 21 OECD countries, excluding Japan, Turkey and Mexico for 1996 to 2000 is projected to be 2.4%. He concludes that OECD countries probably can not do much to improve their growth rates, stating

"Basically, 2% per capita growth seems to be about as good as it gets in the long run for a country that is already rich."

Critiques

There are many criticisms of work such as that of Barro. Harberger (1998), for instance, says "*Cross-country regressions seem hopelessly naive* to long term observers of the growth process like myself." His grounds are that too much is drawn from comparisons of completely disparate countries and more detailed analysis is required. The warning seems appropriate but insufficient ground to dismiss studies such as that of Barro, where the work has a reasonable theoretical foundation, is applicable to developed as well as developing countries and is part of a lengthy, careful research program.

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[25] Knowles, Lorgelly and Owen (1998) dispute this somewhat controversial result in a New Zealand contribution, using a similar approach to that of Barro. They find that female education has a positive effect on productivity, especially in more developed countries.

[26] Shocks to variables such as the terms of trade, not simply movements, may also be important to explaining growth according to Easterly, Kremer, Pritchett and Summers (1993).

Temple (1999) provides an excellent summary of the strengths and weaknesses of the cross-country growth literature. There are data quality problems, especially with developing countries. Much work has serious omitted variable errors, especially omitting the level of technology. There may be unobserved country fixed effects; comparison of non-comparable countries; outliers may unduly influence the results; and treatment of endogenous regressors as exogenous. More careful studies can reduce these problems, especially with panel data. Temple is finally prepared to agree that the better studies can provide worthwhile insights into growth.

Levine and Renelt (1992), in an influential study of GDP growth rates, also criticise cross-country studies. They suggest that many cross-country studies omit key variables, such as those relating to fiscal policy or trade and that only a few studies are robust to slight alterations in their list of explanatory variables. They test the stability of cross-country regressions across a data set of 119 countries for 1960 to 1989, examining a maximum of 8 of 50 variables each time. They acknowledge that there does not exist a consensus theoretical framework to guide empirical work on growth, but then attempt to develop core models likely to be seen as reasonably consistent with a variety of approaches. The core model used assumes the following are related to GDP growth: the ratio of investment to GDP (+ = positive for growth), secondary school enrolment (+), initial GDP in 1960 (-), and population growth (-). These are used in each model tested. Variables are considered robust if the relationship and sign for each variable remain the same when extra variables are added.

The core model variables are generally significant, but the only “robust” relationships found involve the ratio of trade to output and share of investment in GDP. Those found to be not robust include fiscal expenditure, monetary policy indicators and political stability indexes. The test applied requires variables to remain highly significant in all cases as other variables are added to the equations.

Notwithstanding this, at least some results emerge. It appears that trade openness is strongly related to growth, regardless of whether imports or exports are used in the analysis. The share of trade in GDP is robustly positively correlated with the share of investment in GDP. No inflation variables are robustly linked to growth. There is some support for the conditional convergence hypothesis.

Sala-i-Martin (1997) argues that the tests applied by Levine and Renelt are far too demanding. He conducts tests using a similar methodology involving 62 variables, including the level of income in 1960, life expectancy in 1960 and primary school enrolment in 1960 in all regressions, as these appear to be significant in a wide range or published analysis. He then reports variables that appear to be significant in a range of regressions, even if not in every case. Factors related to growth appear to include:

- Geographical location variables, such as being in sub-Saharan Africa or Latin America. Another is absolute latitude, with being further away from the equator being good for growth.
- Variables such as the rule of law appear significant
- Religious variables appear significant, with Christian affiliations appearing to be negative for growth
- Market distortions such as real exchange rate distortions or the standard deviation of the black market premium are negative for growth.
- Equipment and non-equipment investment are significant, with the former more so.
- Primary sector production is significant with the fraction of primary products in total exports being negatively related to growth
- The number of years the economy was open between 1950 and 1990 was positively related to growth.
- A greater degree of capitalism appears to be positive for growth

Variables that did not appear to be significant included those related to:

- Government spending
- Inflation
- Scale effects, measured by total area and labour force
- Tariff restrictions[27]

Tariff and trade restrictions are particularly important for New Zealand, given that a moderately high proportion of GDP is involved either in trade or import substitution and some additional views are worth reporting. Barro and Sala-I-Martin (1995) note work that suggests tariff levels are significantly negative for growth in cross-country analysis, seeing the mechanism as another channel through which distortions of markets can reduce the growth rate. Chand (1999) notes that neither international theoretical nor empirical work has produced an unambiguous association between trade policy and growth. Chand's study suggests that Australian manufacturing pooled data over 1968 to 1995 provides a better test than most because of its completeness and variability and suggests that reducing the nominal rate of assistance by 1% leads to an average 0.18% to 0.5% increase in total factor productivity. Another Australian view is that of Gruen (1986), who like Olson (1982), suggests that protection may be particularly harmful in small economies like Australia, with less domestic competition and because it tends to be concentrated in industries with potential economies of scale.

At another level, trade liberalisation and abolishing regulations which impede entry or competition also feature as part of the so-called "Washington Consensus" of policies which should be followed in generating growth through a reform process, according to Williamson (1994). This "consensus" also

[27] This is a more limited variable than the years of openness variable above, drawn from and referenced in the work of Sachs and Warner (1995)

encompasses modest budget deficits; moving expenditure to areas such as health education and infrastructure; broadening the tax base and cutting marginal tax rates; market determined interest rates; and an exchange rate managed to assure exporters that competitiveness will be maintained in future; privatisation and secure property rights. While possibly less well-founded empirically than the studies cited, the consensus is at least broadly consistent with them.

Summaries of Empirical Work

The broad conclusions of the cross-country studies above tend to show up in explicit summaries of other work. Three examples will be mentioned here.

Bates (1995) summarises overseas experience in an internal Treasury paper. He found that no country with per capita income greater than 30% of the US level in 1960 managed to achieve per capita income growth greater than 4% per annum in the period 1960 to 1990. Moreover, fundamental change in an economy can be slow to emerge: public and business attitudes are slow to change; there are limits to the speed of renewal of physical capital and limits to the speed at which workforce skills can be transformed.

Policy fundamentals for achieving growth include having:

- well established property rights
- macroeconomic stability

- openness to international trade
- an environment conducive to skill acquisition and innovation

Even if these fundamentals appear to be in place though, there is evidence that this may not be enough to achieve high growth. Culture can be important for growth, including cultural homogeneity and cosmopolitanism.

Like others, he finds high investment may be a symptom, not a cause of growth and may not work as a growth strategy.

More recently, Pilat (1998) claims that the determinants of productivity growth are the subject of broad agreement. He suggests these include:

- private investment in physical capital, training and technology
- supportive public investment in education, research and infrastructure
- organisation of factors within firms
- openness to trade
- a high degree of competition

The latter two factors may be effective through pressing firms to improve their performance.

Temple (1999) concludes that:

- Poor countries are not catching up with rich countries overall, although there is evidence of OECD member convergence.
- Countries do converge to their own steady state income levels at a positive but uncertain rate, through adopting new technology and investing in human and physical capital in particular.
- Diminishing returns do set in on physical capital investment.
- Macroeconomic instability constrains growth
- R&D is positive for growth
- The benefits of education are imprecisely measured and not sufficient by themselves for growth. There is much uncertainty about the contribution of education, given that many studies have an inadequate theoretical base, which may not allow for variously the direction of causality, possible human capital externalities or the returns to schooling being driven by signalling effects. Proxies for human capital, such as school enrolment or years of schooling, may not correspond well to the theoretical variable concerned and ignore training as opposed to schooling.
- Population growth is probably negative for growth but less important than often supposed
- High inequality may lower growth, perhaps through social and political instability.
- Depth of financial intermediation is important to growth

- Democracy is not critical but economic freedom and established property rights help
- Big government and high taxes may be negative for growth but evidence is ambiguous.
- Trade openness definitely helps growth.

Conclusions about Empirical Work

Just as with the theoretical work, there is no simple consensus. Much work acknowledges that it is in practice often very difficult to distinguish between models.[28] It is important to acknowledge that uncertainty is inherent in any efforts to understand the major contributors to growth, given the diversity present in the real world and ongoing change. However, some of the work highlights factors that are likely to influence longer-term growth rates, to be taken into account in considering New Zealand contributions in later parts of this paper. These include:

- The growth rate of population and the labour force. Rapid population growth, at least from high fertility, is likely to be negative for per capita income growth.[29]
- The level and growth rate of the capital stock which should raise per capita incomes. Both savings and investment can contribute to the capital stock. There is a good chance that there is both way causality between growth and investment and/or savings. While there may be diminishing returns to capital (and other factors), the time elapsing before this becomes significant is probably sufficiently long that savings and investment can grow considerably without this substantially reducing the growth rate.
- Human capital, including knowledge and skill acquisition. This emerges strongly as an important factor in many theoretical writings. In contrast, the empirical literature is less certain and the role of education in particular is somewhat more questionable, as Hazledine (1998) argues.
- Changes in technology and innovation. This is critical in most writings.[30] Absorption of overseas innovations is important as well as domestic innovation. Moreover, innovation can be important, beyond just R&D.
- Institutions and cultural conditions. Institutions appear critical, particularly in upholding the rule of law and property rights, although it is possible that New Zealand, as a relatively developed country, already has many of the required institutions and structures in place. Providing for competition

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[28] Poot (1999a) for instance refers to the "commonly observed observational equivalence of competing theoretical models of the macro-economy".

[29] This conclusion may be influenced by developing countries with high fertility rates. However there is no reason to think it irrelevant to New Zealand, which has tended to have slightly higher fertility than other high income countries (Cook 1997).

[30] In fact, some very strong claims are made for its pre-eminence. North (1993) for instance, suggests that applying science to technology is the underlying determinant of modern productivity. Stoneman (1995) suggests that "there is sufficient evidence to suggest that technological change is a (if not the) major contributor to growth in economic welfare over time."

between firms appears to be important. While we can be reasonably sure that cultural factors are important, the international literature offers few insights directly applicable to New Zealand.

- Government roles in regulation, taxation and expenditure. Regulatory approaches are likely to be important, given what has been found about institutions. Maintaining market-oriented mechanisms without distortions is likely to be important for growth. Government expenditure and tax levels are not clearly so important, although the majority of studies specifically on the subject tend to suggest that high levels may be unhelpful for growth.
- Trade conditions. Openness over long periods appears to be positive for growth, although not necessarily export production per se. Improved terms of trade also appear likely to help growth. Adopting a production mix oriented to growing sectors and less based on primary commodities is also likely to be positive.[31]
- Geographical factors, including location and scale of population. These appear to be important, particularly for New Zealand given our isolation from large markets and small population centres.
- Macroeconomic conditions. Controlling inflation appears to be important but maintaining very low rates appears less so, with rates up to 3% or a little higher having little apparent effect. Macroeconomic stability does appear to be important. Maintaining aggregate demand over time is probably also important.
- Inequality, depth of financial intermediation and democracy. While these may be significant, the levels found in New Zealand seem unlikely to differentiate New Zealand performance from that in other developed countries.

The international literature clearly implies that in the post war period up until the 1990's, New Zealand would have faced a real struggle to match top growth rates, even before specific New Zealand evidence is examined in more detail. The factors involved include New Zealand's initial high income levels, still relatively high by world standards; geographical isolation; heavy dependence on primary produce exports; declining terms of trade; past limits on the operation of markets; persistent trade barriers; lack of R&D orientation; and relatively high population growth.

[31] This certainly does not mean that New Zealand should not exploit primary product opportunities, some of which may offer strong growth opportunities, as discussed below.

4. New Zealand's Performance and Explanations for it

This part of the paper reports New Zealand's performance from several angles, primarily as recorded by Statistics New Zealand and summarises the views of a wider range of analysts about what may be driving New Zealand's performance.

It is structured as follows:

4.1 Recent Trends in New Zealand's GDP

Part 2 argued that GDP per capita, despite its limitations, is the most appropriate performance measure for this paper. Figure 2 shows real GDP and real GDP per capita.[32] Per capita income has not quite doubled in the 51 years from 1947 to 1998. While real GDP has grown significantly in the 1990s, it is clear that per capita GDP has grown much less, with population growth limiting the gains.[33] Figure 2a uses real GDP data from Statistics New Zealand for a slightly shorter period. From 1987 to 1998 on a peak to peak basis, per capita GDP grew at 0.67% per annum. If the decline in the ratio of real gross national disposable income per capita to real GDP per capita of 1.8% from 1993 to 1998 is taken into account, given the increase in factor payments abroad, the growth rate would drop to under 0.5% per annum.

One particular limitation in GDP worth highlighting here is that it measures production rather than welfare. It is quite possible that static welfare gains to consumers from greater choice, improved service quality and lower prices have been much greater than these numbers imply during the post reform period. It is also possible that consumption has risen as a proportion of GDP, improving welfare, as changes such as financial liberalisation have allowed households to increase debt.

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[32] The measure used here is based on a composite series of national income measures prepared in Treasury to provide a long-term view. The measure is not entirely satisfactory, as it is based on deflating a number of different series by movements in the CPI.

[33] One possible mechanism is that at times of higher growth, additional migrants may enter, or New Zealanders return from the Australian side of the open Trans-Tasman labour market. Growth may have been temporary, based on fiscal stimulation or unjustifiably high business confidence, but the population remains higher even after the temporary stimulus is removed. This hypothesis is admittedly speculative and there does not appear to have been serious study of the issue.

While distributional issues are generally outside the scope of this paper, they remain important. For instance, median real household equivalent disposable income fell 7.9% from 1982 to 1996 according to Statistics New Zealand (1999)[34]. As noted earlier and in Appendix B, it is possible that GDP statistics understate welfare improvements and it is likely that incomes at the end of this period are more sustainable than in the early 1980s.

4.2 Comparisons with OECD Performance

Figure 3 shows New Zealand's GDP per capita performance compared with selected OECD countries and the OECD as a whole.

New Zealand has been losing ground against the OECD as whole since 1960, even allowing for some measurement error. It might be possible to argue that New Zealand's comparative performance has levelled out in the 1990's following the period of major reforms. However, given that levelling out occurred temporarily on several earlier occasions and that New Zealand has dropped again since 1996, the argument is yet to be strongly established. It might also be suggested that New Zealand's relative decline is driven to some extent by outstanding performances by a limited number of OECD members, such as Japan in the early part of the period shown. Even taking this into account, New Zealand's performance has generally been towards the bottom of the OECD.

Nahar and Inder (1998) provide another interesting insight on New Zealand performance. They test for convergence of OECD per capita income levels for longstanding OECD members from 1950 to 1990, and find that all countries are converging to US income levels over the period except New Zealand and Australia. Australia is neither converging nor diverging but New Zealand has the singular distinction of diverging from US income levels at a rate of 0.76% per annum.

4.3 Output, Productivity and Factor Contributions

Another view of aggregate New Zealand performance comes from examining productivity performance. This can show the relative contributions to output and productivity from different factors, especially total factor productivity (TFP). TFP illustrates New Zealand's ability to get more output from a given amount of inputs and has historically been the single largest contributor to GDP growth.[35] It can be seen as particularly relevant as a contributor to raising GDP per capita or other welfare related measures of performance, in that it does not necessarily require additional inputs to achieve gains.

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[34] Specifically, Table 6.1 of the data tables for the publication on the Statistics New Zealand web site.

[35] Lawrence and Diewert (1999) suggest that assuming all other factors unchanged, TFP growth would have raised GDP by 29% over 1978 to 1998, compared with contributions of 7% from labour inputs, 20% from capital growth and –3% from terms of trade changes.

Lawrence and Diewert (1999) have probably carried out the most definitive recent productivity work.[36] They examine New Zealand's market sector productivity performance from 1972 to 1998, using an index number based methodology with two separate databases.

Their preferred "Diewert and Lawrence" database includes input measures such as land and natural resources, as well as the capital and labour inputs usually included in studies. Including these additional inputs tends to raise measured TFP slightly compared with less comprehensive studies. Their main aggregate results are shown in Figure 4.

The other "Official" database Lawrence and Diewert use provides data for individual industry production groups, but with only capital and labour as factor inputs.

Inevitably, preparing such databases has required judgements to be made about the data to be used. For instance, the official database incorporates a decision to estimate depreciation rates for calculating the net capital stock as the reciprocal of assumed asset lives. Philpott (1999) suggests that this will produce a somewhat higher capital stock growth rate than a more common declining balance depreciation approach. However, while the resulting TFP rate is lower, the impact is not great.

Lawrence and Diewert provide the output index underlying their total factor productivity calculation, labelled "Diewert-Lawrence Chained Fisher" in Figure 5, together with slightly lower output indexes calculated using Statistics New Zealand GDP data on both expenditure and production bases. The various indexes show output rising between 54% and 68% from 1978 to 1998. This illustrates well the inevitable variations in measuring output with different techniques and data, warning against placing too much weight on slight differences in performance measures.

The growth in factor inputs in New Zealand over time can also be illustrated with the Diewert-Lawrence database. Table 1 shows the growth in major inputs from 1972 to 1998. Notable features are the sharp increase in numbers of Managers within a growing labour force; declining numbers of production workers; capital growing much faster than labour, especially in electrical machinery and plant; and inventories showing little growth. Labour force growth is relatively high by international standards, reflecting New Zealand's population growth.[37]

[36] They also review other recent work.

[37] The OECD (1998) show New Zealand's population growth over the 10 years to 1996 was relatively high at 1.1% per annum.

Productivity Results

Overall, market sector labour productivity grew 1.66% per annum from 1978 to 1998 while capital productivity has declined 0.9% per annum, possibly because of growing capital intensity as capital equipment prices have declined over time.

TFP has grown at a trend rate of 1.4% per annum over 1978 to 1998 according to Lawrence and Diewert's preferred estimate, or 0.8% per annum if the series is started in the more buoyant 1972 year. Lawrence and Diewert also prepare an alternative estimate of 1.1% for 1978 to 1998 with data from their second, "official" database. The figure is lower because household labour force hours are used to measure labour inputs, as these grow much more strongly than Lawrence and Diewert's preferred labour measure, and the "official" database recognises only labour and capital as inputs, biasing the results downwards.

Lawrence and Diewert's New Zealand TFP calculations using the "official" data are broadly comparable to estimates prepared by the OECD. While international comparisons are always fraught with difficulties, the OECD results quoted by Lawrence and Diewert for the slightly different period of 1979 to 1997 show New Zealand's average TFP growth rate of 1.1% sits at about the median level of OECD performance. (See Table 2, which shows the performance for the market sectors of OECD economies.) This result is barely distinguishable from those of a large group of other countries clustered around 0.9% to 1.3% TFP growth, given likely measurement difficulties. The OECD result is consistent with the suggestion that growth be measured on a peak to peak basis, given Lawrence and Diewert's finding of cyclical output peaks in 1979 and 1997.

The overall picture that emerges is of a TFP performance that has improved since 1979, attributable to bursts of growth in the mid-1990s and early 1980s. The disappointing performance from 1960 to 1979 is well known. Some disappointment has been expressed about the later period too, but this would seem to be more related to high expectations in the light of reforms than to measured performance. In reality, New Zealand's TFP performance might best be seen as moderate over the last two decades, sufficient to have placed New Zealand in the lower half of the OECD in terms of living standards.

New Zealand's absolute performance is also worth briefly recording. The OECD (1998) show New Zealand's rank on a number of living standard indicators as recorded in Table 3. New Zealand ranks consistently in the lower half of OECD countries, except for car ownership, with primarily Eastern European countries, Turkey, Mexico and Korea ranking lower.

4.4 Sectoral Performance

Lawrence and Diewert's analysis provides some insights for market sector performance, although measurement problems are more acute at a sectoral level. For the period 1978 to 1998, sectoral trend TFP growth rates, derived as

simple averages from the D&L data for component production groups are as follows[38]:

Primary industries:	3.8%
Manufacturing:	0.9%
Construction	0.6%
Utilities	4.7%
Services	-0.9%

The picture that emerges is one of considerable improvement in primary industries including agriculture; outstanding improvement in utilities as Government controls were removed and the utilities were placed on a commercial footing; and a poor performance in manufacturing, services and construction. These results are reasonably consistent within the sectors, implying that sectoral analysis holds promise for revealing something about New Zealand's overall growth performance over the last two decades. This might be more revealing for the past than the future, given that the major industries contributing to growth regularly change over time as Harberger (1998) notes.

There may be some promising signs of change within manufacturing, based on the Lawrence and Diewert (1999) results. For those industries that can be seen as largely through the process of tariff reductions, including non-metallic minerals, other manufacturing and basic metals, TFP appears to have been rising since 1992, following a period of stagnation. This seems less true of machinery and textiles, where high protection continued longer. It seems highly likely that with value added being measured at domestic prices, measured productivity in manufacturing industries is likely to decline as protection is phased out. Capital stock may also be temporarily overstated until capital made redundant by loss of protection is written down, although no measurements of this are available.

Measurement difficulties may affect these results. Philpott (1994) suggests that TFP has risen in agriculture because much investment is disguised as intermediate consumption, for instance in horticulture. The poor rates of growth for services may well be generated in part through output measures being based on numbers employed and capital being attributed to the finance sector when used under leases in other sectors. This is subject to further Treasury research but nevertheless, the services growth rates are likely to have been low in any event.

[38] While it might be preferable to derive these results by weighting individual production group contributions by output shares, these simple average indicators almost certainly provide representative results.

4.5 Performance Projections

The OECD (1998) has suggested that if New Zealand could achieve total factor productivity (TFP) growth of 1.75%, structural unemployment falling from 6% to 3% and a rate of capital accumulation of 3% per annum, per capita GDP could move from 82% of the average OECD per capita income level to 92% by 2020. Such a "high performance" scenario would see real GDP rise at 3.4% per annum from 1997 to 2003, 3.9% from 2004 to 2010 and 3.1% from 2011 to 2020. This would take New Zealand back to 1982/3 relative per capita income levels. The expected growth of other countries represents a rising hurdle for New Zealand in any efforts to catch up.

Under a more plausible "status quo" scenario, assuming 2.8% capital stock growth, TFP growth of 1% and structural unemployment of 6%, the OECD projected New Zealand's per capita income to continue to decline against the OECD average in the long term. In this OECD scenario, the annual GDP growth rate for the shorter period of 1997 to 2003 was projected to be 3.2%. In the latest review, the OECD (1999) has revised the projection down to 2.6% for the period 1998 to 2004, better than achieved in the 1970s and 1980s. Such growth is still insufficient to prevent a renewed decline in New Zealand per capita incomes relative to the OECD average. The revision also illustrates the potential volatility in producing any estimates.

The OECD (1998) and Giorno, Richardson, Roseveare and van den Noord (1995) describe the methodology for the OECD projections. Essentially, the OECD estimates total factor productivity assuming a Cobb-Douglas production function, with capital and labour as factor inputs for the business sector. Labour quantities are based on estimated potential employment, derived from the estimated NAWRU[39]. Key assumptions are that the NAWRU is relatively stable, the change in wage inflation is proportional to the gap between actual employment and the NAWRU and that New Zealand real wages have moved ahead since 1991 only when the unemployment rate reached 6%.

The per capita incomes calculated for the OECD as a whole are based on scenarios prepared in OECD (1997) and UN population projections, while New Zealand population projections are based on Statistics New Zealand median fertility and mortality rate assumptions. None of the methodological or "status quo" assumptions appear prima facie unreasonable, although, naturally considerable uncertainty attaches to them, as to any projections. The total factor productivity assumption for New Zealand of 1% growth per annum, based on the historical record, is broadly in line with other calculations, such as those by Lawrence and Diewert (1999).

From Treasury's own projections, it also seems likely that New Zealand per capita incomes will not close the gap with average OECD performance significantly. Treasury projections in 1999 suggest rates of 1.5% labour

[39] Non-accelerating wage rate of employment

productivity growth, consistent with 1% TFP growth, 1% labour force growth averaged over the next decade and GDP growth of 2.5% per annum.[40] The Treasury long-term fiscal model as of 1999 assumes unemployment declines only to 6%[41], not 3%.

A further check on the realism of these projections from an independent source is the New Zealand Institute of Economic Research (1998) medium term projection of the outlook from 1998 to 2003 by industry, prepared on a year by year basis. It suggests an annual average growth rate of 2.8% will apply for the 6 years ending March 2003.

4.6 Microeconomic Indicators

Apart from the aggregate indicators of growth discussed so far, there has been extensive research into the performance of New Zealand industry at the firm level. This work is important in understanding New Zealand's growth performance as it is axiomatic that growth depends upon decisions and practices at the firm and individual level; not just macroeconomic influences.

The single best summary of this work is undoubtedly Campbell-Hunt and Corbett (1996). It is conducted within a theoretical framework drawing on and summarising authors such as Porter, Enright, Prahalad and Hamel and Kay.[42] In this framework, sustainable advantage amongst firms is built on firm culture, including relationships with suppliers, the workforce and reputation with clients. Innovation per se is less important, being driven by these more basic factors. Organisational learning is important and management practices are crucial to success. The study focuses on resource and process based advantage.

It contains a number of important conclusions, although these are largely of a qualitative nature:

- The 1990's have seen a revolution in economic strategy and practice to match that in economic governance in the 1980's
- It takes many years for firms to create assets based on sustainable advantage and decades to achieve the full return from this.

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[40] It should be noted that there is uncertainty about any projections. The figures quoted are probably best seen as indicating a possible range rather than being reliable point estimates. The Treasury methodology differs from that of the OECD, being based on estimating and combining labour force growth and labour productivity growth. Its labour force component is based on Statistics New Zealand projections, together with the judgement that labour productivity will stay close to its long-term historic track at 1.5%, partly reflecting the work of Lawrence and Diewert (1999). The Treasury assumptions are reflected in Annex 3 of the Government's Fiscal Strategy Report of 20 May 1999 in Birch (1999).

[41] The OECD and Treasury unemployment assumptions are not strictly comparable but it seems unlikely that any differences would have a significant effect on the relative sizes of the two sets of projections.

[42] Details are included in pages 7-17 of Campbell-Hunt and Corbett (1996).

- The sustainable advantage created to date is limited to close, cooperative relationships with the workforce and distribution chain – not through the alternative paths of international brand or product leadership
- Many firms are close to developing these strategies
- Key determinants of firm expansion include the ability of managers to adopt empowering relationships; achieve greater specialisation and cooperation within networks of business partnerships; and devote themselves and their organisations to the creation of distinctive customer value
- Whether this happens can not be predicted.

Campbell-Hunt and Corbett found that businesses in 1996 showed more, though uncertain, promise of adopting the sorts of changes that would lead to growth, compared with earlier work in 1993. There was evidence of:

- Fundamental changes in unhelpful attitudes developed in New Zealand's past, more protective environment
- Greater interest in undertaking expansion
- Interest in exporting was becoming the norm amongst manufacturers with even an astonishing 40% of manufacturers employing fewer than 10 employees having carried out some exporting in one survey
- Quality improvements, teamwork and process technology improvements were more in evidence
- Outsourcing and both-way overseas investment were becoming more evident
- Three quarters of manufacturing plants surveyed claimed to be within 4 years of world best practice compared with only one quarter in 1989, given equipment upgrades
- Governance had improved
- Practices such as full product costing, discounted cash flow analysis and use of marketing skills had increased dramatically
- Large numbers of firms still showed only limited signs of adaptation
- New Zealand possibly had as few as 50 globally competitive firms. These differ significantly from other firms in having direct relationships with offshore distribution channels; use of benchmarking; and emphasis on staff culture, including feedback and empowerment.
- The attitudes of society at large, for example in attitudes towards work, still left much to be desired.

More recent work appears to be consistent with this 1996 study, including an update by Campbell-Hunt and Corbett (1998) prepared for the 1998 visit of Professor Michael Porter. The authors, in referring to the improvements observed in their 1996 study observe, however, that "Nagging doubts have persisted about the permanence of this recovery".

Another major study, carried out by the Ministry of Commerce, Knuckey, Leung-Wai and Meskill (1999), involved a survey of 1400 medium and large New

Zealand manufacturing firms, with a high response rate. It concluded that manufacturers have come a good way towards best practice in a number of areas, although most have not taken the important, but difficult, step towards a coordinated and strategic approach to business improvement. There has been great commitment to enhancing customer focus, quality of output and operational flexibility. Less attention appears to have been devoted to leadership issues, employee development and innovation, with just less than half of sites devoting less than 1% of total sales on R&D.

Together, these studies provide a picture of consistent, positive change at the microeconomic level, of the sort that could ultimately be expected to improve output and productivity. Such studies are more vulnerable to influence by the prior expectations of their authors and respondents than more quantitative studies but nevertheless appear credible, given careful methodologies. They are initially difficult to reconcile with relatively poor reported aggregate results from the manufacturing sector in particular, unless weight is given to their findings that change processes take a long time and that there are many laggard performers. This seems plausible, especially given findings such as those of Harberger (1998), that normally only minorities of participants account for the vast majority of growth in most industries and economies. It is also likely that surveys miss completely responses from firms that are winding down operations or quitting, although these will inevitably be contributors to the macroeconomic picture. Efforts recorded in surveys of managers will also not necessarily reflect the results achieved.

4.7 Conclusions on New Zealand's Performance

This part has provided a brief review of New Zealand's performance within the last two decades from several perspectives: per capita economic growth; performance relative to the OECD; growth projections; sectoral performance and apparent microeconomic performance.

The overall picture is one of extremely slow growth in per capita GDP since 1987, at 0.4% per annum. This is despite the growth surge of the mid-1990's, as much of that growth simply represented recovery from the early 1990's recession and much was absorbed by population growth. Total factor productivity growth looks better, with New Zealand lifting to about the middle of a large bloc of OECD countries in the last two decades, compared with a poor performance earlier. At the microeconomic level, there appears to have been much positive change, although not across the board. Improved performance shows up strongly in the performance of utilities and primary industry, but not in manufacturing, services and construction, which are in aggregate a much larger part of the economy.

Over the last two decades, as before, New Zealand's growth has been insufficient to avoid a widening per capita income gap with OECD countries. Projections suggest this is likely to continue, despite the positive changes achieved so far.

4.8 Analysts' Views

Appendix A summarises the views of significant writers with a consistent involvement in analysing the performance of the economy as a whole over the last decade, together with some limited commentary from 1982 to 1985 before major reforms were initiated.

There is a surprising amount of agreement in the views expressed, given the entrenched reputation of economists for disagreeing with each other. This may be because much of the literature puts forward hypotheses about what has driven New Zealand's growth but does not seek to provide conclusive evidence.

The common threads in this literature are drawn together in the next part of this paper.

5 Reasons for New Zealand's Moderate Growth Performance

As noted above, New Zealand's per capita growth performance continues to lag OECD levels. Projections largely based upon existing performance suggest it will continue to do so. TFP performance places New Zealand at the OECD median, despite long-running reforms aimed at lifting performance and expectations that New Zealand might grow faster than advanced OECD members on the basis of convergence theory. The performance can hardly be seen as disastrous given the TFP results achieved and the improvement since the 1970's and 1980's. Nor is it outstanding. Hence, the word "moderate" is used to describe it here.

The possible explanations are many. This part of the report discusses them in the following order, broadly from factors over which New Zealand has little influence to those where it has some.

Factors Over Which New Zealand Has Little Influence

5.1 The Post 1945 Legacy
5.2 Geographical position
5.3 Economies of Scale
5.4 The Reform Process
5.5 International Conditions

Factors over Which New Zealand Has More Influence

5.6 Demographic Factors
5.7 Human Capital
5.8 New Zealand Values and Attitudes
5.9 Capital Growth
5.10 Macroeconomic Policies
5.11 Government Expenditure, Welfare Support and Taxation
5.12 Innovation
5.13 Microeconomic Policies

In addition, Appendix B comments briefly on measurement issues, which are also referred to where relevant in the text.

5.1 The Post-1945 Legacy

A clear theme from the literature reviewed for this paper is that New Zealand at the end of World War II was in a strong economic position for several reasons. Most of these did not represent permanent advantage.

New Zealand's infrastructure was intact and New Zealand business was in a position to contribute to first to the war effort and then to overseas rebuilding through its exports. The balance of payments and production were strong during the war, thanks to strong UK demand for agricultural production at good prices and US demand for supplies and bases for troops in the Pacific theatre.

An inability to import during and immediately after the war further strengthened savings and the balance of payments.

The 1930's saw New Zealand benefit from British preferential tariffs, which remained in place for many years. New Zealand was then not long past reaching the frontier, according to Gould (1982) with the advantages that stemmed from being able to exploit frontier resources at low cost. However, that advantage had been lost by around the end of World War I.

New Zealand may have also have been accumulating at the same time an unhelpful legacy from past social and economic experiences, which was to reduce future growth prospects. Prosperity based on the ready exploitation of resources provided relatively few incentives for skill development as high wages could be earned in straightforward primary processing activities. Unfavourable attitudes towards payments of skill premiums may have been fostered by the history of migrants seeking to move from the more rigid British class based society. Putting in place strong welfare safety nets for individuals and industry was encouraged by the 1930's Depression and helped to foster egalitarian attitudes as argued by Franklin (1985). A long period of high incomes and stability may have fostered rigidities and limited adaptation to change, as argued by Olson (1982) and Blyth, Hawke and Smythe (1984).

On the macroeconomic front through the 1950s, according to Singleton (1998), an inability to tolerate even 1% unemployment led to chronic excess demand and balance of payments deficits. Demand management in New Zealand may have led in New Zealand, as elsewhere in the post-war period, to increased, entrenched inflation, ultimately requiring costly action to bring inflation back under control.[43]

New Zealand was also firmly locked into specialisation in commodity production for which prices have fallen approximately 80% in real terms over 100 years, according to the Economist (1999a).

The historical legacy was not conducive to strong growth.

5.2 Geographical Position

Theoretical literature identifies geographical position as having a significant influence on growth, as discussed in Part 3 of this paper.

Likewise, New Zealand's geographical position is often mentioned as a contributor to its economic performance in the material reviewed for this paper, although without in-depth analysis. One example is Bayliss (1994) who argues New Zealand is handicapped by high international and domestic transport costs. Another is Gould (1982), who notes that New Zealand has had to devote

[43] See Anderson and Gruen (1995), who argue that OECD economies generally stimulated output to excessive levels over 1951 to 1973, generating this problem.

an unusually high proportion of resources to transport, given its terrain. However, transport and communication costs have tended to fall sharply over time.

As is well known, the effects of high transport and communications costs on growth are not straightforward. Their effect depends upon the interaction with other transaction costs and economies of scale. In some cases, isolation may raise the prospects for an activity developing. Examples might include nineteenth century New Zealand manufacturing, where economies of scale were less important; primary products, where comparative advantage in natural resources is intensified by isolation; or local service delivery now in areas where direct human involvement is important. In other cases, where economies of scale are important or services can be provided remotely, there will be less chance of development occurring.

There are other barriers. Helliwell (1999) suggests that national borders themselves show up as much more important barriers than gravity models, taking into account market size and distance, would predict. However, border effects apply to a wide range of countries. There is little prima facie reason to think these barriers will be more important to New Zealand than other developed countries. These models imply distance may be rather less important than might first be thought in international interactions.

The effects of distance may involve more than just physical distance. If developing sustainable advantage requires firms to develop relationships with clients and suppliers, as suggested by Campbell-Hunt and Corbett (1996), then distance will be a major hurdle. The concentration of US innovation within a limited number of US geographical regions, noted by Glaeser (1996), also suggests distance from major developed countries will be an obstacle to growth.

There are no obvious examples of countries with small populations, isolated from major markets, having achieved consistently high per capita GDP levels without having a strong natural resource export base.[44]

While transport and communications costs have fallen and new communications technologies reduce the barriers of distance, those barriers still remain. Flights from New Zealand to major markets except Australia continue to be physically demanding and expensive. Personal contact appears to remain important to business relationships even in the face of new electronic communications tools.

New Zealand does of course have geographic advantages. Isolation from northern-hemisphere environments supports a clean, green image.

[44] Pritchett (1998) divides countries into groups which achieved growth with differing levels of consistency form the 1960's onwards. Those countries which have achieved the highest growth rates consistently tend to fit a description as being either situated close to large populations in high or growing income regions (eg Malta, Ireland, Cyprus or East Asia) or being able to exploit natural resources (eg Botswana).

New Zealand can provide out of season produce to northern-hemisphere markets. Business can be processed here overnight. New Zealand can be promoted as the first major tourist destination to see in the new millennium. These advantages, though, are all either resource related or of limited importance.

In summary, these points tend to suggest that distance may limit New Zealand's growth rate through certain mechanisms. These include higher transport and communication costs and very large distances limiting interpersonal communication. These might well tend to reduce the level of per capita GDP that New Zealand is able to achieve, as New Zealand faces both higher costs in what it does and carries out fewer transactions.

There may also be adverse growth rate effects. In some endogenous growth models, knowledge spillovers are important and could be limited by distance. While these models tend to depend upon spillovers of technology, it is not difficult to envisage them being extended to include a wider class of commercial relationships, including marketing relationships and management practices. Clearly these effects could be investigated in more detail, but they are not implausible.

5.3 Economies of Scale

Economies of scale are closely related to geographical factors. Isolation combined with recent settlement means New Zealand has a small population. Gould (1982) and Franklin (1985) note the lack of economies of scale in New Zealand. Empirical work by Chapple (1994) has found some limited, non-robust evidence of economies of scale being important at the 20 sector level in food, wood, paper, chemicals, electricity and restaurants and hotels. According to Chapple, Campbell (1984) also found some evidence of economies of scale in New Zealand manufacturing in the 1952 to 1973 period, but for only 9 of 93 industries. However, empirical work will not necessarily find the full influence of economies of scale easily. Some activities where they are important may simply not be undertaken and some instances may be hidden within the wider industry classifications usually employed in studies.

While robust macroeconomic evidence may be hard to come by, it seems clear that there are many areas where economies of scale are important to international competitiveness and domestic production. Economies of scale show up clearly in case studies. For example, dairying, both in farming and processing; red meat; fishing; telecommunications; and sugar refining clearly show signs of significant economies of scale (Pickford and Bollard 1998). It is clear that small scale car assembly plants were unable to survive and that successful smelting plants are likely to be large in basic metals manufacturing. All in all, experience suggests economies of scale are likely to be important in much manufacturing, primary processing activity and in some services and utilities.

Economies of scale may well be important in some Government activities too. New Zealand needs international representation in a wide variety of fora despite its small population and has to staff and provide most systems found in larger countries.

A possible more recent example of economies of scale may include the transfer of a company's accounts payable systems to Singapore from New Zealand, where they could be handled together with payments for 14 other countries within the region (National Business Review 1998).

Economies of scale are of course not all pervasive. Many small businesses operate successfully. Chapple (1994) found some suggestion of diseconomies of scale at the sectoral level in transport and some areas of manufacturing.

An inability to achieve economies of scale is likely to limit the types of activities found in the New Zealand economy. This does not mean that industries can not operate successfully, but it is likely to mean that costs are higher or incomes lower in a number of instances. Again, this discussion tends to imply that a lack of economies of scale may constrain achievable income levels, perhaps more than growth rates.

There may also be an impact on growth rates, as illustrated in the following somewhat speculative comment. Innovation is important to growth, as argued in section 5.12, and also possibly subject to economies of scale, at least in some instances. For instance, The Economist (1999) in a recent survey on innovation, provides information that is suggestive of economies of scale in some R&D activities. Large R&D activities within Xerox, for instance, gain the advantages of easier access to markets, supplies and finance because of the parent company's image; a large concentration of proprietary patent know-how; and support within a company with expertise in many new technology start-ups. As a larger company, Xerox appears to have found mechanisms to capture new ideas applying outside its core business, which formerly tended to slip away with the staff creating them.

The effect of scale on growth is ripe for further investigation but does not seem to have received much detailed attention in New Zealand research.

5.4 The Reform Process

Several aspects of the post 1984 reform process suggest that New Zealand's growth has probably been limited up to the present by transitional factors inherent in the reform process itself. Adjustment may be costly, slow and have benefits, which though cumulatively large, may be slow to appear and not fully measured. There has also been an ongoing debate about sequencing.

Reforms are often costly, with the costs up front. Silverstone, Bollard and Lattimore (1996) express cautious optimism that the reforms have contributed to growth but suggest that adjustment costs were high and were probably

underestimated at the time New Zealand's reforms were undertaken. Both physical capital and human capital have been made redundant, directly reducing production at least in the short term.

There are also substantial costs in adopting new technologies and systems as suggested by Greenwood and Jovanovich (1998). New Zealand had many of these to adopt. North (1993) provides a particularly interesting insight on the likely costs of reform, arguing that economies, once on a particular path, find it very hard to fundamentally alter the direction. Network externalities, economies of scope and complementarities bias incremental costs and benefits in favour of those organisations that are broadly consistent with the institutional framework. This suggests the costs of reform in New Zealand may have been widespread.

Quite apart from costs, path dependence undoubtedly affects the time required to make and see responses to changes from reforms. New Zealand's skill levels now reflect decisions on what skills to acquire, sometimes made decades ago in the face of high returns to unskilled labour, even after that demand may have dropped. Savings attitudes and New Zealand owned capital quantities reflect past decisions to provide tax-funded, pay as you go superannuation and past, high, real income expectations, even though these may not be well founded.

Delayed Payoffs

The pay-offs may well be delayed. This was not the view of the former New Zealand Planning Council who thought the disadvantages of reform would be relatively short term (Blyth, Hawke and Smythe 1984) but it is a consistent theme of overseas and later writings.

Anderson and Gruen (1995) examine the pay-back period for reducing inflation in Australia, assuming a real discount rate of 5%. They variously suggest delays of 7 to 16 years, in illustrative scenarios for recouping the initial output cost of achieving a reduction, notwithstanding that the ultimate pay-off may be quite large. There appears to have been little such analysis in New Zealand.

Harberger (1998) suggests:

"But observing even the best of real-world growth experiences, I think we have to conclude that the adjustment is going to be extended over a lengthy period in any event, thus causing the big observable result of better policies to be a higher growth rate over an extended period rather than a discrete jump to a totally different level."

Winston (1998), examining US industry adjustment to deregulation, suggests "it takes firms a long time to tear down decades-old barriers to efficiency and to adopt more efficient production and marketing practices."

McMillan (1998), in a view of the New Zealand economy from the outside, also suggests that it necessarily takes time for new ways to organise firms and to do business to arise. He suggests a number of contributing mechanisms:

- Labour market frictions, with too little search effort by both workers and employers; sticky wages; and difficulties in assessing the skills of laid-off job-seekers
- Information externalities, where it pays firms to delay undertaking new investments until others have demonstrated their viability
- Externalities in downsizing, where it pays to wait until another firm downsizes, carrying more of the burden of industry adjustment.
- Obsolescence in skills
- A legacy of inexperience of competition
- Redesigning internal hierarchies; introducing new staff incentives; finding new managers for a new environment; imposing new financial oversights; finding new trading partners and revamping customer and supplier networks.

There is a strong theme in recent New Zealand writings, too, that output gains are likely to take time to come through following reforms. The OECD (1999) suggests that the benefits of reform are likely to be slow to emerge and reforms require consistent application, despite impressive overall progress with structural reform. Campbell-Hunt and Corbett (1996) suggest that building sustainable advantage by firms depends upon establishing a network of relationships with external suppliers and the workforce and building a reputation with clients. Years are required to build these assets, even with the incentives to do so provided by reforms. Hall (1998a) suggests that by 1984, New Zealand had unsustainable macroeconomic imbalances and serious microeconomic problems and that these often take longer to turn around and require more persistent corrective action than many originally envisage.

A fundamental source of delay in adjustment is likely to be in the responsiveness of a range of resource "gatekeepers".[45] While institutions, attitudes and management may all be slow to adjust, individuals also need to adjust in order to respond to changed incentives. New skills may need to be acquired. New sources of information flows and improvements in market institutions may be needed to support adjustment processes.

For instance, individuals control the allocation of their own labour. Crude signals and incentives, such as job losses will bring re-allocation, but to achieve a continuing, higher level of responsiveness will require new skills to be learned, monitoring of the labour market and job search. Land resources locked into specific farming types may be another example. In Southland for example, there is a prolonged process of conversion of sheep and mixed farms to dairy farms, where new skills are required. The long delays in the process of diffusion of innovations, found in almost any study, may also be instructive. Stoneman

[45] My thanks to John Yeabsley for pointing this out.

(1995), in the context of international studies of innovation, suggests diffusion of innovation may typically take from 5 to 50 years from first use to 95% take-up. Further research on New Zealand responsiveness could be worthwhile.

These suggestions of slow change seem plausible. Growth promoting changes are likely to require acquisition of new skills, new investment, structural change and attitudinal changes, all on a sufficiently large scale to be discernible at a macro level.

Of course the suggestion that pay-offs are delayed leaves the way open for critics to suggest that delay is actually symptomatic of failure in the underlying reform processor that the expected pay-off date is constantly being shifted forward in time, as noted by Easton (1998). Such suggestions are comparatively unusual in the economic material reviewed for this paper, as most analysts tend to accept that some reforms were needed, while arguing for differences in emphasis or implementation. Some like Porter (1998) tend to suggest that particular aspects of reform, such as the move to encourage a knowledge-based economy have not proceeded far enough. Others, like Easton, Bayliss and Philpott, as reviewed in Appendix A, argue that parts of the reform process were badly implemented, especially macroeconomic aspects.

The arguments depend closely on the analyst's assumed counterfactual – what would New Zealand's path have been without reforms? The majority tend to suggest that the appropriate counterfactual on both micro-reforms would have been continued deterioration in performance. McMillan (1998) and Evans, Grimes and Wilkinson with Teece (1996), for instance, suggest that the pre-1984 policies, and macroeconomic stabilisation they made necessary, caused much of the social cost endured by New Zealanders in the mid-to-late 1980s. Dalziel (1998), in the minority, as noted in Appendix A, suggests a different counterfactual based on higher, earlier growth rates.[46]

Hazledine (1998), as summarised in more detail in Appendix A, also accepts that some reforms were needed but comes closest of the analysts reviewed to suggesting that the reason for delayed pay-offs was that the reform process was fundamentally flawed. He argues that many reforms fostered selfishness, and imposed additional supervision and management costs on society, to stem the resulting harmful effects. Many markets do not work particularly well, while externally, New Zealand is excessively dependent on trade, given its isolated location.

In some respects, Hazledine's views can be seen as a warning against taking any policies to extremes and are consistent with international thinking. Examples might include his warnings against attempting to implement policies that may be inconsistent with underlying culture, or assuming a simplistic pay-

[46] It is important to distinguish this "what would have happened?" counterfactual from the different counterfactual of "what might have been achieved with optimal policies?", where the majority offer some criticisms, especially in the macroeconomic debate, discussed in section 5.10.

off to human capital investment. However, his arguments that New Zealand was remarkably successful in its economic management from 1945 to 1975 and that restricting trade would assist growth appear strongly inconsistent with both a New Zealand majority and international consensus. A key piece of evidence offered for his views is that "management" effort has increased in New Zealand over time. This is questionable on the grounds that such phenomena may simply reflect a move towards knowledge based work and are also found elsewhere in more successful economies (North 1993).

In summary, the argument that the pay-off to reform is slow, but spread out over time seems more convincing than arguments that the reform process has failed. The broad consistency of New Zealand's post-reform policies with international growth analysis supports this conclusion. It would, however, be another matter altogether to try to argue that more could not be done.

Slow Implementation

In New Zealand's case, a number of key reforms have been implemented very slowly, despite rapid reform in other areas. It took variously 7 to 12 years for tariffs to be halved from 1987 levels in high tariff areas such as apparel, automotive and electrical equipment, under constant reform programs. Protection reform began in the late 1970's but tariffs will not be eliminated until 2006. Meanwhile, protected industries have continued to attract resources but new investment must have been limited. This may be consistent with the findings of Hall (1996), that the pace of structural change in New Zealand has been slow, even after 1985, compared to other countries, measured in terms of changes in highly aggregated industry shares of employment and output.

Measurement Issues

Measurement issues may also have contributed to an apparent slow pay-off from reforms. For example, it seems possible that measured value added in formerly heavily protected industries, such as textiles and machinery, will have reduced as prices fell, even if essentially the same commodity is still produced at the reduced prices. The matter is further discussed in Appendix B.

A further measurement issue related to reforms may be the effect of recognising previously unrealised liabilities. When the Government recognised liabilities arising from guarantees to major projects and Producer Boards in the 1980's, the resulting debt taken on included a substantial overseas component, which had to be serviced, with the costs appearing as a one-off reduction in GNI, while not necessarily affecting GDP. The earlier stimulus of construction or production undertaken under a guarantee might alternatively be seen as generating an artificially high, earlier level of GDP. Similarly, non-recognition of large Government liabilities for ACC or the Government Superannuation Fund prior to the 1990s may have lead to a higher measured level of Government spending and consequent activity level than after those reforms. The subsequent growth level might appear smaller, as measured on an initial point

to final point basis, but is more sustainable than the previous, somewhat artificial position.[47]

Sequencing

Possibly the major debate about the impact of the reform process on growth, as opposed to the reforms themselves, has been about sequencing. Bollard (1994) stated the established principles of sequencing at the time of reform to be:

- stabilise before attempting structural reform, to ensure balance in the Government sector
- deregulate product markets and labour markets before financial ones, to ensure that commodity and not capital flows determine the real exchange rate
- deregulate domestic markets before external ones, to allow local interests to absorb any economic rents and to retain internal balance before liberalisation

Bollard notes that all of these rules were broken in New Zealand, sometimes for considered reasons, but argues there were few precedents to follow. Joumard and Reisen (1992), as OECD analysts, suggest that opening externally, before stabilising inflation and undertaking labour market reform, produced a classic Dornbusch-style real exchange rate overshooting, with subsequent hysteresis effects in manufactured exports.

Evans, Grimes, Wilkinson and Teece (1996) argue that while better results would have been seen from earlier labour market reform and a reduced fiscal deficit, there is nevertheless a case for proceeding on all fronts at once, given a widespread need for reform and given final outcomes. This latter view seems to have gained support over time, with the OECD (1999) suggesting that the consideration of sequencing issues should not, by itself, inhibit the pursuit of reform measures. McMillan (1998) notes that current empirical knowledge of how markets react to reforms is actually quite limited, in turn limiting the prescriptions that can be offered.

Other writers have also suggested that sequencing of particular policies was less than optimal. For instance, Hazledine and Murphy (1996) suggest that trade liberalisation from 1982 to 1988 actually increased the rate of effective assistance to manufacturing, favouring low wage manufacturing industries on balance by raising effective rates of assistance in highly protected industries.[48]

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[47] For the sake of clarity, the elimination of artificial Government stimulus and recognition of liabilities is likely to show through as a one-off measured output level reduction, not as an ongoing reduction in the annual growth rate.

[48] Effective rates of assistance take into account both the assistance rates on an output and on inputs, to give a measure of net assistance to an industry, say from tariffs. Because many manufactured goods represent inputs to primary activities and vice verca, the faster

This occurred because assistance measures were phased out more quickly in lightly assisted industries. This seems a serious matter: diverting incentives away from long term directions risks delaying inevitable structural adjustment and does not fit with the more relaxed view of sequencing now gaining favour.

Conclusions about Reform Process

On balance, it is not clear from analysis of sequencing issues that New Zealand long-term growth finally suffered. In any event, sequencing costs are now well and truly sunk. However, sequencing and implementation issues are clearly highly relevant to implementation of future policies aiming to generate growth.

The reform process could reasonably be expected to have a slow but prolonged pay-off. There is widespread acceptance from writers sympathetic to the reform process, as well as those critical of the process, that there have been output costs and costs of dislocation to capital and labour.

A final point worth making is that many of the benefits of the reform process may have been static, possibly reflected more in welfare measures such as consumer surplus, rather than growth or income directly. This is implicit in the comment from Silverstone, Bollard and Lattimore (1996) that consumers have done well compared with producers in terms of prices, variety, quality and services.

5.5 International Conditions

International conditions have plainly had a major influence on New Zealand's growth performance in areas over which New Zealand has relatively little influence. These include terms of trade effects, market conditions, financial conditions and regulatory conditions.

New Zealand has faced an overall commodity terms of trade decline since the 1950s and 1960s, despite the recovery after 1986. (Figure 6 shows New Zealand's terms of trade.) This phenomenon continues to be debated, despite its clear underpinning in product life cycle theory and empirical experience in commodity prices. The Economist (1999b) shows a basket of commodities declining approximately 80% in real price over the last century.[49] As noted in Part 3 of this paper, declining terms of trade do seem to affect growth adversely, with some impact from sharp variations experienced in the 1970s and 1980s. Easton (1997) points out that sharp oil price declines were

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elimination of assistance to primary production resulted in a rise in manufacturing assistance.

[49] It should be noted that the product life cycle also affects commodities and manufactured products imported by New Zealand, offsetting declines in New Zealand export prices.

damaging to major project investments founded on an assumption of continuing high oil prices, just as increases had been earlier.[50]

International demand and supply conditions have a major influence on the terms of trade. Short-term fluctuations may have relatively little effect on growth. Nevertheless, more fundamental changes in demand patterns can arise, such as a trend away from red meat because of concern for a healthier diet, overseas protectionism or the recent rehabilitation of suppliers such as Argentina and Uruguay, after successfully eliminating foot and mouth disease. Meat receipts dropped from 27% of total export receipts in 1981 or 1982 to 12.5% in 1994 or 1995, illustrating the potential order of magnitude of such effects (Maughan 1998).

One important trend has been towards growth being more knowledge based (OECD 1996). Grant (1998) also emphasises this. The development of new knowledge intensive products and services in a product life cycle world places continual pressure on New Zealand to upgrade its existing products and production processes, in order to compete and maintain or improve per capita GDP. Based on US data, more knowledge intensive plants tend to pay higher wages, are more productive, grow more and generate more employment. This tends to imply that developing more knowledge based industries would be a helpful direction for New Zealand per capita incomes, although not that a simple, knowledge based development strategy is necessarily appropriate, as argued in parts 5.12 and 5.13.

The rise in world real interest rates in the early 1980s was, according to Easton (1997), equivalent to a 5% commodity term of trade drop, illustrating the influence of financial markets. Since 1992, however, international real interest rates have dropped significantly, to New Zealand's advantage as a debtor country, according to Brash (1999).

Protection levels adopted in overseas markets are generally beyond New Zealand's ability to influence in the short term and have a serious effect in dairy and meat markets in particular. Trade agreements such as CER with Australia or made under the WTO have provided scope for New Zealand to limit these influences, although the underlying dynamics encouraging overseas protection remain strong. Seeking to extend the scope of international markets within which New Zealand can operate can be seen as a key policy for boosting growth for a number of reasons. New Zealand gains the stimulus of foreign competition for New Zealand industry, obtains outlets for areas of New Zealand comparative advantage and gains economies of scale.

While the international conditions concerned can not be directly influenced, New Zealand need not accept them passively. The pace of response to international price signals can be varied, thus modifying their impact. This might be through

[50] It would be implausible to argue that New Zealand did not benefit overall from the oil price decline.

reducing debt levels in response to high interest rates or changes in the structure of production. It is not only declining commodity prices that might limit New Zealand's growth but also possibly a slowness to respond to such price signals. This would have been more significant in the pre-reform period prior to 1984, when specific subsidies and protective measures favoured existing activities, than now.

In fact, in the 1980s, it was expected that structural change could improve New Zealand's terms of trade. This does not appear to have been widely researched, although there is one exception. Winkelmann and Winkelmann (1998) find that eliminating import licensing improved New Zealand's terms of trade substantially, suggesting that the earlier total welfare loss involved on imports sourced from the USA alone was as much as 1% of GDP in 1985. It is possibly suggestive that New Zealand's terms of trade have not declined over the 1990s as they appeared to do over the previous thirty years, as shown in figure 6. Experience suggests, though, that many years of data are required to be certain about such trends.

New Zealand may be slightly less vulnerable to adverse terms of trade shifts now than 15 years ago. Further investigation of the following could be warranted:

- Why the terms of trade seem to have improved since 1988
- Why the terms of trade have been more stable since 1989 than in the previous 30 years
- Whether the diversification of exports towards services such as tourism, commodities such as fish, mining and forest products, added value dairy products and manufactured exports has helped
- Whether price declines for imported goods, including other commodities and electronic goods have helped.

Factors over Which New Zealand Has More Influence

5.6 Demographic Factors

The influence of demographic factors upon New Zealand's per capita GDP growth is complex and does not appear to have been researched in particular depth. This summary can do little more than sketch the main points that have been made in New Zealand writings.

These are:

- Fast population growth is probably a negative influence on per capita growth through the reduction in the ratios of other inputs to labour. The

resulting reduction in per capita income for New Zealand from fast population growth has possibly been quite significant.[51]

- Immigration on the other hand is probably slightly positive for per capita growth in the long term, though the effects are not well established.
- The primary mechanism for population growth to affect growth is through its effects on the size and composition of the labour force, although there are many other mechanisms. These include both economies and diseconomies in city population growth and in the short term, aggregate demand changes.
- While Governments have some ability to influence demographic variables, it is quite limited, applying mainly to inward migration but not emigration or natural increase.

These points are expanded upon below.

Demographic factors influence population size through the natural rate of increase of population and net emigration, of which the latter has been better researched in New Zealand. General perceptions are that New Zealand can do little to influence the rate of natural increase, at least within a democratic society (Pool and Bedford 1997). This is clearly true in the short to medium term. Immigration is more subject to policy influence through controls, although rights of New Zealanders to return impose limitations on the influence of policy, as do rights of exit. This may explain the relative emphasis on migration in demographic work touching on economic growth.

Emigration has fluctuated enormously in its contribution over time, producing a large net outflow between the 1976 and 1981 censuses but contributing one third of the overall population increase from 1991 to 1996 (Cook 1997). A consistent feature in the last two decades, according to Winkelmann (1998), has been net emigration of New Zealand citizens every year since 1981, who tend to be better qualified than those remaining. In numbers, this flow has been more than made up by an inflow of non-New Zealand citizens, again better qualified than the overall population. The impact of the outflow could well be important but has not been closely examined to date and certainly merits more attention.

New Zealand has had a relatively fast rate of population growth by high-income country standards. According to Easton (1997), New Zealand's population grew 1.6% per annum from 1945 to 1990, 0.3% per annum more than OECD countries, especially prior to 1966. The growth absorbed more than half of GDP growth of 2.8% per annum. This continued from 1990 to 1997, when New Zealand's average rate of population increase of 1.2% per annum exceeded that of high income countries by 0.5%[52] (World Bank 1998).

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[51] However, as Sarel (1995) points out, to the extent that fast growth produces a young population with expected lower productivity, there may be scope for later catch-up with an aging population, with productivity peaking at age 55 and then declining slowly.

[52] The World Bank (1998) shows that in 1990-97, New Zealand's growth was the same as that of other high immigration countries such as Australia and Canada and slightly greater than

Just how population growth affects per capita income growth is still an open question. While classical thinkers such as Malthus considered that population growth would reduce incomes as production could increase only more slowly, thinking about population has varied over time. Temple (1999) in reviewing international work recently suggests that there may be a small, negative effect on growth.

One useful way to think about the issue is as a trade-off between positive economies and diseconomies from population growth, such as those discussed in part 3 of this paper, relating to city size. The effects of population growth in New Zealand will be largely those of effects on cities, because of the extent of urbanisation of the New Zealand population and because city populations tend to be the areas in which growth is concentrated in any event. Glaeser (1998) suggests that at least in US cities, the elasticity of income with respect to population is 0.1. However, the observed cost of living also rises strongly with population, with an elasticity of 0.11. This may be dependent on the overall range under discussion, with some suggestions that costs increase more sharply in very large cities such as New York – off the New Zealand scale. Scope exists for New Zealand research.

There is a consistent thread in New Zealand writings on population and growth that high population growth has contributed somewhat to New Zealand's poor economic growth. Gould (1982) suggests that high population growth diverted investment into relatively unproductive investments and exacerbated balance of payments difficulties. Poot (1999) suggests that population growth is generally found to be negative for per capita income growth.

Easton suggests the high rate of increase may have dropped New Zealand's per capita GDP growth from 1945 to 1990 by 0.17% per annum, compared to the OECD, based on cross-country results from Dowrick and Nguyen (1989). This would be enough to drop New Zealand's relative per capita GDP over such a lengthy period by 7%. Smith and Grimes (1990) take the same approach, suggesting like Easton that a mechanism of relative capital shallowing is responsible.[53] Hazledine (1998) also emphasises that population expansion with finite resources will lower welfare. Rebstock (1997) suggests that while more people produce more, per capita output is what counts and that diminishing returns are likely to set in.

All these views are consistent with neoclassical theory and cross-country evidence.

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the USA. In 1980-1990, New Zealand's growth rate was only marginally above the high-income country average but less than the other three high immigration countries.

[53] Temple (1999) notes that this is the main mechanism suggested. He also suggests there is some evidence that students in countries with higher population growth record lower achievement. Temple (1999) also suggests a weak negative relationship between population growth and total factor productivity and that population growth affects labour force participation.

This does not seem implausible, especially given the historic resource base of the New Zealand economy. Natural resources and land availability through development activity seem likely to respond slowly at best to increased population. A retreat from marginal land development activity after the 1980s seems to confirm that there are limits in expanding natural resource exploitation, although new ways of adding value in pastoral farming, horticulture, processing, forestry, fishing and mining have clearly been found over recent decades.

It is likely that an expanding population involves some beneficial effects for per capita incomes, such as the ability to exploit more economies of scale in production processes and exploitation of infrastructure, as Easton (1997) points out. He reports work by Philpott and Poot in the late 1980's suggesting that capital intensity and economies of scale effects were not as important as technological growth. That the latter are small certainly fits with the evidence on the growth of cities reported by Quigley (1998) in Part 3 of this paper. New Zealand would still have a small, isolated population even if it doubled from its present level.

These comments do suggest, though, the worth of researching more closely the effects of net population expansion on per capita income levels.

Recent views about the contribution of inward migration to growth appear to be more positive about its long-term effects. The NZIER (1998a) suggest that the macroeconomic impacts of immigration are ambiguous and effects on incumbent New Zealanders complex, but conclude that international research suggests that the macroeconomic impacts of migration are positive but small. Poot (1998) also reaches the same conclusion.

Box (1999) summarises the influences of migration on per capita growth in more detail, noting that the effects depend upon migrant profile, savings and investment habits, consumption habits, and capital brought in. Productivity may be boosted through entrepreneurial skills, contacts and contributions to economies of scale. Demand is stimulated. However, inflationary pressure may be exacerbated and local capital and skill development may sometimes be crowded out. Some entrepreneurs have had difficulty transferring their skills, at least in the short term, with possibly more interest in migration for lifestyle than business reasons (Forsyte Research 1998).

There is thus a conflict between positive views about the growth contributions of net inward migration and the preponderance of negative views about population growth for per capita incomes. The following points might assist in resolving it:

- Migration has made a net contribution to population growth and is thus likely to have contributed to a shallowing of capital and other inputs.
- Migration inward lifts sharply immediately following booms and reverses after recessions commence. This pattern certainly suggests that migration

may be a significant factor limiting growth in per capita incomes even if it also serves as a cushion during downturns. This aspect is worthy of further study.

- The contribution of migration or population growth to per capita GDP growth probably depends upon the contribution it makes to the ratio of human capital to raw labour in the workforce. Inward migration would probably have added less to human capital before emigration criteria were changed to emphasise skills more in the 1980s and possibly have contributed less to per capita GDP growth than it does now. Similarly, natural population growth that adds to human capital, discussed separately below in section 5.7, is likely to make a more positive contribution to growth.[54]

Labour

The increase in New Zealand employment over time clearly has the potential to have a major impact on GDP growth, as illustrated by Treasury's (1996a) assumption that the employed account for a 60% share of output.

The actual impact has probably been somewhat less significant. Lawrence and Diewert (1999) suggest that employment growth would have raised real GDP only 7 percentage points from 1978 to 1998, assuming all other variables were unchanged. In contrast, of the other variables examined, the terms of trade contributed –3%, capital growth 20% and total factor productivity growth 29%. The method assumes the economy follows a translog functional form. Employment growth is measured as the contribution of hours of three groups: managers and professionals; clerical, sales and services; and production and labourers, weighted together by incomes, benchmarked to census data.[55] For illustrative purposes, Lawrence and Diewert record total employment numbers as growing by 20% from 1978 to 1998. Market sector hours worked per worker declined 11% over the same period.

Labour force[56] growth in New Zealand over the last two decades has been considerably higher than in other high-income countries. The World Bank (1998) shows that for New Zealand's labour force, including both employed and unemployed, annual average growth rates have been 2.0% from 1980 to 1990 and 1.4% from 1990 to 1997. These compare with 1.2% and 0.9% respectively for all high-income countries. The high population growth rates discussed above, through earlier high natural increase and emigration, undoubtedly provide the basic driving forces.

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[54] It has probably been doing so, given that younger members of the population tend to be better qualified. While the Household Labour Force Survey in 1986 showed that around 40% of the population had no school or higher qualification, by 1996 this was down to 30% and to 18% of those aged 25 to 44, according to Cook (1997).

[55] Lawrence and Diewert do note that labour inputs have grown more on other measures, based on employment numbers rather than hours, and on household labour force survey data numbers or hours. There is a need for more research on differences between series.

[56] The labour force includes those employed and those seeking work but not employed.

New Zealand writers interested in per capita economic growth do not seem to have focussed particularly on the composition of the labour force. The key issue here is the proportion of the population actually working, as an increase could potentially raise per capita incomes, assuming there are not diminishing returns to additional labour[57]. Such an effect is more likely to be one-off rather than offering any permanent increase in growth.

Overall participation rates of the working age population in the labour force have risen strongly since the 1950's, as noted by Easton (1997), from 62.1% in 1951 to 71.8% in 1991. The ratio of the labour force to total population rose from 38.2% to 46.7%. Over the period, important influences on the size of the employed proportion of the population have included:

- Children being an initially increasing, then decreasing, proportion of the population, with corresponding effects on female availability for paid work
- An increase in the participation rate of women, which has continued. From 1980 to 1997, the female proportion of the New Zealand labour force rose from 34% to 44% according to World Bank (1998)[58], compared with high-income country proportions of 38% and 43% respectively. With comparable countries such as Australia, Canada and the United States having female labour force proportions of 43% to 46%, the scope for further large increases in female participation would seem more limited. Scandinavian countries achieve higher ratios though.
- Increased in school leaving ages and in post compulsory education, which reduce numbers available for work.
- More recently, an increasing proportion of elderly
- An effective decrease in 1975, then more recently an increase in the age of eligibility for superannuation, which saw workforce participation by 60 to 64 year olds rise from around 24% of the group in 1989 to 1992 to 43% in 1997, according to Cook (1997).
- Increasing unemployment, which for example rose to 7.7% of the workforce by the time of the June 1998 Household Labour force survey, from around 4% at the start of the survey over 1985 to 1987. This undoubtedly reflects both structural factors and cyclical factors, with the 1998 recession lifting unemployment at the end of the period.
- Relatively high hours worked by OECD standards, according to PCD (1996). Average hours have declined, though, with a substantial increase in part-time work.

These influences have produced relatively high labour force participation rates by OECD standards as PCD (1996) notes. Compared to the high-income

[57] As discussed above, there may well be diminishing returns, although it would be an extremely pessimistic assumption that these would overwhelm the effects of increased participation. The participation rate is the ratio of the labour force to working age population, which in turn is generally seen as the total population between ages 15 and 64.

[58] Cook (1997) suggests a higher figure of 45.4% women in the workforce by 1997.

country participation rate of 48.1% in 1997, New Zealand shows a rate of 49.2% in the year to March 1998, up from 46.7% in the year to March 1991.[59] High-income country participation rates also appear to have increased over time, from 45.1% in 1980.

Despite these various influences, the proportion of the total population employed has been remarkably stable in New Zealand since the mid-1970's, generally remaining around 44% to 46%, except for the recession in the early 1990's. This tends to suggest that changing dependency ratios and changing mixes of dependents have had little effect over this period.[60] Given that average hours worked have tended to decline, this implies that a relatively smaller contribution from labour to GDP over time may have made a small contribution keeping New Zealand's per capita income growth moderate. However New Zealand's labour force participation history does not suggest a record much different to that of other comparable countries. Explanations for New Zealand's per capita performance lie elsewhere.

5.7 Human Capital

The immediately preceding section examined writings on the contribution to New Zealand's growth performance from increments in the quantity of labour. This section concerns work on the growth contribution of the quality of labour. It stops short of matters that relate to culture or values, which are discussed in section 5.8.

The concept of human capital goes back at least to Becker (1962). For this paper, as in Williams, Andrews, Nana and Rose (1999), it is defined to be an accumulation of knowledge, education, training etc by a person which increases the productivity of that person's knowledge as a factor of production. This leaves aside the possibility that accumulating human capital might stimulate growth in other ways, which have not been discussed much in a New Zealand context.[61]

The definition also leaves aside health and other possible contributors to human capital apart from knowledge based contributors. Although these play a role in international research, such as that of Sala-I-Martin (1997), largely as a proxy for human capital attributes, there is little reference to the effects of health on growth in the New Zealand literature reviewed here.[62] There is a suggestion in

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[59] The data is sourced from World Bank (1998) Table 3 and Statistics New Zealand.

[60] Dependency ratios mean the ratio of those not employed to those who are.

[61] A possible exception is the Porter model which sees demanding consumers as contributing to raising competitive advantage and hence growth. Education might play a role in making consumers more discerning although this is not emphasised in Crocombe, Enright and Porter (1991).

[62] An exception here is Knowles and Owen (1995), which extends a neoclassical growth equation by including both health and education variables. Cross section estimates using Mankiw, Romer and Weil (1992) data for 77 countries suggest a strong, positive link between growth and health, measured through life expectancy, but if education is included as a variable. However, the work is not New Zealand specific and appears to leave out

literature on the link between health and productivity that health has important effects, but with economic development, improved health becomes less important in influencing labour market outcomes and education and skill acquisition more so (Strauss and Thomas 1998).

There is a strong theme in the New Zealand literature on growth suggesting that a lack of skills and/or education is a major contributor to New Zealand's moderate growth performance. Bandyopadhyay (1997) takes an extreme view and suggests that models based on educational achievement differences can explain 75% of the cross country variation found in income levels, better than the record of the more complex Solow or Mankiw, Romer and Weil (1992) explanations. This seems somewhat implausible, given the likelihood of joint causality between income levels and education levels, with education having strong consumption good characteristics.[63]

Most New Zealand writers see human capital to be important but without suggesting a unique role for it or quantifying its contribution. Franklin (1985) suggests low-income families are affected by a lack of education and that there have been continuing demands to downgrade the academic and scholastic aspects of education. While noting data difficulties and difficulties in international comparisons, Easton (1997) also suggests that historically, New Zealand did not have a well educated or trained labour force.

Vandersyp (1993) and Treasury (1996) separately suggest skill development is a key issue for growth. Treasury suggested a number of mechanisms from various studies. Better education is associated with lower absenteeism and propensity to leave a job. Higher schooling and particular academic subjects are associated with higher job productivity. More tertiary educated workers may help firms adopt new technology. The performance of certain industries is based on how average students perform in mathematics, science and other aspects of general education. Treasury (1996) emphasised the gap between wages for the skilled and those with less skills as a key factor driving investment in skills and the importance of institutional arrangements to support responsiveness to student, employer and wider community needs.

The lack of human capital thesis extends firmly to business and management. Williams, Andrews, Nana and Rose (1999) suggest, for example, that New Zealand firms tend not to invest significantly in training, possibly because many are small and lack the resources to invest. Crocombe, Enright and Porter (1991) found there was little firm involvement in staff training programs.

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variables that other work suggests have a very strong influence on growth, such as trade openness. Winkelmann (1998) also suggests health may influence the income of Maori men.

[63] Bandyopadhyay's models are slightly more complex than this might imply. He also argues that inequality in the initial distribution of education is important in addition to levels of education, and develops models in which external spillovers of knowledge from better educated people ("Managers") have an important role, as in Bandyopadhyay (1993). However, these have not been widely investigated in a New Zealand context.

Bayliss (1994) also argues New Zealand has had a poorly educated and skilled workforce, with the lack of skills extending to management. Yeabsley (1996) in a study of New Zealand investment in Chile, notes that the transition to investing abroad involved much learning for New Zealand management, given that New Zealand had been a relatively closed economy with few well trained and internationally exposed managers.

Campbell Hunt, Harper and Hamilton (1993) also suggest a lack of marketing, strategic analysis and financial analysis skills in business. Campbell-Hunt and Corbett (1996) suggest that organisational learning is important and management practices are crucial. They quote a 1994 Australian Council of Manufacturing study that found the availability of skills to be a very significant barrier to improvement for New Zealand firms, compared with both Australian and international firms. Their 1996 study at least found that there were considerable signs of improvement in skill-dependent activities in businesses – for instance, marketing, discounted cash flow analysis, costing systems, innovation and governance.

The analysis extends to the quantity and quality of education system outputs at various levels. Crocombe, Enright and Porter (1991) suggested that New Zealand had low participation in formal education and a short school year of 190 days, compared to Australia (200), Germany (220) and Japan (240). Management education was limited. There was a lack of vocational focus in education. Curricula were not highly relevant to business skills, with a lack of emphasis on language skills, poor maths and science participation and a lack of engineering study, although this was comparable to Australia or Canada. They saw limited incentives to upgrade skills where the Government remained committed to full employment, pay was not based on contributions and the legacy of a past emphasis on high pay, low skill industries remained. Moreover, the Government was not seen to have a strong commitment to resource development and there was no clear consensus on results expected from the education system. Upgrading New Zealand's human resources was a high priority, requiring high standards; fostering maths, technology and language skills; more interaction between education and industry; improved vocational training; and improved management and workforce skills.

While most analysts emphasise skill levels as a contributor to New Zealand's growth performance, Hazledine (1998) stands out as a sceptic on the role of education. He states that there is no evidence that the supposed ailments of slow growing economies are due to inadequate investment in human capital and argues that there is no simple mechanism leading from education to growth. People with educated are likely to be more capable to start with; time spent in education has a large opportunity cost; some people are slow learners anyway; and forcing education on people who do not want it is likely to be counter productive. Moreover cultural differences and social skills may be important to performance. Education may provide signalling about the quality of students, which was needed in an earlier era when there was more empathy in society and bosses knew their workers better. Hazledine cites Psacharopolous

as authority for the proposition that countries with high education participation have had amongst the lowest growth rates amongst developed countries.

As mentioned in part 3 of this paper, the international empirical literature on the relationship between education and growth is somewhat inconclusive, despite many analysts suggesting a significant link. There are many problems in making the linkage, including those noted below:

- There has been a prolonged debate over whether education contributes to growth through enhancing human capital or signalling.[64]
- Theoretically, education may be a consumption good as well as an investment good. It may affect output levels both directly and through externalities, which present modelling complexities.
- In this area as in many, the dynamics of the relationship between growth and human capital are not always well specified, with distinctions between stocks and flows of human capital not always being made (Temple 1999). It is often unclear whether the discussion is about levels or growth rate effects. Discussions in the growth literature are more likely to be about growth rates while implicitly at least, studies relating more specifically to human capital are more likely to relate to levels effects. There may be non-linear relationships, with different types of education investment generating different returns (Maani 1999).
- There may well be important complementarities in the effects of education, for instance through skilled labour complementing unskilled (Weiss 1995) or skills complementing other factors, such as physical capital and innovation (Williams, Andrews, Nana and Rose 1999). In this case, human capital investment mechanisms may affect growth rates more than simply raising output levels.
- Higher returns from primary education, literacy programs and vocationally oriented, technical and management training seem to be better established. (Weiss 1995)
- The specific effects of Government funding versus private funding are unclear, with the latter probably generating a closer link between the investment and future private returns. Williams, Andrews, Nana and Rose (1999) suggest examples of ways Governments attempting to deal with human capital market failures may themselves be prone to fail. These include a lack of incentives for performance of the sort faced by firms and workers in markets, the creation of monopolies in funding structures and difficulties for Governments in measuring outcomes.
- Matching the skills produced to jobs available remains important. New Zealand, for instance, risks producing skills in a heavily subsidised education system which do not match market requirements particularly well. In general, labour markets with more flexible wage levels and conditions might be expected to improve the signals and produce better matching now than in the past.

[64] Useful summaries can be found in Psacharopolous (1994), Weiss (1995) and Eliasson (1994)

Those New Zealand and international analysts who have investigated the linkages between education and output specifically are less likely to assume a simple relationship between education and output or growth than those whose primary focus is growth.

Education is not the only source of human capital building, as Gillman (1993) reminds us in considering an endogenous growth model based on learning by doing in a New Zealand context. He points out that countries can build experience through leaning by doing, reinforcing existing comparative advantage. For New Zealand, this suggests the desirability of moving industry to successive waves of new technology in areas with high scope for learning by doing. How this is to be done is not clear, although Gillman does suggest that New Zealand should not ignore existing areas of comparative advantage such as agriculture.

Historically, developing on the job skills may have been particularly important. Successful farmers without certified knowledge of agriculture were not lacking in skills. New Zealand may have lacked certification as much as skills. This in itself is problematic in a more dynamic economy, where certification can play an important part in signalling skill levels, as individuals seek to change jobs or industries.

Recent Outcomes

Comments on recent New Zealand achievement levels give a mixed impression. Essentially, New Zealand's past levels of investment in education may have lagged behind higher income countries, but present investment levels suggest that New Zealand's relative position is improving, compared both with its past and with other OECD countries.

Haworth (1998) assessed human resource changes since the 1990 Crocombe, Enright and Porter (1990) report. Key points in his assessment were:

- New Zealand's education participation rates have been broadly positive. Total industry trainee numbers are less positive but at least exceeded the 1988 peak again by 1997.
- For many small firms, upskilling has not been the norm over the 90s.
- Weaknesses in the management and structure of New Zealand businesses, together with macroeconomic instability have blocked the transformation of New Zealand's human resources.
- It is management's responsibility to take the initiative for further improvements.

Cross-country comparisons provide some indications, although inevitably, they are likely to be affected by differing definitions and other difficulties. The OECD (1998) reports that New Zealand had 41% of the working age population with only early secondary education, compared to an OECD average of 40% and

14% in the USA.[65] However, it notes that New Zealand has substantially increased the proportion of the relevant population in tertiary education, now exceeding the OECD average, although with relatively fewer tertiary students in universities. The OECD (1998c) reports that 11% of New Zealand 25-64 year-olds had university level attainments versus 13% for the OECD as a whole. New Zealand's expected years of tertiary education at age 17 of 3.0 exceeds the OECD average of 2.3.

Wagner (1998a) observed that New Zealand still has a very low proportion of the 25 year plus population currently in tertiary education. However, the OECD (1998c) indicates that New Zealand has a relatively high proportion of those aged 25-64 participating in continuing education and training (46%), for a relatively high mean number of hours per year (204). This area is likely to be of increasing importance.

In a preliminary analysis, indicative of the relative importance of tertiary education, Williams, Andrews, Nana and Rose (1999) estimate overall estimated flows into the stock of human capital over 1992 to 1998. Their estimates suggest a total 2.25% increment, of which new tertiary graduates contributed 1.25%, migrants supplied 0.5%, new entrants to the labour force 1% and exits -0.5%. Current demographics imply that the stock of human capital will stop growing next century with slow population growth. Raising the skills of existing workforce members will accordingly be more critical.

Achievements against various international benchmarks provide another indicator of skill levels. The International Adult Literacy Survey examines performance in a number of countries, using carefully administered standard tests of skills with prose, documents and quantitative material. New Zealand rated highly in mean prose skills, but in quantitative and document skills, only Ireland and Poland showed achievement levels statistically significantly below New Zealand in 1996 (Walker, Udy and Pole 1998). They also comment that poorer literacy skills are concentrated amongst Maori, Pacific Islanders and other ethnic minorities. The results also show that New Zealand outcomes do not differ greatly from the outcomes of Australia, the USA and UK, all countries with higher income levels.

In schooling, Kovacs (1998) has noted that New Zealand's early secondary school standards lag in several areas, where New Zealand has relatively high proportions of pupils failing to attain IEA standards:

- 15% of 14 year-olds fail to meet reading standards (compared with less than 5% in Finland). Mean scores are high, however.

[65] Maani (1999) notes that from 1996 census data, only 34% of working age males and 35% of females now have no school or better qualifications, down from 50% and 54% in 1986. New Zealand's upper secondary school graduation rate (93%) now appears to exceed that of the OECD as a whole (85%).

- 20% of 13 year-olds fail to meet maths standards, leaving New Zealand 8th lowest of 25 countries and well below top achieving countries
- 17% of 13 year-olds failed to meet science standards, again 8th lowest of 25 countries.

Campbell-Hunt and Corbett (1996) provide another perspective. They quote a 1994 Australian Manufacturing Council study as finding that the availability of skills is a very significant barrier to improvement for New Zealand firms compared to Australian or international firms.

These statistics and comments are hardly fully representative of New Zealand's educational outcomes. Nevertheless, they do suggest New Zealand has historically lagged in human capital development compared with top OECD performers, but has improved investment and attainment in human capital since the 1980s. New Zealand's achievement levels on a number of key indicators are not greatly different from those of significantly higher income countries such as the USA or Australia in some instances, again suggesting a weak relationship between education levels and economic performance.

It is reasonable to expect that if there is a pay-off from higher investment in human capital, it would be reflected in performance only with some delay, given the time required for individuals to reach higher earnings levels after participating in education. The earlier comments suggesting some uncertainty about the precise link between education and growth or output are worth reiterating.

Human Capital Policy Framework

New Zealand comment on the policy framework generally seems more positive. Haworth, as noted, suggests that the main initiative now lies with the private sector. Williams, Andrews, Nana and Rose (1999) suggest that New Zealand had an initial period of subsidised and inefficient human capital investment, which entrenched many workers into low skill, low wage returns, followed by a period of scrapping human capital, as some skills were no longer needed after reforms occurred. However, wider reform has made human capital more responsive and flexible to meet the needs of firms, while individuals faced with more of the costs of their investment are likely to make better decisions. The OECD (1999) appears to endorse the broad direction of education, while warning that the benefits of improving skill levels will only be realised over the long term and that substantial improvements in New Zealand's "low skill" position will be needed to match productivity improvements elsewhere.

Given the uncertainty about the linkages between outcomes and human capital investment, it is probably appropriate to be cautious in suggesting that there are obvious policy implications from this review. Eliasson (1994) in an OECD sponsored study of OECD wide human capital issues may highlight areas for possible human capital development that might be relevant to New Zealand. In terms Eliasson's recommendations for OECD countries, New Zealand has

increased incentives to make it worthwhile for individuals to invest in education, relies more on student effort and funding than before, removed barriers to labour market flexibility and emphasised fostering basic skills in schools. However, like its OECD counterparts, New Zealand may have more to do in encouraging continued upgrading of skills, developing education markets to foster innovation in education and addressing the needs of the part of the population which benefits less from education.[66]

Microeconomic Studies

A number of analysts have attempted to estimate the returns to education. Recent New Zealand examples include Maani (1999) and Winkelmann (1998). They suggest significant, positive private and social returns to most forms of education justify continuing investment, even if returns to bachelors' degrees may be reducing as graduate numbers increase. For instance, Maani calculates real, private, after tax returns using an internal rate of return methodology. She shows returns on private investment in most forms of education, mostly over 5%, are generally well in excess of the real after tax returns to capital calculated by Lawrence and Diewert (1999) for physical capital (mostly under 5%) over 1981 to 1996.

These sorts of results do suggest that income levels are likely to rise as a result of additional investment in education and thus should be reflected in reported growth rates. However, as Temple (1999) points out, microeconomic evidence about the returns to education are harder to ascertain at the macroeconomic level in cross-country studies. Maani's results are also suggestive of diminishing returns.

It is also less clear from microeconomic studies that investment in education would boost growth rates per se in any way, apart from the one-off boost to income levels that might be anticipated from investment under a neo-classical growth model extended to include human capital as a factor. There are also many questions over where any investment should be made, several of which are highlighted below.

Critical Types of Human Capital Investment

It is plausible that some types of human capital may be more important for growth than others. Crocombe, Enright and Porter (1991) identified science, technology and engineering skills as particularly important. The basis for this view was not well established, though, especially given that no particular market premium is evident for such skills, and that other researchers such as Campbell-Hunt and Corbett find a need for improvements in skills more

[66] The last group appears to include those who do not succeed in school, for a variety of reasons, including low effort on the part of students, parental disinterest and family environment.

generally, including management skills. Entrepreneurship skills[67] too are often suggested to be particularly important for growth, as in for example OECD (1998a). Grant (1998), of McKinsey and Company's New Zealand office, for instance, suggests that returns to exceptionally talented CEO's and knowledge workers are climbing rapidly as knowledge increasingly becomes the basis of wealth creation. As might be expected, he argues that New Zealand business in particular is insufficiently knowledge based, generating both strategic management and human capital issues.

It seems likely, that however, market conditions, regulatory environments and cultural conditions may be as important to generating this form of human capital as explicit investment in human capital. The OECD (1998a) certainly does not identify specific human capital development programs as a means of fostering entrepreneurship. The character traits of entrepreneurs identified by the OECD are not necessarily matters which are readily amenable to influence through human capital programs either: foresight, imagination, intelligence, decisiveness, alertness and aptitude for organisation.

It is also possible that achieving basic skill levels may be significant for economic performance. The OECD (1998d), for instance, suggests basic literacy is linked to employment prospects and may assist social cohesiveness, with greater participation in community activities by more literate individuals.

Conclusions about Human Capital

There seems little doubt amongst New Zealand analysts concerned with economic performance that weak human capital accumulation has held New Zealand's growth back. Analysts more concerned with educational issues are less certain about these links. Their views seem more consistent with international thinking, although there is still agreement that skill acquisition is important, even if the role of education is less certain.

With Government having a heavy involvement in human capital investment through education, it would certainly be desirable to have a firmer view about how to ensure the resources invested are made most productive. Naive investment in just any human capital development could risk generating poor returns. Yet again, more research is called for. There are some grounds to think that much investment by individuals at tertiary level, with their current exposure to costs within the present policy framework, could be expected to generate positive results for output levels and measured growth. The impact on underlying growth rates is less certain.

There seems to be a consensus that firms should increase their commitment to skill development for their workforces. At least in the New Zealand growth literature, less is said about how this might be achieved. Interestingly, current

[67] The OECD (1998a) define this to be "the ability to marshal resources to seize new business opportunities".

training by adults seems to be at a reasonable level by OECD standards but more investigation of the mechanisms by which skill development contributes to growth could be useful.

5.8 New Zealand Values and Attitudes

According to Temple (1999), there is some distrust of the explanations of growth performance afforded by social capital. One might add values and attitudes. The area has not been deeply researched in New Zealand although there are frequent references to these issues - sufficient to suggest that values and attitudes may have a substantial impact on New Zealand's performance. This is not implausible. What is really being studied here is the contribution of individuals to growth, as opposed to firms, sectors or macroeconomic factors.

The difficulty in handling these issues may stem from the diversity of factors affecting individuals, the need (ideally) to interact with other disciplines such as sociology and psychology, and lack of ready availability of consistent New Zealand data. The lack of data shows up in cross-country studies, which tend to resort to religion, language and race to measure cultural impacts on growth. These show up as significant, for instance in Sala-i-Martin (1997). What they proxy for is another matter altogether. While religion and race may conceivably feature in New Zealand, the main areas that appear in New Zealand commentary appear to be equality, ambition and selfishness/trust. These are discussed below, pointing to the conclusion that there may well be some impact on New Zealand's growth, although one which is difficult to assess without in-depth research.

Equality

Analysts have suggested that New Zealand has been strongly egalitarian and that this has impacted upon growth through several mechanisms.

Casson (1996), in the only New Zealand work located which centres on growth and culture, recognises New Zealand's egalitarian ethos and speculates that it may have been rooted in Victorian religiosity and "social" migration experiments. The ethos was translated into a welfare state, which he considers was developed incompetently, for instance in allowing overmanning.

Franklin (1985) contended that an egalitarian ethos was central to answering what had gone wrong with the New Zealand pre-reform economy. New Zealand had built up a system that trapped resources in protected markets, ostensibly to protect living standards, but in reality becoming ossified, creating a new hierarchy of privilege for those receiving the protection. Acceptance of change would entail acceptance of inequalities.

Similar views about the need for change were expressed by others at the time, although the implications for equality were not drawn out as explicitly as by Franklin.

Franklin's view contrasts with the view from recent cross-country regression analysis, reported as a consensus by Temple (1999), that high inequality tends to be negative for growth, based on analysis including developing countries. A New Zealand example is Bandyopadhyay (1997). However, this might be one area where conclusions influenced by developing countries are not particularly relevant, given that New Zealand's income distribution is not extreme. Perotti[68] (1996) for, example, in a study encompassing a large number of countries at different development stages suggests that the underlying mechanisms which account for a negative linkage between income inequality and growth include:

- a wide income distribution generates sociopolitical instability
- fertility decreases and human capital investment increases as equality increases
- Less strongly, investment in human capital increases as equality increases because those investing in human capital are less affected by borrowing constraints

There seems little reason to see New Zealand being significantly affected by sociopolitical instability. In New Zealand in the period of most interest since the early 1980's, fertility has tended to decrease and human capital investment to increase as equality has decreased. Borrowing constraints also seem unlikely to have been a significant constraint on educational participation, given New Zealand levels of state support for education.

Despite an increase in inequality since 1986 (Statistics New Zealand 1999), New Zealand's income shares of over 25% of income in the hands of the wealthiest 10% and less than 9% in the hands of the poorest 20% are not extreme compared globally[69] or with English speaking countries. More research might however be worth undertaking on whether there are links.

Hazledine (1999) argues that developing inequality is negative for growth. He notes that happiness in a range of countries seems to relate to relative income levels within a country and that a sense of fairness has been well established to influence behaviour in laboratory experiments, both in New Zealand and abroad. He argues that without a widespread sense of fairness in dealings, cooperation levels in society will be lower, adversely affecting the productivity of that society, including in New Zealand now, with increased inequality.

At least in New Zealand economic growth analysis, this would appear to be a minority concern. Research outside economics may however imply that concerns about equality could affect behaviour. For instance, focus groups of

[68] Perotti's approach might also be seen as unsatisfactory in depending heavily upon human capital mechanisms, given that the empirical evidence about these is mixed, as argued in section 5.7 of this paper. Temple's discussion on inequality relies heavily on Perotti and would also seem to be somewhat questionable in a New Zealand context.

[69] See Table 5 of World Bank (1998), World Development Indicators.

New Zealanders in their mid 20s to mid 30s run by The New Colenso (1999) in July and August 1998 suggested that:

- "a fundamental egalitarian streak still pervades our psyche"
- " We don't like the classist society or the widening gap between the 'haves' and 'have-nots' in this country"

This research also suggests that "We're quick to shoot down tall poppies. We're highly critical of people who stand out in the crowd, people who are obviously doing well." This is probably unhelpful to entrepreneurship. The OECD (1998a) suggests that entrepreneurship benefits from supportive cultural conditions, including trust and tolerance of business failure.

Overall, though, the mechanisms through which equality might affect growth are unclear and comments must be seen as speculative in the absence of further research.

Ambition

New Zealanders appear to say they want growth. According to a 1998 survey of 1201 people, 69% of respondents said New Zealand should aim for economic growth over the next 10 years (Dominion 1998, reporting on New Zealand Study of Values).

The analysts reviewed for this paper, however, cast doubt on whether this aim is reflected in personal efforts. Crocombe, Enright and Porter (1991) suggested the kiwi lifestyle was entrenched, involving a "relaxed approach to life with plenty of time for family and recreational pursuits", a low status for business and a search for security. They suggest that "the prevailing goals of individuals do not appear to lend themselves well to the upgrading of the economy". It is difficult to judge how solid the research basis is for these comments though.

Campbell-Hunt and Corbett (1996) suggest society at large receives a "bare pass mark" for work attitudes. They cite a 1995 BERL survey of Managers as showing people with the "right" work attitudes are only available half the time. This material appears to receive backing from an earlier New Zealand Study of Values survey (Gold and Webster 1990). They reported that aspects of work related to productivity, such as accomplishment and a chance to use initiative, rank below matters of social pleasure, personal reward, security and enjoyment. They conclude "There is more in this to suggest a nation committed to comfort and enjoyment than to competition."

There also appears to be a tendency for entrepreneurial businesses grown to a medium or large size by New Zealand standards to be sold or move offshore, perhaps suggesting limits on ambition. Examples include Glaxo in the 1950s[70] and FERNZ recently. Businesses with a dominant offshore operational

[70] See Crocombe, Enright and Porter (1991)

component may not be easily managed from New Zealand. New Zealand entrepreneurs often seem to prefer to sell medium sized businesses in preference to attempting to develop them into global marketing operations. Indeed that is precisely the advice given by a lawyer, Lowndes (1999) recently:

> "The most realistic focus for most New Zealand IT&T companies is still based on Nasdaq, and is to sell a shareholding to, or be bought out by, a Nasdaq listed company."

Of course, this may reflect a realistic appraisal of the New Zealand business environment, not just entrepreneurial values.

Casson (1996) argues that ambitious entrepreneurs, as also in the arts, science and academic life, face limits on the extent to which they can "make things happen" here. New Zealand, like any poorly endowed and isolated country, faces the problem that its most able people tend to leave. There is a constant risk of brain drain for New Zealand businesses.

Some prominent examples seem to support this proposition. Major entrepreneurs who have moved their residence or investment focus largely offshore include Sir Ron Brierley, Sir Michael Fay, David Richwhite, and Alan Gibb, even while retaining some New Zealand links.

The reverse flow of migrants appears to have brought a few high profile migrants but there are strong indications the flow is now motivated by lifestyle more than business considerations. Casson suggested that migrants are attracted by New Zealand's environmentally friendly image and lifestyle preferences, with less interest in expanding their businesses. Other migrants have been attracted to the public sector. Box (1999) also cites survey evidence showing Asian migrants are attracted more by lifestyle than business opportunities.

However, there is evidence suggesting a more positive view, such as a move towards more self-employment over the 1990's. The New Colenso focus groups suggested that the most popular and respected role models are business people such as Dick Hubbard, Karroll Brent–Edmondson and Stephen Tindall, who look to the social as well as the economic bottom line. Moreover, the participants in the focus groups suggest that New Zealanders are doers, hard workers and embrace change, conclusions somewhat at odds with the views reported by economic analysts. A minority was reported to be ambitious and optimistic, generally those earning higher incomes and in the professions.

It is quite possible that an active capable, small minority with entrepreneurial attitudes could make a disproportionate contribution to New Zealand's growth performance.

Even if New Zealanders do have limited ambition, one remaining question is whether this is important to the economy. The issue appears to be little

discussed, but interesting perspectives have been provided in New Zealand research on farming. Ward and Doak (1998) cite research suggesting that the single characteristic, which separates high income earners from average earners, is the ability to make decisions early, set dates for implementation and carry the plan out. They cite further research suggesting that successful farmers have motivation and determination to maximise profit, not just achieve a comfortable standard of living and that observations suggest this is the case in other sectors too. This is not conclusive but is at least suggestive of the importance of ambition. Separating ambition from ability may be somewhat difficult in these sorts of results though.

Overall, this material can not be said to be more than suggestive. It is not calibrated with cross-country comparisons, may well be affected by the timing of the surveys, does not go into details about other potentially important variables such as attitudes to risk, and does not represent a comprehensive survey. However the material is sufficient to suggest that limited ambitions may have a substantial effect on New Zealand's past economic growth and prospects. More research on these issues would seem to be well justified, if it could build a more comprehensive picture and indicate whether there is scope for small changes in attitudes to have significant affects on growth or welfare outcomes. The task is unlikely to be easy.

Trust and Selfishness

Hazledine (1998) suggests these have made a major contribution to New Zealand's poor economic performance. The reforms since 1985 have promoted selfishness, based on models that assume such behaviour and institutions based on the assumption, which reinforce it. Costs of doing business are higher, as more transaction workers and managers are needed to monitor performance in the face of diminished trust and increased selfishness – overall, a diminution of social capital. A selfish reduction in willingness to pay taxes and unwillingness to bear the costs of providing jobs to the otherwise unemployed has increased unemployment, crime and social problems.

There may well be merit in the theory underlying Hazledine's analysis. North (1993) argues that extreme selfishness is unhelpful for growth. It appears that selfishness has increased in New Zealand society, both prior to the reforms, according to Franklin (1985) and after, according to The New Colenso (1999). Trust is increasingly accepted as an important element of successful economies, as suggested in Frey (1997) or OECD (1998a). Casson (1996) argues that a concern for privacy and high level of distrust are important elements in Anglo-Saxon societies, such as New Zealand, but bring costs in the form of increased supervision costs, difficulty in fostering teamwork and a resort to law. Levels of trust appear lower in New Zealand responses to comparable surveys than in Australia, the United States, the United Kingdom or Sweden (Gold and Webster 1990). Campbell-Hunt and Corbett (1996) report lower levels of trust in firms following passage of the Employment Contracts Act in 1991.

However, no other New Zealand economic analysts appear to have advanced similar arguments to those of Hazledine. Scobie (1998) suggests there is a lack of evidence for Hazledine's arguments. His assessment would appear reasonable, at least about the extent of the influence of diminished trust. While diminished trust may well have had some effect on economic performance, it seems unlikely to have been a principal contributor to moderating New Zealand's growth rate. Over decades, total factor productivity has tended to hover around 1% growth per annum, despite the suggested increasing distrust. Other mechanisms and influences in macroeconomic policy, isolation and factor accumulation seem likely to be larger influences on growth, in the light of international analysis and models.

As pointed out earlier, Hazledine uses an undoubted increase in transaction workers in New Zealand to support his argument. This however is widely paralleled overseas and may be argued, as in North (1993), to be an essential part of the process of restructuring institutions to realise the increasing returns attributes of new technologies, the underlying determinant of increased productivity. Those developing theories about trust, such as Frey (1997) appear to be very cautious about how far they are prepared to push their findings.

Institutions

Institutions are closely related to values and attitudes. Many New Zealand institutions derive from our cultural heritage as well as from geographic, economic and other conditions. For instance, features commonly seen as important to growth include secure property rights, the rule of law, an effective Court system and market based economic mechanisms. New Zealand has these, with their form mainly reflecting a British heritage and current Anglo-Saxon thinking, as for instance in its common law legal system. There is little reason to think that these institutions in any substantial way impede New Zealand's growth performance. They are, after all, broadly similar to the sorts of institutions found in other countries with a British type heritage, such as the United States, Australia, the UK and Canada. These include countries with a variable long-term growth performance but which nevertheless has led to higher income levels than in New Zealand with reasonable, recent growth performance by OECD standards.

Bayliss (1994) suggests that New Zealand's economic management suffers from following the intellectual direction of other English speaking countries, through poor savings and investment ratios, poor education and budget and balance of payments deficits. These however cannot really be seen as institutions. On balance, speaking English probably provides major advantages for international economic integration.

There is little sign in New Zealand growth analysis that specific, formal New Zealand institutions have been seen as a brake upon growth. It is still possible that there are exceptions. There is, for example, uncertainty over some

property rights as Treaty issues are resolved. This has lead to delays in at least some instances, including for example in the implementation of new radio communications technologies for mobile telephony. However, resolving the underlying issues may well be sufficiently important that not resolving them would have even more adverse effects on growth.

Conclusions About Values and Attitudes

Perhaps inevitably, this section of the paper is somewhat inconclusive. There is strong theory and clear international evidence that cultural factors can be important for growth. There are reasons to think that these factors exert some influence in New Zealand, at least in the areas of equality, ambition and selfishness and trust. Maori and minority values are also likely to be important, although not discussed in their own right, given a lack of literature.[71]

New Zealand research is not well developed and in most instances, there is little to indicate whether these factors play a significantly different role in New Zealand from elsewhere. Perhaps the area of greatest prima facie concern is New Zealand ambitions. There are definite reasons to expect that emigration and lifestyle considerations will limit ambitions. There is sufficient material to suggest the worth of more research in this area, which might establish the mechanisms and the extent to which they might be amenable to policy interventions.

Finally, it must be acknowledged that if further research did confirm New Zealanders have limited ambition, the policy implications would not necessarily be clear. Some New Zealanders might validly opt for lower income lifestyles. Questions might be raised about myopia, how well informed the people concerned were and whether they were imposing an externality, by choosing to rely on the continuing earnings of other New Zealanders making a greater contribution to living standards.

5.9 Capital Growth

This section of the paper recapitulates the dominant views emerging from theoretical and empirical analysis about the contribution of capital to growth, starting with international contributions about the investment/growth relationship and moving to New Zealand conclusions. It then considers foreign investment and savings more specifically.

That there is a relationship between capital accumulation and growth is one of the stronger conclusions of the growth literature. The neo-classical model sees

[71] One reference which illustrates the potential importance of this issue is Winkelmann (1998a) which suggests that there is a large difference in Maori and non-Maori unemployment rates unexplained by variables such as age, qualifications, family and parental situation. Variables such as health, discrimination and culture are suggested as possible explanations, with Maori culture possibly reducing labour force attachment by putting lower weight on material success and stressing communal values over individual ones.

capital investment as a proximate cause of growth, albeit with diminishing returns. Much endogenous growth literature takes a similar view, as does much empirical literature.

However, while there may be a relationship, causality and endogeneity are issues. Barro (1997) argues that while the ratio of investment to GDP in cross-country regressions may appear to be important, reverse causality is likely to be the explanation. It may simply be that there is a positive relationship from growth opportunities to investment, especially in open economies. Evidence includes that the coefficient on contemporaneous investment tends to be high while that for investment, lagged 5 years, tends to be insignificant.[72] Barro finds variables that promote growth, such as human capital, the rule of law, Government consumption and inflation also tend to explain investment, if it is substituted for growth as a dependent variable.

Temple (1999) suggests that investment may simply be endogenous and that returns to physical capital are almost certainly diminishing. However, there may well be externalities to investment. Equipment investment may be particularly important, based on the findings of De Long and Summers (1991), possibly through providing opportunities for learning by doing or positive externalities.

On the other hand, in much empirical research, the investment/growth relationship seems to pass both tough and slightly less tough "extreme bounds" regression tests, according to Levine and Renelt (1992), Sala-I-Martin (1997) and Ghosh and Phillips (1998). The latter also suggest that the investment to GDP ratio is a particularly strong discriminator between high and low growth countries, with those investing more than 22% of GDP growing faster.

For those analysts who do accept that investment may contribute to growth, a variety of mechanisms seem to be suggested. Plain capital accumulation is the implicit mechanism in much of the material. Illustrative alternative mechanisms include innovations being embodied in new capital or less plausibly, capital being an important direct component of the R&D process (Howitt and Aghion 1998).

New Zealand Analysis of Investment

New Zealand analysts seem to have been more convinced that investment is a contributor to growth. Hall (1998) suggests that sustainable high fixed business investment will be needed to achieve higher growth. Bayliss (1994) considers saving and investment should be raised and that the volume and quality of investment in plant and machinery is particularly important. Easton (1991) considers that growth has been constrained by capital investment. Smith and Grimes (1991) suggest that New Zealand has had capital accumulation below the average of other developed countries. Crocombe, Enright and Porter

[72] Carnahan and Camilleri (1995) find exactly this result for New Zealand in examining the savings/ growth relationship.

(1991) saw New Zealand, as they wrote, as facing an acute shortage of savings due to fiscal deficits, the effects of subsidies and social welfare incentives on saving, which in turn produced a shortage of capital, and high real interest rates, crowding out private investment.

Philpott (1994) offers a more sophisticated view, in which capital accumulation may help to drive productivity growth, along with innovation, rising demand and output and adequate profits. He sees rising demand as raising investment, including through technology embodied in new capital goods. Vandersyp (1993) also points to investment and growth being promoted by demand growth and profits, suggesting that lower company taxes might spur investment and growth.

Not all New Zealand analysts suggest investment is directly important to growth though. Investment did not rate directly as one of the "three key drivers of future economic growth" for Treasury (1996), although it has an indirect role. These were seen as enhancing skills, fostering a more innovative business sector and creating an environment that limits biases against saving. Nor was investment a priority within Hazledine's (1998) more radical diagnosis.

Investment Quantity

As it happens, New Zealand's recent ratio of gross fixed capital formation to GDP appears to be close to the OECD average and has tended to be so historically. In the September 1998 quarter, not atypical of recent trends according to PC Infos data, New Zealand's ratio was 21.1% compared with 21.9% across the OECD. The OECD average is pulled up by Japan and Korea In fact, in 1996, New Zealand rated fifth highest of 29 countries for the ratio of gross fixed capital formation to GDP and sixth highest for plant and machinery investment (OECD 1998). There thus does not appear to be a clear-cut case for portraying New Zealand's current investment levels as inadequate, especially given that they appear to have held up through the 1998 recession. One cautionary note is that New Zealand might well be expected to invest more as a relatively capital short country, at least by OECD standards.

Investment Quality

One point of near unanimity amongst New Zealand analysts is that while New Zealand has undertaken a reasonable amount of investment, it has suffered from poor investment quality in the past. Easton (1997) in discussing the pre-reform period cites past inefficient investment design and implementation; the 1980's major energy projects; freezing works hygiene investments; and breaking in of marginal land, as all contributing to New Zealand having an extremely high capital/labour ratio. However, investment quality is seen as having improved since the period of major reforms, including by Easton (1997) and Grant (1998).

Grant suggests that the position may not have improved sufficiently yet. He suggests that market disciplines and reporting standards require improvement

and that equity market standards in particular are poor. From 1988 to 1998, New Zealand stock market returns at just over 1% per annum considerably under-performed the US, London and Australian markets.

Lawrence and Diewert (1999), in a more robust analysis, show the real, post tax return for the entire New Zealand market sector averaged 3.7% per annum over the 27 years to 1998. They suggest that this is consistent with a range of 3% to 5% for most Western countries. The simple average is notably higher in the last seven years at 6.1%, perhaps supporting the view that investment quality has improved. Lower tax rates, lower inflation and removal of price controls may all have played a role, but even allowing for these, returns seem to have improved substantially. Although they find that capital productivity declined at a trend rate of 1.13% per annum from 1972 to 1998, New Zealand was not unusual in this.

Foreign Investment

Foreign investment, both ways, provides another window on capital as a contributor to New Zealand's growth. Some significant points emerge:

- Foreign investment is substantial. Based on the balance of payments approach used by Statistics New Zealand (1998a) to measure New Zealand's net international investment position, at 31 March 1998, the gross stock of foreign investment in New Zealand was $124,691 million. Of this, $64,503 million was foreign direct investment. New Zealand foreign direct investment abroad amounted to $10,440 million. The net position was that New Zealand owed $89,505 million (90.8% of GDP) abroad.
- While there are exceptions, the predominant view tends to be that foreign investment in New Zealand is positive for GDP, certainly for the level and probably for the growth rate (Enderwick 1998).
- The ratio of net foreign debt to GDP is still growing, while already at the highest level in the OECD (OECD 1999). While providing capital, this exposes New Zealand to the risk of a change of overseas sentiment and is clearly now attracting more concern, despite risk sharing through denomination of much debt in New Zealand dollars and much indebtedness taking an equity form. This raises issues about the sustainability of growth.[73] It may even raise questions about an impact on growth itself.[74]
- The high flow of factor returns abroad[75] following from New Zealand's indebtedness underlines the lacklustre growth of GNI per capita.

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[73] Collins, Nadal De Simone and Hargreaves however argue that adjustment in the face of a large current account deficit, the major contributor to New Zealand's large stock of foreign liabilities, need not be disruptive to the economy.

[74] Fry (1997) for instance suggests that Government debt ratios over about 50% of GDP in developing countries become associated with significantly lower growth rates and that private sectors may also borrow more abroad than is socially optimal.

[75] These have risen from 2-3% of GDP in the early 1970s to around 8% now, according to the OECD (1999).

- At a more micro level, Cartwright (1998), writing from a broadly neutral perspective, raises further questions about the character of foreign direct investment in New Zealand. He argues that:

    - Experience shows New Zealand is not an attractive site for manufacturing by foreign multinational enterprises (MNE's)
    - Foreign MNE's tend to focus strongly on local market servicing, and therefore do not contribute forms of intellectual capital that would enhance New Zealand's capabilities for exporting and operating beyond New Zealand.[76]
    - Export focused MNE's are focused strongly in resource based areas such as food, beverages and wood fibre, enhancing the productivity of New Zealand resources and labour, but allowing New Zealand to capture little or none of the value that is generated offshore.
    - Foreign MNE's are also engaging in small New Zealand firms with distinctive capabilities, especially in electronics, software, IT and sophisticated engineering. Sometimes this results in local capability being nurtured and productivity increasing, using the MNE's overseas channels. On other occasions, purchases provide New Zealand market based compensation, but result in the immediate source of international competitiveness being lost to New Zealand.
    - In contrast, resource based New Zealand owned firms have achieved international presence and competitiveness, but no non-resource based firms have so far achieved a substantial presence in world markets, despite some having sources of international competitiveness.

- Akoorie (1998) notes some significant points in examining the regional implications of foreign direct investment. It appears to be driven by proximity to urban centres, transport infrastructure, financial and commercial infrastructure and skills, resulting in it being heavily concentrated in Auckland and Wellington.

The picture from this New Zealand analysis fits with a view expressed by the IMF (1998), that traditional features that make a country desirable for foreign investment include its investment regime, market size, natural resources, market growth prospects and labour market conditions. In the IMF's view, these are now supplemented with specific advantages or "created assets" such as communications infrastructure, marketing networks, attitudes to wealth creation and business culture, innovative capacity, the stock of information and intellectual property protection.

The main conclusion from reviewing this material is that foreign investment has and is likely to provide a substantial contribution to New Zealand's capital accumulation, with a net positive contribution to GDP. Much, though not all, of

[76] This appears to overlook the contribution that MNE's might make to New Zealand's competitiveness through enhancing the services infrastructure.

the value of that contribution to the economy is, however, likely to be captured by foreign investors in a limited range of services, resources and regions. These observations underline the importance of the original opportunities for investment in encouraging capital accumulation.

The presence of foreign investment per se is not a particularly important issue for growth in most New Zealand analysis, probably as a result of the now widespread acceptance of the likelihood of at least small net benefits being generated.[77]

Savings

Savings often do not seem to be treated separately from investment in empirical growth literature, as in Barro (1997) and Temple (1999), perhaps reflecting the neoclassical closed economy assumption that savings flows equal investment flows. However, it is plain that savings might have an independent impact upon growth, particularly in New Zealand, with open capital markets.

There appear to be few clear policy conclusions though about the relationship of growth and savings. It seems theoretically likely that in a fast growing economy, saving will be boosted. Even if all households have no net lifetime savings, younger cohorts in a growing economy will save more in theory, according to Eisner (1995). Consumers may also face costs in adjusting spending patterns and habits are likely to persist, according to Carnahan and Camilleri (1995). However, this does not indicate what savings will do for growth.

In theory in an open economy, capital needs could be met entirely through foreign savings, and currently are to a substantial extent in New Zealand. The IMF (1995) has suggested there are limits to foreign capital inflows to supply savings, seen largely as the counterpart to a current account deficit. In its view, a deficit of 4% to 6% of GDP may be sustainable, especially in a country with natural resource based development opportunities. The New Zealand average for the decade to 1998 was a more comfortable 3.1% of GDP.[78]

Empirical Savings Material

The IMF (1995) suggests research on the empirical relationship between savings and growth is inconclusive, but that positive effects are likely in both directions, raising the enticing but unlikely possibility of initiating a virtuous circle if savings or growth can be boosted initially in some way.

Carnahan and Camilleri (1995) use Granger causality techniques to investigate the relationship between growth and savings in both directions for 8 OECD countries, including New Zealand, from 1960 to 1992. They find little evidence

[77] Hazledine (1998) is an exception, arguing that foreign investors are likely to diminish New Zealand's social capital, thus limiting growth.

[78] The statistic is drawn from Dalziel and Lattimore (1999)

of support for causality from savings to growth. The data might indicate weak causality with a one to two year lag for New Zealand, although the authors consider the result should be treated with caution. Barro (1997) suggests similar results really capture simultaneous effects generated by growth.

Most New Zealand authors reviewed seem to be more enthusiastic about the potential positive effects of saving on growth, although mostly without in-depth treatment. These include Bayliss (1994), Hall (1998a), Crocombe, Enright and Porter (1991), Vandersyp (1993) and Treasury (1996). Treasury suggested then that higher savings could generate higher incomes if wisely invested in New Zealand or overseas, implicitly suggesting the mechanism is the simple effect of accumulation of savings, with a positive investment return. As well, New Zealand would be less exposed to changes in investor confidence.

A simple savings accumulation mechanism, without any further effects beyond generating further investment income, would be relatively slow to build incomes at the past rates of return suggested by Lawrence and Diewert, with a return of perhaps 5% to 10% pre-tax.[79] However, it may be among the more certain means of boosting per capita national income growth. Savings rates are at least capable of being influenced by Government policy action (IMF 1995 and Treasury 1996). Whether the welfare effects of such action make it worthwhile, given the inter-temporal consumption trade-offs involved, is a matter for further research, as outlined in Treasury (1999).

Conclusions about Capital Growth

Based on ratios of investment to GDP, New Zealand seems to have been investing broadly in line with the OECD average and still doing so. Whether the contribution of capital accumulation to growth is purely a simple accumulation effect or there are spillovers, New Zealand has not accumulated capital at a rate that suggests high growth should be expected, say on the historic scale of East Asian countries. Much capital investment has been foreign sourced, with positive benefits, but a lower net return to New Zealand income levels. Real after tax returns to capital investment, of 3.7% from 1972 to 1998 according to Lawrence and Diewert (1999), lie in the range experienced in most Western countries. Improved returns since 1992 are more promising for growth, being consistent with improved investment quality in the post reform period.

Savings have not been high, either in the past with large Government deficits or more recently with low household savings. The link from savings to growth is not strong, but a simple accumulation effect, with average returns suggests that per capita GNI at least would be raised. Applying income to savings imposes a cost of current income foregone, which any policy aimed at increasing welfare would need to take into account. Again, the picture of capital growth presented here contains nothing to suggest that New Zealand could have expected to generate high-income growth in the post reform period.

[79] See “Investment Quality” above.

5.10 Macroeconomic Policies

Temple (1999) identifies short run macroeconomic management as one of the most controversial areas of empirical work on growth. The area is generally seen to encompass the influences of monetary policy, the budget balance and exchange rate policies on growth. The influences of these policies may be reflected variously in endogenous variables such as the rate of inflation, budget balance, real rate of interest, real exchange rate and current account deficit, as suggested by Anderson and Gruen (1995), in a comprehensive Reserve Bank of Australia survey.

Views vary on the importance of these matters for growth. Porter (1998), for instance, suggested that although New Zealand has sound stable macroeconomic policies, having good macroeconomic policies is not enough – because macroeconomic policies do not create wealth. Firms will not create wealth unless the microeconomic foundations of an economy are sound and improving. Pilat (1998) does not include macroeconomic policies as a key driver for long-run growth, although most New Zealand analysts, as discussed below, see the issues as being critical in understanding New Zealand's performance.

This section of the paper again restates current international thinking on the area. It then reviews New Zealand views on the two issues that seem to have attracted most local attention – the impact of inflation and macroeconomic policies on growth and the impact of macroeconomic policies on the real exchange rate. A range of other issues including fiscal policy, the current account deficit, exchange rate mechanisms, real interest rates, monetary targeting will be treated in much less detail, as their impact on growth has attracted less attention.

International Views

Excellent overviews of the influence of macroeconomic policies on growth are provided in Fischer (1993), Anderson and Gruen (1995), and Temple (1999).

Fischer sees macroeconomic stability as being conducive to growth. Drawing on a World Bank approach, he suggests stability exists when inflation is low and predictable; real interest rates are appropriate; fiscal policy is stable and sustainable, the real exchange rate is competitive and predictable; and the balance of payments position is perceived as viable. He notes that none of the criteria other than inflation are readily quantifiable but that the inflation rate has added significance as an indicator of the ability of a Government to manage an economy.[80] It thus can be seen as particularly important. The main channels for

[80] Fry (1998) also suggests that stable macroeconomic policies, including low inflation are often associated with higher growth rates, possibly reflecting overall good government management.

macroeconomic stability to influence growth are through uncertainty, which can impair the price mechanism or reduce investment. Fischer presents the budget surplus as being positively associated with capital accumulation, because of reduced crowding out and deficits, like inflation, serving as an indicator that Governments are losing control of their actions.

Although endogeneity is acknowledged as a problem, Fischer reaches some reasonably clear conclusions, starting with an analytical framework like that of Levine and Renelt (1992), discussed in Part 3. He concludes that growth is negatively associated with three variables: inflation, perhaps in a non-linear manner; large budget deficits; and distorted foreign exchange markets. Causality probably does run from good macroeconomic policy to growth. His major conclusions are relatively modest. Low inflation and small deficits are not necessary for growth, even over long periods but high inflation is not consistent with sustained growth.

Anderson and Gruen (1995) also apply the methods of Levine and Renelt (1992), recalling their finding that the relationship between growth and inflation is fragile. Anderson and Gruen find using OECD data that high inflation does tend to be associated with lower average growth, but without a high level of statistical significance. Assuming there is a relationship, they suggest that with modest effects of inflation on growth, assuming plausible discount rates and parameters, there is likely to be a positive pay-off to reducing inflation. However, it is likely to require seven or more years to recover the output cost of disinflation, using Australian data.

The likelihood that inflation may have a non-linear relationship with growth is becoming a consistent theme. Barro (1997) suggests inflation is typically likely to reduce growth by 0.3% to 0.4% for a 10 % increase in inflation, but more discernibly at rates over 15% per annum. Sala-I-Martin (1997) suggests inflation doesn't matter much for growth but may be involved in a non-linear relationship that he does not enlarge upon. Ghosh and Phillips (1999), IMF staff, examine the issue in detail and suggest using a more plausible, large panel data set, that inflation and growth are in fact robustly, negatively related using the Levine and Renelt methodology, at all but the very lowest inflation rates, below 2% to 3%. The negative effect tends to grow less than proportionally as inflation gets up to higher ranges of 40% to 50% per annum.

All these writers tend to acknowledge that there will be a cost of a specific disinflation program, with an output cost typically of at least 2 percentage points of GDP to reduce inflation by one percentage point. Ghosh and Phillips are not unusual in suggesting that the cost is usually well worthwhile, except possibly for very rapid deflations, such as reducing inflation more than 50% in one year at moderate inflation rates.

Interestingly, variability in inflation per se now tends to be seen as less likely to be significant, including by those inclined to find inflation itself to be significant for growth, such as Barro (1997).

On the relationship between the exchange rate and growth, Anderson and Gruen (1995) suggest that very little empirical work has been done for industrial countries. There is little to suggest this position has changed since.[81] They point to difficulties in identifying any relationship. Equilibrium levels are likely to be difficult to identify. Short-run effects are easier to identify than medium-term effects and prone to reversal before the medium term is reached. Amongst developing countries, they suggest that it may be possible to exercise medium-term influence over exchange rates but that efforts to use the exchange rate to reduce inflation often have not succeeded, resulting in quite long periods over overvaluation.

Temple (1999) suggests the relationships of macroeconomic variables and growth are far from clear cut, partly because things tend to go wrong together: inflation is accompanied by political instability, exchange rate volatility and so on. Endogeneity and variable selection bedevil regressions. Temple is more convinced that output volatility matters for growth, based on data for OECD countries.

The impression this literature leaves is one of severe difficulty in proving causality conclusively, but that moderately high rates of inflation are likely to be negative for growth, even if positive rates below 2% to 3% may not be. There is difficulty in harnessing policy instruments to achieve short run results, but a tendency to agreement that macroeconomic instruments can have some medium term influence on growth.

New Zealand Views on Inflation

At the start of the period of major reform, Blyth, Hawke and Smythe (1984) saw reduced inflation as important to growth. There was relatively little discussion of mechanisms, but they appeared to see reduced inflation as enhancing international competitiveness and possibly providing clearer price signals. Smith and Grimes (1990) reflecting earlier international research, saw inflation, particularly variable inflation, as likely to have a negative effect on productivity, but with a relatively small effect on growth compared to convergence.

Treasury (1996) considered that macroeconomic stability could contribute to growth through promoting investment and savings and reducing uncertainty. Policy instruments were seen as having uncertain short-term influence and being best targeted to achieving medium term results, in consistency with apparent current mainstream international thinking.

The Reserve Bank appears to take a strong view on the effects of inflation on the economy, perhaps understandably given the legislative framework within

[81] Aziz (1999) suggests that there is a vast literature on the causes and extent of exchange rate volatility, mostly concerning the choice of exchange rate regime. The concensus of international studies on the effects of exchange rate volatility on trade and investment appears to be that the effects are small, but may be larger in a specific country.

which it works. The most detailed view expressed recently is possibly that of Bonato (1998). He suggests that the public is averse to inflation and that it imposes a variety of static costs and costs on both the level and growth rate of GDP. However, he also notes that the evidence of a negative relationship between inflation and economic growth is not very robust, acknowledging that some studies suggest that low inflation has little effect on growth while others suggest it has. He cites research suggesting that inflation volatility can reduce growth slightly even at low inflation rates. At very low rates of inflation (2%), he suggests that there will be benefits of 0.39% of GDP per annum of eliminating inflation, based on the interaction of inflation with the tax system, although these are not related to growth effects.

Other New Zealand analysts generally seem to have followed conventional thinking that inflation in most ranges is negative for growth, including Vandersyp (1993) and Hall (1996). Hall also notes that New Zealand has faced a relatively high "sacrifice ratio"[82] of 7.7, from 1986 to 1992, to reduce inflation, suggesting that the growth cost of eliminating inflation has been high by international standards. Possible reasons for this high ratio are suggested by Hall for consideration include whether disinflation proceeded more slowly than it could have; whether labour market flexibility legislation should have been introduced faster (Hall 1996); and whether market based disciplines on agents operating in non-tradeables sectors are still relatively weak.

Hall's view of the sacrifice ratio contrasts somewhat with Bonato (1998) who reports a ratio of 2.0 currently, although for a later period, perhaps less affected by adverse international conditions and restructuring. Bayliss (1994) however suggests there is little evidence that a marginal difference in inflation has much effect on growth.

Overall, these views suggest that past relatively high inflation, including at levels just above the Reserve Bank's current target band, probably reduced New Zealand's past growth. As might be expected, there does not appear to be a strong case that variations in rates around the Reserve Bank's target zone of 0% to 3% inflation have any significant direct influence on growth, although reductions may possibly have positive, static impacts on welfare. The issue of the effect of negative inflation has received no local attention, although it is conceivable, given the Lawrence and Diewert (1999) analysis that current rates around 0% are in fact significantly negative already, with the probable overstatement of inflation by the consumer price index.

The Real Exchange Rate

While strong views about inflation have been relatively uncommon amongst New Zealand analysts, the reverse is true about movements in the real exchange rate, with many seeing sharp appreciations in the real exchange rate

[82] The sacrifice ratio is the cumulative loss in aggregate real output divided by the fall in trend inflation.

in the late 1980's and 1990's as an important policy failure. The concern could be summarised as that the sharp appreciation in the real exchange rate in both periods has been attributable to a considerable degree to the combination of a restrictive monetary policy with a floating exchange rate, damaging the profitability of exporting and import substitution.

The real exchange rate[83] calculated by the Reserve Bank is shown in Figure 7.

Easton (1997) is not atypical of those that identify these real exchange rate appreciations as being harmful for growth. He argues that floating the exchange rate in 1984 led to massive real exchange rate overshooting. The situation was exacerbated by financial liberalisation that made monetary conditions difficult to read and allowed international portfolio diversification, with overseas investors moving into New Zealand under boom conditions. Largely because of this, his assessment is that macroeconomic reforms swamped the productivity gains from microeconomic reforms during the period. In Easton's view, export growth remains important to economic growth. In support of this view, he cites findings from the Research Project on Economic Planning that sustainable 3% growth per annum requires 4.5% export growth per annum.

Bayliss (1994) also thought that good microeconomic policies were swamped by poor macroeconomic policies in the period from 1984 to 1991. There were risks that exporters' concerns about exchange rate fluctuations could lead to a further repetition. In his view, the loose fiscal policies in the exit from the 1984 price and wage freeze saw the real exchange rate surge. After monetary policy was tightened, too late, in 1985, there was too much reliance on it to control inflation, producing a real exchange rate appreciation. This damaged farming, manufacturing, forestry and tourism development and led, according to Bayliss, to many businesses dismantling their export divisions from 1985 to 1990.

Lattimore (1998) argues that there is a close association between the real exchange rate and growth. From 1985 to 1989, liberalising the capital account ahead of the current account mirrored overseas experience in leading to a sharp real exchange rate appreciation. Because of long lags of up to three years in primary export production, the export response to an appreciation is slow. Lattimore sees a similar phenomenon having been in place from 1993 to 1997, driven by monetary policy.

Lattimore cites with approval the work of Joumard and Reisen (1992), OECD analysts, as showing the hysteresis effects of lagged increases in export production. They argue that with financial opening preceding stabilisation and labour market reform, with a floating currency, monetary tightening was bound to lead to Dornbusch style overshooting of the exchange rate. Moreover, once

[83] This real exchange rate is the nominal trade-weighted exchange rate multiplied by the domestic consumer price index excluding interest rates and divided by a trade-weighted measure of foreign consumer price indexes. The foreign indexes are those of Australia, Germany, Japan, the UK and USA.

overshooting is corrected, exports and growth were unlikely to pick up immediately, given:

- Binding constraints, delivery lags, implicit and forward contracts and regressive expectations
- Fixed, sunk market entry costs such as adapting to foreign requirements
- Uncertainty created by structural reform

The Joumard and Reisen study, while successfully highlighting the hysteresis issue, does not provide conclusive evidence. They attach a dummy variable to a manufactured export volume equation for the period 1980 to 1990 and suggest that it shows hysteresis effects from the first quarter of 1986 onwards. This seems rather early, considering that a sustained peak in the real exchange rate above the level experienced up to 1982 did not arise until 1987.

Philpott (1991 and 1998) has also argued that the real exchange rate should be managed through monetary and fiscal policy so as to generate tradables growth.

Other related arguments include:

- Hazledine (1998): the 1990's cyclical recovery was flattened by foreign exchange and interest rate policies amongst other matters
- The OECD (1998): containing inflation in the early 1990's led to an overvalued New Zealand dollar
- Hall (1996): achieving higher long-term economic growth depends upon maintaining an internationally competitive real exchange rate.

There is clearly an extremely strong current of opinion amongst New Zealand analysts that, somehow, the management of the policy settings can have a strong influence on the real exchange rate and growth, especially in tradables.

The view is not universal, but analysts taking a more sanguine view about the real exchange rate are a distinct minority. Aziz (1999), from an overseas perspective, agrees that the large amplitude and long length of the exchange rate appreciation in the mid-1990's does stand out compared to other countries. Hedging options are likely to reduce the costs of exchange rate volatility, although he concedes that opportunities to hedge the risk of a lengthy exchange rate cycle may simply not exist. He also suggests that reducing exchange rate risk may generate more volatility in other variables; that there is little evidence that the strictness of New Zealand's inflation targeting regime played a role in the real exchange rate cycle; that strictness was in any event required to establish policy credibility; and that reduced household savings contributed to the exchange appreciation.

Reserve Bank analysis has focused quite closely on the issue over 1998 and 1999. Brash (1999) notes that the real exchange rate appreciated 29% from early 1993 to April 1997, based on the analysis behind Figure 7. Brash

acknowledges that this resulted from a strong domestic economy generating inflationary pressure, requiring the Reserve Bank to lean against the inflation through monetary policy and consequently raising real interest rates and the exchange rate. He then argues that New Zealand's recent real exchange rate appreciation is not exceptional by the standards of 1990's appreciations experienced by our trading partners, a point also made by Brook, Collins and Smith (1998).

Finally, Brash argues that alternative policy options that might have been considered to avoid a real exchange rate appreciation, would have been either ineffective or precluded. These were:

- Resisting inflation less vigorously: the real exchange rate would still rise through the mechanism of rising prices and inflationary expectations would become deeply embedded and more costly to remove
- Minimising situations where strong monetary tightening is required, through the Reserve Bank being quicker to spot excess demand 18 to 24 months ahead: Here, it is impossible to forecast perfectly.
- More limited fiscal expansion: The stimulatory fiscal policy of 1996 and 1997 must bear some of the blame for the strong appreciation of the exchange rate. A full recognition of the monetary policy implications of changes in fiscal policy is necessary to avoid large future appreciations.
- Driving a wedge between the exchange rate and interest rates, say, through capital controls: this is likely to generate inefficiencies
- Pegging to a larger currency: No one, large currency makes an obvious choice given the diversity of New Zealand's trade. Other countries have large real exchange rate fluctuations too.

Conclusions on Real Exchange Rate

The weight of arguments that macroeconomic policies have impacted on growth via the real exchange rate strongly suggests that the impact of macroeconomic policies on the real exchange rate requires further consideration. While some of the views cited have relatively little analytical underpinning, there are some that can not be lightly dismissed, including those of Joumard and Reisen (1992) and Lattimore (1998). Additional reasons for considering this issue seriously include:

- The evidence cited by Brash (1999) on the 1990's exchange rate appreciation can be interpreted to suggest that New Zealand's appreciation is not out of line with our trading partners. It also suggests that New Zealand has had one of the more sustained and higher appreciations, as noted by Aziz (1999). Moreover, it followed another sharp appreciation the previous decade.
- New Zealand's exports have grown relatively slowly, continuing to decrease as a share of world exports. There are certainly other causal factors, but this is consistent with a difficult export environment.

- Gawith and Grimmond (1998) suggest, possibly reflecting direct exporter contacts, that cyclical exchange rate volatility is a problem for New Zealand exporters, and that the volatility is greater in New Zealand than in Australia.
- In other Reserve Bank research, Orr, Scott and White (1998) highlight that there is probably a trade-off between short run output volatility and inflation volatility. Drew and Orr (1999) conclude, after comparing New Zealand volatility to other OECD countries, that cross country rankings are consistent with the notion that less variability in inflation can be associated with more instrument and output growth variability. Reflecting research such as this, New Zealand's monetary policy framework has been altered to allow a wider target of 0% to 3% inflation, as inflationary expectations have declined and the policy horizon lengthened to a medium term focus, 18 to 24 months ahead. Implicitly, earlier, narrower monetary targets may have had higher output costs.
- It is possible that exchange rate volatility is a more serious problem for New Zealand's relatively small enterprises than might be the case overseas. The OECD (1998b) in a non-New Zealand study, suggests that short term cyclical policies to suppress inflation may have quite debilitating long term effects on the international competitiveness of small and medium sized enterprises – firms of 500 employees or below. They are seen to be more sensitive to interest and foreign exchange rate changes than large firms and "tend to bear the brunt of anti-inflation policy".
- It would appear that there is a tendency for relatively expansionary fiscal policy to be associated with a need for tighter monetary policy, in both 1985 to 1988, while a relatively large fiscal deficit remained and 1996/7 as argued by Brash (1999).

This brief analysis would require further development before strong policy conclusions could be drawn. Tentatively, however, it suggests:

- Hysteresis effects in tradables, with long lags in adjusting production, are extremely plausible, especially after two sharp real exchange rate peaks and troughs, notwithstanding that traders are likely to be learning to cope with these experiences.
- It is quite possible that import dependent activity has also been adversely affected by real exchange rate volatility experienced, even though it has not been the subject of analysis.
- It has been appropriate to reinforce the Reserve Bank's medium term focus through widening its target band to 0% to 3%; extending its focus to 18 to 24 months ahead; and targeting the indirect effects of interest rates and the exchange rate on inflation, rather than the direct effects of the exchange rate.
- Any effort put into ensuring the effective implementation of monetary policy, for instance through accurate forecasting, could be well worthwhile.

- The Government should be extremely cautious about exacerbating adverse effects on the tradables sectors through fiscal expansion or contraction.

Other Macroeconomic Issues

By comparison with real exchange rate issues, the effects on growth of most remaining macroeconomic policy issues appear relatively settled. Savings and investment issues may be an exception but have been discussed elsewhere in this paper. The size of the current account deficit has similarly been treated elsewhere. The effects of the size of Government expenditure and taxation are also treated below as a topic in their own right.

Remaining macroeconomic issues that might be seen as being of some significance include:

- The budget balance
- Exchange rate mechanisms
- Real interest levels
- Inflation targeting mechanisms
- Demand management
- Unemployment

These have however, for better of worse, generally attracted much less attention in the literature reviewed for this paper than inflation and the effects of macroeconomic policy on the real exchange rate. This may reflect a combination of the way economists have come to think about issues and recent experiences, both in New Zealand and overseas.

The budget balance may have attracted less attention in New Zealand simply through having turned positive for a prolonged period, but it is interesting that analysts such as Sala-I-Martin (1987), Barro (1987) and Temple (1999) give it little attention. Bayliss (1994) suggested that Treasury has overemphasised its importance, in not acknowledging that a lack of growth was in fact the primary cause of deficits. The budget balance is however seen as significant in New Zealand material in its effects on monetary policy as already discussed and acknowledged to be significant in the international material.

Exchange rate mechanisms, whether currency unions, fixed, floating or some intermediate option similarly seem to have attracted little attention in literature specifically concerned with growth, possibly through not being seen as current issues. The institution of a float in 1985 has attracted some New Zealand attention, but more in the context of real exchange rate effects. Coleman (1999) has suggested the issues surrounding monetary integration justify more discussion.

Real interest levels do not appear to feature much in growth literature. Fischer (1993) somewhat unhelpfully suggests they should be “appropriate” but offers

little analysis. Vandersyp (1993) suggests that realistic interest rates of say 6% real should be maintained, but is one of few analysts to venture a view. Possibly the lack of analysis here may reflect a combination of views. Interest rates may be endogenous, investment may not be especially sensitive to interest rate levels, or perhaps New Zealand's real interest rates have not varied greatly from international levels once country risk and monetary policy effects have been taken into account.

Discussion of inflation targeting mechanisms, a major concern of monetary policy also seems to have featured little in the growth literature, although arguably, monetary policy implementation mechanisms may have been of some significance, as argued above.

Demand management has attracted a little attention locally. Dalziel (1999) and Philpott (1994) for example have suggested a positive role for short-term demand management. Treasury (1996), however, probably reflects the predominant view in suggesting that macroeconomic stability is best achieved through concentration on a limited number of medium-term objectives, rather than attempting to use monetary and fiscal policy to manage the economy actively.

Unemployment might also be seen as a macroeconomic variable. However, there is relatively little discussion of its contribution to growth either in New Zealand or abroad. Both Hazledine (1998) and Lawrence and Diewert (1999) offer analysis in which unemployment might be construed as making a contribution to growth, respectively treating the unemployed as transaction workers and calculating "social total factor productivity".[84] However, these are isolated analyses.

5.11 Government Expenditure, Welfare Support and Taxation

The influence of the Government activities in this heading on growth is subject to less agreement than most of the factors considered in Part 5 of this paper. The issues have received considerable attention internationally, although relatively little New Zealand scrutiny. Two particularly useful New Zealand papers are, however, readily available on the effects of expenditure and taxation on growth. As a result, this discussion will be less detailed. These are Poot (1999) on the impact of Government on long run growth and Lockwood (1998) on the relationship between taxes and growth. Both are at least implicitly concerned with effects on per capita income growth.

This section of the paper considers first expenditure and then taxation effects on growth.

[84] Social total factor productivity involves treating the unemployed as a separate, additional input.

Government Expenditure

Poot (1999) notes various mechanisms through which Governments may influence growth rates:

- Regulatory means
- Provision of pure public goods such as defence and public infrastructure
- Budgetary influences on monetary conditions
- Changing market prices through taxes and duties
- Ownership of institutions providing external benefits to society or having natural monopoly positions
- Regulatory instruments to protect property rights or respond to externalities
- Income redistribution[85]

It is widely acknowledged that different types of Government expenditure will have different effects. Expenditure adding to physical or human capital, contributing to institutions supporting growth or addressing a growth enhancing externality should be more positive for growth than pure consumption. Poot examines separately general Government consumption, education and health, defence and public infrastructure, reflecting both these expected differences and the relative abundance of studies since 1983.

General Consumption

A variety of findings on general consumption spending is apparent in the international literature reviewed for this paper. For instance, Barro (1997) finds negative effects, attributed to non-productive Government expenditure and related taxation effects, illustrating the link between the two. Levine and Renelt (1992) find higher Government consumption to be negative for growth but once again, the relationship is not robust. Temple (1999) regards the studies done as inconclusive, with the nature of the expenditure being particularly important.

Poot summarises the results of 36 international studies on general consumption. He finds the following weaknesses to be common:

- No distinction is made between consumption and transfers or other expenditure types, even though different growth impacts might be expected, with investments like R&D activity being more positive than pure consumption.
- The usual problems of endogeneity in cross-country studies are present. Although some studies use other techniques, such as time series analysis or pooled data, there is no more evidence of consensus of the effects of expenditure from these studies than the cross-section studies.

[85] For completion, social insurance might be added.

- No account is taken of the Government budget constraint, which can mean firm and household behaviour is influenced by effects on the public debt.[86]

The varying quality of these studies is illustrated by one of them, Gwartney, Lawson and Holcombe (1998). The theory put forward appears reasonable. They plausibly suggest that some Government expenditure on items such as protecting property rights, contract enforcement, providing stable monetary policy, infrastructure and education will be beneficial for growth. At higher levels of expenditure, diminishing returns set in, affecting workforce participation, changing incentives to invest and take risks and causing crowding out effects. They suggest Government organisations are less dynamic than private institutions, taking longer to weed out mistakes and bad practices and being slower to develop and implement new technologies. The various empirical studies provided in support of the theory purport to show that growth is restricted once expenditure exceeds about 20% of GDP. However, the study loses credibility in suggesting that reduced Government expenditure in the 1990's in New Zealand and Ireland boosted growth, ignoring the alternate, plausible possibility of economic growth outpacing Government growth and many other plausible influences on growth in each case.

On balance, 7 of the 36 studies cited by Poot find positive effects of Government expenditure on growth, including one New Zealand study, Bairam (1988), which suggests increased expenditure over 1960 to 1980 accelerated business investment and eventually economic growth. The study is somewhat dated and could be questioned on the grounds of whether long run effects of Government expenditure were effectively captured.

Twelve of the other general consumption studies find significantly negative effects and seventeen are inconclusive.

Other Studies

Most of 12 further studies find expenditure on education to be positive for growth, while the only one reported on health finds it to be negative. A slight majority of 22 studies find defence expenditure is likely to have a negative effect rather than show either a positive or inconclusive result.

Poot also examines 34 studies on investment in public infrastructure, such as roads, dams, communications, water and sewerage. Three-quarters find a positive impact, with one survey of this work suggesting a range of output elasticities to Government infrastructure expenditure of between 0.03 and 0.39.

[86] Poot considers further work is needed to obtain better information on the contributions of Government expenditure. This could involve parameter calibration methods for micro-foundations based models, more detailed assessment of previous studies, natural experiments and more use of instrumental variables based techniques in regressions.

An Australian study, Otto and Voss (1994), which Poot does not cite, and might be seen as reflecting an environment closer to that of New Zealand, suggests an elasticity of 0.20 with a wide 95% confidence interval of 0.04 to 0.036. Public capital includes state owned enterprise and general Government investment. They find that private investment returns are higher, that public and private capital are complementary, and marginal increases in public capital produce modest returns on private capital. This is hardly surprising. There is little in these studies though, to suggest that there is anything special about Government doing the investment, as opposed to suitably structured private operators. It must be acknowledged that difficult regulatory issues might arise with private provision in some instances, such as provision of transport infrastructure.

Welfare Expenditure

One area not covered by Poot is the effect of welfare spending on growth. New Zealand literature once again seems to be scarce, with relatively little attention given to the issue in New Zealand material concerned specifically with growth. The main area of comment relates to the effects of welfare transfers on incentives of beneficiaries. Hazledine (1998) for example comments that leisure is too attractive. Crocombe, Enright and Porter (1991) suggest that unemployment benefits should be replaced with training benefits and that a meaningful gap should be opened between unemployment benefits and wages, to promote labour force participation. Treasury (1996) was also more explicitly concerned with this aspect than with other potential effects, such as reduced savings incentives or low incomes limiting the acquisition of skills by children within low income households.

The OECD (1999), in examining New Zealand's economic strategy, notes the impacts of benefit reform since the early 1990's and of the Employment Contracts Act in stimulating labour force participation and job growth. It suggests that reforms could go further to reduce the generosity of benefits, to increase the incentives to take work and avoid poverty traps. These analyses are not in depth and implicitly seem to be more about output levels effects rather than growth rate effects.

In a different approach, Stephens (1996) argues that poor growth in the 1970s and 1980s can not be blamed on high levels and growth of Government expenditure and welfare spending. He argues that New Zealand welfare spending was at less than OECD average rates[87], especially after netting out the tax component of welfare payments to allow valid comparisons. Dalziel (1999) makes the same point with respect to New Zealand's taxation to GDP ratio. These seem reasonable arguments. Dalziel also argues that redistribution can build social capital, which builds economic productivity. Public expenditure can build a sense of participation and belonging in the community. Greater

[87] Gwartney, Lawson and Holcombe suggest New Zealand's Government expenditure as a proportion of GDP was 28.9% in 1960 and 39.1% in 1996, compared with OECD averages of 27% and 48% respectively.

social cohesion and civic responsibility can build productivity to everyone's benefit. These arguments also seem plausible, but the magnitudes of these effects are difficult to assess, and marginal benefits are likely to be smaller than average benefits.

More substantial work has been carried out by Maloney (1997) and (1998) on the effect of benefit reform and the Employment Contracts Act, focusing on the direct effects of benefit changes rather than the effect of overall benefit expenditure. According to Maloney, the 1991 cuts in benefits reduced the unemployment benefit and domestic purposes benefit by 9.5%; provided for a 26 week stand-down on voluntarily leaving employment; an increase in the age of eligibility from 16 to 18 years and a tightened work test. An increase in the age of eligibility for superannuation from 60 to 65 was phased in from 1992. Levels of superannuation benefits have also been reduced. Maloney considered from time series analysis that benefit reforms strongly increased both employment and hours of work, explaining between 29.6% and 37.6% of the 4% rise in the proportion of the workforce in employment from 1991 to 1996. The Employment Contracts Act in contrast explained much less.

International Research on Welfare Expenditure

Implicitly considering welfare expenditure, Temple (1999) suggests that there is not much evidence that fiscal policy is closely related to inequality, even though the latter could affect growth. Atkinson (1995) examines the question directly, reviewing cross-country evidence and theoretical mechanisms. Nine studies of various groups of OECD countries find that a 5% decline in welfare spending would raise the annual growth rate variously between 1% per annum and –0.9% per annum. There is no agreement in the results. A number of possible reasons are suggested by Atkinson:

- The underlying relationships are more complex than the studies might be expected to elicit, with difficulties in determining causality. For instance, where welfare effects relate to output levels, poor economic performance may lead to high welfare spending rather than vice versa. Alternately, successful countries may be able to "afford" a more generous system or industrialisation may lead to both higher living standards and the need for social insurance in a more complex society.
- It is unclear whether a reduction in welfare expenditure would affect the level of GDP, without a permanent change in the growth rate, or affect the growth rate.
- Measurement of the welfare state size varies between countries. Some countries' benefits are paid gross of income tax, as in New Zealand, while others are paid on a net basis, affecting overall expenditure to GDP ratios.
- The nature of apparent high spending on welfare may vary, depending upon whether it is influenced by say, high benefit rates or simply low rates but a high proportion of the population being eligible. Incentives to participate in work will vary.

- The form of welfare programs will have definite effects, for instance depending on differences in the conditions attached to benefit receipt.
- Welfare systems may also affect savings behaviour, not just work participation incentives. How savings affect growth is in turn complex, depending for example on whether private pension funds have a short term view of investment, making them unsupportive of R&D.

In summary, while welfare spending almost certainly affects long term growth through effects on workforce participation, savings and skill acquisition in beneficiary households, neither in New Zealand nor internationally does it appear that strong aggregate evidence is available. This probably implies a need for further research, possibly at a micro level, more than it implies that the effects of welfare spending programs on growth should be discounted. Indeed more narrowly focused studies, such as that of Maloney may produce more credible results, although still leaving questions about economy wide effects. Maloney's work at least suggests a one-off boost to output levels may follow from reduced spending in some circumstances, possibly through the effects on work participation incentives. However, it says little about static welfare effects or possible wider effects.

Taxation

At the outset, it must be noted that expenditure and taxation are related, although not necessarily closely, given that mechanisms such as borrowing or even inflation taxes[88] might separate the two. Making a complete distinction between their effects on growth in empirical work could prove difficult, although the underlying theoretical mechanisms are often suggested to be different.

Lockwood (1998) provides a good summary of the effects of taxes on growth. Major points only will be mentioned here. The paper deals with micro level and aggregate channels through which taxes may affect growth. As with expenditure, the structure of taxes can be important for growth effects, not just aggregate taxation. Effects may be on output levels or growth rates and many effects may be on welfare without affecting growth.

Taxes may affect growth through both the efficiency with which productive inputs are used and the rate at which resources are accumulated, in turn affecting growth through labour supply and productivity, investment amounts and productivity and saving. Lockwood reports the following effects, all small but negative on growth:

- The overall economy wide labour supply elasticity to a change in after tax wages is likely to be small and positive, mainly based on US and UK data. Women's response is more elastic than that of men.
- Labour productivity may be affected by effects on incentives to invest in skill acquisition, with taxes probably discouraging the investment. They

[88] The transfer of real resources to a Government resulting from its condoning inflation.

may also reduce the amount of capital New Zealanders have to work with and make New Zealand less attractive to high productivity migrants.

- Taxes may discourage investment through raising the cost of capital. The effect is probably small, although empirical studies suggest international financial capital flows may be highly sensitive to regimes and rates in particular.
- Uneven taxes across sectors may shift activity to less productive activities.
- Taxes may reduce savings through reducing returns, but these effects may be small and muted as, say, households reduce saving in response to increased corporate saving.

Macroeconomic studies show mixed results. Poot (1999) reports that of nine studies, none found higher taxes to be associated with higher economic growth. Rather, higher taxes tend to reduce growth, especially where the studies focus on marginal rather than average tax rates. However, tax variables do not show up as robustly linked to growth in Levine and Renelt (1992). The problems that affect most cross-country analysis show up here too, including model specification, causality, differences in tax structure and measuring tax to GDP ratios on a comparable basis (Lockwood 1998)[89].

Lockwood finds studies aggregating micro level evidence more convincing, supporting the suggestion of a small, positive effect of tax reductions on growth, at the level of tax to GDP applying in New Zealand.[90] He notes that even with small growth effects, the case for reducing taxes may be strengthened by static welfare effects. There are certainly good prior reasons to expect marginal and average effects and individual program effects on growth to differ substantially, lending support to a microeconomic approach. The importance of considering the effects of different types of taxes is heightened in analysis such as that of Vandersyp (1993), who contends that that investment is affected by tax rates and depreciation rates and that research tends to show investment is affected by profitability and cashflows.

There has of course been a wider debate in New Zealand. Scully (1996) in particular purports to show that the growth maximising level of taxation is around 20%, but the results have been found to be not robust, including by Sieper (1997) and Chapple (1997), for both model specification and data reasons.

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[89] Slemrod (1995) identifies a further set of factors complicating studies of the effects of high income tax regimes:

- the use of nontax, nonbudgetary instruments
- the availability of safety valves within tax and transfer systems to mitigate disincentive costs, such as work tests or lack of a capital gains tax
- the availability of responses such as tax avoidance or evasion
- adjustments in institutions to reflect the absence or presence of taxes, such as higher levels of private giving in the US, which has no European style church taxes.

[90] The study investigated the effect of a tax reduction of around 2% of GDP.

Conclusions about Expenditure and Taxation

New Zealand is not exceptional by OECD standards in its current ratios of tax and expenditure to GDP – in fact, these appear to be in the lower half of the OECD. There is little clear evidence about the effects of Government expenditure and tax activity at present levels being responsible for New Zealand's moderate growth performance.

Empirical studies tend to suggest that lower tax levels compared to current New Zealand levels would be beneficial for achieving higher GDP levels, but without strong suggestions that growth rates would improve markedly. The results are more uncertain for expenditure studies and, as might be expected, are highly dependent on the nature of the expenditure. The effects of welfare expenditures, like other expenditures, are also not clear-cut in empirical studies, again depending on the nature of the institutional structures.

Theoretical arguments do tend to suggest that reducing expenditure and tax slightly from present levels could be beneficial for growth, but such conclusions must be viewed as weak.

5.12 Innovation

The importance of innovation for growth is almost universally recognised, including in overseas writings, as already discussed. The position is similar in New Zealand writings. Crocombe, Enright and Porter (1991) for instance go so far as to suggest that

"...in assessing any Government policy that affects the economy, we must ask: Does this policy provide the incentives, pressures and/or opportunities for our firms to innovate and upgrade? If the answer is no, the policy is unlikely to contribute to long-run prosperity."

Treasury (1996) also identifies fostering a more innovative business sector as a key issue for growth. None of the New Zealand material reviewed for this paper suggests otherwise.

The literature on innovation is vast. A few broadly supported findings from the international literature relevant for assessing the New Zealand position include:

- There are high private average returns to R&D, with even higher social returns because of spillovers. However, in small, open economies, some spillovers may flow out abroad. Any case for Government support may depend more upon spillovers in areas such as developing skills through related educational activities and developing the capacity to absorb knowledge from abroad. (eg Griliches 1995).
- Local R&D is not the only source of innovation – strong flows of technology and information among people, enterprises and institutions are the key to the innovation process (OECD (1997), Stoneman (1995)).

- Much innovation occurs through trade in producers' goods ie capital equipment (Patel and Pavitt 1995)
- Innovation processes are time consuming. Using the common three phase analysis of innovation into invention, innovation and diffusion, Stoneman suggests the innovation phase may take a mean of 13 years, where innovation is defined as the development of ideas into marketable products. Diffusion of innovation may typically take from 5 to 50 years, from first use to 95% take-up.
- Government research institutions may be among the less important external sources of innovation for firms, being much less important than interactions between firms and those they relate to and technical analysis of competitors products (OECD 1997). They may still be important as a source of knowledge.
- Much innovative activity is unrecorded, especially in small firms without formal R&D (Patel and Pavitt 1995)
- National capability in basic research may not be closely directly linked to economic performance, although it does contribute through providing training, measuring instruments and complementary inputs to other industries Mowery ((1995), Salter and Martin (1999)).

The New Zealand Record

At first sight, viewed using the indicator of R&D spending, the New Zealand innovation record does not look good. If the consensus on the importance of innovation for growth is correct, then this may be a significant contributor to New Zealand's moderate growth record.

Crocombe, Enright and Porter (1991) noted that New Zealand spent less than 1% of GDP on R&D in 1987 compared with the OECD average of 1.58%. The largest proportion of that was Government spending and of that, 53% was spent in agriculture, which does not figure in international lists of high tech industries.[91] Davenport and Campbell-Hunt, in an update on innovation prepared for the 1998 Porter visit, suggest that by 1996, New Zealand's gross expenditure on R&D was still only 0.99% of GDP. A glimmer of light was that the expenditure had grown by 2.8% per annum from 1990 to 1995 compared with 0.8% for the OECD as a whole, although it is possible that reduced military R&D may account in part for the latter result (Bassols 1998). Bassols also notes that R&D expenditure as proportion of value added has been falling in the OECD – from 2.3% in 1985 to 1989 to 2.2% in 1995.

New Zealand also seems to have been reducing the share of expenditure by private firms. Davenport and Campbell-Hunt report that New Zealand's firm R&D expenditure as a proportion of sales by firms dropped from 0.45% in 1987 to just under 0.4% in 1995. Private expenditure on R&D was down to 27% of total New Zealand spending in 1995/6 compared with 39% in 1987. Moreover,

[91] According to Patel and Pavitt (1995), typically 75% of new technology is concentrated in machinery and instruments; electrical; chemicals; and transport.

at the firm level, private sector R&D is heavily concentrated in a few firms. In 1995/6, 660 enterprises or 0.4% of the total population of New Zealand firms were undertaking R&D, a decrease of 14% since the high of 765 in 1991/2. The top five firms accounted for 18% of firm R&D and the top 70 for 65%. Only 1 in 216 firms spends more than $5000 on R&D.

Davenport and Campbell-Hunt do however suggest that the R&D expenditure results they report are of an essentially static character and may not do justice to changes in New Zealand over the 1990s. They suggest that New Zealand firms may be moving towards best practice and that increased innovation might well become more important once a "frontier of competitive best practice" has been reached. Increasing internationalisation may direct more firm attention to innovation. They suggest studies by Corbett in 1994 and 1996 confirm that an increasing number of firms are gaining competitive leadership from product innovation – up from 13% of manufacturers to 28%.

For manufacturers, where formal R&D might be expected to be more common, the picture is confirmed by a large sample, 1997 study, Knuckey, Leung-Wai and Meskill (1999), which shows that R&D effort was quite low across manufacturing. Just less than half of sites spend less than 1% of total sales on R&D. There is a lack of integration of innovation and technology practices with planning processes. Just over 50% of respondents report at least moderate improvements to products or services in the three years prior to the study. The position may be more encouraging in services, where Davenport and Campbell-Hunt report that services sectors carry out far more R&D than the OECD average.

In a more recent New Zealand study examining New Zealand's experience from a national innovation system perspective, utilising a range of indicators, giving weight to diffusion as well as R&D, Darroch (1998) in comparing 18 selected large and small OECD countries using mainly 1994 data, suggests:

- New Zealand has the poorest record in its potential to produce knowledge, with low expenditure on R&D, low business expenditure on R&D, a low number of researchers in the labour force; low direct payments for disembodied knowledge from abroad[92] and relative concentration of activity in non-high tech activities.
- New Zealand rates better in terms of opportunities for ideas to flow into New Zealand with a high level of foreign direct investment inflows and strong imports of high and medium technology products.[93]

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[92] Darroch reports that the ratio of technology payments to business expenditure on R&D in New Zealand is disproportionately low at 0.09 compared with 0.64 for 9 small OECD members, 0.13 for Australia, 0.19 for G7 countries and 0.39 for the 18 countries in the study.

[93] To the extent that investment is concentrated on acquiring access to resources and domestic service provision in New Zealand, it is possible that the foreign investment indicator used, based on overseas experience, may give an unduly optimistic view of information flows into New Zealand. However, good evidence on the relative concentration of R&D in various areas of foreign investment was not available.

- Average numbers of tertiary qualified individuals by OECD standards offer a reasonable level of absorptive capacity for new ideas[94]
- New Zealand evidence suggests diffusion of technology is occurring at a low rate. (Darroch's evidence here, though, seems questionable. It is based on a low GDP growth rate, to which many factors contribute and relatively low proportions of high tech manufactures production and exports, which could be influenced more by the past than the present and by many other factors than diffusion.)

The relatively pessimistic view above of New Zealand's innovation performance is reflected in other, more general New Zealand studies. Bayliss (1994) for instance suggests that New Zealand has been slow to adapt historically. Blyth, Hawke and Smythe (1984) and Treasury (1984) make similar suggestions at a more macroeconomic level, in suggesting the economy was unresponsive to change.

None of the New Zealand literature cited above attempts to directly relate the amount of innovative effort to overall GDP growth.

Assessment of New Zealand Views

On its face, the New Zealand evidence cited suggests that a poor innovative record, by OECD standards, may well have been a contributor to New Zealand's moderate economic performance. The widespread view, at least internationally, that innovation is particularly important to growth lends weight to this conclusion.

However, there are some important caveats to this view of a poor performance which emerge largely from considering the international literature and have been discussed little in the New Zealand material reviewed for this paper:

- By international standards, New Zealand's businesses overwhelmingly consist of small and medium sized enterprises, whose R&D effort is thought to be systematically under-reported. Small businesses that undertake little formal R&D may not have their effort recorded. (Bassols 1998)
- New Zealand does not offer tax concessions for R&D, which is likely to mean R&D effort is under-recorded, compared to say Australia.
- With New Zealand's income level lagging behind the highest income countries, there may well be some truth in the Davenport and Campbell-Hunt view that New Zealand first needs to reach the frontier in many areas before returns to innovation rise sufficiently to justify more expenditure. Japan's extremely high research intensity came only after its income levels had risen (Patel and Pavitt 1995). Diffusion of innovations from abroad is therefore likely to be relatively more important to New Zealand.

[94] A measure based on raw graduate numbers may however be misleading: New Zealand has relatively few science and engineering graduates, compared to say Finland or Ireland.

- New Zealand has clearly been importing much more plant and equipment through the 1990's, which is likely to provide much embodied technology. This is shown by import volume statistics for capital equipment except transport equipment, which from 1996 to 1998 for example were 60% above their 1989 level.[95] Campbell-Hunt and Corbett (1996) report research showing that at their date of writing, three-quarters of respondents to one survey reported their plant to be at or within 4 years of industry best practice, compared with one quarter in 1989. Fare, Grosskopf and Margaritis (1996) who suggest that openness to foreign knowledge and technology is the principal engine of TFP growth, reinforce the importance of this mechanism.
- Some indicators suggest a better performance and need to be taken into account to provide a balanced picture. For instance, New Zealand inventiveness, as recorded in per capita resident patent registrations in 1994 is relatively high by OECD standards, with New Zealand ranking 7th of 21 reported OECD members (OECD1998a). Patenting of course need not imply high success in the wider innovation process. Mowery (1995) points out that access to facilities such as marketing and manufacturing may be necessary to capitalise fully on research. As pointed out earlier in this paper, New Zealand seems to have a history of selling inventions, rather than exploiting them in international markets from New Zealand.
- New Zealand research productivity, measured using patents produced from labour inputs, also appears relatively high according to Eaton, Gutierrez and Kortum (1998). Writing about European experience, they suggest that the relative lack of research in smaller countries may be explained by a relatively low value of research, without a large home market for inventions. Of the 21 countries reported in the article, New Zealand has by far the lowest estimated pay-off to research – some 11% of the USA figure. This raises the wider issue of comparative advantage in R&D. It is possible that New Zealand's comparative advantage lies less in research than is the case in larger, higher income, higher skill countries nearer to large research facility agglomerations and larger markets. In other words, it is possible New Zealand's apparent poor record in innovation may be a rational response to market conditions.
- New Zealand's recent record of innovation may also look slightly better, assuming there is a connection between aggregate industry level data and innovation, rather than considering only micro level data. Insights might be possible from several sources. Easton (1997), for instance, points to the considerable diversification in New Zealand's export product mix, and export and import product mix over the last three decades. While New Zealand is still heavily dependent upon primary exports, not only has the proportion dropped but the primary product mix has changed considerably towards forestry, fishing, mining and horticultural products over time. Hall (1996) notes that New Zealand's rate of structural change, measured by comparing absolute changes in employment shares across sectors

[95] Statistics New Zealand import volume data

increased substantially from 1985 to 1993 compared with 1978 to 1985, having been historically low by OECD standards from 1970 to 1987.

- New Zealand has historically devoted a high proportion of R&D effort to primary products and now appears to be doing so in services. These might well be rational strategies, given New Zealand's relative lack of success in developing manufacturing behind protective barriers. New Zealand's innovation efforts may have been better directed than if viewed only from a manufacturing oriented perspective, with which many overseas studies appear to be conducted.

Conclusions on Innovation

There appear to be good reasons to think that New Zealand's moderate growth rate owes something to a relatively low rate of innovation, particularly as measured by R&D expenditure levels. This is especially true when considering the limited volume of private sector R&D, which seems likely to have a higher pay-off than public sector R&D. New Zealand's ability to assimilate overseas innovation may also be limited in some respects by its apparent low proportion of R&D activity and limited direct expenditure on overseas technology.

The picture may look brighter when account is taken of New Zealand's apparent comparative advantage in primary products, small business orientation, lack of fiscal incentives for R&D, geographic factors and ability to import overseas technology in embodied form. New Zealand is probably more innovative than the statistics usually used in comparisons suggest. This is not to say that more could not be achieved with higher levels of innovation, especially given the universal agreement on its importance to growth. However, it does warn against simple policy conclusions about what Governments might do to stimulate growth through encouraging innovation.

Policy Responses

There are many warnings about Government interventions in the literature. Mowery (1995), in surveying technology policy practice, accepts that carefully structured Government interventions[96] can raise levels of innovation but notes:

- Public sector activity may displace private activity to some extent
- "There is abundant evidence of the limits to the ability of public agencies to closely direct and control the development of commercial technologies for civilian markets"
- Much intervention depends on context. For example, formal instruments of R&D support may only become effective after establishment of a more R&D intensive industrial base.[97]

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[96] These may include tax breaks and grants; public procurement; information provision; development of technical standards and competition policies. These all have risks.

[97] Davenport and Campbell-Hunt take a similar line. They suggest that there are dangers in the public sector being pressured prematurely into programs of "technology push" in frustration

- Improving the ability of mature industries to absorb and exploit the products of R&D may be more important than nurturing sunrise industries.[98]
- Many policies determining overall economic performance may have little to do with technology per se. It could be that education at all levels and regulatory and financial policies conducive to savings and capital formation assist both growth and innovation.

To these general warnings might be added one that the environment for New Zealand innovation to be successful is complex and not necessarily the same as in other countries where most research has been done. Once again, the analysis reported here suggests that comprehensive policies are more likely to be successful in promoting growth than any single factor. The impression that is left, though, is that careful promotion of innovation undoubtedly could enhance New Zealand's growth prospects, particularly within the private sector.

5.13 Microeconomic Policies

The contribution of microeconomic or firm level policies to growth is important. Indeed, Porter (1998) picks it out as the most important area for growth. Harberger (1998) implicitly takes the same view in arguing that "the great bulk of the action associated with the growth process takes place at the level of the firm."

This section of the report briefly summarises international and New Zealand views and notes two particular issues which stand out amongst a surprising degree of agreement that the area of microeconomic reform has been positive for New Zealand. These are:

- The scale of the contribution of competition to growth
- The level of support which should be offered to particular sectors

A third microeconomic issue briefly discussed is the structure of New Zealand business.

The scope of microeconomic reform is enormous. It includes:

- The extent of openness of markets to competition, including international markets[99]
- Means and methods of regulation
- Governance and ownership of firms

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at the lack of growth in demand for science, when evidence suggests firms will increasingly be providing "market pull" for it, as they reach a further stage of development.

[98] The OECD (1997) points out that high tech applications may be found in primary industries, citing Norwegian aquaculture, which demonstrates applications of optics, acoustics, electronics and information technologies.

[99] In this context, there is little to distinguish opening local markets to competition and opening local markets to overseas competition. In both cases, allowing competition is the key feature.

- Institutions and arrangements for markets, including specific market arrangements
- Demand and supply conditions

New Zealand microeconomic reform has involved all these areas, with emphasis on:

- Moving to market based regulatory mechanisms
- Opening markets to entry and competition, including entry by private firms
- Removing unnecessary regulation and uneven industry assistance measures and adjusting regulation to support a competitive environment
- Redefining property rights in ways more consistent with competition, as in radio spectrum, fishing or forestry cutting rights.

Taking these areas together tends to suggest that if there is a single key feature to microeconomic reform, it is opening markets to competition.

It is clearly not possible to do justice to all these areas within one overview paper. However, the task of examining the contribution of microeconomic policies to New Zealand's growth is simplified somewhat by the assessment of this area in most recent New Zealand writings noted below, that microeconomic reform has tended to be broadly positive for growth or welfare. This supportive view is certainly consistent with international writings, although like all work on growth, unanimity is lacking and uncertainty remains.

International Views

Research tends to support the view that introducing competitive market conditions is positive for growth. Poot (1999a) reports that there is wide support for the view that economic liberalisation, amongst other factors, is beneficial for growth. As noted in Part 3 of this paper, analysts such as Levine and Renelt (1992), Temple (1999), Pilat (1998), and Barro and Sala-I-Martin (1995) confirm the importance of trade openness and competition to growth. The precise mechanism is less clear, but may involve a combination of the stimulation of competition to improve productive efficiency, improve allocative efficiency, and through continuous pressures for innovation.

Trade openness does not necessarily equate to a lack of regulatory barriers to trade per se, although it is not unreasonable to expect the two to be related.

Removing market distortions and establishing clear property rights also receive wide support.

A useful New Zealand reference to literature on privatisation and competition is contained in Boles de Boer and Evans (1996). They cite arguments that Government Departments are less productive than private firms because of the political connection to management, multiple objectives and the absence of an immutable budget constraint. Competition and managerial accountability matter

particularly. Several reviews suggest that privatisation contributes greatly to static welfare. Boles de Boer and Evans themselves suggest that there were very large static gains to welfare, especially for consumers, following the combination of privatisation, allowing competition and corporatisation in New Zealand telecommunications. They also suggest that competition is significant to dynamic efficiency, spurring the earlier adoption of new technology.

Economy-wide New Zealand Views of Microeconomic Reform

New Zealand analysts' views of microeconomic reform are broadly positive. This is not surprising in material such as Evans, Grimes, Wilkinson and Teece (1996), Treasury (1996), Silverstone, Bollard and Lattimore (1996) or OECD (1998) and (1999), which can be seen as broadly supportive of the view that reform has contributed positively to New Zealand's growth prospects. The last for instance suggests:

"Overall, the economic strategy that has evolved in New Zealand since the mid-1980's appears to be on the right course, particularly with its emphasis on structural reform and the implementation of transparent policies within a medium term context."

In all cases, though, the positive assessments tend to be qualified. It may be suggested variously that:

- It is too soon to make a firm assessment, because the fruits of reform are likely to be slow to emerge
- Policy implementation alone is insufficient to produce growth
- Mistakes made in areas such as macroeconomic policies or sequencing have limited the pay-off to microeconomic reform
- There has been some unevenness in implementing reform or inconsistency in implementing policies through time, contributing to uncertainty. The OECD (1999) provides an example of this view.

At the level of industry studies, there is also a positive view of the effect competition. According to Bollard and Pickford (1998), summarising the results of a number of selected industry studies,

"Taking the studies overall, one consistent feature is the inefficiency, high prices and poor product qualities of regulated industries, and the substantial improvements across all dimensions of performance when industry-specific controls have been removed and effective competition has emerged (eg, red meat, freight distribution, telecommunications. Other industries subject to general controls, including import protection, have also improved their performance with deregulation and competition (eg. banking, brewing)".

In the specific realm of state owned enterprises and privatisation, studies tend to suggest strong positive results from reforms. These include Duncan (1996), Boles de Boer and Evans (1996) and Spicer, Emanuel and Powell (1996).

Duncan, for instance concludes that corporatisation raised productivity. These studies however face difficulty in distinguishing the effects of privatisation, corporatisation and regulatory changes as well as the effects of important environmental changes such as technological change. There are strong reasons to think that all the first three would push the organisations concerned to improve productivity and it may be fruitless to attempt to tie down the distinction.

At an empirical level, perhaps one of the more telling pieces of information is the result for total factor productivity in the utilities sector, as calculated by Lawrence and Diewert (1999). These include transport, electricity, gas and water and communications. State owned enterprises historically dominated these industries more than most, both in size of operations and levels of protection provided to them. In each case, total factor productivity appears to have accelerated since 1987, despite it being a peak year for economic activity and despite the goal posts being higher, with productivity in each of these cases already rising strongly prior to 1987.

What is more surprising is that economic writers who might be seen as sceptical about overall economic management tend to take a broadly positive view of microeconomic reform. Easton (1997), for instance, suggests that:

"The micro reforms probably contributed to the disinflation, in that it made it easier to lower prices. However, few of the benefits – such as productivity gains – claimed for the reforms appeared, primarily because the damage caused by the macroeconomic mismanagement has swamped any potential gains from microeconomic liberalisation".

Easton also argues however that the gains from protection reform are likely to be small based on older international studies, with a maximum gain to GDP or welfare of 0.7%.

Bayliss (1994) also suggests that microeconomic policies were basically right, while heavily criticising macroeconomic policies. Hazledine (1998) acknowledges that there are many anecdotes of productivity improvement, but sees an important role for competition, arguing for a strengthened competition policy and suggesting that a more moderate pace of reform, with less extreme application of market based policies, would have been beneficial. Hazledine and Easton (1997a) share this last view, arguing that commercial models have failed in areas where they are incompatible with the culture of the industry. Dalziel (1999) argues that that the reform program as a whole was directed towards growth. Like a number of these critics, adverse effects on distributional outcomes and on macroeconomic policies are of concern to him.

The Scale of the Contribution of Competition to Growth

Easton (1997), as noted, has argued that the welfare gains from introducing competition are small. This is not because the welfare gains from competition

in a given industry are necessarily small. Boles de Boer and Evans (1996), for instance, suggest that in telecommunications, the net benefit from price reductions by Telecom alone over 1987 to 1993 amounted to $575 million, generated by increased consumer surplus and reductions in fixed costs, offset by reduced producer surplus. These figures at least suggest the static gains might be large. However, as Temple (1999) notes, microeconomic studies like that of Boles de Boer and Evans often miss the economy wide effects.

There are arguments that the wider welfare gains from increased competition can be very large. Winkelmann and Winkelmann (1998), for instance, argue that import licensing had the effect of enabling overseas exporters to raise their prices for sales to New Zealand substantially, estimating that the total welfare loss due to quotas on US exports to New Zealand in 1985 alone was nearly 1% of GDP.

Most of these arguments are conducted within an essentially static framework. There appears to be an absence of detailed evaluation in New Zealand of the effects of allowing competition in its widest sense, including international competition, on growth.

It could well be that the most significant impacts of microeconomic reform are in fact static. Moreover, if these show up primarily through a mechanism such as increased consumer surplus, through large price reductions on services or imported goods, it is also possible that GDP growth may not reflect the welfare gains.[100]

Easton (1997) in fact says that to argue there are "dynamic effects" from reducing protection levels without detailed analysis is merely "hand-waving". He is not alone. Quiggin (1998), in examining Australian microeconomic reform experience, which is similar to that of New Zealand in many respects, also argues that expecting benefits from competition in stimulating technical efficiency or dynamic efficiency lacks a theoretical foundation. Any benefits, which might come from mechanisms which he regards as credible, such as reduced x-inefficiency or producer satisficing, are likely to be small in practice. In contrast, Parnham (1999), of the Australian Productivity Commission points out that Australian productivity has surged and argues that microeconomic reform is partly responsible.

From an international innovation perspective, Mowery (1995) suggests that there is little strong evidence either way on the effects of competitive structures on innovation, perhaps the most plausible mechanism for achieving gains from microeconomic reform, but nor is there a strong case for relaxing competition

[100] Consider an imported consumer good where there is a large price fall and a large increase in the quantity imported, so that the value imported remains the same. The value added in distribution and the amount of imports may be measured as being the same, but consumer surplus, and consequently welfare is likely to have increased considerably. However, GDP need not have budged.

policies. However, at least allowing more firms to try out different strategies should enhance innovation.

The debate is however unlikely to be resolved through purely theoretical arguments. Empirically, Quiggin's views receive little support in New Zealand industry studies, such as those included in Pickford and Bollard (1998). Providing conclusive empirical evidence on the effects of competition on growth in New Zealand is likely to be difficult, given the welter of different influences affecting any industry.

To summarise, it seems quite conceivable that there are relatively large static welfare gains from introducing competition, which may not be fully reflected in GDP. International growth literature tends to suggest that enhanced competition will be positive for growth, and local writings mainly accept the proposition. There appears to be sufficient weight behind this argument that for policy purposes, it is probably best accepted. However, it is still open to debate, especially on the size of any contribution, and more research into the extent to which competition has stimulated growth would be in order.

The level of support which should be offered to particular sectors

One consistent theme, which is reasonably classed as a microeconomic issue, is whether New Zealand has allocated its resources to the “right” sectors. The issue is old, being closely associated with Sutch (1966), who argued that New Zealand was concentrating too heavily on producing agricultural products facing declining terms of trade.

Related arguments are run by Crocombe, Enright and Porter (1991), that New Zealand is too heavily based in resource based products, rather than industries which are more knowledge based and likely to support high living standards. Similar arguments are apparent from Bayliss (1994) and Grant (1998). Lattimore and Wooding (1996) suggest that if New Zealand’s exports had not been concentrated in slow-growing meat, wool, dairy and Aluminium products, over 1970 to 1985, export growth would have been far higher. Hall (1995) also suggests that New Zealand suffered from having too much resource in slow-growth sectors and in shifting further into such services sectors has accordingly experienced a reduced growth rate.

These arguments are all valid, taken at face value, as ex-post assessments. There does appear to be a clear trend for more knowledge-based workers to earn higher incomes internationally, as argued for instance by Audretsch (1998). Caution is required, though, before concluding that services sector growth has been slow, given that there appears to be a tendency to underestimate services sector output. It is also another matter altogether to draw a strong policy conclusion about the desirability of Government promoting growth through explicitly directing resources into particular sectors.

New Zealand seems unlikely to have had a knowledge based, higher growth scenario easily available. Upgrading skills is more likely to be a slow process, taking decades. Geographic isolation may well also affect the feasibility of such a strategy.

As noted in part 4 of this paper, primary products appear to have enjoyed a relatively high rate of total factor productivity growth over the 1978 to 1998 period, at least by New Zealand standards. This may well reflect embedded resource based advantage, as New Zealand's institutions have developed in line with past industry comparative advantage and requirements, in a pattern that North (1993) identifies. It may also reflect that less protected areas do better as high effective rates of assistance are wound down, in areas where New Zealand has less comparative advantage, as was expected, when the policies were introduced. Increasingly since 1984, private industry has had a choice about where to invest, with increasing knowledge about the prospects for commodities and diminishing influence from earlier industry assistance measures.

The theme of the dangers of Governments picking winners is still alive and well. As Bayliss (1994), who sees a role for the Government in planning, points out, earlier policies directing investment into manufacturing for many years directed investment into low skill, low value added areas. Overseas analysts continue to emphasise the lack of success of Governments in attempting to pick strategic sectors, including Ostry (1993) and Mowery (1995).

Sachs and Warner (1995) specifically investigate the links between growth and natural resource intensity. They find that a high rate of resource based exports to GDP is associated with low growth, without necessarily identifying precisely why. The mechanisms considered and conclusions include that resource dependence may:

- allow an inefficient bureaucracy to develop (no strong evidence);
- foster protection of weaker sectors, such as manufacturing (stronger evidence)

They are careful to warn that promoting non-resource based growth is not necessarily a conclusion from the analysis. Resource based development may still support high consumption levels, more basic policies such as open trade may be more important for growth and their aggregate analysis is far from definitive. To this might be added that the study focuses on developing countries.

Harberger's (1998) conclusions reinforce the warning, in emphasising that at industry and firm level, typically only a few industries experience rapid growth at a time, with a minority generating most of the growth of a country. Moreover, these industries regularly change.

There are clearly still significant dangers in Governments attempting to identify likely winners. A particular risk could be attempting to emulate the apparent success of other countries in areas in which they appear to be successful now – which are both more likely to attract international competition and reflect another country's comparative advantage in skills or geography.

A safer exception to the general policy rule of forbearing intervention might however be the recommendations of Porter (1998) and Crocombe, Enright and Porter (1991), to support the development of emerging clusters of successful industries, reinforcing their development through areas of existing Government activity in education or research support.[101] In this case, support is at least likely fit with underlying strengths. Porter goes further in arguing against resource based development for New Zealand but if the arguments put forward here are accepted, this aspect of his advice should be treated with scepticism. Similar conclusions are reached by Campbell Hunt and Corbett (1998) and Cartwright (1998), who argues that it is possible succeed in resource based industries, with value adding strategies.

Regulation

The effects of regulation on growth have also received relatively little attention in the material reviewed for this paper. It is possible that literature dealing

[101] Porter's views, particularly as reflected in Crocombe, Enright and Porter (1991) have attracted some criticism in New Zealand including from Philpott (1991) and Burnell and Sheppard (1992), as noted in part 3 of this paper. However these critics, perhaps somewhat reluctantly concede that Porter's views are really more mainstream. Philpott suggests that the "new right" framework is forced into Porter's framework. Burnell and Sheppard suggest that even although unproven, many of the propositions are "probably true". These seem fair assessments, given that Porter's views do appear largely consistent with much of the wider growth literature.

Key propositions from Porter's analysis include that growth will be assisted by:

- upgrading human resources and foster capital accumulation through saving
- stimulating domestic competition
- improving infrastructure
- tackling microeconomic issues as well as macro issues and avoiding over-reliance on exchange rate depreciation to maintain industry competitiveness
- focusing on innovation
- promoting the development of industry clusters in obvious areas of success, with Government support through policies such as human resource development and research support
- encouraging more demanding consumers, to help develop industry's ability to meet demanding standards.

Little if any of this appears to be in conflict with the more widely agreed propositions in international growth literature. Government support for cluster development is less conventional, but it can also be seen to fit with endogenous growth models based on R&D, conventional thinking about spillovers and newer thinking about agglomeration economies, such as that on urban scale economies, reviewed in Part 3 of this paper.

explicitly with regulatory issues, rather than growth, would be a more fruitful field. However, the overall impression left is that static effects may often be of more concern, with relatively little attention being given directly to growth effects. A typical example is Ministry of Commerce and Treasury (1995), a major discussion paper on regulation of access to vertically integrated natural monopolies, which tends to be more concerned with static efficiency and administrative issues.

There has been considerable debate about certain regulatory issues, most notably the extent to which competition policy should be applied. Crocombe, Enright and Porter (1991) are convinced that New Zealand's small market has limited competition, losing New Zealand the benefits of vigorous domestic rivalry as a means of spurring international competitiveness. Hazledine (1998) suggests there should be more vigorous enforcement, while Evans (1998) is more convinced that a light-handed approach, as followed up to that time is justified. New Zealand's competition law up to 1999 does appear to be more tolerant of duopolies than the regimes of larger markets, such as those of the EU of United States. While there is broad acceptance that competition policy measures are needed, this debate finally tends to be around the margins of the policy. Possibly the apparent importance of competition for growth suggests that New Zealand would be better to err towards more vigorous enforcement measures where the choice is otherwise unclear.

Regulatory measures otherwise are not clearly a constraint on growth. It is abundantly clear that New Zealand commercial regulation is typically far simpler than that typically found in larger economies, such as in Australia, North America or Europe. Crocombe, Enright and Porter (1991) consider that tougher regulatory measures in the domestic market may actually assist firms in learning to compete in more demanding, more difficult export markets. This is not implausible, but it seems more likely that firms will be more productive with fewer restrictions on their conduct.

Goff (1996), who rather unusually specifically attempts to measure the macroeconomic effects in the United States of higher quantities of regulation, suggests that there is a significant, measurable reduction in growth rates with a lag as regulation increases. The study develops an index of regulation as a latent variable and suggests that a 10% reduction in an index of the volume of regulation could be associated with a 2% higher growth rate. Other studies are quoted suggesting a variety of figures but finally, there is no more certainty about the magnitudes of such effects than most other growth parameters.

New Zealand firm level surveys also suggest that the effects of regulation are not necessarily large here (Knuckey, Leung-Wai and Meskill 1999). Their report indicates that for manufacturers, safety regulation is not onerous but compliance costs and the Resource Management Act generated concerns. Campbell-Hunt and Corbett (1996), suggest Government regulation is now perceived to be broadly supportive of the primary drivers of competitive behaviour. They report a BERL study showing legislation has been perceived

as negative for innovation in the areas of tax law and environment law however (Frater, Stuart, Rose and Andrews 1995). Views were more positive on competition, patent, industrial relations,health and safety laws.

Structure of Business

The structure of New Zealand firms may have some implications for New Zealand's growth performance. This relates more to the scarcity of large, strong multinational enterprises (MNEs) controlled by New Zealand interests rather than the high population of small firms.

An excellent illustration of the importance of small firms in New Zealand can be found in comparing the thresholds used for defining small and medium size in New Zealand and OECD studies. For Knuckey, Leung-Wai and Meskill (1999) in their study of 1400 New Zealand manufacturers, small firms had less than 10 employees; medium sized firms less than 40 and large sized firms 40 or more employees. In contrast, in OECD (1998b), small and medium sized firms for the purposes of an OECD-wide study of small and medium sized enterprises and globalisation range up 500 employees in size.

For firms which are small or medium sized in the OECD sense, it is not clear that there are important barriers to establishing global competitiveness either internationally or in New Zealand that larger firms do not also face. There are clearly disadvantages in being small, such as lack of back-up, lack of specialisation, financial and time constraints (Knuckey, Leung-Wai and Meskill 1999). There are advantages in flexibility, customer and within-firm relationships. Interestingly, in Knuckey, Leung-Wai and Meskill's study, outcomes across areas such as timeliness, quality, innovation, flexibility and competitiveness do not appear to show a marked disadvantage to New Zealand medium sized manufacturers compared with large manufacturers.[102]

In a related vein, the OECD (1998b) suggests small and medium sized enterprises can be globally competitive, with 1% of the OECD population of small firms being active in multiple countries or continents. Success factors include attention to the need of customers; products and services of international quality; management resources and commitment; international experience; access to accurate and reliable information and Government programs and regulations taking account of the needs of small firms.

More of an issue may be the scarcity of large, strong MNEs controlled by New Zealand interests, as suggested by Cartwright (1998). Cartwright suggests that only Fletcher-Challenge, Lion Nathan and the New Zealand Dairy Board qualify, with other potential candidates disqualified by sourcing products

[102] Medium sized firms in the study do show a tendency to a lower rate of adoption of firm "best practices". The reasons this does not show up in outcomes may be that the definition of best practice is more appropriate to larger sized firms, or that the benefits from best practices are harder to achieve in large firms.

largely from within New Zealand.[103] Cartwright suggests however that it would be reasonable to expect to find a limited number of New Zealand MNEs comparable to Finland's Nokia. Without these firms, New Zealand does not gain the downstream value from marketing, manufacturing and production operations on some scale overseas. We may also lack the spillover of skills in running large businesses. Running and developing small to medium sized businesses may involve a different skill set.

There are some obvious, possible reasons for the lack of New Zealand MNE's to explain the position identified by Cartwright, although he does not suggest them. The difficulty in managing business relationships across long distances from major markets and attraction to entrepreneurs of operating directly in larger markets have been raised in sections 5.2 and 5.8 of this paper. Further research in this area could be valuable.

Conclusion on Microeconomic Issues

The microeconomic reforms undertaken in New Zealand since 1984 seem broadly consistent with most international thinking about growth, in that allowing competition, the single key factor characterising the reforms, is consistent with most prescriptions. New Zealand thinking largely appears to concur. Perhaps the strongest evidence of success comes at the industry case study level. Microeconomic reform may possibly contribute as much to static welfare as to growth, where the precise extent of the contribution remains an open question. Its major contribution to growth could well be through pressures to generate further innovation and increase the degree of international openness of the economy. There are, however, question marks about how much microeconomic reform alone could be expected to deliver, with culture, macroeconomic policies and factor accumulation also being important to varying degrees. This certainly does not mean that microeconomic reform should not be a key part of any growth strategy but simply that it is a part only.

Overall Conclusions to Part 5 Analysis

These are included in Part 1 of this paper.

[103] The proposed sale of the Fletcher-Challenge paper interests and sale of the Myers interest in Lion Nathan, subsequent to the Cartwright paper being written, may raise questions about two of these three.

6 Conclusions and Policy Implications

The analysis in this paper examines theoretical and empirical views of what contributes to growth, New Zealand's growth performance and reasons why that performance has only been moderate since the period of major reform commenced in 1984. This section of the paper summarises conclusions from the analysis about what might have driven New Zealand's growth performance and seeks to draw policy conclusions from it, identified below in italics. It concludes with a summary of potential further areas for research.

New Zealand's Growth Performance

New Zealand's per capita GDP growth from 1987 to 1998, on a peak to peak basis, has not been high, at 0.67% per annum. The GDP boost after 1992 was accompanied by high population growth.[104] Much of that growth in per capita terms was simply making up lost ground from the 1990-1992 recession. Allowing for increased factor payments abroad with a measure such as GNI (Gross National Income) would reduce the growth further, although leaving it positive.

The evidence of low growth may understate New Zealand's achievements in welfare terms. Welfare improvements arising from lower prices, increased choice, better product quality and services growth are not fully picked up in GDP statistics. As Lawrence and Diewert (1999) point out, much services sector output is still measured using input measures such as employment growth and the deflators used to calculate real output probably overstate inflation. Measured value added before the reforms was probably boosted by price distortions caused by protection from foreign competition. Given that New Zealand has tended to have more reforms than most OECD countries since the 1980s, and that the benefits of reforms may tend to be understated in GDP measures, New Zealand's welfare performance may be slightly better than measured in its growth rate.

[104] OECD (1999) contains a table comparing statistics for various OECD members. Leaving aside an anomalous German figure, this shows New Zealand's annual population growth rate of 1.1% in the 10 years to 1996 was exceeded only by Mexico, Turkey, Luxemburg, Australia and Canada. Although New Zealand experienced amongst the higher GDP volume growth rates over the five years to 1996 at 3.7%, countries such as Ireland, Korea and Norway enjoyed much higher GDP growth and lower population growth rates than New Zealand. Table 12 of the same publication shows New Zealand's per capita GDP growth over the period 1983 to 1997 to be behind the following selected major countries: the United States, Japan, France, Italy, United Kingdom, Canada and Australia. New Zealand's GDP growth exceeded that of countries such as France and Italy, but per capita growth was higher in those countries because of their lower population growth. New Zealand at least increased its per capita growth rate from 0.5% per annum from 1973 to 1983 to 1.3% from 1983 to 1997. In all three periods covered (1963-73, 1973-83 and 1983-97), New Zealand had the lowest per capita growth rate of the countries listed except for Germany in the last period, where reunification seems to have affected many German statistics.

Growth and output levels at the start of the 1980's were boosted by unsustainable policies, such as Government guarantees and borrowing, now mostly unwound. However, these factors are not necessarily large in their impact and also would have been experienced in some other countries. New Zealand's relative per capita income growth has simply been slow.

Encouragingly, total factor productivity did improve in the 1990's. However, OECD and Treasury projections do not suggest that New Zealand is likely to close the gap with average per capita OECD incomes.

Reasons for Moderate Post Reform Performance

On reflection, there is little reason to have expected New Zealand's recent growth performance to be outstandingly high, at least compared with other OECD countries. The specific reasons for this are summarised below. Possible policy areas for further consideration follow under each heading in italics. These should be seen as tentative suggestions for further work and research, not definite policy recommendations. The latter would require consideration within a wider welfare framework than one that simply considers growth and would require analysis beyond the merely economic analysis here.

Convergence

Economic theory tends to suggest that lower income countries' incomes will converge to those of higher income countries. Research tends to find such results at least amongst OECD and APEC members.[105] Taking these results at face value suggests New Zealand would have been unlikely to experience high growth in the post war period. In fact, there are some suggestions that New Zealand incomes are diverging downwards relative to the OECD and APEC.

Despite some support for the view, there is not a consensus that convergence exists more generally. If it did, there are few reasons to think that it would pull New Zealand incomes towards the average or top of the OECD with any strength. New Zealand's per capita GDP is still relatively high at around 80% of the OECD average. Any tendency to convergence could be expected to be weak at this level. The mechanisms that might bring rapid convergence are absent. There is no obvious, large technology gap able to be bridged with the transfer of technology from wealthier countries, little unproductive labour to transfer to a high productivity sector and no large, adjacent high-income area for New Zealand to integrate into.

- *Policy work should not assume convergence of New Zealand incomes to higher levels.*

[105] Convergence is less likely to be found globally though.

Geographical Factors and Economies of Scale

Geographical and scale effects are likely to constrain the levels of income that New Zealand can achieve. Distance from markets makes it more difficult to develop business relationships and participate in innovative activity. Having a small, isolated population makes it difficult to achieve economies of scale in many areas. To the extent that this involves a level rather than a growth effect, it may impact more upon New Zealand's ability to close the income gap with wealthier countries than on the growth rate itself.

While New Zealand may face some limitations on the income levels to which it can aspire, from these factors, some possible policy implications do emerge:

- *New Zealand may face some significant disadvantages, but there are possible policy responses to these.*
- *Policy makers should actively consider possible scale and geographical effects in policy development*
- *We should be extremely cautious in following industry policies or development approaches which appear to work overseas but in very different geographical or scale settings*
- *Geographic isolation, coupled with existing industry strengths, greatly increases the chances that resource based development will be an important part of a successful growth strategy for New Zealand. Resource based industries are less affected by distance from major markets.*
- *Geographical factors raise the pay-off from policies that help overcome the effects of distance and scale. These might include seeking improved quality and cost of transport (especially for people) and communications services; international economic integration through bilateral and multilateral fora; and open trade policies in all areas of trade in goods and services. Given that national boundaries seem to create significant barriers to interactions[106], research and consideration should be given to policies which could break down such boundaries, reducing isolation and scale effects.[107]*
- *If economic growth is given a high weighting, supportive policies towards urban development could be appropriate. Naturally, national growth is not the only consideration in developing policy.*

The Restructuring Process

Lawrence and Diewert (1999) suggest that New Zealand's recent measured productivity has been lower than anticipated by many while Hazledine (1998) goes as far as to suggest that the reform process itself has failed. What the real

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[106] This is noted in Coleman (1999) and Helliwell (1999).

[107] Apart from countries with high natural resource endowments, there is a clear tendency for countries with high incomes to be clustered in regions allowing high levels of interactions, including across national borders. These are notably in North America, East Asia and Europe. Countries with consistent high growth rates since 1960 tend to be adjacent to these zones (Pritchett 1998).

impact of the restructuring since 1984 on growth has been is probably impossible to determine given the many different factors operating. However, the following points seem worth making:

- Adjustment costs were high and up front
- They were probably exacerbated by costs of unconventional but expedient sequencing
- The full results of reforms are often seen as slow to emerge, given the deep-seated changes required in structures, attitudes and responsiveness of participants within the economy.
- Some aspects of the reforms were very slowly implemented, such as the phase-out of border protection being timetabled over more than a quarter of a century, probably generating uncertainty and limiting investment.
- Measurement errors may well have resulted in the benefits of reforms being under-recorded

On balance, these points tend to suggest that New Zealand's growth rate, both real and measured will have eased upward as reform processes are completed and that there may still be some upside. It is difficult to say how much. In many respects, New Zealand may have simply been catching up to the growth potential of other OECD countries in undertaking reforms, not exceeding them.

- *The full benefits of New Zealand's economic reforms since the mid-1980s are still probably coming through.*
- *With major policy changes having up-front costs, generating uncertainty and requiring wide consequential institutional change, it is probably desirable to have in place mechanisms which allow constant, incremental change rather than requiring periodic shocks. An open, lightly regulated economy is more likely to allow this, although regulation and other interventions are still needed to address real market failures.*
- *There is a high probability that the welfare and growth benefits of reforms are not fully measured. Further analysis would be desirable.*

International Conditions

International macroeconomic conditions have probably not had a marked impact on New Zealand's recent growth performance. The terms of trade rose slightly after the major reforms commenced but have been remarkably stable by past standards since 1988, with only a slight decline. On the other hand, international real interest rates have fallen significantly since 1992, to New Zealand's great advantage as a debtor country. Market access has tended to improve. There do not seem to be any strong implications from international conditions for New Zealand's growth performance more recently, at least viewed from a medium term perspective and ignoring short-term business cycles. In the longer term, New Zealand faces ongoing pressures from continual innovation overseas, requiring innovative responses.

- *Reduced international real interest rates may explain some of the increase in New Zealand's indebtedness over the last decade. The possibility of an increase at some point, perhaps remote at present, would pose a risk to New Zealand's growth prospects*
- *Other countries are continually seeking to upgrade their economic performance, including in areas in which New Zealand has strengths. Policy development should acknowledge that New Zealand has to actively pursue innovation and growth opportunities even to maintain its relative position.*
- *It would be wise to assume that New Zealand's commodity export prices will continue to fall over time, reflecting the product life cycle model in operation. However, similar effects also apply to New Zealand's imports. It is difficult to say which effect will be more significant for the terms of trade.*

Employment and Population Growth

New Zealand's population growth has been fast compared to OECD countries in the post-war period and still relatively fast in the 1990s. Employment has grown faster too, with indications that participation is relatively high by OECD standards, although tending to decline. Other things equal, higher participation might be expected to have boosted the level of New Zealand's GDP per capita. However faster long term population growth tends to be associated with somewhat slower per capita income growth. Such results may be influenced by developing country experience, but there is no reason to think they are not applicable here, as the primary mechanism is probably a simple dilution of capital per workforce member.

In addition, New Zealand has a medium-term tendency for population to rise as growth occurs and sink as it reverses. This at least in the short run is a significant effect in limiting per capita growth, even if research about inward migration suggests it may have slightly positive effects on long run income levels.

- *Population policies could play a role in increasing per capita incomes. This area particularly requires further research. On the one hand a larger domestic market and knowledge spill-overs arising from dense urban centres may be positive for growth. Inward migration probably has net positive effects according to existing research. On the other, the medium term tendency of population to expand rapidly as soon as income grows requires investigation.*

Human Capital

There is little in the picture of human capital developed here to suggest that New Zealand's post reform growth would pick up strongly compared with OECD members. While the proportion of people in tertiary training has increased substantially, any pay-off is likely to be longer term. Skill levels are generally not high by OECD standards, although there are possible exceptions such as

prose literacy. A relatively high proportion of children fail to meet reading, science and maths standards. The proportion of the workforce without qualifications is still moderately high compared to high-income OECD members. Management skills in business appear to have been lacking in some areas, although there are signs of improvement now. There appears to be a substantial net loss of skills through outward migration, despite high skill levels amongst inward migrants.

- *Human capital investment, including through education, seems likely to be a contributor to output levels and growth although the precise contribution is quite uncertain.*
- *The pay-off may not be dramatic, varies across investments and there may be diminishing returns. Careful assessment of specific investment opportunities and interventions is desirable, including by Government, given its extensive investment in education.*
- *Promoting skill development at firm level and amongst disadvantaged groups and further developing education markets might be options that could be investigated further.*
- *The exit from New Zealand of skilled New Zealanders requires further consideration.*

Institutions, Values and Attitudes

New Zealand generally has the sorts of institutions seen as most important to growth, including developed property rights; effective Courts and a developed finance sector. None of these plainly stand out as superior or inferior to those found elsewhere. In terms of culture, there are suggestions that lifestyle considerations may limit ambition. This is not quantified or well researched but again nothing here suggests New Zealand could be expected to have a high growth rate.

- *Cultural issues could usefully be investigated further to see if there are implications for growth or opportunities for measures to promote growth here.*

Capital Stock Growth

The capital stock is not yet well measured, but based on ratios of investment to GDP, New Zealand seems to have been investing in line with the OECD average and still doing so. Whether the contribution of capital accumulation to growth is purely a simple accumulation effect or there are spillovers, New Zealand has not accumulated capital at a rate which would suggest high growth should be expected, say on the historic scale of East Asian countries. Much capital investment has been foreign sourced, with positive benefits, but a lower return to New Zealand income levels. Real after tax returns to capital investment of 3.7% from 1972 to 1998 according to Lawrence and Diewert (1999) lie in the range experienced in most Western countries. Improved

returns since 1992 are more promising for growth, being consistent with improved investment quality in the post reform period.

Savings have not been high, either in the past with large Government deficits or more recently with low household savings.

- *Increasing savings and investment rates might boost per capita income growth, provided average rates of return were achieved through generating an environment that secures suitable investment quality.*
- *Governments can probably boost savings rates, but the total welfare effects, not just the growth effects, would need to be carefully examined in considering any policies seeking to boost growth through this path.*
- *Examining whether the performance of New Zealand's capital markets could be enhanced might be worthwhile.*
- *Investment in human capital and innovation are alternatives to pure capital accumulation. Trade-offs between investment in these various areas require consideration in policy development.*

Macroeconomic Policies

Judging from the main ideas discerned from the literature on the effects of macroeconomic policy on growth, macroeconomic policy changes since the reforms and current settings and achievements have been positive for growth. In 1984, New Zealand started out from a position with serious macroeconomic imbalances. These were costly to remove. Some, like McMillan (1998), comparing experience before and after the reforms, consider that the most clear-cut reform success came in the macroeconomy, with the move from fiscal deficits to surplus and breaking the inflationary spiral. Most analysts would probably agree that these were successes. To this might be added the move to more moderate real interest rates.

Much of the analysis reviewed for this paper has, however, used a more exacting standard. It compares what has been achieved with what might have been achieved with ideal macroeconomic management. The weight of New Zealand analysis has been that macroeconomic management has been harmful to growth on several occasions, through generating high peaks in the real exchange rate. There seems to be some truth in this although other well informed official and quasi-official analysis argues otherwise. It seems plausible that several large, sustained appreciations in the real exchange rate have inhibited exports and import substitution. However, monetary policy is a difficult policy instrument to manage and inflationary expectations have been persistent.

- *There are few obvious, easy gains to be made here. Current policies seem broadly in line with the requirements for generating growth.*
- *Minimising sharp real exchange rate peaks looks to be important and now possibly more feasible given current inflation expectations.*
- *Avoiding net fiscal stimulation when the economy is strong could help this.*

- *The present more flexible monetary policy approach, with a wider target band and medium term focus seems to be appropriate.*

Government Role

New Zealand does not seem to be exceptional in its total tax take or expenditure and there is no really clear evidence that these have a substantial effect on growth, at least at the levels currently applying in New Zealand. However, lower levels of tax and expenditure are more often suggested to be associated with higher growth or income levels.

- *The overall weight of analysis seems to indicate that a slightly smaller proportion of Government expenditure or taxation to GDP would be beneficial for growth, but this is not a strong conclusion.*
- *Ensuring that expenditure is of high quality and is considered in each case for its potential growth effects as well as static welfare effects is desirable. While it is difficult to prove their existence, consideration of expenditure and tax decisions should at least take into account the possibility of positive externalities in areas such as accumulation of capital, human capital and knowledge.*
- *Similarly, ensuring the quality of the tax system is high is desirable.*

Innovation and Microeconomic Policies

A large number of microeconomic policies have impacted on New Zealand's growth including policies affecting innovation, corporate structure, competition, trade barriers, industry policies and regulation.

The predominant view amongst New Zealand analysts appears to be that reforms in all these areas have improved New Zealand's growth prospects. Businesses are more exposed to competition and international conditions, improving investment quality. New Zealand's small market however produces less pressure for improvement than larger overseas markets. Competition law may have imposed a lesser degree of restraint on restrictive practices than some overseas regimes. Regulatory restraints are not tight by international standards, although constraints on business inevitably remain in compliance costs, tax compliance and environmental issues.

Innovation is agreed to be a particularly important driver of growth. In R&D, New Zealand has a low level of expenditure. This may be less serious than it might first appear, given that New Zealand has many small businesses; no fiscal incentives to lead to an artificially high measured level of effort; and opportunities to import overseas innovations in many areas. However, it is possible that New Zealand's growth performance could be improved with more innovation, involving faster diffusion as well as R&D.

- *Existing microeconomic measures based on fostering competition, reducing regulatory barriers, compliance costs, and open trade, appear consistent with most views about growth.*
- *Regulatory measures are still required as market failures, including those that can adversely affect growth, are possible. Such failures are best considered within a comparative institutions approach, which requires assessment of feasible alternatives.*
- *There is no clear evidence on industry policies, but much of Porter's advice looks realistic: improve infrastructure; focus Government research programs on opportunities; encourage successful clusters and facilitate new business formation. These approaches involve reinforcing success within a well-developed set of economy wide policies, to be distinguished from selective interventions.*
- *Microeconomic reforms should continue in areas where probable benefits to growth and static benefits can be identified. Viewed from a forward looking viewpoint, they may not be a great contributor to growth in their own right, with many reforms having been completed and other contributors to growth also being important.*
- *Investing in the "right" sectors, viewed retrospectively, does seem to be important. However, we should be very wary of following models that suggest quick, easy pay-offs from selecting sectors likely to prosper. Overseas fashion countries and industries come and go quickly as development models change and booms have a habit of petering out.*
- *New Zealand should be particularly wary of attempting to emulate other high-tech models in investment or research policies.*
- *Policies towards innovation should focus on innovation its widest sense, not just on R&D. This could encompass diffusion of new ideas, new forms of business organisation and marketing. Just why private sector spending on R&D appears to be low requires further investigation.*
- *There is still much promise in resource-based development as part of market led development. Resource based development can involve sophisticated products, not just unmodified commodities moving towards the end of their product life cycle. It has a good productivity track record, there are opportunities to apply sophisticated knowledge, and New Zealand has strengths in the area.*
- *Growth can come in domestically oriented developments too.*

Measurement Issues

Measurement issues affect analysis of New Zealand's growth performance, as they do elsewhere. Amongst these are:

- GDP does not represent national income well, nor does it reflect the per capita position and nor does it represent welfare.
- Services output is not well measured.
- New activities are likely to be missed, while declining industries will be more faithfully recorded.

- Until now the capital stock has not been officially recorded. Other important inputs like human capital are not recorded at all.
- Reforms may well have resulted in output being understated
- Even if the measurement of growth was accurate, sustainability of the measured GDP level must always be considered.

Implications include:

- *Economic performance should be discussed using a range of indicators. Amongst these, there should be much more emphasis on real gross national income per capita and related measures. Plain GDP is very misleading.*
- *Efforts to improve national accounts and hence growth measurement should continue.*
- *There may be a need for new welfare measures to be developed, which capture a broader picture of welfare change than national income measures.*

General Conclusions

This synthesis does not suggest there is much new, low-hanging fruit to be plucked in bolstering New Zealand's growth performance. Such a result should probably not be expected. Intense policy analysis has been put into the reforms undertaken over the last 15 years. The reforms have been broadly in line with the firmer conclusions about what sorts of conditions are most likely to generate growth in mainstream economic literature.

There has been remarkably little direct focus on growth in New Zealand economic research, despite the importance of the topic. It is just possible that low-hanging fruit might be found in some of the many areas that have received little research attention so far.

Economic growth is of course just one potential contributor to welfare, the underlying concern. Much economic research is justifiably concerned with boosting static welfare rather than growth, either in income levels or through higher growth rates.

An important conclusion is that there are many potential contributors to growth. Typically, a small proportion of firms and industries contribute disproportionately to growth in a large variety of ways. The players involved can change quite rapidly. Policy formation needs to take such a vision into account.

At a proximate level, as pointed out by Temple (1999), investment in physical capital, human capital and innovation are important, but there are many other contributors, as already discussed. Many of these interact to provide an overlapping and analytically difficult picture. It is clear that:

- Simple models are unlikely to provide complete explanations

- Almost any theory will be supported by at least some real world example
- There are few if any universal conclusions, although fortunately, there are more areas heading towards consensus than might first be expected
- There is no magic formula to spark growth
- Even if all the basic conditions seem right, there is no guarantee that growth will follow
- Following certain approaches should however improve a country's growth prospects

New Zealand is unlikely to quickly achieve higher income levels or close the gap with higher income countries. Past levels and projections for population growth, capital accumulation, human capital development, innovation and our geography suggest otherwise. There are elements of path dependence affecting a number of these areas. Existing skill levels for older members of the workforce may reflect high past demand for unskilled labour. Past high per capita income levels and welfare support mechanisms have affected expectations of appropriate levels of savings and consumption, limiting current savings levels. Basing success on innovation was less important when manufacturers could sell to a protected home market and primary producers could sell commodities for high returns. These sorts of mechanisms all make it harder for the economy to switch to a different path.

Even just eyeballing the graph of New Zealand's per capita GDP since 1947, in Figure 2, gives no indication that New Zealand has embarked upon a higher per capita income growth path since the 1980s. However, this cannot be ruled out.

There is some good news though. In many areas, policies now being followed seem broadly consistent with the requirements for growth. Macroeconomic policy settings and variables are broadly consistent with recommendations for growth in the international literature. Investment returns have improved. Microeconomic decision-making is largely exposed to market signals that should assist in determining the best course for investment. There is much greater participation in education. A strong theme in much of the growth literature is that it takes time for the gains from reforms to come through. The reforms implemented may be contributing to New Zealand's growth performance for a considerable time to come.

New Zealand's income levels in general appear to be more sustainable than fifteen years ago. They are now not based on large Government borrowing or guarantees. Despite risks, there is a reasonable chance that the present large current account deficit will not bring a disruptive correction to the economy.[108]

However, growth is influenced by much more than Government policy, even if well formulated. Many choices important to growth are largely in the hands of individuals and firms rather than Government. These include areas such as savings and capital accumulation decisions, entrepreneurial and innovative

[108] Collins, Nadal De Simone and Hargreaves (1998)

behaviour, and culture. These and many other areas would justify more research, to determine if there are measures that might contribute more to growth in welfare consistent ways.

Further Research

There is scope for further research in many areas relating to both what New Zealand's growth performance has been and what would generate a higher growth rate.

There have been relatively few attempts to provide a broad overview aimed at a professional audience, even though the complexity of the subject, with many different factors contributing to growth, requires a broad view. The reasons are plain enough. Researchers have their own interests. Some Government interests may have been focused on economic welfare more than growth. New Zealand's small size, despite past economic reforms having attracted international attention, does not support a large research effort. There are difficulties in remaining rigorous when examining a large number of areas simultaneously and many individual areas have attracted little attention.

It is fortunate that growth has attracted a large, intensive international research effort, which has played a larger role in this paper than initially expected. However, even in the international literature, there are many data and methodological difficulties, resulting in high uncertainty about many policy conclusions.

Additional research then is likely to have a positive pay-off, given the limited amount undertaken to date, although it is unlikely to resolve all of the issues often debated. It would be helpful if it had the following characteristics:

- A strong New Zealand focus, as overseas conditions are not necessarily applicable here.
- Firm placement within a broad context of factors influencing New Zealand's growth, given that any narrow focus is likely to miss something important.
- A strong empirical focus
- Use of more sophisticated analytical techniques, such as the panel and case study techniques suggested by Temple (1999)
- A focus on meaningful policy implications

Areas in which further research would be particularly useful include the following. They are not in order of importance, but as the list is long, some indications of areas that might be seen as being more important are offered in brackets:

- New Zealand's position in cross-country regressions – this might highlight areas where New Zealand's policies need close examination, say if New Zealand appears to be an outlier.

- The effects of geography and economies of scale on New Zealand's long term growth prospects.
- Potential gains from further international economic integration. (It is clear that isolated parts of larger, high-income entities such as Tasmania and Hawaii achieve higher income levels than New Zealand, underlining the important potential contribution of wider economic integration.)
- The speed of responsiveness of New Zealand labour, capital and other resources to changed signals and opportunities.
- The interaction of population growth and per capita economic growth. These mechanisms are not well understood and seem to have had little local research, except in the case of immigration.
- How does investment in human capital, especially through education affect growth in New Zealand?
- How, if at all, the permanent outflows of skilled New Zealanders affect growth and might be reduced.
- Effects of values, attitudes and culture on growth: The potential effects of limited ambition; lack of trust; selfishness, views of success and other factors are worth further investigation. Policy responses might be possible, as have been attempted with savings information campaigns. (This area could be important because of the lack of attention it has received to date.)
- Why New Zealand businesses have not expanded internationally or transferred overseas when they have they have attained scale in international operations? (This is particularly important to resolve before developing industry policies, to ensure that policies encourage activities from which New Zealand is likely to benefit long term.)
- The effects of inequality on growth in NZ. International research suggests this is an issue, but there appears to be little rigorous work on the subject here.
- Possible improvements in New Zealand capital market performance, including participants' monitoring of investment quality
- The effect of real exchange rate surges on growth. (The extent to which analysts have raised this suggests its importance.)
- What is currently driving the terms of trade for New Zealand?
- How does innovation, in its broadest sense, including in management, marketing and diffusion of technology as well as the creation of new technologies through R&D occur within New Zealand? Some of the areas other than R&D appear to have had less attention.
- Why does the private sector appear to undertake so little R&D and how much does it matter? (This area is clearly of importance given current interest in the subject.)
- What have been the effects of microeconomic reform on growth?
- Means of better measuring overall welfare and improving national income statistics
- The specific effects of reform on measurements of New Zealand's GDP and GNI performance. (As there are reasons to suspect national accounts statistics may be not capturing these results, further work would be important to allow a more informed policy debate.)

Appendix A: Analysts' Views on the New Zealand Economy and Factors Driving its Performance

This Appendix summarises the views of a number of analysts who have reviewed the overall performance of the New Zealand economy. Those who have written only on narrow aspects of performance are excluded from this survey, to confine its scope and ensure that the views reviewed form part of a consistent, broad picture. Writings reviewed are largely those from over the last decade but with several exceptions intended to illustrate views prior to the major period of reforms commencing in 1984. The writings, with a few exceptions are largely confined to authors writing as individuals rather than those likely to be articulating an institutional line, to increase the level of independence of the material.

Views Before the Reforms

Gould (1982)

Gould takes an economic historian's perspective of New Zealand's growth in the post-war era. He notes New Zealand's growth rate was relatively poor throughout the period. Even in the 1950's, New Zealand achieved only 2% per capita income growth, compared with 4.5% in continental Europe or 8.5% in Japan. TFP was 1.3% from 1950 to 1960 - coincidentally around its present level. Historically, from 1926 to 1964, agriculture had a high rate of TFP growth, and higher than manufacturing, based on research by Philpott.

New Zealand did not have available to it some of the mechanisms promoting growth in other countries in this earlier era. There was less scope for catch up to US productivity levels; a lack of availability of economies of scale; little scope to reallocate resources out of inefficient sectors; and less scope to benefit from new technologies given the limited industrial base in New Zealand.

Other factors limiting New Zealand's growth included:

- High population growth, which tends to limit per capita income growth
- Reduced demand as the baby boom ended
- Lack of availability of a frontier to exploit after World War One
- Declining terms of trade, affected by overseas protection and dumping
- Consistent inflation and balance of payments difficulties
- Costly Government spending associated with the electoral cycle

Treasury (1984)

The key points for long term growth were:

- The New Zealand economy continued to display one of the most lacklustre performances among countries in the developed world.

- The growth, inflation, external payments, and employment records were all poor, despite investment ratios close to the OECD average.
- The poor performance in part reflected New Zealand's unwillingness to adjust to changing external conditions, shown also in increasing external indebtedness.
- Government policies lacked balance and consistency.
- Micro interventions locked resources into areas with low social returns and delayed adjustment through the economy.

Implicit throughout Treasury (1984) is the view that growth would flow from improved economic management, with a medium term focus; reduction of macroeconomic imbalances; and reduction in Government interventions in markets. However, generating growth per se is not a strong structural feature of the document.

Blyth, Hawke and Smythe (1984)

This report by the Planning Council was prepared just after the 1984 election and set out a proposed growth strategy. It contained a blunt, negative assessment:

"In recent years, we have failed to meet our economic objectives which include

- A rising material standard of living
- High employment
- Reasonable price stability
- A sustainable balance of payments situation
- Fair distribution of income"

The prescription offered was that:

- New Zealand needed an economic structure capable of responding continuously to change, with the key attribute of adaptability
- Price signals need to reflect the situation in the real world and be market based; greater flexibility is needed in the exchange rate to reflect overseas realities; and greater flexibility in labour market incomes and mobility
- There should be few specially encouraged activities and subsidies import licensing and domestic controls should be removed
- New Zealand must guard against the inflexibility of monopoly and special privilege
- Growth requires New Zealand to be competitive with foreign goods through achieving lower inflation; a lower real exchange rate; or relative productivity improvement
- The public deficit should be reduced and monetary policy be tightened
- Retraining and relocation assistance might be appropriate

With these policies, the Economic Monitoring Group expected:

- Production of some goods and services would cease and be replaced with new activities
- All of society would benefit eventually and it is much easier to address equity issues in a growing environment
- Attitudinal, educational and institutional changes would be needed before the policies became effective
- A quite rapid transition is required and the disadvantages would be short term
- There is no simple or straight-forward answer to New Zealand's economic problems but past policies offered only continued stagnation

Franklin (1985)

Franklin's book was written just before the major reforms commenced in 1984, and reflected extensive earlier research. He argues that New Zealand's poor economic performance reflected:

- New Zealand trapping its resources in protected markets such as manufacturing. Change and constant restructuring are required.
- An egalitarian ethos had created new privileges and rigidities, in the welfare state, bureaucracies and protected industry. A move away from privileges built up under the welfare state is essential, to allow greater competition and restructuring in industry.
- Creative planning, with cooperation between Government, unions and business was needed to set aside three yearly electoral auctions. Government nurturing is required in markets where science and technology are important.

Views Since the Reforms

Philpott

Bryan Philpott has written prolifically on growth and related issues over many years, as the bibliography of almost every significant work on growth testifies. This summary draws on only a limited selection of his writings as recorded in the bibliography of this paper (Philpott 1991, 1994, 1995 and 1998).

Philpott (1995) uses a Solow-Denison approach to estimate TFP for market based production groups and derives similar results to Lawrence and Diewert (1999) for comparable, though different periods. For the full period 1960 to 1995, he finds real GDP grew 2.8% per annum, although only 1.6% and 2.1% respectively in the last two decades. TFP grew 1.0% for the whole period and 0.1% and 2.6% for the last two decades to 1995.

Important influences on this growth pattern are suggested to be:

- Falling capital productivity due to trade liberalisation in manufacturing and capital intensive major projects in the 1980s
- Tradables, being exportable manufacturing sectors and primary sectors make the major contribution to growth
- Labour productivity was boosted in the late 1980's by restructuring through cutting employment, but this was a one–off effect and did not boost growth.
- Falling terms of trade in the 1970's depressed growth (Philpott 1991)

Elsewhere, Philpott is critical of New Zealand's growth performance. Consistent themes in his work are:

- Economic planning is required – being prepared to monitor and alter policy settings, not just sole reliance on markets.
- Monetary and fiscal policy need to be integrated in economic management, to generate a lower exchange rate to generate tradables growth, control the overseas deficit and spiralling overseas debt. (Philpott 1998) This is especially true in managing the real exchange rate to a level consistent with tradables sector growth. (Philpott 1991)
- Keynesian demand management remains important to generating growth. Output growth raises productivity more than the reverse. (Philpott 1994)
- Incomes policies could reduce inflation and assist exportables growth.
- Microeconomic reforms, such as reducing tariffs may be appropriate, but require support from monetary and fiscal policy to be effective.
- Steady and growing demand will promote adoption of new technologies, as firms are more likely to enjoy economies of scale, reallocate resources between firms and sectors; and undertake managerial changes.
- Adequate profitability is necessary for productivity growth as well as innovation and capital accumulation (Philpott 1994)
- Protection of manufacturing may have reduced welfare and GDP in the 1960's but helped growth (Philpott 1991)

Easton

Brian Easton has also written with an enduring interest in growth, a long historical perspective and an economy wide focus to his analysis. His thinking is most comprehensively set out in Easton (1997), the main source of this summary.

New Zealand had just under 1% per capita GNP growth per annum from1859 to 1939, according to Rankin (1991). A higher growth rate than in Australia, the USA or the UK was achieved from 1932 to 1955, with recovery from the depression and the stimulus of the war. However, in the 40 years to 1992, New Zealand consistently slipped behind the OECD per capita income growth rate, to reach 79% of the OECD level. A brief exception was 1979 to 1985 when New

Zealand exceeded OECD per capita income growth by 0.6% per annum. From 1985 to 1992, however, New Zealand slipped by 1.4% per annum relative to the OECD average. New Zealand growth rates may have been slightly underestimated by Statistics New Zealand, biased downwards by perhaps 0.3% per annum, because of service sector mismeasurement.

Easton's assessment of the factors driving New Zealand's recent performance can be summarised as:

- Micro economic reforms have been on balance beneficial, although the benefits of reductions in protection are quite small: +0.7% of GDP, based on Easton's own 1980 estimate. Subsidies did inhibit agricultural diversification in the 1980's and their removal was beneficial.
- While the decline in the terms of trade since the 1950's has been a large, negative influence for the level of GDP, it is an unresolved question how that affects growth. Easton (1991) suggests that declining long term terms of trade may have moved production into lower productivity industries, away from pastoral exports.
- In the last decade, poor growth is not attributable to the terms of trade though – they have recovered since the mid-1980s. As a debtor country, New Zealand also suffered from higher real interest rates in the 1980's – equivalent to a 5% commodity terms of trade drop in 1985.
- A sharp, sustained rise in the real exchange since the mid-1980's has inhibited GDP growth. The 1985 float was part of an uncoordinated macro strategy. Foreign investment as part of overseas portfolio diversification also raised the exchange rate. Although inflation has been reduced, efforts to control inflation through monetary policy have impacted mainly on the exchange rate and had a substantial growth cost (Easton 1998). Subsequent poor tradables profitability is a key cause of poor economic growth.
- The 1980's major projects imposed high costs on the economy. There is, however, no consistent evidence that Government interventions are always associated with poor growth.
- Rapid post-war population growth probably dampened capital productivity and reduced per capita income growth, perhaps by 0.17% per annum.
- Capital productivity has been low in New Zealand anyway for a variety of reasons: inefficient investment; breaking in marginal land; and freezing works hygiene expenditure for example.
- A low proportion of the population with higher education has probably inhibited growth.
- It takes at least a decade for the effects of crashes such as that of 1987 to be overcome. The 1987 boom destroyed much capital.

Bayliss (1994)

Bayliss wrote his 1994 monograph, "Prosperity Mislaid", as an independent writer, after a long banking career. This summary of his analysis is based on it:

- New Zealand is geographically isolated, heavily dependent on international commodity trade and handicapped by transport costs and the distances required for overseas travel.
- Recent microeconomic policies have been appropriate.
- Macroeconomic policy has been poor for a long time. Loose fiscal policy destroyed the effects of the 1982 to 1984 wage price freeze. Loose fiscal and monetary policies after the 1984 devaluation set off a round of inflationary pressure and speculation. The higher terms of trade of the late 1980's were frittered away by poor macroeconomic policies, which caused a real exchange rate appreciation. With import liberalisation, this undermined exporting. Officials overestimated the benefits of low inflation and were excessively optimistic about the effects of the 1984 devaluation.
- New Zealand has been unsuccessful since the 1920's in achieving stable growth in the face of terms of trade fluctuations and has been hampered by a long-term downtrend in the terms of trade.
- New Zealand's post war living standards were artificially high, thanks to Empire preferential tariffs; coming out of World War II in good shape and high war-time capital investment in farming.
- The policy mix of 1945 to 1975 produced a difficult legacy of internationally uncompetitive manufacturing; a poorly educated and skilled labour force; low-grade business management; bloated construction sector; rigidities in resource allocation and a weak work ethic. Trade barriers, competition from artificial fibres, competitive sources of supply for New Zealand exports and geographic isolation all contributed to poor performance.
- New Zealand suffers from following the intellectual direction of other English speaking countries, which are all bedevilled by budget and balance of payments deficits; poor savings and investment ratios; poor education; and excessive debt.
- Because of bad experience with Government intervention, New Zealand now lacks an economic strategy and long term policy focus.
- International competitiveness depends on having both volume and quality of investment in plant and machinery; low unit labour costs; effort in R&D and training; a culture of excellent customer service and encouraging employee participation.
- Appropriate policies would include improving the skills of the unskilled; raising savings and investment, especially in tradables and services; raising R&D; reducing dependence on commodities; improving racial harmony; raising the quality of welfare spending.[109]
- New Zealand should also consider joining Australia given its lack of resources
- The chances of a substantial lift in performance are low.

[109] He does not suggest how some of these policies could be implemented, nor does he offer a comprehensive account of how New Zealand could have implemented better macroeconomic policies successfully.

Hazledine (1998)

Hazledine's 1998 book provides a comprehensive summary of his analysis, although it is also been presented to professional economic audiences as in Hazledine (1998a)

He argues that New Zealand's reforms have been based on an unsatisfactory neoclassical model, concerned with economically efficient outcomes but ignoring process culture and social capital. Radical commercialisation since 1984 has fed off the previous stock of empathy, shared attitudes and goals, which now needs to be replenished, strengthening trust and forbearance by individuals from exploiting their own selfish advantage. An alternative path to the radical reforms would have been a path of moderate reform. Key points include:

- New Zealand's isolated location makes trade expensive. Excessive emphasis on trade could be at the expense of production in New Zealand for the domestic market and be welfare reducing. We still subsidise tourism and aluminium exports.
- Policy from 1945 to 1975 was remarkably successful in coping with fluctuating and declining terms of trade, as New Zealand diversified; had low unemployment; reduced protection levels, and operated a wage earners welfare state. Growth was understandably lower than in unlucky countries recovering from World War II.
- Many markets do not work particularly well, being affected by greed, ego, concentrated market power, externalities, imperfect information and asset market instability. Private planning guided by markets is usually best but not always.
- Education does not simply lead to growth – it may simply reflect initial capability of individuals. Social qualities may be important to growth, including interpersonal skills, leadership and self-reliance.
- Economic prescriptions like that followed by New Zealand are premised on the selfishness of individuals, but this can be costly. It requires higher transactions costs and more supervision activity, which New Zealand is now experiencing, compared with a society built more on trust and human empathy.
- Excessive concentration on reducing inflation has been harmful.

Hazledine's prescription includes:

- New Zealand should build its social capital, trade less, restrict foreign investment and produce more for the local market, where New Zealanders understand their own needs best.
- There should be less emphasis on GDP growth and more on various social indicators, such as nutritional intake, drug consumption and suicide rates.

- Income should be redistributed to the less well off – this would improve overall welfare, as peoples' sense of wellbeing is influenced by distribution. Controls on high pay rates, minimum wages, safeguards for collective bargaining and proactive competition policy are possible instruments.
- Move away from costly supervision models derived by agency theory and back towards trust based models, which are self-reinforcing. For example, put education and healthy institutions back in the hands of their respective professionals.

Dalziel (1999)

Dalziel (1999) provides a recent summary of his views, argued in a number of publications, including Dalziel (1998), about the economic reform program from 1984 onwards. He considers:

- The reform program as a whole was directed towards promoting economic growth. However, virtually every change involved restraint, retrenchment or redistribution towards the better off. Poverty increased. Adverse effects were recognised, but discounted on the grounds that higher economic growth in the long run would make up for any losses.
- Analysing long term per capita GDP growth trends suggests that output dropped from trend between 1987/8 and 1993/4, causing substantial foregone income. [110] Moreover, the sustainability of the post reform position as argued by Evans, Grimes and Wilkinson with Teece (1996) is doubtful, given a high increase in debt from 1984 to1995 of 30 percentage points.
- Arguments in New Zealand that lower tax rates would contribute to growth are all flawed. These variously ignore the greater welfare impact of the marginal dollar in the hands off the less well off; the negative effects of Government expenditure reductions on growth and the marginal impacts of tax reductions, in analysing impacts on average taxpayers.
- Redistributing income towards the less well off would rebuild social capital, which builds productivity. (The mechanism, as in Hazledine's analysis, is unclear.)
- New Zealand may have ignored the demand side of the economy. With an over-reaction to inflationary experience in the 1970's, there is now no conscious Government effort to smooth peaks and troughs in the growth rate over time. Income distribution towards the wealthy may have depressed demand.

[110] Evans, Grimes and Wilkinson (1998) criticise Dalziel's analysis for ignoring the unsustainability of the growth of per capita income in 1982, the endpoint from which Dalziel extends the pre-reform growth trend. They suggest that growth from 1967 to 1982 was low in any event – so much so as to be not statistically different from zero. They also suggest that post reform growth sustainability is supported by lower inflation, an improved fiscal balance and current account balance and that Dalziel underestimates the initial level of New Zealand indebtedness prior to reforms.

Hall

Viv Hall has written extensively on New Zealand's structural change, economic reforms and productivity and growth in various publications, including those noted in the bibliography to this paper. Hall (1998a), the most recent paper available for this review is the main basis for this summary:

- By 1984, New Zealand had unsustainable macroeconomic imbalances and serious microeconomic problems. These often take longer to turn around and require more persistent corrective action than many originally envisage.
- Following reforms, there is widespread but not universal recognition that significant progress has been made.
- New Zealand has successfully controlled inflation and reduced unemployment from its peak, probably helped by the Employment Contracts Act although the evidence is not conclusive. Unemployment has probably been affected more by macroeconomic policies than structural change.
- New Zealand has made significant progress with fiscal deficits and public debt sustainability.
- The current account deficit is uncomfortably close to the 6.6% average of 1982 to 1987 and the overseas debt to GDP ratio leaves New Zealand vulnerable to substantial real and financial shocks.
- Growth since the-mid 1980s of 1.6% per annum is still unfavourable compared to comparable OECD countries and is still slightly less than the poor performance of 1977 to 1984.
- There is general agreement that New Zealand's growth performance has been poor for a long time, that there were considerable costs through to 1991 from correcting macroeconomic imbalances, including reducing inflation and that performance has since improved. It is too soon to tell if there has been a structural improvement.
- Achieving growth rates higher than 3 to 3.5% is needed to reduce unemployment and improve living standards on a sustainable basis. This is unlikely without further micro reforms, higher savings and sustainably high business fixed investment.
- Structural change was substantially greater during 1985 to 1995 than in the period 1978 to 1985. The best industries at improving productivity have been significantly affected by structural reforms. This offers some encouragement as does State Owned Enterprise performance.
- New Zealand has gained little from shifting employment into more productive sectors and still has too great a proportion of resources in poor or badly performing sectors. (Hall 1995 and 1996)
- Generating sustainably higher long-term growth probably depends upon maintaining an internationally credible macroeconomic environment; continued microeconomic reform; maintaining an internationally competitive real exchange rate and generating the domestic savings necessary to finance investment opportunities.

- Further measures which would help growth, which Hall quotes without demurring, include consolidation of health and education reforms; electricity restructuring; improvements in local Government financial management and accountability; workforce skill and competence development; reduced trade protection; corporatisation and privatisation of central and local Government business operations; Producer Board reform; and compliance cost reduction.
- Despite progress, there are still major challenges for sustainability and improvement on all fronts. This arises from the relative ease with which macroeconomic imbalances can re-emerge under lax policy settings, inconclusive evidence of sustained productivity improvement, a desire to reduce the NAIRU[111] further and the likelihood that other countries' reforms have eroded some of the advantages achieved earlier by New Zealand.
- There is evidence that changes in the terms of trade have a substantial impact on growth (Hall 1996)
- Further fiscal contraction in the period 1989 to 1994, rather than simply generating benefits through reduced inflation and an improved country risk premium would probably have had a substantial contractionary effect (Hall 1996)

Porter

Professor Michael Porter has had a continuing interest in New Zealand economic performance since 1991, when his views were applied to New Zealand and reported in Crocombe, Enright and Porter (1991). They were updated in a visit by Porter (1998), supported by New Zealand academic research in Yeabsley (1998). The Porter view of the New Zealand economy can be summarised largely from the 1991 book as:

- New Zealand has failed to broaden and upgrade its competitive advantages to cope with increasing international competition, despite market liberalisation
- New Zealand has specialised too much in resource based activities such as agriculture. These have low entry barriers and face powerful buyers. This was fine in 1888 when agriculture represented 76% of world trade but not by 1988 when it was 9%.
- The education system has too little participation and insufficient focus on vocational needs, such as maths and science, modern languages and engineering.
- New Zealand innovation and R&D spending in the private sector are too low. Firm strategies have often been short term, with limited investment in human resource development, distribution channels and brands, and a cost or commodity orientation.
- Capital constraints exist, with household savings slipping during the 1980's as consumers sought to maintain living standards. Social welfare and Government deficits undermine saving.

[111] Non accelerating inflation rate of unemployment

- Government subsidies and protection may have stopped the development of the competitive supporting industries needed in clusters, with exceptions in farming and horticulture.
- Firm rivalry has been limited. New Zealand culture has not helped this, with emphasis on a relaxed lifestyle; low status of business and limited incentives to upgrade skills. Success in commodity production may have contributed to this.
- Firms need to move beyond cost based strategies; develop clusters; focus more on knowledge base and innovation; invest in human resource development, corporate leadership and more global strategies.
- The Government needs manage carefully the incentives resulting from all it does; avoiding protecting existing institutions and stifling change; encourage innovation; upgrade skills and training; reduce flows of skilled emigrants; stimulate more domestic competition; maintain an open economy, improve transport and communications infrastructure; improve access to capital; and stimulate clusters.
- Porter (1998) in reviewing progress considered New Zealand has successfully addressed macroeconomic issues, ceased many of the most harmful Government interventions and now needs to address microeconomic issues
- Key policy requirements are now to:
    - adopt a Government strategy
    - improve human resource skills through education and universities in particular
    - increase innovations, R&D expenditure and links between academic research and firms
    - develop specialised banks to provide equity and venture capital
    - develop incentive structures, not grants, to encourage private sector investment in New Zealand, for instance in R&D and training, recognising that externalities exist there
    - build the level of business rivalry to promote innovation
    - generate more demanding consumers and Government purchasing to improve firm capability
    - promote cluster development

The recipe is much the same as in 1991.

Grant (McKinsey and Company)

Grant (1998) offers another management-oriented perspective. He argues that the New Zealand economy has under-performed comparable economies in per capita GDP growth and TFP since the 1950's. The performance is mirrored at a corporate level. It shows through strongly in an under-performing equity market, since 1988, after the 1987 crash. His diagnosis and prescription includes:

- Knowledge based industries now dominate international growth

- Knowledge workers are commanding an increasing share of the returns, making it more difficult for corporate shareholders to retain a share of the surplus generated
- New Zealand has under-performed because of:
  - Previous distortions of market signals supporting unattractive sectors of the economy at artificially high levels of activity
  - Wasteful public sector capital investment
  - A slow transition in the sectoral composition of New Zealand output to faster growing industries
  - The inability of New Zealand businesses to transform themselves into intangible asset rich businesses, capturing global growth
  - Low managerial aspirations and standards
- New Zealand businesses must focus more on intangible assets; raise management aspirations and standards; provide better value to attract talent; and adopt new organisational models such as webs and alliances.
- The Government needs a dialogue to promote these changes; to address the venture capital market failure; examine education and immigration strategy to attract and retain talent and sharpen market disciplines and reporting standards for companies.

Evans, Grimes, Wilkinson and Teece (1996)

This is possibly the most influential review of New Zealand's reform process to date, given its publication in the Journal of Economic Literature. They describe the reforms and provide substantial analytical comment. They also describe the background of New Zealand's per capita GNP sinking relative to the United States from 92% of the United States level to about half by 1988. Meanwhile, overseas indebtedness climbed from 11 percent of GDP inn 1974 to 95% in 1984, with high inflation, a high current account deficit, fiscal deficit and rising unemployment.

Conclusions about New Zealand's growth experience include:

- Adjustment costs during the reform process were higher than necessary due to sub-optimal sequencing. A faster reduction in the fiscal deficit and earlier introduction of labour market flexibility could have reduced lower real interest rates, exchange rates and wage rates, assisting employment and traded goods output.
- Later favourable outcomes indicate reform should proceed anyway, even if fiscal and labour reform sequencing is not strictly optimal. Traditional sequencing need not dominate a policy of proceeding rapidly on all fronts.
- The economic recovery from 1991 provides some basis for an encouraging conclusion about the reform process, although with room for debate about how far it might be structural versus cyclical.
- The reforms have markedly improved New Zealand's economic prospects, and represent a radical break from New Zealand's heavy regulation, high inflation and large fiscal deficits.

- New Zealand appears to have finally diagnosed its predicament appropriately and is on a trajectory to maintain its economy as a consistent high performer among the OECD.

The latter conclusion is considerably more optimistic than any other work reviewed, possibly reflecting an undue concentration on short term trends over the 1991 to 1996 recovery period. Dalziel (1998) challenged it, as noted elsewhere in this Appendix.

Silverstone, Bollard and Lattimore (1996)

This volume was also a major review of the reforms. The editors' conclusions are noted here rather than individual contributions.

- The authors are cautiously optimistic that reforms have contributed to economic growth, although 1995 was too soon to tell long term impacts.
- Assessments of microeconomic reforms are generally more optimistic than macroeconomic assessments.
- The 1986 to 1991 period was overlaid by stabilisation policies and had an impact on unemployment. The macroeconomic adjustment costs were generally underestimated. Reducing inflation from 13% to 1% took seven years and real per capita incomes were static from 1987 to1992.
- There was little focus in the reform process on the dynamics of the adjustment process. The program itself was an exercise in comparative statics and little attention was paid to sequencing, where the normal view would have been stabilisation before structural reform; product and labour reform before financial reform and deregulation of domestic markets before external markets.
- Consumers may have done well from the reforms compared to producers, with prices, variety and quality of service improvements.

Treasury (1996)

In 1996, Treasury's briefing to the incoming Government devoted a chapter to economic growth. Key messages included:

- The New Zealand economy is performing differently from the way it performed in the 1970's and 1980's, with changes in behaviour by individuals and firms leading to higher growth and employment.
- Sustaining growth requires a medium term Government focus on enhancing decision-making, especially business decisions.
- Macroeconomic stability is a key element for growth
- Enhancing skills and ensuring the education system works well are important, including through increased employment, education participation, on the job training and business strategies aimed at increasing performance.

- Producing an environment that fosters business innovation and efficient and effective resource allocation are important.
- Rapid growth has not lead to marked inflation and balance of payments pressures.
- Firm performance has improved, based on Campbell-Hunt and Corbett's (1996) research.
- Higher savings would help growth, through simply accumulating savings; boosting overseas confidence in New Zealand; reducing tax distortions; and considering the effects of taxpayer funded retirement income.
- Improving competition levels could accelerate business growth, including through Producer Board reform and tariff reductions.

OECD

The OECD is the major international organisation producing regular analyses of the New Zealand economy as a whole. Other organisations that produce analyses either do not publish their analysis widely, such as the IMF or ratings agencies, or have a short-term orientation, such as most financial institutions.

This material draws primarily on the OECD Surveys of New Zealand for 1998 and 1999 as the most recent views.

The OECD (1998) took that view that:

- New Zealand economic performance has changed for the better. Applying a Hodrick-Prescott filter to New Zealand's growth performance from 1978 to 1998 suggests a considerable steepening in the growth rate took place after 1991. It is too early to say whether the trend decline in New Zealand's per capita real GDP performance compared to OECD members has been definitely reversed.
- Better inflation, export and employment positions are positive factors and there are prospects for a rebound in growth.
- The current account deficit of 6 to 7% poses risks to New Zealand's economic prospects, including shifts in investor sentiment and higher risk premium being sought by foreign investors.
- Structural reforms have lifted potential output, but more through increased factor inputs than productivity.
- Productivity growth may have been muted by reforms in key areas being relatively recent; the long time required for economic behaviour to change; transition costs and remaining impediments to better performance.
- Other factors which might explain part of the relatively poor growth performance include:
    - Structural reforms may have rendered much of the capital stock obsolete
    - Reserve Bank efforts in the early 1990's to control inflation lead to an overvalued dollar, and losses in export market share.

    - New Zealand has a high proportion of the workforce with less than an upper secondary education (41% in 1996).
- Further reforms could assist growth in a number of areas:
    - Producer Board exports
    - health care provision
    - public sector delivery of goods and services, including accident compensation
    - avoiding restrictions on foreign investment
    - removing tax distortions on savings
    - avoiding large increases in the minimum wage
    - improving the quality and responsiveness of the education system
    - reducing business compliance costs

The OECD (1999) view is broadly consistent with its 1998 view:

- Despite the 1998 setback to growth, some indicators point to an underlying improvement, including higher investment and employment; increased trade openness; and reduced inflation.
- Average growth in the 1998 to 2004 period of 2.5% per annum would be better than in the 1980's but probably insufficient to prevent a renewed decline of real per capita incomes relative to the OECD average
- Balance of payments pressures and poor TFP growth are still a concern.
- New factors suggested as reducing the pay-offs to reform include:
    - Slippage in achieving long term fiscal objectives
    - The lack of a growth promoting focus in spending and tax decisions
    - Monetary policy has involved a long learning curve and been complicated by changes in the fiscal stance
    - Microeconomic policy has sometimes been inconsistent, creating uncertainty, as in trade, taxation and superannuation
    - Some policies have changed without evaluation, as in health
    - Some policies have been slowly implemented as in education reform and Producer Board reform
    - The lack of scope for economies of scale given the small domestic market
    - High and continuing trade barriers in overseas markets

- The benefits of reform are likely to be slow to emerge and reforms require consistent application, despite impressive overall progress with structural reform.

Vandersyp (1993)

Vandersyp provided another independent view, noting that New Zealand's poor growth record was longstanding and rooted in the past before 1973. Much of the growth record is attributable to poor TFP growth rather than factor accumulation. Significant points made include:

- Investment is significantly spurred by demand growth
- Profitability and cashflow are important to investment in research results
- Many growth models do not stand up to scrutiny, reflecting data difficulties and that there can be alternative paths to growth
- A sustained increase in savings will boost growth
- Population growth and high real interest rates have a negative impact on growth
- While growth theory does not provide a platform for unequivocal recommendations, helpful policies might include:
    - Minimise business taxation to boost R&D and investment
    - Provide a stable macroeconomic and political environment
    - Acknowledge the limited ability of Government to affect economic and social development
    - Have private firms recognise the importance of innovation to their own survival and enhance employee skills
    - Encourage integration with Australia, to allow risks to be more evenly spread
    - Expand trade openness
    - Structure financial markets to allow a wide range of risk taking opportunities for saving
    - Maintain realistic interest rates, at say 6% real

Appendix B: Measurement Issues

In examining why New Zealand's recent economic performance appears to have been moderate, one possible explanation could be that performance has not been well measured. Gross Domestic Product (GDP) measurement issues are discussed in more detail in two useful publications, Lawrence and Diewert (1999) and Statistics New Zealand (1996) which are drawn on here. Measurement issues are problematic globally. Any given measures face limitations based on both conceptual difficulties and difficulties in accessing data.

The key issue here is whether statistical issues are more of a problem for New Zealand than for other countries, thus accounting for some of the apparent New Zealand under-performance. It is not possible to draw a strong conclusion, but it is possible that because of the extent of reforms since 19984, New Zealand is slightly more affected by these issues than other OECD countries.

A number of possible contributing factors are briefly outlined below.

Aspects of performance that are outside National Accounts concepts:

- Non-capture of welfare effects

The New Zealand System of National Accounts captures the value added resulting from production (GDP) or the value of final uses or demands (Gross Domestic Expenditure or GDE). It does not however capture consumer economic welfare, let alone more esoteric concepts such as happiness.[112] It is likely that welfare may move broadly in line with GDP or its more satisfactory relatives such as Gross National Income (GNI). However, it is possible that, say, consumer surplus may increase more than production if entry to a market is liberalised, resulting in more choice, more service or lower prices to consumers, particularly in imported goods and services. Reforms may have generated more of these sorts of benefits. With the high pace of reforms in New Zealand since 1984, it is possible that a period of "catch-up" may have occurred for consumer welfare. With New Zealand's border protection now being arguably the lowest in the OECD, these effects may be greater than elsewhere.

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[112] Hamilton (1999) lists several shortcomings of GDP as a welfare measure. These include:

- not taking into account changes in the distribution of output within the community
- failure to account for household work
- counting defensive expenditures (on matters such as pollution clean-ups and defence as contributions to GDP)
- ignoring changes in stocks of both built and natural capital

He applies to Australia one measure which attempts to take account of these matters, the Genuine Progress Indicator and concludes that welfare on this measure has grown much less than GDP.

- Non-capture of non-market transactions

Much household activity is not captured in National Accounts, through being non-market activity, as pointed out for example in Hazledine (1998). However, this is a feature of National Accounts everywhere. With New Zealand's labour force participation having moved to above the OECD average and accordingly allowing relatively fewer opportunities for unrecorded production, it is possible that New Zealand's growth performance would show a relative deterioration over the last two decades if this factor could be properly taken into account.

Aspects of Performance which should be captured in National Accounts

- Output Measurement Problems

New Zealand's output is likely to be somewhat understated, particularly in growing service areas. In New Zealand, output in some but not all services areas is measured by extrapolating base period value added by employment, resulting in labour productivity increases being missed from value added, and understating growth.

Services sector output measurement is problematic in many countries (Lawrence and Diewert 1999). However, it is possible that the problem may be greater in New Zealand with a switch to services recently accompanying the major reforms. Services measurement may also be affected by introducing new dimensions to output or new services as regulatory restrictions are eased.[113] For instance, longer shop trading hours may show up as increasing costs and therefore decreasing value added, even although effective output has significantly increased as Lowe (1995) suggested happened in Australia. Measured output and productivity should increase as these effects are left behind. (They have done so since 1992 in New Zealand Trade, Restaurants and Hotels, in the Lawrence and Diewert (1999) data.)

Further possible output understatement in the face of reforms, could arise through use of Laspeyres base period weights in GDP measurement. This could give too much weight to industries that were scaling down in the face of industry assistance being phased out and insufficient weight to new activities. It should be less of an issue as reform processes are completed and national accounts are rebased to more recent time periods or possibly moved to a chained Laspeyres index basis as is now being considered by Statistics New Zealand (1998b).

Lawrence and Diewert (1999) also suggest use of a user cost approach to measuring services output in the finance sector, which acknowledges that the

[113] Easton (1998) suggests that a majority of households surveyed in 1993 considered service levels had improved, although higher income groups were more positive. Silverstone, Bollard and Lattimore (1996) at page 22 also suggest that consumers may have done well relative to producers with improvements in prices, increased choice and quality of service.

opportunity cost of capital is a real cost, although it is not taken into account in national accounts data. This is based on an approach used in the United States. It would be likely to find that finance sector output has been growing more strongly than is recorded in national accounts, possibly reflecting service quality improvements.

- Underground Economy

The underground economy may be quite significant within New Zealand, with illegal and unrecorded activities possibly being over 10% of activity. Giles (1999) estimated the effect to be as much as 11.3% in 1994. This may have increased over time. It is difficult to estimate how significant this is in New Zealand compared to overseas countries though.

- Input Measurement Problems

Lawrence and Diewert (1997) discuss a number of national accounts input measurement problems, including non-use of double deflation, non-allowance for natural resource depletion or environmental effects and not taking account of inventories or land. It is not clear that many of these would have any systematic effect on New Zealand output compared with results elsewhere. One possibility is that capital write-offs as a result of restructuring may not always be fully reflected in New Zealand national accounts. Again, if this is the case, the accuracy of measurement of growth and levels should improve over time as adjustments are made.

- Business Intermediate Expenditures versus Consumption Expenditures

A move to self-employment may be associated with a move to treat items formerly treated as consumption as intermediate inputs, such as entertainment expenses or Internet connections. This would decrease measured GDP levels. With a relatively large move to self-employment, this may be more significant for New Zealand. Lawrence and Diewert note that self-employment as a proportion of total employment increased from 28% to 33% (an 18% rise) of the Australian labour force from 1985 to 1997. In contrast, New Zealand self employment measured in the Household Labour Force Survey increased 26% over 1986 to 1997, suggesting self employment may have increased slightly faster here, perhaps reducing relative measured growth.

- New Goods Problem and Bias in Consumption Components

National Accounts have some difficulty in taking new goods and services, quality improvements, benefits from having new outlets available with better offers and changes in weights fully into account in developing the deflators to be used in preparing real national accounts estimates, as outlined by Lawrence and Diewert. Lawrence and Diewert suggest that these biases may result in the New Zealand CPI being up to 0.65% to 1.0% too high per annum. Moreover they suggest the effects of new goods and quality change biases may have

accelerated with reforms in recent years, leading market sector TFP to be up to 0.4% to 0.7% higher than their estimates.

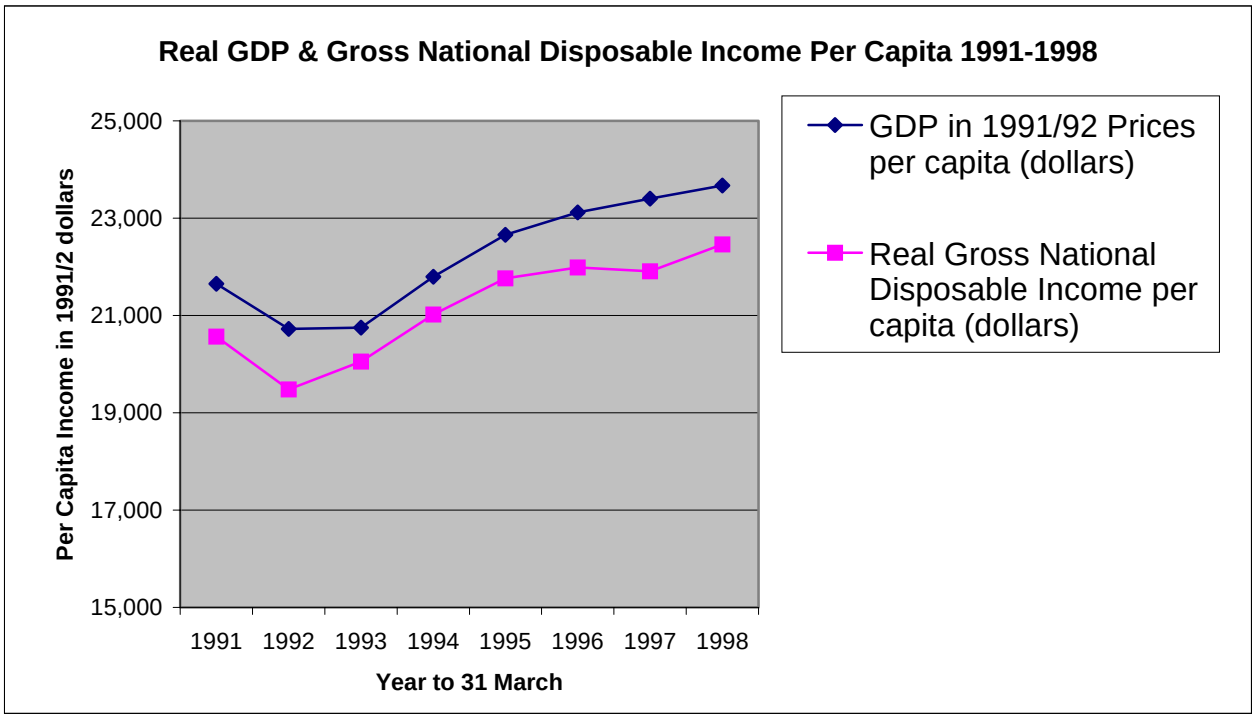
It seems likely that this effect is present to some extent, although how much is difficult to ascertain. The same effects are likely to be present overseas, but perhaps to a lesser extent in the 1980s, given the pace of reforms in New Zealand. The issue may now be less important, with fewer reforms being undertaken. Statistics New Zealand tends to consider that its methodology is better than in some countries, the United States being one example.

Conclusion

It is likely that New Zealand's output as measured by GDP is slightly greater than national accounts suggest. The same issue exists for other OECD countries too, but it is possible that New Zealand is more affected by these issues than most because of the extent of reforms since 1984. If this is the case, some of the effects should reduce over time and New Zealand's relative measured growth performance could begin to appear better as the pace of reform has eased. More research would be required to obtain a more accurate picture.

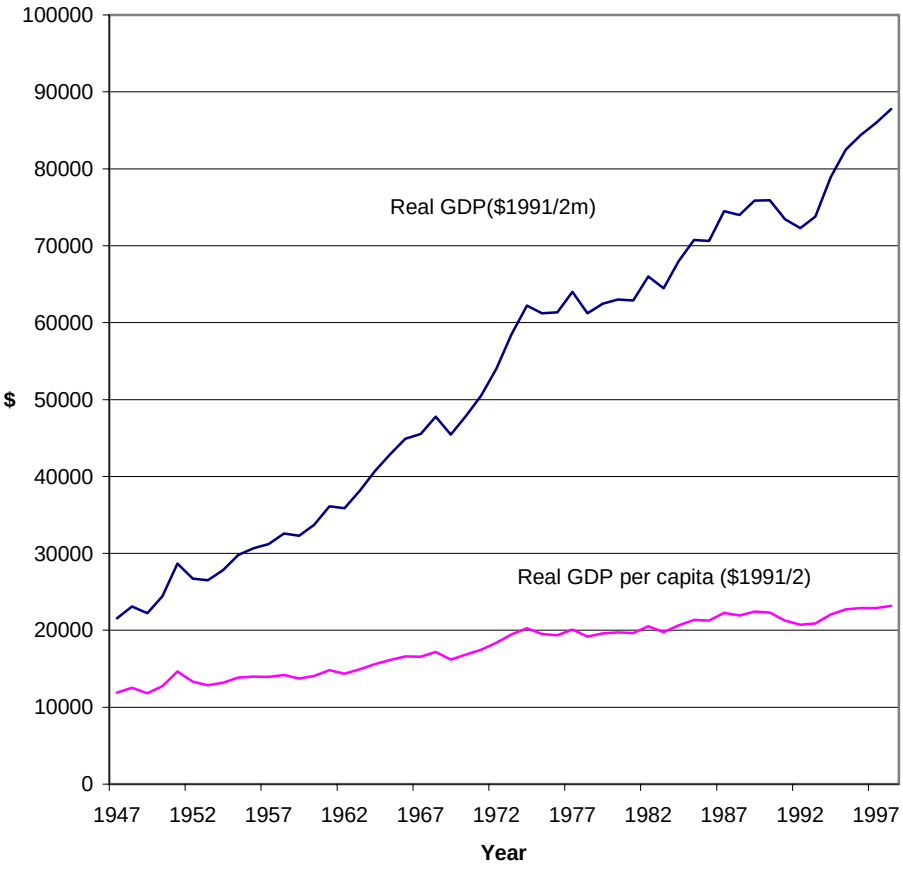
FIGURES

Figure 1:



Source: Statistics New Zealand

Figure 2: Real GDP and GDP per Capita



Source: Spliced National Income series sourced from Statistics New Zealand, deflated with the CPI

Figure 2a: Real GDP and GDP per Capita – using SNBA. S2AZAT

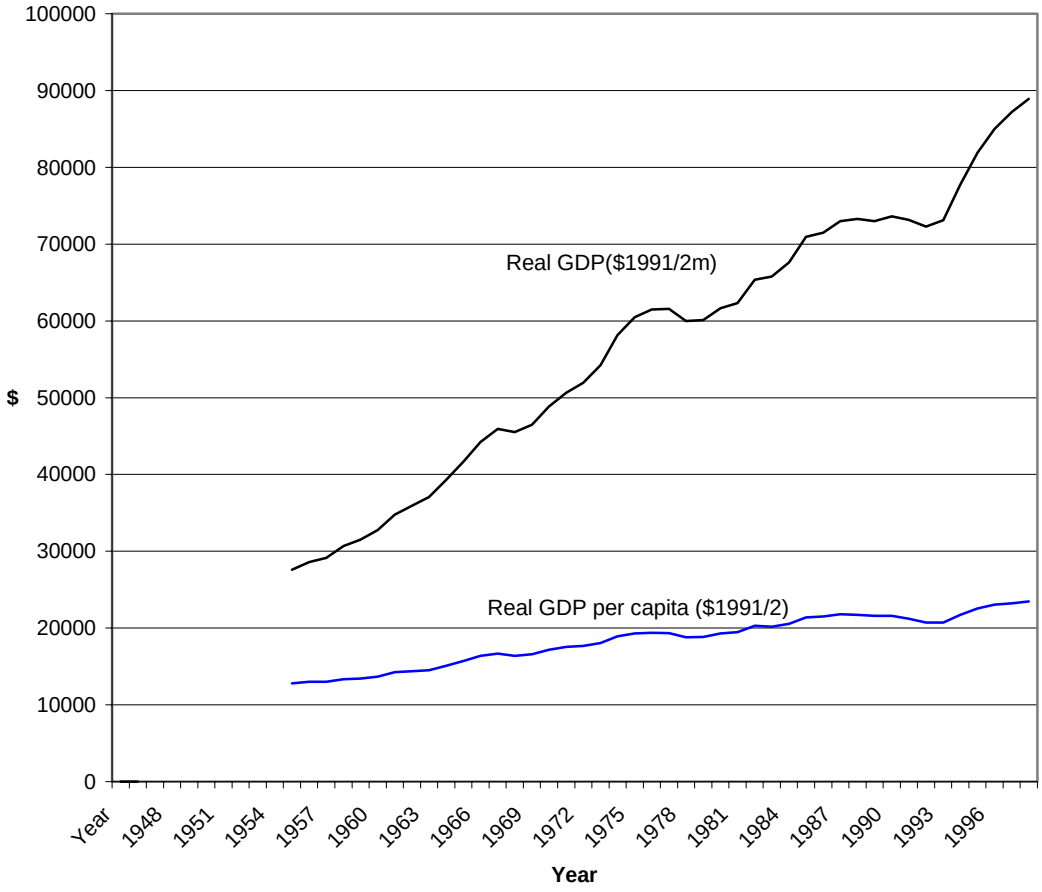


Figure 3: GDP per head in Selected OECD Countries

Source: Haines (1998) and OECD

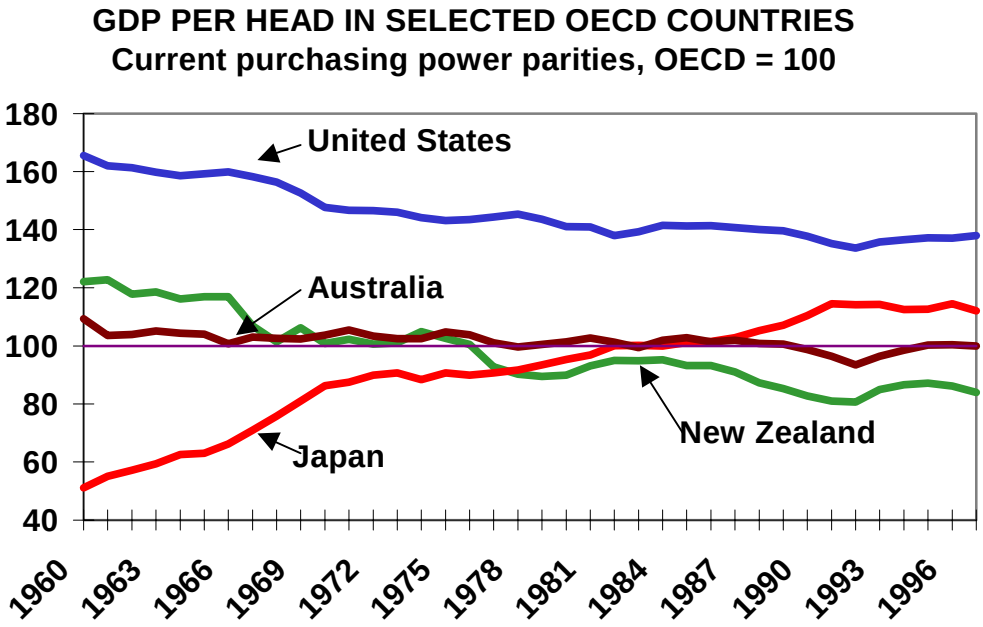
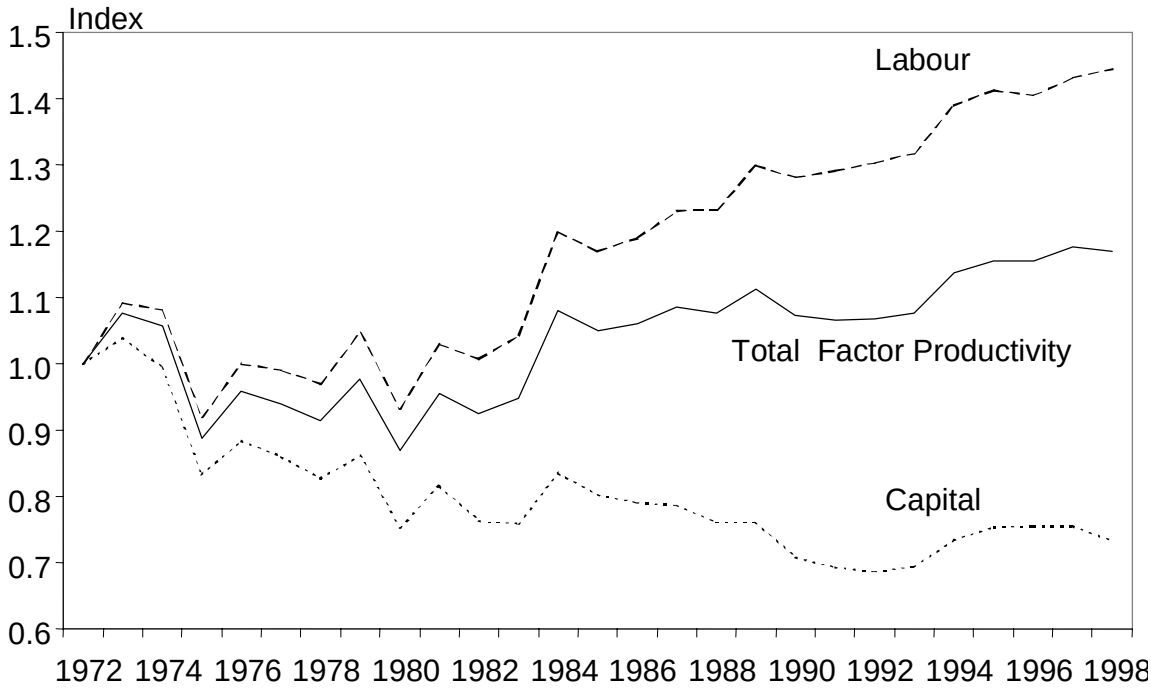
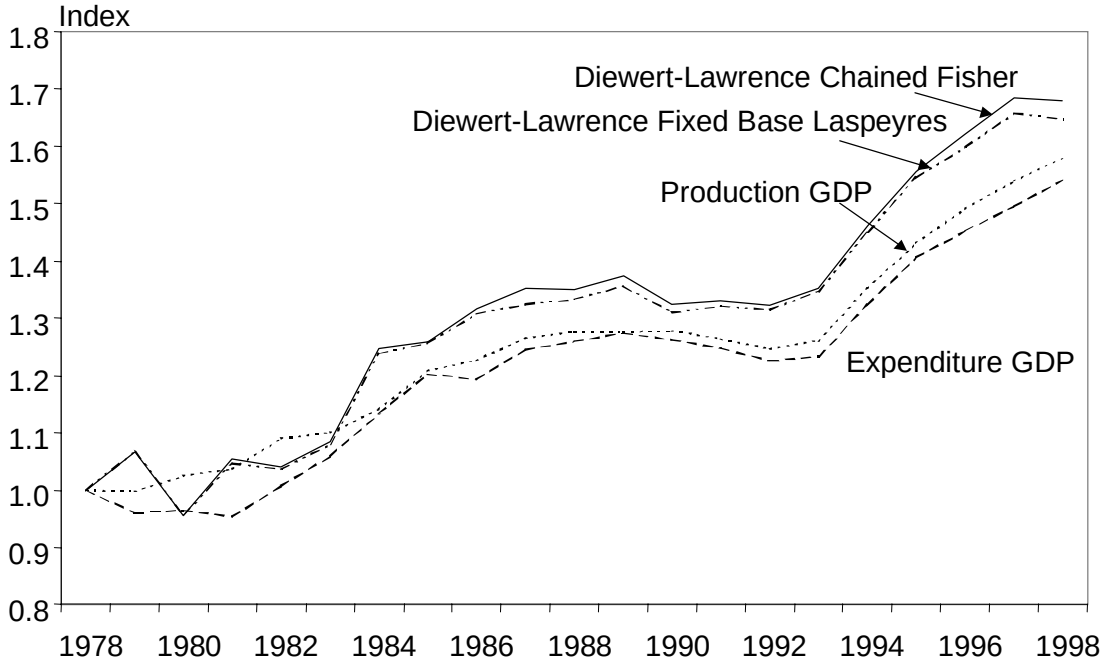


Figure 4: Diewert & Lawrence Productivity Indexes



Source: Lawrence and Diewert (1999)

Figure 5: Diewert & Lawrence Output Indexes



Source: Lawrence and Diewert (1999)

Figure 6: New Zealand Terms of Trade

Source: PC Infos, Statistics New Zealand

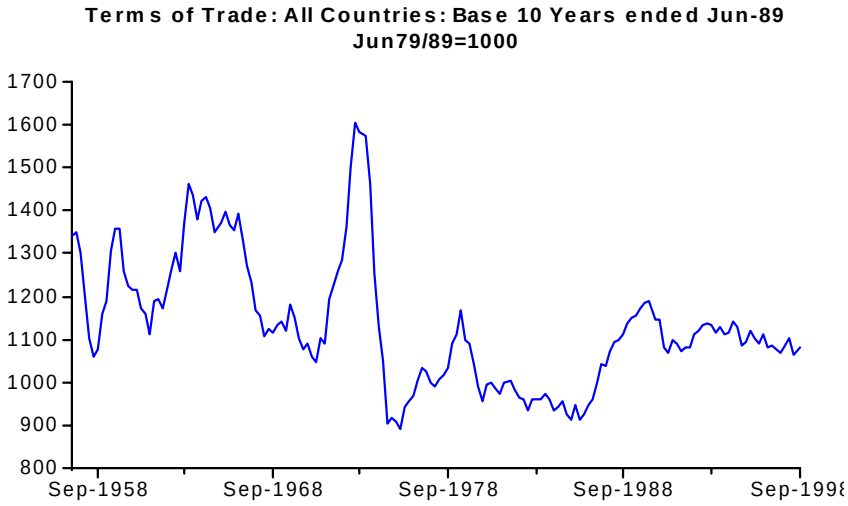
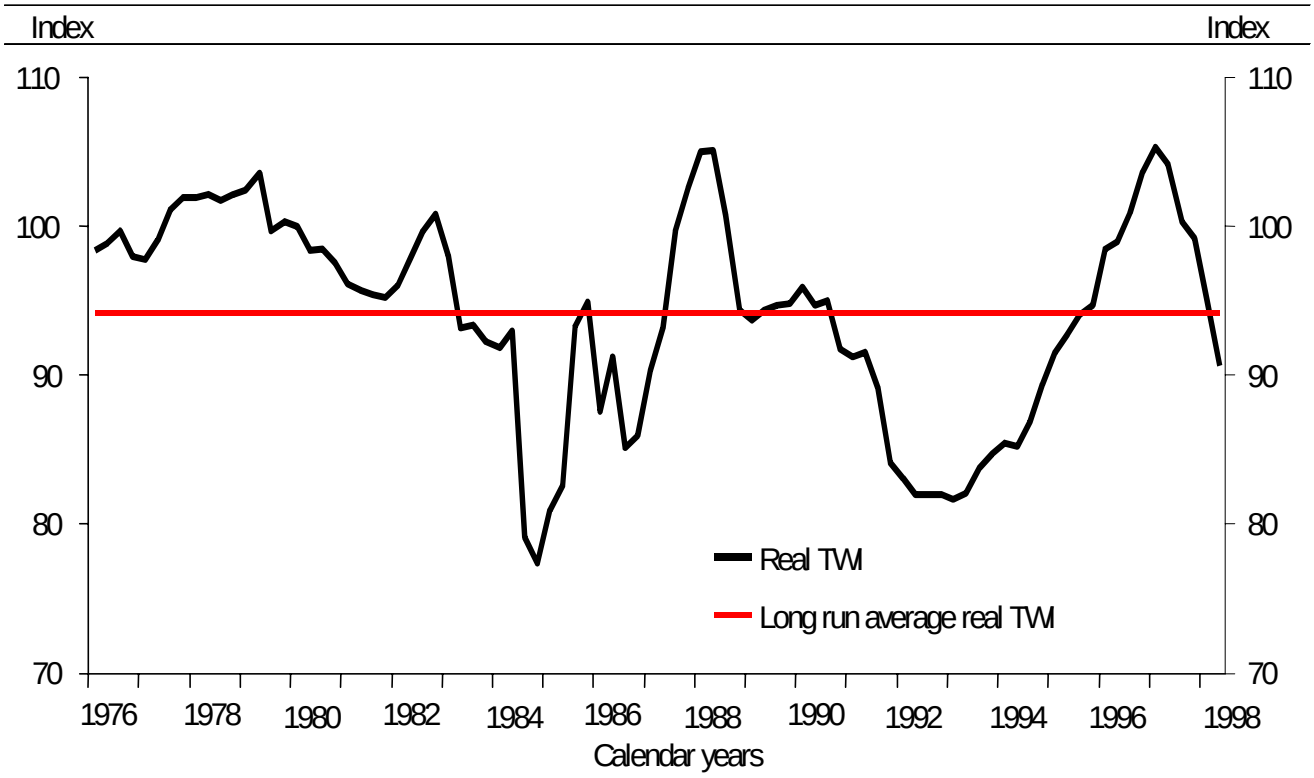


Figure 7: New Zealand Real Exchange Rate

Source: Brash (1999), p27



TABLES

Table 1: Growth in Major Inputs in New Zealand 1972 - 1998

Input	**1972** ($1972m)	**1998** ($1972m)
Managers	531	1274
Clerical	975	1304
Production	1892	1654
Total Labour	*3398*	*4232*
Non-Residential Construction	754	1552
Transport Equipment	251	436
Electrical Machinery	78	997
Plant & Other Machinery	298	814
Total Physical Capital	*1381*	*3799*
Livestock Inventories	1207	1380
Non-Agricultural Inventories	1649	1505
Total Inventories	*2856*	*2885*

Source: Lawrence and Diewert (1999) Tables B41b and B41c

Table 2: OECD Economic Outlook Average Annual Percentage Change in TFP

Country	*1960–73*	*1973–79*	*1979–97*
OECD Estimates	*% p.a.*	*% p.a.*	*% p.a.*
United States	1.9	0.1	0.6
Japan	5.6	1.1	1.2
Germany	2.6	1.8	0.6
France	3.7	1.6	1.3
Italy	4.4	2.0	1.2
United Kingdom	2.8	0.7	1.2
Canada	1.1	–0.1	–0.6
Australia	*2.2*	*1.2*	*0.9*
Austria	3.2	1.1	1.0
Belgium	3.8	1.3	1.0
Denmark	1.1	0.1	0.7
Finland	4.0	1.9	2.6
Greece	2.7	0.8	–0.2
Ireland	4.6	3.9	3.6
Korea		3.1	2.7
Netherlands	3.5	1.7	1.0
New Zealand	*1.6*	*–1.4*	*1.1*
Norway	2.2	1.3	0.6
Portugal	4.1	–0.7	1.0
Spain	3.3	0.7	1.7
Sweden	1.9	0.0	1.2
Switzerland	1.5	–0.7	–0.1
Diewert-Lawrence Estimates – New Zealand			
Diewert–Lawrence database		0.0	1.4
Official Database – Net Capital Stock			1.1
Official Database – Gross Capital Stock			0.9

Source: Lawrence and Diewert (1999)

Table 3: New Zealand Living Standards Indicators

Indicator	Units	Year	New Zealand rank from Top (number of countries)	New Zealand Value
GDP per capita	$US, current prices and exchange rates	1996	20 (29)	18093
GDP per capita	$US, current prices and PPP's	1996	20 (26)	17473
Private Consumption	$US, current prices and PPP's	1996	17 (26)	10895
Cars per 1000	number	1994	7 (29)	457
Telephones per 1000	number	1994	17 (29)	470
Television sets per 1000	number	1993	21 (28)	451
Doctors per 1000	number	1995	21 (28)	2.1
Infant mortality per 1000 live births	number	1995	19 (29)	7.2

Source:OECD (1998)

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