
Distribution of firms by size: observations and evidence from selected countries

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Abstract: It is commonly remarked that Small and Medium-Sized Enterprises (SMEs) form the backbone of many different economies around the world, but the extent to which such national trends form part of a quantifiable larger global pattern has rarely, if ever, been examined. It is not unusual to hear business leaders, elected officials, public policymakers and researchers in a given region claim that small businesses represent a surprisingly large share of the local economy. They typically argue that SMEs constitute the majority of all firms, and have done so for an extended period of time. The claim is repeated across many national jurisdictions, but each statement is only ever considered in isolation. Few attempts have been made to compare the proportionate distribution of SMEs in one nation-state with those in other jurisdictions. Large-scale trends, however, are often the aggregate sum of many local occurrences. Is it possible that what seems to be an isolated regional phenomenon is, in fact, a common pattern across much of the world? This paper examines the number of micro, small, medium and large-sized

enterprises from a selection of different countries. Using definitions and data provided by the national statistical agency in each nation, it seeks to compare the relative proportion of firms by size, and to determine if there are any common patterns. It then suggests some indicative theories about SME distribution for future research to test.

Keywords: SME; small and medium-sized enterprise; firm size distribution; business demography; Canada; Australia; China.

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1 Introduction

Firm size distribution has long been an object of interest to researchers, especially those working in the fields of economic modelling, competition policy and the impact of government regulation. Johansson (1997) studied the number and size distribution of firms in Europe. *Small Business Economics* had a special issue (Volume 22, Numbers 3–4/April 2004) on Entrepreneurship and the Demography of Firms and Industries.

It has long been noted that the distributions of firms is skewed (Ijiri and Simon, 1964; Ijiri and Simon, 1977; Simon and Bonini, 1958), but such observations have typically been drawn from analysis of a particular industry, or, on more limited occasions, from a whole national economy. An early seminal study by Gibrat (1931) looked at the patterns of firm growth and its impact on firm size distribution, resulting in the development of Gibrat's Law, which postulates that firm growth rates are independent of size. Indeed, the link between firm growth has often been one of the main foci of studies into firm size distribution.

Other studies of firm size distribution have been largely focused on distribution patterns within a particular industry or industrial sector (see, e.g. Chavas and Magand, 1988; Doi and Cowling, 1998). Such studies have noted that micro and small size firms are much more numerous than larger entities, and have examined the rate of increase amongst such enterprises compared to those of other sized firms.

Henrekson and Johansson (1999) have argued that, since the 1970s, there appears to have been a trend in which the number of micro- and small-sized firms has increased relative to medium- and large-scale enterprises. They also noted that very few studies had examined firm size distribution patterns over an extended period of time.

A recent paper by Cabral and Mata (2003) noted that firm size distribution tended to be markedly skewed in many west European nations (that is to say, there are more smaller firms than larger ones), and that the total distribution of firms appears to remain static over time (even though size distributions within some subsets of that population, such as specific industries, may gradually evolve).

A number of attempts have also been made to model the nature of firm size distributions as power laws. For example, Marsili (2005) and others have argued that such distributions can often be fall into a Pareto-style pattern, whilst Axtell's (2001) review of US tax-paying firm sizes has suggested that they fall into a Zipf distribution which holds true over several years.¹

It is also notable that most studies into firm size distribution only examine employing firms (see, e.g. Kumar et al., 1999). However, many of the smallest firms in existence often only employ their owners, and hence are treated by some national statistical bodies as non-employing. When this occurs, the exclusion of so-called 'non-employing' business entities tends to underestimate the number of micro-sized firms in existence.

Finally there are some studies that have attempted to compare countries on the basis of the number of firms per capita (such as Hall, 2002; Henrekson and Johansson, 1999). An example is the current Global Entrepreneurship Monitor (Bosma and Harding, 2006), which has sought to measure differences in the relative numbers of adult persons owning and operating a new business venture in various countries. But whilst such studies have identified a number of apparent links between business ownership rates and national macro-economic factors, they have not attempted to examine the relative distributions of small, medium and large firms between nations.

Overall, however, there have been few, if any, systematic attempts to compare the relative numbers of firms across numerous different economies. This is a notable omission in the existing small and medium-sized enterprise (SME) research literature. As the Organisation for Economic Co-operation and Development (2000, 2008) has noted, the number of SMEs in most countries typically outweighs the number of larger firms. The majority of all enterprises are either micro, small or medium-sized in their scale; only a limited number can be categorised as 'large' in scale (however these terms are set by various data collection bodies and researchers).

Similar claims about the numerical primacy of SMEs have also been made about many regional economies. For example, government statistics in the Hong Kong Special Administrative Region indicate that SMEs represent 98% of all firms, although the breakdown between micro, small and medium enterprises is not given. An estimate of 99% has been provided amongst the recent and potential future entrants to the European Union (European Commission, 2004; Hong Kong Trade and Industry Department, 2001). Likewise, in Japan and South Korea, although detailed breakdowns by size are not readily available, it is claimed by both national governments that SMEs account for more than 99% of all private-sector firms (Small and Medium Business Administration, South Korea, 2004; Small and Medium Enterprise Agency, Japan, 2004).

2 The current distribution of firms by size

Whilst it is not possible to obtain standardised business firm size distributions globally, many nations collect and publish their own data sets of business demography, with an accompanying categorisation of firms as micro, small, medium or large-sized.

Table 1 Distribution of firms by size in selected nations

| | Australia, 2002 | Europe-19, 2003 | China, 2003 | New Zealand, 2004 | UK, 2002 | USA, 2000 | Canada, 2004 |
|--------------------|------------------|---------------------|------------------|-------------------|--------------------|---------------------|------------------|
| Microbusinesses | 952,200 (81.80%) | 17,820,000 (92.28%) | NA | NA | 2,600,000 (68.42%) | 19,988,000 (94.18%) | 596,043 (56.9%) |
| Small business | 169,800 (14.59%) | 1,260,000 (6.53%) | 172,591 (87.96%) | 253,655 (86%) | 1,170,000 (30.79%) | 1,009,000 (4.75%) | 307,309 (26.4%) |
| Medium enterprises | 39,300 (3.38%) | 180,000 (0.93%) | 21,647 (11.03%) | 31,990 (10.8%) | 27,000 (0.71%) | 167,000 (0.79%) | 134,161 (12.8%) |
| Large firms | 2800 (0.24%) | 40,000 (0.21%) | 1984 (1.01%) | 9309 (3.2%) | 7000 (0.18%) | 59,000 (0.28%) | 9619 (0.9%) |
| Total | 1,164,100 (100%) | 19,310,000 (100%) | 196,222 (100%) | 294,954 (100%) | 3,804,000 (100%) | 21,223,000 (100%) | 1,047,132 (100%) |

Sources: European Commission (2004), Ministry of Economic Development, New Zealand (2004), Australian Bureau of Statistics (2002, p.27), United Kingdom Department of Trade and Industry (2003). Figures may not add up due to rounding. For New Zealand, 'small business' category includes microfirms.

The use of published data provides both opportunities and problems for researchers. On the one hand, it gives access to national data sets that would not otherwise be collectable by individual researchers. However, many nations use different criteria to define firms as micro, small, medium and large sized, respectively, which compromises the validity of the data comparison process.² However in the absence of a standard universal set of criteria there is little other way in which the international distribution of firms by size can be examined, and it is an approach already adopted by the OECD (2008).

Table 1 provides a compilation of different national counts published from a selection of data collection agencies. An examination of the data indicates two substantial trends.

In all countries, SMEs account for at least 95% or more of the total national business count. Microfirms (where counted separately) and small enterprises together account for well over 80% of private sector enterprises in all of the various countries shown, whilst medium-scale firms typically account for another 5–10%. Large enterprises only represent about 1–5%. In each case, micro, small and medium-sized firms collectively account for 95% or more of the national business population.

A second identifiable feature is that small and micro-sized firms are the largest cohorts in each country. Indeed, in those nations where microfirms are counted separately, they constitute at least half of the total business population.

There is also a third trend that is not evident in the collected data in Table 1, since it is essentially cross-sectional in nature: the continuity of firm size distribution patterns over time. Although the published data sets do not all extend back over several years, several nations have maintained their own business demographic counts over timeframes of up to 20 years. Tables 2–4 inclusive show the distribution of firms for a number of countries for which such data is readily available: Canada, Australia and China. A striking feature in almost all of these nations is that the relative proportions of firms in each size category has remained constant over the long term.

Table 2 Composition of private sector firms in Canada, 1983–2001

| <i>Number of firms (proportion of firms)</i> | <i>2001</i> | <i>1999</i> | <i>1991</i> | <i>1983</i> |
|---|--------------------|--------------------|--------------------|--------------------|
| Micro-small businesses (0–19 employees; includes self employed) | 919,100 (92.1%) | 902,100 (92.4%) | 847,200 (92.8%) | 712,700 (94.1%) |
| Medium enterprises (20–99 employees) | 64,300 (6.5%) | 61,000 (6.3%) | 54,300 (6%) | 36,600 (4.8%) |
| Medium to large enterprises (100–499 employees) | 11,600 (1.1%) | 10,600 (1.1%) | 9000 (1.0%) | 6200 (0.8%) |
| Large firms (500+ employees) | 2400 (0.2%) | 2300 (0.2%) | 2100 (0.2%) | 1700 (0.2%) |
| Total | 997,500 (100%) | 976,000 (100%) | 912,600 (100%) | 757,200 (100%) |

Source: Statistics Canada (2005).

Table 3 Composition of private sector firms in Australia, 1983–2002

| | <i>Number of firms (proportion of all firms)</i> | | | |
|--|--|---------------------|---------------------|---------------------|
| | <i>2002</i> | <i>1998–1999</i> | <i>1995–1996</i> | <i>1983–1984</i> |
| Micro-businesses (0–4 employees; includes self-employed persons) | 952,200 (81.80%) | 791,400 (79.9%) | 748,400 (80.16%) | 455,400 (78.67%) |
| Small business (5–19 employees) | 169,800 (14.59%) | 159,800 (16.14%) | 147,900 (15.84%) | 99,200 (17.13%) |
| Medium enterprises (20–199 employees) | 39,300 (3.38%) | 36,100 (3.65%) | 34,600 (3.7%) | 22,500 (3.9%) |
| Large firms (200 or more employees) | 2800 (0.24%) | 2700 (0.27%) | 2700 (0.29%) | 1800 (0.31%) |
| Total | 1,164,100 (100%) | 990,000 (100%) | 933,600 (100%) | 578,900 (100%) |

Source: Australian Bureau of Statistics (2002, p.27; 2000, pp.27–29). Figures exclude agricultural enterprises; totals may not add up due to rounding.

Table 4 Composition of private sector firms in China, 1999–2003

| | <i>Number of firms (proportion of all firms)</i> | | | | |
|---|--|---------------------|---------------------|---------------------|---------------------|
| | <i>2003</i> | <i>2002</i> | <i>2001</i> | <i>2000</i> | <i>1999</i> |
| Small business (both annual sales and assets are less than 50,000,000□) | 172,591 (87.96%) | 158,234 (87.15%) | 148,269 (86.58%) | 141,161 (86.66%) | 139,798 (86.28%) |
| Medium enterprises (annual sales less than 500,000,000□, assets more than 50,000,000□) | 21,647 (11.03%) | 14,571 (8.03%) | 14,398 (8.41%) | 13,741 (8.44%) | 14,371 (8.87%) |
| ‘Large firms (annual sales more than 500,000,000□, assets more than 50,000,000□) | 1984 (1.01%) | 8752 (4.82%) | 8589 (5.01%) | 7983 (4.9%) | 7864 (4.85%) |
| Total | 196,222 (100%) | 181,577 (100%) | 171,256 (100%) | 162,885 (100%) | 162,033 (100%) |

Source: National Bureau of Statistics of China (2003).

3 Discussion

The data presented above suggests that firm size distribution within a modern economy is a somewhat predictable process that is longitudinal in nature. It appears that business populations may tend towards an inherent type of distribution typical of a self-governing system that repeatedly adopts a certain form of equilibrium.

However, the reasons why such size distribution patterns appear to be commonly distributed are unclear. The existing body of research literature suggests several different potential factors that might contribute to firm size distribution patterns. Lucas (1978) has

suggested that it may be a reflection of an underlying distribution of persons by managerial 'talent', whilst Kumar et al. (1999) argue that it may be reflective of the relative efficiency of judicial systems. Henrekson and Johansson (1999) suggest it is due to institutional factors such as government policies, regulatory regimes and macro-economic policies. Cabral and Mata (2003) indicate that financing constraints serve to keep many firms small, whilst Marsili (2005) argues that technological factors shape the distribution of firm size.

4 Conclusion

Each of the national data sets discussed above seem to conform to three similar patterns: a '95% rule' (in which the numbers of SMEs is always more than 95% of all private sector firms), a 'pyramid rule' (whereby micro- or small-sized firms are always the largest in number, medium-scale enterprises the second most common and large firms the least), and a 'consistency rule' (in which these patterns appear to have stayed the same over recent decades).

Due to the reporting inconsistencies between the different national data sets, the data presented here must be weighed carefully. An important caveat is that this paper is reliant upon the published data provided by each of the relevant national statistical bodies, all of whom use somewhat different interpretations of what constitutes a micro, small, medium and large sized firm, respectively. As Kumar et al. (1999) have noted, such data should be treated as an exploratory analysis which allows the initial identification of possible patterns and distribution models. However, this is still a useful exercise in itself, since it lays the framework for subsequent future testing and refinement.

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Notes

¹In a Zipf distribution, the probability a firm is larger than size s is inversely proportional to s .

²For a detailed discussion of some different ways to measure firms see Schaper (2006) and Bartelsman et al. (2003).