# NEW ZEALAND ECONOMIC GROWTH:

# AN ANALYSIS OF PERFORMANCE AND POLICY

**The Treasury**

This paper is one of a series of ongoing contributions to the development of Treasury's understanding of New Zealand economic growth and the development of policy advice on economic growth. It was prepared in response to Treasury Senior Management Group (SMG) commissioning a synthesis of Treasury's work on New Zealand's economic growth performance and the policy issues that are raised by that analysis.

The paper provides a review of Treasury's current understanding of New Zealand's historical growth performance, the determinants of economic growth as adduced from the international literature and New Zealand empirical research, and the strengths and weaknesses in New Zealand's policy settings as they apply to economic growth.

This paper, which was completed in November 2003, was primarily written with an internal Treasury audience in mind. We are releasing this paper to share our findings with a wider audience and to add to public debate on this important policy area.

John Whitehead
Secretary of the Treasury

22 April 2004

# Contents

## Preface

This paper is one of a series of ongoing contributions to the development of Treasury's understanding of New Zealand economic growth and the development of policy advice on economic growth. It has been prepared in response to Treasury Senior Management Group (SMG) commissioning a synthesis of Treasury's work on New Zealand's economic growth performance and the policy issues that are raised by that analysis. SMG Minutes - Tuesday 3 June 2003 (Treasury:531216)

The paper provides a review of Treasury's current understanding of New Zealand's historical growth performance, the determinants of economic growth as adduced from the international literature and New Zealand empirical research, and the strengths and weaknesses in New Zealand's policy settings as they apply to economic growth. Terms of Reference and Request for Resources: Growth papers (Treasury:531990)

Growth is a key outcome for Treasury. As we plan our future work, SMG wants to see engagement and input across all branches. This paper is intended as a stock-take and an input into that process. We are seeking some early responses to the paper to sharpen up our initial thoughts on work priorities for the rest of this year and the medium term. We expect to have on-going discussions with the Minister of Finance on the topic. Internal discussions on future priorities will also need to be on-going, so for those people who miss the initial discussions, there will be future opportunities to contribute. Parts of this paper will require further editing in light of these discussions and feedback.

The Steering Group for the project included Struan Little, Steve Cantwell, Jeremy Corban, Elisa Eckford, Dean Hyslop, John Janssen, Geoff Lewis, Vivien Wynne and Bob Buckle. The responsibilities of the Steering Group were to (i) approve the broad outline of the paper, (ii) provide an editorial role commenting on the draft chapters, (iii) review and finally approve the paper for wider circulation and (iv) to arrange internal presentations.

The paper was prepared by a Secretariat comprising Nathan McLellan, David Law, Melleny Black and Bob Buckle. The preparation of the paper has included contributions provided by other Treasury staff. Chapter IV in particular draws on contributions from staff in various policy sections of Treasury and is intended to reflect current thinking within the respective sections of Treasury, although that thinking is inevitably evolving.

Bob Buckle,

Growth Outcome Leader.

14th November, 2003

## I.    INTRODUCTION AND SUMMARY

1.    Rising living standards are inextricably linked to economic growth.  Ultimately peoples' material welfare is derived from the quantity, quality and variety of goods and services they are able to consume.  Although the welfare of individuals encompasses more than just the level of real GDP per capita and is also determined by social cohesion and the environment for example, growth in GDP per capita is a critical means of improving welfare and raising living standards.  This paper concentrates on examining issues from a growth perspective and does not attempt to balance these against wider welfare or social perspectives where there may be competing objectives.  If competing policy objectives exist or could arise in the future, this paper provides a contribution toward understanding the potential implications for growth.

2.    The level of New Zealand's per capita GDP was approximately 85 per cent of the OECD mean level of per capita GDP in 2002, on a 1995 purchasing power parity basis.  In terms of its ranking, New Zealand's GDP per capita was 20$^{th}$ in the OECD.  To rise to the OECD mean over the next twenty years, New Zealand's per capita GDP would need to grow by around 1 per cent per year faster than the OECD average growth rate.  Based on historical OECD growth rates, this requires that New Zealand's annual per capita GDP grow on average at a rate slightly in excess of 3 per cent per year over the next twenty years.   This is a higher average growth rate than New Zealand has achieved over any sustained period at least since the 1960s.

3.    The purposes of this paper are to examine New Zealand's growth performance in the light of the international literature and prior research at Treasury, to form judgements about key hypotheses concerning New Zealand's economic growth, and to identify the key challenges for government policy if sustained higher economic growth is to be achieved.   The remaining sections of this chapter provide a summary of the key conclusions of the paper concerning New Zealand's historical growth performance (Chapter II), the proximate and ultimate factors likely to have influenced New Zealand's economic growth performance (Chapter III), and the key policy challenges (Chapter IV).

4.    New Zealand's economic growth performance has improved since the early 1990s.  Its average annual GDP per capita growth since the early 1990s has been higher than the growth rate for the total OECD.  In the eleven year period to 1992, New Zealand's average annual per capita GDP growth was around 0.50 percent compared to the OECD average annual per capita GDP growth of around 2.25 percent.  In the eleven years to 2002, New Zealand's average annual per capita GDP growth was around 2.25 percent compared to the OECD average annual per capita GDP growth of around 1.75 percent.  These points are illustrated by Figure 1 which compares New Zealand's per capita growth rate to the OECD average per capita growth rate on an 11-year moving average basis.

5.    New Zealand's growth recovery has been largely sourced from growth in the service sector (particularly trade, transport and communications, business services, and personal and other services) and from increases in labour utilisation.  In addition, the composition of labour productivity growth changed with most growth being sourced from growth in multifactor productivity rather than growth in the capital-labour ratio.  In the period from 1992 to 2002, multifactor productivity growth in New Zealand's 'market sector' was similar to that for the

Australian 'market sector'. The qualitative distribution of multifactor productivity growth across New Zealand industries was similar to the industry distribution of multifactor productivity growth in Australia. Nonetheless, there are quantitative differences.

**Figure 1: New Zealand's GDP per capita growth compared to the OECD average**
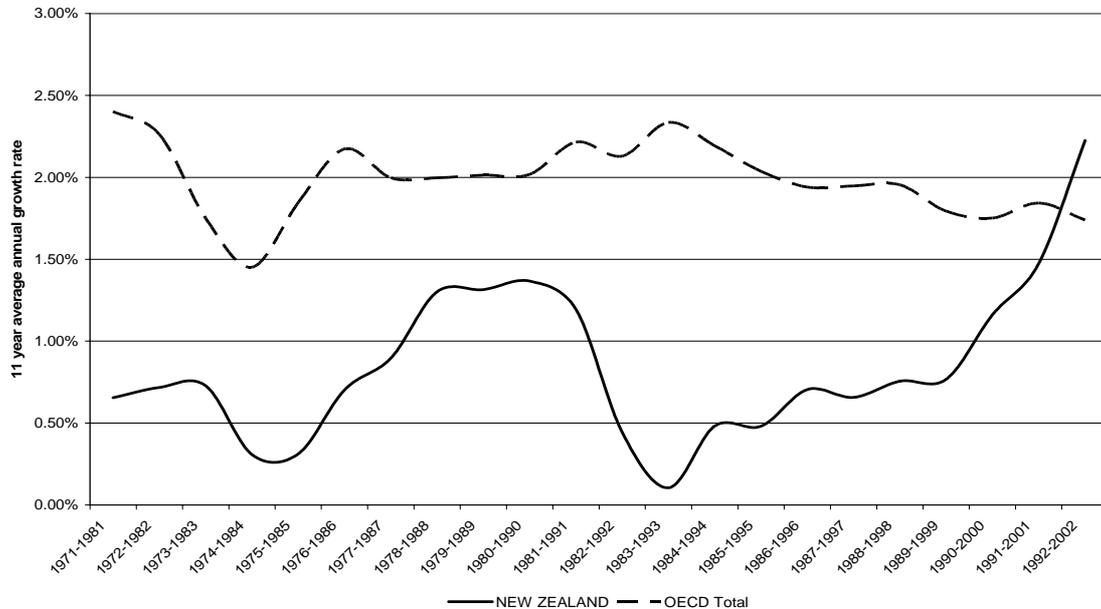


6. While average multifactor productivity growth has been similar in both countries, the difference in labour productivity growth between Australia and New Zealand is associated with differences in the evolution of the capital-labour ratios between the two countries. Since the early 1990s, and perhaps also in earlier years, New Zealand's rate of physical capital accumulation has been slower than average rates of accumulation in OECD countries.

7. Insights from the analysis of the contribution of input accumulation to per capita GDP growth identifies the *proximate* sources of economic growth. This assists in understanding historical growth performance and for identifying where there is scope for improved growth in the medium term. To understand the role of policy also requires an understanding of the factors that have caused the evolution of productivity and input accumulation. This requires an understanding of the *ultimate* (or deeper) factors that have influenced New Zealand's growth. These factors include institutions, economic policy, geography, and the impact of convergence effects and economic shocks. These factors are not necessarily mutually exclusive.

8. The role of institutions and economic policies are likely to have been important in determining New Zealand's relative economic growth performance, particularly in relation to difficulties the New Zealand economy experienced in adjusting to economic shocks in the 1970s and the 1980s. Institutional and policy reforms since the early 1980s are likely to have raised New Zealand's steady-state level of per capita GDP and the speed at which New Zealand converges to this steady-state. The lags in this process mean that the full effects of these changes are likely to still be emerging. Nonetheless, New Zealand's steady-state level of per

capita GDP may be impacted by the size of New Zealand's domestic market and the distance from overseas markets. However, this impact may be alleviated by fostering institutions and policies that help to mitigate the affect of New Zealand's geographical characteristics on its per capita GDP growth. Furthermore, the maintenance of institutions that embody first order economic principles, such as the protection of property rights, is important to sustaining per capita GDP growth.

9.  The policy issues are grouped into the areas of macroeconomic framework and stability, public sector management, saving, investment and financial systems, infrastructure, human capital, labour markets, and enterprise and innovation. This list is not exhaustive but is intended to capture the key policy areas for economic growth. Figure 2 illustrates that these policies impinge on economic growth via their effects on labour utilisation and labour productivity. In discussing these policy issues, assessments have been made of how the economic environment and the structure and behaviour of markets may be improved to enhance incentives by firms and individuals to invest in human and physical capital, and to innovate and thereby raise labour productivity and labour utilisation.

**Figure 2:   Contributors to economic growth**
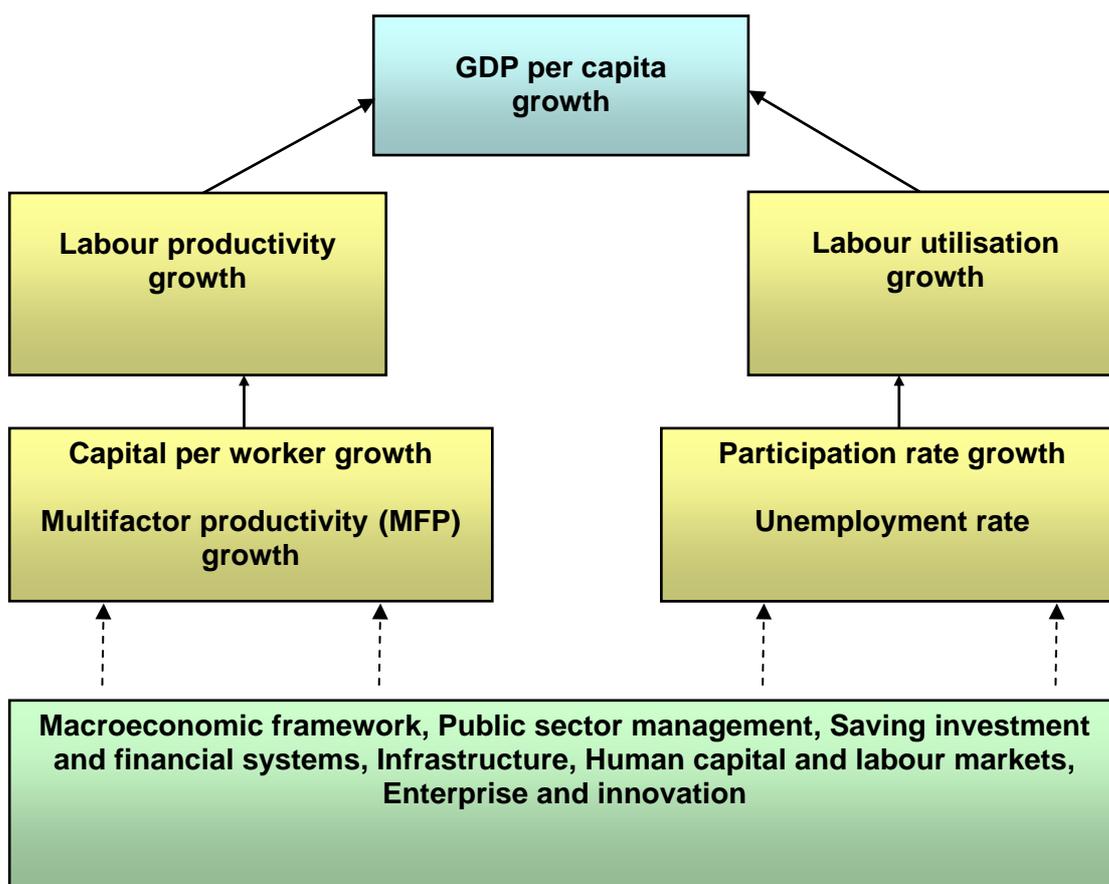


10. The growth accounting framework is a useful taxonomy for organising discussion about how the different policy areas impact on per capita GDP growth, but it is not a model of economic growth. Moreover, it does not capture interactions

between different components in the system. For example to the extent that learning-by-doing affects skill development, changes in labour utilisation and the duration of employment, will impact on multifactor productivity growth. Some of these interactions can lead to negative side-effects. A policy that in itself is justified, perhaps by addressing a market failure, may lead to behaviour that has an adverse impact on economic growth (such as rent seeking, which diverts resources from productive activities).

11. Although New Zealand already has a relatively high rate of labour utilisation compared to other OECD countries, scope exists to increase labour utilisation, particularly through raising labour participation rates. However, the greatest scope for raising New Zealand's economic growth rate lies with increasing labour productivity. This could be achieved in the medium term through capital deepening. In the long term, a sustained faster rate of labour productivity growth will occur through greater multifactor productivity growth. This will require a range of policies that induce innovation and sustained investment in human capital. The latter will be important in fostering research, facilitating technology uptake and capturing spillovers.

12. Labour market institutions and regulations are a key influence on labour utilisation. Raising labour utilisation can be achieved through altering the tax and benefit interface in order to encourage individuals to move from welfare to work or to increase their number of hours worked. Some recent and proposed changes to employment regulation may adversely impact on the gains in labour utilisation achieved since the early 1990s, notwithstanding other objectives that have motivated labour regulation changes.

13. The key policy areas for increasing the rate of physical capital accumulation and capital deepening are the macroeconomic framework and stability, saving, investment and financial systems, and developing appropriate frameworks for regulation and public involvement in infrastructure. In addition to maintaining stable macroeconomic frameworks and improving their operation, work investigating the influence of taxes on capital accumulation and examining the composition of government expenditure would be worthwhile. It is also important to recognise the potential for regulations pertaining to other policy areas, such as the Resource Management Act, to impact on physical capital accumulation.

14. Raising and sustaining multifactor productivity growth in New Zealand is linked to human capital accumulation and providing a business and regulatory environment that develops an innovative economy. The economic benefits associated with human capital accumulation may occur with a long lag after the investment was made, and can be quite long lived. New Zealand appears to have failed to match increases in average education levels amongst other OECD countries, and rates of basic educational achievement amongst younger New Zealand workers may now be slightly lower than the OECD average. There are a variety of possible interventions, but consensus must be reached on where and what mix of interventions would have greatest benefit. Policy making would benefit from a greater understanding of the influence of human capital accumulation on labour utilisation and productivity.

15. While human capital accumulation assists in developing an innovative economy at all points in production, specialised human capital (such as scientific research staff) can play a particularly important role in developing and absorbing new

technology and in facilitating the commercialisation of leading edge ideas. However, better understanding is needed of the conditions that encourage firms to undertake research and development, that will generate collaboration between research institutes, universities and industry, and of the role that government policy can play to enhance the knowledge transfer processes. Fostering attitudes that encourage research, innovation and commercial development will also enhance the contribution of human capital to development of an innovative economy.

16. The business and regulatory environment will be important for raising and sustaining multifactor productivity. The regulatory environment should be one that encourages new firms to emerge and grow, and allows failing firms to exit. Understanding the impact of regulations, compliance costs and identifying the key influences on firm performance is another area of work that warrants greater attention.

17. Global connectedness will enhance the development of an innovative economy and multifactor productivity growth. The Government has a clear role in activities such as negotiating favourable trade conditions for exports and having an immigration policy that builds New Zealand's international connectedness. The potential importance of international connectedness warrants investigation of the scope for policy to supplement trade and immigration policy by enhancing international capital flows and the international transfer of ideas and technology.

18. Careful attention should be given to uncertainties around the understanding of the benefits and costs of policy interventions when evaluating policy options. Similarly, differences in the public choice implications of broad policy versus targeted policy instruments should be taken into consideration in weighing up the merits of alternative policy options. Furthermore it is important to recognise institutional policy changes, such as the adoption of a transparent fiscal framework and of more flexible labour market institutions and regulations which have been associated with improvements in New Zealand's economic growth. It is important to protect those policy strengths that have resulted in positive economic benefits.

19. Table 1 provides a summary of the areas considered to be priority areas for policy development. These areas have emerged from the analysis of the contributions of the factors contributing to New Zealand growth performance discussed in Chapter II, from the insights of the international literature and analysis of the key influences on New Zealand's growth discussed in Chapter III, and from judgements about New Zealand policy strengths and policy weaknesses contained in Chapter IV. These judgements are inevitably evolving and some areas are less resolved than others. Table 1 should therefore be viewed as a basis for opening up a process of discussion about the priority areas for policy research and development.

**Table 1:    Priority areas for policy development**

| Policy priorities | Context |
|---|---|
| Regulatory environment | Ensuring the regulatory environment and property rights issues do not impede firm investment, employment, innovation, international connectedness and growth. |
| Taxation | The implications of taxation progressivity on human capital development, labour utilisation and capital investment. |
| Capital Markets | Understanding reasons for New Zealand's relative capital shallowness. Investigating how capital market structures are influencing the development and growth of small and medium sized enterprises. |
| Infrastructure | Developing appropriate frameworks for regulation and decision making about public involvement in infrastructure. |
| Human Capital | Better understanding of the impact of human capital accumulation on labour utilisation and productivity and its role in supporting technology adoption. |
| Labour markets | Better understanding of the influence of labour market regulations and institutions on labour utilisation and productivity. |
| Innovation | Ensuring alignment of government policies with the goal of increasing innovation and enterprise. Understanding and developing policy that recognises the special characteristics of knowledge and leads to appropriate investment in and commercialisation of technology. |
| Global Connectedness | Continuing to ensure New Zealand is open to international connections. Looking for market failures that may prevent the development of those connections. Seeking opportunities for favourable trade arrangements. |
| Protect first best policies | Protecting and improving the functioning of policy institutions that have resulted in positive economic benefits. |

## II.    NEW ZEALAND'S ECONOMIC GROWTH PERFORMANCE

### Introduction

20.    Although rising living standards are inextricably linked to economic growth, the well-being of individuals within a country encompasses more than just the level of GDP per capita.  Family and community ties, security, trust, freedom, a sense of identity, and the quality of the physical environment are some of the other factors that influence well-being.[1]    Nevertheless, an individual's material welfare is derived from the quantity, quality and variety of goods and services that they are able to consume (that is, the consumption possibilities set).  Consumption possibilities are dependent on an individual's level of income and the prices they face for different goods and services (that is, the budget constraint).  The metric typically used to measure and compare average income levels across countries is GDP per capita.[2]

21.    The limitations of GDP per capita in measuring a country's level of welfare are widely understood.  First, it only measures material welfare.  Second, GDP per capita is a crude approximation for income per capita.  When a country has external liabilities, part of the revenue from domestic production will be paid to foreigners.  Third, owing to the way in which GDP is measured, changes in the prices faced by consumers may not always be reflected in GDP (Kohli, 2002a and 2002b).  This is why some have argued for the use of alternative measures of income, such as Real Gross National Disposable Income (RGNDI) (for example Oulton, 2002), which captures income flows with the rest of the world and attempts to adjust for changes in a country's purchasing power.[3]    Other limitations of per capita GDP include the failure to account for all goods and services (for example, the complete flow of services from the physical environment), the exclusion of unpaid work, the inclusion of economic activities associated with 'bads' (for example, economic activity associated with cleaning up an oil spill), and the lack of accounting for the distribution of income.

22.    Nevertheless, the level of GDP per capita is widely used as an indicator of average living standards.  Indicators of relative levels of welfare across countries are broadly related to relative (purchasing power adjusted) GDP per capita across countries (see for example Mankiw, 2001, Table 22-3).  Hence, per capita GDP growth is commonly used as an indicator of changes in average living standards.

### Measuring economic growth

23.    GDP growth rates calculated over short time periods fluctuate considerably owing to business cycle effects.    When analysing a country's economic growth

---

[1] Some of these other aspects of well-being are sometimes described as constituting social capital as distinct from physical, human and natural capital.  The Treasury (2001) examines in detail social capital (or social capability) and how it relates to economic growth.
[2] Throughout this paper GDP and GDP per capita will refer to real GDP and real GDP per capita respectively, unless otherwise indicated.
[3] Statistics New Zealand (SNZ) has recently reintroduced publication of their RGNDI series. However, because RGNDI is not available for all OECD countries it is not used for comparisons in this paper.  While the level of RGNDI in New Zealand is lower than GDP, the growth of both series has been broadly similar over the period from the early 1990s to date.

performance, we are interested in measuring trend economic growth. That is, we want to measure economic growth that has had business cycle effects removed. There are several approaches to doing this. One common approach is to measure GDP growth over the classical cycle. This is done by calculating the average growth rate between two consecutive peaks or troughs in the level of GDP. This is a valid method for measuring trend GDP growth provided input utilisation rates are the same at the consecutive cyclical peaks or troughs.

24.    An alternative approach is to measure trend GDP growth over the growth cycle. This is done by measuring the average growth rate between three consecutive points at which the economy is deemed to be on trend. On-trend points can be identified in one of two ways. First, a variety of survey based measures of input utilisation can be used to judge when the economy is on-trend. An example of this approach applied to New Zealand is Downing, Janssen, McLellan and Szeto (2002). Second, statistical filters can be used to measure the economy's trend level of GDP and on-trend points identified where the trend level of GDP and actual GDP are equal. Examples of this approach applied to New Zealand are to be found in Claus, Conway and Scott (2000) and Buckle, Haugh and Thomson (2002).[4]

25.    11-year moving average growth rates are used throughout this chapter. This approach is preferred for two reasons. First, it does not require the identification of cyclical peaks or troughs, or on-trend points when measuring trend growth. Second, it has the advantage of being computationally easier when comparing the economic growth performance of different countries. This is why it is common for international agencies to report average GDP and GDP per capita growth rates over 11-year periods (although they unfortunately often do this for each decade rather than presenting the entire time series of growth rates).[5] One drawback of this approach is that it may still capture cyclical effects. Geometric growth rates are used throughout.[6]

26.    There is no ideal time horizon over which to calculate an average economic growth rate. If the average growth rate is calculated for a shorter time period, average economic growth rates are likely to fluctuate considerably owing to business cycle effects. If the average growth rate is calculated over a longer time period, significant changes in the growth performance of an economy may not be

---

[4] A further issue is the choice of growth rate to use when measuring economic growth. Mawson (2002) considered four possibilities: the least squares growth rate; the log difference growth rate; the annual average growth rate; and the geometric average growth rate. He argued that the least squares growth rate was inappropriate when the data series contained a unit root. Most countries GDP and GDP per capita series are likely to contain a unit root, rendering the least squares growth rate inappropriate. Mawson also showed that the log difference growth rate and the geometric average growth rate are identical, and that the annual average growth rate is an approximation to the former two growth rates. The geometric average growth rate has the nice property that when one takes the level of GDP or GDP per capita at the start of the sample period and grows it at the average geometric growth rate, the number obtained will be the same as the level of GDP or GDP per capita at the end of the period.

[5] Decade to decade growth comparisons (or any fixed time span comparison) across countries suffers the significant drawback that they do not allow for possible differences in the timing of business cycle phases across countries.

[6] The one exception is when measuring industry percentage point contributions to aggregate GDP growth, where we take an 11-year arithmetic average of annual industry percentage point contribution to aggregate GDP growth.

included in the average growth rate for some time. For example, if the New Zealand economy experienced an increase in its trend per capita GDP growth during the last few years, this improvement would not be captured for some time when using the 11-year average growth rate.

**New Zealand's absolute growth performance**

27. Figure 3 shows the level of New Zealand's GDP ($NZ 1995/1996) and Figure 2 the level of GDP per capita.[7] For the period since 1979 both these figures suggest a significant improvement in New Zealand's growth performance from around 1993, as evident from the steeper slope of the level of both GDP and GDP per capita after 1993 compared to the slope of the level of GDP and GDP per capita before 1993.

28. An improvement in New Zealand's growth performance from the early 1990s is supported by other research. For example, Buckle, Haugh and Thomson (2002), who used regime switching models to analyse New Zealand's GDP data, found changes in New Zealand's growth characteristics dating back to the early 1990s. Specifically, they found that New Zealand GDP growth switched to a high growth regime in 1993 and it remained in a high growth regime for an unusually long period of time, much longer than had been experienced since at least the mid 1970s. Likewise Razzak (2003) has argued that trend labour productivity growth in the 1990s was higher than in the previous two decades. The OECD (2003b) has expressed the view that the economic reforms that were begun in the mid 1980s "boosted the economy's sustainable growth rate and its resilience to recent adverse shocks" (page 6).

29. Figure 5 shows New Zealand's 11-year average GDP and GDP per capita growth rate for the 11-year periods from 1987 to 2001 (using data from 1977). This figure shows an improvement in New Zealand's average GDP and GDP per capita growth rates for the 11-year period from 1990 to 2000. A similar picture emerges when using OECD per capita GDP data for New Zealand for a longer time period 1971 to 2002 (see Figure 6).

---

[7] This GDP series was calculated by Haugh (2001). It is the official Statistics New Zealand (SNZ) chain-linked production GDP series between the June 1987 and the September 2002 quarters and a calibrated series between the September 1977 and the March 1981 quarters. These data were used to form an annual GDP series. Per capita GDP was calculated by dividing the annual GDP series by the New Zealand population estimates drawn from SNZ. Population estimates before 1992 are de facto estimates. Figures 3 to 7 are based on years ending 31 March.

**Figure 3:   New Zealand's GDP level**
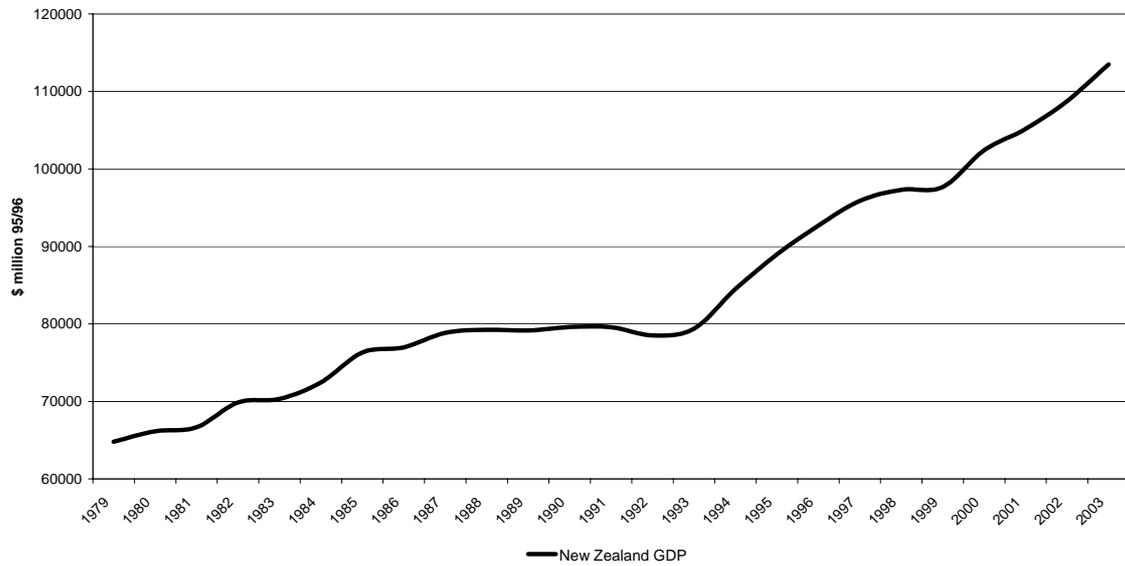


Data source: Statistics New Zealand


**Figure 4:   New Zealand's per capita GDP level**
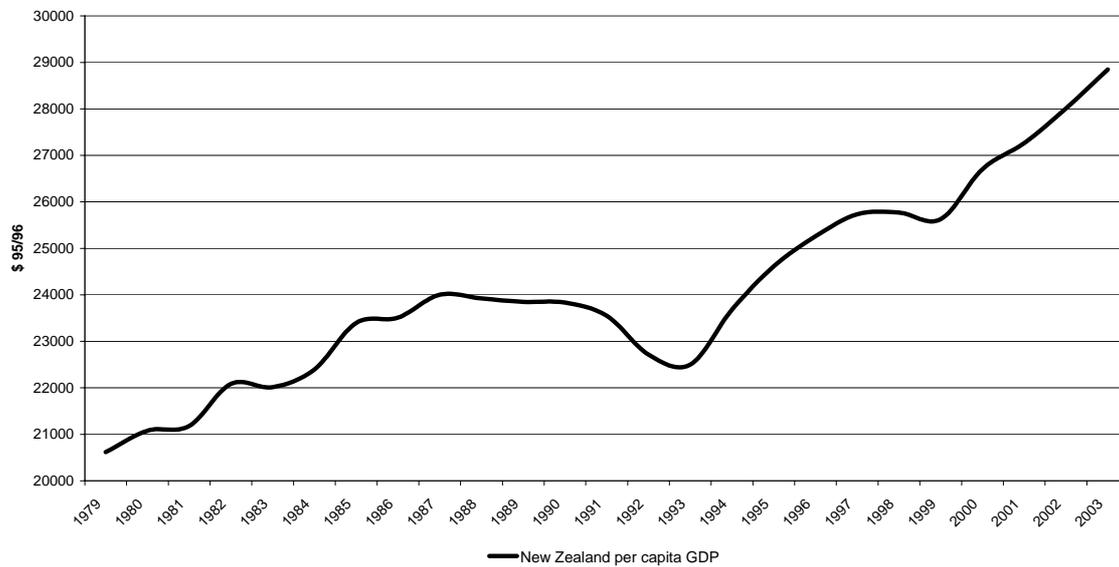


Data source: Statistics New Zealand

**Figure 5: New Zealand's average GDP and per capita GDP growth rates**
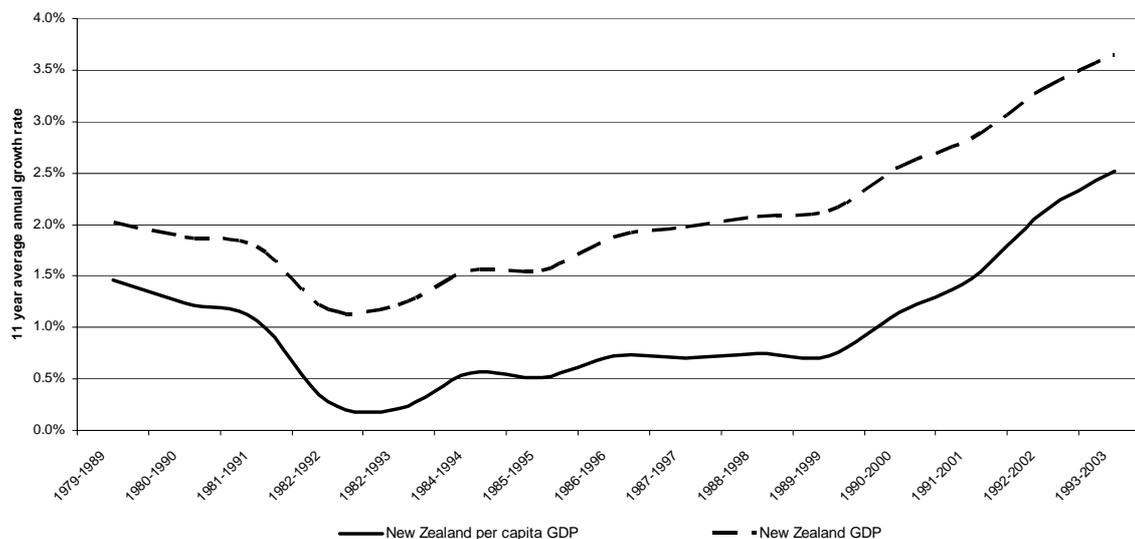


Data source: Statistics New Zealand

**Proximate sources of New Zealand's economic growth**

30. What are the factors that contributed to the recovery in New Zealand's economic growth beginning in the early 1990s? This question can be approached from a number of angles. First, we look at what industries have contributed to the pick-up in aggregate GDP growth. Second, we look at the contribution to per capita GDP growth and GDP growth from the inputs to production (such as labour and capital) and productivity.

31. Since market deregulation in the mid 1980s there has been a marked change in New Zealand's industrial structure (Buckle, Haugh and Thomson, 2001). Output from services industries have increased as a share of total GDP, reflecting a large jump in the relative growth of services output. The primary sector also increased as a share of total output by continuing its above average industry growth rate, a pattern that has been occurring for at least the last 25 years.

32. A more detailed industry breakdown of the industry contributions to the increased GDP growth during the 1990s is provided in Figure 6. This shows the percentage point contributions to aggregate GDP growth owing to nine broad industries comprising the New Zealand economy. These nine industries are: primary (agriculture, fishing, and forestry and logging); mining and quarrying; manufacturing; electricity, gas and water supply; construction; trade (retail, wholesales, and accommodation, cafes and restaurants); transport, storage and communications; business services; and personal and community services and government. The industry percentage point contributions shown in Figure 6 show their respective contributions to the aggregate 11-year average annual GDP growth rate.

14

**Figure 6: Industry percentage contributions to average GDP growth**
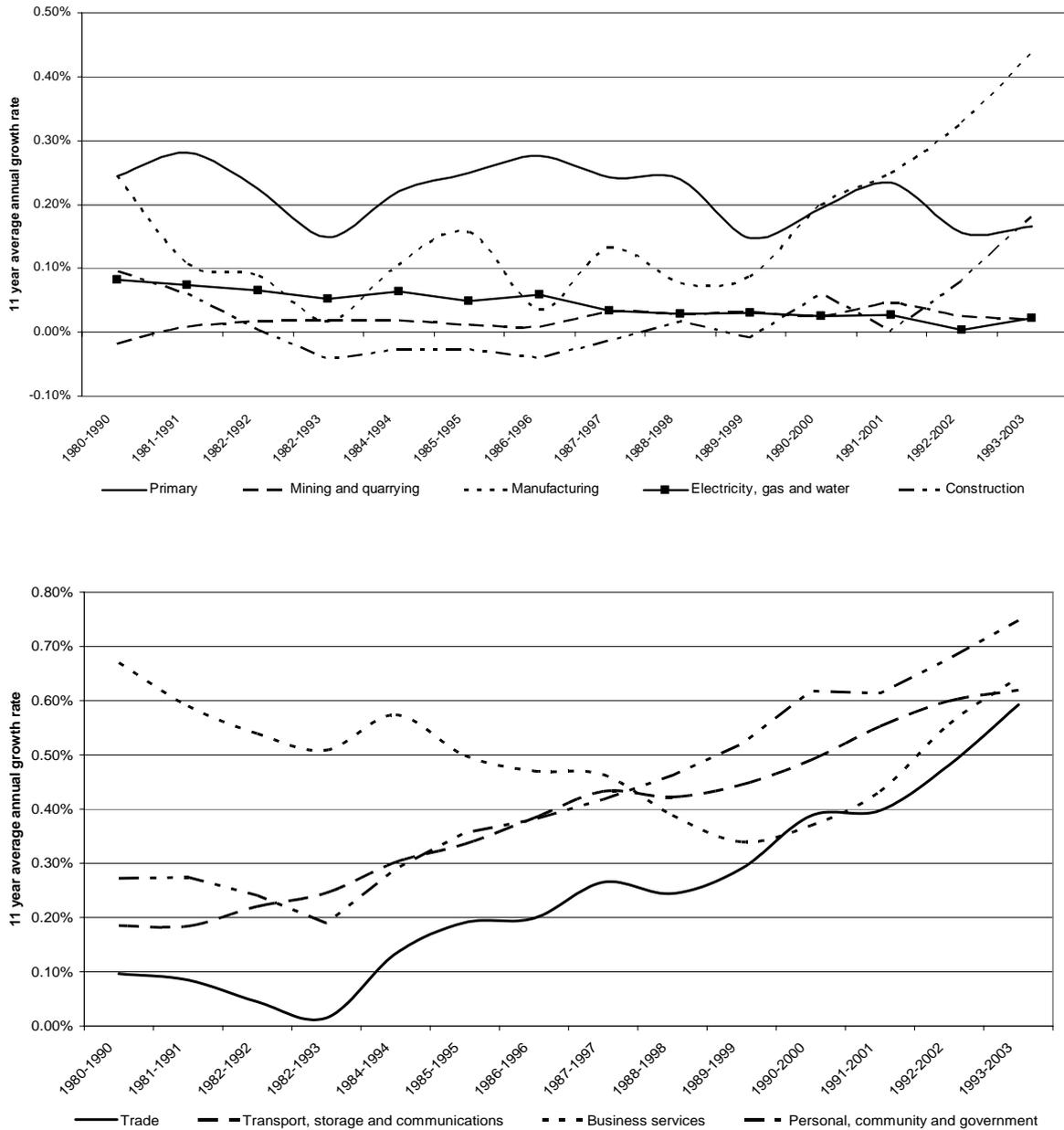


Data source: Statistics New Zealand

33. Figure 6 suggests the improvement in average GDP growth since the early 1990s has largely resulted from higher growth from industries located in the service sector, in particular trade, the transport, storage and communications industry and the personal and community services and government industry. The improved percentage contribution to aggregate GDP growth from the transport and communications industry has largely come from a rapid increase in productivity growth (Diewert and Lawrence, 1999; Black, Guy and McLellan, 2003). The primary sector continued the pattern of relatively high industry growth that has prevailed in that industry since at least the early 1970s.

34.	There are a number of possible explanations for the changing industrial structure and for the rapid growth of the services industries. Services are an increasingly important component of most modern economies. Furthermore, industry deregulation may have been an important catalyst for the change in New Zealand's industrial structure and the recovery in economic growth. The association between regulatory reform and industry growth is discussed in detail in Buckle, Haugh and Thomson (2001).

35.	An alternative decomposition is to investigate the proximate sources of GDP growth arising from input growth and productivity growth. One common decomposition is to decompose per capita GDP growth into labour productivity growth and growth in labour utilisation using the following growth accounting identity:

$$\frac{\dot{Y}}{Y} - \frac{\dot{P}}{P} = \left( \frac{\dot{Y}}{Y} - \frac{\dot{H}}{H} \right) + \left( \frac{\dot{H}}{H} - \frac{\dot{P}}{P} \right) \tag{1}$$

where $Y$ represents GDP, $H$ total hours worked, and $P$ Population. Dot notation is used to denote the time derivative. The first right hand side term in equation (1) is labour productivity growth The second term in equation (1) is growth in labour utilisation (that is, growth in hours worked per head of population). Labour productivity is a partial productivity measure, and while important for per capita GDP growth, it should be kept in mind that labour productivity could change owing to a change in the mix of inputs used to produce output in an economy. For example, investment in physical capital may raise labour productivity because individuals now have more capital to work with. Additional insights can be gained by further decomposing labour productivity growth into multifactor productivity growth and growth in the capital-labour ratio (which is discussed in more detail later in section II).

36.	Furthermore, there are a number of assumptions that underlie this growth accounting method, and for this reason there are some drawbacks to using this approach. It should also be stressed that the growth accounting decomposition is not a model of economic growth in that it does not tell us what drives productivity growth, or input accumulation, or if there is any interaction between input accumulation and productivity growth.

37.	Using expression (1), figure 7 shows the percentage contributions of labour productivity and labour utilisation to per capita GDP growth. Percentage point contributions are to the 11-year average annual per capita GDP growth rate. For example, the growth rate corresponding to 1980-1990 on the horizontal axis is the average growth rate for the 11-year period 1980 to 1990. Figure 7 shows that the improvement in New Zealand's average GDP growth in the 11-year periods from 2000 arose from growth in labour utilisation, rather than an increase in the growth of labour productivity. Average labour productivity in the last 11-year period was around its historical average.

**Figure 7:   Growth accounting decomposition of average GDP growth**
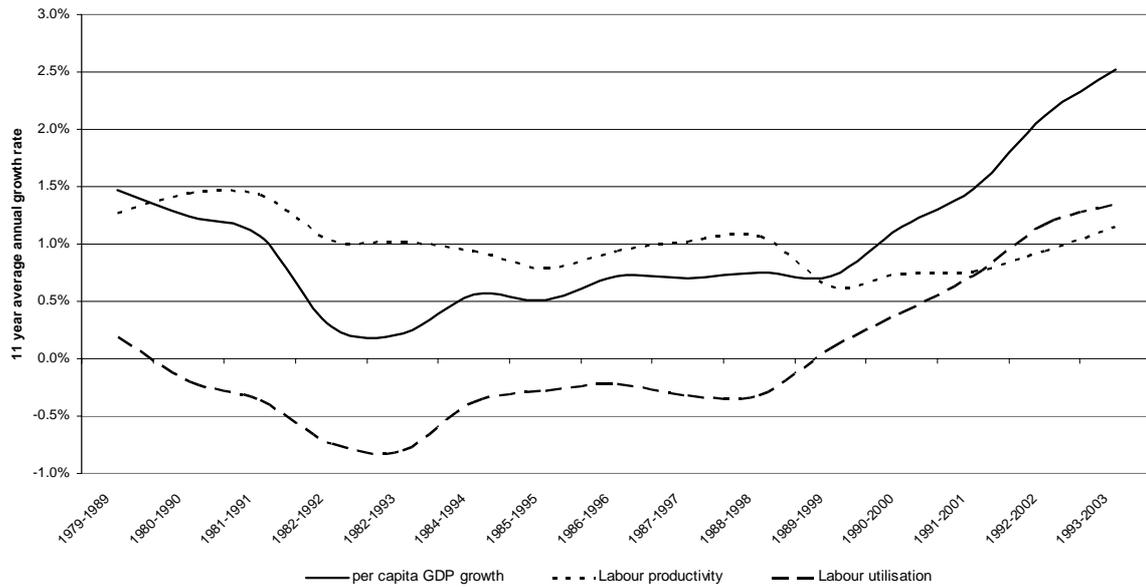


Data source: Statistics New Zealand

38.    Looking forward, there appears to be greater scope for sustaining and increasing New Zealand's per capita GDP growth via increasing labour productivity growth, rather than labour utilisation.  Higher growth in labour productivity could be sourced from improvements in the skill composition of those in employment (Solon, Barsky and Parker, 1994) and increases in the amount of physical capital per worker.  Chapters III and IV discuss this issue in greater detail.

**Relative performance: per capita GDP growth**

39.    This section compares the relative per capita GDP growth performance of different countries within the OECD.[8]  Figure 8 shows 11-year moving average per capita GDP growth for New Zealand, Australia, the United States the Euro Area and the OECD mean (both population weighted and unweighted), since 1971.[9]  From the early 1970s until the 1990s New Zealand's average per capita GDP growth (measured over an 11-year period) was slower than the OECD

---

[8] Per capita GDP data are drawn from OLISNet.  Data available on OLISNet are drawn from various OECD databases and publications.  Per capita GDP data are available denominated in both $US (1995) and purchasing power parities (1995 $US).  The purchasing power adjustment of per capita GDP attempts to account for changes in the relative cost of purchasing an identical basket of consumer goods in different countries.  The level of per capita GDP differs depending on whether it is denominated in $US or purchasing power parities.  However, the growth of per capita GDP is invariant to whether it is calculated in $US or purchasing power parities.  This is because domestic currency per capita GDP data are adjusted to $US and purchasing power parity per capita GDP data using $US exchange rates and purchasing power parities for the 1995 year.  Analysis throughout the remainder of this paper is based on 1995 purchasing power adjusted GDP per capita data.  Again the focus is on trend per capita GDP growth rates measured using an 11-year moving average growth rate.

[9] New Zealand GDP and per capita GDP data correspond to the year ending 31 March.  Data in figures 8 to 11 are plotted on the basis of the New Zealand March year, even though the data for most (but not all) other countries is for the previous calendar year.  For example in Figures 8 to 11 the observations for the US and New Zealand corresponding to the 2002 marker, are years ending 31 December 2001 and 31 March 2002, respectively.

mean and per capita GDP growth in the United States, Australia and the Euro Area. Since the early 1990s, New Zealand's average per capita GDP growth has increased relative to the OECD mean. By 2002, New Zealand's average growth exceeded the Euro Area and the OECD mean. New Zealand's average growth rate was also slightly higher than the average per capita GDP growth in the United States but around 0.5 percentage points lower than that of Australia.

**Figure 8: New Zealand's GDP per capita growth compared with selected countries**
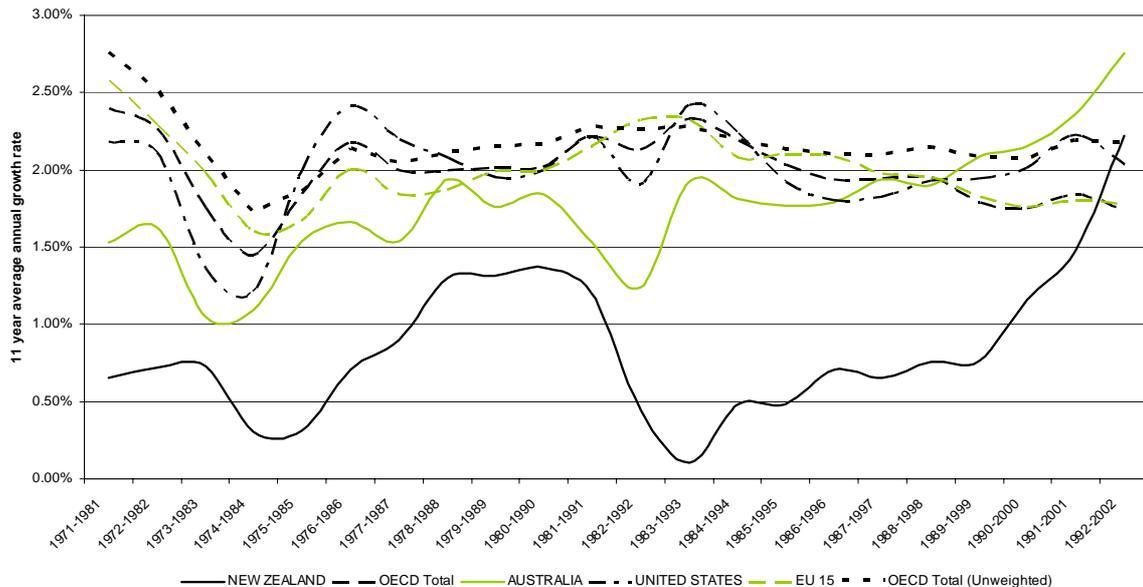


Data source: OECD

### Relative performance: per capita GDP level

40. A country that experiences consistently slower per capita GDP growth than other countries will experience a decline in its level of per capita GDP compared to other countries. Likewise, when a country is able to match the growth rate of other countries, its level of GDP per capita expressed as a proportion of other countries will remain unchanged.

41. While comparisons of per capita GDP levels are commonplace, they may mask the impact of differences in relative growth rates. One useful way of presenting both relative levels and growth information in a single chart is to compare one country's per capita GDP as a proportion of the other's per capita GDP or by comparing both countries each as a proportion of a third country. Figure 9 shows New Zealand's and comparator countries' per capita GDP levels as a proportion of the OECD mean level. The decline in New Zealand's per capita GDP relative to the OECD mean from 1975 to 1980 and 1988 to 1993 is evident from Figure 9, with New Zealand's per capita GDP falling as a proportion of the OECD mean during these periods. Between 1993 and 2002, New Zealand's per capita GDP as a proportion of the OECD mean has risen slightly, as a result of New Zealand's higher growth rate. On a 1995 purchasing power parity basis, New

Zealand's GDP per capita was 85 percent of the OECD mean level of per capita GDP in 2002.

**Figure 9:  New Zealand's GDP per capita and some country comparisons as a proportion of the OECD mean**
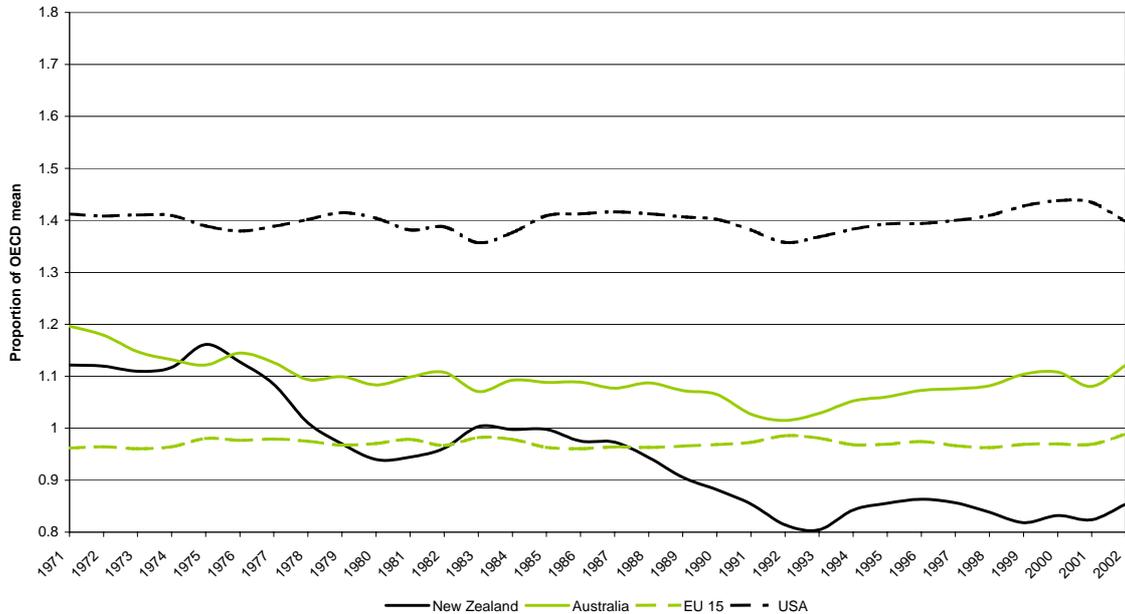


Data source: OECD

42.  In summary, Figures 8 and 9 show that New Zealand's relative per capita GDP growth performance was stronger in the 11-years to 2002 than in any previous 11-year period since 1971.  This improvement has resulted in a slight increase in New Zealand's per capita GDP relative to the OECD average, the Euro Area and the United States since the early 1990s, but fall as a proportion of Australia's per capita GDP.

**Relative performance: labour productivity and labour utilisation growth**

43.  Figures 10 and 11 present decompositions of per capita GDP into labour productivity growth and growth in labour utilisation for a selection of OECD countries.[10]  Figure 10 shows that for most of the 11-year periods since 1990 the US and the United Kingdom have recorded higher labour productivity growth than New Zealand.  Moreover, Australia recorded higher labour productivity growth than New Zealand in the 11-year periods from 1996 onward and more recently Canada has recorded higher labour productivity growth than New Zealand.

---

[10] The range of international comparisons in this section was largely determined by data availability.

**Figure 10: New Zealand's labour productivity (output per hour) growth compared with selected countries**
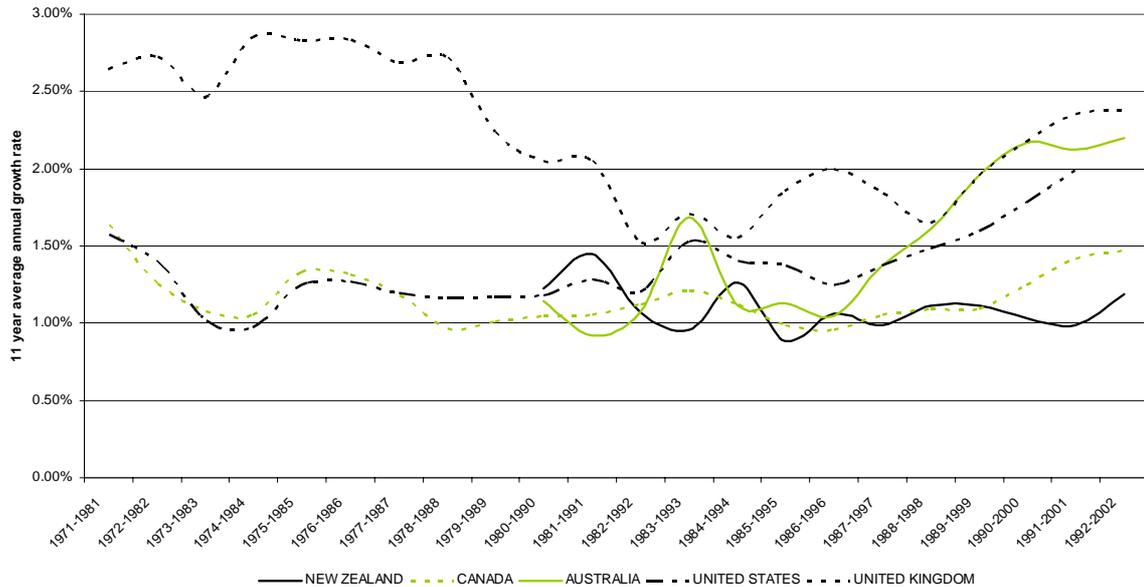


Data sources: OECD and Statistics New Zealand

44. Figure 11 also shows that in most of the 11-year periods since 1990 New Zealand experienced lower growth in labour utilisation than the selected OECD countries. In the 11-year periods up to 1999, New Zealand experienced average declines in labour utilisation. However, during 11-year periods after 1999 New Zealand experienced higher growth in labour utilisation than the other selected countries.

**Figure 11: New Zealand's labour utilisation (hours per head of population) compared with selected countries**
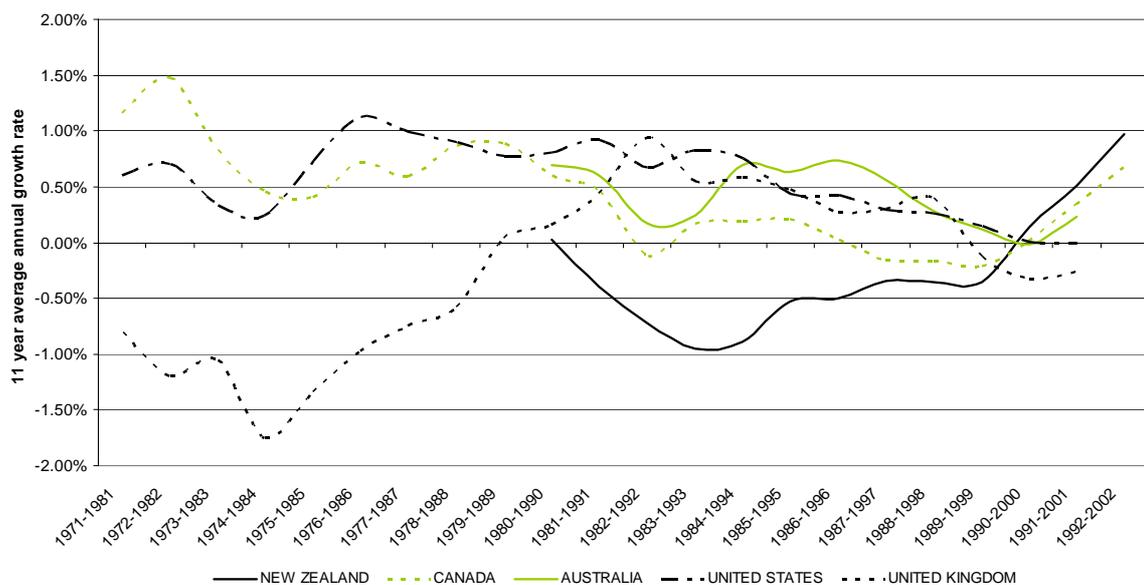


Data sources: OECD and Statistics New Zealand

**Decomposition of New Zealand labour productivity growth**

45. Labour productivity growth can be further decomposed into multifactor productivity growth and weighted growth in the capital-labour ratio, that is:

$$\frac{\dot{Y}}{Y} - \frac{\dot{H}}{H} = \frac{\dot{MFP}}{MFP} + \alpha_t \left( \frac{\dot{K}}{K} - \frac{\dot{H}}{H} \right) \tag{2}$$

where $MFP$ denotes multifactor productivity and $\alpha_t$ capital's income share in time $t$.

46. While Figure 7 suggests average labour productivity growth in the most recent 11-year period is around the historical average, Black, Guy and McLellan (2003) have shown that the composition of labour productivity growth changed over the 1990s, with proportionally more labour productivity growth owing to multifactor productivity growth rather than growth in the capital-labour ratio.

47. Black, Guy and McLellan (2003) investigated aggregate and industry productivity performance for the market sector of the New Zealand economy using index number techniques for the period 1988 to 2002. Those statistical agencies that currently report official productivity estimates construct these productivity series using index number techniques.

48. Figure 12 shows the evolution of labour productivity, capital productivity and multifactor productivity for the market sector of the New Zealand economy between 1988 and 2002.[11] [12] Changes in input utilisation arising from business cycle fluctuations are reflected in productivity measures. Although during slack periods some labour is usually shed, workers that are retained or do not have their hours reduced are often under-utilised. Under-utilisation of the capital stock tends to be greater, because the capital stock cannot be shed as easily as labour. For this reason when measuring trends in productivity growth it is common to measure productivity growth over the full business cycle in order to account for changes in input utilisation.

49. Measured over alternative business cycles, average multifactor productivity for the market sector of the New Zealand economy ranged from around 0.8 percent to 1.2 percent per annum. Average labour productivity growth varied between 0.7 percent and 0.9 percent per annum.

---

[11] Industries excluded from the market sector are: Central government administration and defence; Local government services and Ownership of owner occupied dwellings. Hence the coverage of the economy is less than presented in the earlier analysis that looks at aggregate GPP and GDP per capita.

[12] Multifactor productivity and total factor productivity (TFP) are often used interchangeably. Strictly speaking, total factor productivity measures changes in the ability of *all* inputs into the production process to produce output over time. Rarely is it possible to measure TFP because it is difficult to obtain data on all inputs. Hence the preference for the term "multifactor productivity".

**Figure 12: New Zealand market sector multifactor and partial productivity**

Index=1.00 1988
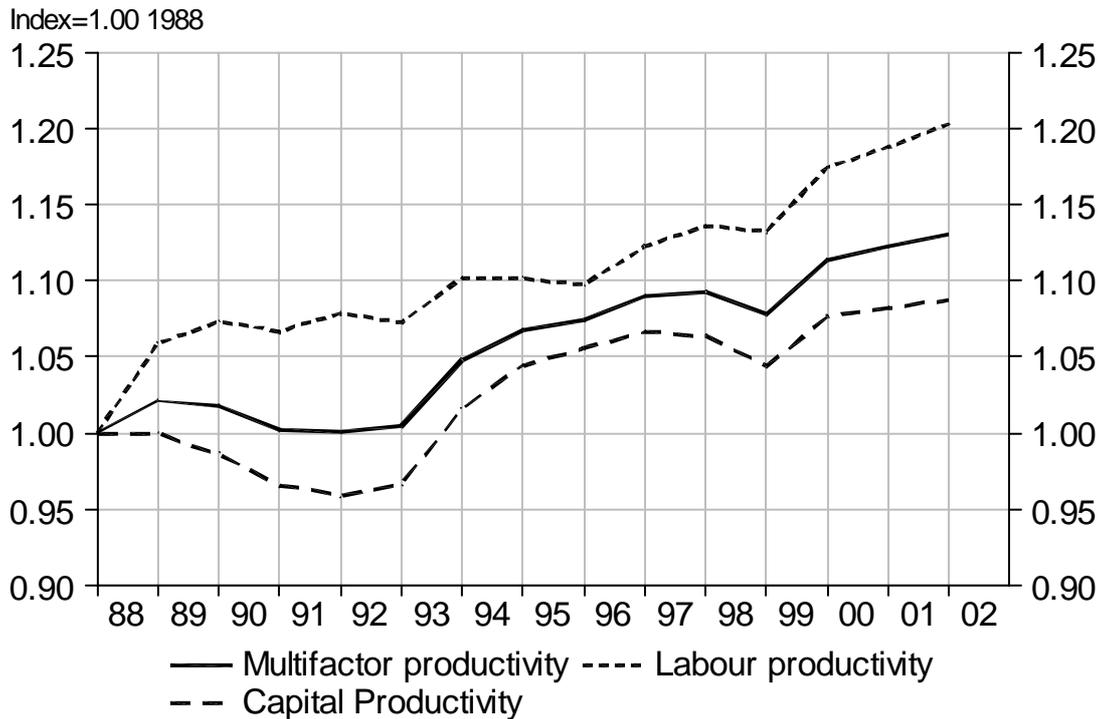


Source: Black, Guy and McLellan (2003)

50. Figure 12 indicates there may have been a change in average multifactor productivity growth from around 1993. Average multifactor productivity growth in the period 1988 to 1993 was 0.1 percent per annum compared with average multifactor productivity growth of 1.3 percent per annum between 1993 and 2002. However, it is difficult to conclude that this represents a permanent improvement in trend multifactor productivity growth given the short time period covered by the data. Nonetheless, this is consistent with some recent research using longer time series (noted in paragraph 28) that has suggested New Zealand experienced a change in its growth characteristics dating back to the early 1990s (Buckle, Haugh and Thomson, 2002; Razzak, 2003).

51. Average multifactor productivity growth differs markedly across the nine industries examined. Over the period 1988 to 2002 average multifactor productivity growth was highest in the Transport and communication (6.0 percent per annum), followed by the Primary (1.4 percent per annum). The Personal and community services industry also displayed strong productivity growth at 1.2 percent per annum for the period 1988 to 2002. The improvement in multifactor productivity in these industries may reflect industry deregulation or the uptake of technology (for example, in the telecommunications sector). The distribution of multifactor productivity growth across New Zealand industries has been qualitatively similar to the distribution of industry multifactor productivity growth in Australia after 1993. Nevertheless, some quantitative differences remain. For example, between 1993 and 2002 average multifactor productivity growth in the manufacturing sector was negative in New Zealand but positive in Australia.

52. The Australian Bureau of Statistics (ABS) produces multifactor productivity, labour productivity and capital productivity series for the market sector of the

Australian economy. The ABS's definition of the market sector excludes those sectors where output is deemed to be 'hard to measure'. In 2002, the ABS market sector comprised 65 percent of total real GDP in Australia. When comparing New Zealand's productivity with the ABS productivity series it is necessary to exclude the corresponding 'hard to measure' industries for New Zealand in order to align the New Zealand industry coverage with the ABS definition of the market sector. The resulting 'ABS equivalent' New Zealand market sector was around 58 percent of total GDP in 2002.

53.  Figure 13 shows New Zealand and Australia's multifactor productivity growth on a comparable basis for the period 1988 to 2002. For the period 1988 to 2002, average multifactor productivity growth in Australia and New Zealand was identical at 1.1 percent. During this period, the one time in which the Australian and New Zealand multifactor productivity series diverge is 1999. Buckle, Kim, Kirkham, McLellan and Sharma (2002) found that the 1997 and 1998 summer droughts had a substantial adverse impact on New Zealand's GDP during this period. Climate shocks are likely to be captured within multifactor productivity growth and the stagnation and then decline in multifactor productivity during 1998 and 1999 are consistent with the idea that adverse shocks had a negative impact on New Zealand's GDP during this time.

**Figure 13: Australia and New Zealand multifactor productivity**
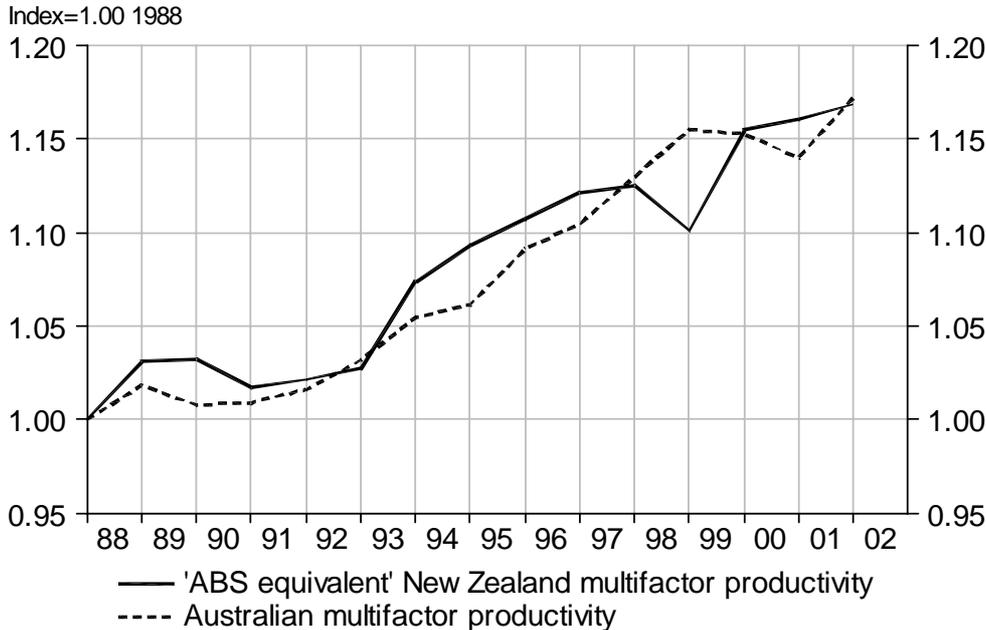


Source: Black, Guy and McLellan (2003)

54.  Figure 14 shows New Zealand and Australia's labour productivity growth on a comparable basis. Average labour productivity growth was similar in New Zealand and Australia in the period up to 1993, and higher in Australia between 1993 and 2002. Labour productivity growth can be decomposed into multifactor productivity growth and growth in the amount of capital available per hour worked (that is, the capital-labour ratio). While average multifactor productivity growth has been similar in both countries over the period 1988 to 2002, the difference in

labour productivity growth between Australia and New Zealand is associated with differences in the evolution of the capital-labour ratios between the two countries. Figure 15 shows Australia's higher labour productivity growth after 1993 has been associated with higher growth in Australia's capital-labour ratio compared with New Zealand.

**Figure 14: Australia and New Zealand labour productivity**

Index=1.00 1988



Source: Black, Guy and McLellan (2003)

**Figure 15: Australia and New Zealand capital-labour ratios**

Index=1.00 1988
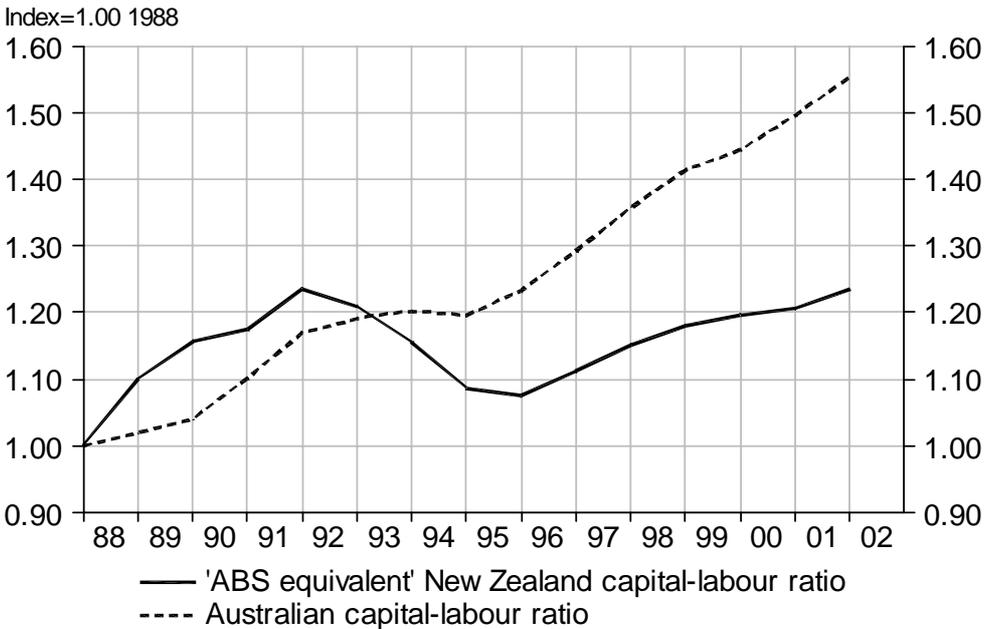


Source: Black, Guy and McLellan (2003)

55. There are a number of possible explanations for the difference in the evolution of capital-labour ratios between Australia and New Zealand. Australia's relatively higher rate of capital accumulation after 1993 may reflect differences in the industrial structure between the two economies. For example, the Australian economy has a larger mining and quarrying industry compared with New Zealand which, given the high degree of capital intensity in the mining and quarrying industry, may be a factor behind Australia's higher rate of capital accumulation. Preliminary work suggests however that this is unlikely to be a significant explanation.

56. Another possible explanation is that a high concentration of household wealth in housing assets may have diverted funds away from more productive forms of investment, resulting in lower capital accumulation in New Zealand.

57. New Zealand's small domestic market may be another contributing factor. The size of the domestic market coupled with the costs of expanding into foreign markets may affect rates of return to capital, thus reducing the incentive of firms to invest in capital.

58. Another potential explanation is that some firms may be finance constrained. The findings from international research suggest that smaller firms are more likely to be finance constrained and have to rely more on internal cash flow for funding capital investment than is generally the case for large firms (Gertler and Gilchrist, 1994; Bernanke, Gertler and Gilchrist, 1999). While firm specific information may affect the credit experience of small firms (Cavalluzzo and Cavalluzzo, 1998), an economy with a preponderance of small firms might nevertheless be expected to be characterised by a high proportion of finance constrained firms due to the high cost to financial institutions of collecting firm specific information. However, Australia would appear to have a higher proportion of small firms and the proportion of small firms in New Zealand is similar to the proportion in several European economies (OECD, 2003b).

59. Finally, changes in factor market regulation may have changed firms' incentive to source output growth from employing more labour versus investing more in physical capital, because of a change in the relative price of labour to capital. Differences in the timing of regulatory changes to labour and capital markets is another possible explanation for the differences in the evolution of capital and labour growth in New Zealand and Australia during the 1990s.

**New Zealand's per capita GDP ranking**

60. In 1970 New Zealand's per capita GDP ranking was 9th in the OECD. By 2002 New Zealand's per capita GDP ranking was 20th in the OECD, one place behind the United Kingdom and one place ahead of Spain (see Figure 16). This fall in New Zealand's OECD per capita GDP ranking largely occurred between 1975 and 1980 when New Zealand's level of per capita GDP was surpassed by a number of other middle income countries.

**Figure 16: GDP per capita of OECD member countries in 2002**
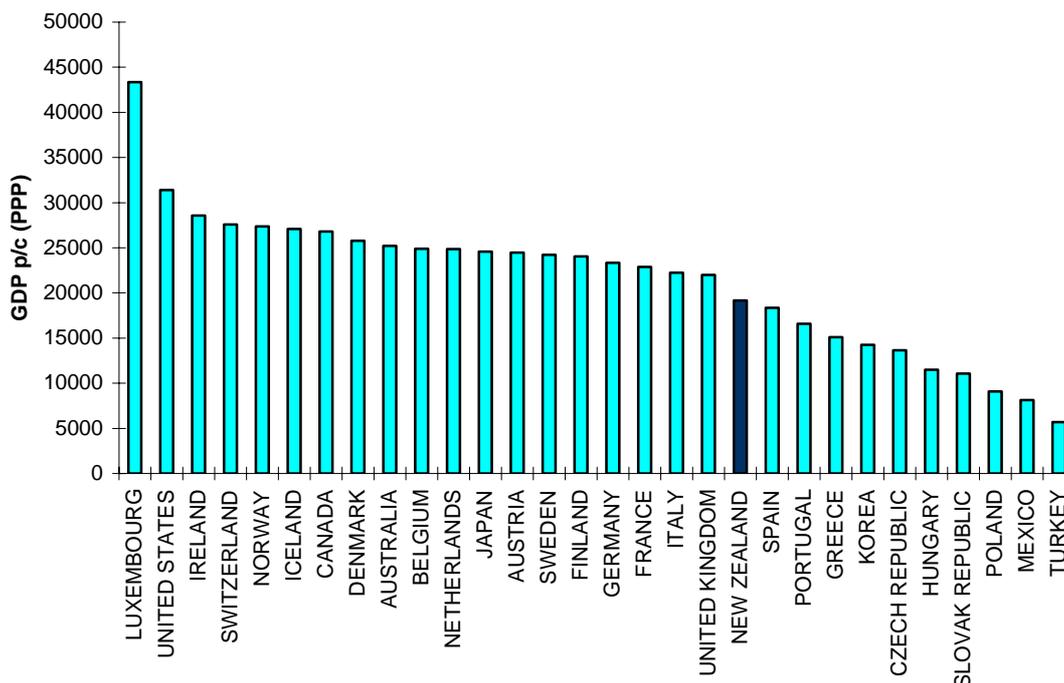


Data source: OECD

61.  A large decline in per capita GDP ranking is not unique to New Zealand (although New Zealand did record the largest OECD ranking decline in the period 1970 to 2001). For example, Sweden's OECD per capita GDP ranking fell from 6th to 14th between 1971 and 2002, with a significant fall occurring in a relatively short period between 1990 and 1993. France recorded a somewhat smaller and more gradual decline from 11th to 17th position between 1971 and 2002. In contrast other countries have shown remarkable upward movements. Between 1971 and 2002, Ireland's per capita GDP ranking rose from 22nd to 3rd, Norway's per capita GDP ranking rose from 19th to 5th, and Iceland's per capita GDP ranking rose from 13th to 6th.[13]

62.  Although the evolution of a country's per capita GDP ranking provides some useful information about its level of per capita GDP relative to other countries, it can also conceal information about a country's relative growth performance. For example, New Zealand's per capita GDP growth between 1984 and 1993 was substantially slower than the OECD mean (this can be inferred from Figure 9 which shows that New Zealand's per capita GDP as a proportion of the OECD

---

[13] The evolution of other countries' per capita GDP ranking also illustrates limitations in using per capita GDP rankings to judge a country's economic growth performance. Between 1971 and 2002 Spain's per capita GDP ranking fell from 20th to 21st, yet over this period Spain's per capita GDP growth was 0.3 percent per annum higher than the OECD average. Because the distribution of per capita GDP amongst the OECD economies in 1970 was skewed towards the lower end, an economy (such as Spain) situated at the lower end of the distribution may grow faster than the OECD mean for an extended period, but its ranking may change very little, remain the same or even decline (if it is passed by other countries at the lower end of the distribution that have faster per capita GDP growth).

mean fell from approximately 1 to 0.8 between 1984 and 1992). Despite New Zealand's substantially slower per capita GDP growth between 1984 and 1993, New Zealand only fell one place from 18th to 19th in the OECD rankings. Similarly, despite New Zealand's per capita GDP growth rate slightly exceeding the OECD mean in the last 11-years its ranking has not yet increased.

**Moving up the OECD per capita GDP rankings**

63. To move up the OECD rankings, New Zealand has to at least grow faster than countries that currently have higher ranks. Figure 17 shows, for instance, that to catch up with the United Kingdom's level of GDP per capita in 10 years, New Zealand would have to maintain per capita GDP growth rates that were, on average, 1.4 percent per annum higher than for the United Kingdom. Figure 17 shows equivalent figures for all the countries in the OECD. The required growth rates are calculated in Figure 17 for 10 and 20 year time horizons as at 2002.

**Figure 17: New Zealand GDP per capita in excess of growth in other countries required to match their GDP per capita in 10 and 20 years**
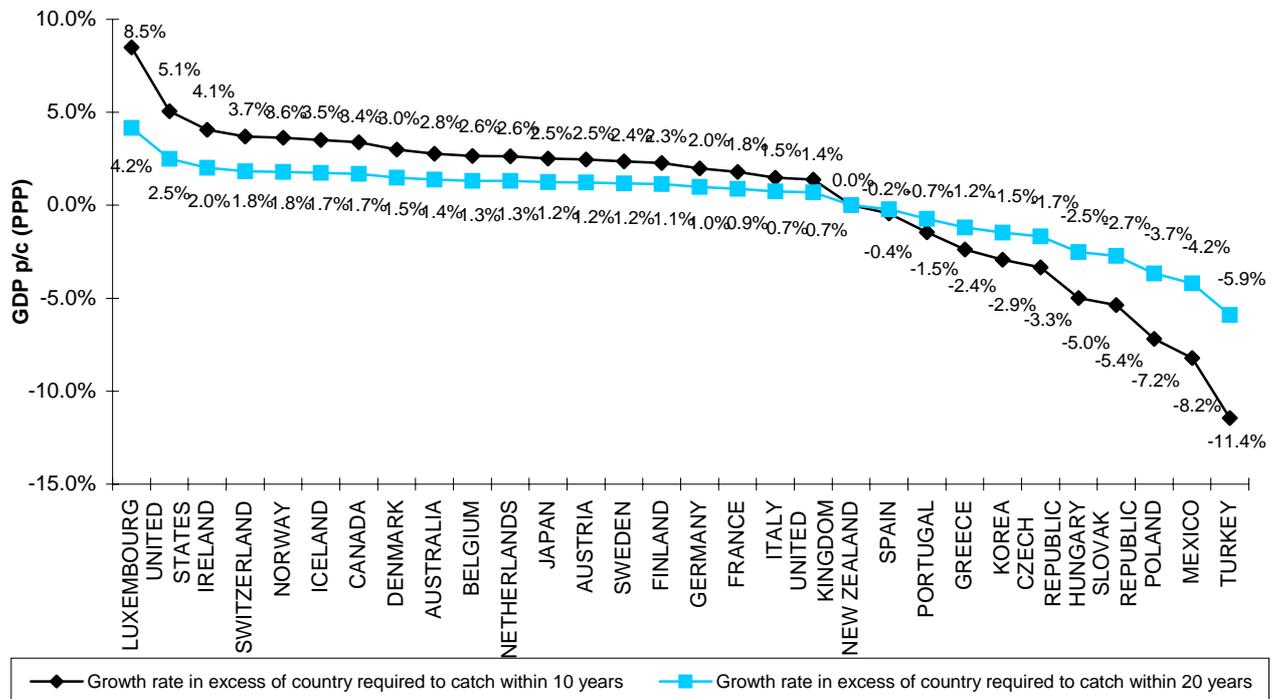


Sources: OECD and Treasury Report T2003/204

64. The OECD mean GDP per capita growth rate has been 2.1 percent per annum over the last 30 years. If all countries aside from New Zealand were to grow their GDP per capita at this annual rate over the next 10 years, New Zealand would have to grow its GDP per capita at 4.1 percent per annum, or 2 percent per annum faster than the rest of the OECD, to reach the top half of the OECD by the end of the period. As the time horizon is expanded to 20 years the average per capita GDP growth rate required would fall, to approximately 3.1 percent per annum, which would be 1 percent per annum faster than the rest of the OECD. These required growth rates are higher than New Zealand's 11-year average growth rates achieved for any period since 1971. A few countries have achieved

average per capita GDP growth in excess of 4 percent per annum over a 10 year period.  Examples in recent history include Ireland, Korea and Poland in the last decade and Luxemburg in the 1980s.

**Summary**

65.  New Zealand's economic growth performance has improved since the early 1990s.  New Zealand's average annual GDP per capita growth since the early 1990s has been higher than the average growth rate for the OECD and has been one of the highest in the OECD.  This growth recovery has been largely sourced from growth in the service sector and increases in labour utilisation.  In addition, the composition of labour productivity growth changed with most growth being sourced from growth in multifactor productivity rather than growth in the capital-labour ratio.  As was highlighted in the Treasury's Post Election Briefing (Treasury, 2002a) New Zealand's GDP per capita is approximately 15 percent below the OECD mean.  To rise to the OECD mean by 2023, New Zealand's per capita GDP would need to grow around 1 percent per annum faster than the OECD average.

### III. REVIEW OF THE ECONOMIC GROWTH LITERATURE AND EXPLANATIONS FOR NEW ZEALAND'S GROWTH PERFORMANCE

66. The description of New Zealand's economic growth performance in Chapter II provides a foundation from which to explore the various hypotheses that seek to explain the long term growth performance of the New Zealand economy. Although Section II identified the *proximate* sources of economic growth, that is the contribution of input accumulation to New Zealand's GDP and per capita GDP growth, the insights from this analysis can only take us so far. For example, we are still unable to answer questions like what factors caused the increase in labour utilisation over the 1990s or what factors caused the substantial increase in the growth rate of some service industries, both of which coincided with the pick-up in New Zealand's average per capita GDP growth rate. Eventually, we want to be able to say something about the *ultimate* (or deeper) factors that contributed to the relative decline in New Zealand's per capita GDP from the mid 1970s to the early 1990s, what stopped the relative decline thereafter, and what will sustain growth in the future.

67. This section begins with a review of the theoretical and empirical growth literature which forms a basis for thinking about the various factors that have influenced New Zealand's relative growth performance. In particular we look at the influence of convergence, economic policy, economic shocks, distance from markets and market size, and institutions on New Zealand's relative growth performance.

68. The various factors that may have influenced New Zealand's long term per capita GDP growth are not necessarily mutually exclusive. Ideally, we would like to develop a framework that would allow us to test the relative importance of each of these factors. Developing such a framework would be a challenging task, as it would need to be capable of capturing possible interactions between different factors (for example, external shocks and institutions) to adequately identify their impact on New Zealand's growth.

**Theoretical literature**

69. The neoclassical growth model (Solow, 1956 and Swan, 1956) is based on an economy-wide production function in which the level of output is related to the level of technology, labour and capital. The economy-wide production function is assumed to exhibit constant returns to scale and technology is assumed to be labour augmenting (that is, technology is assumed to raise the productivity of labour).

70. An important result that emerges from the neoclassical growth model is that an increase in the fraction of output devoted to domestic saving, and hence available for domestic investment, leads to a higher level of per capita output, but not a permanent increase in the steady-state growth rate.[14] In other words, an increase in the rate of capital accumulation results in a level shift in per capita output, with the economy experiencing a temporary increase in per capita output growth as it moves along the transition path to the higher level of output per capita, but not a permanent increase in output growth per capita. This occurs because the

---

[14] The steady-state in the neoclassical growth model is reached when output and the capital stock growth at the same rate so that the output to capital ratio is constant.

aggregate production function exhibits diminishing returns to capital (that is, the marginal increase in output diminishes as the capital stock increases).

71.  Within the neoclassical growth framework, the steady-state or long-run growth rate in per capita output is determined by the growth rate in labour augmenting technology, which is determined outside the model. Thus per capita GDP growth in the neoclassical growth framework cease in the absence of technological change. This result highlights the centrality of technological change (knowledge accumulation) in sustaining per capita GDP growth.

72.  The last two decades have seen the emergence of the so-called 'new growth' or 'endogenous' growth literature. This literature emerged for two reasons. First, from discontent that technological progress, the driver of long-run economic growth, was exogenous in the neoclassical growth model. Second, because of methodological advances in incorporating increasing returns to scale within formal economic models. The introduction of increasing returns within formal growth models allowed diminishing returns to factor accumulation to be overcome resulting in sustained economic growth.

73.  In general, endogenous growth models introduce some type of new capital that overcomes diminishing returns to physical capital in the neoclassical growth model. Spillovers play an important role in much (but not all) of the endogenous growth literature, which results in a divergence between the private and social rate of return on capital. Examples of spillovers include knowledge spillovers within and between countries (or within and between firms), and learning-by-doing through physical and human capital accumulation and by increasing product quality and expanding product variety (Mare, 2003).

74.  Endogenous growth models bring technological change (knowledge accumulation) to the forefront of the analysis. The introduction of knowledge introduces additional complexities because knowledge has public good characteristics of being (partially) non-rival and (partially) non-excludable.[15] The non-rival nature of knowledge is an important source of increasing returns to scale because new knowledge arises from existing knowledge and because knowledge spillovers occur between people and firms (Hansen, 2002). The difficulties in making knowledge excludable reduce the incentive to invest in knowledge accumulation. This creates a tension between making knowledge available for all to use, but ensuring some degree of excludability so there is an incentive to invest in knowledge accumulation.

75.  Different classes of endogenous growth models introduce different types of capital and spillover to sustain economic growth. One class of endogenous growth models uses human capital accumulation to sustain growth. For example, Lucas (1988) specified an endogenous growth model in which an individual's human capital accumulation has a positive spillover effect, raising the productivity of other workers, even though the other workers do not contribute to the cost of education and/or training of the individual that accumulates the human capital. Innovation based models sustain growth via knowledge accumulation through learning by doing and investment in research and development (R&D). For example, Romer (1990) developed a model where R&D investment decisions

---

[15] Strictly speaking it is only disembodied knowledge that is completely non-rival and non-excludable.

increase the available pool of knowledge that firms can draw upon in producing new goods.

76. Policy prescriptions often differ amongst the various classes of endogenous growth models. Some endogenous growth models maintain the assumption of perfect competition, resulting in decentralised equilibria that are socially optimal. For example, AK models, which sustain growth by assuming the producing function is linear therefore overcoming diminishing returns to input accumulation, are compatible with perfect competition.[16] In contrast, the private and social rates of return on capital differ in the Lucas (1988) human capital model and the Romer (1990) R&D model suggesting there is a role for government in subsiding human capital accumulation and R&D investment, respectively.

77. A key insight to emerge from some of the endogenous growth literature is that the accumulation of the new type of capital can cause a permanent change in the long-run growth rate and not just the level of per capita output. This is in contrast to the neoclassical growth model where an increase in the accumulation of physical capital results in a temporary but not a permanent increase in the growth rate of per capita output.

78. However, Temple (2003) has argued that when thinking about the theoretical insights that emerge from the economic growth literature, the sharp distinction between level effects and growth effects should not be made, for two reasons. First, the steady-state is a theoretical abstraction that is of limited practical relevance. Most countries are probably not on their steady-state growth paths, with much of the observed variation in per capita output growth across time and countries due to transitional dynamics. Second, the sharp distinction between level effects and growth effects tends to downplay the importance of level shifts in per capita output which may have significant welfare effects.

**Empirical literature**

79. The theoretical literature highlights the importance of technological change in sustaining per capita GDP growth. In the neoclassical growth model, technological change is exogenous, whereas endogenous growth models make technological change central to the analysis, by modelling technological change as the outcome of an economic process. Moreover, alternative models point to different factors to sustain ongoing technological change. Some of the empirical literature has tried to discriminate between different types of theoretical growth model. For example, Jones (1995) looks at the relationship between total factor productivity (TFP) and the number of scientists and engineers devoted to R&D to test the validity of innovation based growth models. However, as pointed out by Temple (2003), it is extremely difficult to discriminate between different theoretical growth models because we do not observe countries on their steady-state growth paths. Most of the empirical growth literature, however, looks at those factors that are associated with economic growth rather than trying to discriminate between different theoretical growth models.

80. A large body of empirical literature also looks at the various factors that impact on economic growth. This section provides a brief review of the international literature on the role of convergence in economic growth and the influence of

---

[16] AK models take their name because the production function is specified as Y=AK.

economic policy, economic shocks, geography and institutions on economic growth. Much of this literature is based on cross-country growth regressions that are subject to various econometric problems. For example, endogeneity problems associated with variables influencing economic growth while economic growth influences these same variables makes identification of causality difficult. Furthermore, cross-country growth regressions are based on average relationships between per capita GDP growth and other variables. This allows one to make generalisations about the factors that are important to per capita GDP growth. However, the relationship between a particular variable (say financial development) and per capita GDP growth may differ for a particular country more or less than is suggested by the 'average' relationship from the cross-country growth regression.[17] Indepth reviews of the empirical growth literature include Klenow and Rodriguez-Clare (1997) and Temple (1999).

81. The growth literature identifies institutions, economic policies and economic geography as being important for per capita GDP growth. Moreover, the interaction of economic shocks with institutions and economic policies is also important to countries' relative economic growth performance. For example, countries relative economic growth performance may be adversely affected by poor institutions and economic policies that do not allow economies to readily adjust to economic shocks. Poor institutions and economic policies may also impact on the speed at which countries converge to their steady-states. Moreover, institutions, economic policies and economic geography may also determine countries' steady-state level of per capita GDP. The remainder of Chapter III considers each of these influences and how they relate to New Zealand's relative per capita GDP growth performance.

*Institutions*

82. According to North (1990; 1994) the incentive structures of societies are formed by institutions. Political and economic institutions are therefore underlying determinants of economic performance. Rodrik (2003) has also argued that sound institutions are essential in sustaining long-run growth via ensuring an economy is able to ride out adverse shocks more easily and maintain productive dynamism (dynamic efficiency).

83. The IMF (2003) have pointed out that the term 'institutions' has been applied to a wide spectrum of definitions that vary in the detail of specification. At one end is the notion of institutions as establishing "the rules of the game" for a society as suggested by North (1990), or the formal and informal constraints on political, economic and social interactions, and their enforcement characteristics. Toward the other end of the spectrum are definitions that specify in more detail the organisational, governance and incentive arrangements for entities, procedures, and regulatory frameworks. Examples include fiscal rules, the institutional design of central banks, international trade agreements, and regulations applying to various markets.

---

[17] This problem of 'parameter heterogeneity' has lead some to reject the cross-country growth regression approach (for example, Harberger, 1987). Additionally, it is one reason why predicted per capita GDP growth based on the estimates from a cross-country growth regression may differ from the actual per capita GDP growth for a particular country (see paragraph 99 for a discussion of this issue in relation to New Zealand).

84. Rodrik (2003) has pointed out that sound institutions should be based on first order economic principles (for example, protection of property rights, competition, and appropriate incentives) to underpin economic growth. However, he also noted there is wide scope in designing specific institutions based on first order economic principles. Hence it is possible for countries to develop quite different institutional arrangements which still underpin economic growth. In other words, the translation of economic principles into specific institutions leaves a lot of options open to policy makers.

85. The recent expanding volume of empirical research indicates that the quality of institutions affects the level of GDP per capita (see Hall and Jones 1999; Acemoglu, Johnson and Robinson, 2001; Rodrik, Subramanian and Trebbi, 2002; Easterly and Levine, 2003); the growth of GDP per capita (IMF, 2003b), and the volatility of growth (IMF, 2003b). The ways in which institutions are considered to affect the level, growth and volatility of GDP are complex and are likely to be interactive. One of the ways that institutional settings can affect the steady-state level of GDP per capita is through their influence on the rate of physical and human capital investment. The influence of institutions on the growth rate of GDP per capita may partly reflect their role in enhancing the sustainability of policies and improving incentives to innovate and raise productivity growth. Sustainable policies, by lowering uncertainty, may also contribute to the rate of investment and the steady-state level of GDP per capita. These same institutional characteristics may help improve the quality of fiscal and monetary policies and therefore the volatility of GDP per capita.

86. Nevertheless, in regard to institutional settings and economic policies (which are discussed in more detail below) there is still a lively debate concerning the relative importance of institutions and policies. For example Rodrik, Subrananian and Trebbi (2002) and Easterly and Levine (2003) consider that institutions dominate the influence of policy settings such as trade openness, whereas Sachs (2003) challenges this view. But it seems there is much potential for two-way interactions between policies and institutions. The IMF (2003b) argues that "sound policies need to be supported and sustained by strong institutions, while weak institutions may reduce the chance of good policies being adopted" (page 17).

87. There are good reasons therefore to think that the quality of institutions matters. The important issues for policy are the feasibility of introducing and sustaining good institutions, understanding what successful market based institutions deliver, recognising the appropriate form institutions should take, and understanding what can be done to spur institutional reform.

*Economic Policy*

88. The literature investigating the relationship between economic policy and economic growth has found an association between per capita GDP growth and many variables including macroeconomic stability, human capital accumulation, R&D, financial development, openness to trade, and innovation. Moreover, the literature has found a link between economic policy and the proximate sources of growth, especially physical capital accumulation. To the extent that these variables are determined by policy, they imply that macroeconomic stability, human capital accumulation, R&D, financial development, openness to trade, and innovation will influence per capita GDP growth.

89. Monetary and fiscal policies have the potential to influence long-run growth by minimising business cycle fluctuations, enhancing labour participation, lowering the interest rate premium, and reducing uncertainty around the sustainability of economic growth and low inflation. The potential for monetary and fiscal policy to raise an economy's long-run growth rate by minimising business cycle fluctuations is suggested by studies that have documented a link between short-run business cycle fluctuations and long run growth (Fatas, 2002).

90. Several studies have found a link between inflation and inflation variability and economic growth. For example OECD (2003a) found a negative relationship between inflation variability and economic growth. Furthermore, they also found an inverse relationship between capital accumulation and the level of inflation. The OECD have argued these findings are consistent with a view that uncertainty about inflation primarily influences economic growth by blurring price signals that are essential for optimal resource allocation, while higher levels of inflation discourage savings and investment.

91. There is an extensive literature investigating the relationship between fiscal policy and economic growth. Gemmell (2001, p. 20) has pointed out that results from early studies were non-robust because of limited data and the use of econometric techniques that would now be regarded as inappropriate. These early studies also ignored the government's budget constraint by including either government expenditure or taxes in the cross-country regression, but not both. More recent work (for example, Kneller, Bleaney and Gemmell, 1999) has sought to remedy these deficiencies by incorporating the government's budget constraint. Furthermore, these studies have also looked at the impact of distortionary and non-distortionary taxes and productive and non-productive government expenditures based on a framework suggested by Barro (1990). Robust findings from these studies are that for an OECD panel for the period 1970 to 1990, public investment spending had a positive impact on economic growth and higher 'distorting' taxes had a negative economic growth effect.

92. Public provision of infrastructure would generally fall within the category of "productive". However, estimates of the divergences between private and social rates of return to infrastructure investment is limited (Besley, 2001) and "decidedly mixed" (Gramlich 1994). For example, early investigations by Aschauer (1989a) found that for the United States, public investment in 'core' infrastructure such as highways, streets, water systems and sewers, had made a significant contribution to United States productivity growth. Moreover, Aschauer (1989b) found evidence that while public investment in some forms of infrastructure may "crowd-out" private investment, it can also complement private investment. His results imply that the complementary effects of 'core' infrastructure investment by the public sector may have dominated the crowding-out effect and raised the national level of total investment. However, more recent evidence from Holtz-Eakin and Schwartz (1995) find more modest productivity effects from infrastructure investments. The quality of these investments will also be important.

93. There are two main views of the part played by human capital in the growth process. One approach sees human capital as an input to production, with human capital entering the production function like physical capital. The alternative view suggests that the role of human capital is one of helping to absorb international technology spillovers. The latter view is usually modelled by

interacting the level of human capital with a productivity catch-up variable. The empirical evidence regarding the two views is mixed. Several studies have found that human capital is an important proximate source of growth (Mankiw, Romer and Weil, 1992 and OECD, 2003a), while other studies have found that human capital is important to the growth process because it facilitates technology and knowledge spillovers. Some studies have also found human capital threshold effects where a host country needs to have a minimum threshold level of human capital to absorb international technology and knowledge spillovers (Borensztein, De Gregorio and Lee, 1998; Benhabib and Spiegel, 1994).

94. Recent OECD (2003a) work has suggested there are substantial gains from further investment in human capital, with estimates suggesting that one additional year of schooling across the workforce could raise the level of per capita GDP between 4 percent and 7 percent. The size of this effect might point to an aggregate return to investment in education that is larger than the return to individuals. The larger economy-wide return to education could be due to productivity spillovers between workers or because of links between human capital accumulation and technological advance through the creation, adoption and adaptation of technology. Engelbrecht (2003) has found some support that human capital is important as both an input to production and a means of facilitating technology spillovers for OECD countries.

95. R&D plays a central role in a number of theoretical growth models (for example, Romer, 1990) and therefore the impact of R&D on economic growth has been investigated in a number of empirical studies. Although several microeconomic studies have found a high private return to R&D, the studies that have looked at R&D knowledge spillovers between countries suggest that the social return on R&D is higher still (Temple, 1999). The OECD (2003a) found evidence of a link between R&D and economic growth, although their results suggested that it is R&D performed by private sector business, rather than through government funded agencies, that have the strongest link to per capita GDP growth. However, the OECD also noted that publicly funded R&D is likely to be important in generating 'basic knowledge' that may have significant spillovers, and that lags from public sector R&D to economic growth can be quite long and therefore difficult to identify.

96. Related to R&D is the role played by innovation in driving per capita GDP growth. Innovation involves producing a new and profitable product or finding a more profitable way of producing an existing one (Treasury, 2002a). Given the importance of knowledge accumulation in sustaining per capita GDP, an environment and policies that foster innovation are important in raising and sustaining New Zealand's economic growth.

97. Croxson (2003) has argued that innovation is costly because it involves firms creating new products or processes, or adapting existing products or processes. Integral to the innovation process is the capability to absorb existing knowledge. The capacity to absorb knowledge is likely to be particularly important for small countries where knowledge creation is likely to occur on a smaller scale. In this direction, it is interesting to note some research has suggested New Zealand's ability to absorb R&D knowledge spillovers has been poor. This may be a function of deficiencies in New Zealand's National Innovation System.

98.    There is a burgeoning cross-country literature looking at the importance of financial market development to economic growth.  A good review of this literature is Levine (1997).  Temple (1999) concludes that the literature suggests the depth of financial intermediation seems important.  Recent work for OECD countries also finds a link between financial sector indicators and economic growth and some evidence of a link between private sector credit (which is a proxy for banking sector development) and per capita GDP growth.  There is also a positive relationship between private sector credit and investment, suggesting that a well-developed banking sector is important in channelling funds to high return economic activities.

*Economic Geography*

99.    Insights from the endogenous growth literature have influenced thinking about the impact of distance from markets and market size on economic growth.  Distance from markets and market size may reduce the scope for agglomeration in the factors that contribute to knowledge accumulation.  Distance from markets may also make it difficult to achieve substantial external scale economies because distance adversely impacts on international flows of capital, people, goods and services, and technology.  Furthermore, a relatively small domestic market may reduce the scope for internal scale economies

100.    The idea that distance impacts on the distribution of international trade has been formally tested with gravity models.  Widely cited is the work of Frankel and Romer (1999) who found that distance had a negative effect on international trade.  In other words, the propensity to trade was found to be inversely related to distance from markets.  They argued this implies that trade is a mechanism to achieve scale economies.

101.    More recently these gravity models have come under closer scrutiny.  For example, Coe, Arvind, Tamirisa and Bhavnani (2002) have suggested that stable gravity models in the presence of falling transport costs are somewhat puzzling.  When these authors specified the gravity model to allow for the impact of changing transport costs through time, they found that, while still statistically significant, the impact of distance on trade has fallen substantially over time.  Nonetheless, the authors still found an impact of distance from markets on trade (around 60-75 percent of the effect that distance had in 1975).

102.    A number of studies have found a positive relationship between international trade and the level and growth rate of per capita GDP.  However, because of endogeneity problems in panel growth regressions, where causation may run both from trade to growth and from growth to trade, the evidence is far from conclusive.  For example, Rodrik, Subramanian and Trebbi (2002) found that when using predicted trade shares from a gravity model in cross-country per capita GDP regressions, the coefficient on the instrumental trade variable was negative and insignificant.

103.    Technology transfer may also be hampered by distance.  While the emergence of new information and communications technologies may have led to the reduction in the costs of transferring some information between countries, some evidence suggests that because of the increasing complexity of some forms of information, the costs associated with transfer have increased.  This is owing to the tacit

nature of this form of information, which requires face-to-face contact for transfer to occur (Leamer and Storper, 2001; McCann, 2003).

*Economic Shocks*

104. Easterly, Kremer, Pritchett and Summers (1993) have argued that economic shocks are important in explaining the cross-country variation in per capita GDP growth. Starting with the fact that decade average per capita GDP growth rates were unstable over time, while country characteristics (trade share, education attainment, etc) were highly persistent, the authors found that economic shocks, particularly terms of trade shocks, explained a significant amount of the cross-country variation in per capita GDP growth.

105. Rodrik (1998) has argued that the impact on growth arising from adverse shocks will also depend on the degree of latent social conflict in an economy as well as the institutional arrangements in place for conflict management.

*Convergence*

106. The renaissance of research on economic growth beginning in the second half of the 1980s has resulted in debate about whether the levels of per capita GDP in different countries with similar economic institutions and structures should converge over time. Per capita income convergence, which is often described as "catch-up", is a property that is derived from the neoclassical growth model (Solow, 1956 and Swan, 1956), although it is possible to construct an endogenous growth model that also exhibits convergence (Baumol, 1986; De Long, 1988; Barro and Sala-i-Martin, 1997).

107. The neoclassical growth model states that the further away a country's level of per capita GDP is from the steady-state level of per capita GDP, the faster its growth rate of per capita GDP. When a group of countries have a similar steady-state, the neoclassical growth model predicts that poorer countries will grow faster than richer countries, leading to convergence in the level of per capita GDP across countries. The hypothesis of convergence in per capita GDP amongst countries with similar steady-states, also known as *absolute β-convergence*, lends itself to the estimation of the following cross country regression equation:

$$\frac{1}{t}\ln\left[\frac{y(t)_i}{y(0)_i}\right] = a + b\ln(y(0)) + \varepsilon_i \tag{3}$$

where *y(t)* is the level of per capita GDP in time *t* and *y(0)* is the level of per capita GDP in the initial period. When $\hat{b}$ is less than zero, there is sample evidence of β-convergence.

108. However, it is possible that countries do not converge to the same level of per capita GDP because of differences in their steady-state levels of per capita GDP. In other words, countries may converge to their steady-state level of per capita of GDP, but these may be different between countries owing to different steady-state levels of per capita GDP. This is known as *conditional β-convergence*,

which lends itself to the estimation of the following cross country regression equation: [18]

$$\frac{1}{t}\ln\left[\frac{y(t)_i}{y(0)_i}\right] = a + b\ln(y(0)) + \Psi + \varepsilon_i \tag{4}$$

where $\Psi$ is a vector of variables that control for differences in the steady-state level of per capita GDP across countries.

109. Differences in steady-states between countries, say because of differences in structural characteristics, has spawned a literature investigating the formation of 'convergence clubs': the notion that countries with similar steady-states exhibit absolute convergence.

110. The finding that groups of countries exhibit convergence in per capita income does little to elucidate what is the driving force behind convergence. Convergence in the neoclassical growth model is driven by capital flowing to countries where per capita GDP is lower (and hence where the rate of return on physical capital is higher). However, it is possible to conceive of a model in which per capita income convergence is driven by technology catch-up as low-income countries converge towards the technology frontier. Klenow and Rodriguez-Clare (1997) have characterised the debate between those who favour technological catch-up versus capital accumulation in driving convergence as the $A$ versus $K$ debate (where $A$ denotes technology and $K$ denotes capital from an economy-wide production function).

111. The empirical growth literature has also looked at $\sigma$-*convergence*, which is defined as a reduction in the dispersion of per capita GDP levels over time. Denoting the standard deviation of the log of per capita GDP as, σ, σ-convergence occurs among a group of country's when:

$$\sigma(t) < \sigma(0) \tag{4}$$

where 0 and t denote the initial time period and time t, respectively.

---

[18] The neoclassical growth model predicts convergence in per capita GDP levels among economies that have similar steady-states. More generally stated, the neoclassical growth model predicts *conditional $\beta$-convergence*, where convergence in per capita GDP is *conditional* on holding steady-state characteristics of different economies constant. The neoclassical growth model does not predict *absolute $\beta$-convergence,* the notion that cross country GDP levels will converge regardless of differences in the steady-state level of GDP between different countries. When researchers are dealing with a sample of countries where steady-states are likely to vary substantially, additional variables are included in the regression equation to control for cross-country differences in steady-state levels of per capita GDP. In the neoclassical growth model the steady-state level of per capita GDP is dependent on the level of savings, population growth and the depreciation rate of the capital stock. These variables are often used to condition on the steady-state. A range of additional variables is often included to control for other dimensions of the steady-state. For example, Barro (1991, 1997) has included variables that control for the level of government spending, protection of property rights, and market distortions.

112. A necessary condition for $\sigma$-convergence is that economies exhibit *absolute $\beta$-convergence*. That $\beta$-convergence is a necessary condition for $\sigma$-convergence can be readily seen in Figure 18.

**Figure 18: The relationship between $\beta$-convergence and $\sigma$-convergence**



a) β- and $\sigma$-divergence       b) β- and $\sigma$-convergence
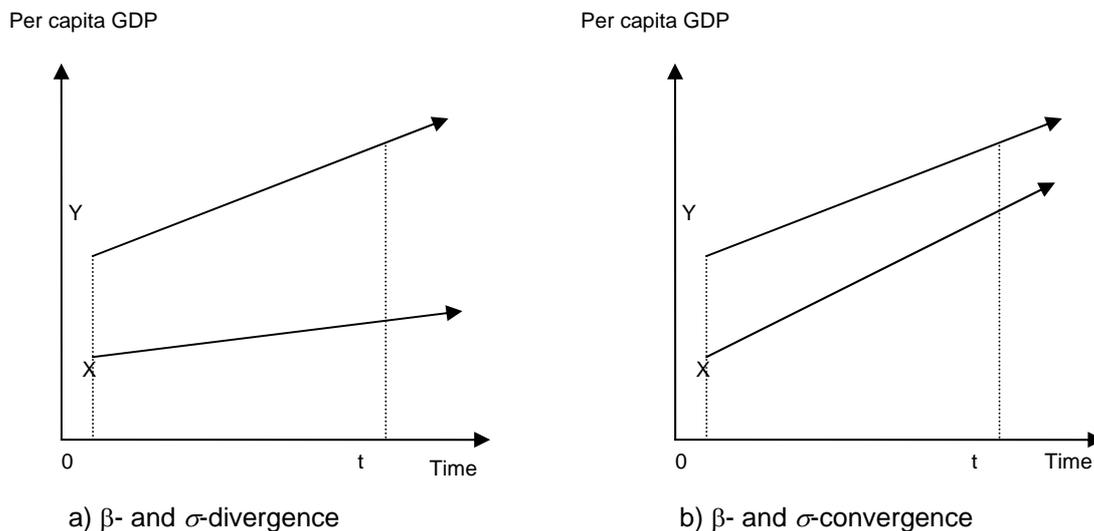
113. Figure 15 shows the time paths for GDP per capita for economies X and Y. The dispersion of per capita GDP is measured by the vertical distance between the two economies. Panel a) shows the absence of $\beta$-convergence, and hence the absence of $\sigma$-convergence, between economies X and Y.[19] In contrast, Panel b) shows the level of per capita income in economy X 'catching-up' towards that in economy Y (β-convergence), with the dispersion of per capita GDP narrowing over time ($\sigma$-convergence).

114. Various studies have found evidence of a β-convergence relationship among the OECD countries for the period 1970 to 2000, but the speed of convergence is slow (although recent OECD (2003a) work has suggested that conditional β-convergence is reasonably fast). This work suggests the OECD countries may constitute a convergence club. Furthermore, it also suggests that part of the explanation for New Zealand's long-term decline in its OECD income per capita ranking may be due to the convergence catch-up of previously lower ranked countries. For example, in 1970 Ireland was ranked 22nd in the OECD in terms of its GDP per capita. New Zealand ranked 9th. In 2000 Ireland was ranked 3rd while New Zealand was 20th. This reversal of rankings is probably attributable to more than a convergence effect. Nevertheless, Honohan and Walsh (2002) attribute the rise in Ireland's growth rate to a delayed convergence or catch-up effect.

---

[19] Because the path of GDP per capita in economy X does not converge towards the level of per capita GDP in economy Y, the dispersion of per capita income widens over time (that is, there is *$\sigma$-divergence*).

**Explanations for New Zealand's Economic Growth Performance**

*Institutions*

115. In the discussion of the impact of convergence, economic shocks, and distance from markets we have suggested that prevailing institutions are important conditioning factors that can either accentuate or mitigate the impact of economic shocks and distance from markets on countries' level and rate of economic growth. As discussed in paragraphs 82 to 87, the quality of institutions has long been considered important for economic growth and development. The enormous cross-country differences in per capita GDP have prompted renewed attention to this topic and spawned considerable empirical research. This research suggests that income differences are correlated with indicators of institutional quality (see the review in Chapter III of International Monetary Fund, 2003b).

116. Recent research linking institutions to a country's historical origins and geographical influences suggests that New Zealand's early development into a relatively high income country may have reflected the establishment of institutions that supported investment and growth.

117. A possible reason for New Zealand's relative income decline during the post-war years may have been institutional catch-up in other countries, the erosion of historical ties that provided favourable trading conditions (e.g. favoured access into the UK market) and a falling behind in the quality and appropriateness of its institutions to cope with large relative price shifts and the globalisation of financial product markets.

118. Arguably New Zealand's institutional arrangements prior to the mid 1980s were highly centralised and promoted widespread regulation, protection and indexation. These institutions promoted unsustainable fiscal policy, monetary policy that was meant to achieve multiple objectives, centralised and relativities based wage bargaining, a protected tradeables sector, and a highly regulated public sector, culminating in high inflation and low per capita GDP growth compared to other countries. The institutional framework also exacerbated costs associated with structural adjustment because producers and consumers were unable to discern true (shadow) relative price signals because of distorted relative prices and high inflation. This is a further explanation for New Zealand's relative growth performance. As discussed in the section on economic shocks, in the face of adverse economic shocks in the 1970s, New Zealand's institutional arrangements probably exacerbated the impact on New Zealand economic growth compared with other countries.

119. A perception that New Zealand's institutions were leading to poor economic outcomes was part of the reason for embarking on a programme of economic reform commencing in 1984. Evans, Grimes, Wilkinson and Teece (1996) have argued that the principles underlying the reforms were coherent policies on a broad front, credibility and time consistent policies, policies that followed a comparative institutional approach, and efficient contracting arrangements.

*Economic Policy*

120. The international empirical literature suggests countries' economic policies are important to economic growth. However, when looking at New Zealand it is often the case that cross-country growth regressions predict higher per capita GDP growth than was actually realised. For example, based on the OECD (2003a) cross-country growth regression and New Zealand's policy settings over from the 1970s to the 1990s New Zealand's per capita GDP growth rate should have been around 0.9 percent per annum higher. This suggests there are other factors at work, in addition to economic policies, that have influenced New Zealand's relative per capita GDP growth.

121. Moreover, the OECD (2003a) study also suggested that changes in policy settings between the 1970s and 1980s and the 1980s and 1990s have been beneficial to New Zealand's economic growth. In particular, the OECD (2003a) suggested that improvements in human capital, reduced inflation variability, reduced size of government and increased trade exposure have all been beneficial to New Zealand's per capita GDP growth.

122. Other work has suggested there are dynamic interactions between institutions, economic policies, and convergence. For example, Honohan and Walsh (2002) have emphasised that macroeconomic stabilisation was a prerequisite for the surge in economic growth in Ireland, and that poor policy responses in the 1970s probably delayed convergence in Ireland.

*Distance from markets and market size*

123. Distance and size were considered potentially important influences on New Zealand's income growth by Gould (1982) and Franklin (1985) and these ideas have more recently been canvassed in Treasury's 1999 *Post Election Briefing*, and by Galt (2000), Skilling (2001a; 2001b) and Lewis (2002).

124. There are essentially two reasons why New Zealand's geographic characteristics may influence its per capita GDP growth. First, New Zealand's trade in international capital, technology and other international flows may be affected by its distance from key markets and by difficulties in getting access to preferential trade blocks (which in turn may be related to New Zealand's distance from markets). International trade provides a means by which an economy can lift its productivity growth by helping to achieve external economies of scale (which may lead to additional economic growth via human capital accumulation and learning-by-doing), exposure to greater competition, and technology transfer (Lewis, 2003). The second argument relates to the implications of market size. The small size of the domestic market coupled with its distance from larger markets means there is less scope for agglomeration of factors of production. To the extent that production is affected by agglomeration this may cause lower productivity growth. While other small countries have been able to reduce the impact of market size on their per capita GDP growth by expanding their market through international trade, this may have been harder for New Zealand.

125. As noted in paragraph 100, the idea that distance impacts on the distribution of international trade has been formally tested using gravity models. Even if one accepts that linear gravity models provide a reasonable approximation of the impact of distance on the distribution of international trade, it is interesting to note

that New Zealand exports more than is expected given its location (Leamer and Storper 2001; Smith, 2002), suggesting impediments arising from New Zealand's distance from export markets can be partly overcome through appropriate institutional arrangements.

126. Moreover, both the cost of international transport (Coe, Subramanian, Tamirisa and Bhavnani, 2002) and New Zealand's distance from economic activity have declined markedly during the past 30 years (Delaney, 2003). This suggests that the effect of distance on trade flows and economic growth may have diminished over time. This is consistent with the work of Subramanian, Tamirisa and Bhavnani (2002) who found that once gravity models are specified to incorporate changes in transport costs the impact of distance on trade has fallen substantially over time. The balance of evidence therefore seems to suggest that broadly defined transaction costs of trade have been falling over time (McCann, 2003).

127. However, the growing importance of tacit knowledge (that is, having an intimate understanding of local markets, being able to interact with key people in these markets, etc) and the costs associated with gathering it, which are probably a function of distance, may nevertheless maintain the importance of distance from markets as a hurdle for New Zealand in sustaining per capita GDP growth. The importance of face-to-face contact in facilitating technology transfer, which is more costly as distance from markets increases, is also an impediment to sustaining New Zealand's per capita GDP growth.

*Economic Shocks*

128. A third potentially important influence on New Zealand's relative economic growth performance between 1970 and 1990 is the impact of adverse economic shocks. In the late 1960s and in the 1970s New Zealand experienced a series of external shocks manifest in large reductions and fluctuations in its terms of trade and the loss of preferential access to the British export market. In the second half of the 1980s and early 1990s, New Zealand experienced a large internal shock owing to economic reform that lead to comprehensive restructuring. Arguably, the economic reforms that commenced in 1984 were in part a response to the external economic shocks that had earlier hit the New Zealand economy.

129. A number of authors have argued that economic shocks, particularly external economic shocks, have played a major role in the evolution of New Zealand's post war per capita GDP growth. For example, Easton (1997) has placed emphasis on the impact of the permanent collapse in the price of wool following the Korean War wool price boom and the switch to synthetics on New Zealand's per capita GDP growth. The sharp rises in the real price of oil in 1973 and 1979 have also been identified as significant influences on New Zealand's potential growth (See Buckle, 1978). The New Zealand economy for several reasons was, and remains, a net importer of oil, an input into production that is difficult to substitute away from and which impacts substantially on transport costs.

130. Higher oil prices particularly in the mid-1970s impacted on New Zealand's growth in several ways. First, this resulted in a slow-down in the industrialised countries' growth, owing to a redistribution of world income from oil importing to oil exporting countries. This initially impacted on the growth and distribution of demand for New Zealand's exports. Second, higher oil prices increased the real cost of intermediate inputs. In production processes that involve limited opportunities for

substitution away from oil to alternative inputs (or at least involve low rates of substitution); a rise in the price of oil is equivalent to a fall in the level of productivity (Bruno and Sachs, 1985). Third, an extension of this intermediate inputs transmission process is the impact that higher oil prices have on transport costs (Coe, Subramanian, Tamirisa and Bhavnani, 2002; Figure 2). This effect will have adversely affected the competitiveness of New Zealand export production and increased the foreign currency price of non-oil importable intermediate inputs.

131.    Furthermore, the institutional wage and price setting environment and monetary policy prevailing during the 1960s and 1970s made it more difficult to maintain macroeconomic stability in the face of these adverse shocks during the 1970s. As Bruno and Sachs (1985) and Findlay and Rodriguez (1977) showed, higher oil prices can precipitate stagflation. This stagflation effect was accentuated by the indexation based wage-price inflation process that prevailed in New Zealand during that period.

132.    The social and political conflicts that arise from shocks of the type New Zealand experienced during the late 1960s and the 1970s are also likely to have a significant bearing on how a country's growth rate responds. Some econometric support for this proposition is provided by Rodrik (1998). He finds that countries that experienced the sharpest drops in growth after the oil price shocks of the 1970s were those countries with weak institutions of conflict management (as represented by the quality of governmental institutions, etc). New Zealand's government institutions, rule of law and social institutions were not markedly different to other higher income countries in the 1970s. Nevertheless it was characterised by relatively high levels of border protection, internal production subsidies, and institutionally enforced wage and price indexation. These characteristics coupled with reforms introduced much later than in some countries (USA, UK and Australia for example) may have prolonged the negative growth effects of the adverse external shocks experienced in the late 1960s and the 1970s compared with other countries.

133.    An initial assessment would suggest that this hypothesis is supported by the evolution of New Zealand's per capita GDP relative to the OECD mean between 1970 and 2001. This can be seen from Figure 9 where big declines in New Zealand's per capita GDP as a proportion of the OECD mean occur at times when New Zealand experienced substantial adverse economic shocks. The first big decline occurs between 1975 and 1980, when New Zealand's OECD per capita GDP ranking also fell from 7th to 18th, following the oil price shocks. The second big decline occurs between 1985 and 1993, the period in which New Zealand experienced comprehensive and widespread economic reform. With the exception of these two periods, where level shifts in New Zealand's per capita GDP as a proportion of the OECD mean occur, the ratio of New Zealand to mean OECD per capita GDP remains fairly constant. This implies that during periods in which New Zealand did not experience substantial economic shocks, per capita GDP growth was similar to OECD mean per capita GDP growth.

134.    Moreover, despite some substantial adverse shocks to the New Zealand economy over the 1990s, the majority of which were external shocks, in addition to successive droughts in 1997 and 1998 (Buckle, Kim, Kirkham, McLellan and Sharma, 2002), the New Zealand economy posted per capita GDP growth that was slightly higher than the OECD average. This suggests that one of the further

benefits of economic reform in New Zealand is an economy that is able to better adjust to economic shocks.

*Convergence*

135. The convergence literature raises a number of insights and issues relating to New Zealand's economic growth performance. Because New Zealand started the post-war period with a relatively high level of per capita income, the convergence property suggests New Zealand's per capita GDP growth would be slower than most OECD countries. However, New Zealand continued to experience slower growth throughout the 1970s and 1980s that suggests there may have been other factors at work. One possible explanation is that New Zealand's institutions and economic policies were not conducive to facilitating per capita income convergence in New Zealand during this period. Honohan and Walsh (2002) have proposed a similar argument in regard to Ireland's economic growth performance.

136. Alternatively, there is the issue of whether New Zealand belongs to the OECD 'convergence club'. If New Zealand is not in the OECD 'convergence club' because of its structural characteristics (for example, New Zealand's size and distance from markets or industrial structure), which may result in a lower steady-state level of per capita GDP, New Zealand's per capita GDP may differ from the other OECD countries.

137. Although New Zealand was below the average OECD convergence relationship (that is, the regression line) for the entire 1971 to 2001 period, 10 year rolling regressions show that the gap between New Zealand and the regression line has narrowed over time. This is consistent with the hypothesis of institutional reform that began in the mid-1980s facilitating per capita GDP convergence back to the OECD mean. While New Zealand's relative income per capita may have declined since the 1960s, with appropriate reform of domestic institutions the convergence hypothesis would suggest there is the prospect of eventual catch-up. Furthermore, evidence that New Zealand is relatively capital shallow (IMF, 2002) and probably behind the technology frontier, suggests there is scope for convergence in New Zealand's per capita GDP.

138. Nonetheless, even if one accepts that the convergence relationship has moved in New Zealand's favour in the last decade, other factors have probably also been at work.

*Reforms, sequencing, learning and lags*

139. The literature looking at the interaction between economic performance and institutions (formal rules and enforcement characteristics) has suggested there might be long lags between institutional reform and changes in firm and household behaviour. For example, North (1994, p. 366) has noted that the "rules of the game" may change overnight but that informal norms usually change only gradually. This coupled with the observed relationship in some countries between economic policy settings and convergence, the nature of the shocks that hit an economy, and the importance of reform sequencing, suggests the lags associated with the impact of reform on economic growth could potentially be long and persistent.

140. The main argument for undertaking the reforms in New Zealand, as expressed in the 1984 Treasury Post Election Briefing, was that they would generate a substantial improvement in allocative efficiency. It was also thought that gains from productive and dynamic efficiency would be generated by the improved policy settings. Allocative efficiency gains were expected to come about through a more stable economic environment in which relative price signals are relatively undistorted, leading to resources flowing into those sectors offering the highest returns. Productive efficiency gains were expected to arise as firms moved closer to the production possibilities frontier (PPF) by improving processes and operations, cutting costs, and adopting new technologies from overseas. Dynamic efficiency gains were also expected to result as firms should have clearer incentives to respond to changing markets and to develop profitable new opportunities (Skilling 2001c).

141. At the time there was significant debate around the optimal scope and sequencing of the reforms. In particular, the order in which trade, fiscal, monetary and foreign exchange measures were undertaken is likely to have had an impact on the final outcome of the reforms when the transition from one steady-state growth path to another is not instantaneous.

142. It is generally agreed that, if politically feasible, trade and labour market reforms should come early in the reform process, as should reform of the financial system, although gradually. Only in the final stages of the reform process should international capital controls be relaxed. The rationale for this is the fact that free capital flows have been a major source of difficulties for the reform process in countries that have undertaken a combination of stabilisation and financial liberalisation policies. This is because these policies tend to increase the perceived returns on domestic assets, and with a flexible exchange rate, the resulting capital inflows are likely to lead to an appreciation of both the real and nominal exchange rates. This would generally be incompatible with the desire to successfully liberalise the tradeables sector and may destabilise the adjustment process (Buckle 1987). In the event, owing to political constraints, financial market reform, the removal of international capital controls, and the floating of the exchange rate came very early in the reform process. Fiscal and labour market reform both came in the later stages.

143. Hall (1996) uses simulations from a small model of the New Zealand economy to assess whether economic growth could have been better if the sequencing of certain key policy changes had been different. In particular, he examined the sequencing of labour market and fiscal reform and found that the sequencing of these reforms had a substantial impact of some key macroeconomic variables.

144. Another reason why an economy may take time to respond to economic reform is that it takes time for an economy to learn what it is good at producing, combined with a market failure that exacerbates this lag (Hausmann and Rodrik, 2002). For example, following the opening up of a country to international trade and investment, it may take time for a country to discover what it is good at producing (or rather what it can produce at relatively low cost). Once this discovery is made this information has high social value because other local firms can profitably imitate it. However, the private incentive to make such discoveries will be less than their social value because the discoverer will not be able to fully appropriate the knowledge and earn returns reflecting the social value. Therefore, there will be too little effort devoted to making such discoveries.

145. This problem is compounded since the discovery of how to apply existing foreign technology in a local setting can be very costly but is not something that can usually be protected as private intellectual property. The problem therefore typically affects "follower" economies seeking to modernise and raise productivity and per capita growth via the application of modern technology from abroad.

146. Changes in management techniques and culture also take time. Following reforms and a change in economic environment current managers and management structures will not necessarily be suitable for the post reform environment. It will take some time before management culture changes and management cohorts move on and new managers are in place that are better positioned to take advantage of the new environment.

147. It also takes time to shift resources. Although reforms may make relative price signals clearer so that resources should flow to sectors offering the highest returns, not all factors of production are perfectly mobile. This means it will take time for resources to shift to the most productive sectors and for the economy to realise the resulting gains in allocative efficiency. For example, labour may have to learn new skills, and some types of capital equipment are extremely specialised and simply cannot be used for purposes other than those they were designed for.

148. The international evidence on the outcomes of reforms and the existence of lags is somewhat cloudy. Honohan and Walsh (2002) review Ireland's economic development since the 1960s with a view to putting into context the strong growth in the 1990s. The Irish economy of the 1960s was stable but it had a lower standard of living than the UK that was attributable to a much lower participation rate and a high proportion of labour in the low income rural sector. Although the Irish economy was ripe for a catch up this did not occur until much later. This delay was mainly due to poor macro policies (inappropriate responses to the oil shocks: an expansionary fiscal policy and abandonment of the fixed link to the sterling which resulted in a loss of fiscal and monetary control). It wasn't till around 1987 that the catch up began with a strong fiscal consolidation. The growth surge continued through the 1990s and was driven by increased levels of human capital, increased participation, strong foreign direct investment (FDI) and favourable circumstances facing the tradeable sector.

149. In contrast to Ireland the UK undertook two decades of economic reform beginning in 1979 under Margaret Thatcher. Card and Freeman (2002) have argued that these reforms have made the UK more market friendly than its traditional European competitors. In addition the UK was able to halt its nearly century long relative decline in GDP per capita and labour productivity and has partially closed the gap between itself and France and Germany.

**Summary**

150. Chapter III has highlighted the importance of institutions and economic policies to New Zealand's relative economic growth performance, particularly in relation to difficulties the New Zealand economy experienced in adjusting to economic shocks in the 1970s and the 1980s. Subsequent institutional and policy reform has been associated with per capita GDP growth in New Zealand that has been around the OECD average, even though New Zealand experienced a number of adverse economic shocks over the 1990s. Institutional and policy reforms are

likely to have raised New Zealand's steady-state level of per capita GDP and the speed at which New Zealand converges to this steady-state. Furthermore, as noted by Rodrik (2003) the maintenance of institutions that embody first order economic principles, such as the protection of property rights, is important to sustaining per capita GDP. Nonetheless, New Zealand's steady-state level of per capita GDP may be impacted by the size of New Zealand's domestic market and the distance from overseas markets. However, this impact may be alleviated by fostering institutions and policies that help to mitigate the effect of New Zealand's geographical characteristics on its per capita GDP growth.

## IV.  NEW ZEALAND POLICY PRIORITIES

**Introduction**

151.  The purpose of Chapter IV is to identify the policy priorities for sustaining higher economic growth in New Zealand.  Chapters 2 and 3 have provided an empirical and theoretical basis for examining key policy areas that are likely to contribute to sustaining and raising New Zealand's per capita GDP growth.  Chapter IV builds on chapters 2 and 3, discussing specific policy settings and improvements that are likely to enhance the influence of ultimate determinants on growth.  There is significant overlap between the policy areas offering opportunities for improvement that were identified in the Treasury's Briefing Paper to the Incoming Government (Treasury, 2002a) and those identified in this chapter.  However, this chapter incorporates additional policy issues that have arisen since the 2002 election and develops several areas in more depth.

152.  Figure 19 is a stylised representation of the growth accounting framework that can be used to identify important policy areas for economic growth.  This framework provides a systematic approach to covering the policy areas discussed in this chapter.  The economic growth literature has also guided the choice of areas important for sustaining and raising New Zealand's per capita GDP growth, as have comments made by international agencies (including the International Monetary Fund, OECD and the World Trade Organisation).  The list of areas likely to offer opportunities for improving New Zealand's growth performance is not exhaustive.  But comprises issues that in Treasury's judgement offer the greatest potential payoff to policy attention.  Chapter III provides the underlying rationale for organising the policy issues into the themes listed in Figure 19 and how policies discussed under each theme can affect the growth accounting components of economic growth.

153.  As explained in Chapter II, per capita GDP growth can be decomposed into labour productivity and labour utilisation.  Labour productivity can be further decomposed into growth in multifactor productivity and growth in the capital-labour ratio.  The proximate sources of growth (represented by the four middle boxes in Figure 19) are influenced by the policy areas that make up the environment within which firms and individuals operate (represented by the bottom box in Figure 19).  For example, labour-market regulation will affect labour utilisation through the impact of regulation on firms' employment decisions, incentives for skill development.  The mobility of labour and labour costs.  New Zealand's global connectedness is important to the extent that trade and the absorption of new ideas and technology impact on economies of scale and productivity growth.

154.  Scope exists to increase labour utilisation, particularly through raising labour participation rates, even though New Zealand already has relatively high rates of labour utilisation (refer figure 7).  The greatest scope for sustained increases in economic growth however lies with increasing labour productivity.  This may be achievable in the medium term through capital deepening.  In the long term, a sustained faster rate of labour productivity growth will require higher multifactor productivity growth.  To achieve this will require a range of policies that induce higher physical capital investment, firms that innovate, and sustained investment in human capital.  The latter will be important in facilitating technology uptake and spillovers.

**Figure 19: Contributors to economic growth**

```
                          ┌─────────────────────┐
                          │   GDP per capita    │
                          │      growth         │
                          └─────────────────────┘
                           ↗                   ↖
        ┌──────────────────────┐        ┌──────────────────────┐
        │  Labour productivity │        │   Labour utilisation │
        │       growth         │        │        growth        │
        └──────────────────────┘        └──────────────────────┘
                   ↑                                ↑
        ┌──────────────────────┐        ┌──────────────────────┐
        │ Capital per worker   │        │ Participation rate   │
        │      growth          │        │      growth          │
        │                      │        │                      │
        │ Multifactor          │        │ Unemployment rate    │
        │ productivity (MFP)   │        │                      │
        │      growth          │        │                      │
        └──────────────────────┘        └──────────────────────┘
             ↑          ↑                     ↑           ↑
        ┌──────────────────────────────────────────────────────┐
        │ Macroeconomic framework, Public sector management,    │
        │ Saving investment and financial systems,              │
        │ Infrastructure, Human capital and labour markets,     │
        │ Enterprise and innovation                             │
        └──────────────────────────────────────────────────────┘
```
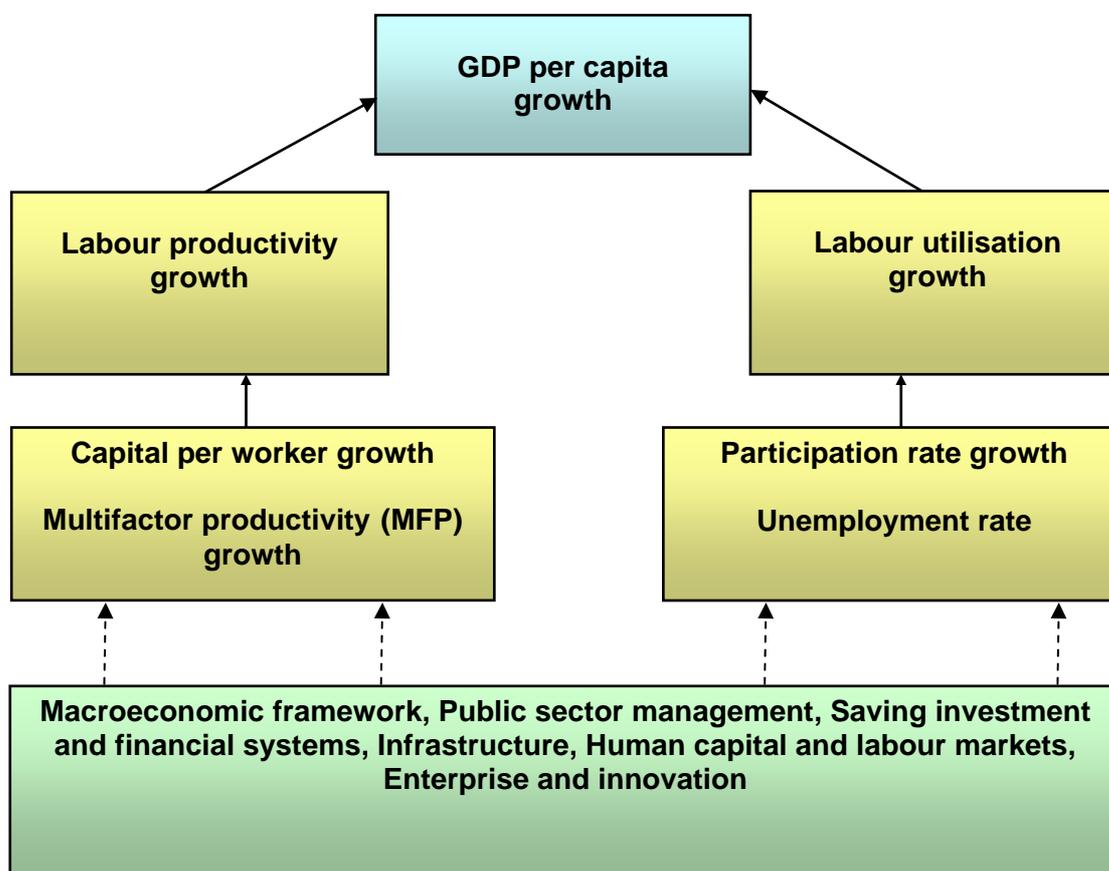
155. While the framework presented in Figure 19 is a useful taxonomy for organising discussion about how the different policy areas impact on per capita GDP growth, it is not a model of economic growth. Moreover, it does not capture interactions that may occur between different components in the system. For example, to the extent that learning-by-doing affects skill development, changes in labour utilisation and the duration of employment will impact on multifactor productivity growth and therefore labour productivity growth. Similarly, to the extent that new technology is embodied in new physical capital, increases in physical capital investment by firms may also raise multifactor productivity growth. Hence, labour market institutions and regulations that impact directly on the labour utilisation rate may impact on the rate of growth of multifactor productivity. Similarly, impediments to growth in firm capital investment may also impact on multifactor productivity growth.

156. There are many potential interactions of this type. Formal general equilibrium models of the economic growth process endeavour to capture the most important of these direct and interactive influences of institutions, economic geography and policy on the economic growth process. These effects will depend on the type of

formal model of the growth process. This chapter is not intended to capture all these interactions. Its purpose is to form judgements about the most important channels of influence and where policy can be improved to exploit these influences.

157. These judgements involve assessments of ways in which the economic environment and the structure and behaviour of markets can be improved to enhance incentives for firms and individuals to invest in human capital and physical capital, and to innovate. They need to be based on evaluations of the effectiveness of government interventions intended to correct market failures. For example, addressing market failures in the business environment may help to equalise social and private rates of return and to this extent would be beneficial for growth and welfare. However, a downside that must be considered in policy formulation is what is sometimes called "government failure": poorly designed policies may foster a culture that encourages lobbying government for favours, and this has the potential to undermine growth gains and put pressure on the fiscal position.

158. The rest of Chapter IV is organised around the policy areas that are listed in the bottom panel of Figure 19. They are broadly arranged in order starting from the influences of the macroeconomic environment on the incentives of firms and labour, down to specific labour-market and business conditions.

**Macroeconomic framework and stability**

159. Well designed fiscal and monetary policies can enhance growth by minimising business cycle fluctuations, enhancing labour participation (through well designed taxation and benefit structures), lowering interest rate premiums, and reducing uncertainty around the sustainability of economic growth and low inflation.

160. The main roles for monetary policy in developed economies are to ensure the stability and efficiency of the financial system and to achieve low inflation. These objectives contribute to growth by reducing uncertainty and improving the allocation of resources. This is achieved by creating an environment that facilitates the mobilisation of savings, the trading, hedging, diversification and pooling of risk, and the reduction of information, monitoring and transactions costs. The environment will also reduce price uncertainty. There is however widespread debate concerning the consequences of inflation targeting for exchange rates, interest rates, and business cycle volatility.

161. New Zealand's consumer price inflation in the 1970s and 1980s was amongst the highest and most volatile in the OECD. The introduction of inflation targeting in New Zealand was followed by a marked reduction in inflation, with the annual rate of CPI inflation averaging around 2 percent over the 1990s. Moreover, Buckle, Kim and McLellan (2003) presented evidence that on average monetary policy had a countercyclical impact on GDP and CPI inflation around trend, although there are periods when this was not so. They also found that monetary policy generally contributed to the reduction in GDP and inflation variability in the inflation-targeting period.

162. Fiscal policy, that is the level and composition of taxation and government spending, can also affect the level of income and its growth rate. Governments also use fiscal policy to pursue equity objectives. Much of the literature has

focussed on the relationship between the 'size' of government and growth. However, as discussed in paragraph 91, a more useful way to evaluate the growth effects of fiscal policy is to think about the distinction between 'distortionary' and 'non-distortionary' taxes and between 'productive' and 'non-productive' public expenditure.  A sound fiscal position may also enable an economy to cope with shocks, helping to reduce volatility.

163. Fiscal policy is solvent if it satisfies the intertemporal budget constraint (IBC). However, the IBC can be met by potentially large changes to the primary balance sometime in the future.  Sustainability is satisfied when the IBC is satisfied without the need for large fiscal corrections in the future (Janssen, 2002).  This requires that fiscal balances over time are large enough to cope with uncertainties about (i) trend real GDP growth, (ii) short-term shocks to the fiscal balance (Buckle, Kim and Tam, 2002) and (iii) the fiscal effects of population ageing included in the IBC (Janssen, 2002; Creedy and Scobie, 2002).  If conditions (i) and (ii) are satisfied, then over shorter time horizons fiscal policy would be able to rely more heavily on automatic stabilisers to cope with adverse shocks rather than having to reverse fiscal policies to maintain a sustainable fiscal position.  Over longer time horizons, sustainability would also require that condition (iii) were met.

164. The level of public debt is potentially another mechanism through which fiscal policy can influence growth.  New Zealand's real interest rate has declined in line with world interest rates since the early 1990's.  Research suggests the level of public indebtedness influences the real interest rate premium and the decline in public indebtedness has contributed to the decline in New Zealand's real interest rate (Plantier, 2003).  Whether further reductions in public indebtedness will have a similar impact is unclear.  As the level of public debt decreases, the marginal benefit of further reductions in lowering real interest rates may get smaller.

165. As with the outcomes associated with monetary policy, there has been a significant improvement in New Zealand's fiscal performance.  Governments have run fiscal surpluses since the mid-1990s and there have been large falls in New Zealand's public debt levels as a percentage of GDP.  At present, New Zealand's gross public debt to GDP ratio is one of the lowest in the OECD and the government spending to GDP ratio is slightly lower than the OECD average (Grimes, 2003).

166. Crown balance sheet management can impact growth through influencing the long term level and variability of tax rates (Bohn, 1990), by influencing government incentives to pursue time-consistent policies, and by influencing the level of national savings.  The structure of the Crown balance sheet can also influence financial markets by providing financial securities and products for risk sharing.

*Monetary policy framework*

167. The Reserve Bank Act (1989) assigns the Reserve Bank of New Zealand with the responsibility of maintaining price and financial stability.  In relation to the former, the *Independent Review of the Operation of Monetary Policy in New Zealand (*Svensson, 2001) found New Zealand's monetary policy to be consistent with international best practice as a flexible inflation targeting central bank.  The current Policy Targets Agreement (PTA) between the Governor of the Reserve

Bank and the Minister of Finance requires inflation outcomes between 1 percent and 3 percent on average over the medium term. The current PTA is consistent with the key principles set out in Treasury (2002b).

*Fiscal policy framework*

168. Current perception is that New Zealand's fiscal institutions and legislation governing fiscal policy are consistent with international best practice. The fiscal policy framework is primarily 'transparency' rather than 'rule' based, with a requirement for Governments to specify long term fiscal objectives and short-term fiscal intentions. The IMF (2003a) has noted that New Zealand's fiscal policy framework provides a sound medium term anchor and the OECD (2002) has commended New Zealand's fiscal provisions framework for being able to mitigate expenditure slippage by, amongst other mechanisms, raising the political cost of additional spending.

169. The Government's current approach to fiscal management aims to link short-term decision making to long term fiscal objectives, particularly the gross sovereign issued debt objective. The Government also aims to generate operating surpluses on average over the economic cycle to meet contributions to the New Zealand Superannuation Fund. For the 2003 Budget Policy Statement the long term fiscal objectives were simplified to increase their consistency and make it easier for the public to monitor whether the Government is progressing towards its objectives. Replacing the three year fixed provisions with an approach that manages more directly the fiscal objectives also provides an approach that is more easily adaptable to changing economic and fiscal information, but continues to retain the requirement to publish clear spending intentions in the *Economic and Fiscal Updates.*

170. An important challenge for New Zealand's fiscal policy is managing operating surpluses over the medium term. The Government's operating surplus is forecast to rise to around 4 percent of GDP over the period to 2007, which comfortably meets the Government's objective to run operating surpluses to make contributions to the New Zealand Superannuation Fund. For the year ended 30 June 2003 the Government's operating surplus was $5.6 billion. This healthy fiscal position presents the Government with scope to cut taxes, increase expenditure, and build-up financial assets. Treasury provided the Minister of Finance with several options for managing the surplus in May 2003 (Treasury 2003b). At the time, given the Crown's healthy balance sheet position, the Treasury suggested the growth benefits from further increasing financial assets, over and above the current investment programme, were less than cutting taxes or increasing spending.

171. Past experience has shown that capital spending initiatives tend to occur sporadically throughout the year, making it difficult to evaluate competing bids or to trade-off capital expenditure against operating expenditure. In 2002 the Government announced its intention to improve capital decision making processes, and recently Cabinet has decided to incorporate capital spending initiatives into the Budget process wherever possible. While this has gone some way to addressing problems with the capital budgeting process, there are still issues that need to be addressed to ensure capital is directed to the Government's highest priorities (see paragraph 192 for more detail on this issue in relation to State Owned Enterprise investment).

172. Long term spending pressures, associated with population ageing, increase the uncertainty around New Zealand's long term fiscal outlook. The extent of this uncertainty was explored in Creedy and Scobie (2002). This increased uncertainty has led to suggestions that New Zealand's fiscal policy framework may need broadening to better illustrate these long term spending pressures. For example, the IMF (2002) and the OECD (2002) commented on the challenge that resulting demands for increased social spending will represent to the fiscal position and fiscal policy framework. To deal with this issue, the OECD has suggested that specific timeframes be introduced for meeting long term fiscal objectives.

173. Treasury considers that specific time frames for fiscal objectives are inappropriate because these time frames can ignore changing economic situations, creating perverse incentives for fiscal decisions. Instead, a number of changes have been made to directly ensure the fiscal framework adequately considers long term spending pressures. The Public Finance (State Sector Management) Bill (2003) will require specification of time horizons for long term fiscal objectives, without introducing specific timeframes for achievement. The Act will also require an increased level of long term reporting through publication of 40 year fiscal projections every four years. In 2002 the Government renewed its commitment to ensuring short-term fiscal policy decisions are more directly linked to the Government's long term fiscal objectives through changes to the fiscal management process. The New Zealand Superannuation Fund has also been setup to tax-smooth long term spending pressures arising from increasing pension costs.

*Structure of Government Revenue, Expenditure and the Balance Sheet*

*Government revenue*

174. A foundational principle for a taxation system that seeks to support economic growth is that it should be "broad based – low rate" (BBLR). BBLR taxation helps to support economic growth by minimising distortions arising from the harmful impact of tax on incentives and relative prices that may adversely distort behaviour and the allocation of resources. A further principle for designing the taxation system in a small open economy like New Zealand is that residents should be taxed on their world-wide income while non-residents should be taxed lightly, if at all.

175. From a purely growth focus without taking into account other welfare implications, moving to a flat tax rate for both personal and corporate tax rates is likely to have the greatest impact on economic growth as it conforms most closely to the BBLR principle. While in depth analysis of this option has not been undertaken by Treasury, theory and some empirical evidence suggest a positive effect for economic growth. Some initial approximate calculations suggest the fiscal cost of moving to an 18 percent flat tax rate for example would be $4.7 billion. This calculation does not consider dynamic effects including labour supply responses, effects on revenue from other taxes, savings from reduced administration and compliance costs, or revenue from other base broadening changes.

176. A less radical and less effective option to enhance economic growth would be to reduce the top personal tax rate because of the adverse impact that a high

personal income tax rate is likely to have on input accumulation via reducing the incentive to work, save and invest (which is most distortionary for those facing the highest marginal personal tax rate). Furthermore, cutting the top personal tax rate to 33 percent would reduce opportunities for tax avoidance by aligning the top personal and corporate tax rate. A reduction in the top personal income tax rate was recommended in the Tax Review (2001) and by the OECD (2002).

177. One argument for exceptions to the BBLR principle is the taxation system should be used to address externalities. Currently the New Zealand taxation system corrects for some negative externalities (for example, through the use of tobacco, alcohol and gaming excises). However, the taxation system also has the potential to address positive externalities (for example, externalities arising from capital accumulation).

178. Chapter II noted that New Zealand's rate of capital accumulation since the early 1990s has been lower than Australia's rate of capital accumulation, and suggested a number of explanations for this (see paragraphs 55 to 59). If there are substantial spillovers associated with physical capital accumulation, and these are greater than spillovers from human capital accumulation, there may be some justification for supporting physical capital accumulation. Various options are available including reducing the corporate tax rate, moving to a Nordic Taxation system (which attempts to separate out the taxation of labour and capital and taxes all capital income at a low, flat rate), an increased level of accelerated depreciation, and reduced taxation of foreign investment. Treasury (2003c) discusses the advantages and disadvantages of these proposals in more detail. However, using the taxation system to address positive externalities has drawbacks because, apart from the difficulty in knowing whether there would be an overall positive benefit, departures from the BBLR principle have risks and costs that are difficult to manage.

179. Treasury (2003c) also considers a number of other taxation issues that may have positive or negative impacts on New Zealand's economic growth, including tax breaks for R&D and the Kyoto emissions charge. The issue of road taxes is also discussed and has links with infrastructure investment that is discussed later in this chapter.

*Government expenditure*

180. As discussed in paragraphs 91, the recent theoretical and empirical literature on fiscal policy and economic growth, has classified government expenditure into 'non-productive' and 'productive' expenditure. While expenditures relating to the first classification may be welfare enhancing, they do not contribute to economic growth.

181. The classification of expenditure into 'productive' and 'non-productive expenditure' while conceptually appealing, can be quite difficult in practice. However, an attempt should be made (at least qualitatively) to determine whether expenditure is 'productive' or 'non-productive', and the likely impact of the expenditure on economic growth. Furthermore, when government expenditure is intended to remedy market failures, the nature of the market failures should be made clear, and the effectiveness of interventions should be evaluated. For example in the case of primary and secondary education, the nature of the market failure is a marginal social benefit outweighing the marginal private

benefit, which will potentially lead to under investment by individuals. The intervention is to reduce the private cost of education to the opportunity cost of not undertaking work or leisure, and to use compulsion between 6 and 16 years of age.

*Management of the Crown balance sheet*

182. A key future component of the Crown balance sheet is the New Zealand Superannuation Fund (NZSF), which partially prefunds the increase in government spending that will result from ageing of the New Zealand population. This will lead to less variable tax rates than if the NZSF did not exist. Diversification of the NZSF into foreign and domestic equities is also likely to provide a natural offset to shocks to the Crown balance sheet (Davis and Fabling, 2002) and make the balance sheet and tax rates less variable. Diversification of the NZSF is also likely to lead to a risk-adjusted rate of return above what can be earned on a non-diversified portfolio. This is likely to lead to lower long-run average tax rates.

183. Further work needs to be undertaken to assess the potential costs and benefits associated with the tax smoothing and alternative Crown balance sheet objectives and their impact on aggregate savings. It would also be desirable to undertake specific work relating to the build up of financial assets in the NZSF, including potential agency costs and time inconsistency problems, the potential longer-term macroeconomic implications, and the opportunity costs associated with higher taxes in the short term under the New Zealand Superannuation Fund policy.

**Public sector management**

184. The New Zealand State sector is an important part of the total economy with Central Government expenditure around 35 percent of GDP (including transfer payments), which is similar to other OECD countries. This ratio and the relative size of public sector employment is similar to other OECD countries (Claus and Li, 2003). Public sector performance can help or hinder economic growth through its size (for example, as a user of resources, as an investor and as an employer), through its implementation of policy, regulatory and legislative frameworks (within which businesses operate and government products and services are delivered), and through its capital investment.

185. The state sector includes both central and local government. Linkages between the two levels of government exist in the overlap of their activities, such as maintaining different parts of the roading network, and in the requirements which central government can impose on local government. The central government includes State Owned Enterprises (SOE).

186. In addition to the mechanisms discussed under macroeconomic framework and stability, there are several other ways in which the public sector impinges on private sector behaviour. One way is through the efficiency with which Governments desired outcomes are achieved, the other is through the design and implementation of regulations.

*Achieving Government objectives efficiently*

187. If the public sector is able to achieve the Government's desired outcomes in an efficient manner, the government will have greater choice between cost reduction and increasing activities, thereby raising welfare and productivity. The Managing for Outcomes initiative is the guiding framework to help ensure that services achieve their desired outcomes. The process requires departments to review with Ministers the outcomes they want to achieve and the best interventions to deliver them. They must also evaluate the interventions to learn how well the desired results are achieved. (Treasury 2003g).

188. Efficient service supply will contribute directly to welfare and the business environment. For example, the efficiency and certainty of the legal and court system will be valued by citizens and may impact on business investment and location decisions. In addition, the level of state activity in a sector, or method of subsidising certain suppliers, will potentially affect the price and choice available to consumers and businesses.

189. As employer of around 13 percent of the labour force, trends in public sector pay levels, remuneration structures and broader employment practices will influence employment behaviour in the private sector. The Pay and Employment Equity Taskforce, which is currently examining the public sector, may have costly implications for the private sector (Treasury 2003d). In particular, the results of the taskforce findings may raise the wage rate for public sector nurses. Because the Government is the dominant employer in the industry, this is likely to raise wage rate expectations of other health workers, including those in the private sector. Increasing wage costs may reduce labour utilisation.

190. Efficient management of physical assets impacts on the cost of providing services and consequently the productivity of the public sector. As the Crown's holding of financial assets grows, the efficiency of their management will contribute to the Crown's fiscal position.

191. The Government must decide where to invest these assets and must decide the appropriate level of Government involvement in commercial activities. The rationale for ownership of a SOE is weak where the enterprise's operations are wholly commercially viable and no regulations to allow disinvestment are needed. Treasury (2002b) identifies weak rationale for ownership pertaining to Solid Energy, Timberlands, Landcorp, Learning Media, Quotable Value NZ, The Metservice, and Agriquality.

192. Where ownership is justified, increased ministerial guidance in the allocation of capital between SOEs' competing projects is potentially useful, assuming all projects are required to have a positive net present value. Ministers will need criteria against which to make decisions and to assist them in considering the impact on economic growth of a project's externalities. The allocation of crown capital should also be carried out in a manner consistent with meeting the Government's fiscal objectives. As discussed in the macroeconomic framework and stability section, this may require trade offs between social facility investment, infrastructure, and SOE investment.

*Ensuring quality design and implementation of regulations*

193. Throughout this paper, we have discussed how the objectives of regulations may impact on economic growth. The structure and implementation of regulations will also impact on economic growth through the cost to firms of compliance. The requirements for business to meet regulations, and the resourcing of institutions that must implement those regulations, will determine the compliance costs for firms.

194. Local Government decisions can significantly impact on the environment in which firms operate as they have broad powers to tax, purchase goods and services, and regulate activities within their districts. The Local Government Act (2002) reversed the way in which territorial authorities were empowered to undertake activities. Previously, they could only undertake a list of permitted activities. Under the new Act, local government may undertake all but prohibited activities.

195. While the Department of Internal Affairs has provided some guidance to local authorities on how to responsibly manage such broad powers, the Act does not subject them to, or require them to develop, a fiscal management framework. Smaller authorities tend to be less well resourced to make policy, but as a result, and because they are very tightly tied to their populations, they tend to restrict the range of their activities. In comparison, larger authorities may be more inclined to expand the range of their activities, but tend to be better resourced to undertake policy development.

196. However, from time to time, central Government may require local governments to undertake specific activities for which they may have insufficient capability. The Resource Management Act placed a large burden on local authorities, and the Act's implementation was insufficiently resourced. For example, new dog control standards will pose a further burden for local authorities. Consolidation of territorial authorities may help raise capacity but must consider the trade-off between the behaviours and risks associated with different sized units discussed above.

## Saving, investment and financial markets

197 Over the last two decades aggregate saving in New Zealand, that is the sum of household, business and government saving, has fallen slightly as a ratio of GDP. This trend is evident across many OECD economies, though New Zealand's savings rate has been among the lowest for much of that period due to relatively low private saving.

198. From a growth perspective there are two reasons why low levels of national savings may matter in an open economy. If there are higher agency costs due to additional information asymmetries between foreign lenders and domestic borrowers, this may impact on the supply of loanable funds and the real interest rate. The significance of these effects are however unclear, especially since domestic banks tend to operate as intermediaries for foreign lenders.

199. Furthermore, to the extent that higher foreign borrowing increases a country's external vulnerability there may be effects on the country risk premium for interest rates. While there is some evidence suggesting that the level of external indebtedness impacts on real interest rates (Plantier, 2003), external vulnerability

is not necessarily a current concern for New Zealand. However, if the currently strong financial (budgetary, financial system, monetary and exchange rate) and policy frameworks that underpin that assessment were to weaken, that could pose a risk to the sustainability of current rates of external borrowing (Claus, Hay and White, 2003).

200. Two further issues are identified by Claus, Hay and White (2003). One is the choice of tax base and the appropriate mix of income and consumption taxes. Another is the efficiency of the financial system in overcoming information asymmetries and in providing a wider range of financial instruments.

*Policy influences on saving*

201. If aggregate savings were considered to be too low, there are at least four areas where policy can potentially influence saving. These areas are financial education, taxation, the institutional environment and financial regulation. In each of these areas there is still the question whether there may be offsetting responses that frustrate the policy objective of raising aggregate saving.

202. There may be insufficient information about saving rates and forms of saving required to provide appropriate income flows in retirement. This is a basis for public provision of information and financial educational.

203. There are two issues associated with the option of tax incentives for saving. One is the fiscal cost of tax incentives; the other is the inefficiency of incentives. Furthermore, the degree to which the state can affect the supply of private savings via tax incentives is unclear, and if able to do so there are liable to be offsetting income effects. In addition, there is evidently no clear international evidence that there are strong divergences between private and social returns to savings (Besley, 2001).

204. Insights from the behavioural economics literature suggest that the institutional environment may matter for saving outcomes (for example, by providing commitment mechanisms). Employment-based saving arrangements are a possible way of influencing behavioural traits associated with saving.

205. Compulsory saving is another means to counter these possible adverse behavioural traits. However, compulsory schemes imply a loss of flexibility and impose welfare costs where insufficient scope exists to accommodate diverse individual circumstances. The government, by accumulating fiscal surpluses, can save on behalf of the community, for example the New Zealand Superannuation Fund.

206. In New Zealand, regulation of financial markets and institutions mainly involves the regulation of information that must be provided to savers and investors. This approach has been thought to be more effective in maintaining financial stability than merit regulation (where a regulator monitors and enforces financial standards). However, a disclosure based approach relies on savers and investors undertaking this monitoring role, which can be difficult in the presence of information asymmetries.

*Foreign Investment*

207. Foreign investment is a substitute for domestic savings and should be allowed to flow freely in and out of New Zealand. Types of foreign investment can be considered on a spectrum, with foreign direct investment (FDI) at one end and portfolio investment at the other. FDI tends to be longer term with less likelihood of liquidation and repatriation and investments with these characteristics tend to be favoured. FDI may also be associated with knowledge spillovers and other benefits related to global connectedness, which may raise productivity. Equity financing is also more costly than debt because of the "lemons" premium. However, extreme caution is advised in using tax policies to specifically try and to attract FDI (IRD and Treasury, 2003; IMF, 2003a).

**Infrastructure**

208. Infrastructure is the systems established to facilitate social and economic activity. This can range from institutions for the enforcement of contracts and property rights through to transport and energy systems and communication networks. This section focuses on infrastructure as a facilitator of economic activity that allows goods and services, factors of production, information, and technology to flow between economic agents.

209. If investment in infrastructure fails to respond to a growing economy then bottlenecks may result. Wise investment in infrastructure can contribute directly to both the level and growth of productivity. Infrastructure investment can also contribute indirectly to productivity growth through potential spillover effects. For example, investment in transport and communication networks may facilitate agglomeration, as well as contribute to improved scale economy effects internal to the firm. Some investment in infrastructure (in communications for example) may enhance the take-up of new technology on a wider scale. Investment in broadband infrastructure for example may increase the tendency for complementary investment in more technologically advanced plant and equipment and computers.

210. Ensuring the efficient provision of infrastructure raises difficult regulatory issues. Infrastructure is often characterised by natural monopoly, network externalities, and distributional concerns. Their provision often requires large and lumpy investment in highly specific sunk assets. In such cases the corresponding issues around lock-in require at some level a relational contract (a long term deal that both sides have confidence in) between the public at large and the utility provider. The optimal way to express this deal will depend on the balance between the degree of (ex post) contestability, the scope for opportunism (on both sides), and the transactions costs of regulation or public ownership. Optimal arrangements may therefore take various forms and may include public ownership, explicit public-private partnerships, regulation of private providers, or relying on competition. The overall stance of regulation of utilities in New Zealand has changed from light-handed and generic to more interventionist and sector-specific, and in some cases increased resort to public ownership.

211. A rationale for public provision and ownership of infrastructure will arise when the benefits are not sufficiently appropriable to allow private investment to achieve a competitive return. Consequently, the private market may fail to generate sufficient investment in the infrastructure. Nevertheless the ability to appropriate benefits changes with available commercial technology and therefore the case for public provision can change as technology changes.

212. While infrastructure would typically represent productive expenditure, the case for public investment in infrastructure is unclear. Hence, it is not surprising as Temple (1999) observes that there has been intense debate surrounding the role of public capital investment in the growth of developed economies. With that uncertainty, we now consider some specific New Zealand infrastructure policy issues. These include energy, road transport infrastructure and infrastructure to assist ICT usage.

*Energy*

213. The reliability in energy supply is likely to influence private investment decisions. An important source of energy in New Zealand is electricity provided through the national grid system, but in the medium to long term other forms of energy can be a substitute. In 2002 the OECD recommended a review of the effectiveness of regulation in the electricity industry. Problems identified were: lack of pass through of market signals to retail customers, dependency on hydro power, bottlenecks in the network, and a thin hedge market.

214. Following dry-year supply problems in 2001 and 2003, the electricity industry is undergoing a second set of reforms in three years. An Electricity and Gas Industries Amendment Bill will introduce governing commissions with responsibility for overseeing the functioning of each market.[20] The Electricity Commission will have responsibility for ensuring security of supply for a 1 in 60 dry year event, as part of developing security of supply. And in addition to building new electricity reserve supply capacity, supply security may be obtained through trading in a forward hedge market. The Commission should not be restricted on the source of the reserve plant that it may contract, with contracts with existing plants taking into account both the lower costs to the reserve energy scheme and the effects on competition in the "ordinary market" in the short term. Correct determination of the price at which reserve generation will come on stream will potentially affect firms' incentives to invest in capacity and to ensure they manage their own dry year risks. The Electricity Commission will also be asked to review reserve mechanisms after they have operated for 12 months.

215. Increasing security of supply will raise the price of electricity. A levy will be charged to cover costs of supply security (as will the costs of the Electricity Commission) and this will be paid by the sector. The introduction of an emission charge under the Kyoto protocol in 2007/08 is likely to further increase electricity prices as well as alter the relative cost of generation types (for example, thermal generation will be relatively more expensive than hydro, and the relative prices of different thermal fuels may also change). Future gas sources are unlikely to be able to generate electricity as cheaply after the Maui gas supply runs out, also raising average electricity prices.

216. Increasing the price of electricity, and of energy more generally, will impact on the profitability of firms, with potential implication for incentives to invest. While some will be protected from the full impact of the emission charge under Negotiated Greenhouse Agreements, all will be exposed to gradual increases in the price of

---

[20] In the case of the gas sector, this will be in the form of backstop legislation that will be triggered into effect if required.

electricity due to increasing security of supply and increasing costs of (new) generation.[21]

217. Ongoing investment in the sector to ensure supply meets economic growth requirements is essential.  The Resource Management Act has often been cited as delaying infrastructure expansion.  However, the recent slowdown in building new generation may also be linked to uncertainty regarding the level of the proposed emission charge.  The price of the emission charge is unknown; meaning the impact on costs of fuels and generating options is uncertain. Consequently, firms appear to be deferring long term investment in generation plants.  Mechanisms for allocating water rights under the RMA are also leading to difficulties for the construction of Project Aqua and ongoing regulatory change may be creating further industry uncertainty.

*Road transport*

218. The basic roading network plays an important role in facilitating the movement of people and goods within the economy, allowing domestic trade.  Rail transport can substitute for road transport, particularly over long distances.  However rail is restricted by a lack of direct connections to households, firms and resources. Reflecting this special status, the roading network has traditionally operated outside of a market system.  While this is useful due to the complex relationship between user, investor and Government, price signals to help guide demand and supply for roads are lost.  As a consequence, non-market methods of road planning, funding and demand control have been developed.   The Land Transport Management Bill will make the development of mixed ownership structure roads easier and, along with transport developments in Auckland, may see a greater use of market mechanisms within the transport and road system.

219. While basic transport networks are important in facilitating economic activity, the link between transport investment and economic growth is unclear (The Treasury and Ministry of Transport, 2003).  However, the road network is likely to influence the location of economic activity and transport planning may therefore be able to affect economic growth.  For example, if productivity benefits from agglomeration are believed to be possible, appropriate network planning, including public transport, will allow these to develop.  Central Government road development decisions are based on high level government priorities that guide Transfund's decision making.

220. Road maintenance and investment funding is split between central and local government.  At the central government level, actual road investment levels are divorced from estimates of the strategically preferable level of new roading. Uncertainty in ongoing funding levels is compounded by new road funding being a residual, after funds for other transport spending have been determined. Uncertainty of ongoing funds may create bias against longer-term and larger road investments.  In addition, the revenue raising system, which primarily relies on fuel excise revenue, may be unsustainable as cars become more efficient.  This could potentially result in lower excise revenue unless the excise rate is raised

---

[21] Firms in metal smeltering, wood processing and some food processing are likely to be amongst the worst effected.  In these circumstances, the Government may need to consider how it may manage the exit of such marginal firms from the economy, and the associated regional economic impacts, that would result.

continuously.  The existence of two authorities for funding an interlinked network requires co-ordination.  Underinvestment by one authority will increase pressure on the network administered by the other authority, resulting in congestion transfer.  Ensuring the objectives of central and local government are aligned will help to increase consistency in approach, help networks to be most effectively utilised and continue to allow the consideration of road and transport issues within the broad context of other policy issues, such as educational institute location and urban planning.

221.  In a market system, prices are an important influence on, as well as reflection of, demand.  At the national level, road users are levied through petrol and road user charges.  This sends an overall signal of the cost of the national transport system, but does not accurately reflect the cost of road network maintenance.  Furthermore, the current pricing measure is blunt, failing to differentiate between the cost to maintain and meet demand pressures on various roads.  At the local government level, road maintenance is funded through rates on properties.  The contribution of the individual bears no relation to their use of the roads.  Price signals to users help to optimise the use of the road system, by guiding choices between substitutes.  Opportunities for substitution will affect the distributional effects of road user pricing.

222.  Following an approach by Auckland Mayors, Central Government has given an indication that it will contribute to funding improvements to Auckland's transport network.  Central and local government officials of the Joint Officials Group (JOG) are developing an agreed land transport strategy.  Components of this strategy are likely to include increased public transport infrastructure and extension of motorway networks, and officials have recommended the introduction of network pricing in central Auckland.  This process has assumed that a problem currently exists with the Auckland transport system.  A study cited by JOG found the total annual cost of congestion for the Auckland region was $755 million (The Treasury and Ministry of Transport, 2003).  However, transport problems can result from decisions taken in other policy areas, and therefore should be considered in a broad context.  It is unclear that the perceived transport problem in Auckland is an infrastructure problem per se, rather than related to how well the current infrastructure is being utilised or due to broader regional planning or public service provision decisions.

223.  In the longer-term, the issues highlighted by problems in land transport funding in Auckland, and discussed more broadly above, appear to pertain to the wider land transport funding system.  Correcting these may help avoid future under-investment in infrastructure from occurring in either Auckland or elsewhere.

*Infrastructure for information and computer technology*

224.  The widespread growth of the information and computer technology (ICT) industry was a feature of the United States growth and productivity surge in the 1990s (Jorgenson and Stiroh, 1999).  While ICT is a sector identified in the Government's Growth and Innovation Framework, investment in ICT production is not a necessary condition for benefiting from the potential productivity benefits of ICT (Jorgenson and Stiroh 1999, Parham, 2002).  Because ICT embodies new technology, enhances communication and reduces the costs associated with geographical distance, its widespread use has the potential to generate productivity spillover effects.

225. New Zealand has relatively widespread basic telecommunications infrastructure allowing basic internet access, and ranks well compared to other OECD countries for e-commerce infrastructure (OECD, 2002). However, there is relatively low web presence of private firms and the uptake of high-speed internet access has also been relatively slow compared to other OECD countries. Moreover, the OECD (2002) was concerned that New Zealand's regulatory framework, particularly Kiwishare, may be holding back development in the telecommunications infrastructure as rural or heavy users are subsidised by urban and light users.

226. The OECD (2002) was also surprised that New Zealand had not chosen to unbundle the local loops. The Commerce Commission issued a draft investigation in September recommending unbundling the local loop network but not the fixed public data network.[22] In other countries, the local loops have usually been unbundled, but this has been to indirectly overcome regulatory problems in other parts of the network. Treasury has generally recommended that regulatory systems deal directly, rather than indirectly, with problems within networks.

**Human Capital**

227. Human capital will affect physical capital productivity and labour productivity through three channels.[23] First, raising the human capital of an individual will allow them to more effectively utilise available physical capital, albeit with diminishing returns. The second channel arises when spillovers exist, such that increases in the human capital of an individual leads to increases in the labour productivity of other staff. For example, the foreman increasingly better able to co-ordinate how staff work together will continue to raise the output of their staff.[24] The third channel relates to the ability of human capital to absorb ideas from other sources and introduce these to the production process.

228. Human capital accumulation can occur through formal education, in work training, learning by doing and through broader experiences such as involvement in social groups and voluntary work. Because of the broad manner in which human capital can be acquired, it is difficult to measure. Moreover, the economic benefits associated with human capital accumulation may occur some time after the initial investment was made and be quite long lived. Measures of formal human capital accumulation through education suggest that older workers in New Zealand are relatively highly educated compared to the OECD average. However, New Zealand appears to have failed to match increases in average education levels amongst other OECD countries and rates of basic educational achievement amongst younger New Zealanders may now be slightly below the OECD average.[25]

---

[22] This investigation was required to be carried out by the Commerce Commission in 2003 under the Telecommunications Act 2001.

[23] This assumes the measure of labour productivity does not incorporate a measure of the quality of labour. The impact of changes in human capital on multifactor productivity will depend upon whether human capital is included as an input to the production process.

[24] The increase in output will accrue to members of the foreman's staff, without necessarily accruing to the foreman.

[25] OECD (2003B).

229. As discussed above, in the presence of spillovers not all benefits from increasing human capital will accrue to the individual. That is, the marginal social benefit of raising human capital may be greater than the marginal private benefit. This can result in lower than optimal investment in human capital. This market failure creates a rationale for Government subsidising formal education costs. Employers may also share in the cost of raising human capital for similar reasons of disparity between the benefit to the firm and the individual. However, raising human capital has costs, such as course costs, disutility of study, and work and wages foregone. Both individuals embarking on study and government spending on existing or new courses must consider whether the marginal benefit of raising human capital will outweigh the cost, including opportunity costs. Changes in the price of labour will alter the opportunity cost of training, affecting the accumulation of human capital.

230. Governments may also contribute to formal education as a form of subsidised childcare, allowing guardians to participate in the workforce. This motivation often exists in countries providing free comprehensive pre-school childcare. However, the economic contribution of guardians and the benefit of childcare or education to the child must be weighed against the cost of providing care and the social development cost of separating child and parent.

231. The discussion that follows looks primarily at the contribution of policies for formal education. In particular, it looks at three topics that the OECD has commented on: addressing educational under-achievement, the responsiveness of the tertiary sector to the demand for labour, and improving teacher and school performance. Relatively little is known about how improvements in these policy areas will increase economic growth. Nor is a lot known about the firm-based mechanisms by which formal education contributes to growth, such as assisting in the accumulation of knowledge and skills that are rewarded in the labour market, supporting the adoption of new technologies, and generating wider benefits such as social capital. There is, therefore, some uncertainty about which education and training policies will make the most difference.

*Assisting under-achievers in education*

232. New Zealand has a wider distribution in educational outcomes than most other OECD countries (Treasury, 2001). Although New Zealand's average level of achievement is above the OECD average, there is nevertheless a long tail of low achievers, the outcomes for the worst of who is similar to their international counterparts (Johnston, 2003). The growth implications of raising the level of educational achievement of those lower achievers remain uncertain and warrant further analysis.

233. The New Zealand education system includes a range of interventions targeted at raising the standard of low achievers, including early-childhood education, remedial reading and adult literacy and education. Poor educational achievement is correlated with disadvantages often associated with low socio-economic status. Early childhood education (ECE) can help to alleviate some of these disadvantages, but a range of interventions is required as gains from ECE can be lost if later teaching quality is poor.

234. Participation in early education programmes amongst those social groups with the most potential to benefit appears low. The Government is currently implementing the Early Childhood Education strategy, which aims to substantially increase participation and quality of education for all children. Greater targeting of resources for early childhood education to those with the most potential to benefit would increase allocative efficiency. Targeted interventions in primary schooling can also bring disadvantaged students up to the level of their advantaged peers.[26]

235. Treasury strongly supports a focus on literacy and numeracy in education, and funding for associated programmes has increased in recent years (e.g. ECPL and Numeracy Project). Results have been encouraging. Given the apparent success of current initiatives, we are not proposing change, although it is not clear at this stage whether current interventions will prove sufficient or whether more will be needed.

236. The Government is currently undertaking a general review of Foundation Education, Adult and community education programmes. This is with a view to improving effectiveness of provision, increasing availability and better integrating the area into mainstream tertiary education. Further capability building in the programmes is required before substantial increased participation is possible. While expensive, case studies of literacy training within firms suggest productivity increases in the firms where these programmes have been run. Success in these programmes may partly stem from contextual factors, such as the relevance of the course to an individual's job.

*Responsiveness of tertiary education.*

237. The use of market mechanisms in the delivery of public goods and services can increase the efficiency and innovation of competing providers and influence the incentives of users. Recent Government policy in the tertiary sector is moving away from a market based model. Examples of these changes are the reduction in competition between providers and moving from a demand driven to a slightly more purchase driven funding system. In addition, universal rather than targeted extensions of leniency provisions in student loan interest charging are likely to reduce the allocative efficiency of the student loan scheme.

238. Recent policy has differentiated between public and private training enterprises (PTE), and includes capping funding to PTE courses. This is reducing the ability of private sector providers to compete with public sector providers. Initially, growing numbers of private sector courses were correlated with increases in tertiary education participation by Maori and Pacific Islanders. Evidence of causation is mixed, but a number of rigidities in the public provision system, such as the range of courses and form of delivery, may have meant the public sector was unable to meet the needs of these groups. Nevertheless, Wananga have proved popular tertiary course providers amongst Maori. The Maori participation

---

[26] The OECD (2002) cited concerns raised by the Education and Science Committee, 2001, regarding the teaching of reading, particularly remedial reading, in schools. Questions about the targeting of resources for remedial reading were also raised, with programmes more prevalent in financially better-off schools and the fact that school specific programmes are rare.

rate in tertiary education is now higher than that of most other ethnic groups, although it is concentrated at lower levels of tertiary study.

239. Planned changes will introduce funding mechanisms for tertiary education aimed at influencing student course selection. This will move tertiary education funding along the spectrum from a primarily demand driven system towards being a "purchase driven" system. This will effectively require the Government to take a central planning role, which increases the risk of poor overall decision-making. However, the current change to the system is marginal. PTE will be able to access some of the new funding provided under the scheme, but will be disadvantaged compared to other providers.

*Teacher and school performance*

240. In 2000 there was a reduction in the decentralising of primary and secondary school decision-making by reinstating school zoning and discontinuing bulk funding of teachers' salaries. Although physical resource limits at schools mean that only students at the margin were able to move between schools, student movements signalled where quality was poor. (OECD, 2002). This mechanism of improving educational outcomes for their children appeared relatively popular amongst Maori. However, the evidence on whether school choice improves education outcomes is still regarded as mixed.

241. Bulk funding of teacher salaries presented opportunities for individual schools to innovate and to determine how best to meet their students' needs. Foundation work to allow the introduction of performance pay schemes is required, such as documenting professional standards and introducing remedial training options for teachers. Raising teaching quality is a priority for the Government over the next 3 years. However there is little evidence that broad rather than targeted investment in New Zealand teacher quality would result in better educational outcomes.

242. There has been a substantial increase in spending on teacher salaries and in improving teacher supply (for example, in hard to staff schools). Bulk funding of teachers' salaries presented schools with the opportunity to increase pay for teachers with expertise in subjects where they may struggle to find someone with expertise. Schools still have some limited opportunity to reprioritise spending from bulk funded operational expenditure into staff salaries if they wish.

**Labour Markets**

243. Labour market institutions and regulations influence labour utilisation and labour productivity. Labour market institutions, such as the Employment Relations Act (2000), and policies settings, such as the level of the minimum wage, will influence the participation rate, the unemployment rate, and the number of hours worked by employees. Labour market institutions and regulations may also influence search, information and regulatory compliance costs. To the extent that labour market institutions and regulations enhance labour mobility they will enhance the process of knowledge spillovers and therefore labour productivity growth.

244. Labour productivity may also be affected by the degree of flexibility embodied in labour market institutions and the interactions between labour utilisation and

labour productivity.  For example, if the marginal product of an additional worker is lower than the average product of existing workers, then the additional worker will lower the average product of labour.

245. Social welfare policies impact on labour utilisation by changing the relative attractiveness of work versus leisure and therefore participation in the work force and labour supply.  Changes in the work and leisure trade-off may also influence labour productivity owing to changes in the skill composition of workers employed.  Likewise, immigration polices have the potential to influence per capita GDP growth, via the impact on labour productivity.  This will depend on the skill composition of migrants and the proportion of migrants of working age relative to the indigenous working age population.

246. Since the early 1990s New Zealand has had improved labour market outcomes.  The unemployment rate fell substantially from the early 1990s and New Zealand experienced increases in labour force participation in the 1990s compared to the previous decade.  In the middle of 2003, the unemployment rate was under 5 percent, below that recorded in over half the OECD countries.  New Zealand's labour force participation is also relatively high compared to many other OECD economies, although for both genders it is below the levels prevailing in several OECD countries (OECD, 2003b).

*Reform of the Social Welfare system*

247. Although New Zealand has a relatively high level of labour utilisation compared to a number of other OECD countries, there may still be scope to raise the level of per capita GDP by increasing labour utilisation.  Labour utilisation can be increased by moving individuals that do not currently have jobs into work and by increasing the number of hours worked by existing workers.

248. Improving the interface between income tax and social welfare systems is one means of increasing labour utilisation by reducing the disincentive to move from welfare to work.  The IMF (2003) cited complexities in the interface between the income tax and social welfare systems as a disincentive for some individuals to move from welfare into work.  In addition, the OECD (2002) noted relatively high effective marginal tax rates at this interface, creating opportunities for increasing in-work benefits to ease the transition to employment.  The OECD (2002) and the IMF (2003) noted the generosity of the benefit system for the long term unemployed and the potential gains from tightening work-seeking requirements for beneficiaries.

249. Treasury advice to the Government in moving welfare recipients into work has been based on a three-pronged approach.  First, the economy must be capable of absorbing increases in labour supply.  Second, there must be a financial incentive to increase labour supply.  This involves monitoring effective marginal tax rates at the income tax and welfare interface.  Third, financial "pull" incentives need to be combined with "push" incentives that create penalties for beneficiaries not genuinely attempting to find employment (or increasing their labour supply).  On the basis of this third principle, Treasury advice given to the Government considered the removal of work testing for the domestic purposes benefit (DPB), widows, and sickness benefit as weakening the combined approach in moving people from welfare to work.  Initiatives in the Jobs Jolt package, such as

increased case management, will partially replace the role that work testing played in motivating beneficiaries to seek employment.

250. The Government has acknowledged complexities in the welfare and income tax interface, and reform of the welfare system as part of the 2004 Budget has been announced. It is expected that these reforms may partly remedy the concerns of international agencies about complexity at the interface. While reform may have raised labour force participation, there are complex design issues that need to be considered. Work in this area will focus on advice to Ministers that places greater emphasis on the employment aspects of reform. Proposed changes to the tax and welfare interface raise concerns about the impact on labour utilisation and labour productivity. Work in this area will highlight trade-offs between static redistribution objectives and dynamic growth effects.

*Active Labour Market Policies*

251. Active labour market policies (ALMP) help people into employment through job-seeking assistance, raising skill levels or relocation to where jobs exist. Moreover, ALMP are one way of helping individuals to be "work ready". Along with providing financial incentives for moving into work and penalties for not taking available work, being work ready may help people into the workforce.

252. The OECD (2002) has suggested ALMP are generally more economic growth friendly than passive social assistance policies. There is some evidence that New Zealand's expenditure on ALMP as a proportion of all labour market spending is relatively low compared to other OECD countries (OECD, 2002). The OECD (2002) also suggested on-the-job training be given precedence over other training programmes. In this direction, the Government has implemented significant initiatives for firm-based training for young people (for example, Gateway and Modern Apprenticeships) and has signalled significant further expansion particularly in industry training.

253. The success of ALMP in helping people to move into work is partially dependent on the degree of targeting. For example, overseas evidence suggests that training schemes are often ineffective unless well targeted to specific groups. Contextual factors, such as delivery of course material in a relevant way, are also important. For example, the OECD (2002) welcomed the initial use of outside contractors to provide work support aimed at Maori and Pacific Island job seekers. They suggested broader use of contractors if monitoring proves these arrangements effective. The success of outside contractors in part lies in their ability to provide the appropriate context to their audience. For these reasons, ALMP should be evaluated to gauge the effectiveness of various programmes.

*The impact of regulation changes on the labour market*

254. The introduction of the Employment Contracts Act (1991) was associated with a large upswing in employment growth during the 1990s. There were other changes occurring after the early 1990s that would have contributed to the growth in employment, including the broader reforms, the international economic upswing, recovery from a recession in New Zealand and the raising of the age qualification for national superannuation (Hurnard, 2003). Nevertheless, the IMF (2003) credits increased flexibility in the labour market, stemming from the

introduction of the Employment Contracts Act, with having allowed this rapid growth in employment.

255. Accordingly, the introduction of the Employment Relations Act (2000) (ERA) could be viewed as potentially reducing labour market flexibility, though the impact so far appears to be limited. The OECD (2002) has expressed concern about the Act resulting in reduced flexibility in industrial negotiations, but acknowledged that the impact has so far been limited. However, they also pointed out that this may be owing to few multi-employer agreements having been signed. Furthermore, both the OECD and IMF have suggested further regulation, for example measures to protect workers in the event of a business being sold, would slowly reduce the efficient and flexible functioning of the labour market. Concern has also been expressed about other regulatory initiatives in the labour market, such as proposed amendments to the ERA (2000), further reducing the flexibility of the labour market.

256. The proposed amendments to the ERA (2000) include around fifty changes to current legislation. These include penalties for breaches of good faith bargaining, promotion of collective and multi-employer bargaining, employee protection in contracting out, sale, or transfer of business situations, and amendments to the Equal Pay Act (1972). Changes to the Holiday Act (1981) would strengthen provisions for employees working public holidays. Other initiatives that may lead to further changes to labour market regulations are also occurring, including the Taskforce on Pay and Employment Equity, work and life balance and the proposed increase in statutory annual leave. While at this time the Taskforce on Pay and Employment Equity is limited to the public sector, the impacts of government employment and wage setting practices may gradually spillover into the private sector (Treasury, 2003e).

257. While the objectives of protecting employees in the case of business sale or contracting out and encouraging work and life balance are positive, tradeoffs resulting from any regulatory changes to meet these objectives need to be considered carefully. In particular, if regulatory change leads to an increase in the cost of employing or dismissing labour, labour utilisation may fall. Falls in labour utilisation are likely to result in reductions in the level of per capita GDP, unless sufficiently offset by an increase in labour productivity.

*Migration policy*

258. Recent changes to immigration rules which have increased the emphasis on employability are likely to have been positive for labour productivity and economic growth. However, further changes could be introduced to encourage skilled individuals to migrate to New Zealand, such as alterations to tax laws for overseas investment income. However, giving priority to particular skills or industry in support of the GIF may not work well in a rapidly changing economy, a concern raised by the OECD (2003b).

259. Regulatory changes in 2003 have broadened the immigrant selection process to include an assessment of individuals' potential to settle and contribute to New Zealand. Having a New Zealand qualification or job offer will carry higher weighting under the new system. The ability to fast-track applications for people with skills in areas where New Zealand has an identified skills shortage continues.

260. New Zealand's laws for taxing the overseas income of immigrants are considered comprehensive compared to other developed countries. Adapted from recommendations made in the McLeod Review (2002) of the tax system, work is currently underway investigating tax relief for new migrants. This initiative is likely to reduce inefficiencies flowing from the current system that may result in highly skilled immigrants recruited from overseas passing some New Zealand tax costs on to their employers. The extent of tax relief for new migrants may be either broad, exempting all offshore income, or relatively narrow, exempting new migrants from particularly comprehensive aspects of the New Zealand tax system. Broad relief is offered by the United Kingdom and Hong Kong, and is currently proposed in Australia. The World Trade Organisation (2003) also has suggested that the 39-cent top income tax rate may discourage highly skilled immigrants.

## Enterprise and innovation

261. At its simplest, growing the New Zealand economy is about growing the individual businesses that comprise the economy. For this to occur the business environment must be one where the incentives encourage enterprise and innovation, where firms seek out and develop profitable new opportunities, and where well performing and more productive firms will prosper, while poorer performers exit. Innovation is any activity that produces a new and profitable product or service, or finds a more profitable way to produce an existing one (Ahn, 2001).

262. Government policies aim to make the most of, or minimise the disadvantages due to, non-policy influences on the business environment. An example of this is the cross-policy focus on global connectedness. Culture and attitudes towards enterprise and innovation may also be important in determining whether the business environment is supportive of enterprise and innovation. Government policy can influence culture and attitudes both directly and indirectly.

*Regulations for Enterprise Development*

263. Aggregate productivity growth is a process of dynamic change occurring at the level of firms. This process is characterised by new and more productive firms entering the market, some existing firms innovating to improve their productivity, and the more productive existing firms expanding while the less productive fall away.

264. Research on the effect of firm dynamics on productivity suggests that understanding this process is important to understanding productivity growth (Haltiwanger, 1997). The OECD (2003a) study on the sources of productivity growth point to differences across countries in the contributions of new firms to aggregate productivity. Furthermore, this study identifies burdensome regulation on entrepreneurial activity and high cost of adjusting the workforce as negatively impacting the entrance of new small firms.

265. Regulatory frameworks should facilitate these dynamic processes and a regulatory environment that is in line with international practice may also encourage global connectedness. New Zealand has low administrative barriers to starting businesses and bankruptcy provisions are relatively lenient. New

Zealand's rates of firm entry and exit and New Zealand's employment turnover rates appear to be relatively high compared to other OECD countries (Carroll, Hyslop, Mare and Wood, 2002). What is less well understood are the reasons for these characteristics and their implications for productivity. Research on these issues would seem to be important for understanding New Zealand productivity dynamics and the potential role for policy.

266. A feature of the New Zealand economy is the prevalence and importance of small and medium sized enterprises (SME). SME pose a challenge to policy making because of their sensitivity to transactions costs, including business compliance costs. Undertaking research for innovation or to begin exporting may require a greater proportion of small firms' resources.

267. The conjunction of size and distance means that firms in New Zealand wanting to expand may face decisions about exporting sooner in their development than would be the case in larger markets. International transactions costs tend to be falling (McCann, 2003). Nevertheless, some anecdotal and interview based survey results suggest that establishing overseas distribution channels is a significant challenge (Simmons, 2002). Policy interventions to reduce these international transactions costs and help small firms manage this transition have been strengthened with the creation of Industry New Zealand and its subsequent integration with Trade New Zealand.

268. As discussed earlier, financial markets and financial institutions channel funds from savers to borrowers and play a key role in allocating resources to their most productive use. Particular characteristics of SME, such as less formal governance structures making external monitoring difficult, may mean accessing finance is harder than for larger firms (Bernanke, Gertler and Gilchrist, 1999). If SME are finance constrained they will be less able to cope with cyclical changes in cost and demand. There is a view that banks in New Zealand tend to be risk averse with respect to business lending (although solid empirical evidence is lacking), biased towards instruments (debt rather than equity) and investments (banks and large companies, rather than smaller firms) less subject to informational asymmetries. PriceWaterhouseCoopers (2003) found that there are no obvious inefficiencies in the bank lending to small and medium sized enterprises (SME) market, with interest rates competitive given sector specific considerations. However, they suggested that bank lending may not be the appropriate vehicle for SME start ups and firms whose main asset is intellectual property. A question exists over whether New Zealand financial markets have sufficient and appropriate finance instruments for small non-listed firms.

*Competition Regulation*

269. Competitive product markets are central to an environment that encourages enterprise and innovation. Competition law aims to balance the benefits of competition with the potential benefits of greater scale and exclusivity.

270. The small size of New Zealand's domestic market and the importance of international markets raise several key issues for competition policy. To the extent that market structure affects internal scale economies, there are questions about whether competition policies should place more weight on allowing firms to accrue the benefits of internal scale. There may be potential scale efficiencies domestically and perhaps more importantly, greater weight placed on scale may

allow local firms to develop sufficiently to effectively compete internationally. However, overall the empirical evidence on the extent to which firm size and domestic market size matter for export is mixed. For example, using longitudinal firm-level data for Australian manufacturing firms, Gabbitas and Gretton (2003) find that on average, firm size and the magnitude of domestic sales were not found to be major influences on exporting once account was taken of the influence of other firm specific factors. These other firm specific factors comprise for instance the quality of firm specific assets and management.

271. A second issue relates to the relationship between competition and innovation. Arguably some degree of market power is necessary to provide the incentive and scope for firms to innovate (Romer, 1990). However, the evidence suggests that innovation is not necessarily related to firm size and that the pressures of competition, both domestic and foreign, seem to matter more than market power for innovation.

272. There are also questions about the optimal extent of harmonisation with Australian competition law and institutions. To the extent that the New Zealand and Australian markets are increasingly a single product market, greater harmonisation of our competition law may be warranted. Australia is currently reviewing its competition law and it may be wise to review New Zealand law in light of any changes. Even if the legal frameworks were fully aligned, the respective competition authorities may come to different judgements in respect of specific merger proposals. Attention may need to be given to how best to ensure consistency of judgements between the two authorities (beyond the current work on improving information sharing and co-ordination), or even the possibility of merging into a joint trans-Tasman competition authority at some stage.

273. The Commerce Commission is responsible for a wide variety of commercial regulation and authorising some commercial transactions. In recent years, there have been a number of cases where the Commission has had to assess the impact of regulations or company ownership changes for their impact on competition. These cases have included the proposed Air New Zealand sale to Qantas, the creation of Fonterra, and changes in telecommunications and electricity market regulations. Some assessment of whether the resources of the Commerce Commission are sufficient to adequately consider these issues may be required, given the importance of these issues.

*Resource Management Act*

274. The Resource Management Act (1991) (RMA) plays an important role in balancing economic activity against environmental values and environmental quality is an important aspect of living standards. However, The Ministerial Panel on Compliance Costs (2001) found particularly high compliance costs related to the RMA. The Government responded to the Review Panel by providing one-off funding in the 2002 Budget for guidance and training to territorial authorities, aimed at improving the functioning of the Act. Broader issues, such as a need to establish the standing of objectors to a consent process and their funding by third parties have been issues of public debate.

275. The RMA consent process involves weighting sometimes conflicting rights, or determining rights. A credible system of distributing and maintaining property rights is a foundation of the business environment. The current property rights

debate in New Zealand centres on three interlinked policy issues: the ability of the Resource Management Act (RMA) to efficiently allocate rights to use common property resources (such as water); new and outstanding Treaty of Waitangi claims to resources; and the processes by which competing claims of interest (for example, national interests versus local interests, private versus public interests) are assessed in allocating rights to use resources.

276. New legislation is currently being introduced to overcome the Act's shortfalls regarding common resources and national priorities in regards to Project Aqua. This is a departure from the Resource Management Act's aim to provide unified environmental legislation. The Treasury has not provided advice on the worth of a general amendment to the RMA to overcome problems with managing the commons. Treasury advice on legislation to determine national views and consequently give priority to certain projects has warned of imposing additional delays in the consents process through the time required to finalise such views and the costs of diverting councils and the courts from other projects.

*Encouraging innovation through knowledge and research*

277. Public good science typically has unclear, longer term, and hard-to-appropriate payoffs. Maintaining its relevance to industry, and ensuring benefits of public science are widely applied are ongoing challenges. While Crown Research Institutes (CRIs) appear to be well connected to industry, greater development of relationships involving the commercialisation of CRI-held intellectual property is needed. In the long run, this may require a reconsideration of their role: whether they should be thought of primarily as public labs generating public-good science, or as publicly owned vehicles for disseminating and commercialising public-good science.

278. In contrast to CRIs and industry, collaboration between industry and tertiary education institutes appears relatively weak (OECD, 2002). Initiatives aimed at furthering joint research, such as public-private research partnerships and research consortia, are likely to help. Some initiatives along these lines have been launched including the establishment of a number of Centres of Research Excellence, the Performance Based Research Fund for universities and funding for research consortia. Clarification of the rules around ownership of intellectual property arising from publicly funded research may further strengthen the relationship.

279. While New Zealand's public spending on research, as a percentage of GDP is in line with other OECD countries, reported private expenditure on R&D is low. Theory and evidence suggest that business R&D has a greater direct impact on productivity than public R&D, both as it is more likely to have direct commercial application, and as it raises the effectiveness of local public research and assists in the assimilation into local industry of research findings from overseas (OECD, 2003a). New Zealand is one of a few countries in the OECD that does not provide tax incentives for investment in R&D. Instead, we have opted to support business R&D through direct grants, given the deadweight costs, revenue risks, potential for abuse, and poor targeting to start ups of tax breaks. However, the scale of these grants remains modest, and their allocation requires some degree of subjectivity. In light of the large spillovers from business R&D, there may be

room for greater Government spending on business research, perhaps through co-funding of projects.

280. Overseas experience shows that industry clusters can be a powerful factor in innovation. The small size of New Zealand markets means that there may be relatively few players in particular sectors, and the low density of firms may be a barrier to knowledge spillovers due to few informal interactions. A cautious approach is required in considering policy towards clustering. While clusters are an important part of many countries' innovation systems, international experience suggests that successful clusters are more likely to develop spontaneously than to result from scratch by administrative fiat. The government may have a useful role in helping to provide local training and research entities.

*Global Connectedness*

281. Recent work on Global connectedness (Treasury, 2003i) drew a distinction between connectedness, being the actual flow of factors (such as the goods, services, capital, people knowledge, ideas and technology) between countries, and openness, which is the absence of formal or trade barriers to factor flows. Global connectedness allows us to take advantage of the larger international market and access the latest technology and ideas. Access to technology, knowledge and ideas is likely to be a key element in improving New Zealand's productivity performance. Connectedness is harder for New Zealand given our distance from our main markets.

282. The Government has a clear role in creating policy settings that make New Zealand amenable to achieving extensive global connectedness. Such settings include trade negotiations and immigration policy. But as evidenced in discussing regulatory policies, the implications of what appear to be domestic policy issues may only be fully understood in the context of developing New Zealand's international linkages. The appropriate role for Government in encouraging flows leading to global connectedness is less clear. Better understanding of how New Zealand's size and distance create informal barriers to economic growth would help determine an appropriate role. Government policies to encourage global connectedness have tended to focus on reducing the costs or risks of interacting with the rest of the world.

283. In the face of a small domestic population, exporting and importing offer opportunities to specialise, achieve economies of scale, and transfer knowledge. New Zealand's exports of goods and services are equivalent to almost 35 percent of GDP. Trade policy remains a fundamental component of the Government's broader economic polices designed to promote global connectedness and higher sustainable economic growth. To achieve this growth, New Zealand needs to be able to sell its goods and services abroad without the substantial artificial price and quantity barriers facing our areas of comparative advantage. Accordingly, a key external lever of economic policy is removing barriers to international trade, pursuing trade liberalisation through multilateral, regional, bilateral and national initiatives.

284. The WTO Doha Development Agenda is the top trade priority. The WTO is uniquely placed to free up global trade within a rules-based system which provides improved trading conditions for developing and developed countries alike. Sixty-eight percent of New Zealand exports are resource-based

commodities that face significant export barriers. Only through the WTO negotiations can export subsidies and domestic support (the worst distorters of the international agricultural market) be tackled effectively. Agriculture exports account for around 48 percent of our total exports compared with an OECD average of just 7.2 percent. Bilateral trade agreements are useful but cannot deliver in themselves all the outcomes we are seeking, especially on agricultural subsidies.

285. Free Trade Agreements (FTAs) are an opportunity not only to remove tariff barriers on a bilateral basis, but also to deepen economic integration with trading partners. This is based on a recognition that trade flows are affected as much by internal regulatory and administrative barriers as by tariffs, quotas and other external barriers to trade. Importantly, modern FTAs also provide opportunities to facilitate the exchange of people knowledge and innovation, such as improved access to services markets, mutual recognition of qualifications, relaxed residency rules for visiting business people, and so on, that can enhance our connectedness with partner countries. The most significant such relationship, and the most integrated, is CER with Australia.

**Summary**

286. New Zealand has experienced a marked improvement in economic growth since the early 1990s. These improvements have been associated with significant changes in policy institutions and settings since the early 1980s. Protecting and improving the functioning of policy institutions that have resulted in positive economic benefits will play an important role in sustaining growth. In addition, there are several areas that warrant greater attention. These areas are deduced from the analysis of the contributions of the factors contributing to New Zealand growth performance discussed in Chapter II, from the insights of the international literature and analysis of the key influences on New Zealand's growth discussed in Chapter III, and from judgements about New Zealand policy strengths and policy weaknesses contained in Chapter IV. These judgements are inevitably evolving and some areas are less resolved than others.

287. The areas that warrant greatest attention include: the quality of regulation, implications of the progressivity of the taxation structure, the quality and depth of capital markets, understanding the reasons for New Zealand's relative capital shallowness, appropriateness of frameworks for regulation and public involvement in infrastructure, understanding the impact of human capital on labour utilisation and productivity, the implications of labour market regulations for labour utilisation and productivity, the appropriate environment to foster innovation and the emergence and growth of firms, and implications of different aspects of global connectedness.

# REFERENCES

1.  Acemoglu, Daron, Simon Johnson, and James A. Robinson, 2001, "The Colonial Origins of Comparative Development: An Empirical Investigation," *American Economic Review*, 91, December, 1369-401.

2.  Ahn, S., 2001, "Firm dynamics and productivity growth: A review of micro evidence for the OECD countries", OECD *Economics Department Working Papers*, No 297.

3.  Aschauer, David A, 1989a, "Is Public Expenditure Productive," *Journal of Monetary Economics*, 23, 177-200.

4.  Aschauer, David A, 1989b, "Does Public Capital Crowd Out Private Capital," *Journal of Monetary Economics*, 24, 171-88.

5.  Barro, Robert J., 1990, "Government spending in a simple model of endogenous growth", *Journal of Political Economy*, 98, October Part II, S103-S125.

6.  Barro, Robert J., 1991, "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics*, 106, May, 407-33.

7.  Barro, Robert J., 1997, *Determinants of Economic Growth: A Cross-Country Empirical Study*, Cambridge, Massachusetts: MIT Press.

8.  Barro, Robert J. and Xavier X. Sala-I-Martin, 1997, "Technological Diffusion, Convergence, and Growth," *Journal of Economic Growth*, 2, 1-26.

9.  Benhabib, J. and M. M. Spiegel, 1994, "The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data," *Journal of Monetary Economics*, 34, pp.143-173.

10. Bernanke, Ben S., Mark Gertler and Simon Gilchrist, 1999, "The financial accelerator in a quantitative business cycle framework", Chapter 21 in *Handbook of Macroeconomics*, Volume 1C, John B Taylor and Michael Woodford (Editors), North-Holland, 1341 – 1393.

11. Besley, Timothy, 2001, "From Micro to Macro: Public Policies and Aggregate Economic Performance," *Journal of Fiscal Studies*, 22, September, 357-374.

12. Black, Melleny, Melody Guy and Nathan McLellan, 2003, "Productivity in New Zealand 1987-2002," *New Zealand Economic Papers*, 37, No. 1, June, 119–150.

13. Bleaney, M., N. Gemmell and R. Kneller, 2001, "Testing the Endogenous Growth Model: Public Expenditure, Taxation and Growth over the Long-Run," *Canadian Journal of Economics*, 34, No.1, 36-57.

14. Bohn, Henning, 1990, "Tax Smoothing with Financial Instruments," *The American Economic Review*, 80, No.5, 1217-1230.

15. Borensztein, E., J. De Gregorio and J.W. Lee, 1998, "How Does Foreign Direct Investment Affect Economic Growth?," *Journal of International Economics*, 45, pp.115-135.

16. Bruno, Michael and Jeffrey Sachs, 1985, *The Economics of Worldwide Stagflation*, Cambridge MA: Harvard University Press.

17. Buckle, Robert A, 1978, "New Zealand's Balance of Payments in the 1970s: A Suggested Interpretation," Wellington: New Zealand Institute of Economic Research, Occasional Paper No. 4.

18. Buckle, Robert A, 1987, "Sequencing and the Role of the Foreign Exchange Market," Chapter 11 in *Economic Liberalisation in New Zealand*, Bollard, Alan and Robert A. Buckle (Editors), Wellington, Allen & Unwin, 236-260.

19. Buckle, Robert A., David Haugh and Peter Thomson, 2002, "Growth and Volatility Regime Switching Models for New Zealand GDP Data," New Zealand Treasury Working Paper 02/08.
http://www.treasury.govt.nz/workingpapers/2002/twp02-08.pdf

20. Buckle, Robert A., David Haugh and Peter Thomson, 2001, "Calm after the Storm?: Supply-Side Contributions to New Zealand's GDP Volatility Decline," New Zealand Treasury Working Paper 01/33.
http://www.treasury.govt.nz/workingpapers/2001/twp01-33.pdf

21. Buckle, Robert A., Kunhong Kim, Heather Kirkham, Nathan McLellan and Jared Sharma, 2002, "A Structural VAR Model of the New Zealand Business Cycle," New Zealand Treasury Working Paper 02/26.
http://www.treasury.govt.nz/workingpapers/2002/twp02-26.pdf

22. Buckle, Robert A., Kunhong Kim and Julie Tam, 2002, "A Structural VAR Approach to Estimating Budget Balance Targets," *New Zealand Economic Papers*, 36, No. 2, 149-176.

23. Buckle, Robert A., Kunhong, Kim and Nathan McLellan, 2003, "The impact of monetary policy on New Zealand business cycles and inflation variability", New Zealand Treasury Working Paper 03/09.
http://www.treasury.govt.nz/workingpapers/2003/twp03-09.pdf

24. Card, David and Richard B. Freeman, 2002, "What Have Two Decades of British Economic Reform Delivered," NBER Working Paper W8801, February 2002.

25. Carroll, Nick, Dean Hyslop, David Mare and Julian Wood, 2002, "The turbulent labour market", paper presented to the New Zealand Association of Economists Conference, Wellington, June.

26. Cavalluzzo, Ken S. and Linda C. Cavalluzzo, 1998, "Market structure and discrimination: The case of small businesses", *Journal of Money, Credit and Banking*, 30, November, 771–792.

27. Claus, Iris, Paul Conway and Alasdair Scott, 2000, "The Output Gap: Measurement, Comparisons and Assessment," Reserve Bank of New Zealand, Research Paper No. 44.

28. Claus, Iris, Simon Hay and Bruce White, 2003, "Saving in New Zealand: A synthesis," New Zealand Treasury Working Paper, Forthcoming.

29. Claus, Iris and Grant Scobie, 2002, "Saving in New Zealand: Measurement and Trends," New Zealand Treasury Working Paper 02/02.
http://www.treasury.govt.nz/workingpapers/2002/twp02-02.pdf

30. Claus, Iris and Kathy Li, 2003, "New Zealand's Production Structure: An International Comparison," New Zealand Treasury Working Paper 03/16. http://www.treasury.govt.nz/workingpapers/2002/twp03-16.pdf

31. Coe, David T., Arvind Subramanian, Natalia T. Tamirisa and Rikhil Bhavnani, 2002, "The Missing Globalisation Puzzle", IMF Working Paper, WP/02/171.

32. Creedy, John and Grant Scobie, 2002, "Population Ageing and Social Expenditure in New Zealand: Stochastic Projections," New Zealand Treasury Working Paper 02/28. http://www.treasury.govt.nz/workingpapers/2002/twp02-28.pdf

33. Croxson, Bronwyn, 2003, "Small Country Issues," New Zealand Treasury Internal Note. http://imanage/?number=545238&version=1

34. Davis, Nick, 2001, "Does Crown Financial Portfolio Composition Matter?," New Zealand Treasury Working Paper 01/34. http://www.treasury.govt.nz/workingpapers/2002/twp01-034.pdf

35. Davis, Nick and Richard Fabling, 2002, "Population Ageing and the Efficiency of Fiscal Policy in New Zealand," New Zealand Treasury Working Paper 02/11. http://www.treasury.govt.nz/workingpapers/2002/twp02-11.pdf

36. Delaney, Kate, 2003, "International Competitiveness," Research Paper for Business Council of Australia Scenario Planning Project, 'Aspire Australia 2025'.

37. Diewert, Erwin and Denis Lawrence, 1999, "Measuring New Zealand's Productivity," New Zealand Treasury Working Paper 99/5. http://www.treasury.govt.nz/workingpapers/1999/99-5.asp

38. Downing, Richard, John Janssen, Nathan McLellan and Kam Szeto, 2002, "Trend Growth in New Zealand: An Explanation of Recent Developments and Prospects," New Zealand Treasury, Internal note.

39. Easterly, William and Ross Levine, 2003, "Tropics, Germs, and Crops: How Endowments Influence Economic Development," *Journal of Monetary Economics*, 50, January, pp.3-39.

40. Easterly, William, Michael Kremer, Lant Pritchett, and Larry Summers, 1993, "Good Policy or Good Luck? Country Growth Performance and Temporary Shocks," *Journal of Monetary Economics*, 32, 459-483.

41. Easton, Brian, 1997, *In Stormy Seas: The Post-War New Zealand Economy*, University of Otago Press.

42. Engelbrecht, Hans-Jurgen, 2003, "Human Capital and Economic Growth: Cross-Section Evidence for OECD Countries," *The Economic Record,* 79, Special Issue, June, 2003, 40-51.

43. Evans, Lewis, Arthur Grimes and Bryce Wilkinson with David Teece, 1996, "Economic Reform in New Zealand 1984-95: The Pursuit of Efficiency," *Journal of Economic Literature*, 34, December, 1856-1902.

44. Fatas, Antonio, 2002, "The Effects of Business Cycles on Growth," *Economic Growth: Sources, Trends and Cycles*, Norman Loayza and Raimundo Soto (Editors), Central Bank of Chile.

45. Findlay, R. and C. A. Rodriguez, 1977, "Intermediate imports and Macroeconomic Policy Under Flexible Exchange Rates," *Canadian Journal of Economics*, 10, 208-17.

46. Frankel, Jeffrey A., and David Romer, 1999, "Does Trade Cause Growth?" *American Economic Review*, 89, June, 379-99.

47. Franklin, Harvey, 1985, *Cul De Sac – The Question of New Zealand's Failure*, Unwin Paperbacks.

48. Gabbitas, Owen and Paul Gretton, 2003, "Firm Size and Export Performance: Some Empirical Evidence," Australian Productivity Commission Staff Research Paper, Canberra, April.

49. Galt, David, 2000, "New Zealand's Economic Growth," New Zealand Treasury Working Paper 00/09.
http://www.treasury.govt.nz/workingpapers/2000/twp00-9.pdf

50. Gemmell, Norman, 2001, "Fiscal Policy in a Growth Framework," Paper prepared for the UNU/WIDER project on "New Fiscal Policies for Growth and Poverty Reduction," February 2001.

51. Gertler, Mark. and Simon Gilchrist, Simon, 1994, "Monetary policy, business cycles, and the behavior of small manufacturing firms", *Quarterly Journal of Economics* 109, 309-340.

52. Gordon, Robert J., 1999, "U.S. Economic Growth Since 1870: One Big Wave?," *The American Economic Review*: *Papers and Proceedings*, May 1999.

53. Gould, John, 1982, *The Rake's Progress*, Hodder and Stoughton, Auckland.

54. Gramlich, Edward M, 1994, "Infrastructure Investment: A Review Essay," *Journal of Economic Literature*, 32, No. 3, 1176-96.

55. Grimes, Arthur, 2003, "Economic Growth and the Size and Structure of Government: Implications for New Zealand," *New Zealand Economic Papers*, 37, No. 1, 151-174.

56. Hall, Viv B, 1996, "Economic Growth", Chapter two in Brian Silverstone, Alan Bollard and Ralph Lattimore (Editors) *A Study of Economic Reform: The Case of New Zealand*, North-Holland, 31-72.

57. Hall, Robert and Charles Jones, 1999, "Why Do Some Countries Produce So Much More Output Per Worker Than Others?," *Quarterly Journal of Economics*, 114, No. 1, 83-116.

58. Haltiwanger, J., 1997, "Measuring and Analyzing Aggregate Fluctuations: The Importance of Building from Microeconomic Evidence", *Federal Reserve Bank of St. Louis Economic Review*, May, 55-85.

59. Hansen, Carl, 2002, "A literature survey on increasing returns, agglomeration effects, and economic growth", LECG, Wellington.

60. Harberger, Arnold C., 1987, "Comment," *NBER Macroeconomics Annual*, Stanley Fischer (Ediitor), London and Cambridge: MIT Press, 255-58.

61. Haugh, David, 2001, "Calibration of a Chain Volume Production GDP Database," MVD Technical Note 01/2001, New Zealand Treasury, September. http://imanage/?number=404278&version=1

62. Hausmann, Ricardo and Dani Rodrik, 2002, "Economic Development as Self-Discovery," NBER Working Paper W8592, May 2002.

63. Holtz-Eakin, Douglas and Amy Ellen Swartz, 1995, "Infrastructure in a structural model of economic growth", *Regional Science and Urban Economics*, 35, 131-151.

64. Honohan, Patrick and Brendan Walsh, 2002, "Catching Up with the Leaders: the Irish Hare," *Brookings Panel on Economic Activity*, Washington, D.C.

65. Hurnard, Roger, 2003, "The Effect of NZ Superannuation of Eligibility Age on the Labour Force Participation of Older People," draft paper, New Zealand Treasury, February 2003.

66. Hyslop, Dean and Steven Stillman, 2003, "Youth Minimum Wage Reform and the Labour Market," draft paper, New Zealand Treasury, May 2003.

67. International Monetary Fund, 2002, Selected issues

68. International Monetary Fund, 2003a, "New Zealand: 2003 Article IV Consultation – Staff report", Country Report 03/121, May 2003.

69. International Monetary Fund, 2003b, *World Economic Outlook*.

70. Janssen, John, 2002, "Long-term Fiscal Projections and their Relationship with the Intertemporal Budget Constraint: An Application to New Zealand," New Zealand Treasury Working Paper 02/04. http://www.treasury.govt.nz/workingpapers/2002/twp02-04.pdf

71. Jones, Charles I., 1995, "Time Series Tests of Endogenous Growth Models," *The Quarterly Journal of Economics*, 110, May, 495-525.

72. Johnston, Grant, 2003 "Educational Underachievement," Treasury internal note, http://imanage/?number=503309&version=1

73. Jorgenson, Dale W. and Kevin J. Stiroh, 1999, "Information Technology and Growth," *The American Economic Review: Papers and Proceedings*, May 1999.

74. Klenow, Peter J. and Andres Rodriguez-Clare, 1997, "Economic Growth: A Review Essay," *Journal of Monetary Economics*, 40, 597-617.

75. Kneller, R, M Bleaney and N Gemmell, 1999, "Fiscal policy and growth: evidence from OECD countries" *Journal of Public Economics*, 74, No. 2, 171-190.

76. Kohli, Ulrich, 2002a, "Real GDP, Real Value Added, and Terms-of-Trade Changes," Unpublished Manuscript, Swiss National Bank.

77. Kohli, Ulrich, 2002b, "Terms of Trade, Real GDP, and Real Value Added: A New Look at New Zealand's Growth Performance," Unpublished Manuscript, Swiss National Bank.

78. Leamer, Edward and Michael Storper, 2001, "The Economic Geography of the Internet Age", UCLA, Department of Management and Public Policy, Working Paper, February.

79. Levine, Ross, 1997, "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature*, 35, June, 688-726.

80. Lewis, Geoff, 2002, "The Economic Transformation Debate: Where Have We Got To?", paper presented to the New Zealand Association of Economists Conference, June, Wellington. http://imanage/?number=456906&version=1

81. Lewis, Geoff, 2003, "Exporting and New Zealand's Economic Growth," New Zealand Treasury Internal Note. http://imanage/?number=513063&version=1

82. Lucas, Robert E. Jr., 1988, "On the Mechanics of Economic Development," *Journal of Monetary Economics*, 22, 3-42.

83. Mankiw, N. Gregory, 2001, *Principals of Economics*, South-Western.

84. Mankiw, N. Gregory, David Romer and David N. Weil, 1992, "A Contribution to the Empirics of Economic Growth," *The Quarterly Journal of Economics*, 107 (May), 407-37.

85. Mare, Dave, 2003, "Ideas for Growth," MOTU Working Paper, 2003.

86. Mawson, Peter, 2002, "Measuring Economic Growth in New Zealand," New Zealand Treasury Working Paper 02/14. http://www.treasury.govt.nz/workingpapers/2002/twp02-14.pdf

87. McCann, Philip, 2003, "Geography, Trade and Growth: Problems and Possibilities for the New Zealand Economy," New Zealand Treasury Working Paper 03/03. http://www.treasury.govt.nz/workingpapers/2002/twp03-03.pdf

88. McLeod, Robert, David Patterson, Shirley Jones, Srikanta Chatterjee and Edward Sieper, 2001, "Tax Review 2001: Final Report," Wellington.

89. Ministry of Economic Development, 2003, "Report Back on Implementation of the Recommendations of the Ministerial Panel on Business Compliance Costs", Wellington.

90. Ministry of Economic Development, 2003, "Post 2005 Tariff Review", Wellington.

91. Ministerial Panel on Business Compliance Costs, 2001, "Finding the Balance" Wellington.

92. North, Douglass C., 1990, *Institutions, Institutional Change and Economic Performance,* New York: Cambridge University Press.

93. North, Douglass C., 1994, "Economic Performance Through Time," *The American Economic Review*, 84, June, 359-368.

94. OECD, 2000, "OECD Economic Surveys: New Zealand," *Country Review*, Paris.

95. OECD, 2002, "OECD Economic Surveys: New Zealand," *Country Review*, Paris, May.

96. OECD, 2003a, "The Sources of Economic Growth in OECD Countries", Paris.

97. OECD, 2003b, "OECD Economic Surveys: New Zealand," *Country Review*, Paris, Forthcoming.

98. Oulton, Nicholas, 2002, "Productivity Versus Welfare: or, GDP versus Weitzman's NDP," Bank of England Working Paper.

99. Parham, Dean, 2002, "Productivity Gains: Importance of ICTs," *Agenda*, 9, No. 3, 195-210.

100. Plantier, Christopher, 2003, "New Zealand's Macroeconomic Reforms After 1984 and the Neutral Real Rate of Interest," Reserve Bank of New Zealand Discussion Paper, Forthcoming.

101. PricewaterhouseCoopers, 2003, "Bank Lending Practices to Small and Medium Sized Enterprises," A Report to the Ministry of Economic Development, July.

102. Razzak, Weshah, 2003, "Towards Building a New Consensus About New Zealand's Productivity," Department of Labour, Wellington, New Zealand, January.

103. Rodrik, Dani, 1998, "Where Did All the Growth Go? External Shocks, Social Conflict, and Growth Collapses," NBER Working Paper W6350. http://papers.nber.org/papers/w6350.pdf

104. Rodrik, Dani, Arvind Subramanian and Francesco Trebbi, 2002, "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development", IMF Working Paper 02/189 (Washington: International Monetary Fund).

105. Rodrik, Dani, 2003, "Growth Strategies," NBER Working Paper W10050, October.

106. Romer, P.M., 1986, "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, 94, No. 5, 1002-1037

107. Romer, P.M., 1990, "Endogenous Technical Change," *Journal of Political Economy*, 98, No. 5, Part 2, S71-S102.

108. Sachs, Jeffrey, 2003, "Institutions Don't Rule: A Refutation of Institutional Fundamentalism," NBER Working Paper No. 9490.

109. Sala-I-Martin, Xavier X., 1996, "The Classical Approach to Convergence Analysis," *The Economic Journal*, 106, July, 1019-1036.

110. Sautet, Frederic, 2002, "Economic Transformation, The Pretence of Knowledge and the Process of entrepreneurial Competition," draft paper, New Zealand Treasury, January 2002. http://imanage/?number=407887&version=1

111. Silverstone, Brian, Alan Bollard and Ralph Lattimore (1996), *A Study of Economic Reform: The Case of New Zealand*, Contributions to Economic Analysis, Amsterdam, North-Holland.

112. Simmons, Geoff, 2002, "Growing Pains: New Zealand Qualitative Evidence on Hurdles to Exporting Growth," New Zealand Treasury Working Paper 02/10. http://www.treasury.govt.nz/workingpapers/2002/twp02-10.pdf

113. Sinclair, Geoff, 1999, "Costs and Benefits of Producer Board Deregulation," New Zealand Treasury Working Paper 99/04. http://www.treasury.govt.nz/workingpapers/2002/twp99-04.pdf

114. Skilling, David, 2001a, "The Importance of Being Enormous: Towards An Understanding of the New Zealand Economy", draft paper, New Zealand Treasury available at www.treasury.govt.nz/et

115. Skilling, David, 2001b, "Comparative Disadvantage: New Zealand's Economic Growth in Historical Perspective", draft paper, New Zealand Treasury available at www.treasury.govt.nz/et

116. Skilling, David, 2001c, "The Cheque's in the Mail: Some Thoughts on the Existence of Lags," draft paper, New Zealand Treasury available at www.treasury.govt.nz/et

117. Smith, Christie, 2002, "Currency Unions and Gravity Models Revisited," Reserve Bank of New Zealand Discussion Paper 2002/07. http://www.rbnz.govt.nz/research/discusspapers/dp02_07.pdf

118. Solon, Gary, Robert Barsky, and Jonathan A. Parker, 1994, "Measuring the Cyclicality of Real Wages: How Important is Composition Bias," *Quarterly Journal of Economics*, 109, 1-25.

119. Solow, Robert M., 1956, "A Contribution to the Theory of Economic Growth," *The Quarterly Journal of Economics*, 70, No. 1, 65-94.

120. Svensson, Lars E.O., 2001, "Independent Review of the Operation of Monetary Policy in New Zealand: Report to the Minister of Finance", February. http://www.treasury.govt.nz/monpolreview/default.htm

121. Swan, T.W., 1956, "Economic Growth and Capital Accumulation," *The Economic Record*, 32, 334-61.

122. Temple, J., 1999, "The New Growth Evidence," *Journal of Economic Literature*, 37 (March 1999), 112-156.

123. Temple, J., 2003, "The Long-Run Implications of Growth Theories," *Journal of Economic Surveys*, July 2003, 17, No. 3, 497-510.

124. The Office of the Prime Minister, 2002, "Growing an Innovative New Zealand," Wellington, February 2002.

125. The Treasury, 1984, "Economic Management," Briefing to the Incoming Government, Wellington.

126. The Treasury, 1999, "Towards Higher Living Standards for New Zealanders: Briefing to the Incoming Government," Wellington.

127. The Treasury, 2001, "Towards an Inclusive Economy", Treasury Working Paper 01/15. http://www.treasury.govt.nz/workingpapers/2002/twp01-15.pdf

128. The Treasury, 2002a, "Growing Higher Living Standards for New Zealanders; Briefing to the Incoming Government", Wellington.

129. The Treasury, 2002b, "Appointment of a New Governor: Policy Targets and Relationship Expectations", Treasury Report T2002/1068, Wellington.

130. The Treasury, 2003a, "Regulatory Impact Statements and Business Compliance Cost Statements", Treasury Report T2003/221, Wellington.

131. The Treasury, 2003b, "The Fiscal Position – Trends suggest we should start thinking about our options", internal Treasury note, http://imanage/?number=515749&version=1.

132. The Treasury, 2003c, "Reducing the impact of taxes on economic growth", internal Treasury note, http://imanage/?number=566505&version=4.

133. The Treasury and Ministry of Transport, 2003, "Auckland Transport Funding" Treasury Report T2003/1073, Wellington.

134. The Treasury, 2003d, "Where we have got to on "Managing the Surpluses" work", Internal Treasury note, http://imanage/?number=515749&version=1.

135. The Treasury, 2003e, "Issues for Economic Growth: The Next 12 Months and Beyond," Treasury Report T2003/1701, Wellington.

136. The Treasury, 2003f, "New Zealand's Economic Growth Performance," Treasury Report T2003/204.

137. The Treasury, 2003g, "Managing for Outcomes Guidelines 2003 (final)", Managing For Outcomes Guidelines 2003 final (Treasury:564338)

138. The Treasury, 2003h, *Statement of Intent*, http://www.treasury.govt.nz/soi/2004/

139. The Treasury, 2003i, "Global Connectedness," external strategy - paper to PM (Treasury:530751).

140. World Trade Organisation, 2003, "Economic Environment: New Zealand," Switzerland.