





LESSONS FROM NEW ZEALAND'S EVOLVING INNOVATION SYSTEM

**Rick Christie, Chairman,
Growth and Innovation Advisory Board
15 December 2004**




Population	4 million
GDP	NZD120 billion
GDP Growth	4.4%
CPI	1.5% annual change
Unemployment	3.8%

New Zealand in Asia 2004

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- 1900s** Refrigerated produce to UK
- 1970s** Diversification following UK entry to EEC
- 1980s** Financial and regulatory reform
- 1990s** Corporatisation of institutions
- 2000s** National innovation system approach

Responses to Globalisation




**Knowledge creation and technology absorption
is complex**

**Interaction and collaboration of people, firms
and government is necessary over time**

**Innovation and entrepreneurship support
sustainable competitiveness**


National Innovation System Approach



An agriculture sector that is efficient and highly competitive due to research and development in public research institutions:

- * elite animal genetics**
- * highly productive pasture species**
- * agriculture systems**
- * grazing technologies**

New Zealand's Innovation History




A strategic approach for teaching and research in tertiary institutions

Research consortia and centres of research excellence being established to meet the challenges of collaboration and research scale

Recognition of the need for some measure of non-contestable funding support for institutions to maintain capability in key areas

Special funds to meet the challenges of Capital Markets

New Zealand's National Innovation System



Support for promotional activities, the facilitation of exporting and global connectiveness

Support for sector development to enable a focus on strategically important sectors

Support for regional development to connect communities to global markets

These latter three all delivered by New Zealand Trade and Enterprise

New Zealand's National Innovation System contd...



Globalisation is a challenge

Open deregulated economy is essential, but more is required

Government has a lead role in the innovation system

Government has a role to provide an overall strategy

Lessons We Learned



The Growth and Innovation Framework

Three foci: ICT, Biotechnology, Creative Industries

Three Taskforces

Regional Development and sector strategies

Tertiary Education Strategy

Strengthening support for research and development

Ensuring a sustainable development approach to policy

A Strategic Approach

A person is shown from the chest up, holding a glowing, semi-transparent digital screen in front of their face. The screen displays a close-up of a person's face. The background is a dark, futuristic environment with green and yellow light trails, suggesting a high-speed or high-tech setting. The overall image has a dark, moody atmosphere with vibrant light effects.

**GIF itself provides a focus on New Zealand's
innovation strengths**

Centres of Research Excellence

Public-Private partnerships

Targeting Innovation Strengths

A group of people are gathered around a large table, looking at a map or document spread out on the surface. The scene is dimly lit, with a warm, yellowish glow from a light source, possibly a lamp, illuminating the map and the people's faces. The people are dressed in business attire, and their attention is focused on the map. The overall atmosphere is one of collaborative work and discussion.

Public-Private partnerships internationally

Research institutes with international networks

Government role to provide information

Government role to facilitate opportunities

Enhancing International Linkages



Co-operative agreements

Venture Investment Fund

Supporting international promotional activities

Attracting Venture Capital



With globalisation and innovation, SIZE MATTERS

Geographical isolation an added challenge

De-regulation and support for innovation the key to ongoing competitiveness

Conclusions



**Key strengths pastoral agriculture and
biotechnology**

**Lift private sector R & D, and maintain
innovation system support**

Do a few things well

Conclusions

**ADDRESS BY RICK CHRISTIE, CHAIR OF THE GROWTH & INNOVATION
ADVISORY BOARD IN NEW ZEALAND**

TO APSTM SEMINAR – Taipei 15 December 2004

Ladies and Gentlemen:

Asia has always struck me as an amazing collection of economies – large and small, emerging and established, with a mix of land and sea borders. The New Zealand economy has been integrating more closely with our Asian neighbours over the last 20 years, and at one stage we even regarded ourselves as “part of Asia” although that was a fiction to many. At the same time New Zealand, by virtue of its size and geographical isolation, is essentially at one of the extremities of the Asia Pacific and, in our terms anyway, struggles for attention and influence in the globalised world increasingly dominated by large and sophisticated trading blocs.

Just a reminder, New Zealand's GDP in 2003 was 113 billion New Zealand dollars. GDP growth in real terms over the last 10 years exceeds 3.7% which, in fact, is close on average for the period to that of the United States. We have always had to fight hard to achieve economic growth and, more importantly, GDP per capita growth and; as with many other economies, considerable attention has been paid to this by successive governments over the last 10 to 15 years. However in accepting the need to achieve growth, New Zealanders are fiercely protective of their values, embodied in lifestyle and environment which they do not want to see compromised.

I chair our Growth & Innovation Advisory Board which was formed specifically by the government from largely private sector roots to advise them on policies and initiatives to drive growth strategies. With a population barely over 4 million and with only one significant urban conurbation in Auckland, separated by our nearest and largest trading partner by over 2,000 kilometres, we have a few natural handicaps to overcome towards achieving this growth objective.

Globalisation is a word which has been around for almost as long as I can remember – it probably means that I am younger than I thought I was, or losing my memory, or both. Globalisation is, however, a word we should use carefully. The New Zealand economy “went global”, in a very narrow sense, in the early 1900s with the advent of refrigerated sea transport which enabled us to meet our almost singular market for primary produce, mostly meat, wool and butter, in the United Kingdom. This cosy and lucrative trading relationship flourished for much of the 20th century and over two world wars, and served us well despite the distance between the points of production and consumption.

Globalisation in a broader sense really began in the early 1970’s with Britain's accession to the then EEC, and New Zealand's diversification drive began in earnest. However, globalisation as "real deal" only began in the 80s, when the then new Labour Government commenced a massive programme of deregulation, mostly by the removal of tariffs, import controls and subsidies to the primary sector; but then followed fairly rapidly by similar deregulation of the balance of the manufacturing economy. This was aimed to create a much more efficient environment for investors, and for people and firms, to make informed and competitive decisions. At that time it was believed that efficient conditions alone would go a long way to encouraging foreign investment and the creation of new markets.

In this context, the role of Government was seen to be minimal – largely required only when a market left to itself did not allocate resources efficiently, for example to penalise polluters or provide a public good. Although vitally important to freeing up the sluggish New Zealand economy of the 70s, this exclusive focus on the market doctrine was called into question in the 1990s, especially in regard to provision of outcomes related to knowledge, science and technology, and global connectivity. (It also left New Zealand, and its economy, in something of a leadership vacuum, with little clear direction or vision.)

Today I want to talk about some of these latter changes and will concentrate my talk around the national innovation system which was a response to what could be described as "selective market failure". I will then ask a number of questions about the effectiveness of our approach based on our experience with driving a national innovation system to date.

The national innovation system's policy approach looked at society's knowledge creation, accumulation and exploitation as a complex non-linear process requiring the interaction and

collaboration of people, firms and governments over an extended period of time. These approaches are grounded in a robust economic theory of innovation and technology cycles, for example Schumpeterian Economic Theory. In this approach competition is a vital component of growth but it should not be focused entirely on grinding short term prices down.

Indeed, prior to the 90s much of New Zealand's competitiveness was driven from relatively short term cost and volume optimisation with the primary sector in particular having to become more and more productive to meet the relentless downward cycle of commodity prices, driven in many cases by international markets heavily subsidised by larger economies in the European Union and North America. It has to be said that innovation succeeded in playing a major role in this cost minimisation approach and resulted in our pastoral agricultural sector becoming easily the most efficient in the world. Innovation was manifest in the rapid development of elite animal genetics, the development of highly productive pasture species, and the development of agricultural systems and grazing technologies, for example the electric fence. Downstream, processing became more scale efficient, with downstream products becoming much more differentiated. Much of the R&D underpinning this sector resulted from a collective approach by growers, with science and technology substantially funded by government through funding of science through national research providers and research associations.

So, in one sense, deregulation was a necessary, but not sufficient condition for remaining competitive in an increasingly globalised trading environment. The development of the national innovation system approach provided an essential spur to continued growth, by creating an economy that supports innovation in the long term in a way that complements the short-term efficiency essential for capital markets.

The national innovation system and the policies behind it are now well developed. Government continues to support innovation and entrepreneurship directly, although it has eschewed some of the more widely used forms of support elsewhere in the world. (For example, tax breaks and R&D subsidies.)

We don't yet have many measurable outcomes for these policies, although we have set up monitoring and evaluation processes. At present we can speak of the way the policies have

tuned up the open economy of our small nation to meet the challenges of globalisation. These include:

- A strategic approach for teaching and research in tertiary institutions.
- Research consortia and centres of research excellence being established to meet the challenges of collaboration and research scale.
- Recognition of the need for some measure of non-contestable funding support for institutions to maintain capability in key areas.
- Special funds to meet the challenges of Capital Markets.
- Support for promotional activities, the facilitation of exporting and global connectiveness.
- Support for sector development to enable a focus on strategically important sectors.
- Support for regional development to connect communities to global markets.
- These latter three all delivered by New Zealand Trade and Enterprise.

Overall, the consensus would be that this is all working reasonably well, notwithstanding that we have yet to be able to measure some of these long term outcomes. However, we did learn a number of lessons along the way and it would be useful to mention a few of those.

Clearly, for small economies like New Zealand, globalisation is a huge challenge, even for highly efficient sectors such as our pastoral industries. Second, an open, deregulated economy is one essential ingredient but more is required. Third, the government needs to take a leading role in the innovation system – however it should not and cannot shoulder the entire burden. In doing this, it needs to firstly support the creation of knowledge and technology, secondly actively stimulate firms and people to raise their productivity with innovation, and thirdly actively encourage entrepreneurs and provide other support to take their products to global markets. Last, governments do have an overall strategic role, in close consultation with the productive sector, to guide the process of innovation and ensure the optimum use of resources.

It is now perhaps appropriate to ask how well the innovation system now serves the needs of industry, communities, research institutions, scientists and, of course, the increasingly important environmental sector, which for us in New Zealand is a key part of our economy.

Very early into its first term, the present government articulated its vision for growth and innovation through what it termed a "growth and innovation framework" – the GIF – which was designed to raise national awareness of the importance of growth and innovation. Importantly, they convened three sector task forces as part of a new approach. These task forces were organised around three future focused industries designed to put a fresh face on growth and innovation in the 21st century.

These task forces were nominally targeted at the ICT sector, the biotechnology sector, and the creative industries (comprising the design industry and film and TV production industries). Although these sectors in the long term were seen to be offering a valuable contribution to growth in their own right, more importantly they were seen as enabling industries for other established sectors, particularly in primary industry.

Simultaneously, government responded with a number of other initiatives ranging from regional development strategies and the active encouragement of research institutions to commercialise their R&D. Recent initiatives providing a measure of non-competitive funding seek to address the uncertainty and volatility in funding produced by a completely contestable funding environment. These are justified to counter a trend for short term initiatives to prevail. Also, public funding for research has increased markedly over recent years, with a greater emphasis on multi-disciplinary collaborations. There have also been policies around skill shortages and the role of advanced skills in the innovation system as a departure from the strictly market economy approach taken in the past to education and training.

It should also be said that environmental concerns run the risk of being neglected in a completely market orientated economy unless market failure is identified and responses developed. The government's sustainable development approach was a first mover in the sense that it requires public policies developed from the outset, in a way that is sustainable economically, socially and environmentally.

The next issue I want to briefly touch on is to address the question as to how a small and specialised geographically remote economy can attract the investment in innovation necessary to transform and diversify their industries to participate in global markets.

Government remains the dominant funder of R&D and the real challenge for New Zealand is to improve the private sector contribution. There are a number of responses.

From the outset, the GIF identified the target sectors and this focus may provide a better route to attract foreign investment than a market orientated, laissez-faire approach does not. Similarly, the creation of centres of research excellence give a better focus for foreign investors who might want to understand the speciality areas in which New Zealand researchers excel and can generate and exploit commercial opportunities. Public-private partnerships (such as the Media Lab South Pacific Platform) also provide a focus for innovators, business and investors to collaborate.

At the R&D Leaders' Forum in Christchurch, New Zealand earlier this year, there was strong emphasis on the commercialisation of research and technology, which is now a priority for many research institutions worldwide. In New Zealand our venture capital industry is not well developed, nor are the IT and biotech sectors integrated, so we have to question how we could best achieve commercialisation. How can our small entrepreneur companies best present themselves to international players, investors and/or trade partners, given the cost of establishing and maintaining a presence in these larger economies? Can APEC economy governments at both ends support this process? If so, how?

Firstly, it's extremely important that public/private connections in the innovation system work and develop. Support for core primary industries is a key priority for the research science and technology sector, as it always has been. In the absence of vertically integrated sectors it is incumbent on our larger institutions to act as proxies for the commercial entities we might find in other, larger economies. CRI's substitute for large technology firms that we lack

In this way, the commercialisation capabilities of our research institutions are important, and they need to keep updated on developments through their own technology networks and to disseminate this information to firms in New Zealand with whom they work.

The ability of small firms to promote themselves in global markets and access worldwide opportunities has improved markedly since the Internet revolutionised communications. This, however, is not the only answer. Through the GIF the government sees it has a role to assist firms by providing specialised market research and intelligence as well as facilitating

international opportunities at key events. For example, Biosphere New Zealand is a website that showcases New Zealand's brightest biotechnology businesses and provides investment and promotion on the sector. Biosphere was also the theme for a significant New Zealand pavilion at Bio 2003 in Washington DC last year.

Lastly, with specific reference to biotech; health and pharmaceutical applications dominate the sector and the flow of funds into early stage start-up ventures. In New Zealand we have to ask ourselves how our largely bio-dependent agricultural economy can attract a share of funds available.

Governments can help and are helping through co-operative agreements, a good example being the Australian-New Zealand Biotechnology Partnership Fund. This was intended to accelerate growth in the New Zealand biotech sector through facilitating joint activities in biotechnology development marketing and manufacturing.

In another recent initiative, Government has sought to stimulate our fledgling venture capital industry by the establishment of the Venture Investment Fund, (VIF), which has a mandate to invest alongside private capital to commercialise IP in the ICT sector, health, and more recently, biotechnologies.

So far the take-up of these funds through JV's has been good, although the jury is still out on biotech, which is less well understood by our capital markets, notwithstanding the inherently greater risks in these early stage start-up ventures. Other examples abound in the creative sector, where a range of overseas promotional activities are supported.

So, overall in the globalisation stakes, **SIZE MATTERS!** Not only does New Zealand have but a minnow economy, but our geographical isolation is an added challenge. We took some bold steps in the 1980's to deregulate our markets, and this, together with a systemic response to some areas of perceived market failure have enabled us to remain competitive, at least in pastoral agriculture and agricultural biotechnology.

The future is less certain. Our private sector will need to lift its level of R & D investment, and the Government will need to continue to stimulate our capital markets, and support the growth and innovation framework.

Overall we must be realistic about what we can excel at. Doing a few things well is likely to be more rewarding than trying to do everything.

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