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Business Strategy and Skills in New Zealand

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Abstract

This paper summarises the results from two projects that investigated skills in New Zealand businesses. The first – *The Impact of Skills on New Zealand Firms* – combined three different surveys to investigate the availability of skills and skilled workers both within the firm and their ability to source them from the market. The second – *Management Matters in New Zealand* – benchmarked management practices in medium and large New Zealand manufacturers against their peers in 16 other countries.

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Executive Summary

This paper summarises the results from two projects that investigated skills in New Zealand businesses. The first – The Impact of Skills on New Zealand Firms – combined three different surveys to investigate the availability of skills and skilled workers both within the firm and their ability to source them from the market. The second – Management Matters in New Zealand – benchmarked management practices in medium and large New Zealand manufacturers against their peers in 16 other countries.

The first of these projects examined skills and their availability in the broader context of businesses’ strategy and operation. It looked at the kinds of skills firms find difficult to recruit, what kinds of firms have difficulty finding skills and some of the impacts of such shortages on the firm, in particular on training.

The research found evidence that the unavailability of skills constrains businesses’ strategy. Skills are reported as a key restriction for firms pursuing a high-value strategy via firm’s ability to customise their output, undertake competitive pricing and planning for future change. Firms report that a lack of management resources and difficulty recruiting appropriate employees are constraints to overseas activities.

The data generated by this project enable us to identify vacancies that are hard-to-fill because applicants lacked the qualifications, skills or work experience the business demands (what are called ‘skill shortage vacancies’ or SSVs). Vacancies are a common part of business life, as firms expand and staff come and go. The majority of businesses surveyed (77 percent) reported having vacancies in the previous year. Almost half of all businesses had at least one role that was hard-to-fill. Whilst vacancies are most common for clerical and labouring positions, it is vacancies for managers, professionals, technicians and tradespersons vacancies that are hardest to fill.

In addition to examining difficulties businesses experienced recruiting externally, the project also examined ‘skill gaps’, in their existing staff. Only half of the businesses surveyed felt that all their staff had all the skills required to do their job. The most important reason for staff not having all the skills required was lack of experience (34 percent of firms).
Workers, such as clerical, sales and service workers, labourers and tradespersons contribute the highest proportion of staff not having the skills required to do their job. The categories ‘leadership or supervisory skills’, ‘technical or practical skills’ and ‘customer handling or sales skills’ top the list in terms of skills that need improving.

The main reasons staff need to acquire new skills or knowledge are the adoption of new technology or equipment, new working practices and new products or services. Managers are the most commonly cited occupation needing to acquire new skills in leadership or supervising employees, problem solving and working in a team.

The paper also reviewed work on management capability in medium to large New Zealand manufacturing firms. Firms were interviewed on their management practices and scored based on 18 practices organised into three distinct areas of management (operations, performance and people management). Because the research used an internationally recognised method, it could benchmark New Zealand firms with their peers in other countries. The study assessed the actions businesses take and the policies they have in place.

Management practices in New Zealand businesses were ranked tenth out of the 14 OECD countries and tenth of the 17 countries studied (from China and India to Sweden and the US). NZ manufacturers perform well in some aspects of Operations Management, like the adoption of lean manufacturing (5th out of 17 – the US was top), and Performance Management, such as the interconnection of goals (e.g. goals increase in specificity as they cascade down the organisation). Of particular relevance to this project was the fact that the area NZ firms most needed to improve was people management. In addition to addressing poor performance (ranked 16th), NZ firms perform poorly when it comes to retaining (ranked 14th) and promoting high performers (ranked 13th).
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Business Strategy and Skills in New Zealand

1. Introduction

Skills are an important determinant of the economic performance of people, firms, industries and economies\(^1\). Many have expressed concern that a shortage of workers with particular skills has been detrimental to the functioning of the New Zealand economy\(^2\). Whilst there is information at the aggregate level on the skills issues, much less is known on how these issues affect individual firms. International evidence suggests that the availability of individuals with the appropriate types and levels of skills have a major impact on the success of firms. Skill shortages directly constrain production and prevent firms from meeting demand and using available inputs efficiently, with consequences for lower productivity (Haskel and Martin, 1993; Stevens, 2007). Indirectly, skill shortages inhibit innovation and the use of new technologies, which tend to be skill-intensive activities. This may have longer-term impacts on the way firms do business, in terms of their location, size, structure, production methods and product strategy (Durbin, 2004; Mason, et al., 2003; Mason, 2005). Thus, understanding how these skill shortages manifest themselves and developing policies to address them is critically important if New Zealand is to raise productivity in industry and improve its international competitiveness.


\(^2\) Consider, for example, the following newspaper headlines: ‘Skills shortage hits agricultural science’, *Dominion Post*, 13/01/12, ‘Half of Kiwi companies facing skill shortages’, *NZ Herald*, 30/11/11, ‘Academic warns of major skills shortage’, *Waikato Times*, 4/3/11
One way to think about labour and skills is as a factor input; the more skills put into the production process, the more that will come out. From this, we might argue that that to achieve greater economic growth we need more skills. All we need to do is just turn up the tap in the education sector and produce more graduates. This, of course, focuses simply on the quantity of skills rather than the quality; i.e., it ignores what types of skills are needed by the economy. Discussion of types of skills and skilled labour often has a limited focus on technical skills. However, there may be other skills that are important for the performance of the economy. In addition to technical skills, entrepreneurial and managerial skills are important for business success, as well as ‘basic skills’ like literacy, numeracy, interpersonal and team-working skills.

Another way of thinking about skills and skilled people is that the important decisions that firms make to create value – spotting opportunities, innovating, choosing when, where and how to export – are all done by people. In order for businesses to make the right decisions to grow, they need the people with the skills that enable them to make these decisions. The skills involved here are as likely to be managerial and entrepreneurial as they are technical. Managers play an important role choosing activities (production processes, organisational structure) and ensuring they are carried out effectively.

This paper summarises of some of the results of two projects conducted and contracted by the Ministry of Economic Development along with a number of other agencies. The first, discussed in section 2, is a four-year project looking at the relationship between skills and firm performance in New Zealand. This project focussed on issues of skill shortages, training and businesses’ strategy. The second, on management practices, is discussed in section 3. In section 4 I provide some concluding thoughts.

2. The Importance of Skills for Businesses and the Economy

Skills are an important part of the economy. Numerous studies have found human capital (and education in particular) to be an important determinant of economic development and explanator of international differences in aggregate economic growth or productivity (Barro and Sala-i-Martin, 1995; Stevens and Weale, 2004; Kneller and Stevens, 2005; Madsen, 2010). Basic macroeconomic theory abstracts
from the type of skills individuals have and the match to the requirements of the firms that employ them. When considering the functioning of the skills system and its ability to support economic activity, we need a more sophisticated analysis that allows us to consider how mismatches between the supply of and demand for labour (e.g. Pissarides, 2000; Petrongolo, and Pissarides, 2001; Mortensen, 2005).

Skills are important because they embody economic knowledge and are a means whereby people create economic value. There is a large literature that consistently finds positive private and social returns to skill and education in particular (Card, 1999; Psacharopoulos and Patrinos, 2004; McMahon, 2004; Dickson and Harmon, 2011). Skills are created and expanded upon throughout peoples' lives. Many skills are learned within the education system, in schools and universities, but many are learned on-the-job and in the home. From an economic perspective, people have an incentive to invest in skill formation because this enables them to function better in the economy and society. Crucially, they provide the basis for a person to earn an income. Skills also enable people to acquire further skills – that is to say the acquisition of some skills is complimentary to later skill acquisition. This is particularly true for many skills acquired early in life, usually prior to, and outside of, the educational system (Heckman, 2008).

It is not only individuals and their families who have the incentive to invest in skills. Firms also have an incentive to increase the skills of their workforce as this enables them to perform more tasks or increase the productiveness with which they perform existing ones. However, because they may not reap all of the rewards (staff may move elsewhere or be poached by other firms), firms may invest less in such training that would be socially optimal.

2.1. Classifying skills

There are a number of ways to consider the skills of the population and the skill needs of businesses. In what follows, we shall consider two ways of classifying skills. The first considers the types of skills in terms of the kind of tasks they enable people to perform. The second is through the lens of their usefulness to firms (in particular, other firms).
2.1.1. A typology of skills

We can think of skills as falling into four broad categories:

*Basic or foundational skills*

These are the basic skills that allow one to participate in social and economic life, such as literacy, numeracy, the ability to interact with other people and to acquire new skills. Strictly speaking, one can think of these as a subset of technical skills, but it is perhaps more useful to delineate between basic skills and the more advanced technical skills described below. These skills are not to be dismissed as ‘soft’ skills; they are valued by firms (as we shall see below) and have been found to be predictors of socio-economic outcomes (Heckman, Stixrud, and Urzua, 2006; Borghans, Duckworth, Heckman, and ter Weel, 2008).

*Technical skills*

These are the actual techniques of production and related economic activities, such as the ability to use a particular piece of equipment or undertake a particular role. Technical skills tend to be more advanced and/or specific than foundational skills. These are skills like computer programming, gas fitting, draftsmanship, operating a machine lathe, accounting or medical skills.

*Managerial skills*

These skills relate to the organisation of production in its broadest sense (Bloom and Van Reenen, 2007; 2010; 2011). These include the ability to get the most out of the resources at the firm’s disposal (both internally and externally) and match them to the environment in which it operates. Particularly pertinent for us is that not only is the ability to manage itself a skill, an important aspect of management practices is the management of skills, i.e. the ability to recruit, retain, motivate, organise and develop the firm’s employees.

*Entrepreneurial skills*

These are the abilities of certain individuals to spot gaps in the market, unexploited potential, and new developments in technology, institutions and organisations. People with entrepreneurial skills are able to understand, exploit and change the
economic landscape in order to generate new economic value (Baumol, 1993; Penender, 2009).

2.1.2. General and specific skills

Another useful distinction for analysis is that between ‘general’ and ‘specific’ human capital (Becker, 1962, 1994). General human capital is of value to all employers, whereas specific human capital is valuable only to specific firms or groups of firms (Stevens, 1994). Firms will tend to under-provide training of all skills that have some generality to them (i.e. they are of use to other firms) because of the risks of staff leaving or being poached; there is a risk that they will pay the costs and other firms will get the benefits. Another way to think about the specificity of skills is to think about the tasks that workers perform. Workers that differ in the skills they possess are not merely more or less skilled; by analogy with Ricardian trade theory, they may have an absolute or comparative advantage in particular tasks (Acemoglu and Autor, 2011).

Once we allow for skills to have an element of specificity to them, this makes interpreting aggregate data on the economy much more difficult. An economy may look good from the perspective of having a well-educated workforce, but if the labour market and the education and training system are not working perfectly, there is the possibility of sustained periods of mismatch between the skill needs of businesses and the creation of those skills.

With skills being of more use for some tasks and jobs than others, it becomes clearer how impediments might arise to the smooth functioning of the economy (such as obsolescence and coordination failures). As technology evolves, some skills may become obsolete or at least less valued. Someone who was once a ‘skilled’ worker finds himself or herself effectively ‘unskilled’ because the demand for their skills has disappeared.

An example of this depreciation of skills can be found in Card and Lemieux, (2001), who investigated the college-high school wage gap in the US, UK and Canada. They found that the gap between workers with and without a college education only holds

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3 The specificity of skills may in also be determined by the structure of the market. Acemoglu and Pischke (1999) argue that certain skills might be potentially useful to other firms (i.e. general) may become specific because of market imperfections. For example, if there were only one producer in a sector a particular skill might only be of use to them, whereas if a number of firms were operating in the same area they could be competing for the same labour.
for young workers. This suggests that either: (a) only the information obtained at college by recent cohorts has increased in economic value; or (b) only college students have been able to extract economic value from information obtained in the recent cohort. We can see how this might happen if we consider the case of computers: An example of (a) might be that recent college graduates have all learned to use computers in an economically valuable way and neither people in their own cohort who did not go to college nor the previous cohort have been able to do so. An example of (b) might be that all of the recent cohort has learned to use computers, but only college students have the ability or the complementary skills to become more productive and hence more highly paid.

Workers with obsolete skills find themselves in a similar position to those who have trained in the ‘wrong area’. The smaller the economy – in terms of the number of employers, the number of jobs they require and the sectors in which they operate – the greater this problem becomes. This is because there are fewer alternatives, in terms of potential employers from the perspective of workers and in terms of potential employees from the perspective of firms. Again, this suggests that merely looking at aggregate numbers may not tell the whole story about how businesses needs for skills are being met.

2.2. Skills and firm performance

There are essentially two elements to the link between skills and firm performance. First, skills represent a basic input into the firm’s production technology – thus, the term ‘human capital’. Individual’s with higher skills have more human capital and so produce more output. Second, skills enable other activity – they are complimentary with other inputs, like capital, technology and other workers.

We discuss the links between skills and firm performance in more detail in Mason, Mok, Nunns, Stevens and Timmins (2012a). In summary, skills (and their availability or lack thereof) are found to be an important explanation for variation in firm performance. The evidence on the links between the availability of skills and the performance of firms range from detailed case studies (Keep, Mayhew and Corney, 2002) to econometric analysis using firm-level data and industry level measures of skill shortages (e.g. Haskell and Martin, 1993b). Empirical studies confirm that the most productive firms have more skilled workers than their peers (Abowd, Kramarz
and Margolis, 1999; Haltiwanger, Lane and Spletzer, 1999, 2007; and Haskel, Hawkes and Periera, 2005).

Higher skill levels do not only increase firm productivity through the direct impact on the worker’s own productivity. They also create synergies with other productive inputs, such as other workers, physical and knowledge capital, R&D or new technologies.

We have already mentioned one example of how skills enhance the performance of other workers: the skills of the managers who organise and shape production. The quality of management in businesses is an important predictor of business performance across a number of dimensions in many countries (Bloom and Van Reenen, 2007, 2010; 2011), including New Zealand (UTS, 2009). Because of its importance we shall examine the quality of management practices in New Zealand firms in section 4, below.

Skills are also key to firms’ ability to implement particular business strategies and technology. Mason (2005) found that the ability of firms in a number of industries to execute high value business strategies was contingent on the skills of their workforce. Work such as Abowd, Haltiwanger, Lane McKinney and Sandusky (2007) finds a strong positive empirical relationship between advanced technology and skill. Skills are useful not only for the creation of new technology, but also both for the absorption of new knowledge and its implementation (Lane and Lubatkin, 1998; Rosenberg, 1972; Hall and Khan, 2003; Kneller and Stevens, 2006).

The concept of absorptive capacity captures that idea that firms differ in the ability and effort with which they learn about new technology. It refers to the ability to recognize the value of new external information and assimilate it. The ability of firms’ managers is also an important determinant of its absorptive capacity. This operates through at least three channels, their role in recruiting, retaining and

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5 Note that Cohen and Levinthal (1990) define absorptive capacity as the ‘ability to recognize the value of new external information, assimilate it and apply it to commercial ends’ (p. 128). Our definition is a little narrower here, in that we differentiate between the ability to recognise the value and assimilate others innovations and their ability to realise its potential, i.e. to adopt and implement it. This is consistent with the refinement of Lane et al. (2001) (referred to in Minbaeva et al., 2003) who propose that ‘the first two components, the ability to understand external knowledge and the ability to assimilate it, are independent yet distinct from the third component, the ability to apply the knowledge’ (p. 1156).
motivating staff, their role in influencing their personal development (i.e. on-the-job skill acquisition) and their influence on organisational form (Lane and Lubatkin, 1998; Bosch, Volberda and de Boer, 1999; Minbaeva et al., 2003).

If skills are such an important influence on firms’ performance, shortages of skills could potentially be an important constraint on the economy. However, we must be clear about what we mean by a ‘skill shortage’ and what the evidence actually shows.

2.3. Skill shortages

‘Skill shortage’ is a commonly-used term, but it is at best a broad term, that covers a number of different phenomena and can be open to misinterpretation. Early work focussed on skill shortages as a whole and their impacts. This was driven in part by the data that were available to researchers. For example, in the UK, the Confederation of British Industry has collected information on whether firms’ output was limited by shortages of skilled labour since the early 1970s\(^6\).

However, it has become clear that it is important to distinguish between shortages of skills in existing workers and shortages of staff in the labour market with appropriate skills (Green, Machin and Wilkinson, 1998; Mason and Wilson, 2003). These have been called ‘internal skill gaps’ and ‘external skill gaps’, respectively (e.g. Forth and Mason, 2004)\(^7\).

When examining external skill gaps, it is important to be clear what we are measuring. As Green et al., (1998) point out, we must be careful not to simply equate them with vacancies that are hard-to-fill. As we shall see in section 3.3, there are many reasons why vacancies may be hard-to-fill. These reasons range from the conditions of work to the fact that firms are simply not paying the market wage; not all of them are skill-related. Because of this, authors such as Mason and Stevens (2003) have focussed on the subset of vacancies that are hard-to-fill for skill-related reasons; specifically, by examining the reasons for vacancies being hard-to-fill and only considering those that relate to a lack of qualifications and/or experience in applicants. This is the approach that informed the design of the relevant sections of the Business Strategy and Skills module of the BOS 2008.

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\(^6\) This data has been used as an industry-level measure of shortages of skilled workers by Haskel and Martin (1993a), (1993b) and Stevens (2007).

\(^7\) Although, others have called skills deficiencies relating to the external labour market ‘skills shortages’ and those applicable to a firm’s existing workforce ‘skills gaps’ (Schwalje, 2011).
2.4. Skills and the labour market

Skills are valuable to both the workers who have them and firms in which they work. The wages that firms are able to pay for these skills are determined by the productivity of the firm and the worker (Abowd, Kramarz and Margolis, 1999). However, the wages that firms have to pay also depend on the thickness of the market (Moretti, 2010). More firms competing for a given pool of workers will bid up wages and make some jobs and businesses uneconomical. More workers of a given type applying for a fixed pool of jobs will mean firms have to pay lower wages to attract a given worker.

Economic theory states that whilst an individual’s wages are generally a function of the level of skill an individual has, it also depends on the state of the labour market. Wage dispersion exists in economies among apparently similar workers doing similar jobs because of labour market imperfections (Mortensen, 2005). Firms cannot wait forever for the right worker to come along and workers seldom find the perfect job when they are looking for work. Thus, firms have to accept less than perfect employees for jobs and workers work in less than perfect jobs. Such problems are increased when the pace of technical change means that only a few workers leave school with the right qualifications or have experienced working in the right sort of firm to acquire the required skills. These problems are also greater in small economies because fewer workers will be available who have the skills and fewer firms will be around to demand (or produce) them.

Modern theories of labour markets are based around the ability of the market to match individuals to jobs (Pissarides, 2000; Petrongolo, and Pissarides, 2001; Mortensen, 2005). Trading in the labour market is not without cost. It takes time and money for businesses to advertise for and assess potential employees. It takes time and money for workers to search and apply for potential employment. We call these ‘search costs’. Furthermore, costs are incurred when incoming workers start in a new role; workers need to learn the specific tasks involved in the role and the employer has to learn about the specific abilities of their new employee. Another

8 This is typically measured by years or levels of schooling (to measure the human capital element of formal education) and experience or job tenure (to measure on-the-job). For an extensive overview of the theory and evidence in this area see Card (1999).

9 For more on the training of incoming staff by New Zealand firms, see the companion paper to this (Timmins, et al., 2012).
cost is the time a worker or a firm stays in a state awaiting a ‘good’ match. Workers stay in less-preferable jobs or quit to unemployment while they wait for a better offer to come along. Firms either allocate a worker who is less aptly skilled to a role, or hold it open until the ‘right’ worker comes along. We call these ‘mismatch costs’.

2.4.1. The dynamics of firms and the labour market

When we consider the labour market in a dynamic context, further issues for the overall level of economic development emerge. Firms and workers make decisions with long-term impacts – e.g. migration and production decisions – contingent on their expectations regarding the availability of employment and employees. Average search costs and mismatch costs are likely to be lower in larger labour markets; the more jobs and workers there are, the more likely it is that a good match will exist. Thus, businesses and workers operating in big cities, for example, will benefit from lower search costs, *ceteris paribus*. In part because of this, they are less likely to be stuck in ‘bad’ worker-job matches (as the cost of exiting a low productivity match is much lower).

These ‘thick labour market agglomeration benefits’ can also come from co-location of economic activity with similar demand for skills; whilst there is more competition between firms for skilled labour, there will also be a greater supply (as workers with the appropriate skills are attracted to the area). Larger markets will be driven less by market frictions and more by the fundamental economic determinants of the productivity of the match (i.e. those that determine the productivity of the firm, the productivity of the worker and their complementarity).

*Workers*

Workers with economically useful skills may not find employment in a particular area. This may be because none of the potential employers in the area currently have vacancies (even if they would prefer this worker to the one they currently have) or there are no firms in the area, because of the lack of available skills or another important input, for example. Because of this, they will have to accept a lower-paying and/or less-satisfying job or move elsewhere. If there are two labour markets within easy migrating distance and the only difference is the thickness of the labour market, there will be a tendency for workers to migrate from the thinner to the thicker market. This is simply because they have both a higher chance of getting any job, but also a
higher chance of getting a *good* job (i.e. one with higher productivity and wages – what labour economists call a better “match”). Likewise, a firm that competes or operates internationally is likely to be better off setting up in the economy with the thicker labour market, even though it will be competing with more firms for the labour.

If the thicker labour market is also larger (which is the likely initial cause of the thickness) firms and workers will enjoy another benefit. There will be more jobs (workers) that are similar to the one the respective worker (firm) is looking for and so the cost of a bad match is lower. For the workers this is both in terms of the wages and fulfilment it offers, but also in terms of being able to use it as a stepping-stone to a better job.

**Firms**

We have seen why the thickness of the labour market in terms of the pool of available labour of the requisite skills can make it economic for firms to locate in large markets, even if they are competing with other firms. There are other important dynamic impacts that the availability of skills has on firms, such as affecting adjustment and production technology.

First, firms seeking to expand often have to curtail their expansion because of skill shortages (Stevens, 2007). In the dynamic labour demand model of Stevens (2007)\(^\text{10}\), because adjustment costs are a function of the costs of hiring, which is itself a function of the availability of labour with the appropriate skills, a firm that experiences an increase in demand for its product will not be able to expand to meet this demand because of the cost of hiring labour\(^\text{11}\).

Second, the availability of skills influences firm behaviour through the decisions it makes with respect to the technology of production. Firms make decisions about capital investments, models of production and decisions about which final products and services to provide contingent on their expectation regarding the skills they will have available to them, both internally and through the labour market. If there is a shortage of a particular skill (or a shortage of a particular type of skilled labour) the firm may make one of two decisions. First, it may choose not to produce at a

\(^{10}\) Itself an extension of Nickell (1996) and Sargent (1978)

\(^{11}\) In an earlier version of the work, Stevens (2003) investigated both the impact of shortages on skilled and ‘other’ labour on firms’ labour demand and found that it was only shortages of skilled labour that curtailed demand in times of expansion.
particular location. This may involve either shifting production elsewhere or not producing at all. In extreme cases this will involve the firm failing. Second, it may choose to reconfigure its production. This will involve a less preferable (or profitable) configuration of production to utilise different inputs (e.g. substituting staff with different skills, using more/less capital or different intermediate products), to produce different outputs (say, shifting from individually tailored to generic products/services) or to be organised differently (using hierarchical rather than team based production for example (Black and Lynch, 1996; Wood, 1999; Lazear and Shaw, 2007). Firms who cannot find skilled staff to produce their product in a highly profitable way will change production so that they use low skilled staff and make lower profits (either because it is more expensive to use less skilled staff to produce a given product or service or that the product or service itself must be compromised).

Thus, coordination failures may occur that lead to firms following a low-skill, low-value route rather than a high-skill high value route (Mason, 2006). At the economy level, this may create a ‘low skill equilibrium’ (e.g. Redding, 1999), with lower productivity and lower demand for skills, which will in turn create lower incentives for people to acquire skills or to remain in the country.

Firms operating in areas with few workers of the requisite skills also face the risk that, even if they have the workers they desire, the loss of one of these might have catastrophic consequences. Job turnover is a natural part of the functioning of a dynamic economy. Workers shift jobs because they are in search of a better match, a new set of goals or opportunities or because of friends or family. When these events happen, firms often cannot match other wage offers or compensate for non-financial aspects that led to the decision to move. This may have a dramatic effect on the productivity of the firm and in extreme circumstances make it unable to operate – a problem that is particularly stark for smaller firms where individuals may be the only person with a particular set of skills. This risk is also likely to affect the locational decisions of firms as they seek to minimise this risk.

**Labour turnover**

The labour market is essentially a dynamic place and labour turnover is a basic fact of economic life (Davis, Haltiwanger and Schuh, 1996; Davis, Faberman and Haltiwanger, 2006, 2010). For example, between the September to the December
quarters of 2010, total employment in New Zealand expanded from 1,777,110 to 1,810,580, an increase of 33,470\(^{12}\). This relatively small overall change was in fact the result of around a quarter if a million workers leaving jobs and a similar number starting new jobs.

Firms will post vacancies for two reasons: First, to replace staff who have quit, retired or been fired; Second, to fill new roles that have been created by the expansion of the firm. These two sources of vacancies are likely to have different causes. Voluntary separations may be higher in good times (as the likelihood of alternative employment increases), but involuntary separations may be lower (as firms seek to reduce employment) (Pissarides, 2000). New roles are more likely to be created when a firm is expanding.

Nevertheless, businesses often are taking on new staff and losing staff simultaneously (Davis, Faberman and Haltiwanger, 2006). The total amount of job destruction – separations due to firms shrinking – in the December 2010 quarter was 90,890. This was barely two-fifths of the total worker separations; in the same quarter fully 12.7% of workers in New Zealand became separated from their jobs\(^{13}\).

2.5. Skill specificity and Mismatch

One concept that became popular – particularly in Europe – to explain the persistently high levels of unemployment was ‘mismatch’. The decline in manufacturing industries destroyed thousands of jobs and dumped many workers into unemployment. Because of the changing nature of the economy, these workers found themselves in industries or regions that were not those where they were needed come the upswing in the economic cycle. Because of occupational and regional immobility, businesses that would have sprung up to take advantage of the pool of workers at relatively low wages did not emerge.

These types of model are equally valid in periods of low unemployment, since at their heart there is a mismatch between the skills required by existing and potential firms and those of the workforce.


\(^{13}\) Source: Authors’ calculations based on LEED data. This separation rate is calculated as ‘Worker separations’ in the December 2010 quarter divided by the average of ‘Total filled jobs’ in the December and September quarters.
This is particularly pertinent here and now: Here, because small economies will suffer from problems of market ‘thinness’ more than larger ones; Now, because skills – and those with a degree of specificity in particular – are becoming more important.

Essentially the issue is that skills take time to acquire. Formal education takes years and on-the-job skill acquisition requires time in employment. Technology and profitability can potentially change overnight.

2.6. Firms responses to skill shortages

How firms respond to labour market conditions will affect their performance. This is part of how firms compete.

In an early study of apparent shortages of engineers and scientists, Arrow and Capron (1959) defined a skill shortage as ‘a situation in which there are unfilled vacancies in positions where salaries are the same as those currently being paid in others of the same type and quality’ (p. 301). Although they recognised that excess demand for skills in competitive labour markets should put upward pressure on salaries, Arrow and Capron suggested that, even in a competitive labour market, a steady increase in demand over time for skilled workers could produce a ‘dynamic shortage’ if there were factors impeding rapid salary increases by employers such as delays in accepting the needs for such increases, the further time needed to implement them and a reluctance to incur increased salary costs for existing high-skilled employees as well as new ones. At the same time supply responses to any salary improvements could be slowed down by the length of time required to educate and train skilled workers, as shown by Freeman (1971, 1976) in the case of engineers and scientists.

Later studies have recognised that firms have a range of potential non-salary responses and ‘coping mechanisms’ available to them when confronted by shortfalls in skills – such as asking existing employees to work longer hours, making increased use of subcontractors or retraining existing staff to develop the skills in shortage. In a study based on data from the 1984 Workplace Industrial Relations Survey in the UK, Haskel and Martin (1993b) found no evidence of firms setting higher wages in response to difficulties in recruiting skilled workers. Indeed, they cited other UK survey evidence to suggest that salary responses were much less important than other means of addressing skilled recruitment difficulties.
Increased training provision is a potentially important non-salary response to external skill shortages which, like salary increases, should help alleviate the shortages in question rather than just help firms to cope with them. However, just as some firms may elect to ‘live with’ external skill shortages for periods of time rather than incur the costs of raising salaries for new recruits with knock-on effects on existing salary differentials, some may also be reluctant to respond immediately to skill shortages by increasing training provision for existing workers. Such reluctance could reflect imperfect information about the costs and benefits of training versus other potential responses to skill shortages.

Resource- and knowledge-based theories of the firm suggest that heterogeneity of firms’ training responses to external skill shortages is only to be expected since the ability of any firm to provide training will be strongly conditioned by the specific resources and capabilities (such as management skills and training capacity) which it has accumulated over time (Teece, Pisano and Shuen, 1997; Eisenhardt and Martin, 2001; Teece, 2007).

3. Skills in New Zealand firms

The first project was entitled The Impact of Skills on New Zealand Firms. This project involved MED, the Department of Labour, Treasury and the (then) Ministry of Research, Science and Technology along with the National Institute of Social and Economic Research in London, AERU at Lincoln University and UMR Research.

One of the stimuli for this project was the theoretical notion of ‘low skill equilibria’ (Redding, 1996; Wilson and Hogarth, 2003). This refers to the occasion where the lack of skilled labour itself leads to firms and economies making investments that feed back into the demand for skills. That is, because firms cannot find skilled labour, they make choices about their outputs, markets or processes (e.g. invest in a piece of capital) that mean they get locked into strategies where they no longer demand skilled labour. It is all well and good to show in an abstract piece of mathematics how an economy might find itself stuck in one of these things, but how does it happen in the real world?

One study that suggested how this might occur was conducted in the UK by Geoff Mason (Mason, 2005). In this study, Mason (2005) looked at high and medium value-added firms in four industries: plastic processing, commercial printing, logistics
and general insurance services. He showed two important phenomena for our story. First, there was considerable variation in what constitutes a high value business strategy across industries. Second, this has a consequent impact upon the demand, utilisation and development of skills in those industries. For example, in glassmaking, high value production might involve investment in plant and so substitute capital for skills. On the other hand, in financial services, high value production involves highly customised services requiring high levels of skill from the sales persons, as opposed to ‘off the shelf’ or ‘out of the box’ solutions.

3.1. Data and Method

The study took a mixed-method approach to data collection. We faced the perennial problem that written surveys are cheap and so can be sent to a large number of businesses and are amenable to sophisticated statistical analysis, but they may miss much of the nuance. Face-to-face interviews can provide a more sophisticated understanding of the complex processes in a particular firm, but they face two problems. First, they are expensive to conduct. Second, it is difficult to assess the general applicability of the results of such small-scale qualitative exercises. In this project, we decided to have a ‘bob each way’ – to combine the written survey with interviews (along with a third computer aided telephone interview or CATI). The Business Operations Survey included a question asking whether respondents were willing to participate in a follow-up study. From these we identified three sectors in which to conduct face-to-face interviews. The remainder were used as the population for a computer-aided telephone interview (CATI).

3.1.1. The Business Operations Survey

The first set of results we consider come from a specially designed module of the Business Operations Survey (BOS). The BOS is an annual three part modular survey, which began in 2005. The first module is focussed on firm characteristics and performance. The second module alternates between biennial modules on innovation and business use of ICT. The third module is a contestable module that enables specific policy-relevant data to be collected on an ad hoc basis. As part of
this project we designed a module entitled Business Strategy and Skills (hereafter ‘BSS module’). The BOS excludes businesses that, on the selection date: had fewer than six employees, had been in existence for less than one year and were in five specific industries. The survey is conducted using two-way stratified sampling, with stratification on rolling-mean-employment (RME) and two-digit industry according to the ANZSIC system. The 2008 survey achieved an 81.1% response rate, a total of 5,543 responses. The survey was sent out in August 2008 and responses ceased to be added in March 2009. The data on employment and industrial classification are based on data for the financial year ending 31 March 2009.

It is important to note in the following analysis that these are characteristics of the businesses at the time the sample was drawn. In what follows we shall use tables generated by Statistics New Zealand using this method in their ‘Hot of the Press’ publication. The econometric research summarised in this paper (Mason et al., 2012a, 20012b) used information on employment, industry etc. from the financial year in which the survey was filled out. The survey was sent out in August 2008 and responses ceased to be added in March of 2009. The data on employment and industrial classification are based on data for the financial year ending 31 March 2009. For more details on the data see the data appendices of the two papers mentioned previously.

The BOS is something approaching best practice in such surveys internationally. It has removed replication of surveys – and thus reduces respondent load and makes sampling simpler. It is explicitly designed with a panel element, which enables more...

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14 For more on the 2008 BOS, see SNZ (2009).
15 O Public administration and safety, R89 Heritage activities, R90 Creative and performing arts activities, S95 Personal and other services and S96 Private household employing staff and undifferentiated goods and service producing activities of households for own use
16 Australia New Zealand Standard Industrial Classification. The 2008 BOS was surveyed according the 2006 ANZSIC classification. The 2005 and 2006 BOS used the 1996 ANZSIC classification. The 2007 survey was run as a dual sample to enable results to be collected and produced in accordance with both 1996 and 2006 version of the classification.
17 SNZ (2009)
18 Prior to the BOS, surveys tended to occur on a fairly ad hoc basis. There was a Business Practices Survey in 2001, an Innovation Survey in 2003 and a Business Finance Survey in 2004. Elements of each of these are considered either every year as part of the Business Performance Module (Module A) or every two or more years (i.e. the Innovation Module is run every other year and the Business Practices Module was run in 2005 and is scheduled to repeat in 2009).
sophisticated analysis to be undertaken allowing us to better understand issues of causality and – as the panel element increases – dynamic issues\textsuperscript{19}.

In common with many surveys conducted by Statistics New Zealand (SNZ) the survey is statutory and the front page of the BOS bears the imprimatur: ‘The taking of this survey has been approved by the Minister of Statistics and the return of this questionnaire, duly filled in and signed, is a compulsory requirement under the Statistics Act 1975’. Because of this, the BOS has a considerably higher response rate than comparable surveys internationally (for example, the 2004 Workplace Employment Relations Survey in the UK achieved a response rate of 64%, for example).

The BSS Module was developed by a project team including the Ministry of Economic Development, the Department of Labour, Treasury, the Ministry of Science and Technology and the National Institute of Economic and Social Research in London, in concert with the Business Performance team of Statistics New Zealand. The module consisted of seven sections containing questions on: market focus, current business strategy, a breakdown of staff by skill type, vacancies, internal skill gaps, training and future business strategy. Just over 600 businesses agreed to take part in follow-up studies (about 11% response rate).

The population from which the BOS is drawn described in Table 1 and Table 2, below\textsuperscript{20}. The 5,543 respondents represent 36,075 firms\textsuperscript{21}. Nearly three quarters of these firms are what are usually classified as ‘small’ firms (i.e. they employ more than six and fewer than twenty staff, smaller firms are usually classified as ‘micro’ enterprises). The largest sector is the manufacturing sector, followed by retail trade and the accommodation and food services sectors.

\textsuperscript{19} The panel element is in fact larger than it first seems as there is considerable overlap with previous surveys, such as the 2001 Business Practices Survey (e.g. Fabling, 2007).

\textsuperscript{20} The data underlying the tables in this section (with the exception of the bottom two rows of Table 7, Figure 3 and Figure 5) are taken from the tables published by SNZ with their ‘Hot off the Press’ publication: http://www.stats.govt.nz/browse_for_stats/businesses/business_growth_and_innovation/business-op-survey-2008-tables.aspx

\textsuperscript{21} All figure and tables presented here use population weights to provide representative sample of firms.
Table 1 BOS population, firm size

<table>
<thead>
<tr>
<th>Firm size</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–19.9 employees</td>
<td>26,538</td>
<td>74%</td>
</tr>
<tr>
<td>20–49.9 employees</td>
<td>6,270</td>
<td>17%</td>
</tr>
<tr>
<td>50–99.9 employees</td>
<td>1,779</td>
<td>5%</td>
</tr>
<tr>
<td>100+ employees</td>
<td>1,485</td>
<td>4%</td>
</tr>
<tr>
<td>Overall</td>
<td>36,075</td>
<td></td>
</tr>
</tbody>
</table>

- Percentage based on population weights

Table 2 BOS population, industry

<table>
<thead>
<tr>
<th>Industry</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>3,039</td>
<td>8%</td>
</tr>
<tr>
<td>Mining</td>
<td>105</td>
<td>0.3%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>5,343</td>
<td>15%</td>
</tr>
<tr>
<td>Electricity, gas, water and waste services</td>
<td>105</td>
<td>0%</td>
</tr>
<tr>
<td>Construction</td>
<td>3,786</td>
<td>10%</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>2,955</td>
<td>8%</td>
</tr>
<tr>
<td>Retail trade</td>
<td>4,335</td>
<td>12%</td>
</tr>
<tr>
<td>Accommodation and food services</td>
<td>4,140</td>
<td>11%</td>
</tr>
<tr>
<td>Transport, postal and warehousing</td>
<td>1,419</td>
<td>4%</td>
</tr>
<tr>
<td>Information media and telecoms</td>
<td>357</td>
<td>1%</td>
</tr>
<tr>
<td>Financial and insurance services</td>
<td>552</td>
<td>2%</td>
</tr>
<tr>
<td>Rental, hiring and real estate services</td>
<td>954</td>
<td>3%</td>
</tr>
<tr>
<td>Professional, scientific and tech services</td>
<td>3,501</td>
<td>10%</td>
</tr>
<tr>
<td>Overall support services</td>
<td>1,374</td>
<td>4%</td>
</tr>
<tr>
<td>Education and training</td>
<td>645</td>
<td>2%</td>
</tr>
<tr>
<td>Health care and social assistance</td>
<td>1,944</td>
<td>5%</td>
</tr>
<tr>
<td>Arts and recreation services</td>
<td>474</td>
<td>1%</td>
</tr>
<tr>
<td>Other services</td>
<td>1,044</td>
<td>3%</td>
</tr>
<tr>
<td>Overall</td>
<td>36,075</td>
<td></td>
</tr>
</tbody>
</table>

- Percentage based on population weights

3.2. Business Strategy

It is important not to consider skills in isolation. In order to understand skills in the broader business context, we first examine firms’ business strategy. As Mason (2005) found, firms’ skill requirements are likely to depend upon its business strategy. In this study we looked at a number of elements of a business’ strategy: its market
focus; the degree of customisation of its goods and services; its ability to obtain higher prices than competitors; and its expectations of, and preparations for, future change. Each of these is considered below.

3.2.1. Market Focus

We begin by looking at businesses’ geographic market focus. This can be considered using two perspectives – where the business’ largest market is located, or where its competitors are located. These are of course not the same thing. A firm can operate in a domestic market, but its main competitor could be international – consider a child’s lemonade stall and its rivalry with Coca Cola and PepsiCo. We can see that by far the majority (70%) of firms serve local markets, about a quarter (22%) serve national markets and eight percent consider themselves to be focussing on an international market\(^{22}\). The numbers are similar when one considers the location of business’ competitors. National and international competitors do impinge on firms’ markets, but 64% still just compete with local business.

**Figure 1 Market focus**

![Market Focus Chart]

- *Percentage based on population weights*

\(^{22}\) Note that 15% of businesses in 2008 exported, suggesting that around half of exporters see this as core to their current business (Table 4).
These overall figures reflect the large number of small firms. The focus on local markets declines with firm size (Table 3). The local market accounted for the largest proportion of sales for fewer than half of businesses with 100 or more employees. The main competitors of almost a quarter of these largest firms were international businesses.

**Table 3 Market Focus, by firm size**

<table>
<thead>
<tr>
<th>Location of largest market</th>
<th>6-19 employees</th>
<th>20-49 employees</th>
<th>50-99 employees</th>
<th>100+ employees</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>72</td>
<td>68</td>
<td>54</td>
<td>43</td>
<td>70</td>
</tr>
<tr>
<td>National</td>
<td>20</td>
<td>23</td>
<td>34</td>
<td>43</td>
<td>22</td>
</tr>
<tr>
<td>International</td>
<td>7</td>
<td>8</td>
<td>12</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location of main competitors</th>
<th>6-19 employees</th>
<th>20-49 employees</th>
<th>50-99 employees</th>
<th>100+ employees</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>68</td>
<td>60</td>
<td>45</td>
<td>33</td>
<td>64</td>
</tr>
<tr>
<td>National</td>
<td>21</td>
<td>27</td>
<td>35</td>
<td>42</td>
<td>24</td>
</tr>
<tr>
<td>International</td>
<td>8</td>
<td>9</td>
<td>18</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

- Numbers represent percentage of firms in a particular size category
- Percentage based on population weights
- Note due to rounding, some figures may not sum to the total stated

We can obtain a richer picture of firms’ overseas activities from Table 4. Importing is more common than exporting and overseas collaboration is more common than overseas production. Approximately a quarter of exporting firms reported entering a new market in 2008. All overseas activities are positively correlated with firm size.
Table 4 Overseas Activities Undertaken by Businesses

<table>
<thead>
<tr>
<th></th>
<th>Goods or services</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exporting</td>
<td>Entering new market</td>
<td>Importing</td>
</tr>
<tr>
<td>6–19 employees</td>
<td>13</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>20–49 employees</td>
<td>22</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>50–99 employees</td>
<td>30</td>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>100+ employees</td>
<td>32</td>
<td>8</td>
<td>38</td>
</tr>
<tr>
<td>Overall</td>
<td>16</td>
<td>4</td>
<td>20</td>
</tr>
</tbody>
</table>

- Percentage based on population weights
- Note that the ‘entering new market’ column comes from Module A. It may not be entirely consistent as the firms that report they are exporting based on this Module A are slightly lower than the above figures (12, 20, 28, 29 and 15% respectively). This may be due to the fact that these numbers are based on a question about the percentage of sales accounted for by total exports.

We can get our first feel for how skill shortages affect businesses by looking at what constrains their overseas activities (Table 5). The main constraints on overseas activities are the exchange rate and lack of management resources, with nine percent of firms reporting this. Recruitment seems to be more of a problem than skill deficiencies among existing staff.

Table 5 Constraints on Overseas Activities

<table>
<thead>
<tr>
<th></th>
<th>% of businesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange rate</td>
<td>9</td>
</tr>
<tr>
<td>Lack of management resources</td>
<td>9</td>
</tr>
<tr>
<td>Higher transportation costs and/or logistical complexities</td>
<td>6</td>
</tr>
<tr>
<td>Difficulty recruiting appropriate employees</td>
<td>6</td>
</tr>
<tr>
<td>Limited knowledge about specific markets</td>
<td>6</td>
</tr>
<tr>
<td>Limited access to finance for expansion beyond NZ</td>
<td>5</td>
</tr>
<tr>
<td>Skill deficiencies among existing employees</td>
<td>4</td>
</tr>
<tr>
<td>Difficulty in monitoring overseas operations or processes</td>
<td>4</td>
</tr>
</tbody>
</table>

- Percentage based on population weights
- Note that the figures relate to all businesses and not just all businesses with overseas activities
3.2.2. Customisation

A particular means whereby businesses can obtain higher value from their output is through customisation. In economic terms this can be seen as a kind of market segmentation. By providing something that is closer to the individual customer’s requirements, businesses are able to charge higher prices. Just under half of the firms provided a standardised range of goods and services. Just one-fifth of firms made substantial differences according to customer requirements.

<table>
<thead>
<tr>
<th>Table 6 Degree of customisation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Standard range</td>
</tr>
<tr>
<td>Minor differences according to customer requirements</td>
</tr>
<tr>
<td>Substantial differences according to customer requirements</td>
</tr>
</tbody>
</table>

- **NB:** remainder (=9%) answered ‘don’t know’
- **Source:** Business Operations Survey 2008: Business Strategy and Skills Module
- **Percentage based on population weights**

If customisation allows firms to extract higher rents, why does every business not do it? The main reason is cost (Table 7). Quality costs and some customers are not willing to pay the price. However, it is interesting to note (given the subject of this paper) that around one-fifth of firms state that their ability to customise their goods or services is constrained for skill related reasons (either skill deficiencies among existing employees or the availability of skilled contractors). This suggests a direct link between skill shortages and constraints on pursuing a high value-added strategy, via businesses ability to customise their output.

<table>
<thead>
<tr>
<th>Table 7 Constraints on Customisation of Goods and Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>(1) Cost of providing customised goods or services</td>
</tr>
<tr>
<td>(2) Skill deficiencies among existing employees</td>
</tr>
<tr>
<td>(3) Availability of skilled contractors</td>
</tr>
<tr>
<td>(4) Ability to identify individual customer requirements</td>
</tr>
<tr>
<td>(5) Availability of technology</td>
</tr>
<tr>
<td>Either (2) or (3)</td>
</tr>
<tr>
<td>Both (2) and (3)</td>
</tr>
</tbody>
</table>

- **Source:** Mason et al. (2012).
- **Percentage based on population weights**
3.2.3. Competitive pricing

How able are businesses to obtain higher prices than their competitors. Respondents to the BOS report that 17% of them are able to obtain a higher price than competitors for main goods and services frequently or always (Figure 2). Very few firms can obtain higher prices all of the time and 40% of firms can obtain higher prices some of the time.

**Figure 2 Ability to obtain a higher price than competitors for main goods and services**

![Bar chart showing ability to obtain higher prices](image)

- Percentage based on population weights

3.2.4. Future Business Strategy

An important element of strategy is how businesses expect both their firm and the environment in which they exist to change, and how they will act in order to respond to (or positively influence) it. New Zealand businesses appear to be fairly sanguine; over half expect their sales to increase (Table 8). Even though one-third of them expect competition to increase, one-third of businesses expect their market share to increase. It is interesting to note that one-third of businesses expect the availability of skilled labour to increase. Note, however, that almost one-fifth answered that they did not know what would happen to skilled labour availability.
Table 8 Business Expectations for Change

<table>
<thead>
<tr>
<th>Changes in…</th>
<th>Expected change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Decrease</td>
</tr>
<tr>
<td>Total sales of goods and services</td>
<td>17</td>
</tr>
<tr>
<td>Degree of competition</td>
<td>6</td>
</tr>
<tr>
<td>Market share</td>
<td>8</td>
</tr>
<tr>
<td>New products, processes or methods within the business</td>
<td>2</td>
</tr>
<tr>
<td>Availability of skilled labour</td>
<td>1</td>
</tr>
</tbody>
</table>

* NB: remainder answered ‘don’t know’
* Percentage based on population weights

How do businesses prepare for the future? Over one-half look to develop new products, processes or methods when preparing for the changes described in Table 8 (Table 9). The second most popular preparation is to train staff, we return to the issue of training in section 3.5. Another important activity firms undertake in preparing for future changes is to recruit new staff; 30% of businesses look to recruit staff within New Zealand and one in ten look overseas.

Table 9 Business Preparations for Future Changes

<table>
<thead>
<tr>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>New products, processes or methods</td>
</tr>
<tr>
<td>Training for staff</td>
</tr>
<tr>
<td>Recruiting staff within NZ</td>
</tr>
<tr>
<td>Recruiting staff outside NZ</td>
</tr>
<tr>
<td>Joint venture</td>
</tr>
<tr>
<td>Acquisition</td>
</tr>
<tr>
<td>Moving production overseas</td>
</tr>
<tr>
<td>Moving marketing overseas</td>
</tr>
<tr>
<td>Moving R&amp;D overseas</td>
</tr>
</tbody>
</table>

* Percentage based on population weights
3.2.5. Face-to-face interviews

The qualitative interviews found that HVA firms are more internationally focussed and tended to have a focus on marketing and customers. The MVA firms were more focussed on technical methods and the margin over costs. The study found that it was difficult to separate the businesses simplistically into firms providing high-value products or services and those producing lower value ones. Most firms supplied high value-add or ‘premium’ products as part of a product mix. Many of their premium offerings emerged from cooperation with customers. Firms defined high value-add or premium products as one of two things: those that were better at meeting customer needs or those that commanded higher margins.

We have seen prima facie evidence that skills do play a part in – and unavailability of skills constrains– elements of businesses’ strategy. In the following section, we examine the extent and nature of those shortages.

3.3. Vacancies and Skill Gaps

We now turn our attention to indicators of skill gaps in businesses. We focus on two aspects of skill gaps. The first relates to ‘external skill gaps’, difficulties the business faces finding skilled labour in the market. The second relates to deficiencies in the skills of the existing workforce, what we call ‘internal skill gaps’.

The BSS asked businesses a number of questions about the skills of their existing staff and of their ability to find staff. The responses to these questions allow us to classify firms according to the following three distinctions: those with vacancies, those whose vacancies are hard-to-fill and those with vacancies that are hard to fill for skill-related reasons, that is, due to lack of qualifications or experience. The overall percentage of firms reporting each type of vacancy is depicted in Figure 3, below. More detail on the patterns of vacancies, hard-to-fill vacancies and skill shortage vacancies are set out in the following sections. These are also the subject of the econometric analysis in Mason et al. (2012a), which we refer to in more detail in section 3.7.1, below.

23 High value-added firms; these are firms in the top quartile of labour productivity in their industry. For more on this subject see the discussion of data and methods in section 3.1.

24 Medium value-added firms; firms are firms in the middle two deciles of labour productivity in their industry. For more on this subject see the discussion of data and methods in section 3.1.
3.3.1. Vacancies

Vacancies are a common part of business life. Staff arrive and leave continually and expansion usually requires businesses to hire additional staff. Over three quarters of businesses posted a vacancy in the year prior to the survey (Figure 4). Almost half of businesses found at least one of these vacancies hard-to-fill. Larger businesses are more likely to post vacancies and for these vacancies to be hard-to-fill. Over 90% of businesses with fifty or more employees had vacancies. Over 70% of the very largest (100+ employees) had vacancies that were hard-to-fill.

Figure 3 Businesses reporting, vacancies, hard-to-fill and skill shortage
vacancies

- Figure shows the percentage of firms that report each type of vacancy.
- Percentages based on population weights
- Note that figures for the percentage of businesses with vacancies and hard-to-fill vacancies will not match the tables in the Statistics New Zealand Hot of the Press release because: (a) we use a slightly different sample and (b) we do not use imputed values.
- Source: Mason, Mok, Stevens and Timmins (2012a).
3.3.2. For whom are businesses looking?

We can break the reporting of vacancies down by occupation. Respondents that reported they had posted vacancies in the last year were asked a follow-up question: ‘During the last financial year, how many vacancies has this business had for the following roles?’ In order to give some context to this question, it is useful to consider the actual breakdown of staff by role in firms. This is set out in Figure 5, below. The most common type of staff are ‘clerical, sales and services workers’, who make up just under one half of the workforce of firms in the sample, closely followed by ‘labourers, production, transport or other worker’. These two occupational groups make up the bulk of the population of employees.
It is for ‘clerical, sales and services workers’ that the greatest proportion of firms had vacancies (Figure 6), followed by ‘labourers, production, transport or other workers’. This reflects the greater number of staff in these occupations. However, this picture is not quite true across all firm sizes. ‘Managers’ is the second most popular category for firms with more than 100 employees (and also, marginally, for those with between 50 and 99 employees). Note that the firms reporting hard to fill vacancies for the two most common, lower-skill, occupations is very different from the proportions of employment represented by these occupations. Indeed, the ‘hard-to-fill ratios’ (the ratio of the dark portion to the whole bar in Figure 6) are highest for vacancies ‘Tradespersons and related workers’ and ‘Professionals’, suggesting that the market is tightest for these occupations.
Figure 6 Businesses reporting hard-to-fill and other vacancies, by occupation%

Note that in the face-to-face interviews, the interviewers investigated the usefulness of the concept of ‘core employees’. Do businesses have a core of key employees upon which their business proposition rests or without whom they could not operate? Discussions of this nature yielded two types of response. The first was that ‘everyone is important’. The second was that the core employees of a firm were its senior management core. HVA firms were more likely to identify a few core people, whereas MVA firms were more likely to identify tradespeople. Most firms had sought core employees and most had trouble finding them.

Considering the issue of skill shortages from the perspective of occupations is one way to think about the dimensions over which they might vary. Indeed it is often the way that skill shortages are reported at the macro level. Another way is to think about it is from the perspective of the particular skills themselves. Workers can be thought of as bundles of skills or capabilities. It may not be the type of worker that is the problem, so much as the specific skills which they are lacking. In Figure 7, we present information on the types of skills firms require and whether they are difficult to obtain. ‘Professional/technical’, Management/supervisory’ and ‘Trade related’

- Figure presents data from questions C16 ‘During this last financial year, was this business easily able to fill all vacancies with suitable applicants?’ and C18: ‘Mark all that apply/for this business, which roles were hard to fill?’
- Percentages based on population weights
- Source: Business Operations Survey 2008: Business Strategy and Skills Module,
skills are reported as the most difficult to obtain. More general skills such as ‘Team working’, ‘Numeracy’, and ‘Oral Communication’ are sought by a greater number of firms but are not reported as difficult to find.

**Figure 7 Difficulty in finding skills**

- Marketing
- Computer
- Team working
- Numeracy
- Oral communication
- Customer service/ sales
- Written communication
- Professional/technical
- Management/supervisory
- Trade related

*Figure presents data from question C19 ‘During this last financial year, were any of the following skills difficult to obtain from applicants?’*

- Percentages based on population weights

### 3.3.3. Skill Shortage Vacancies

Respondents that had hard-to-fill vacancies were asked ‘For which of the following reasons did this business find it hard to fill vacancies?’ They were given twelve categories, from which they could choose as many as they wished. Those that replied ‘applicants lack the work experience the business demands’ or ‘applicants lack the qualifications or skills the business demands’ were defined as having skill shortage vacancies (SSVs).²⁵

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²⁵ For the full list of responses, see SNZ (2008).
As we have already seen from Figure 3, 36% of firms report skill shortage vacancies. We break this down into the two constituent parts and present them by firm size in Table 11.

Table 11  
Skill-related reasons for hard-to-fill vacancies

<table>
<thead>
<tr>
<th>Business size</th>
<th>Applicants lack work experience (1)</th>
<th>Applicants lack qualifications or skills (2)</th>
<th>Skill shortage vacancy (1) + (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-19 Employees</td>
<td>26</td>
<td>26</td>
<td>32</td>
</tr>
<tr>
<td>20-49 Employees</td>
<td>36</td>
<td>37</td>
<td>43</td>
</tr>
<tr>
<td>50-99 Employees</td>
<td>39</td>
<td>40</td>
<td>49</td>
</tr>
<tr>
<td>100+ Employees</td>
<td>48</td>
<td>48</td>
<td>59</td>
</tr>
<tr>
<td>Overall</td>
<td>29</td>
<td>29</td>
<td>36</td>
</tr>
</tbody>
</table>

- Percentage based on population weights
- Business size (E) is measured by rolling mean employment, or RME.
- Note that figures for number of businesses with vacancies and hard-to-fill vacancies will not match the tables in the Statistics New Zealand Hot of the Press release because: (a) we use a slightly different sample; (b) we do not use imputed values; and (c) we use rolling mean employment (RME) from the 2008 financial year, rather than 2007.
Table 12  Skill-related reasons for hard-to-fill vacancies
Percentage of business, by industry

<table>
<thead>
<tr>
<th>Industry</th>
<th>Applicants lack work experience</th>
<th>Applicants lack qualifications or skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Mining</td>
<td>23</td>
<td>20</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>Electricity, gas, water and waste services</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>Construction</td>
<td>41</td>
<td>44</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>31</td>
<td>26</td>
</tr>
<tr>
<td>Retail trade</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>Accommodation and food services</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>Transport, postal and warehousing</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td>Information media and telecommunications</td>
<td>29</td>
<td>27</td>
</tr>
<tr>
<td>Financial and insurance services</td>
<td>32</td>
<td>23</td>
</tr>
<tr>
<td>Rental, hiring and real estate services</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>Professional, scientific and technical services</td>
<td>34</td>
<td>35</td>
</tr>
<tr>
<td>Administrative and support services</td>
<td>23</td>
<td>25</td>
</tr>
<tr>
<td>Education and training</td>
<td>21</td>
<td>44</td>
</tr>
<tr>
<td>Health care and social assistance</td>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>Arts and recreation services</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Other services</td>
<td>28</td>
<td>31</td>
</tr>
<tr>
<td>Overall</td>
<td>29</td>
<td>29</td>
</tr>
</tbody>
</table>

- Percentage based on population weights
- Note that figures for number of businesses with vacancies and hard-to-fill vacancies will not match the tables in the Statistics New Zealand Hot of the Press release because: (a) we use a slightly different sample; (b) we do not use imputed values; and (c) we use rolling mean employment (RME) from the 2008 financial year, rather than 2007.

3.3.4. Internal skill gaps

Our discussion thus far has focussed on businesses ability to fill vacancies and obtain skills from the external labour market (external skill gaps). Businesses will look for skills in the open market when they lack them internally over two dimensions. One is just sheer volume. Do they have enough of a particular type of staff? The second relates to the quality of existing staff. Do they have the requisite skills?

Figure 8 shows the proportion of staff in each occupation businesses feel have the skills required for their job. Given, that it is managers that fill in the form, it is perhaps
no surprise to learn that managers are the occupation for whom the greatest proportion of businesses report that all of their staff have the required skills! Nevertheless, they are also the occupation for whom the largest proportion of businesses feels that less than half of staff of that type have the required skills. The subject of management capability was the subject of another piece of research commissioned by MED and others. We discuss this in section 4 below. Around 93% of businesses employ managers. The two other occupations with high proportions of businesses responding that their less than half of their staff have the skills to do their job – Professionals, and Technicians and associate professions – are employed by a much small proportion of firms (44% and 41%, respectively).

Figure 8 Proportion of staff with skills required for job

- Chart depicts the percentage of firms with the particular type of labour reporting each proportion
- Figures in parentheses are the weighted percentage of firms who report staff of that type (or, more precisely, do not report ‘no staff of this type’ to the question).
- Percentages based on population weights

Half of businesses surveyed by the BOS feel that all their staff are fully skilled (Figure 9). For the remaining firms, by far the most important reasons for staff not having all the skills to do their job is a lack of experience (34% of businesses). Next up (but quite some way behind) is a lack of motivation in staff (16% of businesses). Of the businesses who do not feel that all staff have all the skills to do their job, just under a third felt that this was because of recruitment problems.
What is it then that existing staff are lacking? Over a quarter of businesses felt their existing staff needed to improve their customer services/sales skills (Table 13). Interestingly, given a lot of the discussion around skills, professional/technical skills come quite low down the list. However, it is important to note the low numbers of firms with staff in professional/technical occupations (Figure 8).

Table 13 Skills existing staff most need to improve

<table>
<thead>
<tr>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer service/sales</td>
</tr>
<tr>
<td>Team working</td>
</tr>
<tr>
<td>Oral communication</td>
</tr>
<tr>
<td>Management/supervisory</td>
</tr>
<tr>
<td>Trade related</td>
</tr>
<tr>
<td>Written communication</td>
</tr>
<tr>
<td>Computer</td>
</tr>
<tr>
<td>Professional/technical</td>
</tr>
<tr>
<td>Numeracy</td>
</tr>
<tr>
<td>Marketing</td>
</tr>
</tbody>
</table>


Percentage based on population weights
In the BOS survey we only had time and space to ask this question of respondents of their overall workforce. In the follow-up telephone survey, firms were asked this question with respect to specific occupation groups. For managers, the primary skill that needed upgrading was their leadership skills, followed by their problem solving skills. For all but one of the remaining groups it was technical skills that were seen as the main skill in need of upgrading. An interesting result relates to the need for staff to upgrade their customer service skills. Whilst it is no surprise to hear that it is important for Clerical/Sales/Service Workers to upgrade, it is perhaps a surprise to hear that this comes second after technical skills for professionals. This combination of technical and customer service skills is something we shall return to with respect to the face-to-face interviews in the following section.

### Table 14 Main skills that need upgrading, CATI

<table>
<thead>
<tr>
<th>Staff type</th>
<th>Primary</th>
<th>Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers</td>
<td>Leadership skills</td>
<td>Problem solving skills</td>
</tr>
<tr>
<td>Professionals</td>
<td>Technical skills</td>
<td>Customer service skills</td>
</tr>
<tr>
<td>Technicians/Associate Professionals</td>
<td>Technical skills</td>
<td>General IT skills</td>
</tr>
<tr>
<td>Tradespersons and related workers</td>
<td>Technical skills</td>
<td></td>
</tr>
<tr>
<td>Clerical/Sales/Service Workers</td>
<td>Customer service skills</td>
<td>General IT skills</td>
</tr>
<tr>
<td>Labourers/Production/Transport</td>
<td>Technical skills</td>
<td>Problem solving skills</td>
</tr>
</tbody>
</table>

### 3.4. The impact of skill shortages

The interviews found that most firms had tried to fill skill gaps. Firms had pursued a range of options, particularly recruiting from overseas, training an existing employee. Firms often had to relax the criteria under which they had first sought to find staff. Many decided to just leave position unfilled. In the discussions, MVA firms were once again more focused on technical skills. One important result was that no firms reported that they had changed their business strategy because of a lack of skills or skilled staff.
3.5. Training

Training is a crucial element of a business’ strategy. In particular, how it prevents and responds to skills shortages. If a firm feels it cannot obtain the skills it needs, it can either bring these skills in, through recruitment, or invest in either training existing staff or recruiting staff without all the skills and training them. We investigate the relationship between skill shortages and training in more detail in Mason et al. (2012b), which we summarise in section 3.7.2. Here we present some basic figures.

Table 15 sets out the proportion of staff participating in training in businesses. Fairly uniquely for a survey of this nature, the BSS allows us to distinguish between new staff, existing staff either in their existing roles or changing roles. Training for incoming staff is likely to be of a different nature of that focussed on up-skilling existing staff. As we can see from the table, the patterns of firms conducting each type of training are different. Half of firms train all of their new staff, compared with the proportion that train existing staff, which is closer to one-quarter.

<table>
<thead>
<tr>
<th>Staff type</th>
<th>Proportion of staff participating in training</th>
<th>No staff of this type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less than half</td>
<td>Half or more</td>
</tr>
<tr>
<td>New staff</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Existing staff changing roles</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Existing staff in existing roles</td>
<td>26</td>
<td>24</td>
</tr>
</tbody>
</table>

*Source: Business Operations Survey 2008: Business Strategy and Skills Module*
*% of businesses*
*Percentage based on population weights*

In general, the numbers of businesses providing various types of training to staff tend to be lower than the numbers reporting that existing staff need to improve the relevant skill (Table 13). This suggests that firms see such training as much a part and parcel of normal policy than as a response to ‘problems’ with their workforce. The most common type of training provided by businesses is for trade-related skills (Figure 10). Moreover, ‘Tradespersons and related workers’ were the occupation for which most businesses reported hard-to-fill vacancies. These skills were not the most commonly reported skills on which existing staff needed to improve. They were,
however, the most difficult set of skills to find from applicants for roles (Figure 7). It appears that firms are training in response to external shortages for these skills. The next two most common types of training provision are for computer and customer service/sales skills.

**Figure 10 Staff participation in training provided by the business**

- Figure presents data from question C26 ‘During this last financial year, did this business’s staff participate in the following types of training provided or funded by this business?’
- % of businesses
- Percentage based on population weights

### 3.6. Face-to-face interviews

The project commissioned AERU at Lincoln University to conduct a series of interviews of firms from the BOS who agreed to participate. This aspect of the project was based on the UK work by Geoff Mason mentioned above. AERU interviewed High Value Add (HVA) and Medium Value Add (MVA) firms in three industries: engineering, IT, transport. These were identified by looking at the distribution of labour productivity in the 2-digit ANZSIC industry. The firms in the top quartile of labour productivity in their industry were identified as HVA and those in the inter-quartile range (the second and third most productive quartiles) in the industry were identified as MVA.

The interviews were conducted ‘blind’. That is, the interviewers did not know at the time of the interview whether the firm was HVA or MVA. This prevented any positive reinforcement or interviewer bias in the interviews.
The results and method are described in more detail in Kaye-Blake, Flagler and Campbell (2012). In this section, we provide a few highlights.

### 3.6.1. General business environment

The first thing to bear in mind was that the interviews were conducted in mid-2009. Thus, firms did have other things on their mind at the time. The economic situation was found to be affecting most businesses. The interviewers found that firms were adjusting, but there was nothing radical. They were experiencing more competition. This was a product of more and new competitors along with less available business. They also found that the businesses interviewed operated in complex competitive environments. Businesses felt that they offered a unique combination of a number of dimensions (e.g. price, quality, coverage). Few businesses felt that they were competing directly with other businesses in exactly the same space.

### 3.6.2. Business strategy

The study found that HVA firms more internationally focussed; they tended to have a focus on marketing and customers. The MVA firms were more focussed on technical methods and the margin over costs. The study found that it was difficult to separate the businesses simplistically into firms providing high-value products or services and those producing lower value ones. Most firms supplied high value-add or ‘premium’ products as part of a product mix. Many of their premium offerings emerged from cooperation with customers. Firms defined high value-add or premium products as one of two things: those that were better at meeting customer needs and those that commanded higher margins.

### 3.6.3. Core employees

One of the subjects the study investigated was the usefulness of the concept of ‘core employees’. Do businesses have a core of key employees upon which their business proposition rests or without whom they could not operate? Discussions of this nature yielded two types of response. The first was that ‘everyone is important’. The second was that the core employees of a firm were its senior management core. HVA firms were more likely to identify a few core people, whereas MVA firms were more likely to identify tradespeople. Most firms had sought core employees and most had trouble finding them.
3.6.4. Strategies for skill gaps

The study found that most firms had tried to fill skill gaps. Firms had pursued a range of options, particularly recruiting from overseas, training an existing employee. Firms often had to relax the criteria under which they had first sought to find staff. Many decided to just leave position unfilled. In the discussions, MVA firms were once again more focused on technical skills. One important result was that no firms reported that they had changed their business strategy because of a lack of skills or skilled staff.

3.6.5. Summary

In summary, the face-to-face interviews found that MVA firms more focused on technical methods and margin over costs. On the other hand, the HVA firms focused more on: the business skills of professional employees; marketing (branding, customers – the ‘total package’). Skill gaps are a fact of life, and most firms had skills gaps. Finally, firms treat business strategy and employee skills as separate issues. They determine the business strategy and then they see if they have the skills required. If not they look to get them. This lack of consideration of skills within the framework of formulating business strategy is a subject to which we return when we discuss the Management Matters research, below.

3.7. Econometric analyses

The project team also undertook econometric analyses to investigate skill shortage vacancies and firms’ training decisions (Mason et al., 2012a & 2012b). Here I summarise some of the findings.

3.7.1. The determinants of skill shortages

The first paper examined factors relating to firms’ skill shortages. The focus was on SSVs, but it also contrasted these with vacancies that were hard-to-fill for reasons other than the skills of applicants. The paper examined patterns of skill shortage vacancies using an econometric technique that accounted, in part, for the interrelationship between the likelihood of a firm posting a vacancy and for those vacancies being hard-to-fill for skill-related reasons.

The work found that large firms are more likely to have vacancies – they have more workers and so the chance of at least one of them leaving is consequently higher.
However, larger firms do not appear to find it more difficult to source workers with the required skills than smaller firms. As we might expect, when firms’ output grows, the need to seek additional staff also grows. However, this is only in the years the firm is expanding. Expanding sales turns out not to be a good predictor of future additional staff requirements.

As we have noted already, businesses can experience skill shortages internally or externally. A shortage in the skills it requires can manifest itself: (a) in terms of the ability of its existing staff to do their job; or (b) in terms of its ability to find appropriately skilled workers through recruitment. The paper found evidence that these two phenomena co-exist. Businesses experiencing internal skill gaps are also more-likely to have skill shortage vacancies.

There appears to be persistence in skill shortages. Firms that care experiencing recruitment difficulties are very likely to continue to experience them even three to four years later. Firms who undertake training are found to be more likely to have vacancies. This result also holds if we consider training in earlier years, providing further evidence of persistence in skill shortages.

The results confirm earlier work that highlights the importance of two distinctions: First, it is important to distinguish between firms’ general recruitment activity and it having skill shortage vacancies. Second, one must distinguish between firms experiencing recruitment difficulties related to skills and those for other reasons (such as the firm not offering good enough pay and conditions). Failing to account for this may cause us to misdiagnose the problem and will therefore undermine the appropriateness of any policy prescription.

The paper found that the businesses that feel the applicants they are attracting do not have the required skills, qualifications or experience are those that are paying higher wages. The fact that businesses that pay higher wages than others in the same industry and region are actually more likely to experience SSVs suggests that raising wages is not sufficient to fill these vacancies. In contrast, when we focus on vacancies that are hard-to-fill for reasons other than skill, paying higher wages does appear to be a successful policy to fill vacancies. Firms that pay higher relative wages are less likely to have non-skill-related hard-to-fill vacancies. The implication of this is that SSVs and NSRs are different phenomena.
One important issue researchers have to confront when undertaking analysis of this type is that of causality. It is one thing to establish a statistical regularity – a correlation between firm characteristics, activities or environment and an outcome such as external skill shortages. It is another thing to interpret this as a causal relationship. In this paper, we have uncovered some clear statistical regularities. These are consistent with certain predictions we have discussed in this paper and provide us with useful information to aid our understanding of how the landscape of skills in New Zealand and, in particular, we done this from the perspective what businesses are looking for, rather than what the education and training system has provided.

3.7.2. Training

The second paper examined the probability and intensity of training as a function of the external skill gaps. It also considered other factors, such as firm size, previous performance, its ownership, its competitive environment, and the occupational breakdown of its staff.

As we noted above, a unique feature of the BSS module is the ability to measure differences in training intensity for three types of staff: new staff, existing staff changing roles, and existing staff for their existing roles. This paper, therefore, also included additional explanatory variables by combining the BSS module with data from other sections of the current and previous years’ BOS and the LBD.

The paper found that firms that experience difficulties in hiring workers are more likely to train their staff and that they respond by increasing the proportion of existing staff being trained, instead of training new recruits into skilled positions. However, it is more difficult to say whether this relationship reflects a response by firms to make the skills they need (train new or existing workers) when faced with difficulties (increased costs of recruitment) in trying to buy the skills in the labour market or whether HTF vacancies and training are simply associated with a particular business strategy. For example, it could be argued that firms that are continuously developing new products and services and are quick to adopt new technologies will continuously be upgrading the skills of their employees and also face difficulties in finding the right skills in the labour market.
The results from the training intensity regression models show that firms with HTF vacancies are more likely to train half or more of existing staff (either in their existing roles or when they move into new roles) but not for new staff. One possible interpretation is that firms are training staff in order to move them into positions they are finding HTF as opposed to hiring lesser skilled applicants and training them up (for example, apprenticeships).

The other findings suggest that firms with business strategies that involve changing their products and services and introducing new production process are not only more likely to train their staff but to train a relatively large proportion of them. Other results are consistent with findings in other studies. For example, larger firms are more likely to train, but small firms are more likely to train more of their staff.

3.8. Summary

Skills are an important ingredient for successful businesses and a lack of skilled workers can constrain firms’ ability to carry out their business strategy, developing and introducing improved products, services, processes and marketing; and including expansion into new markets.

One of the key questions this project asked is: Do New Zealand businesses suffer from a shortage of skilled workers? The answer has two dimensions. The first is with respect to the current workforce – do they have the skills for the job (internal skill gaps)? The second is from the perspective of the labour market – can firms find the skilled workers they need (external skill shortages)?

Only one half of New Zealand businesses (with six or more employees) feel that all their staff have all the skills required for their job. Around ten percent felt that fewer than half of their managers had the skills they needed. This is consistent with MED-led research on the management capability of New Zealand manufacturers. According to firms, the skills that existing staff most need to improve are their customer service/sales, team-working, oral communication and management/ supervisory skills.

Over one-third of firms found it difficult to fill vacancies because applicants lacked the skills they required. This is almost half of the firms that had vacancies. Statistical analysis suggests that firms with skill shortages tend to be the more productive firms and those looking to expand or internationalise. These are likely to be the firms with
the highest demand for skills. They are also the firms that are particularly important for New Zealand’s growth.

Businesses reported that skills gaps limit their ability to pursue ‘high value’ strategies, such as customising their output, undertaking competitive pricing and planning for future change. A lack of management resources and difficulty recruiting appropriate employees were identified as the main constraints to overseas activity (along with exchange rates and high transport and logistics costs).

In interviews with firms, many see skill gaps and shortages as merely a short term constraint and do not change their business strategy to account for the availability of skills. However, statistical analysis found that firms experiencing skill shortages were more likely to train their staff.

In any market there will be a number of potential customers that cannot purchase all they would wish because they are unwilling or unable to pay the market price. This does not mean that the market is malfunctioning. There is an important question for researchers and policymakers to ask before interpreting reports of unfilled vacancies of any kind, and of SSVs in particular, as a ‘skills problem’. This question is: Why do businesses that cannot fill a vacancy not simply raise the wages they are offering?

There a number of reason why firms may not be able to do so. First, it may be because the firm cannot afford to pay any more. If this is the case, the problem is not the labour market or the education system, but the firm’s own productivity. Firms that undertake activities associated with high productivity are likely to both have a higher demand for skills and be more able to afford to pay skill premia.

Second, the supply of labour takes a long time to adjust. Because of the length of time required to educate and train skilled workers, it takes a long time for changes in wages to influence changes in skill acquisition (particularly if we are relying on the rather indirect mechanism of changes in relative wages influencing the choices of students at school) and immigration is restrained by, among other things, legal barriers and the costs of relocation.

4. Management Matters

The second major project I want to talk about is a piece of work on management capability in medium to large New Zealand manufacturing firms. Management
capability is a perennial interest. The capability of an organisation’s management is vital to its success. However, whilst management capability is often talked about, it is often (a) not clear what is meant by it (a casual browse of any airport bookshop will reveal a plethora of glossy titles expounding the last or latest word in the subject); (b) even if we knew what it is, it is so hard to measure. One of the only pieces of evidence we did have was not promising. The International Institute for Management Development (IMD) World Competitiveness Yearbook ranked us 21st out of 25 countries in 2006.

This interview-based study used a robust, ‘double-blind, double-scored’ method, developed by the London School of Economics along with McKinsey’s. In addition to the rigour of the technique, the use of this method ensured that the study was internationally comparable (it had already been implemented in sixteen other countries, including the US, UK, Canada, Australia, Japan and emerging economies like China and India). In particular, the University of Technology, Sydney team had recently applied it in Australia. This meant that there was a team of trained and experienced interviewers and a ready-made set of benchmarks to test their scoring against to reduce any measurement bias. Therefore, this was an opportunity to ‘leverage’ this existing capacity and save the costs of retraining a new set of interviewers. The discussion that follows draws on UTS (2010).

4.1. Method

The interviews were conducted in a conversational format (as opposed to a question an answer format). It was conducted ‘double blind’. That is to say, the interviewer did not have any background information about the firm and the managers were not aware of the scoring grid. This was so as to eliminate any response or scoring bias. Around two-fifths of the interviews were ‘double scored’. That is to say that they were independently scored by another team member.

4.1.1. Management practice dimensions

The study used a conversation-based interview scoring grid. The grid defines the criteria for scoring management practices from one (worst practice) to five (best practice) across eighteen key management practices. These eighteen practices are organised in three distinct areas of management and are summarised in Figure 11.
The three areas of management practices in essence each answer one of the following three questions:

- **How well are firms’ operations managed?**

  Operations Management revolves around the modern manufacturing techniques and management systems deployed to enhance efficiency, reduce costs, and create and deliver value to customers. Systematically monitoring key performance indicators and methodologically tracking and reviewing operational performance are fundamental to the successful functioning of firms. Best practice requires these operations management practices to be so deeply rooted in the culture of the company that implementing them within firms should be a ‘natural way of life’.

- **Is business performance managed effectively?**

  Performance Management includes the processes around setting goals and targets. Effective management in this area is about ensuring that these goals and targets integrate different business areas, are realistic yet challenging, and lead to

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**Figure 11 Management practice dimensions**

<table>
<thead>
<tr>
<th>Management Practices</th>
<th>18 management dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td>Adoption of Lean Manufacturing</td>
</tr>
<tr>
<td></td>
<td>Rationale for the adoption</td>
</tr>
<tr>
<td></td>
<td>Process documentation</td>
</tr>
<tr>
<td></td>
<td>Performance tracking</td>
</tr>
<tr>
<td></td>
<td>Operation Performance review</td>
</tr>
<tr>
<td></td>
<td>Performance Dialogue</td>
</tr>
<tr>
<td></td>
<td>Consequent management</td>
</tr>
<tr>
<td>Performance</td>
<td>Types of goals</td>
</tr>
<tr>
<td></td>
<td>Interconnection of goals</td>
</tr>
<tr>
<td></td>
<td>Time Horizon</td>
</tr>
<tr>
<td></td>
<td>Setting stretched goals</td>
</tr>
<tr>
<td></td>
<td>Clarity of goals</td>
</tr>
<tr>
<td>People</td>
<td>Installing a talent mindset</td>
</tr>
<tr>
<td></td>
<td>Rewarding top performance</td>
</tr>
<tr>
<td></td>
<td>Addressing poor performance</td>
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<tr>
<td></td>
<td>Promoting high performers</td>
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<tr>
<td></td>
<td>Attracting high performers</td>
</tr>
<tr>
<td></td>
<td>Retaining high performers</td>
</tr>
</tbody>
</table>

- **Source: UTS (2010) Management Matters in New Zealand**
sustainable value creation. A balanced orientation towards both long-term and short-term corporate goals and targets is equally important.

- **How do firms manage their human resource?**

  People management is all about using a firm’s human capital to create a sustainable competitive advantage. Therefore, people management is a key driver of firm performance and productivity. Best practice entails adopting a structured approach towards attracting, retaining and promoting talent and deploying tangible measures to motivate and nurture employees, their skill-sets and competencies.

Figure 12 provides an example of one of the 18 management dimensions and the associated ‘scoring grid’. In this case it is in the area of operations management; the dimension is ‘Performance tracking (e.g. Key Performance Indicators).

**Figure 12 Example of an operations management question and associated scoring grid**

<table>
<thead>
<tr>
<th>Operations</th>
<th>Performance tracking (KPI's)</th>
<th>Measures tracked do not indicate directly if business objectives are being met. Tracking is an ad-hoc process or are not tracked at all</th>
<th>score 1 &quot;worst&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Most key performance indicators are tracked formally. Tracking is overseen by senior management</td>
<td>score 3 &quot;average&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Performance is continuously tracked &amp; communicated, both formally and informally, to all staff using a range of visual management tools</td>
<td>score 5 &quot;best&quot;</td>
</tr>
</tbody>
</table>

- **Source:** UTS (2010) Management Matters in New Zealand

**4.2. So how did we do?**

Overall, the management practices of medium to large New Zealand manufacturing businesses are at the low end of average (Figure 13). New Zealand firms rank tenth out of seventeen the countries studied. New Zealand manufacturers sit on the boundary between the middle and lower tier of countries; just below Italy and just above Poland and Portugal.


### Figure 13 Overall management score

- **US**
- **Sweden**
- **Japan**
- **Germany**
- **Canada**
- **Australia**
- **France**
- **Great Britain**
- **Italy**
- **New Zealand**
- **Poland**
- **Portugal**
- **Ireland**
- **Brazil**
- **India**
- **Greece**
- **China**

<table>
<thead>
<tr>
<th>Management score</th>
</tr>
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<tbody>
<tr>
<td>2.5</td>
</tr>
</tbody>
</table>

- * at 10% significance level
- **Source**: UTS (2010) Management Matters in New Zealand

### 4.2.1. Operations Management

New Zealand manufacturers score more highly in operations management, although they are still toward the bottom of the middle tier (Figure 14). They perform relatively well in some aspects of operations management. One example of this is the adoption of lean manufacturing. In this dimension, best practice involves all major aspects of lean being adapted, worst practice is when firms implement little more than simple just-in-time practices. The US is the top ranking country in this dimension; New Zealand manufacturers rank fifth out of the seventeen countries. They also perform relatively well in understanding the rationale for the adoption of such practices (i.e. they do so to meet business objectives and not just to catch up with competitors); New Zealand ranks sixth in this dimension, with Swedish manufacturers coming out top.
4.2.2. Performance Management

New Zealand businesses score a little lower in performance management; again placing in the middle tier. As with operations management, New Zealand managers do well in some aspects of this area. They do well in the interconnectedness of goals. That is, goals increase in specificity as they cascade down the organisation, rather than the situation where individual workers are not aware of how their contribution is linked to corporate goals. New Zealand ranks fifth in this (the US is top). Another area where they do well in is in the clarity of goals; that is, performance measures are well defined and communicated – worker performance is made public, rather than complex metrics that are not clearly understood. Once more New Zealand manufacturers are ranked fifth, with Japanese manufactures the best practice.
4.2.3. People Management

It is mainly in areas of people management that need the most improvement in New Zealand firms (Figure 16). Overall our firms rank fourteenth, above only Portugal, Brazil and Greece. In particular, we perform poorly in addressing poor performance (second from last). That is, we don’t deal with problems early enough; in extreme cases, poor performers are rarely removed from their positions to less critical ones or out of the organisation. We also do poorly when it comes to retaining and promoting high performers (14 and 13th respectively). That is, we tend to promote people primarily on the basis of tenure and top performers are not actively identified, developed and promoted. In best practice workplaces, managers do whatever it takes to retain top talent. Note that the study assessed the actions businesses take and the policies they have in place. So this problem in retention is not just a ‘brain drain’. Indeed, if as a small and distant country we are worried about losing our brightest and best, we should be performing ahead of the curve.
Figure 16 People management score

- At 10% significance level

4.2.4. Room for improvement

An idea for the areas where the management practices of our medium and large manufactures might improve can be gleaned from Figure 17. New Zealand management practices are quite close to best practice in some of these dimensions, but other they are well behind. A particular stand out is the way the managers in our firms address poor performance.
4.3. Patterns of management capability

In this section we sketch out some more detail of how management capability varies within New Zealand. Large firms employing 200 or more employees have higher management capability than those employing between 50 and 200 staff (Figure 18). This difference is statistically significant across all three areas of management capability (Figure 15). Of course, correlation is not causation; larger firms may have higher management capability because they have better systems, more opportunities for learning etc. or they might be large because they had better managers.
An important potential driver of management capability is ownership. Multinational corporations (MNCs) tend to perform well wherever they are in the world, even in areas where overall management practice scores are particularly low (Bloom, Dorgan, Dowdy and Van Reenen, 2007; cited in UTS, 2010). Foreign- and New Zealand-owned multinationals outperform domestic firms (Figure 19). However, the difference between foreign- and New Zealand owned MNCs is relatively small, by comparison to the difference between them both and domestic companies. Once more, we must be careful not conflate cause and effect. It is possible that it is only the well managed firms that can internationalise.
Another way to think about ownership is set out in Figure 20. Firms with dispersed shareholders have considerably higher management capability scores than firms with other forms of ownership. This may be because publically listed companies are more strongly driven by their need to meet shareholder expectations and deliver robust market value. It may also be that in order to be able to undertake a public offering, the firm must have robust management practices in place. An interesting result for New Zealand was that the difference between family-owned firms with an external CEO and those with an internal CEO is very small. In other countries, businesses that employed an external professional manager as CEO performed much better. This may say something about the size of the market for such people in New Zealand.
5. Summing up

There is general agreement that the two most important engines for economic growth in developed economies are technology and human capital. These two elements are complimentary. Skills are an important factor whereby new technology is developed, dispersed, adopted and implemented. Skills are a means whereby people create value. Skills are the source of innovation and change, but they also facilitate it.

Many of the key policy issues depend upon decisions made by individuals in firms. Successful businesses think strategically about skills. Thus, we need to be aware of the importance of both the skills required for managing, but also of the importance of managing skills. The management and development of a skilled workforce is not merely a nice-to-have, but a fundamental part of successful business strategy.

The availability of workers with the appropriate skills is an important ingredient for successful businesses. A lack of skilled workers can constrain firms’ ability to carry out their business strategy, developing and introducing improved products, services, processes and marketing; and including expansion into new markets.

• Source: UTS (2010) Management Matters in New Zealand
There is a great deal of information collected on the supply of skilled labour. We have information on qualifications and occupations of the population as well as the numbers and qualifications of people leaving school and tertiary education. However, we know much less about the demand for these skills. An important element of this is whether, and how, the skill needs of business are met.

One of the key questions we have asked is: Do New Zealand businesses suffer from a shortage of skilled workers? The answer has two dimensions. The first is with respect to the current workforce – do they have the skills for the job (internal skill gaps)? The second is from the perspective of the labour market – can firms find the skilled workers they need (external skill shortages)?

Only one half of New Zealand businesses feel that all their staff have all the skills required for their job. Around one-in-ten felt that fewer than half of their managers had the skills they needed. This is consistent with our research on the management capability of New Zealand manufacturers. According to firms, the skills that existing staff most need to improve are their customer service/sales, team-working, oral communication and management/supervisory skills.

One-third of businesses find it difficult to fill vacancies because applicants lacked the skills they required. This is almost half of the businesses that had vacancies. Statistical analysis suggests that firms with skill shortages tend to be the more productive firms and those looking to expand or internationalise. Economic theory and a range of empirical evidence suggest that these are likely to be the firms with the highest demand for skills. More importantly, they are also the firms that are essential for New Zealand’s growth.

Businesses report that skills gaps limit their ability to pursue ‘high value’ strategies, such as customising their output, undertaking competitive pricing and planning for future change. A lack of management resources and difficulty recruiting appropriate employees are the main constraints to overseas activity (along with exchange rates and high transport and logistics costs).

Many businesses see skill gaps and shortages as merely a short term constraint and so do not change their business strategy to account for their availability. However, our statistical analysis has found that firms experiencing skill shortages are more likely to train their staff.
In any market there will be a number of potential customers that cannot purchase all they would wish because they are unwilling or unable to pay the market price. This does not mean that the market is malfunctioning. There is an important question for researchers and policymakers to ask before interpreting reports of unfilled vacancies of any kind, and of SSVs in particular, as a ‘skills problem’. This question is: Why do businesses that cannot fill a vacancy not simply raise the wages they are offering?

There a number of reason why firms may not be able to do so. First, it may be because the firm cannot afford to pay any more. If this is the case, the problem is not the labour market or the education system, but the firm’s own productivity. Firms that that undertake activities associated with high productivity are likely to both have a higher demand for skills and be more able to afford to pay skill premia.

Second, the supply of labour takes a long time to adjust. Because of the length of time required to educate and train skilled workers, it takes a long time for changes in wages to influence changes in skill acquisition (particularly if we are relying on the rather indirect mechanism of changes in relative wages influencing the choices of students at school) and immigration is restrained by, among other things, legal barriers and the costs of relocation.

Finally, what evidence we have suggests the management skills required to succeed in the globally competitive marketplace are not universally available to the NZ economy. In particular, there is a long tail of underperformers. This could be related to the size of the economy, its distance from international markets and/or the degree of competition businesses are subject to. It is important, therefore, to consider a number of ways to help increase the level and application of management skills. Management capability is related to (but not the same as) Firm capability: Other people have an influence – often non-managers do managerial tasks and capability and influence often comes from outside of the firm. Firm capability means much more than just managers.
References


