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The Implications of Kiwi Cognition and Behaviour for Innovation and Productivity Policy Making

Research confirms that Kiwi cognition and behaviour associated with national culture has a number of characteristics that impact innovation outcomes and in particular productivity.

If the current level of creativity/invention/discovery were to be held constant and the latent value fully realised and captured, New Zealand's productivity and economic performance would be transformed.

Policies, interventions and strategies should be directed towards the creation and capture, retention and repatriation of additional value from existing and new products and services in new and existing markets serviced by new and existing channels.

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The Implications of Kiwi Cognition and Behaviour for Innovation and Productivity Policy Making

Executive Summary

Research by various academic and management practitioners, including the author of this paper, have identified cognition and behaviour attributable to Kiwi national culture[1] that contributes to New Zealand's productivity paradox. The paradox is why a nation with near textbook policy settings and adequate institutional arrangements delivers only mediocre economic performance. Institutional arrangements and economic geography have been offered as explanations while national culture determined Kiwi cognition and behaviour provides compelling insights to both those factors. Then Kiwi cognition and behaviour itself explains why the nation's apparent high inventiveness does not translate into equally high productivity, profit and prosperity.

Productivity analysis and discussion in New Zealand focuses almost exclusively on efficiency and lowering or removal of barriers. However, the productivity paradox will only be resolved by the creation of additional company profit and its capture as *gross value added* (GVA) and hence contribution to GDP.

Productivity and economic development are functions of innovation. Although New Zealand has typically taken an institutional arrangements approach to analysis of the national innovation system, it is identified that innovation is a multi-faceted psychological and social process occurring within a complex economic and social system. As such all the elements of the system must be considered as an interlinked and interdependent whole if a proper diagnosis of the nation's economic malady is to be made. Institutional arrangements, economic geography and national culture provide alternative approaches to analyse the complex system but each alone provides an incomplete picture. Combined however, they provide new and powerful insights.

The innovation process is identified as comprising two principal parts (initiation and implementation) and those parts are optimised by different cognition, behaviour, resources, institutions and even people, and hence may respond differently and potentially conversely to policies and interventions. Although there is a common expectation that inventiveness will automatically translate into GVA and hence growth, initiatives aimed at increasing invention/

[1] The term "Kiwi" is used to denote the Anglo-Saxon derived, Maori influenced culture that predominates in New Zealand.

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discovery/ creativity will not necessarily translate into creation and capture of company profit and national prosperity, and if they do, that creation and capture is rarely maximised.

It is widely assumed, in accordance with the Anglo-Saxon model of capitalism - and policy making accepts - that market forces will result in maximisation of value and that there is an automatic correlation between creating value and national prosperity. However, research identifies a number of innovation and management practices engaged in by Kiwis that result in suboptimal value creation and capture/ retention/ repatriation. It is argued that attention to exploiting the existing portfolio of intellectual assets and maximising the creation and capture of economic value, even in the absence of new inventions/discovery and investments would transform the New Zealand economy.

The paper contends that in order to maximise value creation and capture, policy and interventions need to be directed at the latter part of the innovation process and in particular the proactive management, recognition, valuing, protection and development of intellectual assets and the capture/retention/repatriation of value through attention to the overall intellectual property/intellectual asset environment, foreign direct investment, immigration, research, science & technology policies, free trade agreement design and implementation, trade promotions, people management and intervention design.

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PART A: BACKGROUND

Productivity and economic development are functions of innovation.

Innovation is a psychological rather than institutional process. Institutional environments do not automatically create cultures that facilitate maximisation of value creation and capture.

Increasing creativity does not automatically increase profit and prosperity.

New Zealand's productivity is compromised by failings in value creation and especially capture/retention/repatriation rather than efficiency.

1. Purpose of paper

This paper discusses the implications for innovation and productivity policy making and interventions of Kiwi national culture. There is solid evidence (eg Hofstede, 1994) that even the cognition associated with the interpretation of scientific data will be moderated by national culture and it seems probable therefore that the same will apply to policy making. Research reports that Kiwi national culture is associated with high initiation activity but low implementation (follow-through). Further research reveals a variety of behaviours that result in sub-optimal creation and capture of company profit and national prosperity. The paper argues that policy outcomes and interventions can be improved by factoring into design and implementation, consideration of the peculiarities of national culturally determined "Kiwi" cognition and behaviour.

2. Introduction

"The mystery is why a country that seems so close to best practice in most of the policies that are regarded as the key drivers of growth is nevertheless just an average performer."

OECD (2003)

New Zealand faces a productivity paradox, underperforming compared to the policy settings in place and relative to the performance of comparator nations over an extended period of time (MED, 2007). To gain a full understanding and make a proper diagnosis of the malady facing New

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Zealand's productivity and National Innovation "System" (NIS), economic geography (eg McCann, 2009), institutional arrangements (eg Smith, 2006; Treasury, 2010) and national culture moderated cognition and behaviour (eg Smale, 2008), along with their inter-relationships and interdependencies must all be considered. For example, McCann (2009) claims the face to face contact benefits of agglomeration (economic geography) is an important determinant of productivity. So to then will be issues that affect knowledge exchange such as a fragmented research, science and technology (RS&T) community (institutional arrangements), and a short term approach (national culture) that negatively affects the accumulation of the social capital (trust) necessary for optimised knowledge exchange and that is exacerbated by feedback reluctance that compromises the quantum and quality of and response to that knowledge exchange (national culture) in the form of feedback reluctance.

To apply a reductionist approach and adopting Occam's razor meta-theoretical principle that entities must not be multiplied beyond necessity as does McCann (McCann, 2009) in seeking a single and "simple" explanation is counter-productive. The NIS and economy are highly complex social and economic systems that should operate and be analysed as highly inter-connected and interdependent elements, not the disjointed and fragmented approach that is adopted in New Zealand (and much of the Western world). To isolate one from the other in search of the principal cause of under-performance is overlooking the very nature of complex systems. The impact of national culture moderated cognition and behaviour is not therefore presented as a simple, single diagnosis but rather as one of the elements of the complex system that has both direct impacts and interacts with and positively and/or negatively moderates other factors.

3. *Productivity and the National Innovation System*

Although the relative decline in New Zealand's labour productivity compared to similar countries was arrested (or at least slowed) following the economic reforms of the 1980s and 1990s, there has been no subsequent catch-up (McCann, 2009). Although having amongst the highest labour utilisation rates in the world (MED, 2007) and hours worked in the industrialised world (Messenger, 2004), this has not offset the failure to achieve gains from technical driven "innovation".

There are positive correlations between economic development as measured by GDP per capita and innovative activity. The success of NISs may explain the differences in growth rates under both old and new growth theories (e.g. Morris, et al, 1994; Lee & Peterson, 2000; Hull, 2003; Pohlmann, 2005; Lundvall, 2006).

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The under-performance of the New Zealand NIS, especially the failure to maximise value creation, explains at least in part, the New Zealand productivity paradox and that underperformance is in turn explained, again in part at least, by cognition and behaviour associated with Kiwi national culture.

3.1 Productivity is a function of efficiency and value captured

Kiwi culture adversely impacts productivity, specifically by reducing maximising behaviour and negatively moderating the cognition and behaviour associated with creation and capture of value.

The productivity calculation is straightforward:

$$\text{Productivity} = \frac{\text{Value of outputs}}{\text{Cost of inputs}}$$

As such, productivity is a function of both efficiency (denominator) and value created and captured/retained/repatriated (numerator). Productivity can be manipulated by either increasing the numerator or decreasing the denominator. An implicit assumption is made that in a market economy, companies will, in some sort of equilibrium, maximise value created and captured given prevailing supply and demand and therefore the principal focus is on efficiency. There are however demonstrable failures in New Zealand's value creation and capture processes arising from the way that Kiwis structure and manage the different elements of the innovation process, and when and how they engage with customers[2]. Irrespective of other considerations (eg institutional arrangements and economic geography considerations), New Zealand's productivity paradox will only be resolved when these failings are resolved.

Without diminishing the importance of efficiency, given Kiwis existing strong focus on process innovation, and especially efficiency, it is contended that the principal focus should be directed towards policies, interventions and strategies that target gains in the creation and capture/retention/repatriation of additional value from existing and new products and services in new and existing markets serviced by new and existing channels. Focus on efficiency is comparatively limiting while focus on value creation and capture is for all practical purposes, open ended.

[2] Eg Forté Management research and NZTE research http://www.nzte.govt.nz/explore-export-markets/Export-Markets-Resources/Pages/Perceptions-of-New-Zealand-research-summary.aspx

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3.2 Innovation is a psychological process within an institutional framework

New Zealand has taken a predominately "institutional arrangement" approach to analysis and development of innovation policy, eg Treasury (2010). Yet despite New Zealand's institutional arrangements being lauded as the product of "A set of textbook changes" (McCann, 2009) and policy settings as close to best practice (OECD, 2003), the productivity malady continues. More importantly, ***"Creativity, innovation, and initiative are psychological processes."*** (Rank et al, 2004: 518). The focus on institutional arrangements is neither incorrect nor inappropriate, but it is incomplete and insufficient.

3.3 Knowledge economies prosper

Of the top ten nations for GDP per capita (Purchasing Power Parity), five (ranking 1, 3, 4, 6, 8) do not rely upon primary production or extractive industries for their wealth creation[3]. New Zealand has accumulated a large portfolio of knowledge (or intellectual assets) underpinning its production industries. At best these are embedded in the goods and services produced and at worst entirely unrecognised as commercial opportunities. Most are dedicated to driving efficiency rather than creating additional value. This may be a distinguishing feature of the New Zealand economy. New Zealand has what may be a unique opportunity to build a mixed primary production/ manufacturing/ knowledge economy when it is recognised that knowledge (and other intellectual assets) itself has tradable value not just as the foundation of the primary production and manufacturing processes. (Finland for instance has used its wood fibre knowledge resource to build dominance in wood fibre machinery, chemicals and consulting. Similarly, Iceland built its fishing technology industry based on its capture fishing industry's technology). There are a variety of reasons why this failure occurs and prominent amongst these are Kiwi cognition or "mindset" and behaviour.

These issues are outlined in the white paper "*Solving New Zealand's innovation and productivity puzzle*" at http://www.forte-management.co.nz/resources/28-White_paper_innovation_and_culture.pdf.ashx and discussed in more detail in the NZTE paper *Playing to Our Strengths: Creating value for Kiwi firms (2010)* (http://www.nzte.govt.nz/features-commentary/In-Brief/Pages/Report-DIY-approach-innovative-but-limiting-.aspx).

[3] CIA World Factbook (https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html?countryName=New%20Zealand&countryCode=nz&regionCode=au&rank=49#nz) 2009 estimates where available.

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4. Foundations of paper

4.1 Innovation comprised of two principal parts

The innovation process is comprised of two major overlapping and sometimes concurrent parts, *initiation* (creativity/ invention/ discovery) and *implementation* (the process of creating and capturing economic value from invention). The two parts rely upon different thinking, behaviour, resources, knowledge, skills, institutional arrangements and even people[4]. The phases will therefore respond differently to policy and interventions. It is relatively easy to drive creativity by lowering barriers/ raising incentives, however there is not an automatic flow through from the initiation to implementation, nor automatic capture of the value created. Innovation policy around the Western world incorrectly makes the assumption that the transition is automatic and therefore innovation driven economic development can be achieved by promoting the early (initiation) phase of the innovation process. The folly of this in the New Zealand context is demonstrated by this statistic:

> **New Zealand ranks number two for early stage entrepreneurial activity in the GEM study (2005) but only 26th out of 36 for high growth businesses.**
>
> (Frederick & Chittock, 2006).

(The GEM study is the largest single study of entrepreneurial activities in the world. In 2009 GEM conducted research in 59 countries however New Zealand was not included in the more recent study.)

Addressing the assumption of automatic transition is one of the most pressing innovation policy issues for New Zealand. Even the US with comparatively high implementation grapples with this same issue: http://www.businessweek.com/innovate/content/feb2006/id20060216_568704.htm).

An equivalent European discussion appears at:
http://ec.europa.eu/enterprise/e_i/news/article_9904_en.htm

[4] In fact Razeghi (2008) makes a compelling argument that even the cognition associated with scientific discovery (of existing hidden realities) varies significantly from that associated with creativity and invention of the novel.

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4.2 National culture influences innovation outcomes

There is a substantial body of literature showing that creativity, innovation, productivity and economic performance are the result of culturally moderated responses to environmental stimuli (eg Shane, 1992, 1993, 1995; Hofstede, 2001; Frederick & Chittock, 2006; Rank, et al, 2004; Pohlmann, 2005). There is a smaller but possibly more important body of literature showing a differential and inverse correlation between culture and the two principal parts of the innovation process (initiation and implementation) (eg Nakata & Sivakumar, 1996; Rank, et al, 2004; Smale, 2008.)

McCann (2009) in attempting to apply Accam's razor principles attributes New Zealand's productivity malady primarily to economic geography issues and the failure to respond to and cope with fundamental changes in the external environment. However there is strong evidence that the ability to and manner in which that response occurs is moderated by Kiwi cognition and behaviour, exacerbating or contributing to the economic geography issues. Failure to recognise that will lead to incorrect conclusions and potentially frustrating and costly policy failures.

4.3 Kiwi culture favours *initiation* over *implementation*

Four international studies [House, et al (2001); Hofstede, (2001); Trompenaars & Hampden-Turner (1998); and Schwatz (1999)] have measured and ranked Kiwi national cultural dimensions. Although using different methodologies and samples, they reported very similar rankings and conclusions. New Zealand may face a unique combination of barriers to maximising the returns on its innovation investments at both the company and policy/intervention levels:

A. All of the dimensions that correlate with innovation favour initiation; and
B. All of those dimensions lay towards the poles of the measurement scales, ie they strongly favour initiation over implementation. That is, New Zealand is strong on the initiation phase of the innovation process but weaker in the implementation phase. This is demonstrated in Figure 1.

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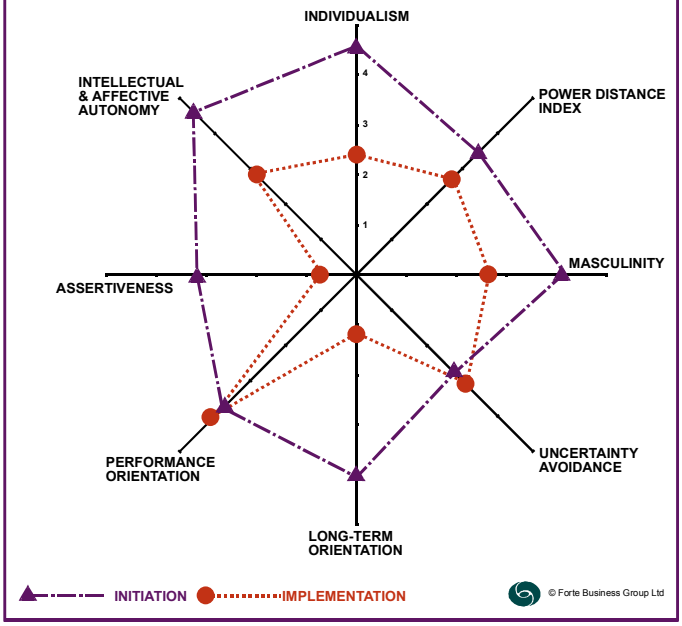

Figure 1: Correlation between initiation and implementation mapped against various Kiwi cultural dimensions showing the superior fit (ideal around the perimeter) for initiation compared to implementation.

It is possible that nations with **moderate initiative strengths and moderate implementative strengths** deliver superior economic outcomes as a result of superior realisation of value from their creativity/ invention/ discovery. The USA and Australia are probably examples of that.

The research findings indicate that Kiwis exhibit a variety of behaviours that act as barriers to the creation and appropriation of value from the innovation effort. Those behaviours are able to be linked to the national culture. The major findings show that:

- High *individualism* is associated with intense self reliance that results in narrow capital structures, in slow market entry/development and heightened risk aversion, poor delegation, and weak succession planning.
- The *tall poppy syndrome* that appears to be a tension between *individualism* and *egalitarianism* moderates against the use of specialists, the emergence of champions and results in deliberate, albeit subconscious, under-performance.
- A *universalist* narrow world view results in a black and white, one size fits all, take it or leave it attitude.
- The short-term orientation acts as a barrier to accumulation of the social capital necessary for effective collaboration and leads to short-term transaction based trading.

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- High *affective* and *intellectual autonomy* favours the pursuit of individual discovery and adventure and sense of self (self actualisation) derived almost entirely from non work related activities and achievements.
- Low *assertiveness* and negative attitudes to failure result in weak negotiating skills and a feedback reluctance that acts as a barrier to learning and performance improvement.

Together these conspire to create a propensity to prefer substance over form (Boven, 2009), a failure to recognise and value intellectual assets, and a failure to maximise value creation and capture, all of which negatively impact productivity.

This contributes to:

- Slow, iterative and DIY (even when specialists are used) new product development, very late engagement with customers, and often the development of clever but not customer refined/focused products and services; and
- When customer engagement does occur, there is a lack of willingness to understand customer values and preferences ("thinking for the customer") and failure to understand New Zealand's true value propositions, thus missing the opportunity to exploit Kiwi strengths in adaptation and customisation and possibly contributing to a continuing "she'll be right" approach;
- Failure to recognise and exploit the value inherent in intellectual assets, instead embedding them in goods and services. Developing and exploiting the latent value in the intellectual assets could potentially represent the paradigm change necessary to transform New Zealand's productivity performance;
- Predominance of non-Kiwi owned channels to market siphon off a large share of the value that New Zealand creativity/inventiveness creates. Capture and repatriation of a small part of that value would significantly increase GVA and contribution to New Zealand GDP and hence productivity ranking.

The author's original fully referenced work on this subject is available at http://www.forte-management.co.nz/resources/5-tonys_dissertation.pdf.ashx

4.4 Satisficing normal Kiwi behaviour

Although satisficing has a concise definition in economics it is misunderstood as it applies to the New Zealand innovation and management context. It can be thought of as "reaching a threshold of 'enough' at a low level", that is, optimising outcomes including personal and organisational productivity, is unwittingly not a priority for satisficers. This is visualised in Figure 2 (following page). It tends to be applied to entrepreneurs as an explanation for the so-called "beach, bach and

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BMW" phenomenon (lack of serial entrepreneurs, high growth companies etc) and "she'll be right" attitude which have an elements of "putting your feet up" and "not caring" that are not correct. It is a broader concept than that with both qualitative and quantitative elements and appears to involve a redirection rather than a diminution or cessation of effort. It results in subtle and sub-conscious changes in a range of cognitions across the entire organisation. As a result, even if an organisation is led by a maximiser, it will still suffer the affects of satisficing. It likely takes the form of a tension between goals, most obviously between work and social/recreational goals and activities but also between goals that match most closely with the high affective autonomy or individual discovery and adventure. It may involve subconscious decisions of the type "Which of these activities will I gain the most pleasure/adventure/discovery from ....?" That may explain the lack of preparation and presentation described by Boven (2009) and represent reaching a threshold of 'enough' preparation etc and then switching to another more satisfying/exciting (self actualising) activity rather than simply lack of attention to detail, follow-through etc.

It seems unlikely that pure maximising behaviour occurs in any market economy. Rather there will

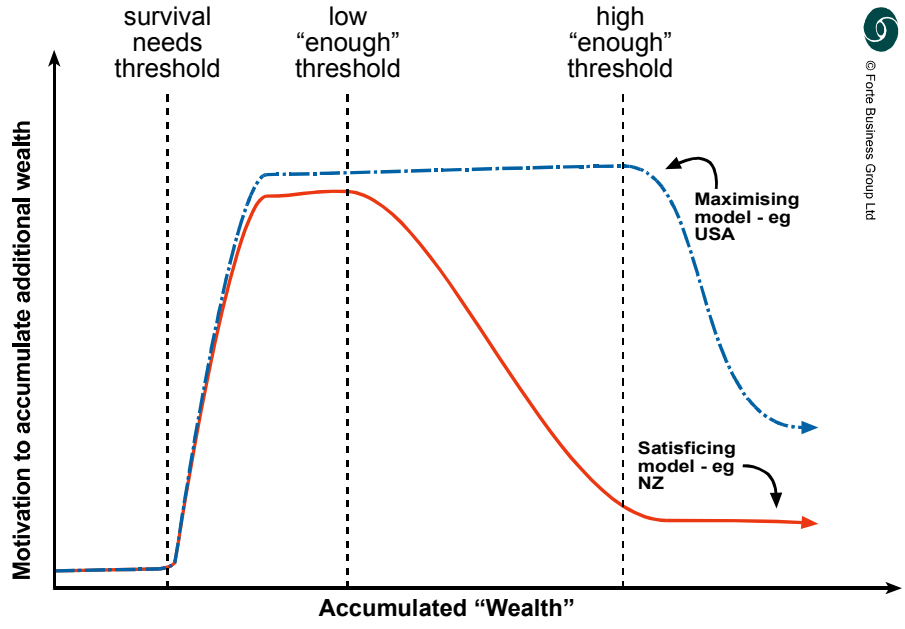

Figure 2: Satisficing conceptualised in terms of "enough thresholds".

be a continuum from high in nations like the USA to low in New Zealand. Whether New Zealand is at the extreme of this continuum has not been quantified but certainly Crocombe, et al (1991) identified behaviours associated with satisficing as a distinguishing feature of the New Zealand economy and *Forté Management*'s research provides a theoretical explanation (Smale, 2008).

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There is an implicit assumption that there will be an economic development response in direct proportion to policy investments, the lowering of barriers or raising of incentives. While that may be valid in a maximising economy like the USA, the productivity of policy is likely to be reduced in New Zealand by satisficing behaviour. That is, suboptimal outcomes will be achieved relative to the policy/intervention "investment". This is represented in Figure 3.

McCann (2009) notes the major economic geography benefit of agglomeration is about maximising the efficiency of knowledge exchange. However that maximising appears likely to be

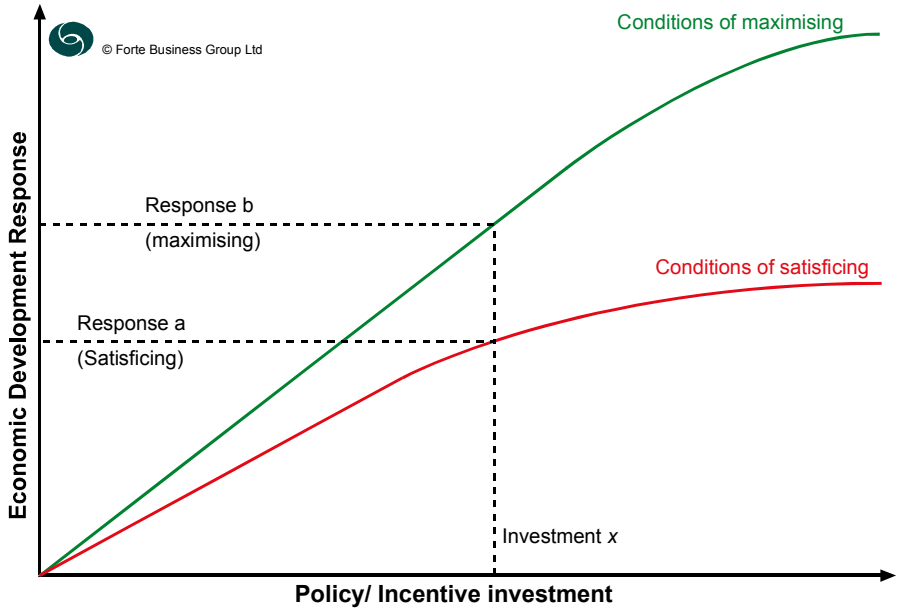

Figure 3: Economic development response from a fixed policy or incentive investment is less under satisficing conditions than under maximising.

negatively moderated by both institutional arrangements (fragmented RS&T community) and New Zealanders' propensity to satisfice. Exacerbating the latter, maximisers are the most probable to migrate from New Zealand and with lifestyle being the number one attractant to immigrants to New Zealand, there is an unwitting selection of people predisposed to making the trade-offs associated with satisficing.

4.5 Workplace is the leading source of innovation

There is a widespread perception that the causal relationship between RS&T and innovation is from RS&T to innovation. However research (NESTA, 2007) indicates that in the UK, only 6% of innovations originate from RS&T. Von Hippel (1988) similarly presented evidence that the company is the major driver and source of innovation. This is consistent with GIAB (2004) '*Research on Growth and Innovation*' findings and conclusions.

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Kiwis engage in DIY at all levels of the company and that is associated with a stubborn resistance to utilise specialist services. That represents a significant and self-limiting barrier to rapid product development and market entry. Rapid market entry is recognised as a critical success factor for modern business (eg McGrath, et al, 1996; Roberts & Amit 2003). Speed to market may be an important and useful innovation indicator.

RS&T is an important tool to increase the available options and to accelerate new product/service development. This implies that the role of the RS&T institutions should include, if they are to optimise their economic development roles, a specific function to engage with companies at the earliest possible stage of development to increase the options available for development and to accelerate the development and commercialisation of in-company discoveries and development. (That is, to increase the productivity of R&D).

4.6 Focus on value capture and retention

A combination of deficiencies in the institutional arrangements and Kiwi cognition and behaviour (that have designed the institutional arrangements) has created a failure in the mechanisms, thinking, behaviour, skills & confidence needed to maximise value capture. This is exacerbated by the imbalance between inbound and outbound direct foreign investment seeing much greater repatriation of profits out of New Zealand than into the country, contributing negatively to the trade balance and productivity (McCann, 2009).

New Zealand's future lies in mitigating institutional arrangements, economic geography and the cognitive/behavioural barriers to capturing company profit and creating national prosperity. One in the absence of the others will just deliver more of the same economic mediocrity and frustration.

To realise the potential of New Zealand's innovation initiation capability the prime innovation and productivity policy focus now needs to be directed at the later parts (implementation) of the innovation process where economic value is captured, retained and/or repatriated to New Zealand.

PART B: POLICY and INTERVENTION IMPLICATIONS

Cultural advantage and disadvantage is leveraged or mitigated respectively by defining the weakness or strength, determining what can and needs to be done, and designing policies and interventions that accommodate the peculiarities of Kiwi cognition and behaviour. A very clear and concise understanding of the desired outcomes (additional discovery or creation/invention versus additional value creation/capture/retention/repatriation of economic value to the New

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Zealand economy) and the differential impacts of policy and interventions on those outcomes is necessary ahead of design and implementation. That has significant implications for policy and intervention design as leveraging Kiwi strengths and mitigating weaknesses relies not upon streamlining current approaches but shifting the emphasis from the familiar focus on creating new products and process efficiency to focus on customer and channel innovation and particularly the maximisation of value capture and retention or repatriation of that value as contribution to New Zealand GDP and hence productivity ranking.[5]

Policy and interventions need to be directed at encouraging and supporting the development of confidence, knowledge, skills, and institutional arrangements to **maximise the creation and capture of value from new and existing goods and services in new and existing markets rather than to further bolster creativity/invention/discovery**. If the current level of innovation initiation were to be held constant and the latent value maximised and captured, it is probable that New Zealand's economic performance would be transformed.

All innovation and productivity policy making needs to take a much broader approach than the "institutional arrangements" model that currently prevails. The Japanese NIS for instance is described as, thought of and functions as an integrated system resting on ***"environment, culture, national character and tradition"*** and extending right through to the market, with a broad view of the range of policies that impact on innovation and hence productivity (MEXT, 2010). Schematic at http://www.forte-management.co.nz/resources/31-Japan_NIS.pdf.ashx

5. Policy implications

The policy implications are relatively straight forward in concept although the rethink in policy making implied is more complex:

1. **Recognise innovation as a complex psychological process:** It is critical to recognise innovation as a complex psychological process functioning within an "institutional arrangement" and economic geography framework. The associated cognition and behaviour varies significantly from nation to nation and influences the design and function of institutional arrangements and the effectiveness of and response to economic geography factors. It is particularly important to recognise the role of that cognition and behaviour in the failure to exploit intellectual assets and the failure to maximise the creation and capture of company profit and national prosperity as measured by GDP. That cognition

[5] Note that repatriating value captured offshore to New Zealand increases the numerator of the productivity calculation without changing the denominator, thus providing a significant increase in GDP per capita.

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and behaviour is introduced in the NZTE paper (*Playing to Our Strengths*) referenced earlier. This has significant implications for efforts to replicate elements of NISs from other countries/cultures.

2. **The two different parts of the innovation process:** Because the two parts of the innovation process require different resources and institutional arrangements, thinking, behaviour, skills and incentives, it is critical to recognise that a single policy or intervention may have different and even converse impacts on the two different parts. It is important to avoid "conventional wisdom" that novelty in and of itself will lead to business profit and national prosperity, especially given Kiwis love of doing new things - including trying new policies and interventions. A salient local example is Syft Technologies world leading technology and its failure to achieve market development as a result of the company's over focus on science and under focus on the market[6] and an American example, the Segway, that is technically brilliant but failed to meet a consumer need and has been a commercial failure.

   Policies targeted at increasing initiativeness are unlikely in the New Zealand context to translate into activity that creates and captures wealth and therefore increase productivity.

3. **Satisficing negative moderator:** It is important to understand that the affects of satisficing apply across Kiwi thinking and across organisations, not just to senior managers and entrepreneurs. The impacts of satisficing behaviour and the sub-optimal economic development responses to policy and interventions that can be expected must be incorporated in the policy making process.

4. **Market response insufficient:** Similarly, Kiwis high self reliance, narrow ownership and capital structures, DIY innovation and management, love of doing new things and low economic literacy and some considerable naivety surrounding intellectual property/assets should be factored into policy and intervention implementation. Sole reliance on market response to policies and interventions as instruments of change, in the absence of communication and "education", may produce disappointing or even paradoxical results. Politicians in particular should refrain from perpetuating the mythology of Kiwi

[6] *"We determined that Syft needed to make a strategic shift into becoming a market-facing technology company. In essence, we concluded that after a six-year gestation period it now needed to be not so much about the science as about the sales."* Hon Ruth Richardson 2009 Chairman's Report for Syft Technologies

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innovativeness, including the mythical number eight gauge wire innovation, (a contention endorsed by McCann, 2009).

5. **Tall Poppy Syndrome negatively moderates performance:** Similarly, the Tall Poppy Syndrome results in deliberate, albeit subconscious under performance. It is possible that in order to succeed as an entrepreneur in New Zealand, some threshold of "immunity" to the affects of the Tall Poppy Syndrome must be exceeded. Policies and interventions that rely upon the emergence of champions and the promotion of "stand-out" performance may produce disappointing results.

6. **Value capture/retention/repatriation critical:** All policies targeting innovation and productivity, (including RS&T, Direct Foreign Investment, Immigration, trade negotiations including Free Trade Agreements and trade representation/ promotion, understanding, designing and presenting *NZ Inc*'s value proposition, company incentivisation etc), must have at their core the capture (as opposed to just "creation") of economic value, and its retention in or repatriation to New Zealand and not rely upon market forces to do so. **There is from New Zealand's national interest perspective, significant market failure in this regard.**

7. **Intellectual assets:** A refreshed view of the potential of intellectual assets is required to:
   a) Factor into policy and intervention design the endemic institutional (eg GIAB, 2004; Smale, 2008) and cognitive/behavioural failure in New Zealand to strategically recognise, value, protect and develop intellectual assets, along with the dearth of professional expertise in this field.
   b) Recognise that the majority of commercialisable innovation originates in companies rather than the RS&T system; and consequently
   c) Without minimising the importance of CRIs in creating innovation options (especially given the dominance of state funded R&D in New Zealand), a new brief to engage with companies as facilitators of in-house development is warranted;
   d) Recognise that in the majority of instances, even when the intellectual assets are recognised, they are largely embedded in goods and services thus creating a failure to maximise value creation from RS&T and R&D investments;
   e) A concerted effort across government agencies to achieve recognition of the value of intellectual assets in their possession and often being the proprietary assets of

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those sectors and companies[7] that affect the competitiveness of New Zealand sectors and companies (even where those sectors fail to recognise the value themselves) is warranted;

e) Recognise that the State (including CRIs and universities) possesses a vast portfolio of unexploited intellectual assets in the form of expertise, reports, analysis, research papers etc, that could be of considerable value to the private sector but that no cue exists to prompt companies and managers to search for such information because it is "hidden" within the government agencies, CRIs etc. For instance, the abstracts from all public good research should be in a publicly searchable database and its potential promoted to the private sector[8].

At the same time, the question of making these and other intellectual assets available to both New Zealand and non-New Zealand firms needs to be grappled with. This is a common and pressing issue across the research institutions where foreign owned companies have equal access to New Zealand research to apply at will in their companies globally.

8. **Review causal relationships:** Reconsider the causal relationships that are relied upon for policy making and intervention design. For example, it has been assumed that the adoption of venture capital (VC) is low because of the immaturity of the VC market (1:10,000 businesses use VC according to Frederick & Chittock, 2006). However, given Kiwi cognition and behaviour it is also possible that the market is immature because of the low uptake as a result of narrow ownership and capitalisation models and investment strategies of Kiwis, their intense self reliance and perception of loss of control arising from VC. It is possible this leads to a preference for being a big fish in a small pond while believing that adopting a VC model will see them become a small fish in a big pond, without ever recognising the opportunity (or having the aspiration) to be a big fish in a big pond.

9. **Short-term outlook:** Identify as an integral part of policy making, the time required for adoption and diffusion of new policies and interventions based on overseas best practice, rather than on Kiwi short term perspectives, and impatience to see tangible results and try the next new idea.

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[7] The author has a numbr of examples available for confidential discussion.

[8] Note that the author has served on a FRST panel briefed with reviewing the accessibility of public good research.

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10. **Immigration policy:** If New Zealand's immigration policy is to maximise its contribution to economic development objectives then the unwitting targeting and selection of satisficiers as a result of New Zealand's greatest attraction being lifestyle traded for income maximising needs to be addressed, and consideration given as to how maximisers can be identified and encouraged.

    Similarly, greater effort is warranted to retain or at least retain contact with Kiwi maximisers through initiatives like the Kiwi Expatriates Association (KEA).

11. **Recognise Kiwi motivation:** Kiwis appear to draw their sense of self and in Malow's terms, their self actualisation, almost entirely from outside of work related activities. Simultaneously Kiwis make a separation of work from personal/social/recreational life that is rarely exceeded in other cultures, to the extent that a case could be advanced that Kiwis have distinct cognition and behaviour at work and outside of work. At the same time, over recent years as Kiwi businesses have strived to increase efficiency (that appears to have become a proxy for productivity), the link between work and social activities has been further weakened. Apart from the motivation impact, this is exacerbating the economic geography issue of "agglomeration" affecting knowledge exchange by reducing the level of socialising with colleagues, attendance at conferences etc.

    Although no specific work has been conducted on this factor it seems from the national culture rankings that this may be an important factor in considering people management issues in the New Zealand environment.

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12. **Intervention Implications:** Since interventions such as those offered by NZTE and FRST cannot be considered development subsidies, they should be viewed from the perspective of incentives to modify cognition and behaviour. The goal of interventions targeting innovation and productivity therefore need to aim at maximising value creation and capture/retention/repatriation and that is a function of both institutional arrangements and cognition and behaviour. Consideration of the latter tends to be absent from intervention criteria. Similarly, there is under attention given to customer and especially channel innovation in New Zealand[9]. Channel innovation is the principal opportunity to increase the capture of value.

Intervention design and implementation could usefully consider and/or incorporate the following:

a. **Early customer engagement & speed to market:** Support programmes should establish as criteria early customer engagement and the applicants' willingness to receive and respond to constructive feedback and criticism, their ambition to maximise the growth of the applicant company and the return from the government investment. Their understanding of the importance of speed to market and channel options available should be tested.

b. **Channel innovation:** Recognise that *channel* innovation is one of New Zealand's greatest opportunities to increase productivity. This may involve consideration of what might at the moment be deemed as "business as usual" and excluded from programme support.

c. **Protect and incentivise commercialisation of intellectual assets:** A much more rigorous approach to the protection and development of intellectual assets developed through public funded research is required, especially addressing the question of foreign access to the research findings.

To facilitate protection and commercialisation, a model with similar intentions as the US Bayh-Dole Act should be considered to incentivise the recognition, protection and commercialisation of government funded research as a criteria for public funding (for both FRST and NZTE business programmes and funding to universities and CRIs). The Bayh-Dole Act:

- Requires each invention to be disclosed to the funding agency;

[9] Innovation can be categoriesed into four streams, product, process, customer and channel. New Zealand is strong in product innovation, excels at process innovation (driving out cost) but pays less attention to customer innovation and almost none to channel innovation where value is captured or ceded to foreign companies and nations.

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- Requires title to the invention be claimed within a defined timeframe otherwise it reverts to the government;
- Requires that Intellectual Property protection be filed;
- Grants the government a non-exclusive, non-transferable, irrevocable, paid-up licence to have the invention developed in the event that the inventing agency does not undertake appropriate development;
- Requires active promotion and commercialisation of the invention;
- Prohibits the agency assigning the rights to the technology, with a few exceptions;
- Requires that royalties be shared with the inventor;
- Requires any residual income to be used for education and research;
- Gives preference to US industry and small business;

d. Sector organisations: Government chooses to use sector organisations as a single point of contact. While that is efficient it does present a generally unrecognised dilemma. First, sector organisations do focus on "generic" activities to create value but they suffer all of the cognitive and behavioural barriers to maximising the creation and capture of value that do individual companies. Further, they frequently operate in a highly politicised environment and include in their membership multinationals whose goal is to maximise the appropriation of value offshore, that is, their interest is not New Zealand's national interest.

e. Education to include national culture's role: The role of national culture, the exploitation of intellectual assets and maximising the capture of value outside of the expectation that market forces will do so should be mandatory components of all management related education and capability upskilling supported by public funding. Similarly, science and education programmes should include mandatory papers on intellectual assets/property and commercialisation.

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