

# DESIGN MANAGEMENT TOWARD A NEW ERA OF INNOVATION

2011 TSINGHUA-DMI  
INTERNATIONAL DESIGN MANAGEMENT SYMPOSIUM  
HONG KONG

## PROCEEDINGS

JUN CAI (Ed.)  
JIKUN LIU (Ed.)  
GABRIEL Y.L. TONG (Guest Ed.)  
ANTHONY K.C. IP (Guest Ed.)

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INTERNATIONAL DESIGN MANAGEMENT SYMPOSIUM  
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## Foreword

When Peter Gorb initiated an education program in design management at the business school of the London School of Economics in the 1960s, it was difficult to imagine in the following fifty years how the same program would be recognized and developed.

Following the shift of industrial development momentum from the west to the east in the 1980s, design management has been receiving more attention in China, particularly in the enterprises and the social sectors.

In the 21<sup>st</sup> century, China has been playing more important roles in the world economy. Manufacturing in China has become an important juncture in global supply chain, while quickly expanding markets have generated new requirements on design innovation. These may range from the manufacture of conventional product to the extension of brand, as well as from the process of new product research and development to the management of business model.

Design in the manufacturing sector has not only been gradually recognized, but design management is also needed to integrate business with technology, brand, customer and user. The relationships between design management and innovation have becoming more significant for exploration in the studies of industries and enterprises.

Whether design is a part of government policy or enterprise customer-based strategic research, the latest theories and practices on design management have become more intensified in China.

From an international perspective, design management began mainly with product development, process control, brand strategy and design strategy, then extending to the latest service design, innovation management and sustainable design. The scope of design management knowledge in terms of breadth and depth has expanded and changed considerably, leading to more complexities.

With the advancement of the information economy and more complex social and business environmental changes, design management based on system thinking are crossing many disciplines and reorganizing various resources to provide new methodology for design solution. The customer and user values could be integrated with business innovation to generate new supply and demand relationships. Hence, design management should be perceived as a knowledge platform to better understand the attributes of innovation management.

It is against this background that we propose the theme of this Symposium: "*Design Management: Towards a New Era of Innovation*". On the one hand, we hope manufacturing in China and those around the world will move towards more innovative models and make constructive suggestions. On the other hand, we like to explore more on the effects of design management on future education and business.

The research scope of the Symposium proceedings has included innovative design thinking, design and business, sustainable design, inclusive design, service design, brand strategy, design education, designer and entrepreneur, small and medium enterprise, design process, innovation strategy, user studies, system design, industrial policy and many others.

It is worth noting that design management research has expanded into psychology, sociology, management, cognition science, communication sciences and other disciplines. Design thinking for business management and design-led innovation have received more attention when performing research and in driving the business innovation process. Undoubtedly, design management will have a lot of room for future development.

Lastly, I like to thank the Authors, Proceeding Reviewers and Editors for their contribution on both the Chinese and English versions, as well as all our supportive friends. Without them, this Symposium would have been impossible!

Professor Jun Cai,  
Executive Chair,  
2011 Tsinghua-DMI International Design Management Symposium, Hong Kong  
20 November 2011

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# **Section 1: Design Management, Strategy and Innovation**

# New Zealand's Design Policy Diagnosis, Prognosis and Strategic Management

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**Abstract.** The proliferation of design initiatives or policies, as means to drive innovation and competitive advantage, have been encouraged by scholarly studies that show positive causal links between design capability and national competitiveness. In New Zealand, the Government approach for economic development was set out in the Growth and Innovation Framework (GIF) of 2002. Among other things, four key pillars - 'engaging with sectors', 'strengthening the innovation system', 'developing skills and talents', and 'increasing international competitiveness' - have been identified for strategic interventions to improve the country's ailing standard of living. In 'engaging with sectors', the Government partnered with sector industries and established sector taskforces. As the four sectors are most likely to apply design, creativity and innovation to achieve their goals, it will be referred here as the "New Zealand Design Policy/Initiative". This paper adopts an epidemiological method to examine the causes of economic decline, and the challenges of nearly a decade of sector engagement in the New Zealand Creative Industries. Based on current statistical evidence, both in New Zealand and abroad, it is argued that design policies are not always effective for healing a nation's economic ills. In many cases, they are hygiene factors hyped as panacea for driving overall competitive advantage of a nation.

**Keywords.** Design Policy, Competitive Advantage, Strategic Management

## 1 Introduction

For a design policy/initiative to be effective, it must exist in a favourable environment where creativity can flourish, and benefit from the nation's cultural dynamics, human capital availability, history, politics, natural resources, and even geographical position of the country (O'Shaughnessy, 1996). This paper examines the challenges, opportunities and strategic management of the 10-year journey (2001 and 2011), by the New Zealand Government, to harness the power of design as one of its strategies to address continual economic decline. The four industry sectors - design, biotechnology, screen production, and information and communication technology (ICT) - are discussed to analyse and critique the effectiveness of the "Sector Engagement" strategy. Sector engagement is enshrined in the New Zealand Growth and Innovation Framework (GIF) as one of the government's key economic initiatives to lift the country's creativity, innovation, and value creation.

New Zealand has experienced six decades of economic decline. This has resulted in the proliferation of government intervention policies to address social, productivity and innovation ills. The threads of persistent deterioration in the nation's GDP, standard of living, and national debts are becoming increasingly real. This economic decline is affecting a small country like New Zealand and distressing larger economies like the US, Britain, and many EU countries.

Since the 1950s, New Zealand's economic growth has significantly declined when compared with other advanced countries. In the 1950s, the nation's GDP per capital was around 60% higher than the OECD average, and the country was positioned fourth in the OECD ranking for economic competitiveness, just behind Switzerland, Canada, and Luxembourg. By 1970 it was ranked in 11<sup>th</sup> place, behind France and Iceland; and 10 years later, in 1980, it had slid to 19<sup>th</sup> place, just behind Italy and Finland. New Zealand held that position for almost 20 years until its economic decline accelerated, with Ireland overtaking it in 1997, and Spain overtaking it in 2000. By 2002 New Zealand's position had fallen to 86%

below the OECD GDP average. Greece overtook it in 2005, leaving New Zealand at the bottom of the pyramid of the OECD chart at 22<sup>nd</sup> out of 30 OECD member countries. This places New Zealand just ahead of Korea, Czech Republic, Portugal, Slovak, Hungary, Poland, Mexico, and Turkey (OECD Factbook, 2009).

Design and strategic management, at business, industry and government levels have been touted as one of the key panaceas to cure the country's economic ill health. It has also been peddled as a key driver for creativity and innovation, aimed at creating brand reputation, value and wealth, GDP and prosperity (Success by Design, 2003).

## **2 Diagnosis: what went wrong?**

The causes for this alarming economic decline are complex and difficult to pinpoint. Reasons posited for the economic decline have included: the rapid deregulation in the 1980s; poor performance of managers of enterprise; lack of natural resources; distance from world markets; acute "brain drain, and browning of the New Zealand workforce" (Catley, 2001, p. 56).

Catley (2001) argued that the brain drain of New Zealand's skilled workforces is an exacerbating factor for the economic decline. Between 1979 and 2001, there was a significant and steady migration of highly skilled New Zealanders to Australia, and other English speaking countries, in search of significantly higher income levels. By 2001, the Australian average income levels were 30-50% higher than those in New Zealand. Catley maintained that once a significant number of skilled people are lost, industry, business and government sectors would face increasing problem meeting staffing needs, leading to the decline of core services across the productive sectors. For this reason alone, it is now very difficult for New Zealand to rejoin the core of high-income countries, let alone compete with them.

As a predominantly agricultural nation, New Zealand's economic performance has always been affected by global events, socio-cultural factors and physical constraints. A small population size and large distance from key global markets also present considerable disadvantages. New Zealand, therefore, cannot continue to compete in low value production of food, or by simply opening the economy to international trade, investment and technology flow, or by providing cheap labour. (GCR Survey, 2006).

Competition and value creation are constantly taking new forms. Globalisation and the Internet have made knowledge, technology, capital and skilled labour increasingly available resources – offering opportunities for enterprises, industries and countries to draw upon an existing stock to produce manufactured goods, without a lengthy and costly learning process.

However, merely turning these resources into commodities, without imagination, are considered to be 'low-road' and short-term defensive strategies that are incompatible with sustained economic growth and global competitiveness. It is believed that New Zealand's long-term and effective creative competitiveness requires capability-building strategies to nurture imagination, innovation and entrepreneurship, especially in the design of value-added meaningful experience in products, services and brands. These 'high-road' drivers are the keys to competitive advantage in the creative economy for a small and distant nation. (UNIDO, 2003; GCR Survey, 2006). Hence, the promulgation of GIF

## **3 Plan of treatment**

The notion of the importance of design and creativity is not foreign to New Zealand. 'Kiwis' consider themselves to be both innovative and ingenious and include New Zealanders such as: Ernest Rutherford who was the first in the world to split the atom in 1919, A J Hackett who invented bungy jumping, Ernest Godward who invented the humble eggbeater, William Hamilton who invented the jet-boat, William Atack who invented the referee whistle, Bill Gallagher who invented the conveyer belt and electric fence, and Richard Pearse who

designed and flew the first powered flying machine. Kiwis also excel in software design, transportation design, and films direction and animation such as Avatar, X-Men, King Kong, The Chronicles of Narnia, and Lord of the Rings.

However, as has been alluded to above, due to a culture of dependence on the land as farmers, the distance and size of the country and its small population, New Zealand has increasingly become uncompetitive. In 60 years it has dropped its global competitiveness ranking from the top to the bottom among OECD countries. With this background in mind, the nation urgently needs to build a stronger design-led culture of business sophistication, and acuity in commercialisation to successfully add value to their its products, services and brands.

The government's economic development strategies – Growing an Innovative New Zealand (GINZ) is the precursor of the GIF. Both documents aim to lift New Zealand competitiveness. The key strategies are outlined here to highlight the challenges and opportunities for economic transformation. The GINZ, announced in Parliament in December 1999, was a bold initiative developed by the Government under Prime Minister Helen Clark to set a new direction for economic transformation for New Zealand. The main aim was to raise productivity and the standard of living of New Zealanders (GINZ, 2002).

The GIF is a broadly based strategy designed to enhance innovation across the economy of New Zealand. It builds on the economic development policies that the government had put in place in earlier years to grow an innovative New Zealand. The GIF stresses the importance of building effective innovation; skills and talent development; sound foundations for national development, including good fiscal management; a sound monetary policy; a competitive, open economy; social cohesion; a healthy, well educated population; a solid research and development framework, and much more. It is beyond the scope of this paper to dwell on the details. However, focus will be placed on the Creative Industries, and the various Design-Led Taskforces the Government has established to lift design and innovation activities in the Creative Industries. The main aim of the Creative Industries is to “build effective innovation that permeates the whole economy” (GINZ, 2002, p. 6).

#### **4 Evidence between design capability and wealth of nations**

The last 15 years or so have witnessed the transformation of design as a potent creative activity that interacts with science and technology to enable innovation to occur. Businesses, industries and policymakers are increasingly convinced that design can play a critical role in the innovation process, to add value to products, services and brands. Recent evidence has also indicated strong correlation between design capabilities with economic competitiveness of wealthy nations. These early evidence and emerging consensus have led to the transformation of design as a key driver for wealth creation and competitive advantage.

Design policies, and creativity programmes have sprouted in almost every country around the world as a weapon not only for wealth creation, but increasingly as a panacea for arresting economic downturns of businesses, states and countries. Here are some compelling evidences for the emerging beliefs:

The relationship between design competitiveness and the economic competitiveness of a nation indicates the value-adding potentials of design. Many studies have indicated compelling evidence of the significant relationship between the use of design and high economic performance (NZIER Report, 2003; Friedman, 2004; Pierson, 2005; Designium, 2006).

The Global Competitiveness Report, published annually by the World Economic Forum, lists the most competitive countries in the world. Using the 2001–02 report and a suite of indexes that measure a range of factors, including the use of design as a business input that influences competitiveness, the New Zealand Institute of Economic Research (NZIER) has demonstrated the significant relationship between design application and economic competitiveness. Among the indexes compiled in the Global Competitive Report, five related

to the application of design – ‘capacity for innovation’, ‘uniqueness of product design’, ‘sophistication of production process’, ‘extent of branding’ and ‘extent of marketing’

Figure 1 (below) shows the strong linear relationship between economic competitiveness and design application for the top 20 countries in the 2001–02 global competitive ranking.

The shaded portion in the chart shows the common area for which both the overall competitive index ranking and the design index ranking are 25 or better. It is worth observing that, with the sole exception of Korea, there are no countries ranked in the top 25 in terms of design that are not also ranked in the top 25 in terms of overall competitiveness.

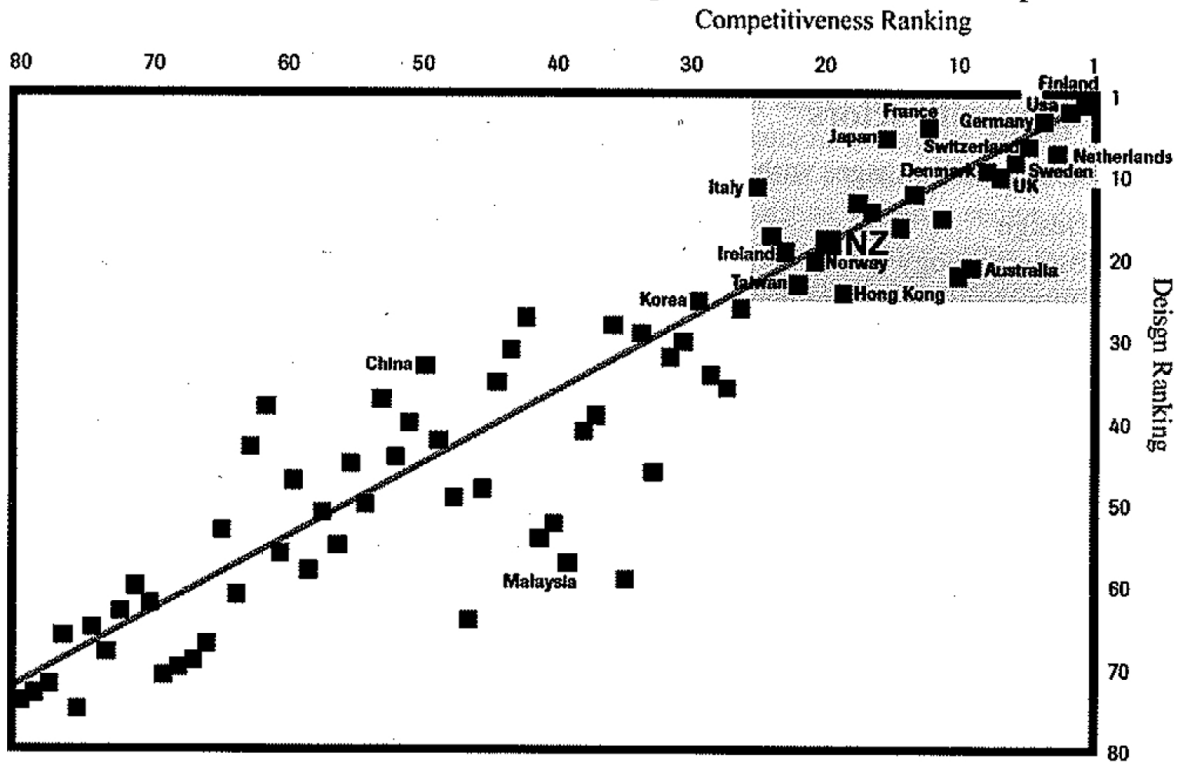


Figure 1. World Competitive and Design Rankings

Source: NZ Institute of Economic Research, “Building a Case for Added Value through Design”

Report to Industry, New Zealand 2003.

Pierson (2005) also found compelling connections between design and competitiveness. In a five-year analysis of share price performance of companies, Pierson noted that those with ‘a high inclination’ towards design were ‘higher than’ the average performers of the Standard and Poors 500 index, and ‘much higher than’ the companies that have ‘little inclination’ to using design. This study revealed that companies that have an inclination towards design performed much better in their share price in five out of five years, between 1995 and 1999, on the Standard and Poors 500 indexes.

Akin to the NZIER study, a comparative study by Power (2004), across five Nordic countries of similar size to New Zealand - Sweden, Denmark, Finland, Norway, and Iceland, provided almost similar evidence that design acts as a powerful driver for profitability, innovation, and business competitiveness. Perhaps the Nordic countries are advantaged by a more deterministic culture to succeed, better positioned within dense market reaches, and more able and determined to strategically manage their design initiatives, than New Zealand?

Further analysis of the competitive edge of design at the economic-wide level is the extent a nation’s brands have become internationally recognised. The countries identified as being the most competitive in the Global Competitive Reports – such as Finland, Sweden, the United States, the Netherlands, Germany and Switzerland – have each developed product brands that, over time, have become household names. Further reflection on the positive

nexus between design and global high-ranking is the obvious role that marketing plays for each of the top-ranking countries.

All these countries have seemingly tapped into the global value chains to gain further economic advantage and competitiveness. Participation in the global value-chain provides countries with a means for accelerating the development of their enterprises for exploiting markets and technological capabilities via wider networking and connections. This means that the enterprise can perform a continuum of related dependent activities that are required to bring a product from its conception to its end users. This includes activities such as design, production, marketing, distribution and support for the final customers. New Zealand is not bestowed with all these criteria due to its geography.

## 5 Engaging with sectors

As noted above, GIF engages with the following four sectors:

1. Design
2. Biotechnology
3. Information and Communications Technology (ICT)
4. Screen Production

These sectors, or industry bodies, were selected because the government considers them to be the potential drivers for high growth, and “because the technologies or capabilities with which they are concerned are enablers of activities across the economy generally” (GIF, 2005, p. 2).

In 2001-02, the Government spearheaded a national programme to recruit individuals from business, industry and education, to develop strategies for the four sector/industry bodies. The four Taskforces appointed by the government are autonomous industry bodies, containing a broad cross-section of people to propose knowledge and insights on how best to grow the country’s economy from their sector perspectives. The reports of the GIF Sector Taskforces, completed in 2003, emphasised the central role industry plays in the success of their growth strategy. Some of the sector strategies in the reports are still growing, adapting and morphing to compensate for changing external economic forces, both locally and globally.

The four Taskforces have now changed their names or adopted new titles to better represent their industries. The Design Sector has since changed its name from Success by Design to *Better by Design*. The Biotechnology Sector is now known as *NZBio*. The ICT Sector is now called *The HiGrowth Project*. And *The Screen Council* now runs the Screen Production Sector.

The original Taskforces reports are now almost a decade old. While they still provide an important direction for the sector’s growth and development, many of their initial ideas have been completed or have changed. However, a 2005 review of the four sectors have identified some significant cross-sector recommendations (GIF, 2005). All four Taskforces identified a lack of commercial and entrepreneurial skills as a major barrier to taking a company global. Each placed priority in improving the commercial and entrepreneurial skill among decision-makers in business. They also recommended that tertiary education providers improve co-ordination with industry sectors to ensure they produce appropriate numbers of graduates with relevant skills for industries.

## 6 Management of the GIF industry sectors

The Government’s Ministry of Economic Development (MED) plays a central role in the establishment of the four Industry Sectors and provides operational funding and project funding to assist the four industry bodies to build co-ordination and leadership capability. The funding is of great importance to enable the sectors to achieve their growth targets and develop approaches to encourage private sector ownership of their strategy. The MED

reviews the progress of the four Sector Taskforces and publishes annual reports to Ministers in Cabinet. The Design Policy governing the four industry bodies is therefore strategically managed at the highest levels.

The size of the funding is comparatively modest by international standard. The New Zealand Trade and Enterprise (NZTE) administer the GIF Sector funding, under a two-tier system:

- An operational funding of \$4.222 million (over 4 years) for the establishment of the Sectors between 2 and 4 years.
- A project based funding of \$12.889 million (over 10 years) to provide additional recourses on a project-by-project basis.

The MED opined that industry bodies are a response by a sector or profession to a market failure, where an individual or firm does not have the means to revert the failure. From an economic development point of view, increased sector-based contribution to GDP growth may be more likely to come from firms as related organisations within a sector co-ordinate their activities, co-invest in research, and collaborate to build capabilities and develop markets. Hence, investing in the GIF sector bodies from central government to develop sectors capabilities, constitutes an important growth strategy in improving sector performance in the future of the New Zealand GDP. Besides these core values, each sector has established important and meaningful dialogue with the government on key issues affecting their industries. These include “improving and stream lining education, taxation, intellectual property, broadband policies, R & D and market development that benefit the entire economy” (MED, 2005, p. 13).

While the four GIF sector bodies have had some successes in managing their economic development objectives, the government is concerned of failures and the risk of being dragged into failed activities to becoming financial guarantors for the industry in the future. The operation funding for HiGrowth and the Screen Council ceased in June 2007. NZBio funding was stopped in 2010. They will continue to exist as charitable trusts. The Better by Design Advisory Board has been very effective in championing the design strategy, and is operating on a unique model of self-funding (MED, 2005).

Recognising that setting up the Sector Engagement strategy is an evolutionary process, future government funding for sector bodies would only be considered where there is a demonstrable gap between the fund the sector body can reasonably derive from member subscriptions and other sources. The MED would expect the industry sectors to develop widespread industry support and eventually become self-sustaining (MED, 2005).

## **7 New Zealand’s report card for 2010**

The New Zealand Institute, a privately funded think-tank committed to generating ideas, solution and debate to improving economic prosperity in New Zealand, published a “big picture” Report Card on the social, economic and environmental health of New Zealand (NZahead 2010). It graded the social, economic and environmental performances of New Zealand in 17 areas. *The Report Card*

	Grade	NZ Rank	Trend	Latest Value	2015 Target	
<b>Social</b>						
Life expectancy	C	14th of 31	✓	80.2	82.8	More
Unemployment	C	11th of 23	⇐	6.6%	4.0	More
Inequality	D	23rd equal of 30	⇐	Gini value 33.1	30	More
Assault mortality	D	23rd equal of 28	⇐	1.6 per 100,000	1.2	More
Suicide	C	13th of 29	✓	11.0 per 100,000	9.0	More
<b>Economic</b>						
GDP per capita	C	22nd of 30	⇐	\$46,683	\$56,000	More
Household wealth	D	9th of 9	✗	\$514,000	690,000	More
Labour productivity	D	22nd of 30	✓	\$43 per hour	\$50	More
Innovation and business sophistication	D	20th of 31	✓	4.3	5.0	More
Educational achievement	B	4th of 29	✓	1043 Combined PISA score	1057	More
<b>Environmental</b>						
Agriculture and forestry land per capita	B	3rd of 27	✗	2.9 Ha	2.4	More
Water quality	C	Not available	✗	0.99 mg/L nitrogen	1.00	More
CO2 concentration in the atmosphere	D	Not applicable	✗	392	395	More
CO2e emissions per capita	D	24th of 28	⇐	17.9	15.0	More
Invasive species	C	Not available		\$3.4b cost	3.4	More
<b>Summary grades</b>						
From the New Zealand Institute	C	Not applicable	⇐	C. Effort graded B-		More
Your voice	C		⇐			More
Net migration of citizens	C	Not available	✓	-14,236	-15,000	More

Source: (NZahead 2010)

## 8 Prognosis

The measures in the report card show a more realistic representation of New Zealand's quality of life. Each measure also has direct international comparisons to position New Zealand's standing more reliably and accurately, to provide a balanced view of the country's comparative strengths, weaknesses, opportunities and threats.

It needs to be said that based on this report, the overall competitive position of New Zealand's economic health is still very vulnerable. This paper has shown that design adds value to products and services and competitiveness to a country's economy; however better empirical insights are needed to show the true contribution of design to increasing the

competitive advantage of businesses, industries, regions and countries. It could be inferred, from the above Report Card, that the design policy of New Zealand has played an insignificant role to putting the country back to the top half of the OECD economic competitive position. The design sectors themselves are too small to make a difference to the country's challenges for competitiveness and economy-wide growth. It is necessary to consider a broader range of highly skilled workers – R&D workers, scientists, engineers – in order to fully exploit the nature of contemporary innovation process (Gertler, 2006).

The forces that shape competitive advantage are beyond of reach of the design initiatives in New Zealand. The threat of new competitors, the bargaining powers of buyers and suppliers, and the threads of new products and services substitutes (Porter, 2008) are persistently driving down the competitiveness of this agricultural and distant country. New Zealand has tried, but it lacks the human capitals, and is too small and far away to fight these external threats.

The New Zealand Business Review (NBR, 2011) posited that, based on the 2000-07 growth rates, China would have overtaken New Zealand by 2030 and would pass the median OECD country in 2034, when New Zealand would sit at 26th place on the OECD ranking. However, the NBR also noted, that getting New Zealand to the top half of the OECD ladder, while extremely steep, is not impossible. Countries such as Singapore, Hong Kong, Spain and Greece were much poorer than New Zealand 20 or 30 years ago. These countries have now surpassed or caught-up with New Zealand, with strategic management of sound pro-growth policies.

Realistically, however, a 7.5% GDP per capital growth rate is required for five years to put New Zealand back in the top half of the ORCD ranking. Unless the country strikes oil or gold, this is almost unachievable. During the past 40 years, there has not been a single year when the country's growth rate has been 7.5%; let alone five years in a row. The highest average growth rate for a five-year period (1992-1997) was 2.9%. And the highest growth rate for a 10-year period (1992 – 2000) was 2.6% (NBR, 2011).

It must be remembered that New Zealand's economy is heavily based on a historical foundation of exports from its efficient agricultural system. Key agricultural exports include dairy products, meat, forest products, fruits and vegetables, fish and timber. Everything this country does is comparatively small and distant from the main export markets. New Zealand's design initiative is well meaning, but no panacea. Akin to other design policies, it signals a world perspective that the competitive advantage of the advanced economies depends on productivity and export of value-added products and services, and these depend on design, innovation and entrepreneurial acuity.

New Zealand's largest 100 technology based exporting businesses account for only about \$5 billion. New Zealand is not as successful as many other small countries, for example Finland, Demark, Sweden or Singapore. New Zealanders are as creative and innovative. However, New Zealand struggles on many other areas due to its small size and geographical remoteness from the rest of the world, other fortunate countries take for granted. The lack of scale and critical mass in the economy is a formidable impediment to achieving higher levels of competitive advantage. The country suffers from a commercial environment where businesses cannot access skilled workers, infrastructure, financial capital, specialised efforts, and large output markets. These are some of the key challenges for New Zealand to improving competitive advantage (Skilling, 2004).

In the economic environment that has been described, a good design policy is not unnecessary, but it must not be considered as 'the' magic potion for advancing competitive advantage of New Zealand, as some of the taskforces' documents seemed to have claimed. The challenges facing New Zealand's ailing economy are substantial and urgent. It requires new and unique creative thinking to develop policies/initiatives that are appropriate to the New Zealand context. The government needs to focus more seriously on its efforts in innovation building – involving industries, education, states and government. It must commit substantially more resources to achieve the economic goals it consider as important for growing a competitively advantaged New Zealand. For instance, Korea commits 2% of GDP

or \$85 billion to funding its strategy to encourage green business activities. Singapore has a policy to increase inventiveness, so it is funding 1000 PhDs at a cost of \$1 billion (Boven, 2010). In contrast, New Zealand seems to consider its “design sector initiatives” merely as a hygiene factor, by allocating a paltry amount of \$12.9 million over 10 years...

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