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# The business size distribution in Australia

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## Abstract

This paper identifies trends and features in the business size structure (by employment) in Australia and investigates some of the drivers of these trends. We find that the dynamics of business counts at the jurisdictional, regional and sectoral level have been variable over the past few years given the interplay of various factors such as local economic conditions and structural characteristics of sub-national economies. Particular focus is placed on the drivers of trends of non-employing firms, which are a heterogeneous class subject to social and personal factors which do not generally influence the dynamics of employing firms. Self-employment, it is argued, is highly dependent on the size of an economic area and is driven by the relative prominence of particular sectors in the economy. The results indicate that an enhanced understanding of the role and differentiated behaviour of firms according to their size and location will assist in guiding effective industry policy in Australia.

**JEL Codes:** L11, L16, L22

**Keywords:** Business counts, Firm size distribution, Industrial structure



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## Key points

- Business size growth is uneven across Australian jurisdictions and industries, implying that various factors impact on business activity.
- Generally, the larger an economy, the greater the number of firms and the higher the proportion of larger firms.
- Compared to other OECD countries, Australia appears to have a total business count proportionate to the size of its economy.
- Regression results show that population estimates (proxy for the size of an economic area) have a positive and statistically significant impact on non-employing and large firms.
- The unemployment rate has a positive and statistically significant impact on non-employing firms, implying that a significant proportion of self-employment is characterized by persons seeking to secure income by means of alternative employment when they encounter a lack of paid employment opportunities ('unemployment-push' effect).
- The share of non-employing firms in the Agriculture, Forestry & Fishing industry is negatively related to educational attainment, the working age population and equivalised disposable income levels.
- The Professional, Scientific & Technical Services industry non-employing business count proportions are strongly positively related to educational attainment.
- There are strong correlations between some regional industry shares for non-employing businesses. A relatively high (low) share of non-employing businesses in the Professional, Scientific & Technical Services industry is associated with:
  - a relatively high (low) share of non-employing businesses in the Information Media & Telecommunications, Education & Training and Health Care & Social Assistance industries; and
  - a relatively low (high) share of non-employing businesses in the Agriculture, Forestry & Fishing industry.

# 1. Introduction

Numerous policy measures, at the federal and state government level, are aimed at fostering business development, particularly with regard to small business. Support for small and medium enterprises is well-founded, with a multitude of research highlighting the contribution of this sector to supporting economic development, technological innovation and employment creation.<sup>1</sup> Growth in the number of small businesses is often explicitly targeted in government policies.

There are various cyclical, structural, policy and other factors that impact on firm counts. Moreover, the business size structure varies between regions as well as between industries within each region in Australia. Similarly, the business size structure is not uniform across countries — substantial heterogeneity can be observed across the developed world. This points to the fact that the business size structure is complex, given the web of relationships that influence the dynamics of business formation. The main aim of this study is to identify trends and features in the business size structure (by employment) in Australia and to investigate some of the drivers of these trends. We investigate the role of macroeconomic and demographic factors, structural features of the Australian economy as well as some government policy settings that impact on the distribution of firms by employment size across industries and regions in Australia.

Studies of this kind present challenges with respect to the availability and methodological consistency of business count data. This paper uses data from the Australian Bureau of Statistics (ABS) publication Catalogue Number. 8165.0 — *Count of Australian Businesses, including entries and exits*, as well as the National Regional Profile available from the *ABS.Stat Beta* website. Businesses included in this data are those trading in the Australian market and actively remitting Goods and Services Tax (GST).<sup>2</sup>

Industry classifications in this paper are according to ANZSIC 2006, and in the absence of a robust method with which to convert ANZSIC 1993 to ANZSIC 2006, time series data investigating specific industry classifications are limited to 2007 onwards. In addition, while trends across aggregated groups of, for example, industry and firm size class have been explored, without access to unit

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<sup>1</sup> See for example Shaffer S (2002) Firms Size and Economic Growth, *Economic Letters*, 76, 195–203; OECD (2004), Promoting Entrepreneurship and Innovative SMEs in the Global Economy, *Second OECD Conference of Ministers Responsible for Small and Medium Enterprises (SMEs7)*, Istanbul, Turkey; Beck et. al. (2005) SMEs, Growth, and Poverty: Cross-Country Evidence, *Journal of Economic Growth*, 10, Issue 3, pp. 199–229; and Leegwater and Shaw (2008), The Role of Micro, Small, and Medium Enterprises in Economic Growth: A Cross-Country Regression Analysis, *USAID micro report 135*

<sup>2</sup> Consistent with ABS methodology, the data cubes available in the ABS Cat. No. 8165.0 publication confidentialise business information by rounding data with few observations. As a result, data derived using these data cubes contain a small error, which is evident when comparing derived aggregate figures with those stated in the accompanying ABS publication. While acknowledging this limitation, it is important to note that the error is small; considerably smaller than 2 per cent for the vast majority of aggregate figures.

record data, investigation of the specific characteristics of actively changing firms is also limited.

The ABS's *Business Counts* publication is useful, nevertheless, given that it contains time series with detailed counts by:

- industry
- main state and territory
- type of legal organisation
- institutional sector
- employment size ranges
- annual turnover size ranges

Similarly, time series data are available for regional business counts by employment size from the *ABS.Stat Beta* website, although the size classes differ somewhat from that of the *ABS Business Counts* publication. As such, this paper provides an overview of the trends and features of the business size structure in Australia, as well as drivers and policy implications of such patterns, with the view to stimulating interest and further research in this sphere.

The rest of the paper is organised as follows. The next section analyses trends in the number of businesses by size in Australia. Following this, features of the business size structure are explored. The impact of macroeconomic factors on business counts are then investigated by means of regression analysis, followed by an examination of some other determinants of non-employed business activity. The final section concludes.

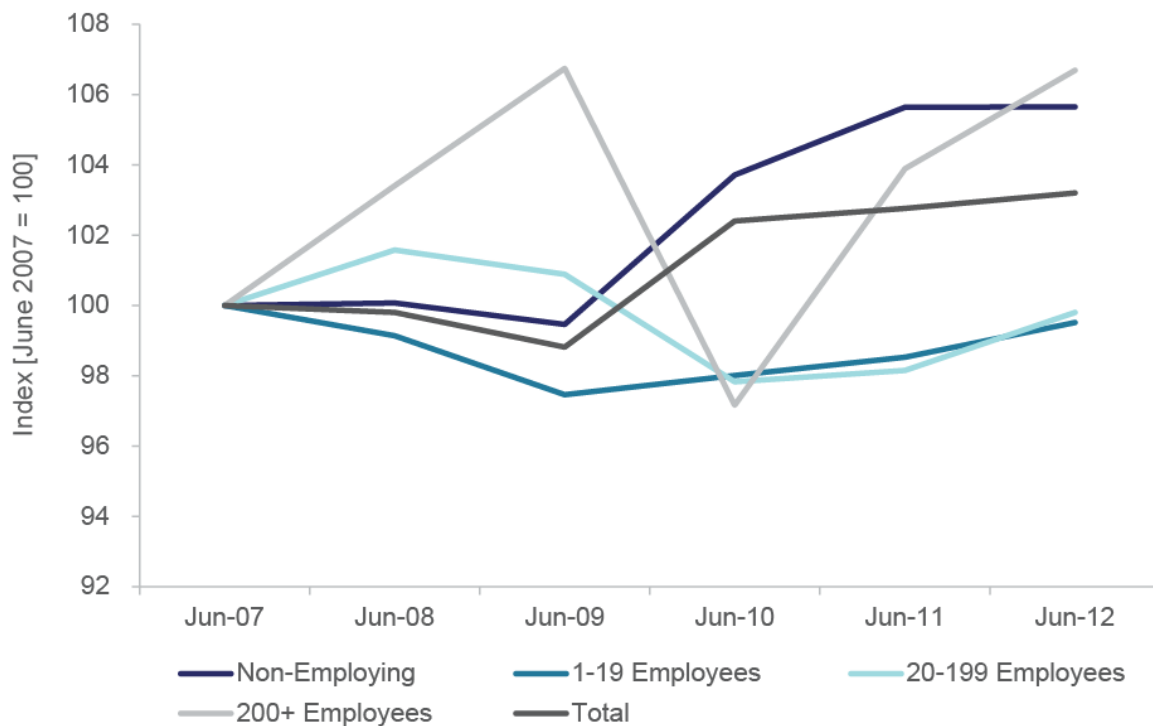
## 2. Trends in business counts by employment size

Small businesses play an important role in any economy and account for the bulk of business counts. The proportion of business counts (actively trading businesses) by employment size in Australia remained broadly stable over the past decade, with non-employed businesses accounting for around 60 per cent of total business counts, followed by micro enterprises (1 to 4 employees) representing around 25 per cent of total business counts and businesses with 5 to 19 employees representing around 10 per cent of total business counts. Larger businesses also play an important role in the economy given their competitive advantages through economies of scale. They are also more likely to innovate and export. Medium (20 to 199 employees) and large businesses (200+ employees) together account for around 5 per cent of the total number of businesses in Australia over the past decade.

Figure 2.1 presents Australian business counts by firm size class between June 2007 and June 2012, indexed against June 2007 levels. Given that non-employed firms account for around 60 per cent of the total business counts in Australia, growth in this firm size class drives trends in the overall business demography. As reflected in Figure 2.1, the Global Financial Crisis (GFC) impacted negatively on all business size classes. Non-employed, small employing (1 to 19 employees) and medium (20 to 199 employees) business

counts contracted in 2008–09. The number of medium size businesses contracted further in 2009–10, while the number of large businesses (200+ employees) recorded a particularly sharp downturn in the same year. This may represent qualitative differences in the ways that small and large firms were detrimentally impacted through the GFC, which will be discussed in more detail later. While the business counts of large firms appear to have recovered quickly, recovery in the number of medium size firms has been slower. Similarly, the recovery in the number of small employing firms has been slow. The number of non-employing firms, despite having experienced a small contraction leading up to June 2009, rebounded quickly,<sup>3</sup> but has recorded only modest increases in recent years. It is interesting to observe that the number of small employing businesses peaked in June 2007, the number of medium businesses in June 2008 and the number of large businesses in June 2009.

Figure 2.1: Business counts by employment size, June 2007 to June 2012



Source: ABS Cat. No. 8165.0

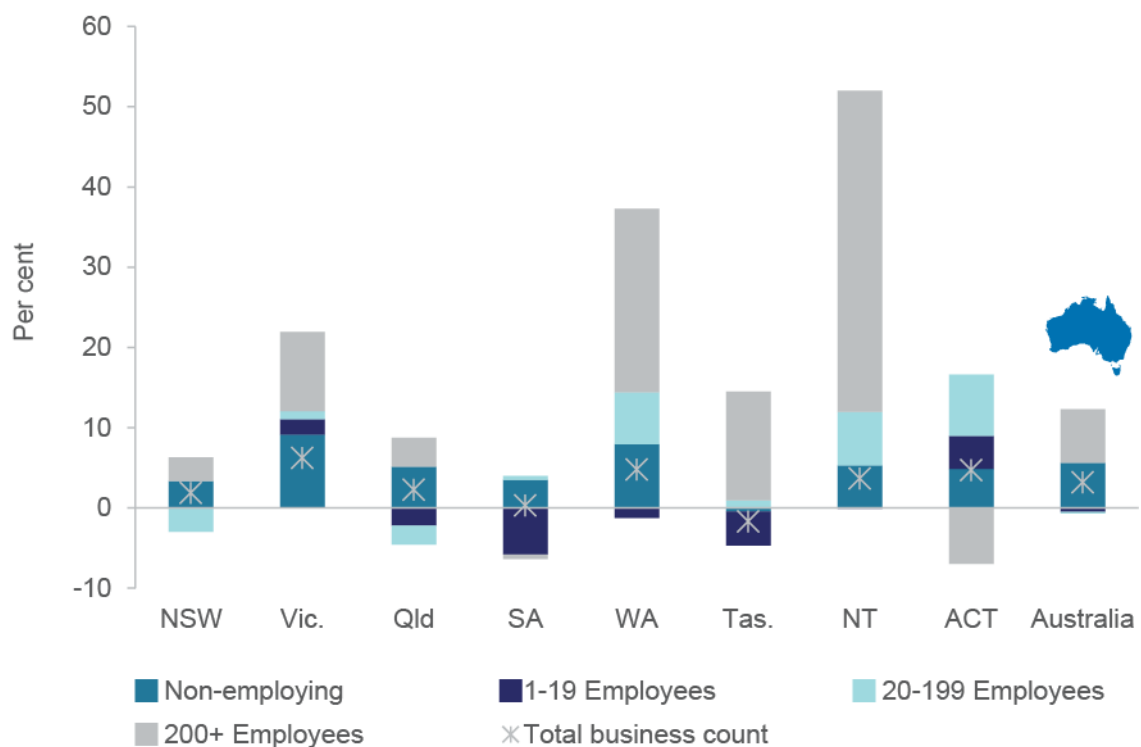
While growth in the number of businesses, in absolute terms, was strongest in non-employing firms (a reflection of their dominance in overall business counts), growth in percentage terms for large firms (with 200 or more employees) outstripped other firm size classes across four jurisdictions (Victoria, Western Australia, Tasmania and the Northern Territory) between June 2007 and June 2012 (see Figure 2.2). Growth in the count of large firms was particularly strong in Western Australia and the Northern Territory (22.9 per cent and 40.0 per cent

<sup>3</sup> It should be noted that a methodological change was implemented in June 2010, which extended the period for classifying long-term non-remitters (LTNR) and effectively resulted in an estimated 20,909 additional firm entries in 2010. These additional entries were predominantly non-employing, representing 1.6 per cent of this firm size class, or 1.0 per cent of the total firm count in 2010. The data presented in this paper has been adjusted to account for this methodological change.

, respectively). Growth in the count of large firms operating in Western Australia may, in part, be attributed to industries supporting the mining boom. Although the number of large firms in the Mining industry grew by 18.8 per cent between June 2007 and June 2012, related industries also benefited from the mining boom, including the Construction and Professional, Scientific & Technical Services industries (which grew by 59.3 and 123.8 per cent, respectively).

Between June 2007 and June 2012, the number of non-employing firms increased across all jurisdictions except Tasmania, which saw a marginal fall of 0.4 per cent. Victoria experienced the strongest growth, in both proportionate and absolute terms, with over 28,000 or 9.1 per cent more non-employing firms by June 2012.

Figure 2.2: Growth in business counts by firm size class by jurisdiction, June 2007 to June 2012, per cent

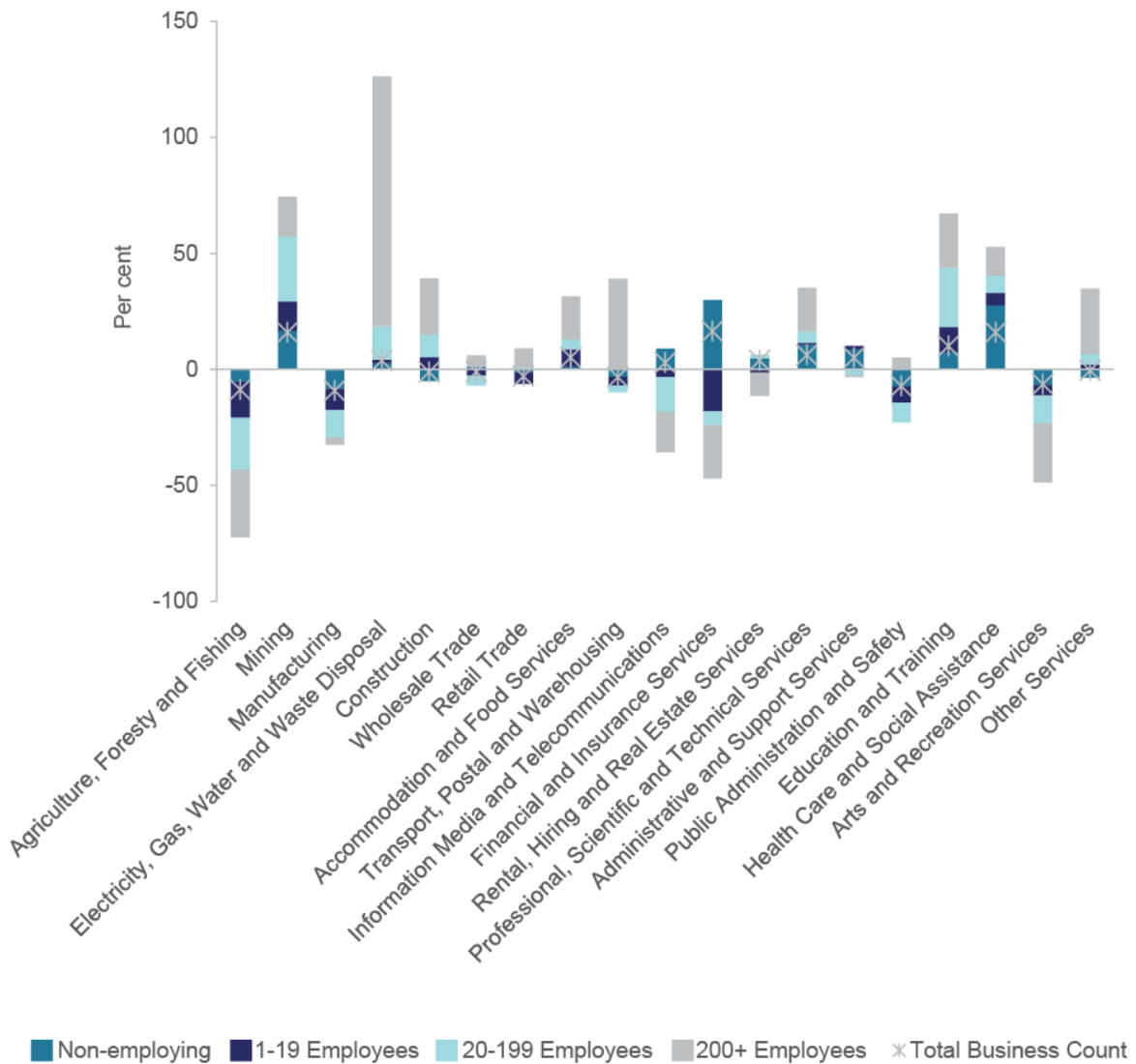


Source: ABS Cat. No. 8165.0

As demonstrated in Figure 2.2, business size growth is not uniform across jurisdictions, implying that various factors impact on business activity. This also applies to industry data, as illustrated in Figure 2.3. Disaggregating data by ANZSIC 2006 classification and employment size provides an interesting picture of the trends between June 2007 and June 2012. Growth was experienced across all firm size classes for the Mining, Electricity, Gas, Water & Waste Disposal, Accommodation & Food Services, Professional, Scientific & Technical Services, Education & Training, and Healthcare & Social Assistance industries. Some industries presented a mixed result, such as the Financial & Insurance Services industry, where strong growth in the number of non-employing firms weighed against a reduction in the number of employing firms across all class sizes to increase the overall number of firms in this industry. A marked decline

can be observed across all firm size classes for the Agriculture, Manufacturing, and Arts & Recreational Services industries.

Figure 2.3: Growth in business counts by firm size class by industry, June 2007 to June 2012, per cent



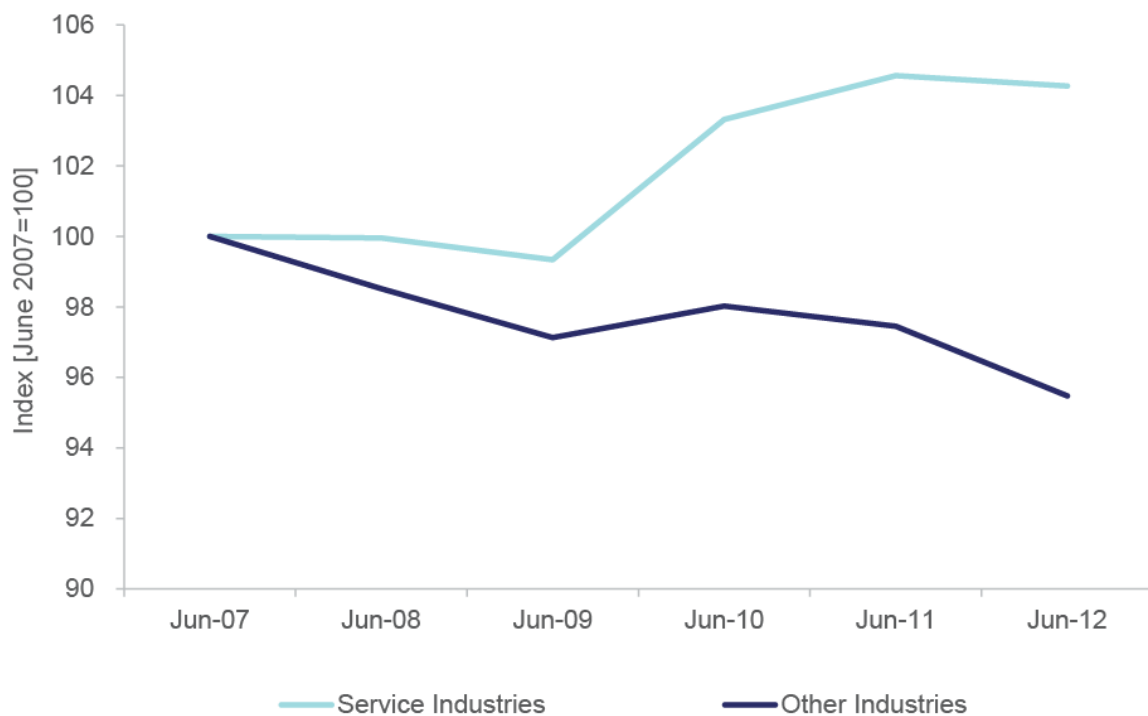
Source: ABS Cat. No. 8165.0

The relative share of non-employed and employing business counts by industry, nevertheless, remained broadly stable over the five-year period to June 2012. The Construction and Rental, Hiring & Real Estate Services industries accounted for relatively large proportions of non-employed businesses in Australia (accounting for 18.0 per cent and 14.9 per cent in June 2012, respectively). The Construction industry also represents a relatively large proportion of employing firms in Australia, with the Professional, Scientific & Technical Services industry the next largest employer (15.4 per cent and 13.2 per cent in June 2012, respectively).



Separating the service industries highlights a marked difference between growth in service industries when compared with growth across other industries.<sup>4</sup> Between June 2007 and June 2012, the combined business count of service industries grew by 5.1 per cent. At the same time, the business count of firms not in the service industries contracted by 4.3 per cent. While both the service industries and other industries were seen to decline during the GFC, the service industries demonstrated a much stronger recovery, with strong growth observed particularly between June 2009 and June 2010 (see Figure 2.4). As of June 2012, the service sector represented 69.0 per cent of all firms. Service firms are more prevalent among the count of larger firms, representing 61.6 per cent of non-employed firms, 63.9 per cent of small firms, 69.9 per cent of medium firms and 70.7 per cent of large firms.

Figure 2.4: Growth in firm count by service industries, June 2007 to June 2012



Source: ABS Cat. No. 8165.0

It is important to note, however, that the relative growth varied significantly between different service industries. That is, in both proportionate and absolute terms, the Financial & Insurance Services industry recorded the strongest growth (with over 23,000 or 16.4 per cent more firms in June 2012). The Health Care & Social Assistance industry also recorded very strong growth (with approximately 14,000 or 15.8 per cent more firms in June 2012). This reflects the growing demand for healthcare services as the ‘baby-boomers’ move further

<sup>4</sup> Service industries include Wholesale trade; Retail trade; Accommodation & food services; Transport, postal & warehousing, Information media & telecommunications; Financial & insurance services; Rental, hiring & real estate services; Professional, scientific & technical services; Administrative & support services; Public administration & safety; Education & training; Health care & social assistance; Arts & recreation services; and Other services. The classification of these industries as service industries is consistent with the definition used by the Australian Bureau of Statistics (ABS).

into retirement and elderly years. The Education & Training industry, while relatively modest in comparison, demonstrated strong growth, with almost 2,400 new firms (representing growth of 10.0 per cent) as of June 2012. In contrast, the count of firms in the Public Administration & Safety industry declined between June 2007 and June 2012, with almost 600 fewer firms in June 2012 (a contraction of 7.2 per cent).

### **3. Features of the Australian business size structure**

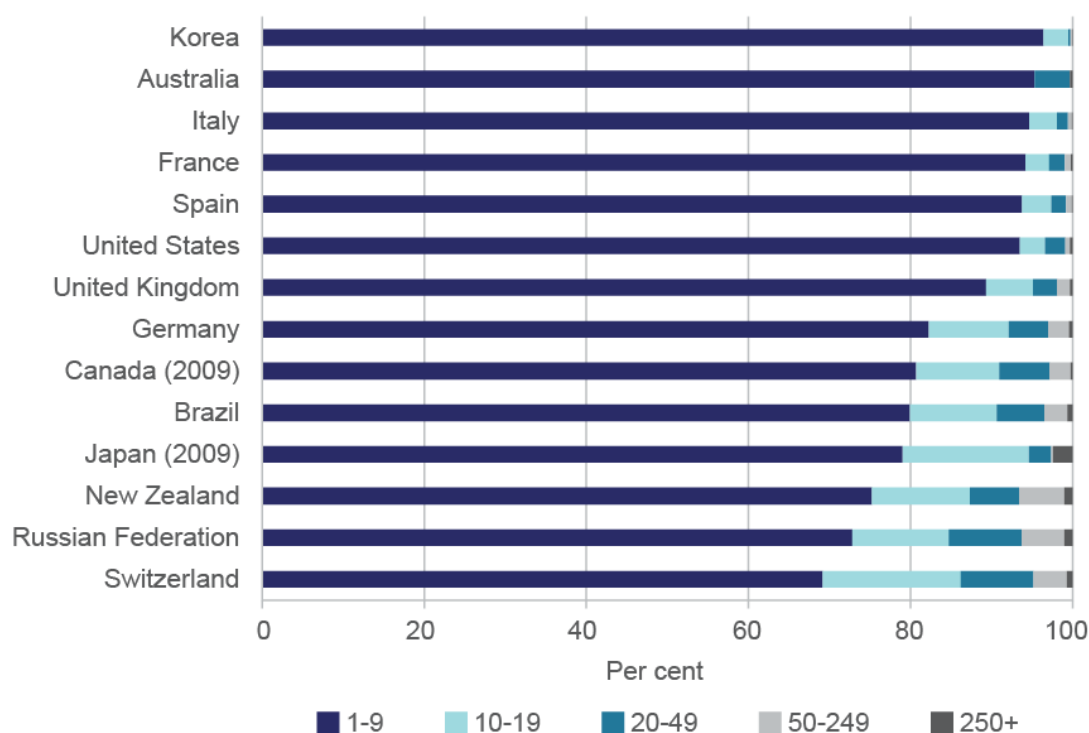
While there is some variation across countries, the distribution of firm counts by employment size is generally bottom-heavy, dominated by small and medium enterprises. Figure 3.1, presents a comparison of the distribution of employing firms across selected Organisation for Economic Cooperation and Development (OECD) countries, clearly demonstrating the dominance of small firms (between 1 and 9 employees, in this case) in total firm counts across all countries.

There is, however, some variation in firm size distribution. The country with the highest proportion of firms employing between 1 and 9 employees was Korea, where such firms accounted for 96.4 per cent of all firms. The smallest proportion of firms to employ between 1 and 9 employees was recorded in Switzerland, where such firms represented only 69.1 per cent of all firms. Although these data suggest that Australian firms employing between 1 and 9 employees make up 95.3 per cent of all firms (markedly above the median value of 92.1 per cent), care must be taken when comparing this figure with others, as the parameters vary slightly.<sup>5</sup>

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<sup>5</sup> In this OECD data, the employment range for small Australian firms actually represents certain firms with between 0 and 9 employees, inclusive. This differs to the parameter for most other countries, which represents firms with between 1 and 9 employees. The parameters are sufficiently different that direct comparison should be treated with care.

Figure 3.1: Distribution of firms by employment size in selected OECD countries, 2010

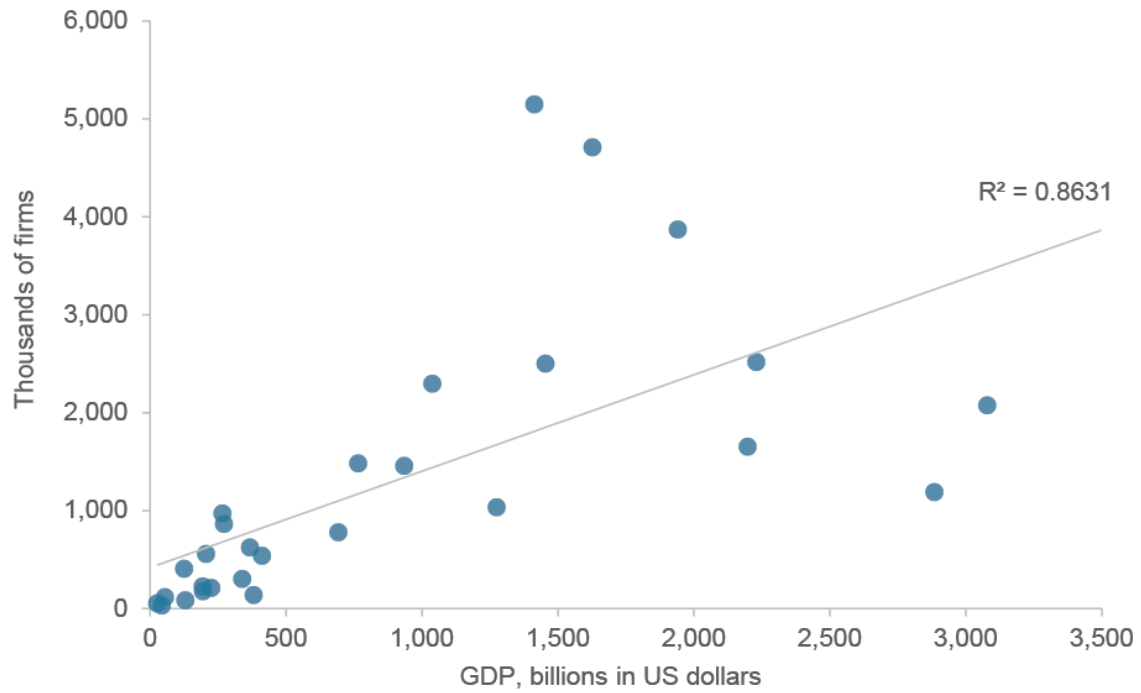


Source: OECD (2013) *Entrepreneurship at a glance*

Generally, the larger the economy the greater the number of enterprises and the higher the proportion of larger enterprises.<sup>6</sup> Figure 3.2, presents firm count by Gross Domestic Product (GDP) across selected OECD countries. Italy, and to a lesser extent Spain have disproportionately more businesses per unit of GDP than other large European countries, such as France, Germany and the United Kingdom, or resource rich countries such as Canada and the Russian Federation. Australia can be seen here to have a total firm count proportionate to the size of our economy.

<sup>6</sup> *Entrepreneurship at a Glance* (2013) Organisation for Economic Cooperation and Development (OECD)

Figure 3.2: Firm counts by Gross Domestic Product (GDP), 2010

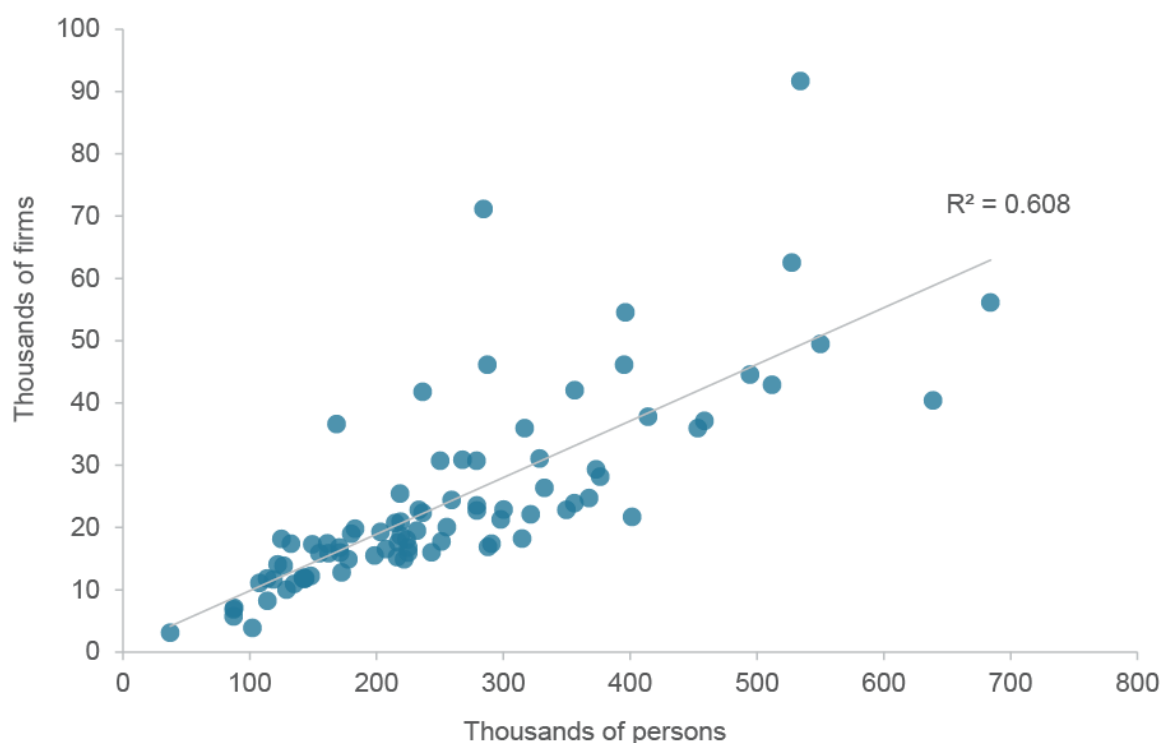


Notes: The linear trend line includes the observations of the United States and Japan that are not displayed on the chart given the size of their GDP.

Source: OECD (2013) *Entrepreneurship at a Glance*

The same general trend can be observed in different jurisdictions within Australia, with larger jurisdictions exhibiting both larger total firm counts as well as a larger proportion of large firms. Regional data in Australia also point to the fact that business counts are proportionate to the size of a region (as judged by population estimates in Figure 3.3).

Figure 3.3: Regional populations by total firm count, 2011



Source: ABS Cat. No. 8165.0

The relative proportions of small employing firms and non-employing firms also vary across Australian jurisdictions. In June 2012, South Australia had the smallest ratio of small employing firms relative to non-employing firms (31.2 and 64.7 per cent of total firm counts respectively). In contrast, the Australian Capital Territory and New South Wales have the largest proportion of small employing firms (each with 36.9 per cent), demonstrating relatively smaller proportions of non-employing firms (58.1 and 59.2 per cent respectively). The proportions of non-employing and small-employing firms in Victoria closely mirror the national average.

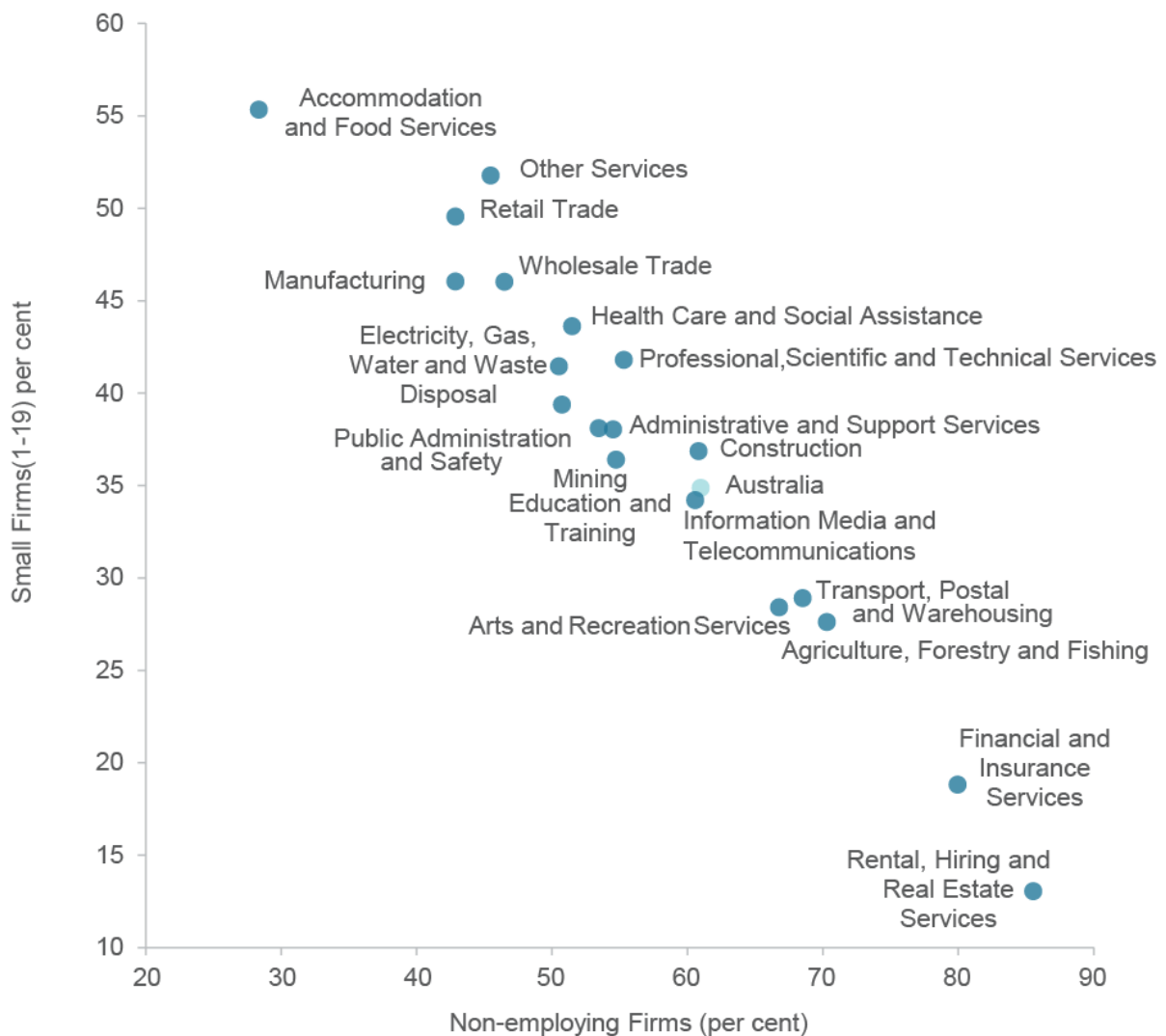
Variety in the ratio of small employing to non-employing firms is more pronounced across different ANZSIC 2006 classifications (see Figure 3.4). At one end, the Accommodation & Food Services industry has a high proportion of small employing firms, for example, presumably as a result of the need to employ staff in such industries, where the division of labour requires chefs, waiters, managers and bar staff. The proportion of small employing firms is also relatively high in the Other Services, Retail Trade, Manufacturing and Wholesale Trade industries where activities are characterised by minimum efficient scales of production.

At the other end of the spectrum, firms in the Agriculture, Forestry & Fishing, Financial & Insurance Services, and Rental, Hiring & Real Estate industries are more often non-employing.<sup>7</sup> Again this relates to the nature of these industries, with family-run farms and consultants in Finance & insurance operating

<sup>7</sup> In South Australia for example, the proportion of business counts for each of these industries is larger than that of the national average, which explains the relatively large share of non-employing firms in this jurisdiction as illustrated earlier.

businesses without the need or motivation to employ staff. Non-employing businesses are particularly concentrated in industries characterised by relatively low barriers of entry and low minimum efficient scales, such as in the services sector in general. There are various other factors that impact on self-employment and these are explored in more detail later. The proportions of non-employing and small-employing firms in the Information Media & Telecommunications industry and the Construction industry closely mirror the Australian industry average.

Figure 3.4: Non-employing and small employing businesses as a proportion of total firm count by industry, June 2012

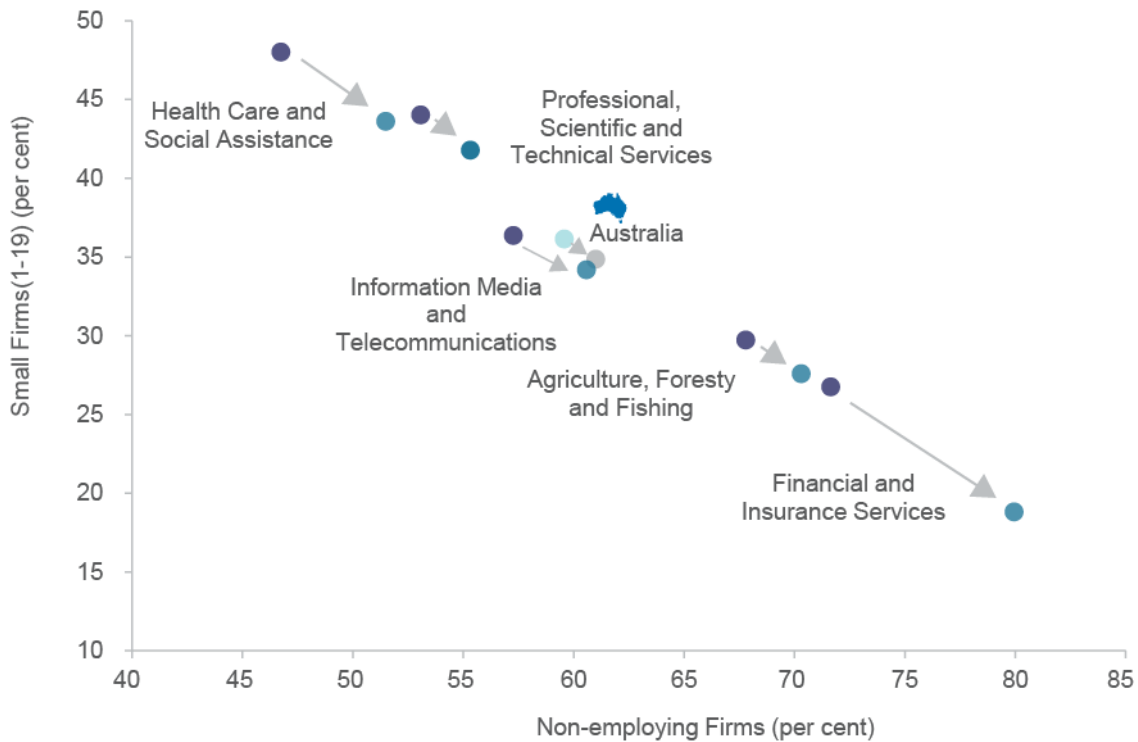


Source: ABS Cat. No. 8165.0

While the proportion of firms that are either non-employing and small employing has remained reasonably stable over time, a general trend can be observed for industries to move away from small employing (1 to 19 employees) to non-employing over the period examined (see Figure 3.5). This may be explained, in part, by the counter-cyclical nature of the count of non-employing firms. That is, the number of non-employing firms has increased strongly in Australia during the economic turbulence that began with the GFC in 2008. This trend was

particularly prominent in the Health Care & Social Assistance, Professional, Scientific & Technical services, Information Media & Telecommunications, Agriculture, and Financial & Insurance Services industries. The trend in relative proportions of small employing and medium firms, and medium and large firms, were also assessed. The overall movements at the aggregate industry level, however, were very small.

Figure 3.5: Non-employing and small employing firms as a proportion of all firms, top 5 moving industries, June 2007 to June 2012



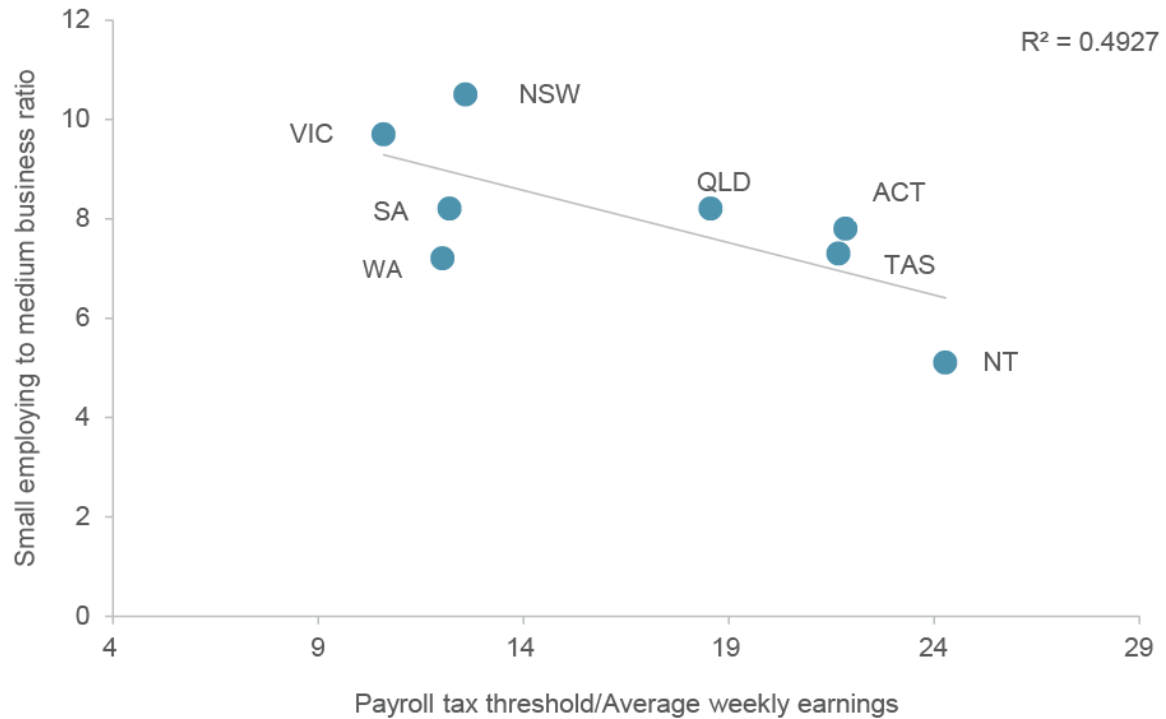
Source: ABS Cat. No. 8165.0

In general, jurisdictional data point to a negative relationship between the ratio of small employing to medium sized businesses and the payroll tax threshold to average weekly earnings ratio.<sup>8</sup> Figure 3.6 reflects results calculated for the 2011–12 financial year. This sheds some light on the relatively high ratio of small employing to medium-sized enterprises in New South Wales and Victoria (given the relatively low payroll tax threshold to average weekly earnings ratio: around 10–13 employees) and the relatively low small employing to medium sized business ratio in the Northern Territory (given the relatively high payroll tax threshold to average weekly earnings ratio: around 24 employees). The fact that the ratio of small employing to medium sized enterprises is broadly similar for South Australia, Queensland and the ACT at different payroll tax threshold to earnings ratios, however, clearly illustrates that other factors play a role as well. One of these factors is varying payroll tax rates. Although the payroll tax threshold in South Australia, for example, is lower than in the ACT, the payroll tax rate is also much lower. The payroll tax threshold in Queensland is

<sup>8</sup> The payroll tax to average weekly earnings ratio is of course a very crude way to gauge the size of firms that might be eligible for payroll tax as wage rates vary from industry to industry. Moreover, there are a range of temporary rebates and exemptions that might apply in each jurisdiction.

somewhere between that of the ACT and South Australia, but Queensland had the lowest payroll tax rate of all jurisdictions in 2011–12.

Figure 3.6: Small employing to medium business size ratio vs. payroll tax thresholds by jurisdiction, 2011–12



Source: ABS Cat. No. 8165.0, ABS Cat. No. 6302.0 and State and Territory Governments

Variation in the rate at which firms take up or shed employees reflects the relative health of the economy. The majority of businesses do not change their size category between years. However, a sharp reduction in the rate of upscaling can be observed across each firm size class in 2009–10 due to the impact of the GFC. At the same time, each firm size class exhibited a marked increase in the rate of downscaling.

Upscale rates are calculated as the percentage of firms within each firm size class that transition into a larger employment class during each financial year. For example, 3.2 per cent of firms that were non-employed at the start of 2011–12 had started employing by the end of the financial year. Similarly, 7.6 per cent of firms that were employing 1–4 employees at the beginning of the financial year were employing 5 or more employees by the end of the financial year, 5.5 per cent of firms employing 5–19 employees at the beginning of the financial year were employing 20 or more employees at the end of the financial year, and 1.0 per cent of firms that were employing 20–199 employees were employing 200 or more employees at the end of the financial year.

Overall, smaller firm size classes have higher rates of upscaling. This, in part, reflects the increasing employment range for each class. That is, a micro firm (1 to 4 employees) will need to take on no more than 4 more employees to become a small firm, while a medium firm (20 to 199) may need to take on as many as



180 new employees to become a large firm. This pattern, however, does not hold for non-employing firms, who exhibit a relatively small upscale rate. This is likely to be the result of the different legal entities that make up non-employing firms (such as sole-traders), as well as the kind of business these operate. For example, many sole trading taxi drivers or people operating an internet retail business from home may not be motivated to expand their businesses by taking on new staff. Non-employing businesses are sometimes also operated due to lifestyle choices with little incentive to upscale.

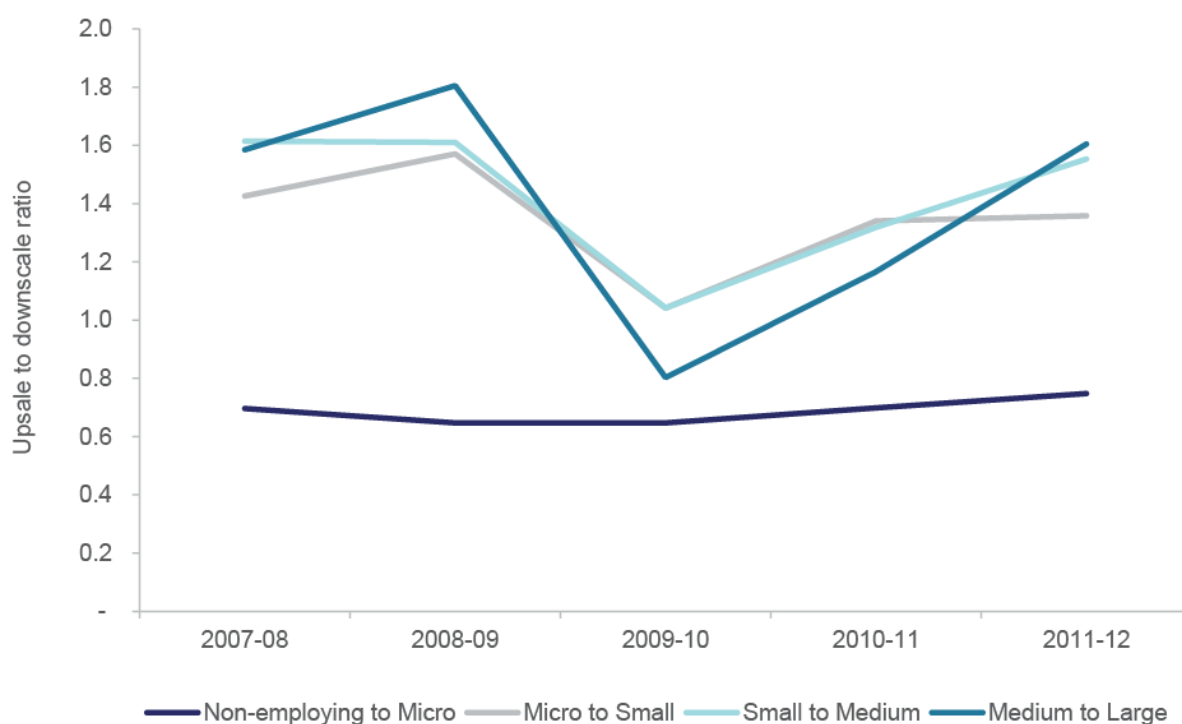
In order to examine the rate of upscaling relative to downscaling, firm size transition ratios were calculated. These ratios represent the net flow, upward or downward, between the firm size classes. To illustrate, the firm size transition ratio for 'non-employing to micro' was calculated as follows:

$$\text{Firm size transition ratio} = \frac{\text{Non-employing firms becoming Micro firms}}{\text{Micro firms becoming Non-employing firms}}$$

Firm size transition ratios greater than 1 represent a net increase across the firm size transition.

Figure 3.7 demonstrates a net upward flow into small employing, medium and large businesses as the transition ratios are higher than 1. The GFC had a marked impact, with heightened downsizing activity during the 2009–10 financial year. Notably, however, the firm size transition ratio did not move below 1 for transitions from micro to small, and small to medium, indicating continued net upsizing at these levels. The transition ratio for medium to large, however, briefly dipped below 1 in the 2009–10 financial year, indicating that relatively more firms transitioned downward across this threshold at the height of the GFC. Another feature worth noting is the relatively small firm size transition ratio for non-employing to micro firms. This transition ratio remained considerably below 1 over the period examined, indicating a net downward flow of firms across the threshold.

Figure 3.7: Firm Size Transition Ratios, 2007–08 to 2011–12



Source: ABS Cat. No. 8165.0

Although the fall in firm size transition ratios in 2009–10 reflected both a reduction in upscale rates and an increase in downscale rates, the change in the transition ratios were driven more by increases in the downscale rate for each transition ratio except non-employed to micro. That is, compared with 2008–09, the number of micro firms upscaling to small decreased by 6.6 per cent in 2009–10, while the number of firms downscaling from small to micro increased by 14.7 per cent. At the same time, the downscale rate increased by 13.2 per cent for the small to medium transition, while the upscale rate decreased by only 4.1 per cent.

#### 4. Drivers of business counts and differences in firm size distributions

As highlighted earlier, larger economies in general are associated with a larger number of businesses as well as a higher proportion of large businesses. The size of an economy captures the effect of expanding local demand for goods and services. Cyclical conditions as portrayed by the unemployment rate also play a role. In the case of non-employed business counts, for example, the option of self-employment becomes more attractive when a worker loses his/her job and fails to find alternative employment. At the same time, soft labour market conditions reduce aggregate disposable income that in turn reduces local demand for goods and services that leads to a less robust economic environment restraining opportunities to start or maintain a small business. The net impact of the unemployment rate on non-employed businesses is ambiguous, depending on which of these effects dominates for a region.

As illustrated earlier in Figure 2.1, the GFC also had a significant impact on business counts across different business size categories. A body of research has examined the differing impact of economic downturns on small and medium enterprises in comparison with large firms. Evidence suggests that small and medium firms, which are considered to be more reliant on bank finance and credit for day-to-day operations,<sup>9</sup> are more vulnerable to credit crunches because they have fewer assets available to use as loan collateral, lack alternative financing sources or access to international markets, and cannot rely on the support of parent companies.<sup>10</sup> Credit-reliant small and medium sized firms in Europe were forced to scale down investment plans and production during the GFC,<sup>11</sup> which Klein<sup>12</sup> argues led to underinvestment in the sector, resulting in reduced labour productivity and thereby a greater fall in value added for small and medium firms when compared with large firms. This finding complements earlier research by Kannan,<sup>13</sup> which found a slower recovery in industries with a greater proportion of small and medium firms. Taken together, research suggests that the impact of the GFC has been deeper and more prolonged for small and medium enterprises.

To examine the impact of key macroeconomic factors that affect the firm size distribution in Australia, the number of business counts was regressed on a cyclical variable (the unemployment rate or employment-to-working age population ratio), population estimates (as a proxy for the size of an economic area) and a GFC dummy variable as our sample includes the recent global financial crisis and the subsequent recovery.

Annual data for Australian jurisdictions as well as regional areas in Australia were used in regressions for different business size classes. Given the methodological changes to the *ABS Business Counts* publication over the years, we restricted the sample period for the jurisdictional regressions to that of the 2013 publication, covering the period June 2008 to June 2012. This counters the effects of data revisions, definitional and classification changes to business counts that make time series analysis problematic over a longer sample period.

Data for the regional regressions were obtained from the *ABS.Stat Beta* website and covers the period 2007 to 2010. In this case, given lack of availability of data, the unemployment rate variable was replaced by a variable that measures the ratio of the number of wage and salary earners to the working age population in a region, which serves as a proxy for the employment-to-working age population variable.

To control for the simultaneous nature of business activity and overall economic growth, we used a one period lag for the unemployment rate (employment-to-working age population ratio) and the population estimates. The GFC dummy captures the period 2008–09, which was marked by a drop in business counts across most size classes. A dummy variable was also used for the 2009–10

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<sup>9</sup> Dell'Ariccia, G. E., Detragiache, and R. Rajan (2008), The Real Effect of Banking Crisis, *Journal of Financial Intermediation*, 17, pp. 89–112.

<sup>10</sup> Klein, N. (2014), Small and Medium Size Enterprises, Credit Supply Shocks, and Economic Recovery in Europe', *IMF Working Paper*, International Monetary Fund.

<sup>11</sup> Ibid. This finding was consistent with evidence uncovered by Kashyap et al. (1994), who found that credit-reliant firms were more likely to cut inventory investment during the 1982 US recession.

<sup>12</sup> Klein, N. (2014), Small and Medium Size Enterprises, Credit Supply Shocks, and Economic Recovery in Europe, *IMF Working Paper*, International Monetary Fund.

<sup>13</sup> Kannan, P. (2010). Credit Conditions and Recoveries from Recessions Associated with Financial Crises. *IMF Working Paper 10/83*, International Monetary Fund.

period, given the lagged impact on medium and large businesses to the GFC as highlighted earlier. The regression equation that was used for each business size class is shown below.

$$Y_{it} = \alpha + X_{it}'\beta + \delta_i + \varepsilon_{it}$$

where  $Y_{it}$  is the dependent variable, and  $X_{it}$  is a  $k$ -vector of regressors, and  $\varepsilon_{it}$  are the error term for  $i = 1, 2, \dots, 8$  cross sectional units (87 in the case of the regional regressions) observed for periods  $t = 1, 2, \dots, 5$  (note  $t = 1, 2, \dots, 4$  in the case of regional regressions). The  $\alpha$  parameter represents the overall constant in the model, while the  $\delta_i$  represent cross-section specific fixed effects.

The regression results are shown in Table 4.1. Lagged population estimates have a positive impact on business counts by all size categories (except for small employing firms).<sup>14</sup> The coefficient for medium sized businesses, however, was not statistically significant. The regional data provides some additional insight (see Table 4.2), reflecting a statistically significant negative coefficient for micro businesses and a statistically significant positive coefficient for businesses with five or more employees. In relation to cyclical conditions, the non-employing business count regressions point to unemployment-push factors (this is discussed in more detail later), while the sign is as expected (pro-cyclical behaviour) for other business size classes with the exception of micro enterprises.<sup>15</sup> An implication of the counter-cyclical finding for non-employing firms is that it points to the fact that new entrants in this size class are not necessarily innovators, but rather persons who are seeking to secure their income by means of alternative employment.<sup>16</sup>

Convincing evidence as judged by both the jurisdictional and regional regressions for the GFC impact could only be obtained for small employing (including the micro and five or more sub-classes) and medium businesses size classes for the 2009–10 period.

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<sup>14</sup> As a sensitivity test, we replaced population estimates with Gross State Product (GSP) per capita estimates in the jurisdictional panel regressions. Estimation results were very similar, with the exception of the unemployment rate and 2009–10 dummy variables in the non-employing regression. The unemployment rate coefficient, which was still very small in magnitude, was negative and statistically significant, while the  $GFC_{t+1}$  variable was negative, but not statistically significant.

<sup>15</sup> A uniform one-period lag was used across the different regressions by firm size as reflected in the previous section. It is plausible that this lag does not apply so much to non-employing businesses. We compared results for non-employing businesses without a lag for the unemployment rate (employment-to-working age population) variable and this still pointed to counter-cyclical behavior.

<sup>16</sup> Robinson *et. al.* (2006) confirms that the line between self-employment, entrepreneurship and business start-ups is indeed blurred. Apart from starting your own business for reasons such as unemployment or to implement a new idea, other reasons include a desire to run your own business or wealth ambitions.

Table 4.1: Regression results based on jurisdictional data

Variables	Dependent variable: business counts			
	Non-employing	Small employing	Medium	Large
C	-0.367 (1.445)	11.336*** (1.180)	8.591*** (1.699)	-6.194*** (1.276)
Population <sub>t-1</sub>	0.818*** (0.102)	-0.043 (0.084)	0.005 (0.120)	0.868*** (0.092)
UR <sub>t-1</sub>	0.001 (0.001)	-0.006* (0.003)	-0.006 (0.005)	-0.058*** (0.015)
GFC	-0.021*** (0.002)	-0.021*** (0.002)	0.006 (0.004)	0.001 (0.009)
GFC <sub>t+1</sub>	-0.000 (0.003)	-0.008* (0.004)	-0.021*** (0.004)	-0.015 (0.016)

Notes: The population and unemployment rate (UR) variables are one-period lags. Business counts and the population variable are expressed in log terms. The GFC dummy (GFC) captures the impact of the Global Financial Crisis (2008–09=1), while GFC<sub>t+1</sub> captures the lagged effect (2009–10=1). \*\*\*, \*\* and \* denotes significance at 1%, 5% and 10% levels, respectively. Fixed effects are not shown in the table. The modelling involved cross-section specific weights and White cross-section standard errors

Source: Department of Industry, Innovation and Science (2015)

Table 4.2: Regression results based on regional data

Variables	Dependent variable: business counts		
	Non-employing	Micro (1 to 4 employees)	Five or more employees
C	-0.074 (0.061)	11.554*** (0.390)	5.753*** (0.423)
Population <sub>t-1</sub>	0.799*** (0.005)	-0.210*** (0.026)	0.182*** (0.031)
Emp/Pop <sub>t-1</sub>	-0.556*** (0.037)	-0.774*** (0.187)	0.055 (0.085)
GFC	-0.002 (0.001)	0.002 (0.008)	0.011*** (0.004)
GFC <sub>t+1</sub>	0.016*** (0.001)	-0.006*** (0.001)	-0.017*** (0.001)

Notes: The population and employment-to-population ratio (emp/pop) variables are one-period lags. Business counts and the population variable are expressed in log terms. The GFC dummy captures the impact of the Global Financial Crisis (2008–09=1), while GFC<sub>t+1</sub> captures the lagged effect (2009–10=1). \*\*\*, \*\* and \* denotes significance at 1%, 5% and 10% levels, respectively. Fixed effects are not shown in the table. The modelling involved cross-section specific weights and White cross-section standard errors.

Source: Department of Industry, Innovation and Science (2015)

The above analysis considered some macroeconomic aspects of business churn. Business formation by size class is, however, a very complex process given various other factors and specific local characteristics that also play a role. This was apparent in the regression results of small employing business counts in particular. Robinson et. al.<sup>17</sup> highlights some industry and firm level factors that play a role. Industry level factors include sunk costs and market size, product life cycle factors<sup>18</sup> and market structure and concentration, while firm level factors for example include the size and the age of firms, entrepreneurial ability and innovation.

Rubini et. al.<sup>19</sup> highlights barriers to growth such as trade costs, restrictive trade policies and transport costs that provide fewer opportunities for businesses to become large as well as factors that impact on firms' capacity to innovate such as the absence of Research and Development (R&D) spending that can lead to a firm size distribution that is skewed towards smaller firms. Size-dependent policies such as taxes (e.g. corporate profit and labour taxes) or subsidies, regulation and enforcement were also highlighted as impacting on differences in firm size distributions. To fully understand and quantify the impact of important drivers of business churn, the above mentioned factors also need to be analysed. This may, therefore, represent an avenue for further research.

<sup>17</sup> Robinson C, O'Leary B and Rincon A (2006) Business start-ups, closures and economic churn: A review of the literature, *Final report prepared for the Small Business Service (Department of Trade and Industry)*, National Institute of Economic and Social Research, URN 06/2112

<sup>18</sup> A young product/industry will attract entrants as the existing producers cannot satisfy demand, or innovation and/or the identification of a niche market. See Robinson et. al. (2006) for more detail.

<sup>19</sup> Rubini L, Desmet K, Piguillem F and Crespo A (2012) Breaking down the barriers to firm growth in Europe, *4th EFIGE policy report*, Bruegel Blueprint No. 18

## 5. Other determinants of non-employing business counts

Non-employing businesses are a very disparate group that include, for example, farmers, real estate agents, construction workers, shopkeepers, doctors, computer programmers, hairdressers and shop owners. The empirical results presented in the previous section pointed to the counter-cyclical behaviour of non-employing firms as judged by labour market conditions. According to the literature, the relationship between self-employment rates and the unemployment rate is not straightforward and many studies have been conducted to investigate this issue.

Meager<sup>20</sup> refers to both push (indirect via the labour market) and pull (direct cyclical) factors. Given that increasing and high levels of unemployment constitutes weakening labour market conditions and therefore a lack of paid employment opportunities, this can be regarded as an “unemployment push” factor that leads to inflows into self-employment, i.e. there is a positive relationship between the unemployment rate and self-employment. The second argument is that economic activity acts as a prosperity “pull” factor on self-employment as workers remain outside the labour force altogether (or as a discouraged effect) and/or a situation of outflows from self-employment given business failures, i.e. implying a negative relationship between the unemployment rate and self-employment. In practice, what happens to the stock of self-employment depends on which one of these two opposing forces dominates. Parker<sup>21</sup> and Le<sup>22</sup> argues that the ‘push’ and ‘pull’ theories emphasize that the returns from self-employment relative to paid employment play a central role in explaining the proportion of the workforce that are self-employed.

There are also various personal, social and other individual characteristics that impact on self-employment levels. A recent Australian study by Atalay, Kim and Whelan<sup>23</sup> for example investigate the role of gender, age, marital status, number of young children, education, immigration status and an indicator for risk aversion on self-employment. The results of this study show that older workers, less risk averse workers, married males and an increase in the number of young children in the case of females all point to workers that are more likely to be self-employed, and less likely to exit from self-employment to paid employment. The results were mixed in terms of education attainment. Atalay, Kim and Whelan<sup>24</sup> argue that the decline in the self-employment rate in Australia can mainly be ascribed to the fact that older workers, particularly female workers, remained longer in paid-employment. Le<sup>25</sup> argues that Australia’s high share of self-employment may be due to characteristics of the workforce such as a relative high share of foreign-born workers or regional considerations given the size of the country. As illustrated earlier in Figure 3.4, the proportion of self-employment

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<sup>20</sup> Meager N (1992) Does Unemployment Lead to Self-Employment?, *Small Business Economics: An International Journal* 4 (2), June, pp. 87–103

<sup>21</sup> Parker SC (1996) A Time Series Model of Self-employment under Uncertainty, *Economica* 63, pp. 459–475

<sup>22</sup> Le AT (1999) Empirical studies of self-employment, *Journal of Economic Surveys*, 13 (4)

<sup>23</sup> Atalay K, Kim W and Whelan S (2013) The Decline of the Self-Employment Rate in Australia, University of Sydney Economics Working Paper No. 3, February

<sup>24</sup> Ibid.

<sup>25</sup> Le AT (1999) Empirical studies of self-employment’, *Journal of Economic Surveys*, 13 (4)

varies significantly across industries. This can partly be explained by the degree of institutional and legal regulation of various occupations given its impact on entry into self-employment in response to cyclical conditions (see for example Meager<sup>26</sup>).

We investigated three variables identified in the literature as influencing non-employing business counts by industry, namely the importance of human capital, educational attainment and income levels (see Wheeler<sup>27</sup> for more detail on variables that explain variations in the location of businesses). Figure 5.1 illustrates average ratios of bachelor level attainment, the working age population and average equivalised disposable income against the proportion of non-employing business counts in selected industries for which a strong relationship could be found.

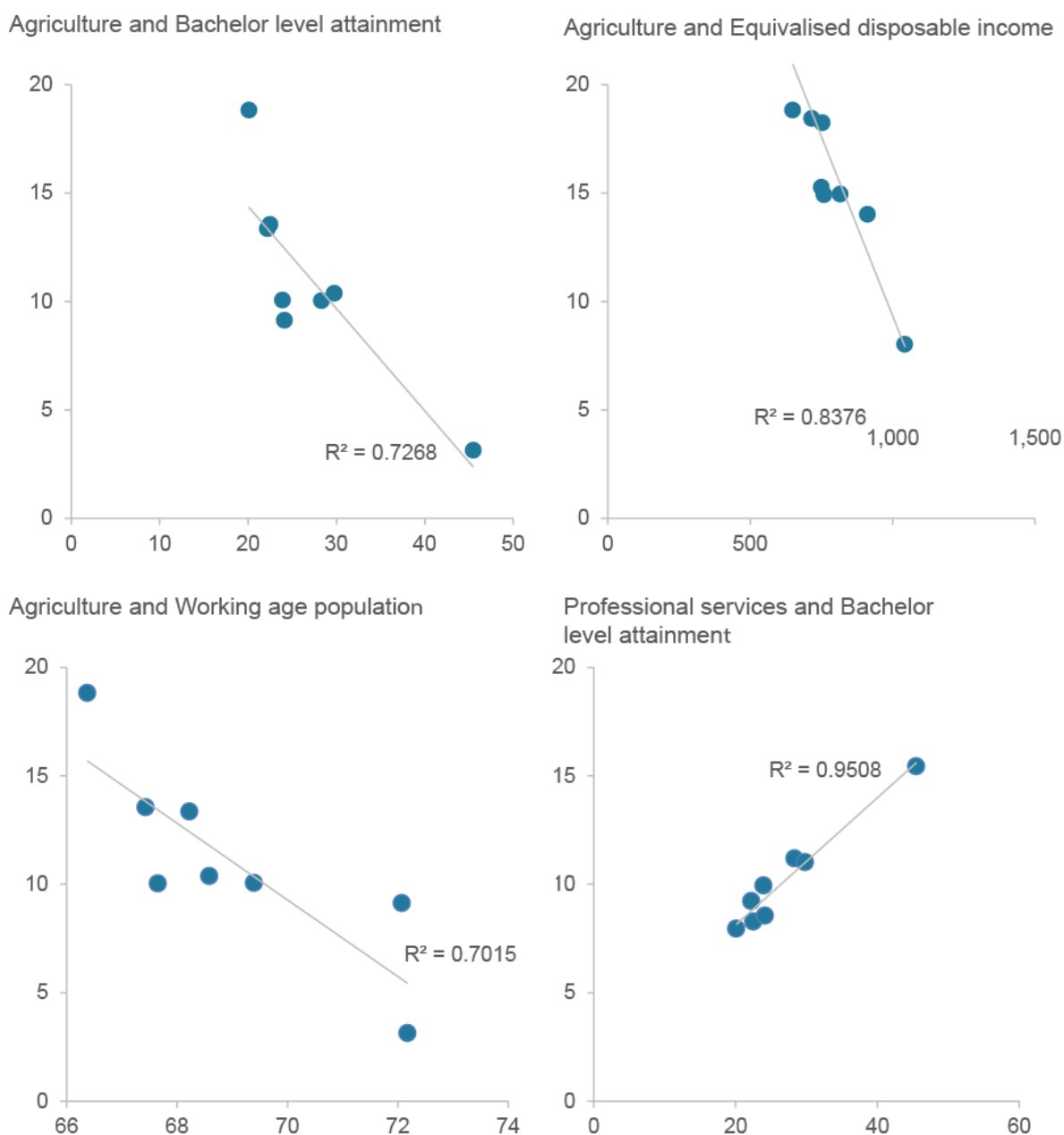
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<sup>26</sup> Meager N (1992) Does Unemployment Lead to Self-Employment?, *Small Business Economics: An International Journal* 4 (2), June, pp. 87–103

<sup>27</sup> Wheeler CH (2006) Neighbourhood Characteristics Matter: When Businesses Look for a Location'. Federal Reserve Bank of St. Louis



Figure 5.1: Variables that explain selected industry shares of non-emplying business counts by jurisdiction (per cent)



Notes: The markers on the charts reflect observations for the eight jurisdictions. The independent variables (a. proportion of people aged 25–64 years with a Bachelor degree or above, b. median equivalised disposable income per week, and c. resident working age population as a proportion of total resident population) are presented on the x-axis. The dependent variable, share of non-emplying firm count by industry, is presented on the y-axis.

Source: Figure 5.1 is ABS Cat. No. 8165.0., ABS Cat. No. 4102.0, ABS Cat. No. 3101.0 & ABS Cat. No. 6523.0

The charts suggest that the share of non-emplying business counts in the Agriculture, Forestry & Fishing industry are negatively related to educational attainment, the working age population and equivalised disposable income levels.<sup>28</sup> That is, in jurisdictions where non-emplying agricultural firms

<sup>28</sup> It should be noted that the ACT can be regarded as an outlier for the Agricultural share of non-emplying businesses. The exclusion of the ACT would lead to a somewhat weaker association

represent a greater share of all non-employing firms in that jurisdiction, educational attainment and income levels are likely to be relatively low. This finding is consistent with literature demonstrating relatively low wealth and educational attainment in rural and remote communities.<sup>29</sup> Moreover, jurisdictions with a high proportion of non-employing agricultural firms are also more likely to have a population with a smaller proportion of working age people. This is also consistent with data suggesting an older workforce in the agricultural industry.<sup>30</sup> As would be expected, the Professional, Scientific & Technical Services industry non-employing business count proportions are strongly positively related to educational attainment. These relationships are also apparent in regional data as illustrated in Figure 5.2.

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between each of the explanatory variables and the Agricultural share of non-employing businesses.

<sup>29</sup> Allen Consulting Group Pty Ltd (2012) Rebuilding the Agricultural Workforce, Report to the Business/Higher Education Round Table

<sup>30</sup> Ibid.

Figure 5.2: Variables that explain selected industry shares of non-employed business counts by region



Notes: The markers on the charts reflect observations for Australian regions. The independent variables (a. average wage and salary, b. proportion of people aged 25–64 years with a Bachelor degree or above, and c. resident working age population as a proportion of total resident population) are presented on the x-axis. The dependent variable, share of non-employed firm count by industry, is presented on the y-axis.

Source: ABS Cat. No. 8165.0., ABS Cat. No. 1379.0.55.001

Regional data also point to strong correlations between some industry shares for non-employed businesses. Table 5.1 reflects pairs of industries where the highest correlations were found. A relatively high (low) share of non-employed businesses in the Professional, Scientific & Technical Services industry in a region is for example generally associated with a relatively high (low) share of non-employed businesses in the Information Media & Telecommunications, Education & Training and Health Care & Social Assistance industries; and a relatively low (high) share of non-employed businesses in the Agriculture, Forestry & Fishing industry.

Table 5.1: Regional industry correlations for non-employing firms

Strong positive correlation ( $r \geq 0.8$ )	
Professional, Scientific & Technical Services	Information Media & Telecommunications
	Education & Training
	Health Care & Social Assistance
Rental, Hiring & Real Estate Services	Financial & Insurance Services
Information Media & Telecommunications	Art & Recreation Services
Strong negative correlation ( $r \leq -0.8$ )	
Agriculture, Forestry & Fishing	Professional, Scientific & Technical Services
	Administrative & Support Services
	Education & Training

Source: Department of Industry, Innovation and Science (2015)

## 6. Conclusion

There were some significant regional and sectoral disparities in business counts growth by firm size class in Australia in recent years, implying that various factors impact on business activity. The aim of this paper was to investigate some of the drivers of these trends, particularly the role of macroeconomic and demographic factors. Considerable attention was also given to self-employment, given that it accounts for the bulk of business counts in Australia.

Compared to other OECD countries, Australia appears to have a total business count proportionate to the size of its economy. Consistent with cross-country data, the regression analysis (based on Australian jurisdictional and regional data) suggests that the size of an economic area has a positive and statistically significant impact on the number of non-employing and large firms. Some other macroeconomic aspects of business churn such as cyclical conditions and the impact of the Global Financial Crisis were also analysed. It should be noted, however, that these regressions do not account for industry and firm level factors such as sunk costs, market size and the age of firms that might be particularly relevant in the case of small employing business counts.

Self-employment is important from an entrepreneurial perspective given the potential for product and process innovation, but is comprised of a range of different firms with various personal, social and industrial characteristics that might complicate policy initiatives aimed at stimulating entrepreneurship. The empirical results of this paper point to an unemployment 'push effect', suggesting that a significant proportion of self-employment might not be due to entrepreneurship. The analysis also shows that there is a strong correlation between the proportion of non-employing business counts of certain sectors of the economy. Moreover, indicators such as educational attainment, household income and human capital are strongly related to the share of non-employing firms in some sectors of the economy.

Firm size matters when trying to understand factors that drive economic and employment growth, entrepreneurship, innovation, productivity and exports. The results of this study indicate that a strategic approach to business policy that adequately accounts for the nature and variety of the firm size composition is integral to industrial growth, considering structural features of each sector, policy developments at the jurisdictional level, macroeconomic conditions, demographic changes and various social factors. An enhanced understanding of the role and differentiated behaviour of firms according to their size and location presents greater opportunity to shape and strengthen industrial policy in Australia.

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