MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

High-growth business in New Zealand

A discussion paper on

- ***Definitional issues;***
- ***Characteristics and presence; and***
- ***Business incubation of HGB***

Research Evaluation and Analysis Branch
February 2013

MBIE-MAKO-14042059

Contents

The evidence for different countries suggests that around 4 to 6 per cent of high-growth businesses produce half to three quarters of all new jobs. Two common features to high-growth businesses are that they are prevalently young and small, with age being a stronger determinant of rapid growth than size. However, they are not disproportionally present in any sector, including technology-based ones, and their incidence is in fact far stronger in services than in manufacturing.

OECD 2013

The OECD defines high-growth businesses as all enterprises with 10 or more employees at the beginning of a three-year period that record average annualised growth (in employment or turnover) greater than 20 per cent per annum over the three-year period.

Acknowledgement

This discussion paper was prepared by Ministry of Business Innovation and Employment staff and has been peer reviewed both internally and by staff at the New Zealand Productivity Commission.

Disclaimer

This report was undertaken while the lead author was on secondment to Statistics New Zealand and was funded by the Ministry of Business, Innovation and Employment, Organisational Evaluation.

The opinions, findings, recommendations and conclusions expressed in this report are those of the author(s). Statistics NZ take[s] no responsibility for any omissions or errors in the information contained here.

Access to the data used in this study was provided by Statistics NZ in accordance with security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular business or organisation. The results in this paper have been confidentialised to protect individual businesses from identification.

The results are based in part on tax data supplied by Inland Revenue to Statistics NZ under the Tax Administration Act 1994. This tax data must be used only for statistical purposes, and no individual information must be published or disclosed in any other form, or provided to Inland Revenue for administrative or regulatory purposes. Any person who has had access to the unit-record data has certified that they have been shown, have read, and have understood section 81 of the Tax Administration Act 1994, which relates to privacy and confidentiality. Any discussion of data limitations or weaknesses is not related to the data's ability to support Inland Revenue's core operational requirements.

Statistics NZ protocols were applied to the data sourced from the Ministry of Social Development, the New Zealand Customs Service; the Ministry of Science and Innovation; New Zealand Trade and Enterprise; and Te Puni Kokiri. Any discussion of data limitations is not related to the data's ability to support these government agencies' core operational requirements.

1. Summary

Aim and scope

This research seeks to inform and stimulate discussion on high-growth business in New Zealand. It involved, firstly, reviewing published research and, secondly, examining the dynamics of growth (measured in turnover and in employment) for all New Zealand businesses using data held at Statistics NZ.

We were particularly interested in identifying those businesses that have achieved exceptional growth. The OECD defines high-growth businesses as all enterprises with 10 or more employees at the beginning of a three-year period that record average annualised growth (in employment or turnover) *greater than 20 per cent per annum over the three-year period*. Many businesses achieve high growth in short bursts. But very few (in any jurisdiction) meet the OECD definition. Such businesses are of interest because they tend to be extraordinary innovators, challenging other businesses and enhancing competition and productivity.

The work complements an evaluation of *business incubators*, a government supported initiative, instrument used to support the establishment of businesses with high growth potential.

Findings

Most businesses achieve modest growth including periods of negative growth

Our analysis shows that the median annual growth rate for New Zealand business was negative; i.e. for any one year, half of all businesses experienced a drop in sales.

High growth businesses

We applied the OECD definition of high-growth to the New Zealand business demography dataset. This indicates that in terms of GST sales, 5.8 per cent of businesses were high-growth in the three years to 2009. In terms of employment levels, 2.5 per cent of businesses were high-growth in the period to 2010. These measures do not reflect growth in exports and other aspects of business growth.

These businesses generally have relatively high profit to capital ratios, R&D spend and export presence (table 8, page 25).

The presence of high growth businesses has been declining

Both the absolute number and proportion of high-growth businesses in New Zealand appear to have been declining (figure 5, page 10). While there are some obvious considerations such as our size, geographic isolation and the risks associated with small/young firms seeking to internationalise, it is unclear what factors underlie these figures.

There are few consistent insights on the sources of high-growth business

International research offers a set of stylised facts on high-growth business (Autio & Hölzl, 2008). These are broadly consistent with the New Zealand evidence and are as follows:

- High-growth businesses derive from individual entrepreneurship and innovation;
- They are rare and are widely disbursed across the economy;
- Their growth is volatile, unpredictable and seldom sustained; and
- They tend to thrive in specialised factor markets.
- However, there is no clear consensus on what causes high-growth – barring the fact that the ‘intention to grow’ is a necessary condition.

Strategies to support and enhance high-growth business

At the outset, we don't know what high-growth-potential looks like. This calls into question the rationale behind policies based on *directly* selecting and/or developing high-growth-potential businesses. Moreover, some policies to stimulate rapid growth may (inadvertently) increase the volatility of firm performance. All businesses experience volatility and most experience periods of negative growth.

There is an obvious rationale for policy interventions to try to increase high-growth business numbers and size and hence their economic impact. But interventions that attempt to identify and *directly* stimulate potential-high-growth businesses may not be effective. It may be better to seek to leverage them through focusing on:

- Existing high-growth businesses, so as to help them to grow fast for a longer period (and become larger). High-growth businesses are more often small and/or young than old/large. In New Zealand, as elsewhere, high growth tends to be in very short spurts.
- Creating a business environment that is conducive to rapid growth for a wide spectrum of businesses may be more effective than narrowly targeting specific businesses or groups.
- Managers with a mix of business acumen and growth aspiration are needed to lead high-growth businesses through different stages and it may be important to encourage this through networks and public recognition.

Current support

Certain programmes in New Zealand have successfully engaged high growth businesses, ranging from 17.2 per cent of clients of the Beachheads programme to 4.5 per cent of Tech NZ (table 10, page 33). We do not yet have sufficient evidence to indicate whether they are enhancing high-growth.

Business incubators

We present the results of an econometric analysis of the NZTE incubator programme. The results are inconclusive regarding the programme's impact on firm performance; i.e. there is no clear evidence of a positive effect (see pages 37-40).

Compared to businesses of a similar age there is no statistically significant difference in their performance.

The mean value added of incubated businesses is below that of other NZ businesses.

While this is consistent with international research on incubators, there are substantial data limitations that mean that we cannot be conclusive. In addition incubators can have an important role to play as part of the wider innovation ecosystem, particularly at the early commercialisation stage of supporting entrepreneurs to establish and grow a business.

Further work

This paper proposes a definition of high-growth relevant to New Zealand that may assist future evaluation. This uses the top performers within the economy in both percentage growth terms and absolute growth terms. Rapid entries to and exits from this group (appearing as 'spikes') may be an indicator of businesses that are having a (positive) disruptive effect on the rest of the economy.

Further analysis into the factors leading to high-growth and the characteristics of the businesses that exhibit it could consider attempting to differentiate between businesses using the different modes of growth (e.g. growth via acquisition, 'organic' domestic growth, overseas growth). The various modes are likely to have different drivers and this may be muddying the overall picture.

2. Why look at high-growth business?

High-growth businesses can contribute a disproportionate amount to economic growth and job creation. They are likely to have creative approaches that grow their market share through innovative products or services.

High-growth businesses that enter new markets often increase the level of competition in that market, sector or niche with a consequent *disruptive effect*. High-growth businesses that do not enter new markets may merely take market shares from competitors and there is a risk of lower competition and increased concentration, in particular when the market size is stagnating.

High-growth businesses often introduce new products, technologies and ways of doing things, giving businesses in the rest of the market no option but to respond by lifting their own productivity (Parham, 2012). Low productivity businesses (relative to others in their sector or market) who cannot "keep up" are forced out of the market. High-growth businesses therefore have a role to play in improving the productivity of the domestic market. This is known as Schumpeterian innovation, or creative destruction. Productivity improvements could nevertheless be low if high-growth businesses use their market power to drive competitors out of the market.

These disruptive forces will appear as spikes in individual businesses' growth performance and can be observed by tracking the entries and exits among the businesses captured by the definition of high-growth businesses proposed for use in New Zealand in section 5.

Recent research by MBIE has found that New Zealand has "a long tail of very low performers that may be able to survive because of weak competitive forces. While there are businesses that can compete with the best in the world, many low productivity businesses are able to continue" (Briefing No. 12-13/0803).

High growth businesses that add dynamic, competitive pressure within the economy are therefore particularly important for New Zealand.

This paper assumes that high-growth businesses are of benefit to the economy regardless of the sector which they are in and the specific activities (such as R&D) which they undertake. Some businesses – for example those in high-productivity sectors – obviously contribute more relative to their size, than others. However, high-growth businesses are able to contribute to productivity enhancements and economic growth regardless of the underlying productivity of their sector.

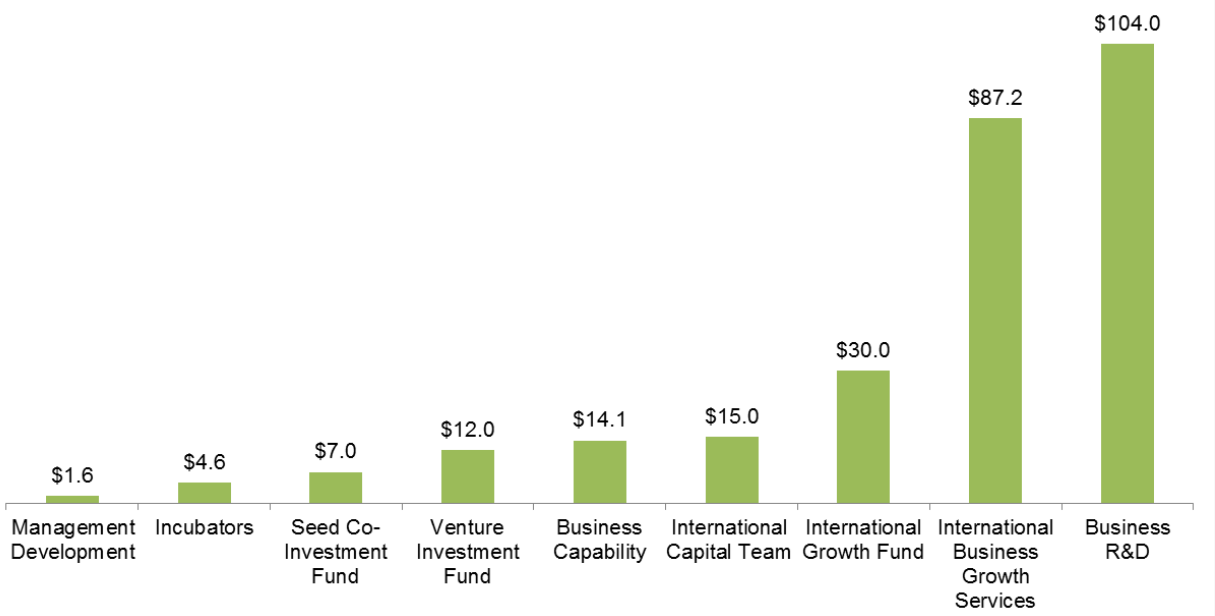
High-growth businesses are therefore of particular interest to economic development. As demonstrated below, New Zealand operates a number of policies that touch on high-growth businesses. While not all of these policies have high-growth as an objective *per se*, but they are all concerned with overcoming barriers to growth.

Despite these interventions the number and proportion of high growth businesses in New Zealand is declining over time (see for instance Figure 5 and Figure 9). Given that high-growth businesses potentially make a positive contribution to productivity growth within the economy, it would appear to be beneficial for New Zealand's productivity to generate more high-growth businesses.

New Zealand's interest in high-growth businesses is articulated in the Business Growth Agenda (2012). This states that: "not enough innovative high-growth businesses are being created in New Zealand and staying located here, and growing to the point where they generate significant economic benefits as well as stimulate innovation in other businesses." The Business Growth Agenda specifically includes actions targeted at potential high-growth businesses. In particular, this involves encouraging business innovation by identifying and implementing improvements to incubator settings.

Current programmes that touch on or support high growth are set out in figure 1.

Figure 1: Programmes touching on high-growth businesses ($m per annum, 2011/12 budgeting)



Source: Figures from 2011/12 budgeted funding

As discussed in section 7, below, econometric analysis of incubated businesses has been inconclusive regarding the incubator programme's impact on firm performance. However, the proportion of incubated businesses that have been high-growth at some stage does not appear to be significantly higher than the economy average. Given that the primary objective of incubators is to "enhance the survival and growth of early-stage high-growth businesses", this has led us to examine high-growth businesses in more detail.

Research on growth (and particularly high-growth) involves studying the exception rather than the rule – most businesses do not grow very rapidly or at all, let alone fast (MYOB, 2009; Storey, 1992). Factors influencing the desire to grow are discussed in more depth in section 6, but in particular, high-growth is associated with high risk and may not involve *sustained* growth in productivity or employment. Although there is a considerable literature on the subject, there are still many unanswered questions and conflicting pieces of evidence. For instance,

- How should high-growth be defined?
- What causes high-growth?
- Is it possible to pick high-growth potential?
- What can governments do to maximise the economic benefits from high-growth businesses?

Given the economic significance of high-growth businesses, the interest that New Zealand currently has in this area, and the fact that none of these crucial questions have definitive answers, this paper suggests some initial steps. In particular, it examines the characteristics of high-growth businesses in New Zealand, proposes a specific definition of high-growth businesses for the New Zealand context and considers New Zealand's incubator programme.

3. Findings

There is a conceptual rationale for intervention to increase the impact of high-growth businesses on the economy…

High-growth businesses can contribute a disproportionate amount (relative to their size) to economic growth, job creation, innovation and productivity improvements (for example through disruptive Schumpeterian innovation) compared to non-high-growth businesses. Focusing on this small subset of businesses has the potential to have a significant effect on the economy in a highly efficient manner.

However, the numbers and proportion of high-growth businesses in the New Zealand economy is declining and New Zealand has a relatively low percentage of high-growth businesses compared to other OECD countries.

If high-growth businesses enter new markets they can contribute to competitive forces and overall productivity improvements. Given that these wider economic benefits are not objectives pursued by individual businesses, it is unlikely that the market is delivering the level of high-growth businesses that is optimal for the economy as a whole. In addition to more competition high-growth businesses, in particular innovative businesses can have a positive knowledge spillover. Once an innovation is discovered or made more easily accessible, other businesses benefit by exploiting the innovation or information. There is therefore a conceptual rationale for intervention to increase the numbers of high-growth businesses and maximise their impact on the economy. For example, using incubators to increase the number of potential high-growth businesses is one of the actions in the Innovation stream of the Business Growth Agenda.

…but interventions that attempt to identify and stimulate potential-high-growth businesses seem likely to be inefficient and ineffective.

The rareness of high-growth businesses and the unpredictable and volatile nature of growth make it very difficult to accurately identify potential high-growth businesses (the selection problem).

There is very little consensus in the international literature regarding what causes high-growth – at this stage it appears to largely be due to chance (although this may simply be because there are unknown variables in the data that are not being controlled for, such as type of growth). This implies that policy makers should be wary of developing specific interventions designed to encourage the characteristics of businesses or managers that will lead to high-growth because simply put, they don't know what these characteristics are. This makes it challenging to make efficient policies in this space and calls into question the rationale for policies based on selecting and developing high growth businesses.

New Zealand's Incubator policy has as its stated primary objective to "enhance the survival and growth of early-stage high-growth businesses" (MBIE, 2012). NZTE's performance measures for the programme address this objective. However, the uncertainty regarding what causes high-growth, the lack of persistent high-growth and the fact that incubators do not yet appear to be producing proportionally more high-growth businesses than the rest of the economy implies that the current primary objective of incubators is misplaced. Note that this does not imply that the incubator programme is of no value: incubators have a role to play as part of the innovation ecosystem – particularly at the commercialisation stage.

Alternative ways that governments might seek to leverage high-growth businesses

1. It may to be more efficient for assistance to target existing high-growth businesses, to sustain their growth and increase in size, rather than attempting to increase the numbers of new high-growth businesses.

It is possible to identify businesses that are experiencing high-growth. This is apparent from private equity funds' success in picking high-growth businesses to invest in and the fact that certain assistance programmes are working with above-average numbers of high-growth businesses. Targeted and tailored specialist support can be effective as shown, for example, in the recent evaluation of support provided to selected businesses by expert mentors/advisors through the Beachheads programme, published on the MED website.

Investors and mangers generally seek to sustain growth of high-growth businesses, rather than create new business with future high-growth potential. This can also have the greatest impact on the economy.

This approach to leveraging high-growth is quite different from that taken by (for example) incubator policy; it requires a portfolio of businesses to invest in and is similar to the approach NZTE is taking with their Focus 500 businesses.

Since the sustainability of high-growth businesses is an issue, rewarding businesses that become high performers over a sustained period would address a gap in the suite of interventions that New Zealand currently runs (as suggested in NZIER, 2012).

However, working only with businesses that are currently high-growth is not a long run solution. In order to sustain the benefits to the economy from high-growth businesses there needs to be a pipeline of businesses coming through with the potential to experience high-growth. This is where the business environment becomes important.

2. Policies focused on creating a business environment that is conducive to rapid growth for a wide spectrum of businesses may be more effective than narrowly targeting specific businesses or groups.

High-growth businesses are dispersed across all sectors, ages and sizes of businesses. Focusing attention solely on high-tech or R&D intensive sectors is likely to result in missing many businesses with high-growth potential. Policies should support innovative diversity – recognising that while R&D is important, innovation is wider than R&D and high-tech (for example process innovation) and makes a positive contribution to productivity through its disruptive effect.

High-growth businesses are often small or young businesses. There are also larger and older ones that may have a significant effect due to their absolute size. Policies aimed at reaping the benefits from high-growth should therefore consider slightly larger businesses too.

Given the difficulty in identifying potential high-growth businesses, policies should focus on the business environment within which businesses exist (framework conditions) to ensure that it both enables and encourages the efficient development of high-growth businesses. This is one area where incubators have a valuable role to play – they can encourage unviable businesses to fail fast, thereby improving overall productivity and freeing up resources that potential-high-growth businesses can use.

Incubators also have an important role to play as part of the innovation ecosystem as places where developing ideas can be commercialised. This shifts the objective of incubators to being a link in the chain and a part of the economic environment rather than hotbeds for potential high-growth businesses.

3. Managers with growth aspirations are a necessary condition for high-growth and encouraging this mind-set is an area where intervention might be beneficial.

Although there is little consensus around what causes high-growth, it is clear that individual managers' motivations/aspirations are critical and should be a key part of criteria in high-growth policies. Growth may be limited by managers' attitudes towards it. Considering the factors that reduce New Zealand managers' desire and ability to lead their businesses through periods of high-growth may be a profitable area for research and one where intervention may be beneficial. This is one area where incubators can contribute to developing potential high-growth businesses.

For a small firm to grow to a medium or large firm, it must either grow extremely fast for a short period of time or maintain steady growth over a number of years. New Zealand's small domestic market means that internationalisation is an important way in which this can occur. The barriers to internationalisation (either real or perceived) faced by small businesses may limit their ability to experience high-growth. The sporadic nature of growth (and exporting) implies that there may be scope for an intervention that rewards sustained export performance (NZIER, 2012) for businesses that did not previously export or had a track record of intermittent exporting.

Note that policies to stimulate rapid growth may increase volatility

Rapid growth brings new challenges to businesses and increases volatility of turnover. Policies aimed at increasing rapid growth are therefore also likely to increase volatility.

The risks associated with high-growth may not always be the best thing for a particular company – policy makers should be aware that while high-growth policies may result in remarkable successes, these are likely to be tempered by spectacular failures.

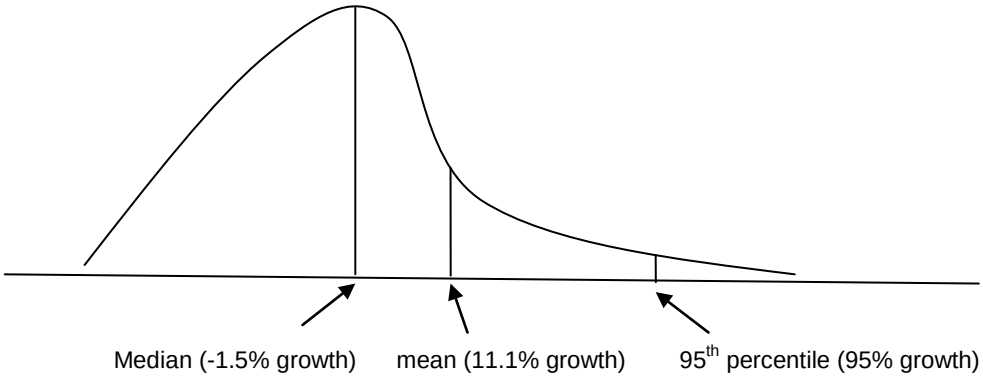
Areas for further research could include:

- Separating the modes of growth in an effort to conclusively identify the drivers of growth
- Why is high-growth unsustainable? – case studies and examination of the characteristics of businesses showing high-growth over longer periods of time
- Managers' attitudes to growth – especially via internationalisation – and compare to other countries
- Are the high-growth businesses in programmes selected as high-growth businesses or become high-growth businesses after the programme?

4. High-growth businesses in New Zealand

Growth, let alone high-growth, is an uncommon occurrence. The population of businesses in New Zealand has a skewed growth distribution (something like Figure 2), as shown by the fact that in 2011 the median of growth (measured in sales revenues) was substantially lower than the mean and the median business actually experienced negative growth. This relationship has held since at least 2001.

Figure 2: Illustration of the distribution of growth (measured in sales revenues) across the New Zealand economy in 2011



Source: provisional figures from Statistics New Zealand's Integrated Data Infrastructure (IDI)

Further evidence was established by Hull & Arnold (2008), who found that over the five years from 2000 to 2005 only a tiny percentage of New Zealand businesses experienced an increase in turnover and the majority actually reduced in size. Recent unpublished research on business productivity growth suggests that New Zealand has "a long tail of very low performers".

If growth is uncommon in the first place, high-growth businesses have an important role to play as contributors to aggregate economic growth. It is therefore important to understand their characteristics as well as possible.

The international literature on high-growth businesses has established a number of stylised facts, which are set out by Autio & Hölzl (2008). Evidence presented below shows that these facts largely hold true in the New Zealand context. Many of the findings in the international literature on high-growth businesses are therefore also applicable to New Zealand.

One of the challenges faced when considering the literature on high-growth businesses is the lack of a consistent definition of what a high-growth firm is. The discussion in this paper recognises that not all studies are directly comparable by noting the particular definition used whenever "high-growth" is mentioned. A comparison of some of the definitions used within the paper for high-growth businesses is included in section 5, along with a proposed definition for use in the New Zealand context.

International research offers a set of stylised facts on high-growth business (Autio & Hölzl, 2008).

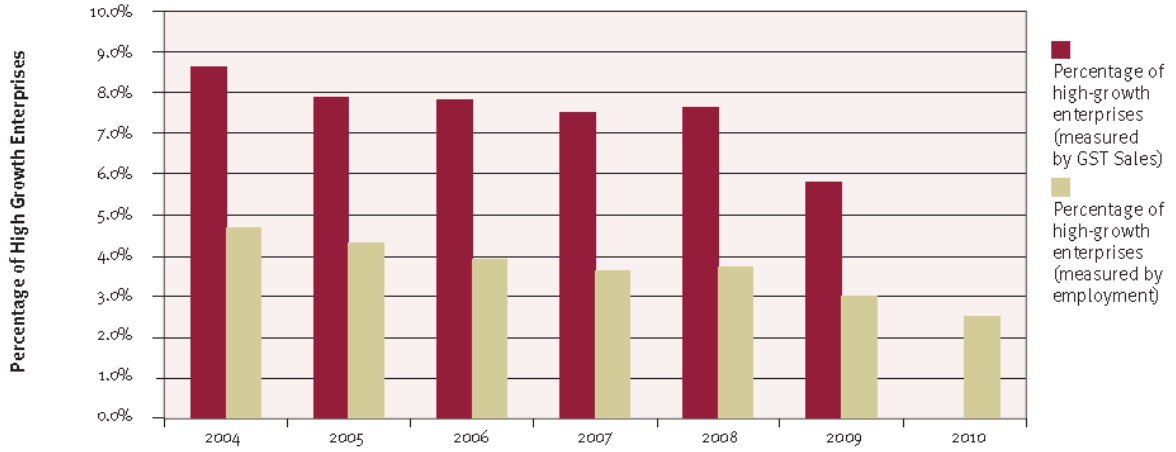
Stylised fact one: High-growth businesses are rare

If growth is uncommon, high-growth is even rarer, with high-growth businesses only making up a small proportion of the business population.

The OECD definition of high-growth has been applied to the New Zealand business demography dataset (Figure 3). This shows that in the three years to 2009, 5.8 per cent of active enterprises with at least 10 employees were high-growth in terms of GST sales and only 2.5 per cent of active enterprises with at least 10 employees were high-growth in terms of employment in the three years to 2010.

Both of these measures have shown a continuous decline since 2004 (Ministry of Economic Development, 2011). Further to this, it is interesting to note that of the Deloitte Top 200 for 2012, only 21 recorded revenue growth of 20% or more for the year[1] (Deloitte/Management Magazine, 2012).

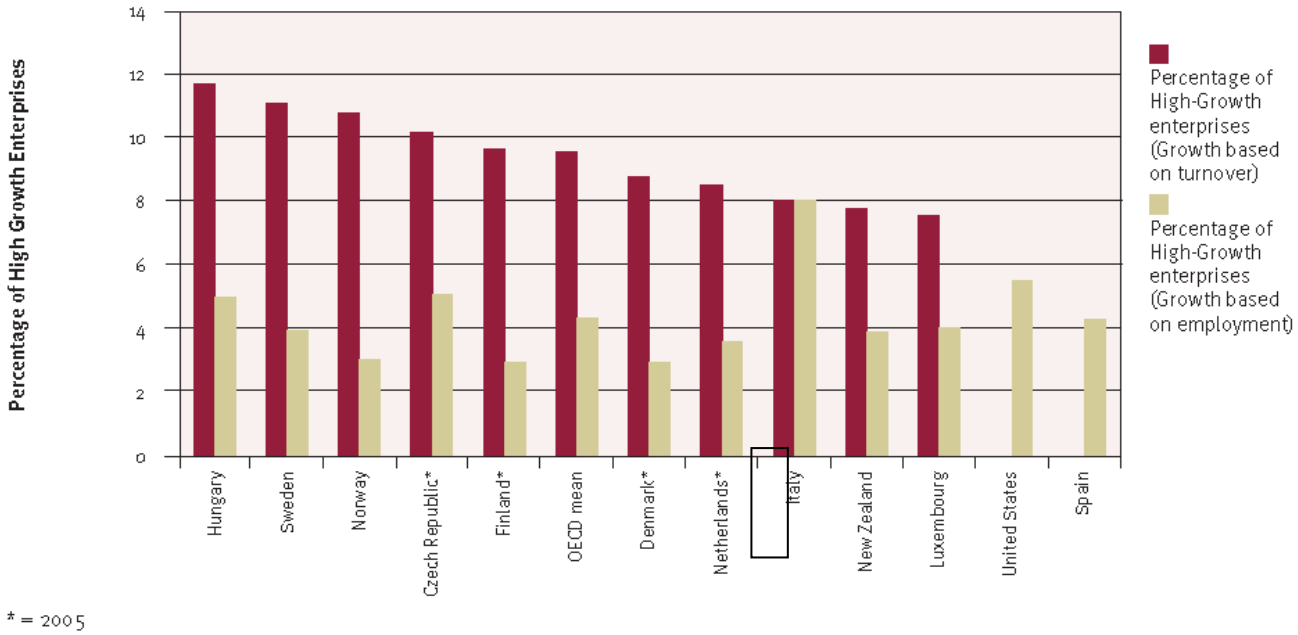
Figure 3: Percentage of High-growth[1] Enterprises by GST Sales (2004-2009) and Employment (2004-2010)



Source: Ministry of Economic Development (2011)

Using the OECD definition, New Zealand is placed middle to bottom of the OECD for percentage of high-growth businesses (Figure 4), depending on whether the sales or employment aspect of the definition is applied.

Figure 4 OECD Data – Rate of High-growth Enterprises by Turnover and Employment (2006)



* = 2005

Source: MED, Treasury, Statistics New Zealand (2011)

[1] This is growth in only one year – compare this with the OECD definition of high-growth, which is for growth across three years.

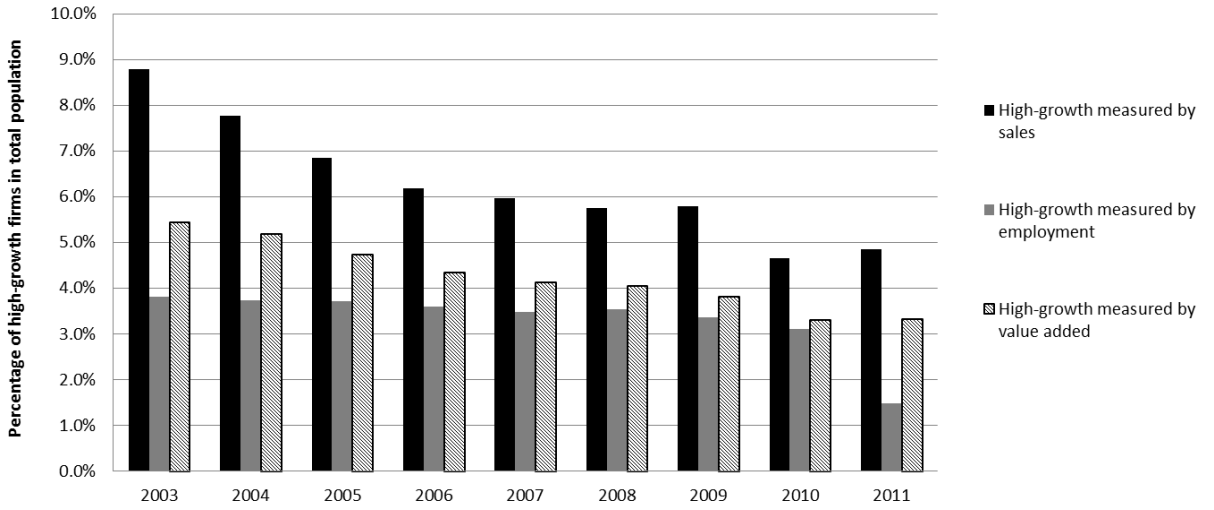
One of the criticisms of using the OECD definition in the New Zealand context is that the 10-employee requirement may not adequately reflect the small *scale* of our smaller businesses, relative to other countries.

If high-growth is defined using the OECD definition, but the restrictions changed to allow any number of employees but a minimum of $50,000 in sales in year one, there have been between 22,044 and 34,566 high-growth businesses in New Zealand each year from 2003-2011.

This definition places between 7.6% and 13.3% of New Zealand businesses with a minimum of $50,000 sales in the high-growth category and between 4.7% and 8.8% of all New Zealand businesses, regardless of sales, in the high-growth category (Figure 5). We found that there was a similar pattern when we considered growth in value added instead of sales.

The median of sales growth of all businesses with a minimum of $50,000 in sales between 2001 and 2011 was negative (-2.5%). The mean growth of these businesses was 15.1%, meaning that New Zealand has a tail of substantial revenue growth businesses.

Figure 5: Percentage of high-growth[2] businesses in the total population of New Zealand enterprises by sales, employment and value added[3, 4]



Source: Statistics New Zealand's IDI

Figure 5 reiterates the fact that the proportion of high-growth businesses in the New Zealand economy has been declining in number and proportion.

It is unclear why this is occurring and it is difficult to present credible explanations of why high-growth businesses are declining when, as examined in section 6, there is considerable uncertainty around what drivers of high-growth.

[2] Where high-growth is defined as all enterprises with a minimum of $50,000 in sales at the beginning of a three-year period that record average annualised growth (in employment or turnover) greater than 20 percent per annum over the three-year period.

[3] Where high-growth is defined as all enterprises with a minimum of $50,000 in value-added at the beginning of a three-year period that record average annualised growth in value added greater than 20 percent per annum over the three-year period.

[4] Sales and value added are derived from IR10 data and data is adjusted to exclude GST. Value added is defined as sales - purchases - change in stocks. All figures are in real dollars based on 2009 dollars. Note that the IR10 only contains data on sales that are taxable in New Zealand. Direct exports are taxed as New Zealand income and included in the IR10, but if income is derived in another country, then New Zealand generally has double tax agreements that allow that income to be taxed over there. For example, if a firm had an Australian division working in Australia, (or an Australian Subsidiary) then their income is not included in the IR10 as it is not New Zealand taxable income.

One factor over this period may be the impact of the housing boom. While this offered growth opportunities for businesses in the construction sector on the other hand it drew resources away from other businesses in tradable sector where there were potentially larger international growth opportunities. In addition, the Global Financial Crisis certainly depressed growth perspectives.

However, despite their increasing rarity it appears that private investors are still able to successfully pick high-performing[5] businesses to invest in.

Table 1 shows data collected for $675m of investments made by private equity fund managers into 74 New Zealand companies over 16 years and with an average holding period of 4 years. Returns have a median average of over 20% per annum. The difference between the pooled average and the median indicates that there is a positive skew in the returns data. A small number of investments generated spectacular returns, whereas 20 companies earned less than that invested.

Table 1: New Zealand Private Equity Returns 1994-2010

	Period	**Pooled average % p.a.**	**Median % p.a.**
NZ Private equity co. returns	1994-2010	33.6%	22.0%
NZ Private equity co. returns (excl. top 2)	1994-2010	26.8%	21.7%

Source: Tregaskis (2010), NZ Venture Investment Fund

Possible policy implications:

1. The declining percentage of high-growth businesses in the New Zealand economy and the relatively low percentage of high-growth businesses in New Zealand compared to other OECD countries may imply that the current suite of interventions is not effective at stimulating high-growth or is at least offset by other factors. However, it is not apparent why this decline is occurring and it is important that a considered view on the reasons for the decline is reached before further policies are formulated to address the issue.

2. The rareness of high-growth businesses and our inability to predict high-growth (see section 4.5) makes them hard to identify before they experience high-growth (the selection problem). This means that targeting them is both difficult and expensive – making it challenging to make efficient policies in this space.

3. However, the apparent success of private equity funds and the prevalence of high-growth businesses in certain government programmes (see Table 10 in section 6.3) indicate that it is possible to identify those businesses that are currently experiencing high-growth. It may be more efficient to work with these businesses than attempt to identify businesses with high-growth potential. In this case, a due-diligence approach similar to that applied by the private sector may be a good way of identifying both those businesses that are most likely to provide a significant economic return on government investment and where these businesses most need assistance to improve the chances that they will succeed.

4. The difficulty in selecting potential-high-growth businesses and their steady decline also implies that rather than trying to select potential high-growth businesses to work with, an economic approach should be taken to ensuring that the business environment is conducive to the development of these businesses.

[5] In terms of profit rather than turnover – see Table 1

Stylised fact two: High-growth businesses matter to GDP growth

While high-growth businesses are rare, it is well established in the international literature that they make a significant and disproportionate contribution to economic growth and job creation (Henrekson & Johansson, 2008). Storey (1992) found that over a decade, 4% of the UK businesses that started provided 50% of the new jobs created.

In New Zealand, "high-growth businesses… generate a majority of new jobs" (MED, Treasury, Statistics New Zealand, 2011).

As discussed in section 2, these businesses can also play a significant role in productivity improvements within the economy. This may occur through either organic growth, where businesses innovate and increase their competitiveness over time, or growth via acquisition, where either a more productive firm takes over a less productive one or innovative businesses are acquired to increase the innovative capacity of a firm. The latter form of growth via acquisition may be becoming more common, as indicated by the fact that "large corporate R&D laboratories increasingly rely on obtaining new technologies from small start-ups rather than developing them internally" (Butler & Anderson, 2012).

New businesses tend to have higher growth rates than older ones (although this is not exclusively the case – see section 4.3) and the coming and going of these businesses creates competitive pressures and churn in the market – a matter particularly important in New Zealand, where domestic competitive pressure is relatively low (see section 2). The rapid elimination of unproductive businesses is important for overall productivity growth and resource availability.

Possible strategic implications:

- Focusing on high-growth businesses has the potential to have a disproportionately large impact (and therefore a highly efficient effect) on the economy. If high-growth businesses matter – particularly for providing significant innovation and increasing competitive pressure – but are declining, then there may be a rationale for intervention to enhance productivity improvements within the economy. This would require a clear market failure to be identified and follows from the fact that individual businesses are welfare enhancing. Encouraging the development of high-growth businesses therefore has the potential to help address New Zealand's apparent lack of competitive pressure.

Stylised fact three: High-growth businesses are widely dispersed across the economy

High-growth businesses occur in all sectors

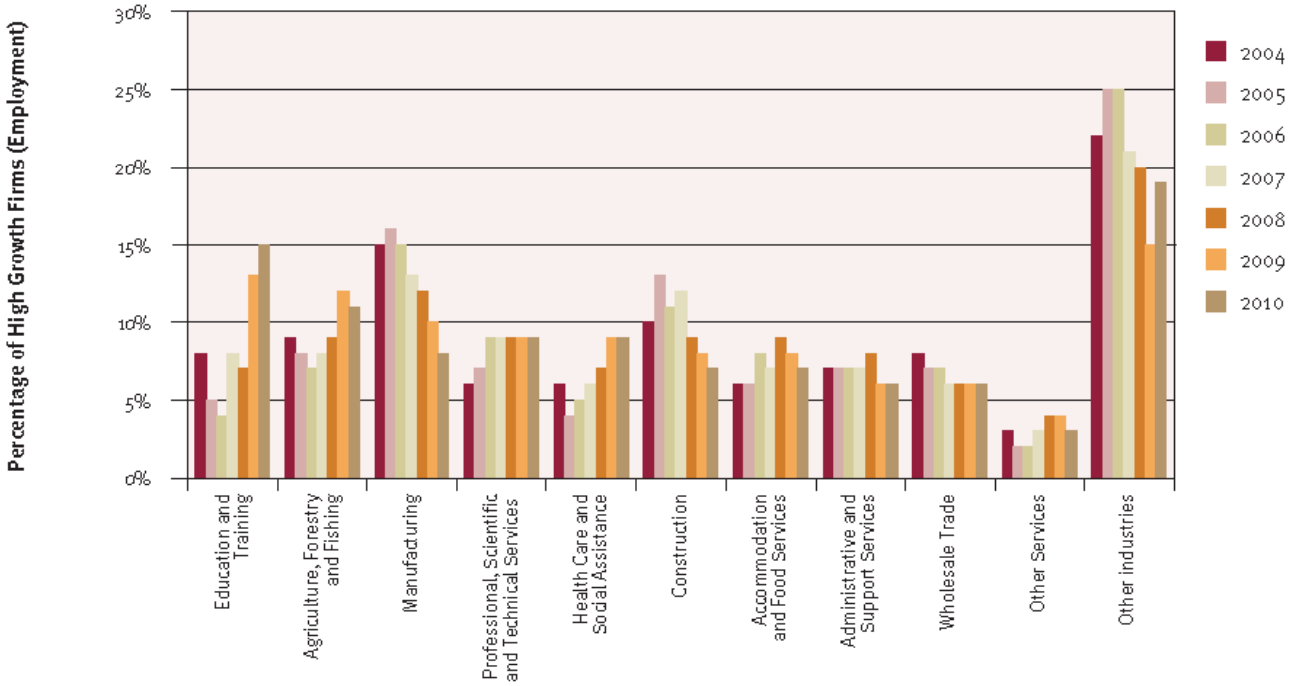
The figure below shows that high-growth[6] businesses are present across all sectors in the New Zealand economy.

The international literature is mixed on whether high-growth businesses are more likely to occur in high-tech sectors than in others (Henrekson & Johansson, 2008; Storey & Greene, 2010) although there is consensus around the fact that high-growth businesses occur in all sectors. "The popular association between high-growth entrepreneurship and R&D intensity appears misplaced… formal R&D expenditure is not a necessary precondition for rapid growth" (Autio & Hölzl, 2008).

As shown in figure 6, New Zealand high growth businesses are widely scattered across sectors.

[6] Using the OECD definition with employment as the measure- A similar picture emerges when sales are used as the measure.

Figure 6: Distribution of High-growth Enterprises by ANZSIC06 Industry (February 2004-2010)



Source: Ministry of Economic Development (2011)

Recent studies cast some doubt on accepted causal links between innovation and R&D. For instance, half of the European businesses surveyed in the Community Innovation Survey do not conduct any R&D at all, (Arundel et al. 2008; Srholec and Verspagen, 2008). A recent British study shows that high-growth businesses are found across sectors (NESTA, 2009). High-growth businesses are almost equally present in the 'high-tech' and 'low-tech' sectors. And all major UK sectors contained between 4 and 10 per cent of high-growth businesses. High-growth businesses do appear to be slightly over represented in services (but are not in the New Zealand data). Limiting consideration to high technology sectors is therefore likely to miss many – "and perhaps the majority – of fast-growth businesses" (Storey & Greene, 2010).

This holds true in New Zealand. The sectors in New Zealand that have the most high-growth businesses[7] are fairly stable from 2001-2011. However, none of the 11 industries with the highest relative number of high-growth businesses appear among the top 11 industries in absolute terms (for example in Table 2 and Table 3).

Table 2: Ranking of sectors in 2011 by number of high-growth businesses

Sector	Total number of businesses	No. of high-growth businesses	% of total
Professional, Scientific and Technical Services (except Computer Systems Design and Related Services)	28902	168	0.6%
Agriculture	35946	162	0.5%
Construction Services	24108	126	0.5%
Property Operators and Real Estate Services	30819	123	0.4%
Building Construction	12918	96	0.7%
Other Store-Based Retailing	13242	81	0.6%
Medical and Other Health Care Services	10518	72	0.7%

[7] Where high-growth is defined as growth over 3 years higher than 20% per annum and at least $50,000 sales in the first year of the 3 year period.

Computer Systems Design and Related Services	6801	54	0.8%
Repair and Maintenance	8088	48	0.6%
Administrative Services	5295	48	0.9%
Other Goods Wholesaling	4728	48	1.0%

Source: provisional figures from Statistics New Zealand's IDI

Table 3: Ranking of sectors in 2011 by relative frequency of high-growth businesses

Sector	Total no. of businesses	No. of high-growth businesses	Relative frequency
Oil and Gas Extraction	21	3	0.1429
Petroleum and Coal Product Manufacturing	27	3	0.1111
Internet Publishing and Broadcasting	33	3	0.0909
Internet Service Providers, Web Search Portals and Data Processing Services	315	9	0.0286
Exploration and Other Mining Support Services	114	3	0.0263
Water Transport	126	3	0.0238
Preschool and School Education	405	9	0.0222
Beverage and Tobacco Product Manufacturing	411	9	0.0219
Non Store Retailing and Retail Commission Based Buying and/or Selling	906	18	0.0199
Residential Care Services	501	9	0.018
Telecommunications Services	177	3	0.0169

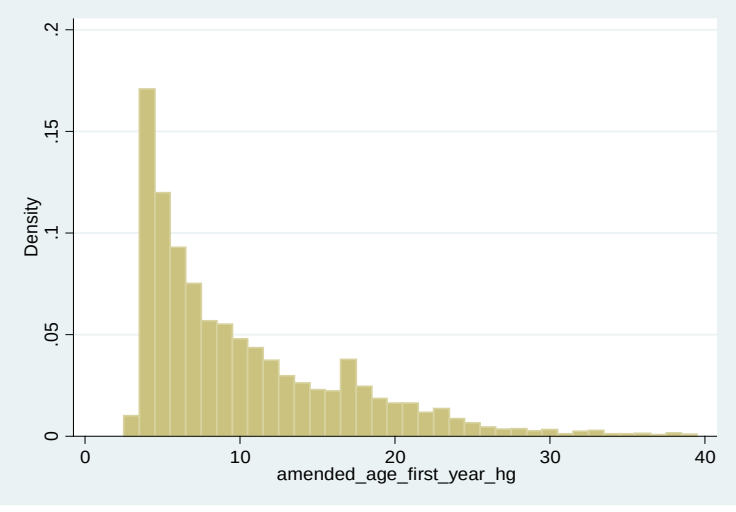
Source: provisional figures from Statistics New Zealand's IDI

High-growth businesses occur in all age and size categories

Younger businesses tend to have higher growth than older businesses, especially in terms of employment (Henrekson & Johansson, 2008). This is true for New Zealand too. The table and graph below illustrate that businesses tend to have their first high-growth experience when they are relatively young.

Table 4: Age of firm when first recorded as high-growth[8]

Age	Freq.
<5	1,713
5 to 9	3,786
10 to 14	1,752
15 to 19	1,200
20 to 29	834
30 to 39	171
40+	135



Source: provisional figures from Statistics New Zealand

[8] Where high-growth is defined as growth of Value Added over a 3 year period higher than 20% per annum and with at least $50,000 Value Added in the first year of the 3 year period. This definition is also used in tables 5 and 6.

However, “the gazelle phenomenon [i.e. high-growth] is not limited to young or small businesses” (Autio & Hölzl, 2008). This is also true for New Zealand although there are more high-growth businesses in the smaller size categories and fewer businesses in the larger size categories[9] (Table 5 and Table 6, Hull & Arnold, 2008; Ministry of Economic Development, 2011 and 2012).

Table 5: Percentage of High-growth businesses by employment and value-added categories for the period 2003-2011

	Value added at the end of three year period								
RME	50k>=va <100k	100k>=va <250k	250k>=va <500k	500k>=va <1m	1m>=va <5m	5m>=va <10m	va>=10m	% of high-growth businesses in each employment category	% of business population 2012
0	0.0%	1.8%	1.9%	1.7%	2.7%	0.4%	0.5%	9.0%	68.8%
0 to 5	0.0%	11.9%	12.9%	7.3%	6.8%	0.8%	0.5%	40.2%	20.7%
6 to 19	0.0%	2.5%	10.6%	11.9%	9.6%	0.9%	0.7%	36.2%	7.6%
20 to 49	0.0%	0.0%	0.3%	1.3%	6.3%	1.0%	0.8%	9.7%	1.8%
50 to 79	0.0%	0.0%	0.0%	0.2%	1.0%	0.5%	0.6%	2.3%	1.0%
80+	0.0%	0.0%	0.0%	0.0%	0.6%	0.6%	1.7%	2.9%	
Totals								100.3%	99.9%

Source: provisional figures from Statistics New Zealand’s IDI

Table 6: Distribution of high-growth companies across different employment and age categories for the period 2003-2011

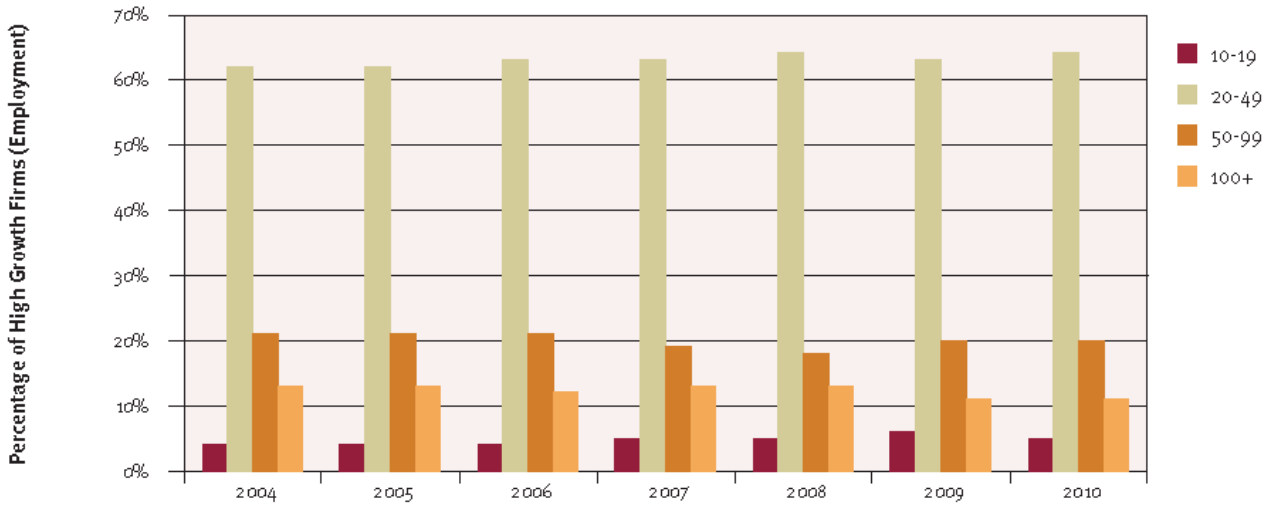
RME at the end of period three	Age							
	0	5 to 9	10 to 14	15 to 19	20 to 29	30 to 39	40+	%of high-growth businesses in each employment category
	0.9%	3.3%	2.3%	1.4%	0.9%	0.2%	0.2%	9.2%
0 to 5	5.7%	16.7%	7.4%	5.9%	3.7%	0.5%	0.3%	40.2%
6 to 19	6.3%	17.2%	6.1%	3.2%	2.4%	0.6%	0.4%	36.2%
20 to 49	1.5%	4%	1.9%	0.8%	1%	0.3%	0.3%	9.8%
50 to 79	0.3%	0.8%	0.5%	0.3%	0.2%	0.1%	0.1%	2.3%
80+	0.3%	0.8%	0.5%	0.4%	0.4%	0.1%	0.3%	2.8%
Totals	15.0%	42.8%	18.7%	12.0%	8.65	1.8%	1.6%	100.5%

Source: provisional figures from Statistics New Zealand’s IDI

The picture is slightly confused when the OECD definition is applied to New Zealand (Figure 7 and 8): “under both measures [sales and employment], high-growth businesses are most likely to occur in the 20-49 employee size group. When measured by employment, the 50-99 employee size group is the next most likely to have high-growth businesses and, when measured by GST Sales, the 10-19 employee size group is the next most likely” (Ministry of Economic Development, 2011).

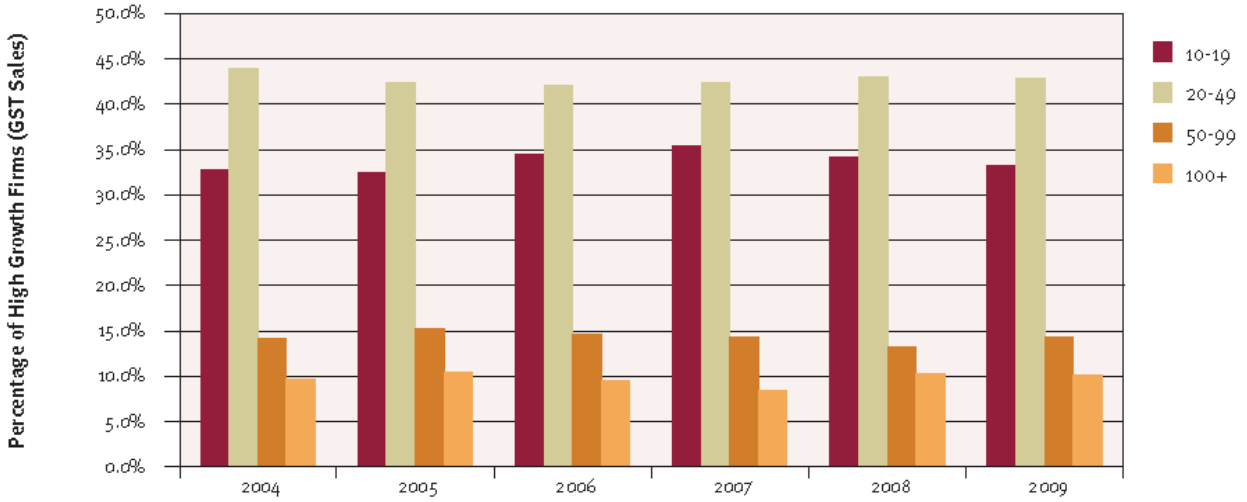
[9] Although note that the definition of high-growth businesess uses a minimum of $50,000 value added at the start of the period, so proportions are not directly comparable with the percentage of the business population which doesn’t have the $50,000 minimum. It is therefore not clear whether there are relatively more high-growth businesess in the smaller categories compared to the larger categories.

Figure 7: Distribution of High-growth Enterprises (OECD definition as measured by employment) by Employee Size Group (Employment – February 2004-2010)



Source: MED (2011)

Figure 8: Distribution of High-growth Enterprises (OECD definition as measured by sales) by Employee Size Group (GST Sales – February 2004-2009)



Source: MED (2011)

This picture serves to illustrate that high-growth businesses occur across all ages and sizes of businesses within New Zealand but that the definition used affects how we interpret the distribution of businesses.

The international literature finds that small businesses are over represented in the population of high-growth businesses, but that larger high-growth businesses are important contributors to job creation in absolute terms (Henrekson & Johansson, 2008). The vast majority of New Zealand SMEs are economically insignificant: only around 30% of New Zealand businesses generate more than $200,000 turnover (Hull & Arnold, 2008) and 90% of the business population have 5 or fewer employees. It is therefore likely that a small number of medium to large businesses in New Zealand have a disproportionately large impact on the economy.

Newness appears to be a more important factor in determining growth than size and employment (Henrekson & Johansson, 2008). This emphasises the importance of the process of 'creative destruction' working well. Creative destruction allows new and efficient businesses to attract resources from inefficient businesses that contract and release resources. Both organic growth and growth-via-acquisition are means by which creative destruction can work efficiently.

Possible strategic implications:

- It may be preferable to take a macro view right across the economy because high-growth businesses occur in all sectors, ages and sizes of businesses; including looking beyond R&D-intensive and high-tech sectors. This is not to deny the importance of R&D or the specific challenges that R&D and high-tech sectors face in relation to others. Instead, it recognises that R&D is only part of the picture. High-growth businesses can contribute to productivity increases in wider ways than R&D and high-tech innovation.
- Focusing on small businesses will capture many high-growth businesses, but there are larger ones that may have a significant effect due to their absolute size. Policies aimed at reaping the benefits from high-growth should therefore consider slightly larger businesses too. Approximately 15% of all high-growth businesses have 20 employees or more (see Table 6).
- To maximise the impacts of their policies, policy makers should also avoid restricting their attention to solely young businesses – high-growth occurs (albeit less frequently) in older businesses too.

Stylised fact four: High-growth businesses innovate

High-growth businesses grow because they are different in a way that adds value. This often means that they are innovative, although not necessarily R&D-intensive, businesses (Autio & Hölzl, 2008). They are more likely to conduct innovation activities leading to innovative products and services (Mitusch & Schimke, 2011).

According to Statistics New Zealand's *Innovation Survey* "innovating businesses were more likely to perform growth activities than non-innovators" (Statistics New Zealand, 2011)[10].

As shown in Table 7, in 2011 New Zealand high-growth businesses were more likely to be innovators than non-high-growth businesses and this did not necessarily involve R&D, although their average R&D spend per annum was substantially higher than that of non-high-growth businesses.

Table 7: R&D and innovation activities of high-growth businesses in New Zealand, 2011

Variable	High-growth[11] businesses	Non-high-growth[12] businesses
Export indicator	3.0%	2.2%
R&D indicator	13.2%	11.5%
Average R&D spend per annum	127,224	78,774
Innovation indicator (BOS defn)	48.1%	41.9%

Source: provisional figures from Statistics New Zealand's IDI

[10] Note that this is not explicit New Zealand evidence that "high-growth businesess innovate", but does draw a link between innovation and growth activities.
[11] High Growth = average annualised growth greater than 20% per annum, over a three year period, with a minimum of $50,000 sales in year 1.
[12] All businesses with a minimum of $50,000 sales in year 1

There is, then, a link between high-growth and innovation although it is unclear whether this is because innovation leads to high-growth or because high-growth enables innovation (for example due to greater cash flow). It is plausible for the link to operate in both directions.

Possible strategic implications:

- High-growth businesses' innovation occurs in many ways – not just through high-technology, and R&D. Policies should support innovative diversity.

Stylised fact five: High-growth is unsustainable, volatile and unpredictable

Linear, stable growth is rarely sustainable over time. If growth is organic, it is constrained by factors such as physical limitations (for example those industries with production facilities) and by the fact that domestic markets can become saturated. In addition, some researchers suggested that the New Zealand internationalising businesses focus on niches can have limited growth opportunities (Simmons). If growth is by acquisition it cannot reasonably be expected to be sustained for extended periods of time.

In New Zealand, there is considerable fluctuation among the businesses counted as high-growth and there is a new cohort every year. For the period 2000-2011 there are roughly 11,500 companies in the IDI that can be classified as "high-growth". Out of these, roughly 9,500 are unique once or, to express it another way, only about 2,000 companies (over 2001-2011) have managed to sustain high-growth for more than a 3 year period. Previous work has identified that growth is rarely sustained over extended periods, with only approximately 2% of New Zealand businesses achieving growth in turnover over ten years (Hull & Arnold, 2008). Similar results are found in other countries, e.g. in Sweden (Daunfeldt & Halvarsson, 2012)

This raises the question of why high-growth is unsustainable and whether high-growth businesses strike a barrier that government can address. Case study research could be fruitful for investigating why these businesses' high-growth was unsustainable and whether there is something that government can do to extend periods of high-growth.

New Zealand has a small domestic market. Businesses that want to grow often have to internationalise. Many New Zealand businesses only export intermittently (Fabling & Sanderson, 2008) and this may contribute to volatile and unsustainable growth. Note that the proportion of high-growth businesses that are exporters (3%) appears to be higher than the rest of the business population (2.2%, see table 7). However, it remains unclear whether this difference is significant. If the small domestic economy and the risks associated with growth via internationalisation are significant barriers to exporting, then encouraging growth via internationalisation may be a means by which New Zealand can increase its number of high-growth businesses.

Perhaps most importantly, high-growth is unpredictable. This is elaborated in section 6.1. A clear and proven consensus on the drivers of high-growth does not exist in the international literature.

Possible strategic implications:

- The selection problem: the unpredictable nature of high-growth makes it difficult to identify winners before they succeed (although avoiding 'losers' is a good start). However, it is possible to create an environment within which businesses are able to grow rapidly. "The policy implications are in line with the OECD's (2007) recent assessment that the evidence of favourable policy impact is more clear-cut for macro/institutional policies than for various types of targeted micro policies" (Henrekson & Johansson, 2008). Rapid growth increases volatility – at least in turnover (Hull & Arnold, 2008). If policies aimed at enhancing rapid growth are successful, then they are also likely to increase volatility. Policy makers should be aware that while high-growth policies may result in remarkable successes, these are likely to be accompanied by spectacular failures.

- For a small firm to grow to a medium or large firm, it must either grow extremely fast for a short period of time or maintain steady growth over a number of years. New Zealand's small domestic market means that internationalisation is an important way in which this can occur. The barriers to internationalisation (either real or perceived) faced by small businesses may limit their ability to experience high-growth. The sporadic nature of growth (and exporting) implies that there may be scope for an intervention that rewards sustained export performance (NZIER, 2012) for businesses that did not previously export or had a track record of intermittent exporting.

- As discussed in section 5, it appears to be the medium-sized businesses that make the biggest absolute contribution to economic growth. Supporting businesses to steadily grow to this size may be an effective stimulus to economic growth.

Stylised fact six: High-growth businesses thrive in specialised factor markets

Many high-growth businesses exploit value-adding differentiation. For instance, Storey (1998) finds that they occur "most frequently in particular niches which are experiencing rapid growth, and where they have sought to differentiate themselves from the competition in a variety of different ways." The focus on differentiation means that businesses are dependent on specialised factor markets such as specialised skills, business services and funding. They also require managers with experience of handling the particular challenges of high-growth (Autio & Hölzl, 2008).

There is evidence that New Zealand businesses seeking to grow via internationalisation tend to differentiate themselves by specialising in niches (Simmons, 2002). There is also research suggesting that there is room for improvement in New Zealand managerial practices (Green, Agarwal, Brown, Tan, & Randhawa, 2010), implying that managers may not have the requisite specialised skills to manage the pressures of high-growth.

Possible policy implications:

- Growth may be limited by managers' capabilities, particularly in New Zealand where the small size of the economy means that specialised factor markets sometimes do not exist (for example, it may be difficult to find angel funding, managers with growth experience etc.).
- The selection problem remains, but where possible, targeted and tailored specialist support can be highly effective (e.g. that provided by Beachheads via expert mentors, cluster-specific policies, sector experts etc.). Incubators have a role to play here too, in helping to develop managers with growth experience and abilities.

Stylised fact seven: High-growth businesses are about individuals rather than the number of businesses in the economy

It is the individuals with the qualities likely to start high-growth businesses and not the generation of sheer numbers of new businesses that are important (Autio & Hölzl, 2008).

New Zealand does not appear to have a problem with generating new businesses: we sit toward the top end of the OECD for firm start up and closure rates (MED, Treasury, Statistics New Zealand, 2011).

On the “who” side of things, it is not clear whether New Zealand managers generally have the desire and capability (gained, for example, through experience) to start and develop high-growth businesses. This is discussed in more detail in section 6 and is an area where more research is required.

Possible strategic implications:

- Business management acumen and individual motivations/aspirations are critical for high-growth. It is important to find out if New Zealand managers have the desire and ability to lead their businesses through a period of high-growth. Manager/owner objectives should be a key determinant in choosing high-growth businesses to support and is discussed in more detail in section 6.

5. Defining high-growth in the New Zealand context

Evaluating the success of policies related to the development of high-growth businesses and conducting research on New Zealand's high-growth businesses is difficult because there is no widely recognised definition of a high-growth firm in the New Zealand context. This section proposes use of a definition of high-growth relevant to the New Zealand situation that could sit alongside the OECD definition.

The OECD defines high-growth as:

> All enterprises with 10 or more employees at the beginning of a three-year period that record average annualised growth (in employment or turnover) greater than 20 per cent per annum over the three-year period.

The OECD definition is useful for international comparisons. However, other ways of examining high-growth are of particular interest and use to New Zealand policy makers.

Definition for use in New Zealand:

We propose that in addition to the OECD definition, using the following definition would also be valuable in the New Zealand context:

> Businesses with a three-year growth rate (in employment or profit) in the top 5% of all significant businesses in either relative or absolute terms. To be significant, businesses must have at least $50,000 turnover at the beginning of the three-year period and at least $500,000 turnover at the end of the three-year period.

As shown in section 2, high-growth occurs across all sectors of the New Zealand economy. When there is a particular interest in specific sectors, we propose adjusting the definition above as follows:

> Businesses with a three-year growth rate (in employment or profit) in the top 5% of all significant businesses in their industry in either relative or absolute terms. To be significant, businesses must have at least $50,000 turnover at the beginning of the three-year period and at least $500,000 turnover at the end of the three-year period.

Note that while this definition usefully captures whether a business is performing well relative to others, it does not capture whether there are "more" high-growth businesses than before. To ensure consistency, we recommend also using the OECD definition of high growth to measure the number and proportion of high-growth businesses in the economy and use profits as a metric in addition to sales and employment. An alternative would be to use the OECD definition but limit the population to businesses with six or more employees rather than 10 or more.

Why use definitions relative to the performance of other businesses?

Making high-growth relative to other businesses implicitly adjusts for cyclical movements (such as business cycles and financial crises) and exogenous factors (such as exchange rate fluctuations) while consistently pointing to the top performers. This is true at both a whole-of-economy and industry level. For example, some industries such as the construction sector are highly cyclical. There can also be significant variation in the typical level of employment between industries. Making high-growth relative to the performance of other businesses in the industry can iron out some of this variation.

Relative rankings implicitly contain a comparison with other businesses. This is useful when trying to assess the additionally of an intervention (although admittedly a rather crude method).

Why the top five per cent?

One definition of high-growth used in the international literature is growth of 100% above the sector median (Moreno & Casillas, 2007). However, in the New Zealand context this would result in the inclusion of many businesses, because the median is below zero for most sectors. A more appropriate benchmark is the top 5% of businesses in the economy or industry. This captures roughly the same proportion of businesses in the economy as that captured by other definitions such as the OECD definition.

Why include both relative and absolute growth?

In terms of impact on the economy, absolute growth is what is important but may just be a function of business size. Relative growth, on the other hand, is important for assessing businesses that outperform others and have greater levels of innovation and productivity. These businesses are important for gaining insights regarding how to lift the whole economy.

A credible definition of growth would therefore seem to require both an absolute and relative component, as suggested by Story and Greene (2010).

Why use three years as the period of measurement?

We are most interested in those businesses that have sustained high-growth over a period because these are likely to have the greatest impact on the economy and may have duplicable characteristics that would help other businesses to sustain similar growth. However, in reality, high-growth is often a short lived and volatile affair (see Stylised Fact Five).

Measuring growth over a relatively short period, such as three years, acknowledges that high-growth is generally a short-lived phenomenon, while simultaneously ironing out some of the volatility that exists in the data.

An alternative approach (for example as suggested by Hull & Arnold (2008)) would be to use a period of five years. This would focus attention on those businesses and their characteristics that sustain growth for extended periods. While this would be an interesting line of research, this may focus too much attention on the tiny number of businesses with sustainable growth and distract from the bigger picture. As shown earlier, selecting such businesses is difficult and the OECD suggests that a wider approach may be more appropriate. A three year time period is therefore more relevant.

Why use employment and profits as metrics?

Many businesses classified as high-growth by one metric are not high-growth by another. We therefore propose using a two-part measure to reflect the areas of most interest to policy makers.

Commonly used metrics to measure high-growth include sales turnover, profits, value-added, market share and employment. The metrics we have chosen are ones that give insights into characteristics of high-growth businesses that make them of interest to policy makers and of importance to the economy.

Employment growth reflects job creation and movement of resources to more productive uses.

One of the key reasons for targeting high-growth businesses is the disproportionate contribution that they make to job creation in the economy. This metric captures the accumulation of knowledge and IP that may be an important aspect of growth but does not show fluctuations the same as financial measures (e.g. due to labour hoarding).

Employment alone is not a perfect measure of high-growth. Employment may be outsourced and so underestimate growth. Note also that few businesses have employment growth as a target – they are largely concerned with profits and turnover. Employment growth is therefore a growth metric that is primarily of interest to government rather than businesses. This makes it desirable to have an additional metric with which to measure growth.

Growth in profits, apart from normal competitive factors, can reflect the productivity of businesses. This is important to the contribution that high-growth businesses make to the economy, along with the fact that profits can be reinvested to enable future growth.

Traditionally sales turnover is used as a measure of growth because it is relatively easy to collect and data on profits are often not readily available. New Zealand is in the enviable position of having access to a rich dataset (the IDI) which allows profit to be calculated for individual businesses across the entire business population.

Using profit is preferred over using sales because it is a better reflection of innovation and productivity than sales growth and is less susceptible to inflation. Profit is also a more common growth objective for businesses than employment growth.

Research based on New Zealand businesses shows that "interpreting sales turnover changes over time has such significant difficulties that it is a poor indicator of growth in the practical timeframes required by policy, policy implementation and evaluation… The difficulty with using turnover is its volatility. The volatility of NZ firm turnover makes it practically impossible to distinguish growth from volatility unless high definitions of growth are used, or long time frames of analysis are taken, such as ten years" (Hull & Arnold, 2008). The study suggests that a measure of profitability benchmarked against industry performance would be a better test of financial performance.

It should be noted that profit can be an imprecise measure. We propose we should define profit as EBITDA[13] (total taxable profit + interest paid + depreciation/amortisation). We have used this definition to measure high-growth, as reported below.

Why set restrictions of at least $50,000 at the start of the period and $500,000 at the end?

A firm that grows from $1 turnover to $10 turnover exhibits phenomenal growth in relative terms, but insignificant growth in absolute terms. This illustrates two points: firstly, the starting point that growth is measured from matters and secondly, a definition needs to contain a threshold below which growing businesses have an economically insignificant impact on the economy.

The OECD definition does this by imposing a minimum of 10 employees on high-growth businesses (an absolute value, below which businesses are regarded, for this purpose, to be insignificant) and a growth rate of 20% per annum (a relative value). The requirement for 10 employees somewhat restricts New Zealand businesses, which may tend to be smaller than their international counterparts. By way of illustration, Table 5 shows that 40% of high-growth businesses in New Zealand fall in the 0-5 employee's category and another 36% in the 6-19 employees category. Restricting high-growth businesses to those with over 10 employees is likely to miss a significant part of the New Zealand business population.

Requiring a minimum of $50,000 at the beginning of the period reduces the problem of having a very low, or zero starting point. The requirement for at least $500,000 by the end of the period ensures that the business is economically significant and somewhat reduces the problem of small and young companies' volatile sales data clouding the growth figures. This threshold at the end of the measurement period is an approach also taken by Autio et al (2000) mentioned in Henrekson & Johansson (2008).

[13] EBITDA in the IDI is calculated from IR10 variables.

At this stage, these parameters have been chosen to reduce the problems noted above and to present a working definition. It has been suggested that they may be too low and could be adjusted in future.

Both organic growth and growth via acquisition should be included

Growth primarily occurs either organically (i.e. the business expands over time) or via acquisition (one business merges with or acquires another business). The different modes of growth have different positive effects on the economy.

Organic growth is generally driven by increases in demand resulting in innovative and competitive advances (Delmar et al (2003) in McKelvie & Wiklund (2010)). There is some "consensus over the importance of seeking to measure only organic growth" (Coad, Frankish, Roberts, & Storey, 2011).

Growth via acquisition results in employment growth for the firm, but not necessarily new job creation at a macro level. In fact, growth via acquisition may reduce the total number of jobs due to consolidation and economies of scale. This mode of growth doesn't inherently create new markets or innovative ideas in the way that organic growth does. However, growth by acquisition may still be beneficial to the economy. Higher productivity businesses can tend to take over lower productivity businesses, resulting in a reallocation of resources to more productive uses and thereby contributing to improvements in the overall rate of productivity (Henrekson & Johansson, 2008). At the same time, many businesses buy smaller businesses in order to obtain their innovative capacity (Butler & Anderson, 2012) – leading to improvements in overall innovative capacity.

The bigger businesses that result from growth via acquisition may also have higher chances of survival in a competitive domestic and international environment and therefore be of benefit to the economy in the longer run.

Because organic growth is generally driven by increases in demand it is more likely to occur in a buoyant economy, whereas growth by acquisition is more likely to occur in a recession (Delmar et al (2003) in McKelvie & Wiklund (2010)). The growth of young and small businesses is more organic compared to that of large and old businesses (Henrekson & Johansson, 2008).

Organic growth and growth via acquisition are exhibited in different periods and by different types of businesses, but both result in benefits for the economy. It is therefore suggested that both are included in measures of high-growth.

Testing the definition

The definition proposed above has been tested in Statistics New Zealand's IDI, with the results shown in Table 8. Key points of interest using this definition are:

- The average high-growth firm in either a relative or absolute sense is not a start-up, but to the contrary has been around for a number of years.

- These businesses have impressive value-added figures when compared to turnover.

- The highest growing businesses that appear to be having the biggest absolute impact on the economy are not, surprisingly, very large businesses, but rather businesses that are medium in size (based on RME). These are businesses that may be flying below the radar of general business and public awareness and debate.

- The highest growing businesses in absolute terms have a much larger capital:profit (EBITDA) ratio than the highest growing businesses in relative terms.

- The highest growing businesses are more likely to be exporters than the general population (where about 2-3% of businesses export – see Table 7). A high proportion of the businesses with the highest levels of absolute growth are exporters (an average of 23% of them) and these businesses have a greater proportion of foreign ownership.

Table 8: Results from the proposed definition of high-growth businesses

High-growth businesses in relative terms 2003-2011			**High-growth businesses in absolute terms 2003-2011**		
Variable	Observations	Mean	Variable	Observations	Mean
Age	47,013	8.6	Age	53,994	13.8
RME	47,013	14.7	RME	53,994	73.6
Sales	40,668	5,380,714	Sales	52,521	27,900,000
Value-added	40,668	1,901,481	Value-added	52,524	10,300,000
Capital	36,915	153,915	Capital	43,239	1,065,988
EBITDA	37,485	264,356	EBITDA	38,091	1,218,225
Foreign owned	34,347	3%	Foreign owned	42,483	8%
Export indicator	47,010	10%	Export indicator	53,994	23%

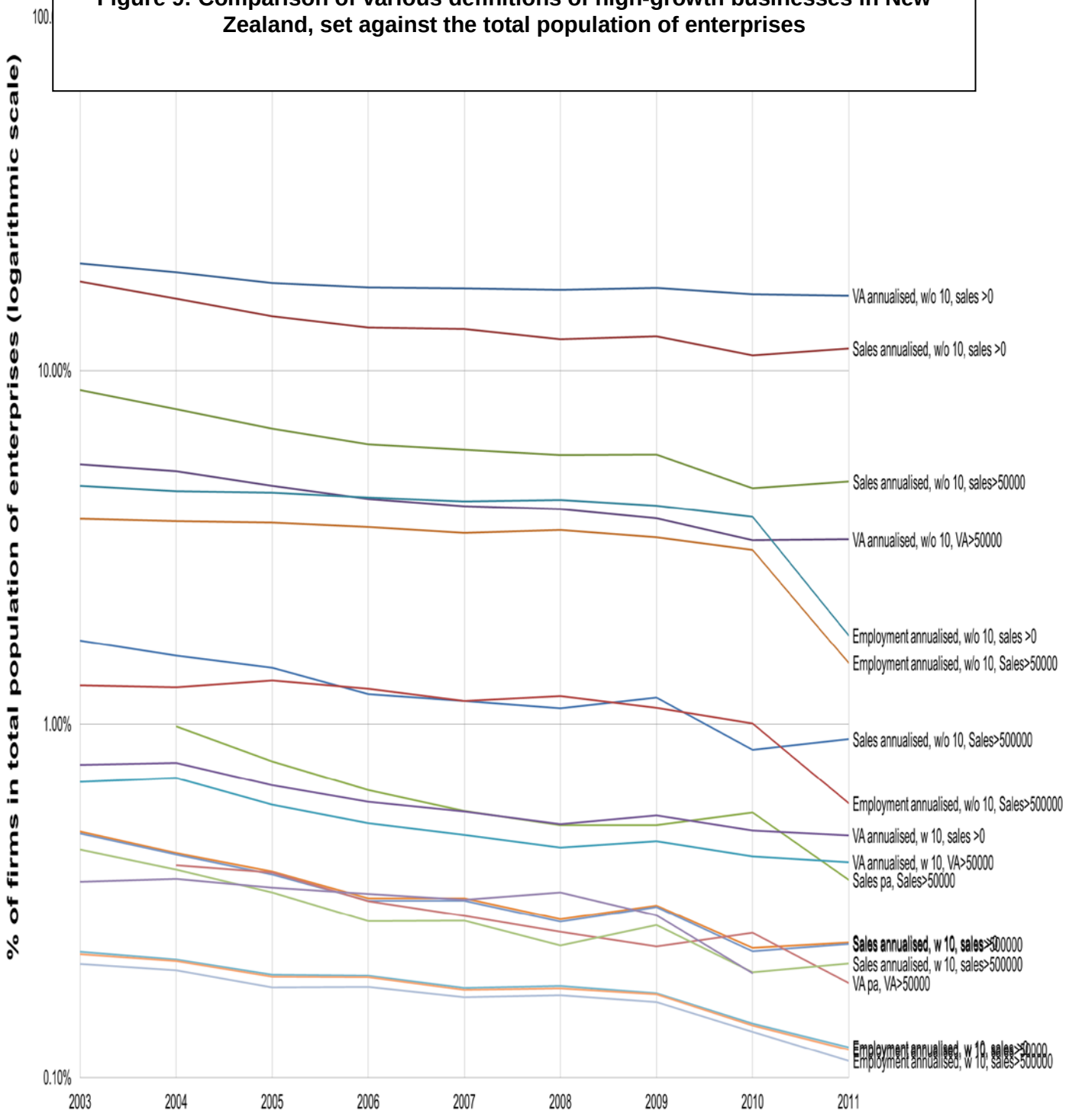
Source: Provisional figures from Statistics New Zealand's IDI

To be truly meaningful, these results need to be compared to other businesses and there are many further tests that it would be interesting to carry out using this definition The figures above, however, suffice to illustrate that the definition 'works' and that it promises to provide interesting insights about New Zealand's top businesses. Further research could consider looking at things such as median values, differences across sectors and whether many of NZTE's Focus 500 businesses meet the definition.

Other definitions of high-growth

Throughout this paper, various definitions of high-growth are used. Figure 9 below compares a number of these different definitions of high growth, all based around some form of average growth of 20% over 3 years with varying types of growth (e.g. sales, value added or employment) and restrictions on which businesses are included.

Figure 9: Comparison of various definitions of high-growth businesses in New Zealand, set against the total population of enterprises



Notes to accompany figure 9

Annual-ised	Growth has been averaged over the three years considered and averages at greater than 20% each year. One (or more) year(s) may have had growth of less than 20% but this was offset by growth in the other year(s).
pa	Per annum. The firm experienced at least 20% growth each year
w10	Only companies with 10 or more employees were considered
w/o 10	Companies with all numbers of employees were considered
Sales>0	Only companies with sales > 0 were considered (similarly for sales>$50,000, sales>$500,000 and value-added)

6. Leveraging high-growth

It would be useful to know which factors can be leveraged, in order to create more high-growth businesses, enable high-growth in businesses to last for longer or develop high-growth businesses that are larger.

In order to do this, the key question to answer is what causes high-growth

There is little consensus around an answer to this. For example, one study states, "there is no single theory that adequately explains why some businesses grow whilst others do not nor… is there much likelihood of such a theory being developed in the future. The main reason is the variety of factors which can affect the growth of a business and the way these interact with each other" (Smallbone & Baldock, 2004).

The vast array of factors influencing growth in small businesses is illustrated in Table 9 below.

Table 9: Factors Influencing Growth in Small Businesses

ENTREPRENEUR	FIRM	STRATEGY
Motivation	Age	Workforce Training
Unemployment	Sector	Management Training
Education	Legal form	External equity
Management experience	Location	Technology
Number of founders	Size	Market positioning
Prior self-employment	Ownership	Market adjustments
Family history		Planning
Social marginality		New products
Functional skills		Management recruitment
Training		State support
Age		Customer concentration
Prior business failure		Competition
Prior sector experience		Information and advice
Prior firm size experience		Exporting
Gender		

Source: Storey (1994) in Cooney & Malinen (2004)

A recent survey of the relevant literature notes that "despite hundreds of studies into explaining firm-level differences, the main finding in this stream of literature is that researchers have been unable to isolate variables that have a consistent effect on growth across studies" (McKelvie & Wiklund, 2010). This finding includes links between high-growth businesses and the characteristics of their management. An "exhaustive review of the empirical evidence" by Storey & Greene (2010) notes that the literature does not support the notion that prior experience at starting and running a business reduces the likelihood of closure, although a few factors such as age, being male and being a limited company seem to explain some aspects of growth.

For New Zealand businesses, Fabling and Grimes (2007) looked at the impact of human resource practices on the performance of businesses in New Zealand. Businesses that adopt certain human resource practices (in particular performance pay and innovation-related employee training) perform better in terms of profitability, productivity and market share. Fabling and Grimes (2006) analyse the relationship of firm performance and business practices in New Zealand. They found that capital investment choices, R&D practices, market research and a range of employee practices are positively associated with firm success.

Lee (2011) investigated what obstacles high growth businesses in the UK face. There are six areas where high growth businesses experience problems: obtaining finance, cash flow, recruiting staff, skill shortages, managerial skills and the availability and cost of premises.

In keeping with Stylised Fact Five, there is more agreement around the finding that growth is largely a random thing and cannot be systematically predicted. For instance, Coad, Frankish, Roberts, & Storey (2011) found that the dominant component of growth is a random walk, influenced by growth in previous periods and start-up size. This influence appears to be simply because growth in previous periods and higher start-up sizes increase the likelihood of survival and therefore the likelihood of future growth. They argue "the usual suspects" such as the age, gender, prior experience and education of the founder and sources of advice have a limited role to play."

Storey & Greene (2010) concluded that there is "very little general evidence to suggest that there was a ready-made formula or recipe that entrepreneurs followed to grow their business… [and] much business growth remains unexplained. This does not imply that business performance is purely a random walk, but it does imply that chance has a major role to play."

They go on to suggest, "What seems more plausible is that the entrepreneurial skill base of the enterprise has to 'fit' the circumstances faced by the business… Most businesses may experience spurts of growth when their entrepreneurial skill base is aligned to the external environment, but once these circumstances change, they return to more 'normal' performance."

One possible explanation for why growth appears to be largely random could be that different modes of growth have rarely been distinguished in the literature and may have different causes. When all are lumped in together, growth appears to be largely random (McKelvie & Wiklund, 2010). It would be advisable to attempt to separate the different modes of growth in future research as this may enable identification of the specific drivers of growth.

There is one thing that appears to influence whether a firm grows or not and that is the intention to grow. The profile of a firm is a reflection of the decisions taken by the entrepreneur – you cannot separate the entrepreneur from the firm (Cooney & Malinen, 2004). If a firm's management does not desire to grow the firm then it is unlikely that the firm will grow. MYOB (2009) Business Monitor identified some different 'types' of business owners in New Zealand. Fifty per cent of all business owners were classified as "Lifestyle Seekers", i.e. they do not want to make a lot of money and it is more a lifestyle choice for the owners. Direct comparability with other countries is not given but this percentage appears to be high.

Growth motives that are stable over time have been found to be effective predictors of firm growth (Delmar & Wiklund (2008) in Massey & Jurado (2008). It is also "clear that the intentions of the owner-manager and the way in which they interpret their economic and social worlds play a pivotal role in the growth orientation of small business" Gray (2000); in Massey & Jurado, 2008).

The OECD (2010) concluded that high-growth phases are temporary and can happen to nearly any enterprise and that while high-growth is due to a mix of factors, growth ambitions are critical.

Approaches to leveraging high-growth

There are primarily two approaches that can be taken to leveraging high-growth. Firstly, working with specific high-growth potential businesses or groups of businesses to increase the likelihood that they will experience a period of high-growth and secondly, creating an economic environment that generally fosters the development of high-growth businesses.

Working with potential high-growth businesses

This approach is attractive because if done successfully then a significant impact can be achieved in a highly efficient manner due to the disproportionate impact that high-growth businesses have on the economy. If the number of high-growth businesses can be increased beyond the market equilibrium, then economic growth may be accelerated (an outcome preferable to that provided by the market when left alone).

A selective approach of "picking winners" was advocated by Storey and Johnson (1987) (noted in Smallbone and Baldock (2004)). The literature generally questions the feasibility of this. Attempts to pick high-growth businesses are likely to be unsuccessful primarily because (a) the fact that they are rare (Stylised Fact One) makes it more likely that losers will be picked than winners and (b) the lack of consensus on the factors causing high-growth makes it difficult to ex ante identify businesses with high-growth potential.

Even where there is consensus (for example on the need for managers to have growth ambitions) it is still very difficult to select those managers most likely to successfully grow their businesses. This is "because people possess varying characteristics and different career motivations, attempting to place any particular traits as primary requirements to becoming the founder of a fast-growth firm is fraught with difficulties" (Cooney & Malinen, 2004).

In addition to this, Cooney & Malinen (2004) warn that "becoming over concerned with developing a definitive identikit of the entrepreneur who establishes fast-growth companies is a regressive research activity. This is because it can lead key players (support agencies, venture capitalists, banks etc.) to eliminating potential successes due to their perception of an individual's failure to meet a set of criteria of entrepreneurial prerequisites."

A shotgun is largely ineffective at a distance. Scattering small interventions over a large number of businesses is similarly likely to be ineffective given that policy makers are typically distant from the internal workings of individual businesses. A study in the UK on advisory support for start-up businesses and SMEs obtained results suggesting that "a more focused, highly intensive profile of assistance works best. Deeper is better than broader… the poorest results come… where a relatively high proportion of businesses are provided with relatively limited intensive assistance" (Mole, Hart, Roper, & Saal, 2009). A recent evaluation of NZTE's Beachheads programme found a similar result – internationalisation advice was most effective when it was tailored to the specific needs of businesses using the programme (Ministry of Economic Development, 2012).

The Beachheads programme has worked with a high proportion of high-growth businesses (Table 10). Internationalisation (the primary function of the programme) may therefore be linked with high-growth in New Zealand businesses. Working with specific successful businesses who want help to enter new foreign markets may be one way in which New Zealand is able to stimulate high-growth.

Working with the economic environment

The other primary approach to leveraging high-growth is to generally ensure that there is an economic environment that fosters the creation and development of high-growth businesses.

Barriers to growth can be internal or external. External barriers include things such as tax, product market regulation, the labour market, economic conditions, exchange rate, and market structure. Internal barriers are created by the firm as it grows and include management attributes and motivation, lack of finance, poor product, and other management deficiencies.

Even if some of these barriers are perceived rather than real, once they exist in the mind of the entrepreneur, they will act as a deterrent to growth aspirations and practices. Managers' perceptions may therefore become barriers to growth in and of themselves.

Due to the difficulties in ex-ante selection of high-growth businesses, the OECD (2010) concludes that governments should seek to create the conditions that will assist any firm to experience a high-growth phase rather than focus on particular businesses. They suggest that appropriate policy strategies should consider attempting to do the following:

a) Improve business environment to remove obstacles and disincentives for growth
b) Encourage an entrepreneurial attitude of growth ambition
c) Support the development of managerial skills and attitudes towards change
d) Improve access to capital if necessary
e) Promote innovation and internationalisation activities

When assessed against the suggested strategies above, New Zealand already tops the world in certain aspects of doing business, e.g. starting a new business. However, improvements in regulatory governance and the institutional settings could enhance New Zealand's economic performance (Conway, 2011). Businesses do not generally have abnormal difficulties in obtaining finance (New Zealand does have policies in place to address aspects of capital markets that may be suffering from market failure – such as the Venture Investment Fund for venture capital and the Seed Co-Investment Fund for angel investment). New Zealand also has policies in place to promote innovation (for example MBIE's Technology Transfer Voucher and Technology Development Grant) and internationalisation activities (for example New Zealand Trade and Enterprise's International Growth Fund and Beachheads programme etc.). Incubators can contribute to all the above strategies.

It would seem, therefore, that the key area requiring attention might be managers' attitudes towards growth and change[14].

The University of Auckland Business School has a Growing New Zealand Businesses (GNZB) research group, which is looking at (among other things) New Zealand managers' growth ambitions. This is an area for investigation that may reveal useful insights for developing policies that will enable more businesses to experience high-growth.

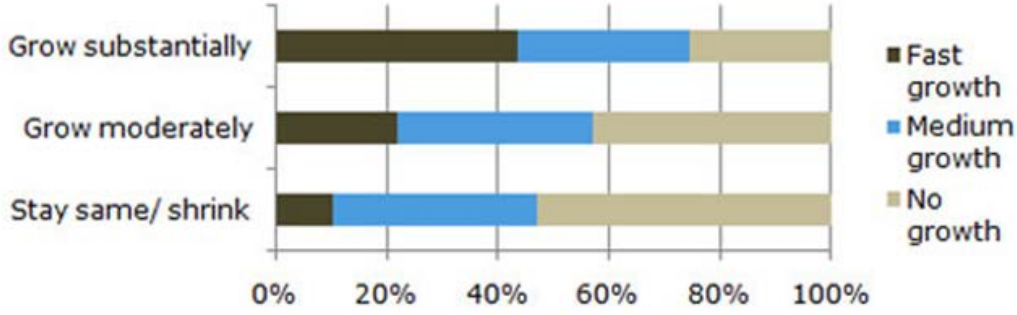
A GNZB survey[15] in 2010-2011 (Auckland University Business School, 2011) found that:

> "4% [of respondents] wanted to become smaller over the next three years, 19% wanted to stay the same size, 57% wanted to grow moderately and 20% wanted to grow substantially. Many with fast turnover growth also wanted to grow substantially, and many with no growth wanted to stay the same size or shrink [see Figure 10]. High growth[16] aspirants were prevalent in medium-sized businesses, fast-growers, exporters, industry-level innovators, high-tech manufacturers and newer businesses.
>
> Those wanting to shrink or stay the same size, on the other hand, were prevalent in micro businesses, non-growers, non-exporters, non-innovators and (to some extent) business services. By size, 80% of those wishing to become smaller were micro businesses, 84% had no exports, and 30% had no competitors, compared with just 7% of those wishing to grow substantially.
>
> [Where micro businesses have 0-9 employees, small businesses have 10-49 employees and medium-sized businesses have 50-249 employees.]

[14] See Department for Business Innovation and Skills, UK (2012) for some international research on this.
[15] The survey contained 1762 responses from New Zealand SMEs with less than 250 employees, covering both services and manufacturing.
[16] It is unclear how the different levels of growth were defined in this survey

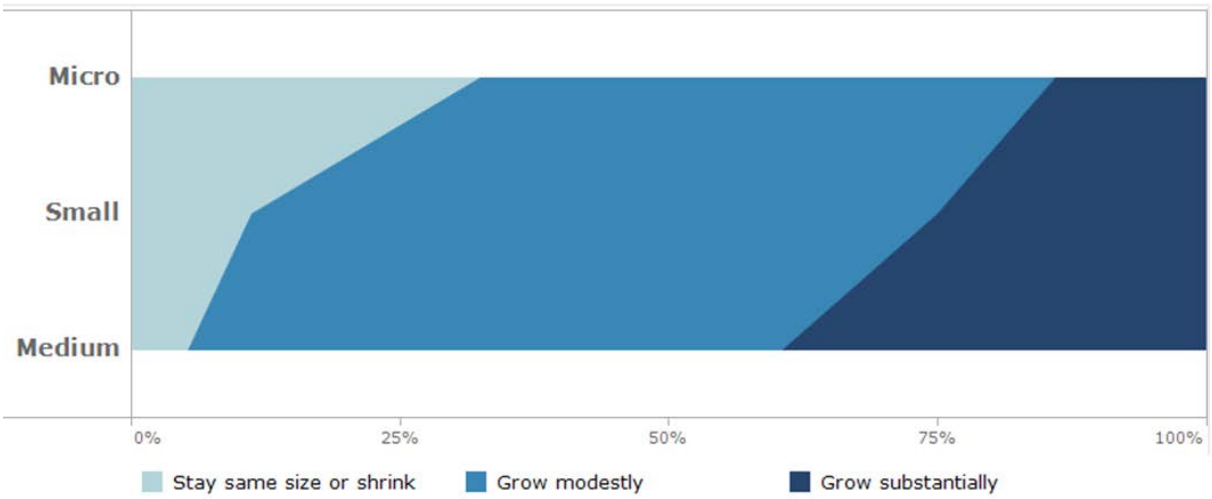
Thus a group of CEOs – perhaps 20-25% of the total – have few aspirations to grow, innovate or export."

Figure 10: Level of turnover growth by growth aspiration



Source: GNZB survey (2011)

Figure 11: Growth objectives



Source: GNZB survey (2011)

This evidence supports the suggestion that there is a link between high-growth and managers' attitudes to growth. The GNZB project currently has work underway to generate international comparisons that will allow comment to be made on whether the level of managerial aspirations for growth is a problem or not in New Zealand.

Anecdotally, the 'lifestyle premium'[17] in New Zealand is often mentioned as a barrier to growth. If this is the case, "eliminating growth defeating management practices might be more important than adopting growth promoting management practices" (Peterson et al (1995) in Cooney & Malinen (2004)).

Another reason why managers may be unwilling to grow their businesses is due to the risks involved in doing so. This may be a perfectly rational decision when taken from the perspective of the individual business, but does not take into account the wider benefits to the rest of the economy from the growth (or high-growth) of that business.

[17] That is, owner-managers and entrepreneurs place a high value on the lifestyle that running their own business affords and are unwilling to trade leisure time in order to grow their business further. The three B's (boat, bach and BMW) are often quoted anecdotally as being the objective of many small business owners.

An example of the riskiness of growth is export growth. Breaking into foreign markets is inherently risky. New Zealand's economy is relatively small and to continue growing, it may therefore be necessary for many businesses to internationalise – and at an earlier stage than their international counterparts. Small businesses with limited resources do not have the same capacity to diversify their activities as larger businesses might and are therefore less able to cope with setbacks and project failures[18]. This may act as an effective barrier to growth via internationalisation.

With this in mind, it is interesting to note that the top growth businesses in the economy as measured by the definition proposed in section 5 are more likely to be exporters than the average company.

New Zealand's previous policy experience in seeking to leverage high-growth

Over several years New Zealand policies containing objectives focused on leveraging high-growth have included Incubators, the Seed Co-Investment Fund and Capability Development Vouchers.

Incubators

Incubator policy in New Zealand seeks to enhance the survival and growth of early-stage high-growth potential businesses. A quantitative assessment of the effectiveness of New Zealand's incubators is included in section 7. The Business Growth Agenda has noted the potential value of incubators for New Zealand and specifically includes actions targeted at encouraging business innovation by identifying and implementing improvements to incubator settings.

Seed Co-Investment Fund (SCIF)

SCIF co-invests in selected businesses and funds market development initiatives with the aim being to "catalyse investment that would not have occurred without SCIF.to assist in reducing the barriers and difficulties in accessing finance for high-growth potential, innovative, and technology intensive start-up businesses, and businesses that have assets which are difficult to value."

New Zealand Trade and Enterprise Capability Development Vouchers

NZTE have promoted the vouchers to "be used to help you access services that build your management capabilities, which in turn may accelerate the growth of your business." To be eligible for the vouchers, businesses must, among other things, "demonstrate a desire to innovate and grow". The fact that the vouchers are only available to businesses that demonstrate a desire to innovate and grow means that they are more likely to go to businesses that are already high-growth potential (as shown earlier, this desire is one of the only factors that can be linked conclusively to firm growth). However, because the vouchers are unlikely to go to managers who do not want to grow, the scheme does not amend managers' attitudes to growth and change.

Growth Services Range (GSR)

NZTE's GSR was a package of grants and services (Client Management Services, Growth Services Fund and Market Development Services) intended to "accelerate the development of businesses with high-growth potential and enhance their contribution to New Zealand's overall economic growth" [Cabinet Paper EDC (03) 55].

[18] While it is unlikely that government policy can do much to address the 'lifestyle premium' attitude of some managers, it may be able to help reduce the risks – either real or perceived – of internationalisation

The rationale for the GSR was that businesses were not investing sufficiently in expertise and information services that would help them achieve their growth potential. High-growth potential was defined as the potential to generate either average 20% per annum revenue growth sustainable for five years, or revenue of $5m within five years, although there was no formal checklist for determining whether a firm had high-growth potential or not. A 2009 evaluation of the GSR, using econometric measurement, found that it had had a significant positive impact on the sales of businesses receiving assistance, but was less conclusive regarding the impact on value-added and productivity.

Clusters

Another way of working with potential high-growth businesses is via cluster policy. "A cluster stimulates the innovation process and economic growth, while offering a favourable business environment" (Mitusch & Schimke, 2011). Cluster policy takes a reasonably targeted, deep approach without necessarily trying to pick individual winners (beyond the group of businesses that has been chosen) and may assist in enabling businesses to experience high-growth. An example of a New Zealand cluster that appears to be experiencing some success is Dairy SolutioNZ – a subsidiary of Innovation Waikato Limited (Ministry of Business, Innovation and Employment, 2012).

Prevalence of high-growth businesses through or in various support programmes 2000 to 2008

It is interesting to look at what proportion of businesses in various government support programmes were high-growth businesses. The programmes engaging with the highest proportion of high-growth businesses (Beachheads and Better-By-Design) both work at a management capability level.

The table below indicates that some other policies have aspects of leveraging high growth. For instance, programmes such as Beachheads and Better by Design appear to be interacting with significant numbers of high-growth businesses (although this does not necessarily mean that they are creating high-growth businesses). Note that the percentage of high-growth businesses may reflect programme selection criteria. To measure the additionality of the programmes a robust econometric analysis is required that compares businesses in the programme with similar, non-participating businesses.

Table 10: Prevalence of high-growth[19] businesses in various support programmes 2000-2008

Government Assistance Programme	Percentage of businesses through the programme who have experienced high-growth
Tech NZ	4.5%
Venture Investment Fund	5.6%
Better By Design	14.9%
Beachheads	17.2%
Client Management Service	11.7%
Escalator	4.1%
Incubators	4.8%
Government service providers (GSP)[20]	7.9%
Invoiced jobs (IVJ)[21]	10.5%

Source: provisional figures from Statistics New Zealand's IDI

[19] 20% growth in value-added per annum over 3 years with minimum of $50,000 VA in year 1.
[20] Government service providers (GSP): a group of smaller or older schemes including Australia New Zealand Biotechnology Partnership Fund, Business Growth Fund, Enterprise Awards Grants, Enterprise Development Fund, Growth Services Fund (and precursors), Strategic Investment Fund, and World Class New Zealanders.
[21] NZTE services delivery directly to businesses by New Zealand and international offices.

7. Measuring the effectiveness of policies targeting high-growth: NZTE's incubator programme

Programme objectives and rationale:

The primary objective of the Incubator Support Programme[22] was to enhance the survival and growth of early-stage high-growth businesses via the development of high-quality incubators.

The Incubator programme's intermediate objectives were to:

a) Focus incubation activities on start-up businesses with potential to become high-growth, as this is where the market failures are greatest.

b) Promote best practice among incubators in New Zealand, so as they can be more effective at assisting start-up businesses.

c) Enhance networking among incubator managers and with organisations that have an interest in incubation and incubated businesses (i.e. angel investors, venture capitalists); and

d) Enhance networking between incubators and Crown Research Institutes (CRIs) and universities to encourage technology transfer and commercialisation.

The goal of NZTE funding of business incubators was to contribute to economic growth by fostering the development of new business and entrepreneurs with high-growth potential. It was the intention that the business incubators would nurture companies to become more successful or achieve success faster than they would have otherwise.

There are two key rationales for government funding for business incubators:

- That the net benefits to New Zealand would be positive and the expected private returns are insufficient to justify the risk that would be incurred by a private organisation, and
- They would help overcome information and coordination problems for start-up businesses.

(MBIE, 2012)

Incubators and high-growth businesses

Since 2009, NZTE has used the following qualitative assessment of whether a firm that exits the programme has the potential for high-growth or not.

> "A high-growth exit occurs when a business leaves the incubator with the following characteristics: is globally ambitious, has a well-thought out and executable business plan; has a thorough understanding of their target market; has a strong and experienced management team, has good independent governance."

This definition can only be used by the incubators themselves because an intimate knowledge of the business is required to make the judgement. According to this definition, 42% of exits from 2009-2011 have been *potential* high-growth exits (Ministry of Business, Innovation and Employment, 2012).

However, when a definition of actual high-growth[23] is applied to incubated companies, only 4.8% have been high-growth at any stage (Table 10). While this is higher than the economy-wide proportion of about 0.5% (using this definition) it is substantially lower than 42%.

[22] EDC (08) 184 on the 22 September 2008

[23] 20% growth in value-added per annum over 3 years, with minimum of $50,000 value added in year 1.

This is not to say that incubated businesses will not become high-growth businesses over time. It is important to remember this when interpreting the results of the econometric analysis below and when attempting to arrive at a conclusion regarding whether the policy has been successful or not. Be that as it may, the 42% potential is in stark contrast to the actual number of high-growth businesses produced.

Following a qualitative evaluation of NZTE's Incubators Support Programme more work has now been done to provide information about incubated businesses in New Zealand and an econometric analysis of additionality of the Incubator Support Programme. This analysis is discussed below.

Context and methodology

Worldwide, business incubators aim to stimulate entrepreneurship and business growth. Robust evaluation of policies targeting high-growth is critical for enabling the allocation of resources to the most efficient and effective policies. However, methodologically sound empirical research on the impact of incubators is rare. Most evaluations do not consider that some companies would have grown outside the incubator; some companies move into the incubator at a later stage of their growth attracted by cheap office space; and some business entrepreneurs who are selected into incubation programmes may be more motivated and more educated than the average new business owner.

In order to evaluate the effectiveness of business incubation, it is necessary to understand what would have happened in its absence. The few sound evaluations suggest that incubators fail in supporting entrepreneurship and business growth (Tavoletti, 2012).

Suitable methods for analysing the impact of incubators are the before-and-after comparison and the use of a control group. The effect of incubation can be estimated from the average performance difference of businesses assisted compared to very similar businesses that received no assistance. The econometric analysis of incubated companies presented here is the first of its kind in New Zealand and uses a quasi-experimental design to infer the effectiveness of the incubator program. It uses quantitative performance measures. The available data sources are discussed below.

In a quasi-experimental approach, there are two groups of companies: a treatment group, i.e. companies that participated in the incubation program and those companies that did not (control group or comparison group). If the two groups are equivalent except for the treatment, the effectiveness of the programme can be estimated through differences in outcomes of the two groups.

The theory of quasi-experimental design is straight forward, but in practice, a number of difficulties arise. Incubator companies are not randomly assigned to the treatment group. Companies are partly self-selected into incubation, i.e. only those companies that expect a benefit from incubation or feel a need for incubation will do so. Whether these self-selected companies are in general higher performing companies or companies that lag behind in their economic performance is hard to assess. Entrepreneurs who apply to be admitted into incubation may be more educated and more motivated or just more connected to the business network than the average entrepreneur. Usually no information on why companies choose incubation is available.

In addition, most incubators do not accept all applicants: incubators admit those companies that they consider most likely to be successful in the future. This competitive selection or screening process tends to ensure that only the most promising companies are admitted into incubation. Selected businesses may therefore perform better than non-selected businesses due to selection bias rather than incubation.

Incubators in New Zealand have focussed on young, often start-up, businesses that have high-growth ambitions. Incubators have rigorous selection processes in which they assess the businesses' needs and usually they are accepted if the incubator has the ability to provide assistance in meeting those needs. There are not usually specific criteria e.g. 'a firm must be less than five years old'. Most of the incubators run 'entrepreneurship competitions' as one source of potential clients. Of the hundreds of people /teams who enter such competitions, only a handful of the "best" become incubator clients.

For the reasons mentioned above selection-bias is presumed to be present because businesses are not randomly assigned in the treatment group. Selection bias can be mitigated with statistical adjustments ("selection on the observables"). These adjustments rely on the observed business characteristics such as age of the company, sector, and capital/labour ratio. Unlike "selection on observables" the "selection on unobservables" approach focuses on unobserved characteristics of companies and encompasses, e.g. the difference-in-differences estimator to assess the effectiveness of a programme.

Data sources

The data for the analysis comes from Statistics New Zealand's Integrated Data Infrastructure (IDI). The IDI contains business-related data for financial years 2000 to 2011 from a number of sources. The main unit of analysis for our purpose is the enterprise and the IDI records firm characteristics and changes in these characteristics over time. The IDI is able to identify the predominant industry affiliation of a firm (ANZSIC code) and several administrative data sources are also attached to the IDI. These include Goods and Services Tax (GST), tax returns (IR4), financial accounts (IR10), and aggregated Pay-As-You-Earn (PAYE) returns provided by the Inland Revenue Department (IRD) and Customs merchandise trade data. Several Statistics New Zealand business surveys are also attached, including the Annual Enterprise Survey (AES), which is the primary data source for calculating the National Accounts; the Business Operations Survey and the Research and Development Survey.

We included participation data for incubated businesses. NZTE and the incubators provided a list of businesses that were in incubation with information on the duration of incubation. These details were matched with GST numbers (where supplied) or linked on name and contact details to the existing companies in the IDI.

Since 2001, 552 businesses participated in one of the incubators supported by NZTE's incubator support programme. Of these, 315 of them could be identified in the ID) of Statistics New Zealand. This information provides a good database to monitor the performance of incubated companies over time and to investigate the role of incubators in enhancing economic growth and supporting potential high-growth companies. For each year, we found the following number of observations:

Table 11: Number of value-added observations for incubated companies in the IDI

Year	Incubated companies with value added data
2000	30
2001	42
2002	69
2003	105
2004	141
2005	171
2006	207
2007	240
2008	264
2009	273
2010	285
2011	279

Source: Provisional figures from Statistics New Zealand's IDI

For a before-and-after comparison we obtained the following number of observations on incubated companies (year 0 = year they exited from incubation).

Table 12: Number of before and after observations for incubated companies in the IDI

Years before entry and after exit	Incubated companies with value added data
-5	45
-4	69
-3	114
-2	159
-1	216
0	252
1	228
2	195
3	159
4	117
5	78
6	39
7	12
8	*
9	*
10	*

* Confidential due to low numbers of businesses
Source: Provisional figures from Statistics New Zealand's IDI

The available data is sufficient in terms of number of observations and period of observation for a positive impact to be apparent if it exists.

The IDI allows us to obtain information on non-incubated businesses. This is a major advantage over previous evaluations and overseas analyses, where information on non-incubated businesses has been extremely difficult to obtain.

We established a comparison ('control') of businesses of a similar age together with other comparable characteristics). We compared incubated businesses in their first year with all other companies in their first year of activity at that time. Similarly, we compared incubated companies in their second year with all other companies two years after birth, etc.

Other firm characteristics such as the sector in which a business is trading or its export status were included in the analysis. However, these additional traits did not have any significant influence on the performance difference between incubated and non-incubated companies. Therefore, age was retained as the only matching variable between the two groups. Comparisons were also made with the average New Zealand firm.

Headline results

The average incubator business is already almost three years old when it enters the incubator and thus is not newly established. Businesses stay on average almost two years in an incubator.

The mean figures for employment, sales and value added for different years (entry year into incubation, exit year and one year later) are reported in Table 13 below.

Table 13: Incubated businesses

Mean	Entry year	Exit year	Exit year +1
Employment	1.3	2.4	2.9
Sales	141,158	264,445	379,199
Value Added	29,213	55,479	147,231
Foreign owned	2%	2%	1%
Exporter	6%	11%	14%

Source: Provisional figures from Statistics New Zealand's IDI

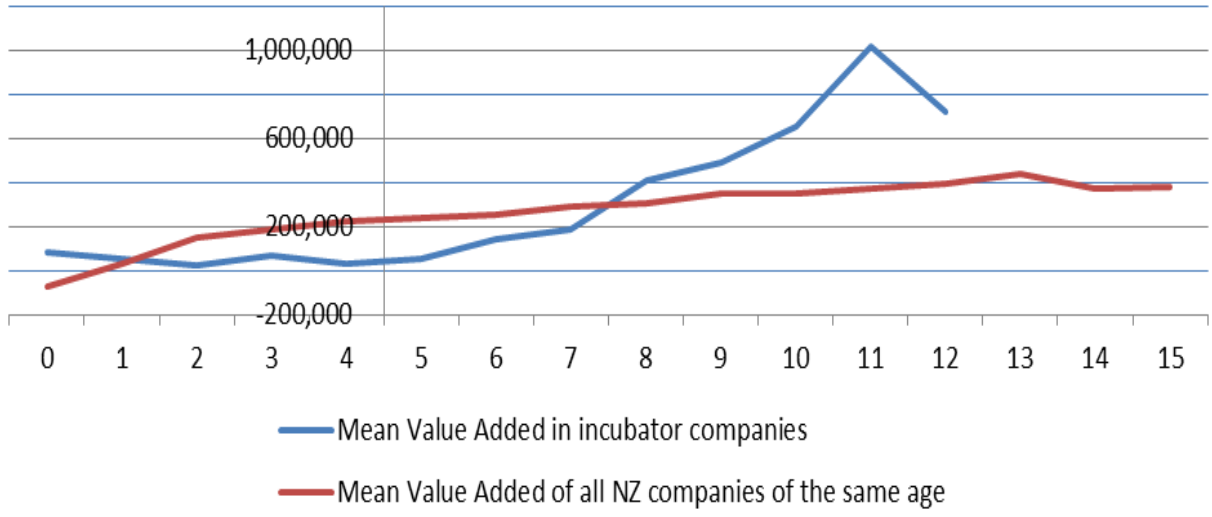
Of all incubated businesses two present are foreign owned and six present were already exporters when they enter incubation.

The econometric analysis could not reveal clear evidence of a positive effect.

Figure 12 compares the mean value-added of incubated businesses with the counterfactual of non-incubated New Zealand businesses of the same age. Where the vertical axis crosses indicates the year that the firm left incubation. This figure does not show clear evidence of a positive effect from incubation.

As we move further from the point when a firm exited incubation, the results become statistically insignificant due to the low number of observations and the high variation in the data (Table 12). Therefore, although it appears that mean value added is higher for incubated businesses from four to eight years after they exited from incubation (Figure 12), this result cannot be attributed to participation in an incubator.

Figure 12: Mean value added after birth (year 0) and after incubation (year 5)



Source: Provisional figures from Statistics New Zealand's IDI

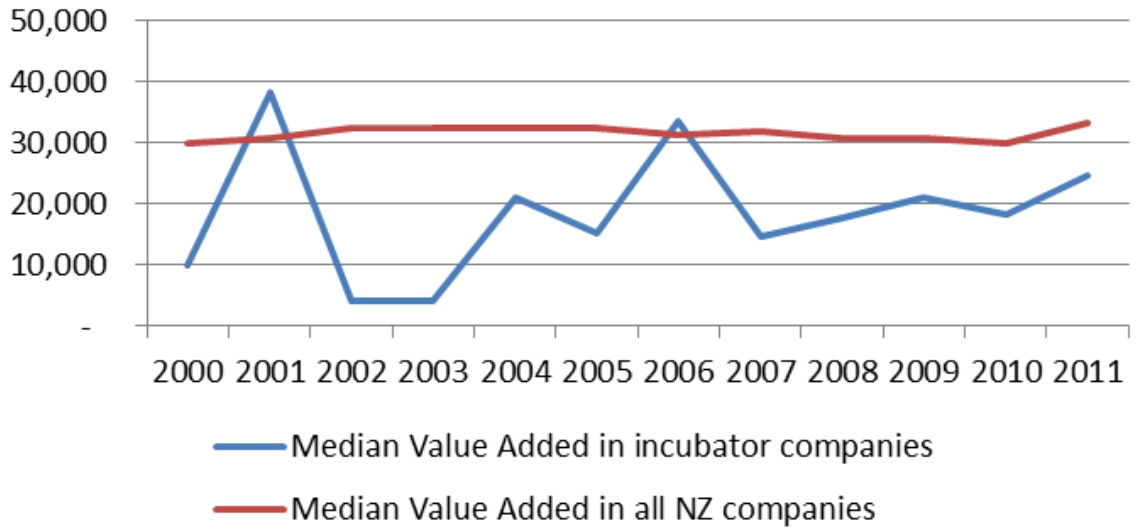
For the nine years of valid data points (given the churn and lead times) for incubated companies no firm conclusion can be drawn whether the NZTE Incubator Support Programme had an impact on firm performance (measured in higher sales, employment or value added).

It is possible that a clear effect might be found with more data, i.e. over time. As shown in Table 4 high-growth most frequently occurs between 5 to 9 years after the birth of a company. This implies that companies incubated after 2007 will experience their high-growth within the next years to come.

It is hard to make any sound claims about the 237 businesses (total 552 incubated businesses – 315 businesses with data) for which no statistical data is available. If at all, it appears that incubators help businesses to abandon their (unsuccessful) ideas quicker and exit the market. These incubated companies should exhibit a higher failure rate compared with businesses outside incubators.

The median value added of incubated businesses is very volatile between 2000 and 2011 and in general lower than the median value added of all New Zealand companies.

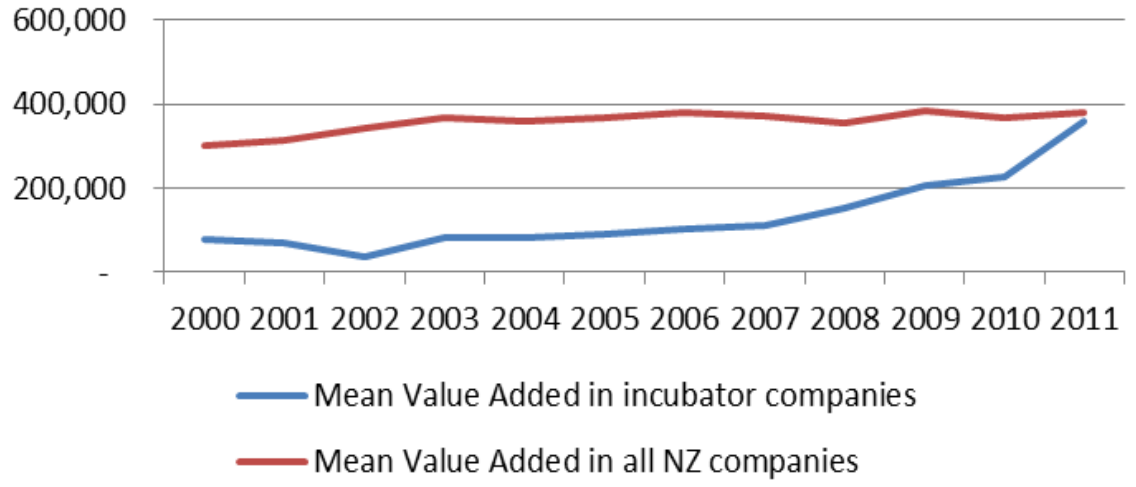
Figure 13: Median value added 2000 - 2011



Source: Provisional figures from Statistics New Zealand's IDI

The mean value added of incubated companies is generally lower than the mean value added of all New Zealand companies with an upward trend in recent years.

Figure 14: Mean value added 2000 - 2011



Source: Provisional figures from Statistics New Zealand's IDI

In summary, the results of our quantitative analysis could not show a significant positive impact on business performance, i.e. the level of performance of incubated businesses is not superior to that of similar, non-incubated businesses. This is not a complete surprise. Results from overseas research on incubators point in the same direction and in particular the empirical research evidence with a control group show that incubators do not fulfil their expected positive impacts (see Tamasy (2007), Siegel; Westhead; Wright (2003), Colombo; Delmastro (2002), Westhead; Story (1994)).

Qualitative aspects

All incubators have a number of common activities like selecting a pipeline of businesses, mentoring business formation, market and business networks and capital-raising. Incubators try to identify motivated entrepreneurs with promising business proposal and work with the entrepreneur to develop the business.

Each incubator model is, however, unique and adapted to the local entrepreneurship environment. Some incubators focus on identifying IP suitable for commercialisation and forming the business around an idea. Both selection models can be successful and often a mix of both models is practiced.

Incubator policy is aimed at businesses wanting to grow. Both young and old businesses can grow and both young and old businesses have been incubator clients. Incubators have rigorous selection processes in which they assess businesses' needs and usually they are accepted if the incubator has the ability to provide assistance in meeting those needs. There are not usually specific criteria e.g. ‘a firm must be less than five years old’. Most of the incubators run entrepreneurship competitions and this is one source of potential clients. Of the hundreds of people /teams who enter such competitions, only a handful of the best usually end up as incubator clients.

The different incubators have different processes and may have different impacts on incubated businesses. Some incubators are considered better than others. Businesses that were incubated prior to 2004 may have received different services from those that have been in incubators since 2010. The incubation process has changed over time and continues to change as the entrepreneurial environment changes. Differences between incubators also reflect differences in the local entrepreneurial environment.

The quantitative analysis could not take into account these qualitative differences in the incubator operating models, nor the changes that have occurred to the incubator models over time.

As mentioned above incubated companies typically entered into an incubator three years after birth and were resident in an incubator for two years during the observation period 2001-2011. However, the length of time businesses are resident in an incubator has decreased over the decade. Businesses entering incubation between 2001 and 2005 remained longer in incubation than those after 2005. Between 2005 and 2010 usually 35-45% of incubated businesses exited the incubator after a year. This trend indicates that most incubators changed their business model between 2005 and 2007. In addition, NZTE also encouraged incubators to increase firm exits (refer also to Figure 10 of Evaluation of the NZTE Incubator Support Programme, (Ministry of Business, Innovation and Employment, 2012)).

Another indicator that incubators have changed their behaviour (i.e. improved their selection process) since 2007 is the number of identified potential high-growth businesses. Using the NZTE potential high-growth definition, there have been more potential high-growth exits in recent years (refer also to Figure 8 of the Evaluation of the NZTE Incubator Support Programme).

References

Arundel, A., C. Bordoy, M. Karneva, (2008). *Neglected Innovators: How Do Innovative Businesses That Do Not Perform R&D Innovate? Results of an analysis of the Innobarometer 2007* survey No. 215. INNO-Metrics Thematic Paper.

Autio, E., & Hölzl, W. (2008). *Addressing challenges for high-growth companies: summary and conclusions of the Europe INNOVA gazelles innovation panel.* Luxembourg: Office for Official Publications of the European Communities.

Butler, O. R., & Anderson, R. J. (2012). *Risky business: A study of physics entrepreneurship*. Physics today, 65(12), 39-45.

Coad, A., Frankish, J., Roberts, R. G., & Storey, D. J. (2011). *Growth Paths and Survival Chances*. *SPRU* Electronic Working Paper Number 195.

Colombo, M. & Delmastro, M. (2002), *How effective are technology incubators? Evidence from Italy,* Research Policy, 31, pp. 1103-1122.

Conway, P. (2011). *How to Move Product Market Regulation in New Zealand Back Towards the Frontier*. OECD Economics Department Working Papers, No. 880

Cooney, T. M., & Malinen, P. (2004). *Firm Growth as a Research Issue*. 1st. Inter-RENT online publication, 4-16.

Daunfeldt, S-O, & D. Halvarsson (2012) *Are high-growth businesses one-hit wonders? Evidence from Sweden*, Working paper

Delmar, F., & Wiklund, J. (2008). *The effect of small business managers' growth motivation on firm growth: A longitudinal study.* Entrepreneurship Theory & Practice*, 32*(3), 437-457.

Deloitte/Management Magazine. (2012, December). *New Zealand's Top 200 Companies*. New Zealand Management: the leaders' magazine, pp. 52-65.

Department for Business Innovation and Skills, UK. (2012). *Business Growth Ambitions Amongst SMEs*.

Fabling, R., & Grimes, A. (2006). *Practice Makes Profit: Business Practices and Firm Success*, Ministry of Economic Development, Occasional Paper 06/01

Fabling, R., & Grimes, A. (2007). *HR Practices and Firm Performance: What Matters and Who Does It?* Ministry of Economic Development, Occasional Paper 07/02

Fabling, R., & Sanderson, L. (2008). *Firm Level Patterns in Merchandise Trade.* Wellington: Ministry of Economic Development.

Green, R., Agarwal, R., Brown, P., Tan, H., & Randhawa, K. (2010). *Management Matters in New Zealand - How does manufacturing measure up?* Wellington: Ministry of Economic Development.

Henrekson, M., & Johansson, D. (2008). *Gazelles as Job Creators - A Survey and Interpretation of the Evidence.*

Hull, L., & Arnold, R. (2008). *New Zealand firm growth as change in sales turnover.* Wellington: Ministry of Economic Development.

Lee, N. (2011). Free to grow? *Assessing the barriers faced by actual and potential high growth businesses*, Nesta Working Paper 11/01

Massey, C., & Jurado, T. (2008). *The social and economic factors that contribute to business growth in small businesses: A review of the published research.* Massey University, New Zealand Centre for Small and Medium Enterprise Research.

McKelvie, A., & Wiklund, J. (2010). *Advancing Firm Growth Research: A Focus on Growth Mode Instead of Growth Rate.* Entrepreneurship Theory and Practice, 261-288.

MED, Treasury, Statistics New Zealand. (2011). *Economic Development Indicators.* Ministry of Economic Development, The Treasury, Statistics New Zealand.

Ministry of Economic Development. (2011). *SMEs in New Zealand: Structure and Dynamics*. Wellington: Ministry of Economic Development.

Ministry of Economic Development. (2012). *Should the focus of publicly provided small business assistance be on start-ups or growth businesses?* Occasional Paper 12/02.

Ministry of Business, Innovation and Employment. (2012). *Evaluation of the Enterprising Partnerships Fund*. Wellington: Ministry of Business, Innovation and Employment.

Ministry of Business, Innovation and Employment. (2012). *Evaluation of the NZTE Incubator Support Programme.* Wellington: Ministry of Business, Innovation and Employment.

Ministry of Economic Development. (2012). *Evaluation of New Zealand Trade and Enterprise's Beachheads Programme.* Wellington: Ministry of Economic Development.

Mitusch, K., & Schimke, A. (2011). *Gazelles High-Growth Companies. Input Paper to the workshop: "Gazelles" as drivers for job creation and innovation: How to support them best?* Europe INNOVA, Sectoral Innovation Watch, European Commission.

Mole, K., Hart, M., Roper, S., & Saal, D. (2009, *August). Broader or Deeper? Exploring the most effective intervention profile for public small business support*. Working Paper 105. CSME, Warwick Business School.

Moreno, A. M., & Casillas, J. C. (2007). *High-growth SMEs versus non-high-growth SMEs: a discriminant analysis*. Entrepreneurship and Regional Development (19), 69-88.

MYOB. (2009). *Business Monitor - NZ Business Owner Profile,* Business Market Briefing for Ministry of Economic Development

NESTA. (2009). *The vital 6 per cent: How high-growth innovative businesses generate prosperity and jobs.* Research summary

NZIER. (2012). *Lifting export performance - Actions to drive growth in exports.* Wellington: New Zealand Institute of Economic Research.

OECD. (2010). *High-Growth Enterprises: What Governments Can do to Make a Difference.* OECD Studies on SMEs and Entrepreneurship. OECD Publishing.

OECD. (2013). *An international benchmarking analysis of public programmes for high-growth businesses.* OECD Directing Committee of the Cooperative Action Programme on Local Economic and Employment development, Final report. OECD Publishing.

Parham, D. (2012). *Australia's Productivity Growth Slump: Signs of Crisis, Adjustment or Both?* Australian Government, Productivity Commission

Simmons, G. (2002). *Growing Pains: New Zealand Qualitative Evidence on Hurdles to Exporting Growth*. New Zealand Treasury Working Paper 02/10.

Smallbone, D., & Baldock, R. (2004). *Policy Support for high growth start-ups: some lessons from the UK experience.* Middlesex University Business School, Centre for Enterprise and Economic Development Research, Hendon, UK.

Srholec, M., & B. Verspagen (2008). *The Voyage of the Beagle in Innovation Systems Land. Exploration on Sectors, Innovation, Heterogeneity and Selection.* UNU-Merit Working Paper Series #2008-008, United Nations University, Maastricht.

Statistics New Zealand. (2011). *Innovation in New Zealand: 2011*. Wellington: Statistics New Zealand.

Storey, D. (1992). *Should we abandon the support to start-up businesses?* Warwick: Warwick Business School Centre for SMEs.

Storey, D. (1998). *The Ten Percenters: Third Report: Fast Growing SMEs in Great Britain.* Deloitte & Touche.

Storey, D., & Greene, F. (2010). *Small Business and Entrepreneurship.* Essex: Pearson Education Limited.

Siegel, D., Westhead, P. & Wright, M. (2003), *Science park and the performance of new technology-based businesses: review of recent U.K. evidence and an agenda for future research,* Small Business Economics, 20, pp. 177-184.

Tamasy, C. (2007), *Rethinking technology-oriented business incubators: developing a robust policy instrument for entrepreneurship, innovation, and regional development?* Growth and Change, 6(3), pp. 460-473.

Tavoletti, E. (2012), Business *Incubators: Effective Infrastructure or Waste of Public Money? Looking for a Theoretical Framework, Guidelines and Criteria*, Journal of Knowledge Economics

Tregaskis, A. (2010). *New Zealand Private Equity Returns 1994 - 2010.* Auckland: New Zealand Venture Investment Fund Limited.

University of Auckland Business School. (2011). *Growing New Zealand Businesses* (GNZB). Retrieved January 22, 2013, from The University of Auckland Business School: http://www.business.auckland.ac.nz/uoa/home/about/our-research/bs-research-groups/growing-new-zealand-businesses-gnzb

Westhead, P., Story, D. (1994), *An assessment of firms located on and off science parks in the UK*, HMSO, London