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Firm Dynamics in New Zealand: A Comparative Analysis with OECD Countries

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Abstract

Previous work has suggested that New Zealand's firm dynamics and business demographics show a high proportion of small firms, small average firm size, and high rates of firm and employment turnover by comparison with other OECD countries. This paper reports on new comparative analyses of New Zealand's firm dynamics and business demography that attempt to control for measurement differences, using data from Statistics New Zealand's Business Demographic Statistics database, the OECD firm-level project, and the OECD's analysis of the Eurostat database. The variables investigated include firm size, firm turnover (entry and exit) rates, employment turnover rates, firm survival rates, and firm growth. The findings suggest that once measurement differences are taken into account, overall New Zealand's firm dynamics and demographics are broadly similar to many other OECD countries. Potential policy implications of these findings are discussed.

JEL CLASSIFICATION L11 - Production, Pricing and Market Structure; Size Distribution of Firms

D21 - Firm Behaviour

KEYWORDS Firm Size; Firm Dynamics; Firm Growth; Entry and Exit

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Firm Dynamics in New Zealand: A Comparative Analysis with OECD Countries

1 Introduction

The entry and growth of new firms, and the decline and exit of existing firms, are important contributors to aggregate productivity growth in OECD countries (Scarpetta**,** Hemmings, Tressel, and Woo, 2002). As well as contributing to productivity directly, firm entry and exit also increase competition, providing an incentive for existing firms to engage in activities to raise their own productivity. For these reasons, high levels of business dynamism are often thought to be positive for economic performance, and institutions or regulations that restrict firm creation and adjustment are seen as potential impediments to economic growth (Brandt, 2004).

The relationship between firm dynamics and productivity growth in New Zealand has not yet been fully investigated. However, several studies have now looked at evidence on New Zealand's business demographics and levels of business dynamism over time. These studies have highlighted some apparent differences between New Zealand and other OECD countries in terms of indicators of firm dynamics and business demography, including small firm size, high rates of employment turnover (job creation and destruction), high rates of firm turnover (entry and exit), and low rates of firm growth.

This paper extends on previous New Zealand research by carrying out an extensive comparative analysis of firm dynamics in New Zealand and other OECD countries. This analysis attempts to take measurement differences into account (as far as is possible given data limitations) by obtaining new business demography statistics for New Zealand that use similar criteria to those applied in recent OECD studies (Bartelsman *et al*, 2003; Brandt 2004). The findings suggest that once measurement differences are taken into account, New Zealand's firm dynamics and demographics are more similar to other OECD countries than has previously been thought.

As well as addressing measurement issues, the current paper also looks at a broader range of firm dynamics variables than has been covered in previous studies. The variables covered in the analysis include overall firm size, size of entering and exiting firms relative to incumbent firms, firm and employment turnover rates, firm survival rates, and firm growth rates.

The remainder of the paper will begin by discussing the previous studies of business dynamics in New Zealand and the measurement issues they raise, and then go on to

outline the key characteristics of New Zealand's business demography data and of the overseas data that are available for comparison. The key measurement issues to be considered in making international comparisons of firm dynamics will then be set out, and the main differences in the different databases highlighted. The paper will then report on the results of comparative analysis of a range of firm dynamics variables, controlling for measurement differences to the extent that this is possible given data limitations.

2 Measurement issues in firm dynamics

2.1 New Zealand studies

As discussed in the introduction, several studies have now looked at evidence on New Zealand's business demographics and levels of business dynamism over time (Johnson, 1999; Carroll, Hyslop, Maré, Timmins, and Wood, 2002; Skilling, 2001; Simmons, 2002; MED, 2003; Mills, 2003). These studies have highlighted some apparent differences between New Zealand and other OECD countries in terms of indicators of firm dynamics and business demography.

First, almost all of the studies of firm dynamics in New Zealand have concluded that New Zealand has a very high proportion of small firms (and correspondingly low average firm size) by comparison with other OECD countries. An exception is MED's (2003) study "SMEs in New Zealand: Structure and Dynamics", which concluded that the proportion of SMEs in New Zealand was broadly in line with other countries, although the proportion of employment accounted for by SMEs was higher in New Zealand. Mills (2003) also presented some preliminary data to suggest that New Zealand's firms were not as small as had been claimed in previous studies.

Secondly, Carroll *et al's* (2002) study presented comparisons with the USA and UK (based on OECD work) which suggested that New Zealand has high rates of employment turnover (ie, job creation and destruction) compared with other countries. Carroll *et al* (2002) suggested that this could be linked to the high proportion of small firms in New Zealand, as job turnover tends to be higher in such firms.

Thirdly, Mills (2003) compared New Zealand's firm turnover (entry and exit) rates with other OECD countries, and found the New Zealand rates to be substantially higher than typical OECD figures. New Zealand's firm turnover rates – as calculated by Johnson (1999) – averaged about 37% per year over the 1990s, as compared with a modal OECD figure of approximately 20%.

Fourthly, although good comparative data were not available, Skilling (2001), Simmons (2001), and Carroll *et al* (2002) all presented preliminary data that suggested low or modest rates of employment growth among New Zealand firms. However, Mills (2003) presented data that suggested employment growth among new firms in New Zealand was slightly higher than in European countries, although lower than in the USA.

A range of views has been expressed as to whether these features of New Zealand's firm dynamics and business demography should be seen as positive, negative or neutral for economic performance. As discussed above, business dynamism is generally thought to be positive for economic performance and productivity. However, some authors (eg, Skilling, 2001; Simmons, 2001) have argued that high rates of firm entry and exit, small firm size, and low rates of firm growth could be indicative of a difficult economic

environment – possibly due to size and distance – that impedes growth in New Zealand firms.

2.2 Measurement issues

Regardless of whether the features of New Zealand's firm dynamics outlined above are thought to be positive or negative for economic performance, a major unresolved question is the extent to which differences in firm dynamics between New Zealand and other countries can be explained by measurement differences. The comparability of firm demographic data across countries has been noted by the OECD as an important potential constraint on studies of firm behaviour, and improving data comparability was a major reason for the instigation of the OECD's firm-level project (Scarpetta *et al*, 2002; Bartelsman, Scarpetta, and Schivardi, 2003). This project attempted to construct a uniform business demography database covering ten OECD countries, through harmonisation of key measurement dimensions (eg, definition of entry and exit, definition of a firm). However, New Zealand was not one of the countries included in the study.

Measurement problems in comparing firm dynamics across countries were also highlighted in a recent OECD paper by Brandt (2004). Brandt made use of a new firm dynamics database – developed by Eurostat – which had some different characteristics from the OECD firm-level project database, but covered many of the same countries. By comparing firm dynamics statistics derived from the OECD and Eurostat databases, Brandt was able to show that specific measurement differences in the data were strongly associated with differences in firm dynamics indicators. A particularly important factor highlighted by Brandt (2004) was that of zero-employee (non-employing) firms – these firms were excluded from the data in the OECD firm-level project, but included in the Eurostat data. Brandt found that the inclusion of zero-employee firms made a large difference not only to measures of firm size, but also to the measurement of other variables, including firm turnover rates and firm growth.

Mills (2003) drew on an early draft of Brandt's (2004) paper to put forward some initial hypotheses on how measurement issues might affect New Zealand's firm dynamics indicators. Mills suggested that the inclusion of zero-employee firms in New Zealand's business demography data might lead to estimates of smaller firm size, higher turnover rates, lower survival rates, and higher growth rates than would otherwise be the case. However, at that time the data needed to test these hypotheses had not yet been obtained.

3 Description of data

3.1 New Zealand data – the Business Demographic Statistics database

All of the New Zealand data discussed in this paper are sourced from the New Zealand Business Demographic Statistics database (BDS). A full description of this database can be found in Carroll *et al* (2002), but to summarise, the BDS is effectively a "snapshot" of the Business Frame (the register of all economically significant businesses in New Zealand) that is updated in February each year. The information in the BDS is derived from Statistics New Zealand surveys, particularly the Annual Business Frame Update or

ABFU, that are administered to all GST-registered businesses in New Zealand (and some that are not registered), provided they satisfy at least one of the following criteria of "economic significance":

a) having over $30,000 annual GST expenses or sales;

b) having more than two full time employees (including working proprietors);

c) being in a GST-exempt industry, except residential leasing and rental;

d) being part of a group of enterprises;

e) being a new GST registration that is compulsory, special or forced (normally meaning that the enterprise is expected to exceed the $30,000 level); or

f) being registered for GST and involved in agriculture or forestry.

These criteria for the database were introduced in 1994. Prior to 1994, businesses were included purely on the basis of GST registration, which is compulsory for firms with $30,000 annual turnover or more, but may also be undertaken voluntarily. Data for the periods before and after 1994 will therefore differ in some respects, and most of the analyses reported on in this paper focus on the period 1994-2001.

The BDS database contains details on business activity, number of employees, and GST sales. Data is available at both the enterprise (firm) level and the geographic unit (plant) level of analysis.

Finally, it should be noted that the BDS contains information on firms across most industries in the economy but *excludes* the agricultural production (farming) sector, as well as some others, primarily community services[1].

3.2 International data

The international data used for the comparisons in this paper are drawn primarily from the OECD firm-level project (Bartelsman *et al*, 2003), and to a lesser extent from the OECD's analysis of the Eurostat business demography database (Brandt, 2004).

The OECD firm-level project provides data on firm dynamics and demography for ten OECD countries – the USA, Germany, France, Italy, the UK, Canada, Denmark, Finland, the Netherlands, and Portugal – primarily for the sample period 1989-1994. The data available from the Eurostat covers Belgium, Denmark, the Netherlands, Spain, Italy, Portugal, Finland, Sweden and the UK, for the sample period 1997-2000.

In addition to the OECD and Eurostat data, some separate data on firm size were also obtained from the public websites of the Australian Bureau of Statistics, the US Census Bureau, and the UK Small Business Service.

[1] Between 1994 and 2001, a full list of industries excluded from the BDS is as follows: Agriculture and livestock production; Residential property leasing and rental; Commercial property and leasing; Child care services; Residential and non-residential services; Business, professional and labour organisations in 1994-95; and Religious organisations, Social and community groups, and Sporting and recreational services in 1994-96.

4 Data issues and cross-country differences

As discussed, measurement issues are likely to affect the viability of cross-country comparisons of firm dynamics. These issues will be highlighted throughout the paper as comparisons are made. However, it is also worth discussing at the outset the key issues in data comparability between the three main data sources used in this paper (the New Zealand BDS, the OECD firm-level project, and the Eurostat). These data differences are summarised in Appendix Table 1.

4.1 Sector coverage

There are some differences in sectoral coverage across the different databases, although generally these do not appear to be substantial. As discussed above, the main sectors excluded from the New Zealand BDS are agriculture and community services. The sectors excluded from the OECD firm-level project vary depending on the country, but many of the analyses reported on in Bartelsman *et al* (2003) also exclude agriculture and community services.

One aspect of sector coverage that is likely to impact on cross-country comparisons is the Government administration/public service sector. In the OECD project, data for around half of the countries surveyed (namely Canada, Denmark, Finland, France, and the Netherlands) includes the public sector, while data for the remaining countries (Italy, Portugal, Germany and the USA) does not. We were not able to determine with certainty the sectoral coverage of the Eurostat database, however Brandt (2004) implies that the Eurostat data covers most if not all sectors of the economy.

Most of the analyses reported on for New Zealand in this paper include the public sector, as many of the obvious benchmark countries for New Zealand in the OECD project (eg, countries most similar to New Zealand in terms of economy/population size) also include the public sector in their data: for example, Denmark, Finland, Canada and the Netherlands. However, some additional data on firm size was obtained to test the effect of excluding the public sector on New Zealand's firm size distribution, and to allow better comparisons with countries like Australia that only include firms from the private sector. Where relevant, the paper reports figures for firm size in the private sector only, either in addition to or instead of figures for the total economy.

4.2 Sample period

The three databases cover slightly different sample periods: mainly 1994-2001 for the NZ data obtained for this paper, mainly 1989-1994 for the OECD project, and 1997-2000 for the Eurostat data. To the extent that the variables in question differ over time, this may impact on the results to some (uncertain) extent. Wherever possible, the analyses in this paper use statistics for New Zealand that cover the same or similar time periods as those used in the comparator data. However, this was not possible in every case. Even where the same time periods are available, it should be kept in mind that different countries may be at different stages of the business cycle, which could affect the comparability of results.

4.3 Measure of employment

4.3.1 Employee vs total employment

Employment can be measured using either an "employee only" measure (where working proprietors are excluded from the count), or a "total employment" measure (where working proprietors are also counted as employees). Publicly available data from the New Zealand BDS generally use a "total employment" measure, but it is also possible to obtain figures just on employees. Both the OECD firm-level project and the Eurostat data generally use an employee only measure of employment.

4.3.2 FTE vs. headcount

Another issue in terms of employment is whether the measure used refers to the number of full-time equivalent employees (FTEs) or a simple headcount of all full and part-time employees. Publicly available data from the New Zealand BDS generally use an FTE measure of employment, although measures of full and part-time employees are also provided. In contrast, both the OECD firm project and the Eurostat use a straight headcount measure of employment.

4.4 Unit of analysis – plant versus enterprise

Data for firms in the New Zealand BDS are collected at both the plant (geographic unit) level and the enterprise level. Some previous New Zealand studies have used plant level data (eg Carroll *et al,* 2002) while others have used enterprise data. The data in both the OECD firm-level project and the Eurostat database are generally at the enterprise level.

4.5 Threshold for inclusion of a firm in the database

Perhaps the most serious problem for international comparisons of firm demography is differences in the threshold for inclusion of a firm in the database. Most countries apply some sort of size threshold (in terms of either earnings or employment) whereby firms below that threshold are not included in the statistics.

The threshold criteria for the New Zealand BDS database have been outlined above. The key criterion for the BDS is GST turnover – in most cases, firms with annual GST sales or expenses above $30,000 will be included in the database, while those with turnover below this level will normally be excluded (although they may still be included if they meet one of the other criteria). This means that even very small firms with zero employees can be included in the New Zealand BDS, provided they have a turnover above $30,000 per year.

In the OECD firm-level project, most of the countries apply a threshold criterion based on firm size: firms must have at least one employee (in addition to any working proprietor/s) to be included in the database. This means that very small firms with zero employees are normally excluded from the statistics. However, to our knowledge most countries in the OECD project (with the exception of France) do not apply a turnover criterion, provided firms have at least one employee.

In the Eurostat data the only criterion that must be met is that a firm must have some positive turnover. Provided turnover is greater than zero, a firm will normally be included

in the database regardless of size. The Eurostat therefore has the most liberal criteria for inclusion of firms out of the three key data sources used in this paper.

4.6 Definition of firm entry and exit

Another issue affecting international comparability of firm dynamics indicators is the definition of firm entry and exit. In both the New Zealand BDS and the OECD firm-level project data, it is not possible to distinguish between entries and exits that result from the "true" creation or destruction of a firm, and entries/exits that result from other demographic events like mergers and acquisitions (for example, if a firm is sold to a new owner, this will normally be measured as the "exit" of one firm and the "entry" of another).[2] To the extent that the frequency of mergers and acquisitions differs across countries, this may affect the comparability of results.

In contrast, the Eurostat database has largely been cleaned of "false" entries and exits (Brandt, 2004). This means that measures of firm entry and exit are likely to be more accurate in the Eurostat data than in either the New Zealand BDS or the OECD firm-level project data. However, the Eurostat measures of entry and exit they will not be comparable with other databases that have not been cleaned in this way.

4.7 One-year firms

Another issue which also relates to firm entry and exit is the treatment of "one-year" firms. In the OECD firm-level project, firm entry and exit were defined in terms of three (rather than two) time periods. Firm entries were those observed as (out, in, in) the database at time (t-1, t, t+1), while exits were observed as (in, in, out) at time (t-1, t, t+1) (Bartelsman *et al*, 2003). Firms that appeared in the database in a given year but not in the two adjacent years (ie, they were observed as (out, in, out) at time (t-1, t, t+1)) were termed "one-year" firms. These firms were excluded from all analyses, including analyses of variables other than entry and exit rates (eg, firm size).

A similar issue to one-year firms is that of non-contiguous firms, which we also term "rebirths". These are firms that disappear from the database for one or more years and then reappear (ie, they are observed as (in, out, in) the database at time (t-1, t, t+1)). In a sense rebirth firms are the opposite of one-year firms. While the treatment of rebirth firms in the OECD project is not made explicit in Bartelsman's (2003) paper, we have assumed that they were also excluded from the analyses. This is because rebirths (like one-year firms) do not conform to the definitions of firm entry and exit used in the OECD project. In the remainder of the paper, references to one-year firms should be taken to also include rebirths.[3]

To our knowledge, previous studies of firm dynamics in New Zealand using the BDS data have not tried to exclude one-year firms. We are uncertain of the exact status of one-year firms in the Eurostat, but have assumed that they are included, given that the Eurostat has the most liberal criteria overall for inclusions of firms in the database. However, the Eurostat approach of cleaning the data to remove false entry and exit might have the

[2] Although it is not currently possible to clean New Zealand's business demography data of false entry and exit, it should be noted that the development of the Linked Employer Employee Database (LEED) by Statistics NZ should soon make this feasible.

[3] It should be noted that sensitivity analysis carried out for this paper suggests that once one-year firms are removed from the data, the additional removal of rebirth firms makes little additional difference to indicators of firm dynamics. We are therefore confident that the treatment of rebirth firms should not substantively affect the conclusions drawn in this paper.

effect of eliminating some one-year firms. This is because the one-year firm category is assumed to include a high number of measurement errors and false entries and exits (Bartelsman *et al*, 2003).

4.8 Addressing measurement differences

To address measurement differences in comparisons of firm dynamics across countries, there are effectively two approaches that can be taken. One would be to obtain indicators of firm dynamics from other countries, but using similar measurement criteria to those applied in the New Zealand BDS data. This is often difficult or impossible, given limited access to other countries' statistical databases.

The other approach – and the one taken here – is to obtain new statistics on New Zealand's firm dynamics from the BDS source data, by adjusting the measurement criteria to mirror the criteria used in overseas databases (to the extent that this is possible given data limitations).

In practice, this means the following. First, for *all* of the analyses reported on in this paper, data were obtained from the New Zealand BDS at an enterprise level of analysis, using an employee only and headcount measure of employment. This is because both the Eurostat data and the OECD firm-level project generally use enterprise level data, and an employee and headcount measure of employment.

Secondly, depending on the comparison being made, further adjustments to the New Zealand data were made to reflect differences in the criteria for inclusion of firms in the database, in the treatment of one-year firms, and in sector coverage. When making comparisons with data from the OECD firm-level project, zero-employee firms and one-year firms were generally *excluded* from the New Zealand data. When making comparisons with the Eurostat data, zero-employee firms and one-year firms were generally *included.* In addition, for some of the analyses of firm size – in particular, comparisons with publicly available data from the USA, UK, and Australia – the public sector was also excluded from the New Zealand data.

Finally, where possible, the statistics for New Zealand were calculated over the same or similar time periods as those used in the comparator data. However this was not possible in every case. And as discussed above, even where the same time periods are available, there may still be business cycle effects that impact on the comparability of firm dynamics statistics.

5 Main findings

This section of the paper presents the results of a comparative analysis of the following firm dynamics variables, in New Zealand and other OECD countries: firm size (Section 5.1); size of entering and exiting firms (Section 5.2); firm turnover (entry and exit) rates (section 5.3); employment turnover rates (Section 5.4); firm survival rates (Section 5.5); and firm growth rates (Section 5.6).

For each variable, comparisons are made initially with the OECD firm-level project data, normally with zero-employee and one-year firms removed from the New Zealand data. Comparisons are then made with the Eurostat data where appropriate (a comparison with the Eurostat data was not undertaken for all of the above variables, for reasons that are

discussed further below). For Section 5.1 on firm size, some additional comparisons are also presented using publicly available data for the UK, the USA and Australia.

5.1 Firm size

Several studies have now concluded that New Zealand has a very high proportion of small firms (and correspondingly low average firm size) by comparison with other OECD countries. However, previous comparisons of firm size are likely to have been confounded by measurement differences, particularly the inclusion of zero-employee firms. Another measurement issue that may have affected some previous studies of firm size is the use of an FTE measure of employment in New Zealand's BDS data. Use of an FTE measure would reduce apparent firm size relative to countries that use a head count measure, since two part-time employees would be counted as one employee under an FTE measure, but two employees under a headcount measure.

5.1.1 Comparison with OECD firm-level project

Proportion of small firms in the population

Table 1 shows the proportion of firms in the population that have fewer than 20 employees, in New Zealand and other OECD countries from the OECD firm-level project (Bartelsman *et al*, 2003). Zero-employee and one-year firms have been removed from the New Zealand data, in order to achieve comparability with the criteria used in the OECD project.[4] However the figure for New Zealand when these firms are left *in* the data is also shown for comparative purposes. The New Zealand figure is an average calculated for the 1994-2001 period, while the OECD data range across the period 1989-1994.

Table 1 – Proportion of firms with less than 20 employees, NZ and OECD firm project data

Country	Proportion
France	78.8%
Portugal*	85.9%
USA*	86.5%
Germany*	87.1%
Denmark	88.1%
NZ	90.7%
Finland	92.6%
Italy*	93.0%
Netherlands	96.0%
NZ (0-emp/1-yr firms in)	96.1%

*Private sector only. Note that if public sector is removed from the NZ data, the proportion of small firms rises to 92.1%.

Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

[4] It should be noted that the removal of one-year firms makes little further difference to measures of firm size once zero-employee firms have been removed.

The comparison in Table 1 suggests that once zero-employee and one-year firms have been removed, the proportion of small firms in the New Zealand population is broadly within the OECD range. New Zealand has a lower proportion of small firms (90.7%) than do Finland (92.6%), Italy (93.0%), and the Netherlands (96.0%) – although it is not possible to be certain in the latter case, as zero-employee firms have been included in the Netherlands data. New Zealand does however have a higher proportion of small firms than Denmark, Portugal, USA, Germany and France. The size of the difference ranges from 2.6% (Denmark) up to 11.9% in the case of France. However, France appears to be something of an outlier, and this is probably due to the fact that the French business register applies a high turnover threshold – 3.8 million FFr per year in the manufacturing sector, and 1.1 million FFr per year in the services sector (Bartelsman *et al*, 2003). This high turnover threshold is likely to mean that many small firms would be excluded from the French data.

Proportion of employment in small firms

Table 2 shows the proportion of *employment* in firms with fewer than 20 employees, again for New Zealand and other OECD countries from the firm-level project. The New Zealand data has been adjusted in the same way as for the previous comparison.[5]

Table 2 – Proportion of employment in firms less than 20 employees, NZ and OECD firm project data

Country	Proportion
France	14.0%
USA*	17.3%
Germany*	23.6%
Finland	25.8%
Portugal*	26.9%
NZ	28.2%
Denmark	30.2%
Netherlands	34.2%
Italy*	38.1%
NZ (0-emp/1-yr firms in, total emp)	40.1%

*Private sector only. Note that if public sector is removed from the NZ data, the proportion of employment in small firms rises to 32.5%.

Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

This comparison presents a broadly similar picture to the previous one on the distribution of firms. New Zealand has a smaller proportion of employment in small firms (28.2%) than do Italy (38.1%), Denmark (30.2%), and the Netherlands (34.2%), but a higher proportion of employment in small firms than the remaining countries (Denmark, Portugal, USA, Germany and France). France again appears to be an outlier, with only 14.0% of employment in small firms, but this is likely to be related to the high turnover threshold discussed above. The USA also has a relatively low proportion of employment (17.3%) in small firms.

[5] The reader may question why removing zero-employee firms would make any difference to the share of employment in small firms. However, as discussed in section 3.3, public data and previous studies in New Zealand have generally used a "total employment" measure, where working proprietors are included in the employment count. The comparison in Table 2 looks at the share of employees only, but a figure for New Zealand using a "total employment" measure is also shown for comparative purposes.

Average firm size

A final indicator of firm size used in the OECD firm-level project is the average number of employees per firm. Table 3 shows the average number of employees per firm for New Zealand and other OECD countries from the firm-level project. The New Zealand data have been adjusted in the same way as for the previous two comparisons.

Table 3 – Average number of employees per firm, NZ and OECD firm project data

Country	Employees per firm
France	33.2
USA*	25.6
Germany*	17.7
Portugal*	17.4
Denmark	15.2
Canada	15.2
NZ	13.7
Finland	13.0
Italy*	10.0
Netherlands	5.8
NZ (0-emp/1-yr firms in)	5.6

*Private sector only. Note that if public sector is removed from the NZ data, the average number of employees per firm drops to 11.6.

Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

Once again, the pattern is similar to the previous two indicators of firm size. New Zealand has a higher average number of employees per firm (13.7) than do Finland (13.0), Italy (10.0) and the Netherlands (5.8) – though again zero-employee firms have been included for the Netherlands data. However, New Zealand has a smaller average number of employees per firm than Denmark, Portugal, the USA, Germany, France and Canada. The differences in most cases are not very great, although the USA and France in particular have a high average number of employees per firm (25.6 and 33.2 respectively). Data caveats again apply to the figure for France.

Table 3 also shows particularly clearly the impact that measurement issues can have on indicators of firm size. When zero-employee and one-year firms are removed from the New Zealand data, our average firm size stands at 13.7 employees per firm, whereas when these firms are left in the data (as they have been in previous studies), average firm size drops to 5.6, the lowest of the countries shown in the table.

Sector comparisons

The above comparisons of firm size relate to the economy as a whole. However, it may also be of interest to look at how firm size compares in different sectors. Skilling (2001) presented data to suggest that New Zealand firms were particularly small in the manufacturing sector, relative to manufacturing firms in other countries. While Skilling's (2001) comparisons are likely to have been affected by measurement issues, it is of interest to see whether the proposition that New Zealand has smaller firms in the manufacturing sector still holds once measurement differences are taken into account.

Tables 4 and 5 compare firm size in the manufacturing and business services sectors for New Zealand and other countries in the OECD firm-level project. Three indicators of firm size are again shown – the proportion of firms with less than 20 employees, the proportion of employment in firms with fewer than 20 employees, and average number of employees per firm. (The table is ordered in terms of average number of employees per firm, as this indicator shows the cross-country differences most clearly.) Zero-employee and one-year firms have been removed from the New Zealand data.

Table 4 – Firm size indicators in manufacturing sector, NZ and OECD firm project data

Country	Average employees per firm	% of firms with <20 employees	% employment in firms <20
USA	80.3	69.9%	5.8%
UK	40.7	74.9%	8.3%
Canada	40.5	data unavailable	data unavailable
Germany	39.1	77.9%	11.3%
Denmark	30.4	74.0%	16.1%
France	32.1	73.6%	17.0%
Portugal	31.0	70.5%	15.7%
Finland	27.8	84.8%	13.0%
NZ	20.0	85.3%	22.3%
Netherlands	18.3	86.7%	16.9%
Italy	15.3	87.5%	30.3%

Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

Table 5 – Firm size indicators, business services sector, NZ and OECD firm project data

Country	Average employees per firm	% of firms with <20 employees	% of employment in firms <20
France	35.7	78.8	12.1
USA	21.4	87.9	20.6
Denmark	12.7	90.8	33.4
Canada	12.0	data unavailable	data unavailable
Germany	11.5	90.2	33.8
Portugal	11.4	92.8	39.8
NZ	10.5	93.4	35.2
Finland	9.9	94.5	33.0
Italy	6.8	96.5	46.3
Netherlands	5.3	96.8	41.9

Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

The comparisons in these two tables provide some support for the idea that it is particularly in the manufacturing sector that New Zealand tends to have smaller firms than other countries. New Zealand's manufacturing firms are not the smallest of the countries shown – Italy and the Netherlands both appear to have smaller firms (although again zero-employee firms have been included for the Netherlands data). However, the

differences in firm size between New Zealand and other countries with larger manufacturing firms are more pronounced than they were for the total economy data. For example, in the total economy data, the average number of employees per firm in New Zealand was similar to countries like Denmark, Canada, and Finland. In contrast, in the manufacturing sector data, all three of these countries have a noticeably higher average number of employees per firm than does New Zealand (30.4 for Denmark, 27.8 for Finland, and 40.5 for Canada, as compared with 20.0 for NZ).

New Zealand is also towards the smaller end of the size distribution in the services sector, as shown in Table 5. However, the cross-country variation in firm size in the services sector is much less than the variation in the manufacturing sector. As might be expected, firms are also considerably smaller in the services sector than in the manufacturing sector overall.

5.1.2 Comparison with Eurostat data

An alternative approach to analysing firm size is to compare the firm size indicators for New Zealand (with zero-employee and one-year firms included) against those from the Eurostat data (Brandt, 2004).

Table 6 shows the proportion of firms in the population that have 0, 1-4, 5-9, 10-19, and 20+ employees, in New Zealand and in other OECD countries covered by the Eurostat. Zero-employee firms and one-year firms have been left in the New Zealand data for this comparison. The New Zealand figures are averages calculated for the 1997-2000 period, in order to match the time period of the Eurostat data.

Table 6 – Distribution of firms by size, NZ and Eurostat data

Size (Employees)	NZ	Den	Finland	Spain	Neth	Portugal	UK	Sweden
0	56.3%	58.2%	61.2%	56.4%	37.9%	56.1%	26.5%	63.8%
1-4	29.9%	27.8%	27.9%	32.4%	45.5%	31.5%	52.3%	24.9%
5-9	5.5%	6.5%	5.5%	5.9%	6.5%	6.2%	10.7%	5.6%
10-19	4.4%	3.9%	2.9%	3.0%	4.3%	3.4%	5.9%	3.0%
20+	3.9%	3.7%	2.6%	2.4%	5.8%	2.8%	4.6%	2.7%

Sources: Statistics NZ and Eurostat/Brandt 2004

On this comparison, all of the countries shown have a very high proportion of small firms (95% or above), but New Zealand seems if anything to have a slightly smaller proportion of small firms than most other countries. Of New Zealand's firms, 96.1% have fewer than 20 employees, the third lowest figure after the Netherlands and the UK. However, it must be kept in mind that the New Zealand data applies a turnover criteria (firms must have annual GST sales/expenses of over $30,000 to be included in the BDS) whereas the Eurostat data does not (any firm with positive turnover is normally included). The $30,000 threshold would be likely to reduce the number of small firms – particularly zero-employee firms – in the New Zealand data relative to the Eurostat. In light of this difference in turnover thresholds, the proportion of zero-employee firms in the New Zealand data appears possibly quite high; however, a definitive comparison is not possible without knowing how many New Zealand firms are excluded by the turnover threshold.

Brandt's (2004) analysis of the Eurostat firm dynamics data did not include either the share of employment by firm size or the average number of employees per firm. It is therefore not possible to make a comparison with the Eurostat data on these indicators.

5.1.3 Other comparisons of firm size

Some final comparisons of firm size were carried out using publicly available business demographic data from the US census bureau website[6], the UK small business service website[7], and the Australian Bureau of Statistics website.[8] One advantage of this additional data was that it provided a more detailed breakdown of firm size at the upper end of the size distribution, allowing comparison not just of the proportion of small firms, but also of the proportion and share of employment of larger firms. The data from these websites also covered zero-employee firms, allowing additional comparisons at the bottom end of the size distribution.

Comparisons with USA and UK

Tables 7 and 8 compare the distribution of firms and share of employment across size brackets 0, 1-4, 5-9, 10-19, 20-99, 100-499, and 500+ employees, for New Zealand, the USA and the UK. Data for all three countries are for the 2001 year, and are for private sector businesses only to ensure comparability[9]. Zero-employee and one-year firms have been left in for the New Zealand data, as for the other two countries.

Table 7 – Distribution of firms by size, NZ, USA and UK – private sector

Size (Employees)	NZ	USA	UK
0	61.0%	77.3%	69.3%
1-4	23.9%	12.3%	20.0%
5-9	7.8%	4.6%	5.3%
10-19	4.1%	2.8%	3.0%
20-99	2.7%	2.4%	1.9%
100-499	0.4%	0.4%	0.3%
500+	0.1%	0.1%	0.1%

Sources: Statistics NZ, US Census Bureau, and UK Small Business Service

6 http://www.census.gov/epcd/susb/2001/us/US--.HTM

7 http://www.sbs.gov.uk

8 http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/A7799B9452831799CA256B35001C9567

9 Data was available for New Zealand and the UK that both included and excluded the public sector. However, data for the USA was only available for private sector firms.

Table 8 – Distribution of employment by firm size, NZ, USA and UK – private sector

Size (Employees)	NZ	USA	UK
0	0.0%	0.0%	*1.4%
1-4	10.9%	4.9%	8.4%
5-9	10.9%	5.8%	6.8%
10-19	11.6%	7.2%	7.9%
20-99	21.9%	17.7%	15.2%
100-499	19.0%	14.3%	13.5%
500+	25.8%	50.1%	46.7%

*The UK Small Business Statistics show a small number of employees in "zero-employee" firms. It is not clear why this would be the case, but they have been left in for the purposes of this comparison.

Sources: Statistics NZ, US Census Bureau, and UK Small Business Service

The comparison in Table 7 suggests that the distribution of firms is broadly similar across all three countries. If anything, New Zealand seems to have a slightly lower proportion of small firms than the USA and the UK (where small is defined as fewer than 20 employees): 96.8% of New Zealand firms have fewer than 20 employees, as compared with 97.2% for the USA and 97.6% for the UK.

The USA has the highest proportion of zero-employee firms, and New Zealand the lowest. However, detailed information on any turnover threshold that may have been applied to the US and UK data was not available on the public websites. It could be that the turnover threshold applied in the New Zealand data (minimum of $30,000 in GST sales/expenses) is again impacting on the number of zero-employee firms relative to the other countries in this comparison.

There is also little difference in the proportion of large firms across the three countries: in all three, around 0.1% of the population of firms have 500 or more employees. However, there is a noticeable difference in the share of employment accounted for by large firms, as shown in Table 8. In New Zealand, only 25.8% of employment is in firms of 500+ employees, whereas in the USA and the UK around half of employment is in such firms. Similarly, 44.8% of employment in New Zealand is in firms with 100 or more employees, while the equivalent figures for the USA and UK are 64.4% and 60.2% respectively.[10] Conversely, a larger share of New Zealand's employment is in small to medium firms.

These figures suggest that New Zealand's large firms are not as large as those in the USA and the UK, and further analysis confirms this view: for example, the average number of employees per firm in firms with 500+ employees is 2532.2 in the UK and 3321.1 in the USA, but only 1593.9 in New Zealand. However the average number of employees per firm overall (with zero-employee firms included for all three countries) is similar across the three countries: 5.6 for NZ, 5.2 for the USA, and 5.1 for the UK. The USA has the lowest average firm size on this comparison, due to the very high proportion of zero-employee firms in the US data. This again reinforces the significant impact that

10 It will be noted that these figures on the share of employment in large firms in New Zealand differ from other studies – for example, MED (2003) and Carroll et al (2002) both calculated the share of employment in firms of 100+ employees at about 40%. However it must be kept in mind that these studies used a "total employment" measure of employment, ie working proprietors were included in the count. In contrast the figures shown here are for employees only. Note also that the MED (2003) study used an FTE measure of employment as opposed to a head count measure.

measurement differences can have in calculations of firm size. When zero-employee firms are removed from the USA data (as in the OECD firm project), the USA has a high average firm size relative to other OECD countries.

Comparisons with Australia

A final comparison of interest – with Australia – is shown in Table 7. The table shows the distribution of firms and share of employment for both countries, across size brackets 0, 1-4 (NZ 1-5), 5-19 (NZ 6-19), 20-99, 100-199, and 200+ employees. The New Zealand data is for 2001 while the Australian data is for 1999-2000. Zero-employee and one-year firms have been left in for both countries, and the figures shown are for private sector firms only to ensure comparability.[11]

Table 9 – Distribution of firms and employment by firm size, NZ and Australia – private sector

Size (Employees)	Firms		Employment	
	NZ	Australia	NZ	Australia
0	61.0%	48.6%	0.0%	0.0%
1-4	23.9%	32.8%	11.4%	13.2%
5-19	11.9%	15.0%	17.8%	25.1%
20-99	2.9%	3.0%	22.3%	22.4%
100-199	0.3%	0.3%	8.0%	8.9%
200+	0.2%	0.2%	36.8%	30.5%

Sources: Statistics NZ and Australian Bureau of Statistics

Table 7 suggests that the distribution of firms is broadly similar across the two countries. New Zealand has a noticeably higher proportion of zero-employee firms (61.0% as compared with 48.6% for Australia), while Australia has more firms sized 1-4 and 5-19 employees. However the overall proportion of small (less than 20 employees) firms is very similar in the two countries (96.8% for NZ versus 96.5% for Australia).

The distribution of employment is also similar in both countries, although New Zealand has a somewhat higher proportion of employment in large firms of 200 employees or more (36.8% vs 30.5% for Australia). This suggests that New Zealand's large firms may in fact be larger on average than Australia's, and further analysis backs this up: the average number of employees per firm in firms of over 200 employees is 686.8 in New Zealand and 649.6 in Australia.

5.1.4 Summary and discussion

Taken as a whole, the analyses in Section 5.1.1-5.1.3 suggest that once measurement differences are taken into account, the size distribution of firms in New Zealand is broadly similar to a number of other OECD countries. While our firms are generally at the smaller end of the size distribution in most of the comparisons, we no longer appear to be an outlier in terms of firm size in the way that many previous studies have suggested. The major reason for the widespread view that our firms are unusually small appears to be that

[11] Although data was available for New Zealand that both included and excluded the public sector, data for Australia was only available for private sector firms.

previous studies have compared statistics for New Zealand that included zero-employee firms, against statistics for other countries that did not include such firms.

It also does not appear to be the case that New Zealand is particularly unusual in terms of having large numbers of zero-employee firms. Where information is available on zero-employee firms (eg, in the Eurostat data and on websites for the UK, US, and Australia) it appears common for 50% or more of the population of firms to have zero employees. However, it is difficult to make accurate comparisons at the bottom end of the size distribution, given limited information on the other criteria that are applied (eg turnover criteria) to determine the inclusion of firms in different countries' databases. The comparison with the Eurostat data did suggest that New Zealand might have quite high numbers of zero-employee firms, when account is taken of the fact that the New Zealand data applies a turnover threshold whereas the Eurostat data does not.

Although generally speaking New Zealand's firms seem to be broadly within the OECD range in terms of size, there are a couple of areas of difference. For one, New Zealand does seem to have relatively small firms in the manufacturing sector by OECD standards. For another, the share of employment accounted for by large firms (and the average number of employees per firm in large firms) is lower in New Zealand than in the USA and the UK. In other words, while we do not seem to have significantly more small firms than many other countries, our large firms seem not to be as large, at least by comparison with some other countries.

Although the data are not sufficient to test hypotheses as to why this would be the case, it seems plausible that the small size of New Zealand's domestic market might constrain firm growth at the top end of the size distribution. Generally speaking, the data do suggest that bigger countries like the USA, the UK, Germany and France have a greater share of employment in large firms than do smaller countries. If economies of scale are more important in the manufacturing sector, this could possibly explain why the differences in firm size across countries are more marked in this sector.

5.2 Size of entering and exiting firms

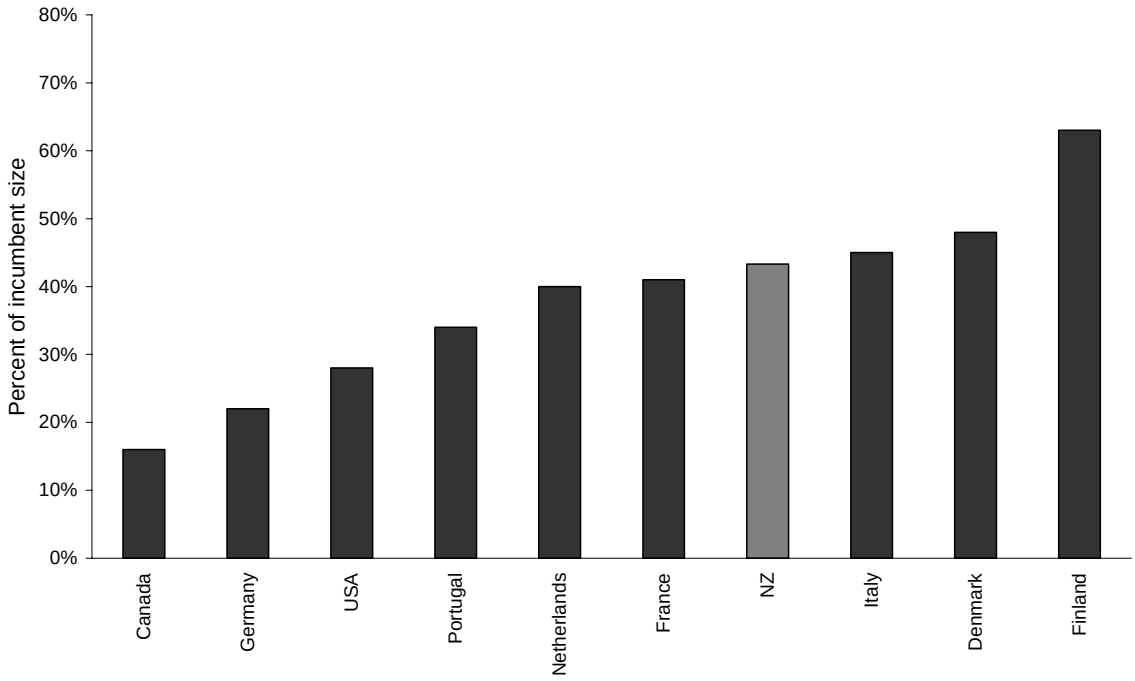
The analyses in Section 4.1 examined the size of firms in the population as a whole. Another variable of interest with regard to firm size is the size of entering and exiting firms. Previous studies (eg Carroll *et al*, 2002; Bartelsman *et al*, 2003) have found that in both New Zealand and other OECD countries, entering and exiting firms tend to be significantly smaller than incumbent firms. However, no attempt has yet been made to compare the size of entering and exiting firms between New Zealand and other OECD countries.

Figures 1 and 2 show the size of entering and exiting firms relative to incumbent firms, for New Zealand and other OECD countries from the firm-level project. The measure of firm size used is average number of employees per firm. The New Zealand data are averaged across the 1995-2000 period, with zero-employee and one-year firms removed from the data.

This comparison suggests that the size of both entering and exiting New Zealand firms (relative to incumbents) is at or slightly above the middle of the OECD range. In New Zealand, entering firms are on average about 43% of the size of incumbent firms, while exiting firms are slightly larger at around 49% of the size of incumbent firms. While these figures are similar to those for a number of European countries, it is noticeable that firms in North America (the USA and particularly Canada) seem to enter at a smaller size

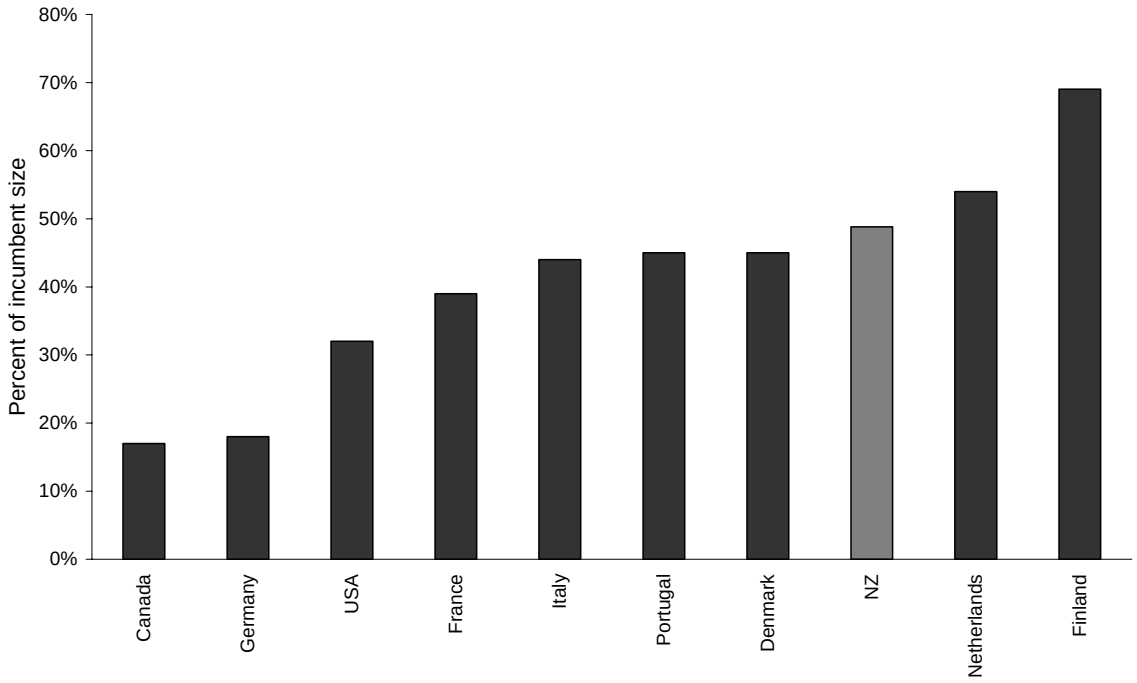
relative to incumbent firms. This pattern is discussed further below under the analysis of firm growth (Section 5.6).

Figure 1 – Size of entering firms relative to incumbent firms, NZ and OECD firm project data



Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

Figure 2 – Size of exiting firms relative to incumbent firms, NZ and OECD firm project data



Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

Firms in New Zealand therefore seem to enter and exit at a similar or slightly larger size (relative to incumbent firms) compared to firms in most other OECD countries. While this result is not particularly informative in and of itself, it is of some relevance to understanding rates of employment turnover and firm growth. This will become apparent under Sections 5.4 and 5.6 below.

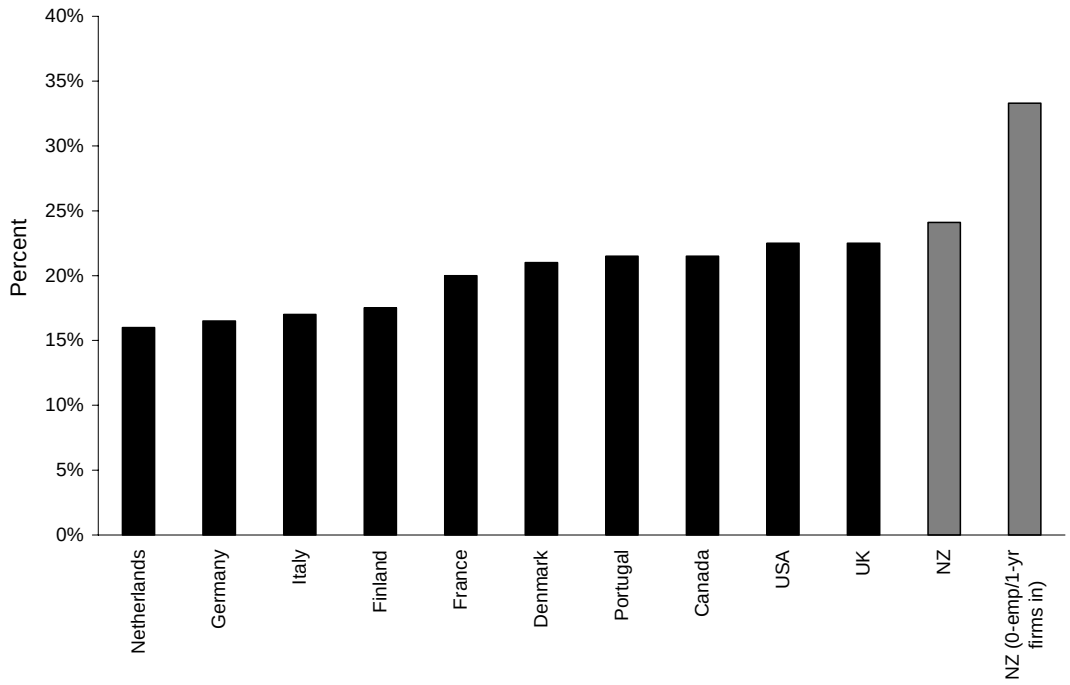
5.3 Firm turnover (entry and exit) rates

Firm turnover (entry and exit) rates refer to the proportion of firms in the population that, in any given year, are either new entrants or will exit the market within the year. As mentioned in the introduction, Mills (2003) found New Zealand's turnover rates to be substantially higher than the typical OECD rates over the 1990s. However, these comparisons were potentially confounded by measurement differences. For one, the inclusion of zero-employee firms in the New Zealand data could have increased firm turnover estimates (relative to the OECD data) because smaller firms tend to have higher entry and exit rates. A second issue is the inclusion of one-year firms in the New Zealand data. Since a one-year firm by definition is a new entrant in one year and an exiting firm in the next, including such firms in the analysis would be likely to increase entry and exit rates in the New Zealand data relative to the OECD.

5.3.1 Comparison with OECD project

Figure 3 shows the annual average firm turnover rates in New Zealand and other OECD countries from the OECD firm-level project. The New Zealand data are for the period 1995-2000, while the OECD data range across the period 1989-1994. Zero-employee and one-year firms have been removed from the New Zealand data. The figure for New Zealand when these firms are left *in* the data is also shown for comparative purposes.

Figure 3 – Firm turnover (entry and exit) rates, NZ and OECD firm project data, annual average



Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

This comparison shows that once zero-employee and one-year firms are removed, New Zealand's firm turnover rates are closer to typical OECD figures. While New Zealand still has the highest turnover rates of any of the countries surveyed (24.1% per year), our rates are not substantially higher than countries like the UK, USA and Canada that are at the upper end of the OECD distribution in terms of firm turnover.[12]

5.3.2 Comparison with Eurostat data

Another way of comparing turnover rates internationally would be to compare rates for New Zealand (with zero-employee and one-year firms *included*) with turnover rates from the Eurostat data (Brandt, 2004). However, while some preliminary comparisons were made in the preparation of this paper, they are not reported on here. The main reason for this is that the Eurostat data have been cleaned for false entry and exit, while the New Zealand data have not. Given that cleaning the data appears to reduce entry and exit rates substantially (Brandt, 2004), it would be difficult to draw any clear conclusions from comparisons of firm turnover rates between the New Zealand and Eurostat data.

5.3.3 Summary and discussion

Once measurement differences are taken into account, New Zealand's firm turnover (entry and exit) rates appear to be more similar to other OECD countries; we no longer seem to be such an outlier on this measure in the way that Mills (2003) suggested.

[12] Further analysis suggests that it is primarily the inclusion or exclusion of one-year firms from the data that has a major impact on firm turnover rates. Removing zero-employee firms alone from the data makes little or no difference to turnover rates, reducing them from 33.3% to 33.1%. However, average turnover rates decrease substantially to 24.1% once one-year firms are removed from the data.

However, New Zealand's firm turnover rates are still at the top of the OECD range. While the data do not allow full testing of hypotheses, it is interesting to speculate why this might be the case.

One possible explanation for high firm turnover rates could be a high proportion of small firms, which tend to have higher turnover rates. However, as Section 5.1 showed, there is no convincing evidence that the proportion of small firms in New Zealand is significantly different to many other OECD countries.

A more plausible explanation could be that high firm turnover rates are related in part to the very low barriers to firm entry in New Zealand. The World Bank (2004) Doing Business survey found that New Zealand is one of the easiest places in the world to start a new business, when measured in terms of the number of administrative procedures involved, the time taken, and financial cost. Costs associated with closing a business are also low in New Zealand relative to the OECD average (World Bank, 2004). All other things being equal, it might be expected that rates of firm entry and exit would be higher in countries where the costs associated with entry and exit are lower.

However, New Zealand's firm turnover rates are still somewhat higher than turnover rates in countries like the USA and Canada, which also have very low barriers to entry and exit. It is not immediately clear why this would be the case, and the data are generally not sufficient to allow testing of hypotheses, but potential explanations could include differences in the sectoral composition of the economy, business cycle effects, or cultural factors such as a preference for self-employment, which could be reflected in high rates of business start-ups. It has also been suggested in some previous studies that high rates of firm turnover are indicative of New Zealand being a difficult environment for new firms – possibly due to issues around size and distance – such that many new firms struggle to survive and grow. However, data presented later in the paper do not indicate that survival and growth rates for new firms in New Zealand are noticeably lower than in many other OECD countries.

A final unresolved issue with regards to firm turnover rates, which could also potentially explain some of the cross-country differences, is the impact of "false" entry and exit. As discussed earlier, it is currently not possible to distinguish "true" from "false" entry and exit in either the New Zealand data or the data used in the OECD project. To the extent that rates of false entry and exit may differ across countries – for example, due to differences in the level of merger and acquisition activity – this could affect the comparability of firm turnover rates. The completion of the Linked Employer Employee Database (LEED) should help to resolve this issue, and may allow better comparisons in future between "cleaned" data on firm turnover rates in New Zealand and overseas data like the Eurostat that have also been cleaned of false entry and exit.

5.4 Employment turnover rates

Employment turnover rates (job creation and destruction) refer to the proportion of jobs in the economy that are created or destroyed each year. While employment turnover can be measured in different ways, the approach taken in the OECD firm-level project – and followed in this paper – was to look at employment turnover in entering and exiting firms: essentially, an employment-weighted measure of firm turnover. It should be noted that this is a slightly different approach to that taken by Carroll *et al* (2002) in their analysis of employment dynamics in the New Zealand labour market. Carroll *et al* (2002) looked at

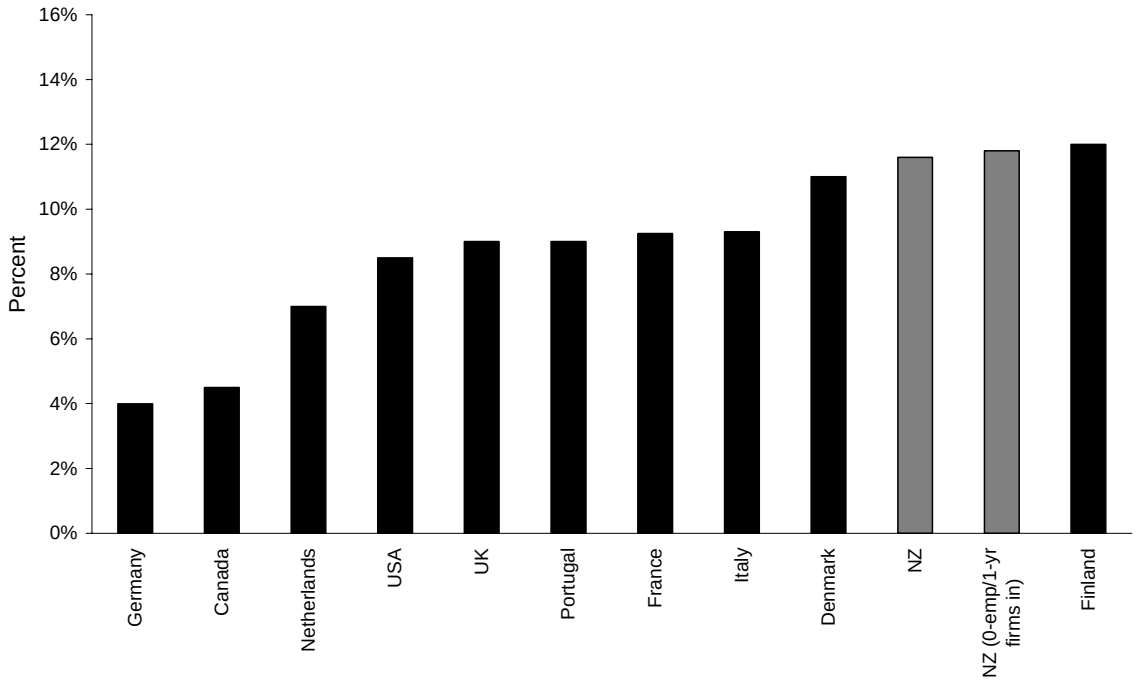
the total number of jobs created and destroyed across all firms in the economy, not just in entering and exiting firms.

5.4.1 Comparison with OECD project

Figure 4 shows the annual average employment turnover in entering and exiting firms (as a percentage of total employment) for New Zealand and other OECD countries from the OECD firm-level project. The New Zealand data are for the period 1995-2000, while the OECD data range across the period 1989-1994. Two figures are shown for New Zealand: one with zero-employee and one-year firms included, the other with zero-employee and one-year firms removed.

Figure 4 suggests that New Zealand has the second highest rate of employment turnover of the countries shown (Finland has the highest). However the inclusion or exclusion of zero-employee and one-year firms appears to make little difference to New Zealand's employment turnover rates. While zero-employee firms should not have an impact on employment turnover (since by definition these firms have no employees), it is surprising that the removal of one-year firms does not appear to make much difference to employment turnover, given the large impact that removing one-year firms has on firm turnover. Further analysis is needed to explain this finding.

Figure 4 – Employment turnover due to firm entry and exit, NZ and OECD firm project data, annual average



Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

5.4.2 Comparison with Eurostat

Similar to the case with firm turnover rates, comparisons of employment turnover rates with the Eurostat data are not reported on here. Again, the reason for this is that the Eurostat data have been cleaned for false births and deaths, while the New Zealand data have not.

5.4.3 Summary and discussion

The above analysis suggests that New Zealand's employment turnover rates are at the high end of the OECD range, although not the highest of the countries surveyed. Because the employment turnover measure used here is effectively an employment-weighted measure of firm turnover, it will in turn be driven by two factors: the first is the rate of firm turnover, while the second is the amount of employment in entering and exiting firms. As we have seen, firm turnover is high in New Zealand relative to the OECD, and the size of entering and exiting firms relative to incumbents in New Zealand is at or a bit above the middle of the OECD range. These two factors – high firm turnover rates, combined with moderately sized entering and exiting firms – combine to produce employment turnover rates that are at the high end of the OECD range, but not quite as high (relative to the OECD) as New Zealand's firm turnover rates.

As discussed above, the measure of employment turnover used in this paper is different to that used by Carroll *et al* (2002), who looked at the total number of jobs created and destroyed across all firms in the economy, not just in entering and exiting firms. It is therefore not possible to tell from the analysis in this paper whether New Zealand's aggregate job creation and destruction rates are higher or lower than in other countries, once measurement differences are taken into account. This could be a task for future research.

5.5 Firm survival rates

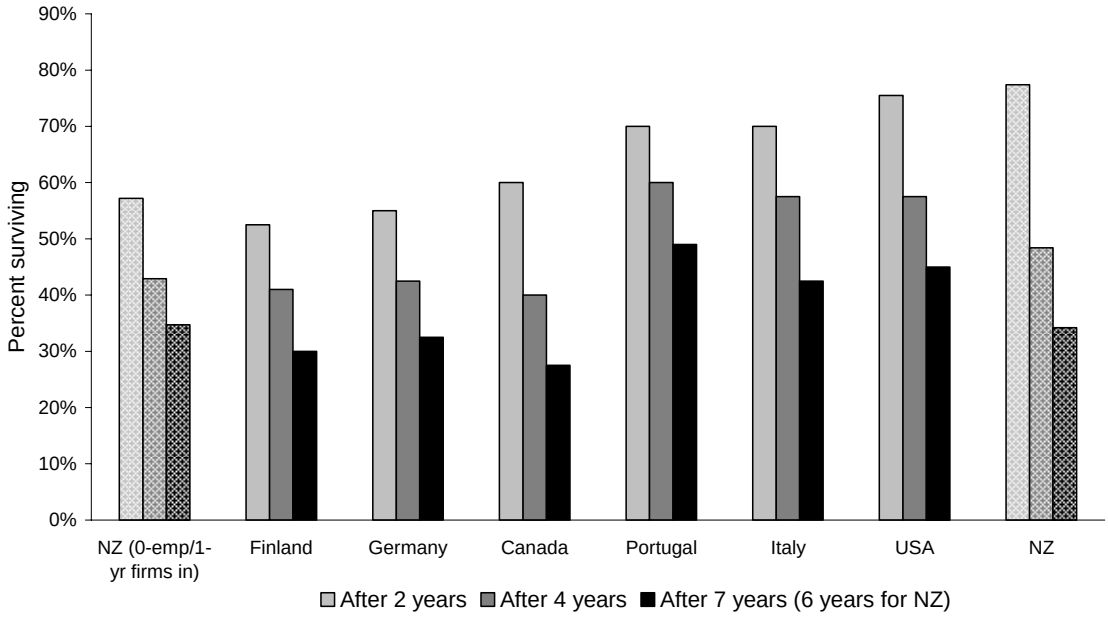
Firm survival rates refer to the proportion of firms in a birth cohort of new firms that remain in existence after a given period of time. A common finding in the cross-country literature is that the survival rates of new firms are quite low – typically, less than half of new firms remain in business by four or five years following entry.

Mills (2003) compared the survival rates of New Zealand firms with data from the OECD firm-level project, and found that New Zealand's rates were at the middle to low end of the OECD range – although not the lowest of the countries surveyed. However, these comparisons could again have been affected by the inclusion of both zero-employee and one-year firms in the New Zealand data. This is because smaller firms tend to have lower survival rates (Brandt, 2004), and one-year firms by definition only survive for one year.

5.5.1 Comparison with OECD firm-level project

Figure 5 shows a comparison of New Zealand's firm survival rates with those of other OECD countries from the OECD firm-level project. Survival rates are shown at two, four and seven years following birth (six years following birth for New Zealand). Again, two figures are shown for New Zealand: one with zero-employee and one-year firms included, and one with zero-employee firms and one-year firms removed. The survival rates for New Zealand at two and four years following birth are averaged across the 1995 to 1997 birth cohorts, but it should be noted that the survival rates at six years were calculated for the 1995 birth cohort only, due to data availability.

Figure 5 – Firm survival rates at different lifetimes, NZ and OECD firm project data



Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

Figure 5 suggests that once zero-employee and one-year firms are removed from the data, New Zealand's firm survival rates – at least at two years and four years following birth – are actually at the high end of the OECD spectrum. Average survival rates after two years are 77.4% (the highest of the countries shown), while after four years average survival rates are 48.1% (fourth highest of the countries shown).

Survival rates after six years remain relatively low, particularly when we take into account that survival rates for the other OECD countries are shown after seven rather than six years. In addition, removing zero-employee and one-year firms seems to make little difference to New Zealand's six-year survival rates – actually reducing them slightly, from 34.7% to 34.2%. However, given that the six-year survival rates are based on only one birth cohort (1995), it is best to be cautious about inferring too much from this finding.

5.5.2 Comparison with Eurostat data

Survival rates could also have been analysed by comparing the rates for New Zealand (with zero-employee and one-year firms included) against those from the Eurostat data (Brandt, 2004). However, similarly to the case with firm and employment turnover rates, such a comparison would again have been difficult to interpret, because the Eurostat data have been cleaned for false births and deaths while the New Zealand data have not.

5.5.3 Summary and discussion

The above analysis suggests that New Zealand's firm survival rates are broadly similar to survival rates in other OECD countries, and in fact may in fact be slightly higher than in some other countries once measurement differences are taken into account. Survival rates at six years following birth still appear relatively low, but this comparison was based on only one cohort of firms.

Survival is certainly difficult for new firms, with only about 50% of firms surviving as long as 4 years. However, there is nothing in the analysis reported here to suggest that new firms in New Zealand face particular issues in terms of firm survival (eg, a difficult business environment), relative to firms in other countries.

Similar to the case with firm turnover rates, an unresolved issue with regards to firm survival rates is the impact of "false" exit. As discussed above, it is currently not possible to distinguish "true" from "false" entry and exit in either the New Zealand data or the OECD firm project data. To the extent that rates of false exit may differ across countries, this could affect the comparability of survival rates. The completion of the LEED database should again help to resolve this issue.

5.6 Firm growth

Another question of interest in terms of firm dynamics is the growth rates of those new firms that do survive. In theory firm growth could be investigated in terms of either financial growth (earnings/turnover/profit) or employment growth. The approach taken in this paper is to look at employment growth, but this is not to imply that financial indicators of growth are not also of interest.

Mills (2003) compared the employment growth rates of New Zealand firms with data from the OECD firm-level project, and found that the growth rates of surviving new firms in New Zealand appeared to be slightly higher than in most European countries, but significantly lower than in the USA. However, it is possible that the inclusion of zero-employee firms in the New Zealand data could have affected growth rates, probably by biasing them upwards. This is because small firms tend to expand more rapidly relative to their starting size than do large firms (Brandt, 2004).

5.6.1 Comparison with OECD firm-level project

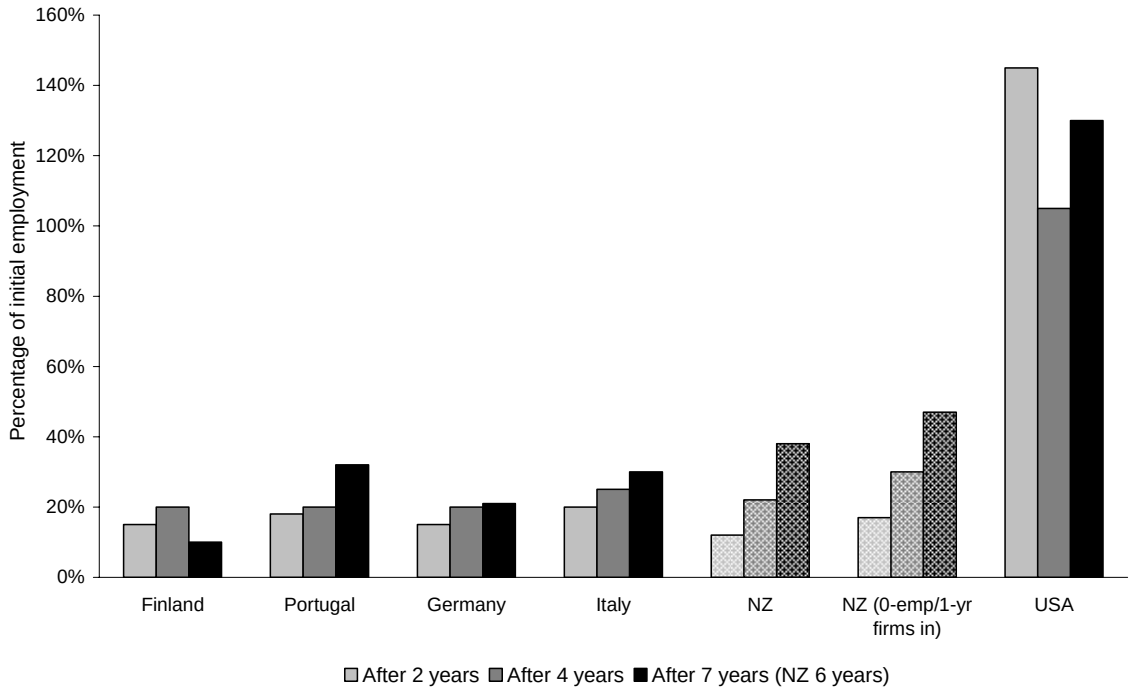
Figure 6 compares the employment growth of surviving firms in New Zealand with other OECD countries from the OECD firm-level project. Growth is measured as a percentage of initial employment, for firms that survive two, four and six years. As with the survival rates, growth rates at two and four years are averaged across the 1995 to 1997 birth cohorts, but growth rates at six years were calculated for the 1995 birth cohort only. Two figures are again shown for New Zealand: one with zero-employee and one-year firms included, and one with zero-employee and one-year firms removed.[13]

Figure 6 suggests that, as expected, the removal of zero-employee firms from the New Zealand data does lead to some reduction in observed growth rates. Growth rates of surviving firms in the adjusted data stand at 12.0% for two year survivors, 22.0% at four years, and 37.9% at six years; this compares with growth rates of 17.0%, 30.3% and 46.6% when zero-employee and one-year firms are included. Once zero-employee firms are removed from the New Zealand data, our growth rates appear very similar to the European OECD countries. The growth rates of six-year survivors are still higher than any of the European countries, particularly when we take into account that growth rates for the other countries are shown after seven rather than six years. This comparison

[13] Under a narrow definition, one-year firms would not be relevant to this analysis, as the comparison looks only at the growth of firms that survive at least two years. However, as outlined above we have used the term one-year firms to also refer to rebirths. Inclusion or exclusion of rebirth firms appears to have some impact (though small) on measures of firm growth in surviving firms.

should be interpreted cautiously though, given that the six-year growth rates for New Zealand are based on only one birth cohort of firms.

Figure 6 – Employment growth of surviving firms, NZ and OECD firm project data



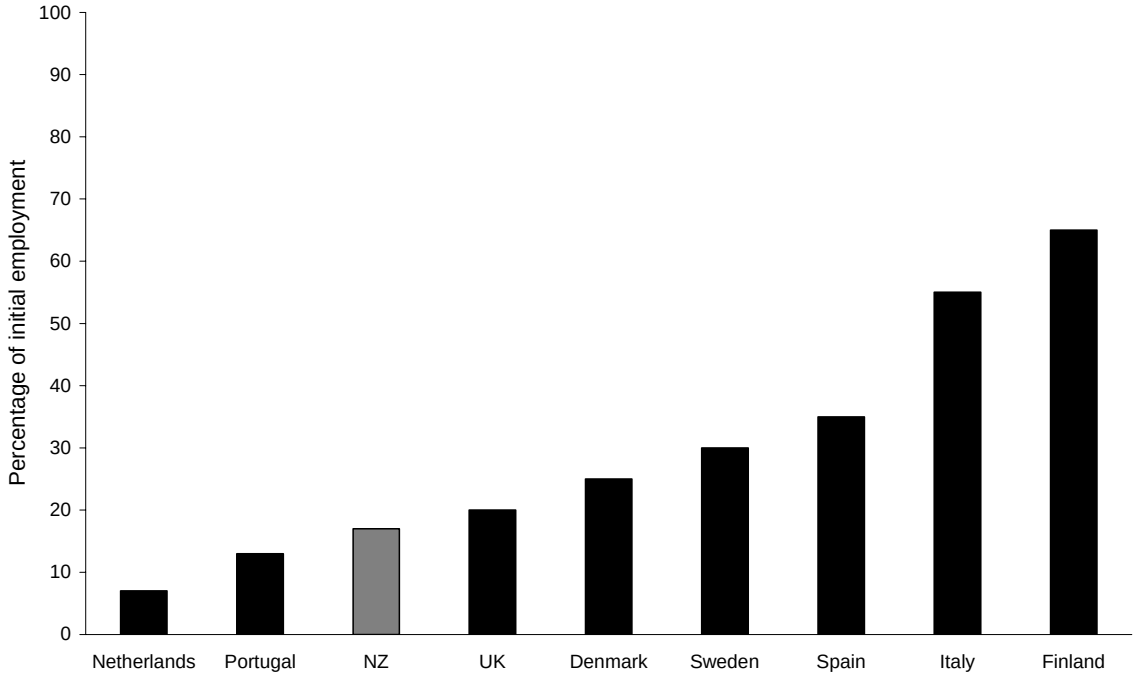
Sources: Statistics NZ and OECD/Bartelsman *et al* 2003

5.6.2 Comparison with Eurostat data

An alternative approach to analysing firm growth rates is to compare the growth rates for New Zealand (with zero-employee and one-year firms included) against those from the Eurostat data (Brandt, 2003). Comparing growth rates with the Eurostat data is likely to be more feasible than comparing firm survival and firm turnover rates, given that the latter are strongly affected by the cleaning of "false" entry and exit.

Figure 7 shows that the two-year growth rates of New Zealand firms (with zero-employee and one-year firms included) are at the lower end of the range of countries covered by the Eurostat, although not the lowest of the countries surveyed. However, this comparison should be treated with some caution, for at least two reasons. For one, the Eurostat data on firm growth is only available for one birth cohort (1998), and at one time period (two years following birth). For another, it is possible that the cleaning of false births and deaths from the Eurostat data could also have an effect on growth rates. For example, if a firm changes ownership this would be treated as a firm exit in the New Zealand data, and thus the firm would not be included in the growth figures. However, in the Eurostat data the firm's growth would continue to be measured. If high growth firms are more likely to be bought out (which seems possible), this could bias the growth rates downward in the New Zealand data relative to the Eurostat.

Figure 7 – Employment growth of surviving firms at two years following birth, NZ and Eurostat data



Sources: Statistics NZ and Eurostat/Brandt 2004

5.6.3 Summary and discussion

The above analysis suggests that once measurement differences are taken into account, the growth rates of new firms in New Zealand are broadly similar to the European OECD countries, but significantly lower than growth rates of new firms in the USA. The Eurostat comparison suggested that growth rates in New Zealand might actually be somewhat lower than in many European countries, but it is best not to infer too much from this comparison, given uncertainty around the impact that cleaning the Eurostat data of false entry and exit might have on observed growth rates.

When looking at indicators of firm growth, one relevant factor to consider is the size of entering firms relative to incumbent firms. Other things being equal, it might be expected that if firms enter at a small size relative to incumbents, they are likely (if successful) to grow more quickly. Data from the OECD firm project provide some support for this view, suggesting that new firms in the USA and Canada tend to enter at a smaller size (relative to incumbents) than do new firms in European countries. (This pattern seems to be particularly evident in the manufacturing sector.) However, surviving new firms in the USA then grow very rapidly by comparison with European and New Zealand firms.

Bartelsman *et al* (2003) interpreted this pattern as consistent with a more "experimental" approach to market entry in the USA, whereby firms enter small (and often at lower productivity), and then expand rapidly over time if successful. This in turn could be related to the lower costs of firm entry and exit in the USA (for example, administrative costs of setting up a business, costs of hiring and firing) by comparison with most European countries.

The analysis in Section 5.2 above suggested that the size of entering firms in New Zealand, relative to incumbents, is at about the middle of the OECD range. Overall then, New Zealand firms seem to start at a moderate size (relative to incumbent firms), and then grow at a similar rate to new firms in European countries. North American firms seem to enter at a smaller size (relative to incumbents), and then grow rapidly if they survive.

While New Zealand's firm growth rates are not out of line with the OECD as a whole, it is perhaps of some interest that our growth rates appear more similar to European countries than to the USA. New Zealand, like the USA, has very low administrative barriers to business entry and exit, and the costs of hiring and firing in New Zealand are also relatively low by comparison with many European countries (World Bank, 2004). However, while rates of firm entry are high in New Zealand, New Zealand firms enter at a larger size (relative to incumbents) than do North American firms, and successful new firms grow at a modest pace, similar to firms in European countries.

In light of this, it would be particularly interesting to know whether new firms in other Anglo-Saxon countries like Australia, the UK and Canada also grow rapidly in the way that US firms appear to do. Comparisons with these countries could shed some light on whether New Zealand is unusual in having modest firm growth rates despite a generally flexible business environment, or whether it is the USA that is unusual in having very rapid growth in new firms. Unfortunately, the data to answer this question were not readily available for the current paper, but this could be a question for future research.

6 Conclusions and policy implications

This paper has undertaken an extensive comparative analysis of firm dynamics in New Zealand and other OECD countries. The paper has highlighted a range of measurement differences in the way that firm dynamics statistics are collected and reported on across countries, and has attempted to control for these measurement differences by obtaining new data for New Zealand that is more comparable to the data available for other OECD countries. The paper has also looked at a broad range of firm dynamics variables, including some (like firm growth rates and the size of entering and exiting firms) that have not been covered in depth in previous studies.

One overriding conclusion that can be drawn from the analyses in this paper is that measurement differences are important. The criteria used to determine whether firms are included and excluded from the data – and in particular, the treatment of zero-employee and one-year firms – can have a substantial impact on measures of firm size, firm turnover rates, and firm survival and growth rates. This reinforces the need to be cautious when comparing indicators of firm dynamics and business demography across countries, and to try to understand and control for measurement differences before drawing conclusions.

Overall, the findings in this paper suggest that once measurement differences are taken into account, New Zealand's firm dynamics and business demographics are broadly within the OECD range. In particular, while our firms are generally at the smaller end of the size distribution, New Zealand no longer appears to be an outlier in terms of having very small firms relative to the rest of the OECD. The distribution of firms and employment in New Zealand is very similar to that in a number of benchmark countries, including Australia, Canada, Finland and Denmark.

While New Zealand's firm turnover (entry and exit) rates are still at the top of the OECD range even when measurement differences are controlled for, they are not substantially higher than turnover rates in countries like the USA and Canada which also have low barriers to business entry. Finally, the size of entering and exiting firms relative to incumbents, and the survival and growth rates of new firms, are also comparable to other OECD countries – although growth rates seem to follow a similar pattern to European countries, rather than the high rates of growth found in US firms.

Although New Zealand's firm dynamics appear to be generally within the OECD range, there are still some apparent areas of difference, which were highlighted in the paper. These include: relatively small average firm size in the manufacturing sector; large firms that are smaller on average than large firms in at least some other countries (eg, the USA and the UK); high firm turnover rates, although not as high as has previously been thought; and rates of growth similar to European countries, despite a business environment that appears to be more dynamic in other respects.

Drawing policy implications from descriptive data at the aggregate level is difficult. However, the analyses in this paper do seem to offer some potential insights into a number of current policy issues. In general terms, the results are reassuring from a policy point of view as they suggest that New Zealand's business dynamics are broadly in line with those of other OECD countries. Once measurement issues are taken into account, there is no obvious evidence that New Zealand firms face particular difficulties in terms of survival and growth, by comparison with firms in many other countries.

In terms of more specific implications, one conclusion that can be drawn from the analyses in this paper is that policy interventions and/or policy issues that are based on a rationale that New Zealand has an unusually large proportion of *small* firms are probably not well founded. Areas of policy that are often discussed (at least in part) in these terms include: access to finance and the functioning of financial markets; compliance costs; the delivery and reach of business assistance programmes; and workplace training. All of these issues have been suggested as being potentially more important in New Zealand than in other countries due to the high proportion of small firms. For example, it has been suggested that the large proportion of small firms in New Zealand poses particular issues for financial markets, due to information asymmetries between borrowers and lenders that are more difficult to overcome efficiently when firms are small. It is also often argued that compliance costs are of more concern in New Zealand than in other OECD countries, due to the high proportion of small firms and the fixed costs associated with compliance. Finally, it is sometimes suggested that administering business assistance programmes and delivering workplace training programmes is a particular challenge in New Zealand due the small size of New Zealand firms.

Generally speaking, the data do not support these conclusions. Of course this is not to argue that issues around access to finance, compliance costs, business assistance and workplace training for small firms are not important, or that they do not need to be addressed through policy. The data in this paper simply suggest that these problems are unlikely to be more acute in New Zealand than in a number of other OECD countries.

While policy rationales based on the proportion of *small* firms appear to lack support given the findings in this paper, policy issues that relate to the apparently smaller average size of New Zealand's *large* firms may still be worth considering. One relevant issue in this context could be the level of R&D activity, given that R&D tends to be concentrated in large firms. Although further analysis is needed on this point, it seems plausible that the

smaller size of New Zealand firms at the top end of the size distribution could be a constraint on R&D activity, and could in part explain our low levels of private sector R&D.

This paper has highlighted several potential areas for future work on firm dynamics. An obvious next step would be to try to explain those remaining aspects of New Zealand's firm dynamics where we still appear to differ somewhat from other countries. In particular, further work could look at the impact of issues such as particular regulations, the size of the domestic market and distance from overseas markets, sectoral composition of the economy, and business cycle effects on indicators of firm dynamics.

In terms of specific issues of interest, one question that warrants further investigation is the relationship between firm size and performance in the manufacturing sector. The analysis in this paper suggested that New Zealand's manufacturing firms do tend to be at the low end of the size distribution internationally, and the manufacturing sector has also generally performed poorly in terms of productivity growth (Black, Guy, and McLellan, 2002). While this in itself is no evidence of a causal link, it would be of interest to carry out further work on the relationship between scale and firm performance/productivity in the manufacturing sector.

Another area that could be worth looking into further is the growth rates of new firms. While the analyses in this paper suggested that New Zealand's growth rates are broadly in line with the European OECD countries, this could be interpreted as somewhat disappointing, given that New Zealand has higher levels of firm entry and exit and more flexible regulations around firm entry and hiring and firing than do most European countries. In light of this, it would be interesting to do further work on the growth rates of New Zealand firms (for example, as suggested earlier comparing growth rates in New Zealand to other non-European countries like Australia and Canada) to try and better understand how New Zealand's growth rates compare internationally and whether there are regulatory or non-regulatory barriers to firm growth in New Zealand.

Finally, there is also work that could be done to further improve the available New Zealand data and to address remaining measurement issues. Some of this work could be done now, while other improvements to the data will become possible in future with the development of the LEED database – for example, the capacity to clean the data of false entry and exit. This should allow more accurate comparisons to be undertaken on rates of firm and employment turnover, firm survival, and firm growth.

References

Bartelsman, Eric, Stefano Scarpetta and Fabiano Schivardi (2003) "Comparative analysis of firm demographics and survival: Micro-level evidence for the OECD countries." Paris, Organisation for Economic Co-operation and Development, Economics Department Working Paper No 348. <http://www.oecd.org/dataoecd/28/53/2494036.pdf>

Black, Melleny, Guy, Melody and McLellan, Nathan (2003) "Productivity in New Zealand 1988 to 2002." Wellington, New Zealand Treasury, Working Paper No 03/06. <http://www.treasury.govt.nz/workingpapers/2003/twp03-06.pdf>

Brandt, Nicola (2004) "Business dynamics in Europe." Paris, Organisation for Economic Co-operation and Development, Directorate for Science, Technology and Industry, Technology and Industry Working Paper 2004/1. <http://www.olis.oecd.org/olis/2004doc.nsf/43bb6130e5e86e5fc12569fa005d004c/d7330a807018cccbc1256e55005051c7/$FILE/JT00159809.PDF>

Carroll, Nick, Dean Hyslop, David Maré, Jason Timmins and Julian Wood (2002) "The turbulent labour market." Wellington, Department of Labour, Paper presented to New Zealand Association of Economists conference, 26-28 June, Wellington. <http://nzae.org.nz/conferences/2002/2002-Conference-Paper-16(2)-CARROLL-TEXT.PDF>

Johnson, Brian (1999) "Business dynamics 1987 to 1999." Wellington, New Zealand Treasury, Internal paper.

MED (2003) "SMEs in New Zealand: Structure and dynamics." Wellington, Ministry of Economic Development. <http://www.med.govt.nz/irdev/ind_dev/smes/2003/smes-2003.pdf>

Mills, Duncan (2003) "Firm performance." Wellington, New Zealand Treasury, Presentation to the Treasury/Ministry of Economic Development Growth Seminar Series, August.

Scarpetta, Stefano, Philip Hemmings, Thierry Tressel and Jaejoon Woo (2002) "The role of policy and institutions for productivity and firm dynamics: Evidence from micro and industry data." Paris, Organisation for Economic Co-operation and Development, Economics Department, Working Paper No 329. <http://www.olis.oecd.org/olis/2002doc.nsf/linkto/eco-wkp(2002)15>

Simmons, Geoff (2001) "The impact of size and distance on New Zealand firm size, behaviour and performance." Wellington, New Zealand Treasury, Internal paper.

Skilling, David (2001) "The behaviour and performance of NZ firms: Some preliminary findings." Wellington, New Zealand Treasury, Internal paper.

World Bank (2004) "Doing business in 2004: Understanding regulation." Washington DC, World Bank.

Appendix

Appendix Table 1 – Key data characteristics – New Zealand BDS, OECD firm-level project, and Eurostat data

Data characteristic	New Zealand BDS	OECD firm-level project	Eurostat
Sector Coverage	Main excluded sectors are agriculture and community services.	Varies according to country – but main analyses generally exclude agriculture and community services. Some countries also exclude government sector (Portugal, Italy, Germany, USA).	Uncertain – covers most or all sectors.
Sample Period	1990 – present. Data used in current paper cover 1994-2001.	Varies according to country. 1989-1994 for most analyses.	1997-2000
Measure of employment – employee vs "total" employment	Publicly available data use "total employment" measure. Data in current paper use employee measure.	Employee	Employee
Measure of employment – headcount vs FTE	Publicly available data uses FTE. Data in current paper use headcount measure.	Headcount	Headcount
Unit of analysis	Enterprise and plant level data available. Data in current paper use enterprise.	Enterprise	Enterprise
Employment threshold	None if turnover threshold met. Otherwise > two full-time employees.	At least one employee (except Netherlands).	None
Turnover threshold	>$30,000 per year	None	None (except UK)
'True" entry and exit distinguishable from "false" (mergers, acquisitions etc)?	No	No	Yes
Treatment of one-year firms?	Normally included. Data in current paper removes one-year firms for some analyses.	Excluded	Uncertain but presumed included

Sources: Statistics New Zealand, Carroll *et al* (2002), OECD/Bartelsman *et al* (2003), OECD/Brandt (2004)