

# Managerial Assets and Actions

## What Can We Learn from New Zealand's Research and Innovation Landscape?

### Abstract

Productivity and innovation are cornerstones of New Zealand's competitiveness. The managerial flow model provides a unique perspective, framing two decades of investment encouraging private sector participation at a national level. The New Zealand case suggests that appropriate managerial actions can lead to managerial assets and vice-versa. This positive feedback loop provides a platform for policies regarding innovation, a forum for organisational learning for policy makers, and an example of best practices in planning and investing in a country's innovation landscape.

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New Zealand had among the highest levels of GDP per capita in world in the 1950s. It became part of the Organisation for Economic Co-operation and Development (OECD) in 1973. The OECD is an economic organisation of 34 countries founded in 1961 to stimulate economic progress and world trade. By 2007, New Zealand fell to 22nd position in the OECD countries. Analysts suggest that one factor contributing to poor performance is New Zealand's low gross expenditure on R&D, which at 1.16 per cent of GDP in 2005 was about about half the average level for the OECD at 2.23 per cent in 2005<sup>1</sup>.

Like many advanced economies, the service sector accounts for about two-thirds of New Zealand's GDP. Following slow services growth in the 1990s, New Zealand grew strongly in the 2000–2005 period, with above average growth through to 2008<sup>2</sup>. The economy posted a two per cent decline in 2009, but pulled out of the recession later in the year and achieved a 1.7 per cent growth in 2010 and two per cent in 2011. Key sectors in New Zealand remain vulnerable due to weak external demand. There was little formal emphasis on Foreign Direct Investment (FDI) and stagnant productivity remains a concern for New Zealand<sup>3</sup>. There are now plans to raise productivity growth and develop infrastructure, while reining in government spending<sup>4</sup>.

The last two decades have seen New Zealand embarking on major economic reforms, including privatisation of public institutions and opening up of markets. The nation overhauled its public sector, restructured its research institutes, fostered public-private knowledge-exchange relationships, and liberalised its markets in a bid to stimulate productivity and innovation. The OECD review<sup>1</sup> highlights economic reforms undertaken in New Zealand since the late 1980s have a number of innovation system strengths. These include positive basic conditions for entrepreneurship and innovation, competent public administration, public research institutional capabilities, competitive nature-resource based sectors, and pockets of excellence in software, creative industries and new sectors. Nonetheless, overreliance on “policy principles” at the expense of “efficacious implementation”, resulting in high transaction costs in public R&D funding was criticised<sup>4</sup>.

**Table 1: Global Competitiveness Index (GCI) and Components<sup>5</sup>**

NEW ZEALAND	GCI	Basic Requirements Rank (Score)	Efficiency Enhancers Rank Score	Innovation & Sophistication Rank Score
2005–06	22	15 (5.66)	13 (5.24)	22 (4.75)
2006–07	23	16 (5.65)	21 (5.15)	15 (5.11)
2007–08	24	17(5.53)	18 (5.10)	25 (4.42)
2009–09	24	19 (5.58)	17 (5.07)	28 (4.26)
2009–10	20	16 (5.58)	15 (5.11)	27 (4.37)

Source: *Global Competitiveness Report*, various editions, World Economic Forum, Palgrave Macmillan.

New Zealand's weak performance for innovation and business sophistication has been observed in the Global Competitiveness Report<sup>6</sup>. The performance gap relative to the other categories of competitiveness has widened over time in recent years (see *Table 1*). Local supplier quantity was reported to be problematic with cluster development gaps, while small domestic companies did not enjoy a broad value chain presence. These issues arise because New Zealand is a scarcely populated country with large land mass. New Zealand is a small economic nation with a population estimate of 4.32 million and GDP of US\$ 168.8 billion<sup>3</sup>.

The case study on New Zealand's innovation landscape is meaningful as New Zealand is a good example of early Western influence embedded within the Asia-Pacific. It was amongst the most competitive and advanced nations in the tropics and is still amongst the top 25 nations in the world. This paper discusses how New Zealand attempts to raise its productivity and innovation by analysing what the country has done to transform its innovation landscape. The paper primarily employs the managerial flow framework using case methodology to investigate her bid to improve national R&D competitiveness. Lessons learnt through New Zealand's managerial actions and assets in the organisation of its research landscape could be useful yet transferable to another small Asian state like Singapore in their quest to create national competitive advantage.

### Managerial Assets and Actions

The Managerial Flow model<sup>7</sup> presents five key issues or gaps (strategy, governance, selection, coordination and integration, communication and knowledge) that may surface during the implementation of public programmes. Gaps arise as a result of interaction amongst public institutions that oversee such programmes. In attempting to close these gaps, public institutions must generate appropriate managerial actions and build managerial assets. This section discusses the theoretical constructs and posits on the relationship between managerial assets and actions.

Institutional theory underlies characteristics and practices reflected in managerial actions. The theory concerns with the development of the *de-facto* assumptions, beliefs, and values. Public institutions set rules, or more formally, the human-enacted constraints and governance structures that shape interactions within the institution and amongst institutions that cooperate or collaborate. Institutionalisation influence managerial actions and practices in many ways, and is a process by which actors transmit codes and practices to shape and justify their behaviours<sup>9</sup>.

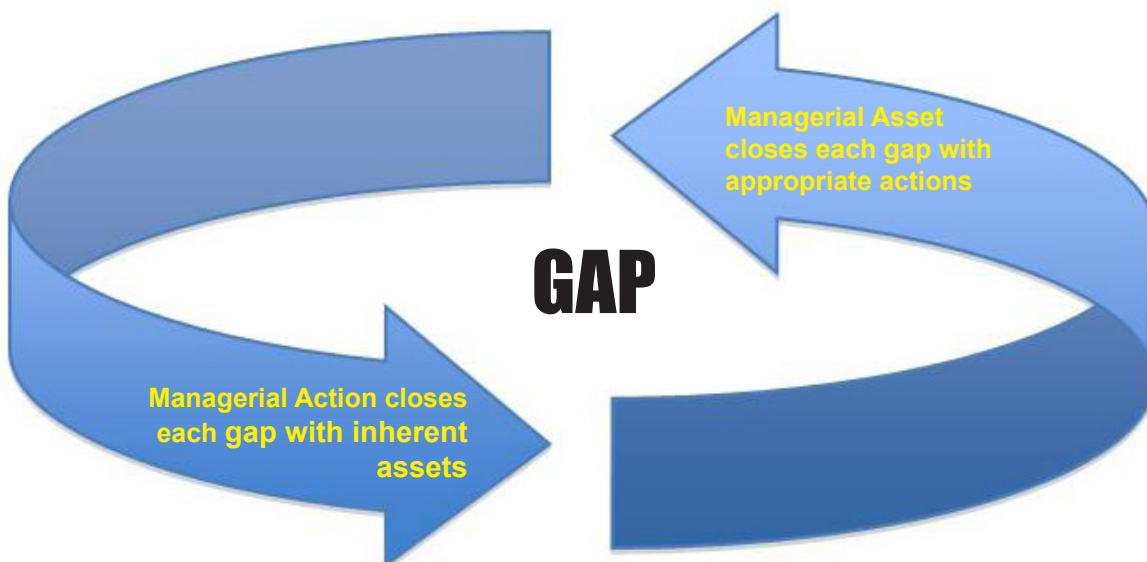
Managerial actions are defined by initiatives, interventions, and actions of public managers towards competition and economic development. On one end of the continuum, public authorities could play a *laissez faire* role<sup>10</sup>. But public authorities can also be an interventionist or an essential supporter of the industry.

Managerial assets follow the resource-based view that includes capabilities, organisational processes, information, or knowledge. Such assets can ultimately be physical, human, and organisational based. Whether assets are appropriate is determined by the environment and needs, as value changes will result in indeterminate outcomes in the resource-based approach. More specifically, the managerial flow model argues that organisational knowledge and learning from experiences can close managerial gaps. Therefore, public managers capable of acquiring comprehensive knowledge about the problems and having the ability to work out solutions<sup>7</sup> are essential.

We posit the relationship between managerial actions and assets forms a virtuous cycle or positive feedback. Well-considered actions can create managerial assets. Having strong and appropriate assets can enhance and support managerial initiatives, interventions, and actions, thereby creating a positive feedback.

Public authorities must therefore adopt a process where “managerial decisions and actions” generate “managerial assets” that could be milestones or enablers aimed at achieving superior results. More broadly, managers must first be able to identify what assets exist and what managerial actions will be necessary to build further assets. This tantamounts to the managerial feedback mechanism supporting managerial flows shown in *Figure 1*.

**Figure 1: Managerial Feedback Mechanism**



### Research Method

Methodologically, the case approach is as an examination of a unit of analysis using multiple sources of data and theoretical framework<sup>18</sup>. The managerial assets and actions in New Zealand, seen through the lens of the Managerial Flow model, is ‘revelatory’<sup>13</sup>, because there is an absence of research at a national level of policy coordination. From interviews with policy makers, business advisory agencies, industry and academic experts, the substance and experience of policies and programmes are profiled using the managerial flow framework to understand the managerial actions and assets. 22 interviews were conducted in New Zealand in November 2009: six with ministries and research foundations, nine with private sector companies, five with universities or crown research institutes, and 2 with non-profit organisations that help to promote trade. In total, 31 people were interviewed.

### Envisioning New Zealand

New Zealand’s limited domestic market and distance from global markets mean that companies in New Zealand must innovate and successfully capture international markets to grow. Recognising this, government agencies have this outward orientation where various programs and networks provide support for SME internationalisation.

One primary change includes investments into key components of the research and innovation landscape so as to encourage private sector participation in innovation. Increase in productivity and innovation are seen as key to New Zealand’s competitiveness<sup>14</sup>, with reported stagnant productivity and low growth rate.

New Zealand enterprises are typically small scale: enterprises having fewer than 20 employees make up 91 per cent of the country’s 21,900 enterprises and employ about one-quarter of New Zealand’s 240,000 workforce. Conversely, only two per cent of enterprises employ more than 100 employees, yet account for over 50 per cent of the manufacturing workforce<sup>14</sup>.

### Strategy

Reforms in New Zealand’s innovation landscape started by having former public research institutes amalgamated and privatised into eight Crown Research Institutes (CRIs) in 1992. The CRIs have been given mandates to undertake commercially oriented research and to collaborate with industry. The Crown Ownership Monitoring Unit of the New Zealand Treasury oversees the CRIs, covering all aspects from environment to trade and agriculture to manufacturing. In 2009, the combined revenues of all CRIs (from public and private sources) totaled NZ\$625 million and they employed about 4,400 researchers and staff<sup>16</sup>.

### Target Selection

New Zealand targeted growth efforts in sectors and niches where the country has some comparative advantage such as agri-bio and plant-bio. The CRIs also focused on high-technology areas, software development (for example, in health IT or graphics), and advanced medical devices where New Zealand seemed able to build and deploy private and public sector capabilities.

It was seen that well-designed innovation initiatives can reach traditional manufacturing sectors and induce significant spillovers. For instance, the offer of “free” R&D services through Industrial Research Ltd’s “What’s Your Problem New Zealand” programme<sup>17</sup> attracted significant interest from companies throughout the country, improved the visibility of this Crown Research Institute, and leveraged new projects and interactions with companies.

### Public Private Partnerships

In utilising all sources of knowledge and skills from industry and commerce, policy makers in New Zealand appear to make effective use of its non-profit organisations and trade associations to facilitate exchange and networking. Such trade organisations include Plastics New Zealand and NZBio. Plastics New Zealand has over 180 member companies, covering 75 per cent of all companies engaged in plastics manufacturing, design, machinery, and associated sectors. NZBio is an association active in national and regional networking in the bio and life sciences sectors. Universities have enhanced their functions and units for technology transfer and industry partnerships. For example, the Plastics Centre of Excellence established in 2008, is the collaboration between the University of Auckland and Plastics New Zealand. In addition, the University of Auckland engaged a returning Kiwi with some 20 years of technology transfer experience in the US to head the technology transfer office of the University, supported by a large team of 30 patent lawyers and faculty promoters.

### Dialogue and Consultation

The open and transparent governance nature of New Zealand’s public agencies and the government are reflected in the development and improvement of policies. Consultation on new policies is typically undertaken in the policy formulation stage, with engagement from business, academia, local governments, and other stakeholders through a partnership style. This active public-private exchange is recognised as important in developing strategies for targeted sectors. There is a broad orientation towards learning and evaluation. All public programmes are subjected to formal published evaluations upon completion, as well as to benchmarking and performance reviews. Evaluations are published online and are drawn upon in discussions of policy improvement and funding allocations. At the same time, there is high level of informal sharing of information and insights.

### Industrial Research Limited

Industrial Research Limited (IRL) is tasked with supporting New Zealand industry and has developed initiatives targeted at core manufacturing sectors. With 320 researchers and staff, IRL is organised in three major clusters: advanced manufacturing technologies (including energy and materials, engineering and applied physics, and high temperature superconductors); industrial biotechnologies; and measurement standards. In 2009, 72 per cent of its revenues of NZ\$60.5 million were provided by government, with 26 per cent from commercial sources and it secured 10 New Zealand patents, 20 overseas patents, eight licensing agreements, five joint ventures and developed close strategic linkages with five high-potential companies.

The relatively low share of commercial funding for IRL's research effort in part reflects some lack in R&D awareness and investment among New Zealand manufacturers. To tackle this problem, in 2009 IRL launched the "What's Your Problem New Zealand" programme and initiated a competition to select a company to receive NZ\$1 million of IRL R&D services. A major marketing and publicity effort was initiated, the idea for which initially came from a group of IRL staff. Of 100 applications received, 10 were selected for review by an independent panel. The winning company, Resene, was awarded the prize to develop water-based paints made from resins using 80 per cent sustainable ingredients.

### Unravelling Managerial Assets and Actions Planning

An overt policy and governance approach in New Zealand may be favorable. New Zealand reorganised and privatised its public research institutes to promote commercial research participation and reduce the dependency on public research. This is an initial managerial action in closing the planning gap. The managerial asset developed by the public institutions over time is its openness and transparency, resulting in reduction of protectionist policy and public ownership of research. The further managerial action to encourage the private sector to collaborate and tap on former public research bodies seems also successful in closing the planning gap. Here, managerial actions and assets have resulted in a virtuous positive feedback loop.

### Governance

There is a multi-tier governance in the public sector, notwithstanding having multiple stakeholders involved, including political lobbyists. At the Government level, the Ministry of Research, Science and Technology is mainly responsible for science and technology advice. For universities, policy advice occurs in the Ministry of Education. Economic development policy is located in the Ministry of Economic Development. Funding decisions are located in a separate set of agencies, with R&D funding allocations being the responsibility of the Foundation for Research, Science and Technology. Implementation, however, lies with a third category of organisations and agencies at the regional and councils levels. As a result, planning and coordination seem to occur at different tiers where interviewees revealed that often multiple organisations can support a particular agenda at the same time, say in regional development.

However, despite the 'confusion' of multi-tier support and implementation, the orientation of the public sector towards learning and evaluation is apparent with program evaluations conducted and published. Managerial actions to ensure feedback on policies included public consultations with engagement from business, academia, local governments, and other stakeholders. This leads to an understanding of policy performance which generates managerial assets.

### Selection

In New Zealand, there are actions to target biotechnology and creative industries in areas of comparative advantage, and with government agencies helping local companies internationalise and access foreign markets. The selection and coordination of policies to aid industrial development however do not appear to develop clear managerial assets, as a consequence of multi-tier efforts and duplicity of actions.

### Partnership

Managerial actions in encouraging CRIs to seek partnership with industry consortia in carrying out valuable applied research have been apparent. The reduction in public funding forces the CRIs to promote commercial interest and awareness and there are managerial actions supporting commercialisation. Universities have enhanced their functions and units for technology transfer. Industry partnerships involving research institutes and universities have evidently emerged with matching funding provided by government agencies, all in the bid to create managerial assets for concerned institutions and the research landscape.

### Knowledge and Communication

Public administrators appear to make effective use of NGOs and trade associations to facilitate exchange and



networking between private sector representatives and policy makers in New Zealand. Such managerial actions enhance communications with different stakeholders and actively engage on their knowledge. In addition, public programmes are subject to formal evaluations as well as to benchmarking performance, whereby reviews and evaluations are open to public. Such open ownership encourages discussions of policy improvement and decisions on future funding allocations that further creates managerial assets derived from successful managerial actions. Hence, managerial actions successfully aid in capturing knowledge and learning from exercised policies and programmes for both institutions and the country. Here, managerial actions and assets have resulted in a positive feedback loop.

### Conclusion

Like some large programs at the federal level and broad international level, New Zealand's multi-tier governance structure may have resulted in, and has been criticised for, its high transaction costs. This is inevitable as with New Zealand's diverse land mass and scattered population. However, is this to the extent of compromising the efficacious implementation of programmes?

This paper argues that the open and transparent governance structure in New Zealand can be a double edged sword. Despite claims, the benefit to New Zealand's

public institutions appears to be less bureaucracies, with multiple agencies working in parallel and alongside each other to support economic and business growth. The broad engagement nature works particularly well in the small and scattered economy of New Zealand.

Secondly, what is clear in this case study is that public-private partnerships can bring mutual benefits and cross-fertilisation in the area of research and innovation. This paper presents the model of New Zealand and her Crown Research Institutes as a lesson for other countries to study. This model might have resulted in some institutions actively pursuing partnerships with industries. Whether these will bear fruition and serve as a model for other advanced economies remains unknown.

Thirdly, determining the direction for economic and industry growth was done in careful consultation with local stakeholders who experience local conditions and policy implications. The lack of multiple stakeholders engagement may not bode well for evaluation and refinement of programs and policies. What other Asian countries can learn from New Zealand is perhaps to be more transparent in having open evaluation and communication, especially when public funds are often used in programmes.

Lastly, in applying the managerial flow model retrospectively for New Zealand, it has been helpful in understand-

ing the managerial gaps at the national level and the reasons why program implementation needs to consider these gaps and possibly to close them. This paper posits and provides some evidence that appropriate managerial actions can lead to further managerial assets and vice-versa, thereby generating a positive feedback or virtuous loop in the managerial flow model. **SMR**

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