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Suresh Singh

Northeastern Illinois University, s-singh1@neiu.edu

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Rise of born globals and their association with high technology intensity or services sector - myths or reality?

Abstract

Literature suggests that the proportion of born globals - firms entering foreign countries soon after birth - has increased significantly over time and such firms are associated with high technology intensity or services sector. However, there is little empirical support for these claims. To address this gap, this paper presents an empirical analysis of age at first global entry of US manufacturing and service multinationals that entered foreign countries in the last century. Only manufacturing showed a significant rise in the number of born globals. Being born global was not correlated with either having high technology intensity or being a service firm.

Keywords

Born globals; internationalization; technology intensity; international new ventures

INTRODUCTION

In the early 1990s, the Australian Manufacturing Council and McKinsey & Company conducted a joint research project that examined Australian firms in the high value-added manufacturing sector. Rennie (1993) reported the results of that project and highlighted the existence of ‘born globals’, small to medium sized companies that began exporting very early in their life unlike other firms that considered exports only after spending many years in the domestic market. Several studies soon followed, spawning a stream of literature (see Rialp, Rialp & Knight, 2005 for a review) that focused on firms that venture abroad soon after their birth.

Two often repeated but rarely tested claims permeating the born global literature are the focus of attention in this paper. First, that the proportion of born globals has increased significantly over time; and second, that such firms have higher technology intensity or that these are more likely to be in the services sector than the manufacturing sector, as compared to late globals. Anecdotal evidence and case studies are often provided in support of these claims but statistical evidence over historical time frames is sorely absent. Moreover, studies on born globals invariably lack a control sample i. e. those studies do not compare born globals with late globals, casting further doubt upon the accuracy of these claims. To address these issues, this paper presents an analysis of age at first global entry of US manufacturing and service multinationals that established foreign operations in the last century.

The structure of the paper is as follows. First, a review of the literature is presented highlighting major shortcomings of the born global literature. Second, objectives of the paper have been delineated, based upon the background presented in the introduction and the literature review. Third, a section on methodology describes the sample and the statistical technique used to analyze the data. Fourth, results of the analysis and conclusions have been described. Finally, the implications of the results have been discussed.

REVIEW OF LITERATURE

A major drawback of the born global literature is that it discounts mode of entry (Gabrielsson, Kirpalani, Dimitratos, & Zucchella, 2008) and makes little to no distinction between born exporters and born multinationals i. e. firms that enter foreign countries through foreign direct investment (FDI). This lack of clear distinction between exports and FDI within the born global literature not only causes theoretical confusion as to what the term 'born global' actually means but also hampers comparability of empirical studies. This confusion is reflected in the plethora of terms used to characterize the phenomenon, such as born globals (Rennie 1993, Knight & Cavusgil, 1996; Madsen & Servais, 1997), international new ventures or INVs (Oviatt & McDougall, 1994; Mudambi & Zahra, 2007), global start-ups (Oviatt, McDougall, & Loper, 1995), accelerated internationalization (Shrader, Oviatt, McDougall, 2000; Weerawardena, Mort, Liesch, & Knight, 2007) or early internationalization (Sapienza, Autio, George & Zahra, 2006). This has happened despite considerable literature on the subject of international entry modes. In particular, the internalization theory of the multinational enterprise (Buckley & Casson, 1976, 2009) clearly distinguishes exporters using market transactions across national boundaries from multinationals that instead internalize those transactions within a hierarchy based organization.

The very feature that is supposed to distinguish born globals from traditional firms is that born globals do not follow the traditional stages of internationalization (Oviatt & McDougall, 1994) i. e. a gradual progression from exports to FDI (Johanson & Vahlne, 1977). 'An INV quickly establishes an operational presence in more than one country, becoming multinational rather than international in its business activities', declared Mudambi and Zahra (2007: 333) . It is an irony, therefore, that much of the born global literature has limited itself to exporting firms. This paper follows Mudambi and Zahra (2007) and deals exclusively with born multinationals, in order to avoid the confusion mentioned above. On the other hand, the findings of this paper may not be applicable to born exporters.

OBJECTIVES

A central claim used to invoke scholarly attention towards born globals is that the growth in the proportion of such firms represents a historic shift. Knight & Cavusgil (1996: 12) stated, for example, that ‘over the last decade or so, Born Global [sic] firms have begun to appear on the world business scene in large numbers’. Similarly, Rennie (1993) described the ‘rise’ of companies that internationalize soon after their inception and emphasized that born globals are important because they manage global operations in a way that was ‘impossible 20 or even ten years ago’ (p. 47). Oviatt & McDougall (1994) referred to the ‘emergence of international new ventures’ while acknowledging that ‘international new ventures have existed for centuries’ (p. 30). Although case studies and anecdotal evidence are often presented in support of this claim, empirical evidence over historical time frames is conspicuous by its absence. Oviatt et al. (1995: 42) stated that ‘the number of global start-ups is small, but growing’ but conceded that ‘no statistical studies on their growth have been completed’. Despite lack of sufficient evidence, the idea that born globals represent a new and growing phenomenon has been accepted at face value (McDougall, Shane & Oviatt 1994; Knight & Cavusgil, 1996; Zahra, Ireland, & Hitt, 2000). Recognizing this lack of evidence, Rialp, Rialp & Knight (2005: 159) pointed out that ‘... this central question of examining whether early internationalization is indeed a totally new and highly sector-specific phenomenon or not, can only be clarified by further research’. The first objective of this paper, therefore, is to find out whether the proportion of born globals has increased significantly over time.

Rennie (1993: 49) stated that ‘the born global story is not about particular technologies or sectors of the economy’. Nevertheless, ‘a large number of studies have tended to assume that the issue under study is associated with high-tech sectors and/or firms’ (Rialp, Rialp, & Knight, 2005: 156). Rapid technological change, shorter product life-cycles, need to recover high research and development (R&D) costs and threat of opportunism have been cited as reasons behind the prevalence of born globals in high-technology, knowledge intensive industries (Oviatt & McDougall, 1994, 1995; Shrader et. al., 2000). However, there is very little evidence to show that high technology intensity firms are indeed more likely

to be born globals than low technology intensity firms. The second objective of this paper is to probe this relationship between technology intensity and being born global.

Although relatively less explored, a case has also been made that born globals are more likely in the services sector (Bell, 1995). Indeed, a large portion of the born global literature is based on computer software firms, classified under services as per the Standard Industry Classification (SIC) of the US Census Bureau. Service firms possess certain characteristics that differentiate them from manufacturing firms such as intangibility, inseparability of production and consumption, perishability and heterogeneity (Boddewyn, Halbrich, & Perry, 1986; Knight, 1999). Moreover, literature on international trade and FDI routinely makes a distinction between manufacturing and services sectors (Bhaumik & Banik, 2006; Banik & Bhaumik, 2014). Each service encounter with the customer is unique; therefore, services cannot be standardized and shipped overseas to the same extent as manufactured products. Consequently, FDI becomes a necessity for service firms unlike manufacturing firms. It follows that service firms are more likely to become global earlier than manufacturing firms. The third objective of this paper is to perform a statistical test to ascertain if born globals are more prevalent in the services sector than the manufacturing sector, as compared to late globals.

METHODOLOGY

The sample consisted of publicly listed US manufacturing and service firms that entered foreign countries through FDI. All firms available in the Compustat database were listed and then, out of these firms, multinationals were identified using Uniworld's *Directory of American Firms Operating in Foreign Countries*. The year of birth and the year of first global entry of each firm was obtained by careful readings of the history of the firm from multiple sources such as company web sites, internet searches and various editions of the International Directory of Company Histories (St. James Press, Michigan, USA).

For comparison over time, samples of manufacturing and service firms were divided into two subsamples, each based on the year of first global entry, such that each subsample contained roughly

equal number of firms. The time periods covered by the two resulting subsamples for manufacturing were 1904-1967 and 1968-2011 and that for services were 1939-1993 and 1994-2012. The first time period for services was much longer than manufacturing because service sector is relatively new and there weren't many service multinationals until recently.

In order to test the relationship between technology intensity and being born global, it was necessary to classify firms into high vs. low technology categories. To do this, the technology intensity of each firm was first measured as the median of the ratio of its R&D expense to its total revenue (Compustat data) during the five year period ending in the year of the firm's first global entry. Sectoral median technology intensity was then calculated separately for manufacturing and services by calculating the median of median technology intensities of firms in each sector. Firms having technology intensities below the sector median were classified as low technology and vice versa. Thus, the classification of low versus high technology firms was derived from the data and no subjective judgments were made.

Quantile-quantile comparison (Wilcox, 1995) was used as the technique for statistical analysis, using the *qcomhd* programme of R statistical software. The age at first global entry was calculated by subtracting the year of firm birth from the year of its first global entry. Figure 1 shows the kernel density distribution of age at first global entry for both manufacturing and services and for each of the two time periods. The distribution shifted slightly to the left for manufacturing while it was almost identical for services. This indicates that while a majority of manufacturing firms, born global or otherwise, went abroad slightly earlier in the later time period, things did not change much for service firms.

“Figure 1 goes about here”

RESULTS

Tables 1 and 2 show estimated deciles of age at first global entry between the two time periods and results of the test of significance of differences between these estimates, for manufacturing and services respectively. The first decile refers to the born globals. The definition of born globals, therefore, is data

driven and not based on a subjective judgement. If the proportion of born globals increased over time, the estimated age at first global entry for the first decile should be significantly lower in the second time period compared to the first time period.

“Table 1 and 2 go about here”

For all quantiles, the estimated age at first global entry was indeed lower for the second time period compared to that for the first time period for both sectors but the differences were significant only for the first four deciles for manufacturing and not significant at all for services. The results indicate that the proportion of born globals has increased significantly only in the manufacturing sector. However, this is also true for several manufacturing late globals (second to fourth decile).

Table 3 presents the difference between estimated age at first global entry between manufacturing and services and the test of significance of these differences. To be consistent with the earlier choice of time periods for both sectors, the second time period for each sector was used. For all deciles, age at first global entry was smaller for services as compared to manufacturing, and the differences were significant for all deciles except the first decile, the decile that represents born globals. The result, therefore, is that all service multinationals, except service born globals, go abroad earlier than their counterparts in the manufacturing sector.

“Table 3 goes about here”

Tables 4 and 5 show estimated deciles of age at first global entry and the test of significance of the differences between these estimates, for both low technology and high technology firms in the second time period, for manufacturing and services sectors respectively. The results indicate that although all deciles of high technology firms in both sectors go abroad earlier as compared to low technology firms, the effect of technology intensity is not significant for born globals in both sectors. In fact, it is not significant for any decile in manufacturing and only significant for very late globals (seventh decile and later) for services. Therefore, the data does not support the claim that high technology firms are more

likely to be born globals, compared to low technology firms, in both manufacturing and services sectors.

“Tables 4 & 5 go about here”

CONCLUSIONS

Based on the results, the first conclusion is that the proportion of born globals has increased significantly in manufacturing but not in services. In the manufacturing sector, the increase is not limited only to born globals. About half of all manufacturing companies entered foreign countries significantly earlier than in the past. Therefore, manufacturing born globals are not a special case but part of a broader trend of early entry into foreign countries by all manufacturing multinationals. In the services sector, there is no significant increase in the proportion of born globals.

Service born globals were not found to go abroad significantly earlier than manufacturing born globals. This was in sharp contrast to service late globals, all of whom entered foreign countries much earlier than manufacturing late globals. The second conclusion, therefore, is that born globals are not more likely in services than in manufacturing.

Lastly, there was no evidence to suggest that born globals are associated with high technology intensity, in either manufacturing or services. In fact, the reverse was true in services. It was the high technology late globals that showed significant differences from low technology late globals, in the services sector. The third conclusion, therefore, is that the association of born globals with high technology intensity is a myth.

IMPLICATIONS

The results are quite contrary to the key claims or assumptions that serve as the foundation of the born global literature. Born global literature not only assumes that the proportion of born globals has increased rapidly but also portrays this as a paradigm shift (Rennie, 1993). However, if the shift in the kernel density distribution of age at first entry is any indication, there is a gradual change not a paradigm shift.

The shape of the distributions in both manufacturing and services remained very similar belying any paradigm shift. Only in the manufacturing sector, firms were found to venture abroad slightly earlier than in the past. However, this is true for about half of the firms not just for born globals. Therefore, early internationalization is a broader trend, not something unique to the born globals.

It is often assumed in the born global literature that firms with high technology intensity or those in the services sector are more likely to be born globals, compared to those with low technology intensity or those in the manufacturing sector. Moreover, studies on born globals invariably draw samples from high technology service firms (Rialp et al., 2005). Although firms with high technology intensity were found to go abroad earlier than those with low technology intensity, the difference was not statistically significant. More importantly, the difference was not specific to born globals. Service firms were found to have significantly lower age at first global entry compared to manufacturing firms, except for born globals. The conclusion, therefore, is that while technology intensity may and industry sector does influence the speed of internationalization, these factors have little to no relationship with being a born global.

To further explore the role of industry on the relative proportion of born globals, boxplots of age at first global entry were drawn for industries within each sector (Figure 2). The median age at first global entry was not the same across industries within each sector. Manufacturing firms in chemicals, industrial machinery and computer equipment, electrical and electronic equipment and measuring, analyzing and controlling equipment industries (SIC 28, 35, 36, and 38) tend to go abroad earlier than others. The same is true for business services (SIC 73). Prior literature suggests that these industries are also more global compared to other industries (Roth & Morrison, 1990; Kim, Park, & Prescott, 2003). Once again, it appears that born globals follow broader industry trends rather than being deviants, as often portrayed in the literature.

The findings also have implications for practice. Based on the assumption that the proportion of born globals has increased rapidly and that it is a paradigm shift, Oviatt et al. (1995: 31) argued that

‘forces for rapid internationalization ... are ...making slowly staged efforts risky for an increasing number of firms’ and further that ‘global startups benefit in the long run from being international at inception’ (p. 34). The findings in this paper do not support the notion that born globals represent a paradigm shift. Although all manner of firms in both manufacturing and services are going abroad a little earlier than in the past, the change is slow and gradual. A vast majority of firms still take many years to venture abroad (20 years in manufacturing and 10 years in services, for more than half of the firms in each sector). It is quite possible that going overseas soon after birth may not be a feasible or worse an inferior approach compared to a more deliberate approach. In any case, there is little justification for a rush to become a born global.

The kernel density distribution of the age at first entry was a continuous function with no hint of a dichotomy (born globals versus late globals) as portrayed in the born global literature. Based on the results in this study, born globals follow broader industry trends and are not a special case. This begs the question as to why disproportionate scholarly attention has been devoted to born globals, firms that represent less than 10th percentile of all multinationals. While it is worthwhile to investigate why some firms go abroad earlier than others (left tail of the distribution), it is equally worthwhile to find out why some do it much later in their life (right tail of the distribution).

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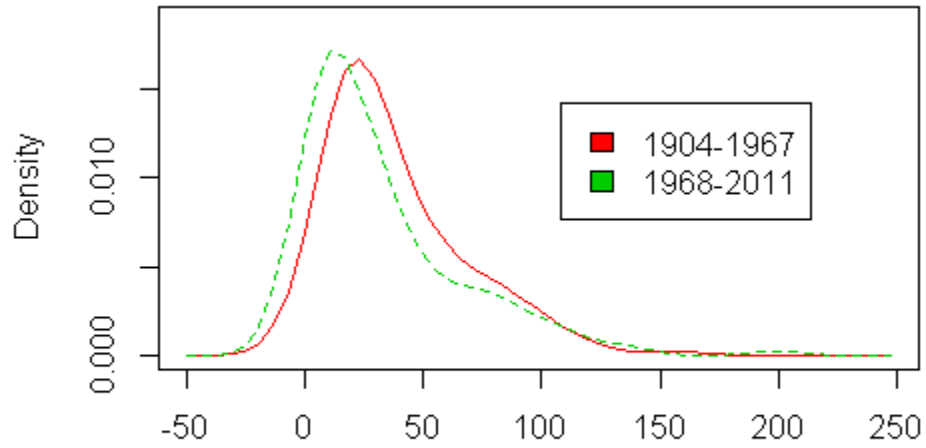
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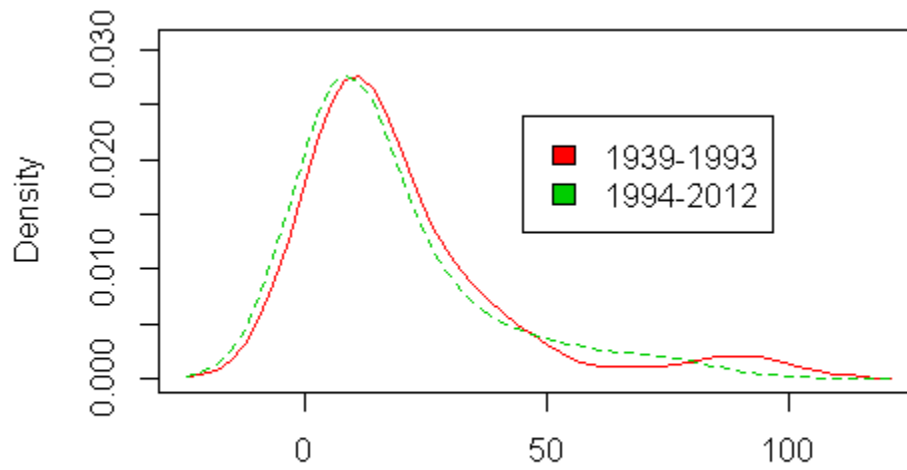
Tables and figures

Figure 1

Kernel density distribution of age at first global entry



Age at first global entry by manufacturing firms in years



Age at first global entry by service firms in years

Source: Prepared by the author

Table 1

Estimates of age at first global entry for manufacturing firms over time

(period 1 = 1904-1967, period 2 = 1968-2011)

Quantile	No. of firms (period 1)	No. of firms (period 2)	Estimate of age (period 1)	Estimate of age (period 2)	Difference	p-value	Significant
0.1	139	139	10.32	3.59	6.73	0.00	YES
0.2	139	139	15.61	7.30	8.31	0.00	YES
0.3	139	139	19.57	10.21	9.36	0.00	YES
0.4	139	139	24.24	14.60	9.64	0.01	YES
0.5	139	139	28.65	21.89	6.75	0.02	NO
0.6	139	139	36.26	27.96	8.30	0.09	NO
0.7	139	139	46.74	38.36	8.37	0.23	NO
0.8	139	139	61.36	56.74	4.62	0.63	NO
0.9	139	139	82.82	82.73	0.09	0.98	NO

Source: Author's own calculations

Table 2

Estimates of age at first global entry for service firms over time

(period 1 = 1939-1993, period 2 = 1994-2012)

Quantile	No. of firms (period 1)	No. of firms (period 2)	Estimate of age (period 1)	Estimate of age (period 2)	Difference	p-value	Significant
0.1	55	59	4.09	2.63	1.46	0.08	NO
0.2	55	59	5.95	3.73	2.22	0.09	NO
0.3	55	59	8.30	5.72	2.58	0.22	NO
0.4	55	59	10.47	8.55	1.92	0.32	NO
0.5	55	59	12.59	11.30	1.28	0.53	NO
0.6	55	59	15.51	14.43	1.08	0.62	NO
0.7	55	59	21.05	18.16	2.89	0.62	NO
0.8	55	59	30.70	28.74	1.96	0.81	NO
0.9	55	59	49.97	47.38	2.59	0.84	NO

Source: Author's own calculations

Table 3

Estimates of age at first global entry across sectors (period 2)

Quantile	No. of firms (manufacturing)	No. of firms (services)	Estimate of age (manufacturing)	Estimate of age (services)	Difference	p-value	Significant
0.1	139	59	3.59	2.63	0.96	0.13	NO
0.2	139	59	7.30	3.73	3.57	0.02	YES
0.3	139	59	10.21	5.72	4.49	0.01	YES
0.4	139	59	14.60	8.55	6.05	0.01	YES
0.5	139	59	21.89	11.30	10.59	0.01	YES
0.6	139	59	27.96	14.43	13.53	0.00	YES
0.7	139	59	38.36	18.16	20.20	0.00	YES
0.8	139	59	56.74	28.74	28.00	0.00	YES
0.9	139	59	82.73	47.38	35.35	0.00	YES

Source: Author's own calculations

Table 4

Estimates of age at first global entry for low vs. high technology manufacturing firms (period 2)

Quantile	No. of firms (low tech.)	No. of firms (high tech.)	Estimate of age (low tech.)	Estimate of age (high tech.)	Difference	p-value	Significant
0.1	50	49	6.29	5.32	0.98	0.70	NO
0.2	50	49	10.79	9.05	1.75	0.41	NO
0.3	50	49	15.36	10.76	4.61	0.16	NO
0.4	50	49	20.52	13.94	6.58	0.24	NO
0.5	50	49	24.80	21.01	3.79	0.55	NO
0.6	50	49	30.78	29.91	0.86	0.82	NO
0.7	50	49	44.55	39.91	4.63	0.70	NO
0.8	50	49	61.75	56.20	5.55	0.71	NO
0.9	50	49	85.60	83.45	2.16	0.85	NO

Source: Author's own calculations

Table 5

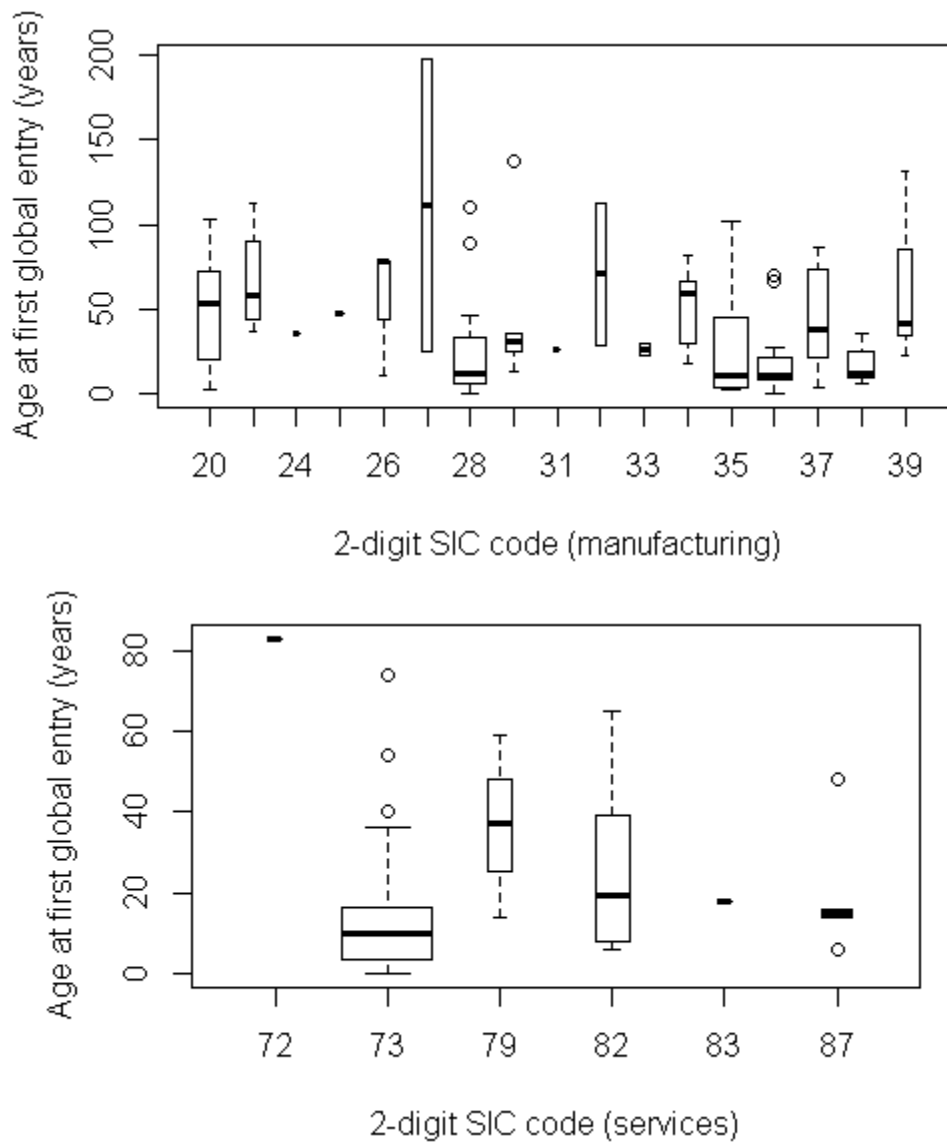
Estimates of age at first global entry for low versus high technology service firms (period 2)

Quantile	No. of firms (low tech.)	No. of firms (high tech.)	Estimate of age (low tech.)	Estimate of age (high tech.)	Difference	p-value	Significant
0.1	27	19	4.34	2.54	1.79	0.14	NO
0.2	27	19	6.93	3.46	3.48	0.05	NO
0.3	27	19	9.57	4.38	5.18	0.04	NO
0.4	27	19	12.49	5.95	6.54	0.04	NO
0.5	27	19	16.01	8.21	7.80	0.03	NO
0.6	27	19	21.31	10.75	10.56	0.01	NO
0.7	27	19	30.41	13.19	17.22	0.00	YES
0.8	27	19	45.22	15.49	29.72	0.00	YES
0.9	27	19	64.80	20.11	44.69	0.00	YES

Source: Author's own calculations

Figure 2

Boxplots of age at first global entry for sub-industries within sectors



Source: Prepared by the author