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International entrepreneurship: evidence on Australian born global firms

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Abstract

This paper contributes to the related international business and the entrepreneurship fields, using administrative tax data on Australian firms. Firstly, we study the role of firms in international trade, focusing on a subset of firms that export from birth; namely *born global* firms. Secondly, we explore the export status dimension in the firm growth-age-size relationship, thus identifying the characteristics of highly successful Australian exporters. Finally, we test the relationship between exchange rates and export sales to determine how resilience to exchange rate fluctuations varies across exporting businesses of different age, size and exporting experience. This research will assist policymakers to better target policies aimed at export promotion and entrepreneurship in Australia.

JEL Codes: D22, F14, L25,L26

Keywords: Born global firms, Business performance, Entrepreneurship, International trade

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Key points

- A born global firm is defined in this paper as a firm that enters export markets in its first year of birth.
- The results on the characteristics of born global firms (BGFs) show that:
 - Most (two thirds) are non-employing. The remainder are overwhelmingly micro in size (employing less than five people), concentrated in four industries, highly export and capital intensive, more persistent on export markets later in life, but have similar rates of R&D activity and foreign ownership compared to exporters in general.
 - The average and median export intensity of BGFs has risen sharply in recent years. A quarter of BGFs rely solely on overseas sales.
 - Principal managers of BGFs are on average older and have higher levels of educational attainment, compared to other small exporters.
 - BGFs are on average more likely to be home-based businesses and are more likely to target additional export markets compared to other small exporters.
- In terms of their relative performance, BGFs:
 - Do not grow as fast as other small exporters in terms of turnover growth, employment growth, capital expenditure growth and R&D expenditure growth. However, when BGFs are mature, they experience a productivity growth premium compared to other exporters.
 - Outperform non-exporting firms in R&D expenditure growth and capital expenditure growth, but underperform in turnover growth and productivity growth.
 - Experience lower survival rates than other small exporters, but higher survival rates than the small employing business population.
 - Have higher earnings and return on assets compared to other exporters
- The growth premium to exporting decreases with firm age.
- The employment growth rate of young exporters is 14.1 percentage points higher than that of non-exporting young firms.
- Smaller, younger exporting firms are more resilient to exchange rate fluctuations than larger, older firms.

1. Introduction

Entrepreneurship and the entry of new firms into the market are important drivers of job creation and long-term economic growth (Bakhtiari, 2019a). Growing interest in new entrant firms that export from birth; so called, *born global* firms (BGFs), has given rise to a new stream of research that combines the international business and the entrepreneurship fields (Acs et al.; 2003, Christensen, 2003; McDougall et al.; 2003; Young et al., 2003). Previous studies have also referred to firms exporting from inception as international new ventures (McDougall et al., 1994), global start-ups (Oviatt & McDougall, 1994) and instant exporters (McAuley, 1999), though this paper will use the born global term throughout. Tuhin and Swanepoel (2016) found there are approximately 3,000 of these firms born each year, representing five per cent of all exporters in Australia, however little is currently known about the characteristics and performance of these firms. Born global firms are important contributors to home economies (Mort & Weerawardena, 2006; Kuivalainen et al. 2007; Knight & Kim, 2009), however empirical evidence that firms that enter international markets early outperform other exporters is lacking.

The internationalisation of businesses has become a pervasive phenomenon, which underscores the importance of the born-global/global start-up concept and the need for policy makers to understand the factors that influence the success of firms that internationalise early in their life cycle. Moreover, policies aimed at supporting entrepreneurship can further drive employment growth. Findings from the Department of Industry, Innovation and Science for example show that around 80 per cent of net jobs growth in Australia over the decade to 2014 is attributed to entrepreneurs and small young firms (Bakhtiari, 2019a). Updated analysis show that this contribution has been increasing over time (Bakhtiari, 2019d).

Australia has initiatives in place to support young and other exporting firms. These include:

- the Landing Pad initiative that provides market-ready Australian start-ups and scale-ups with access to some of the world's most renowned hubs
- SME Export Hubs grants that support hubs in the development of local, regional and indigenous brands through business collaborations
- Export Market Development Grants that encourage businesses to increase international marketing and promotion expenditure; and to embed businesses in global value chains
- Small Business Export Loans designed to help businesses finance a single export contract.

The Australian government is also running an Australia-wide outreach program that provides practical information on how businesses can benefit from Free Trade Agreements (FTAs). A recent Parliamentary inquiry looked into

supporting SMEs to leverage FTAs to pursue export opportunities (Parliament of Australia, 2019). The Committee, amongst others, recommended:

- Better targeting of EMDG grants to high-growth SMEs
- strengthening capacity development of SMEs so that they become more import/export ready, including knowing how to assess destinations and business partners, and using technology to support international engagement and trading activities
- trialling a grant program in selected regional areas for clusters of businesses that wish to collaborate in pursuit of export opportunities, anchored to either geographical provenance or specific sectors.

The concept of BGFs was noted in the Parliamentary Inquiry report in the context of high tech firms and new services and e-commerce offerings that enable firms to be global from the start. This raises the question about what can be done about existing challenges such as digital and other skill shortages in some young firms that might put them at a competitive disadvantage. The Australian Government's *Tech Future report* for example point to skill shortages in key digital skills such as in cyber security, cloud computing, robotics, digital design and software design (Australian Government, 2018).

The findings of this study into the characteristics and performance of Australia's BGFs are therefore well placed to inform policies that could be more effectively targeted to support young firms who want to access new (or expand on existing) international markets.

This paper makes four key contributions using a census of Australian firms. Firstly, we explore the characteristics of BGFs compared to other exporters in the Australian context. Secondly, we assess whether BGFs outperform other firms that internationalise later in their life, and test whether BGFs outperform non-exporting firms. The third contribution will more broadly address the firm growth literature by studying the export status dimension in the firm growth-age-size relationship in the Australian context. The fourth and final contribution of this paper provides findings on the relationship between exchange rates and export sales and how this relationship varies between different types of exporters.

The primary source of data used is the Business Longitudinal Analysis Data Environment (BLADE) provided by the Australian Bureau of Statistics (ABS). The BLADE consists of firm-level data based on the administrative tax reports lodged annually by Australian businesses between 2001-02 and 2015-16. Subsequently, the BLADE is the full universe of Australian firms registered for tax purposes, consisting of financial variables listed in Table A.1, Appendix A. The main limitations of the BLADE in the context of this paper is i) that it does not keep track of firms undergoing mergers or acquisitions and ii) that it does not currently contain information on export products and export destinations. For a full discussion on how the BLADE was constructed, its limitations and how it has contributed to evidence-based policy making in Australia, see Hansell and Rafi (2018).

The remainder of the paper is organised as follows: Section 2 presents the characteristics of Australian BGFs and provides evidence on the performance of BGFs using the BLADE and other linked survey data. Section 3 compares the performance of BGFs with other exporters. The relationship between firm age and export premiums is covered in Section 4. Section 5 presents findings on the relationship between exchange rates and export sales at the firm level and Section 6 discusses implications for entrepreneurship and exporting policies. Section 7 concludes the paper.

2. Characteristics of born global firms

The born global firm literature shows differences in opinion regarding the speed from inception to entry into international markets required for a firm to qualify as 'born global', ranging from one year (Tuhin & Swanepoel, 2016; Rennie, 1993) to three years (Knight & Cavusgil, 1996), to six years (Zahra et al., 2000), to eight years (McDougall et al., 1994). Other studies have also placed an export intensity (export sales divided by total turnover) threshold to define born global firms, using an export intensity of 25 per cent within two or three years (Choquette et al., 2017; Gabrielsson & Kirpalani, 2012; Bals et al., 2008; Oviatt & McDougall, 1997). Braunerhjelm and Halldin (2019) use a number of definitions, and this paper will take a similar approach. In this study, born global firms are defined as exporting up to one year from birth, however sensitivity analyses will be conducted to determine how varying this definition affects the results on business characteristics and performance.

The born global literature began in the early 1990s (Rennie, 1993), and has expanded rapidly since, in response to BGFs becoming increasingly common (Knight & Cavusgil, 1996; Preece et al., 1999; Madsen & Sevais, 1997; McDougall et al., 2003). Knight and Cavusgil (2015) argue the increased presence of BGFs can be attributed to structural change and technological progress. Traditionally, only BGFs from high technology sectors have been studied, however more recently the born global literature has expanded to take a more comprehensive industry approach to include other manufacturing and other services firms (Chetty & Campbell-Hunt, 2004; Liesch et al., 2007). The emphasis has been on the characteristics that lead to the rapid internationalisation of these firms. Taylor and Jack (2013) provide an extensive literature review of these studies and propose a conceptual framework incorporating six propositions relating to the key dimensions of the pace, scale and pattern of internationalisation of firms.

Even though these studies cover Australian firms, they are generally based on survey or interview responses, and therefore suffer small sample and other biases. Further, there is a lack of analysis on the performance of BGFs, both in the Australian context and wider literature. Braunerhjelm and Halldin (2019) seeks to fill this gap using firm-level data on Swedish firms — however, their study is limited to studying the performance of manufacturing BGFs between 1998 and 2006.

To shed light on the characteristics of BGFs, we make use of administrative tax data that provides information on business size, industry classification, foreign

ownership status, capital intensity etc. We also utilise ABS survey data such as the *Business Characteristics Survey* that provides information on the use of information technology and a broad range of other non-financial characteristics; and the *Management Capability Module* that provides information on the management and organisational capabilities of Australian firms.

2.1 Characteristics of born global firms based on administrative data

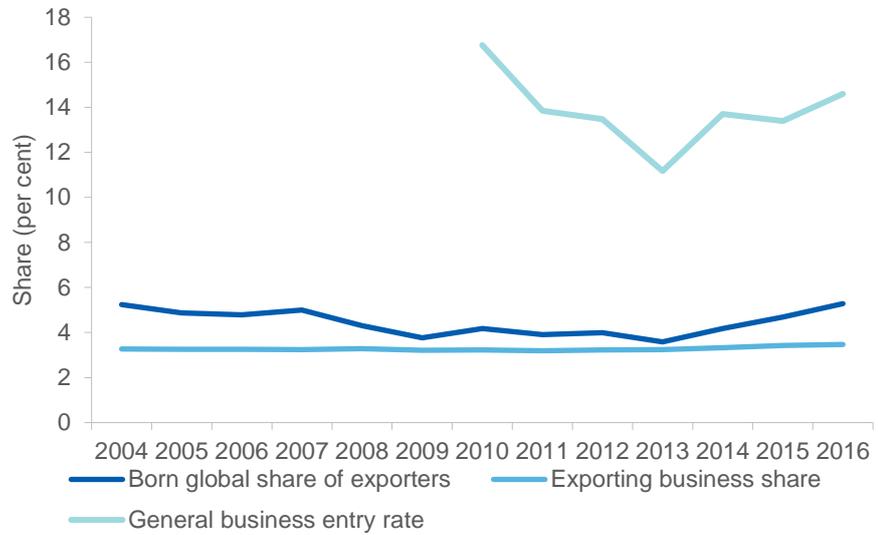
Counts

The BGF share of total exporters, the exporting business share and the general business entry rate are displayed in Figure 2.1.¹ There was a sharp decline in the share of BGFs from 2006-07, and a recovery proceeding the 2012–13 year, aligned with the decline and recovery of the general business entry rate. This trend is consistent with literature on declining entrepreneurship and the subsequent recovery found in Australia and the US (Bakhtiari, 2019a; Decker et al., 2014). In contrast, the exporter share of the general business population increased only marginally over recent years.

We compared the Australian results on the share as well as the export intensity of BGFs with New Zealand given the availability of data and the fact that the two countries are located in the same region, have similar enterprise birth rates and a similar degree of trade openness. Compared to New Zealand, the results show that Australia has a consistently higher share of BGFs, and New Zealand has not experienced the same post-GFC recovery (Figure 2.2).

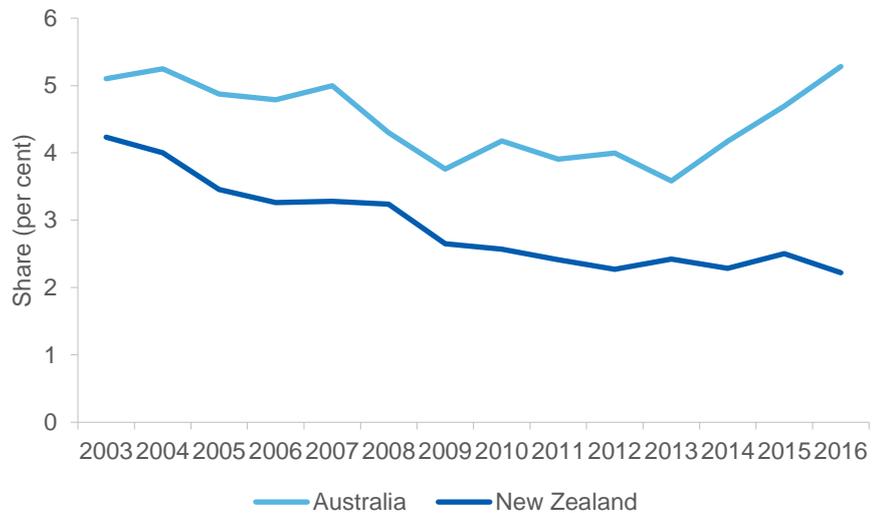
¹ Businesses that report at least \$2,000 (in current prices) of export sales in Business Activity Statements are counted as exporters. This is consistent with the ABS definition of an exporter. The number of exporters as reported in the ABS cat. no. 5368.0.55.006 – Characteristics of Australian Exporters is less than this due to a number of additional exclusions.

Figure 2.1: Born global share of exporters, exporting business share and total business entry rate



Source: BLADE (2019), Author's calculations; ABS Cat. 8165.0

Figure 2.2: International comparison in born global firm share of exporters: Australia and New Zealand



Source: BLADE (2019), NZ Productivity Commission (2019), Author's calculations

This is of course just one measure of international presence. Collaborative work between LinkedIn and the Department of Industry, Innovation and Science for example shows that nearly 6 per cent of Australia's ventures has employees outside of the founding-country within one year of starting. Based on this measure, Australia ranks lower than New Zealand (9 per cent), but

higher than the United States (3 per cent), the United Kingdom (4 per cent) and Germany 5 per cent) (Kaura and Suresh, 2019).

Characteristics

The majority (two thirds) of BGFs are non-employers. The remaining BGFs are overwhelmingly micro in size (less than 5 employees) compared to overall exporters (Table 2.1). The size distribution of born global entrants has not changed a great deal over time, however the rise of BGFs in recent years has been driven by small firms. Other definitions of BGFs yield higher shares of micro firms (Table B.1, at Appendix B).

Similar to the overall exporting business population, BGFs are concentrated in the Wholesale Trade, Professional, Scientific & Technical Services, Retail Trade and Manufacturing industries (Table 2.1). It is interesting to note that BGFs that rely solely on export sales are more concentrated in the Wholesale Trade industry (Table B.1, at Appendix B). There has been a rise in BGFs in the Retail Trade industry in recent years, which might be ascribed to a growing share of BGFs in the Food Retailing, Non-Store Retailing and Retail Commission-Based Buying and/or Selling; and Other Store-Based Retailing sectors (Table 2.2). The concentration of BGFs in the top ten two-digit ANZSIC subindustries has grown considerably in the decade to 2015-16, with the largest number of firms found in the PST services (Except Computer Services) sector. One third of BGFs are in five industry classes, led by Management Advice and Related Consulting Services and Computer System Design and Related Services (Table 2.3).

BGFs are highly export intensive and capital intensive compared to overall exporters (Table 2.4). Capital intensity is higher when the BGF definition is restricted via an export intensity threshold (Table B.1, at Appendix B). Over time, new born global entrants are becoming more and more export intensive, driven by growth in export sales, whereas export intensities for other exporters have remained flat (Figure 2.3). BGFs have similar rates of R&D activity and foreign ownership as overall exporters. Amongst R&D-active firms, overall exporters are more R&D intensive than born global R&D active firms (Table 2.4). The same is true for BGFs with higher export intensity thresholds (Table B.1, at Appendix B).

Table 2.1: Characteristics of born global, exporters and all firms, 2015–16

Characteristic	BGFs ^a	Exporters ^b	All firms
<i>Firm size share^c</i>			
Micro	63.3	44.3	65.6
Small	19.3	34.6	26.1
Medium	n/a ^d	20.0	7.5
Large	n/a ^d	1.1	0.8
<i>Firm age share</i>			
Less than 5 years	100.0	26.8	36.4
5-10 years	0	26.3	30.9
11-20 years	0	29.9	24.2
More than 20 years	0	17.0	8.6
<i>Industry share</i>			
Wholesale Trade	23.5	19.2	3.4
PST	22.0	22.7	11.8
Retail Trade	15.3	9.5	5.8
Manufacturing	5.6	11.9	3.8
Other	33.6	46.2	78.3

Notes: ^aBorn global entrants in 2015–16 ^bFirms that export more than \$2,000 in value in 2015-16
^c67 per cent of born global firms are non-employed; the remainder are either Micro, Small, Medium or Large in size ^dSuppressed due to legislative requirements. 17.4 per cent of born global firms are either medium or large in size.

Source: BLADE (2019), Author's calculations

Table 2.2: Top ten two-digit ANZSIC subindustries of born global firms, 2015–16 (compared to 2005–06)

Industry	2005–06	2015–16
PST services (Except Computer Services)	17.2	16.2
Computer System Design and Related Services	6.8	6.3
Other Store-Based Retailing	7.5	6.1
Property Operators and Real Estate Services	2.3	4.8
Grocery, Liquor and Tobacco Product Wholesaling	3.0	4.1
Non-Store Retailing and Retail Commission-Based Buying and/or Selling	1.2	3.7
Food Retailing	1.8	3.4
Other Goods Wholesaling	7.0	3.2
Administrative Services	3.4	3.0
Finance	1.7	2.2
Total	48.9	61.9

Notes: Commission-based wholesaling (subdivision 38) has been omitted due to a major revision – see cat 1292.0 Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 (Revision 1.0).

Source: BLADE (2019)

Table 2.3: Top five four-digit ANZSIC industry classes of BGFs, 2015–16 (compared to 2005–06)

Industry	2005–06	2015–16
Management Advice and Related Consulting Services	13.1	10.9
Computer System Design and Related Services	12.4	9.7
Other Specialised Food Retailing	0.0	4.7
Non-Store Retailing	1.1	4.4
Other Grocery Wholesaling	1.6	4.3
Engineering Design and Engineering Consulting Services	4.2	3.4
Total	32.4	34.0

Notes: Commission-based wholesaling (subdivision 38) has been omitted due to a major revision – see cat 1292.0 Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 (Revision 1.0).

Source: BLADE (2019)

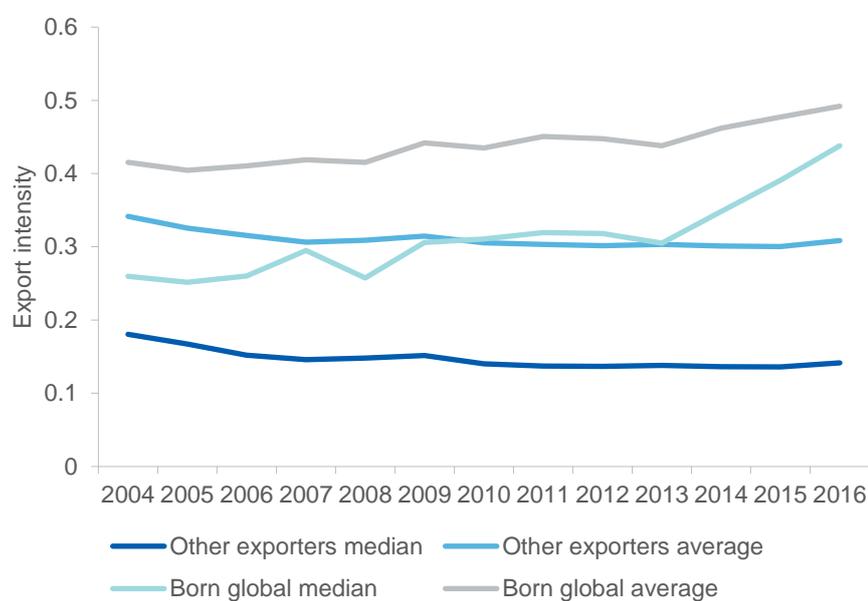
Table 2.4: Additional characteristics of born global, exporters and all firms, 2015–16

Characteristic	BGFs 1 year ^a	Exporters ^b	All firms
<i>Wage to turnover ratio^c</i>			
Median	0.12	11.11	8.59
Average	0.35	249.47	180.54
<i>Export intensity</i>			
Median	0.44	0.14	-
Average	0.49	0.31	-
<i>Foreign ownership (share)</i>			
Any	4.76	4.98	0.49
More than 50%	1.83	3.19	0.34
<i>R&D activity</i>			
R&D active share	5.10	6.55	0.65
R&D intensity (median)	0.01	0.09	0.11
R&D intensity (average)	0.10	0.18	0.21

Notes: ^aBorn global entrants in 2015–16 ^bFirms that export more than \$2,000 in value in 2015-16
^cTotal wages paid divided by turnover

Source: BLADE (2019), Author's calculations

Figure 2.3: Export intensity – born global versus other exporters, median and averages

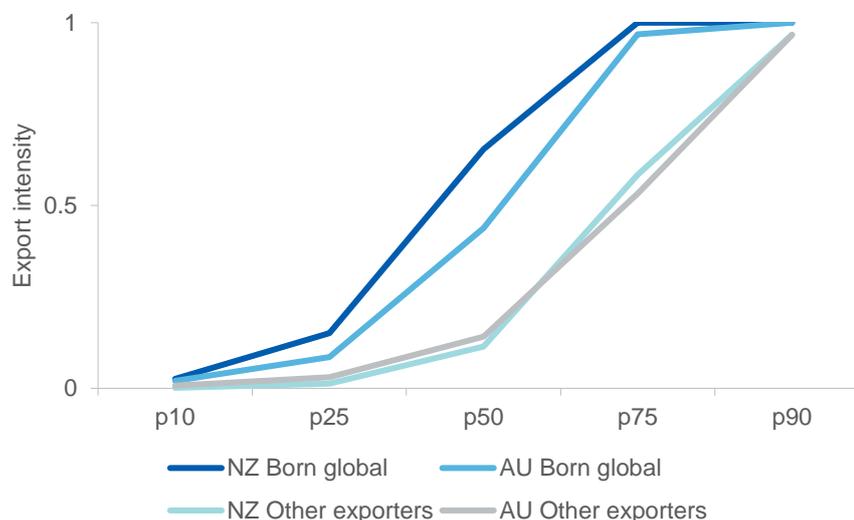


Source: BLADE (2019)

New Zealand BGFs are more export intensive than Australian BGFs (Figure 2.4). There is a widening gap along the distributions between BGFs and other

exporters in both Australian and New Zealand export markets, respectively, until the 75th percentile.

Figure 2.4: Distribution of export intensity for born global firms and other exporters in Australia and New Zealand



Notes: 2015–16 financial year for Australia, 2014-15 financial year for NZ

Source: BLADE (2019), New Zealand Productivity Commission

Persistence and Market Concentration

BGFs are more persistent on export markets than other exporters, which is unsurprising given BGFs are highly export focused. The transitional probability of an exporter remaining an exporter in the following year is 61 per cent, whereas the probability of a born global exporter remaining an exporter in the following year is 78 per cent. The transitional probability of a firm exporting in the following year if they are an exporter in the current year increases with both firm age and firm size.

Recent work on market concentration by Bakhtiari (2019b) finds export intensive industries tend to be more concentrated, and export intensity accelerates the increase in industry market concentration.

2.2 Characteristics of exporters and born global firms based on ABS survey data

Firm-level survey data linked to the BLADE includes the Business Characteristics Survey (BCS) and the Management Capability Module (MCM). The BCS is an annual ABS survey conducted from 2005–06, measuring the use of information technology, innovation and an extensive range of other non-financial characteristics (see Table A.2, at Appendix A). The MCM is an extension of the BCS in 2015–16, and contains key indicators of management and organisation capabilities (see Table A.3, at Appendix A).

We compare born global outcomes with those of other small exporters, to control for the self-selection into export markets. The analysis presented in this

section is based on four industries that represent to bulk of Australia's exporting business population. A sensitivity analysis is also provided at Appendix C to compare results across different definitions of BGFs.

Business Characteristics Survey

We determine the difference in business characteristics firstly between BGFs and other small (but more mature) exporters, then repeat this between exporters and non-exporters. Controls for business size (number of full-time equivalent employees), business age and industry-specific effects (t_i) are included in a probit regression model:

$$Probability(X_{i,t}) = \beta_0 + \beta_1 bornglobal_i + \beta_2 \ln(size)_{i,t} + \beta_3 age_{i,t} + t_i + \epsilon_{i,t} \quad (1)$$

or

$$Probability(X_{i,t}) = \beta_0 + \beta_1 exporter_i + \beta_2 \ln(size)_{i,t} + \beta_3 age_{i,t} + t_i + \epsilon_{i,t} \quad (2)$$

Where X_i is a vector of all BCS characteristics tested for each firm i .

A summary of results are provided in Table 2.5.

The small exporter population is on average more likely to have collaborative arrangements including joint marketing or distribution and joint research and development, compared to small non-exporting firms. Exporters are not more or less likely to have sought or obtained finance, however are more likely to introduce new or significantly improved goods to market, and new to the world goods or services. Exporting firms are more likely to have a web presence and a social media presence, and are more likely to cite increased export opportunities as a main reason for innovating. Exporting firms are more likely to cite IT use in marketing, however this is a statistically weak result.

BGFs are on average more likely to be home-based businesses and are more likely to target additional export markets compared to other small exporters. For many survey questions, there are no statistical differences between responses of BGFs and other exporters, particularly when business age is included as a control. Results are generally robust across the BGF definition tested, however we note that when extending the BGF definition (up to three years, 25% export intensity threshold), BGFs more likely to have joint research and development collaboration and more likely to introduce any new or significantly improved goods (see Table C.1, at Appendix C).

Table 2.5: Business Characteristics Survey

Characteristic	BGFs ^a	Exporters ^b
Collaborative arrangements	No statistical difference	Greater use
Home based business	More likely	No statistical difference
Business focus	More likely to target additional export markets	More likely to have innovation measures
Sought finance	No statistical difference	No statistical difference
Competition	No statistical difference	No statistical difference
Market share	No statistical difference	Higher market share
Business introduced any new or significantly improved goods/services	No statistical difference	More likely
New to world	No statistical difference	More likely
New to Australia	No statistical difference	No statistical difference
IT use in production/service operations	No statistical difference	No statistical difference
IT use in Marketing	No statistical difference	More likely ^c
Web presence	No statistical difference	Greater use
Social media presence	No statistical difference	Greater use
Counts	444	1,096

Notes: ^aStock of small born global firms from 2005-06 to 2015-16 ^bStock of small exporters from 2005-06 to 2015-16. Restricted to four major industries: Manufacturing, Wholesale Trade, Retail Trade & Professional, Scientific and Technical Services. ^cWeaker finding (statistically significant at 10%)

Source: BLADE (2019); BCS (2019)

Management Capability Module

The same probit models are applied using the MCM data:

$$Probability(X_i) = \beta_0 + \beta_1 bornglobal_i + \beta_2 \ln(size)_i + \beta_3 age_i + \iota_i + \epsilon_i, \quad (3)$$

or

$$Probability(X_i) = \beta_0 + \beta_1 exporter_i + \beta_2 \ln(size)_i + \beta_3 age_i + \iota_i + \epsilon_i \quad (4)$$

Where X_i is a vector of all managerial characteristics tested for each firm i .

It is important to note the MCM only measures managerial characteristics in the 2015-16 financial year. Therefore we restrict the sample to firms born from

the 2010-11 financial year, so only firms that fill out the MCM survey at or before age five are included. Due to the small sample size, it is more difficult to measure MCM survey outcomes between BGFs and other small exporters. A summary of results are provided in Table 2.6.

The results show that the small exporter population is on average more likely to address marketing, advertising, promotion and innovation areas in their strategic plan, compared to non-exporting small firms. Exporters are also more likely to indicate new or improved marketing methods, and access to a number of digital technologies, but experience skill shortages in financial and marketing professions. Principal managers of exporting firms are on average more likely to be male and more likely to have higher levels of educational attainment such as a bachelor degree or higher.

BGFs are on average less likely to address innovation, marketing, advertising and promotion and innovation as areas of their strategic plan, compared to other small exporters. BGFs indicate less new or improved marketing methods and skill shortages or deficiencies in marketing. However, BGFs experience less skill shortages or deficiencies in finance and IT support professionals. Principal managers of BGFs are on average older and have higher levels of educational attainment such as a bachelor degree. Results are generally robust across the BGF definition tested, (see Table C.2, at Appendix C).

Table 2.6: Management capability module, 2015–16

Characteristic type	Born global firms ^a	Exporters ^b
New or improved marketing methods	Less likely	More likely
Strategy	Marketing, advertising and promotion, innovation and ICT less likely to be covered	Marketing, advertising and promotion and innovation more likely to be covered
Skill shortages or deficiencies in undertaking core business activities	More likely in Marketing; less likely in finance professionals and IT support	Financial and marketing
Digital business	Greater access to high speed broadband and mobile internet	Greater use of high speed broadband, cybersecurity, data analytics, ecommerce, intelligent software systems, mobile internet
<i>Principal manager</i>		
Age	Older	No statistical difference
Education	Higher	Higher
Gender	No statistical difference	More male
Counts	110	133

Notes: ^aStock of small born global firms from 2010-11 to 2015–16 ^bStock of small exporters from 2010-11 to 2015–16. Restricted to four major industries: Manufacturing, Wholesale Trade, Retail Trade & Professional, Scientific and Technical Services.

Source: BLADE (2019); MCM (2019)

3. Performance of born global firms

3.1 Performance of born global firms compared to other exporters

The relationship between firm growth, size, age and born global status is tested on the population of exporters using the following specification:

$$X_{i,t} = \beta_0 + \beta_1 \text{bornglobal} + \beta_2 \ln(\text{size})_{i,t-1} + \beta_3 (\ln(\text{size})_{i,t-1})^2 + \beta_4 \ln(\text{age})_{i,t-1} + \text{state}_i + \tau_t + \iota_i + \epsilon_{i,t} \quad (5)$$

Where $X_{i,t}$ is a vector of growth outcomes for each firm i in period t , τ_t are time-specific effects in period t and ι_i and state_i are industry-specific effects for each firm i .

BGFs do not grow as fast as other exporters in terms of turnover growth, particularly when BGFs are young (Table 3.1). This result is consistent with

other performance indicators including employment growth, capital expenditure growth and R&D expenditure growth (Table 3.2).

Though BGFs experience less productivity growth in the beginning of the firm life cycle, when BGFs are mature, they experience a productivity growth premium compared to other exporters. This result is robust across different definitions tested (see Table D.1 and Table D.2, Appendix D) and is consistent with findings from Bakhtiari (2019c), who finds entrepreneurs are quite unproductive upon entry, yet the productivity of those that survive makes a quantum leap and converges to that of mature firms. A sensitivity analysis using different definitions for BGF is provided at Appendix D.

Table 3.1: Average annual turnover growth differential between BGFs and other exporters, by age (decimals)

	All exporters	Less than 3 years old	4 to 6 years old	More than 6 years old
BGF	-0.138***	-0.246***	-0.106***	-
$\ln(\text{size})_{i,t-1}$	-0.027***	-0.140***	0.009**	0.013**
$\ln(\text{size})_{i,t-1}^2$	0.003**	-0.009***	-	0.003
$\ln(\text{age})_{i,t-1}$	-0.313***			
n	231,881	59,519	104,753	45,038
Adjusted R ²	0.064	0.042	0.004	0.001

Notes: All coefficients are elasticities. Results are robust to controlling for firm entry and exit and robust to restricting the sample of employing firms only.

Source: BLADE (2019)

Table 3.2: Average annual growth differentials between BGFs and other exporters, by age (decimals)

Performance indicator	All exporters	Less than 3 years old	4 to 6 years old	More than 6 years old
Turnover	-0.138***	-0.246***	-0.106***	-
Employment	-0.115***	-0.181***	-0.097***	-0.052***
Productivity	-0.011*	-0.037***	-	0.030*
Capital	-0.052**	-	-0.067**	-
R&D	-	-0.190**	-	-

Notes: All coefficients are elasticities. Results are robust to controlling for firm entry and exit and robust to restricting the sample of employing firms only.

Source: BLADE (2019)

3.2 Performance of born global firms compared to non-exporting firms

A key limitation of using a non-exporting control group is the inability to control for the self-selection of firms into exporting, i.e. firms' intention to export. As such, the results might be different with a more carefully selected and relevant comparison group of non-exporting entrepreneurial firms that takes into account additional factors such as business and growth dynamics to ensure these firms are as close as possible to the identified BGFs. It is important to note that the results of this analysis might also be impacted by spin-outs and mergers that are included in the analysis. These firms are expected to have different characteristics compared to other new firms.

BGFs outperform non-exporting firms in R&D expenditure growth and capital expenditure growth, but underperform in turnover growth and productivity growth. However this result is quite sensitive to the definition used. BGFs with a three year, 25 per cent export intensity threshold definition actually outperform non-exporters across all performance measures, particularly in the early phase of a firm's life (Figure D.3, at Appendix D). However the results using a three year, 100 per cent definition follow closely the results using the original definition (see Table D.4, at Appendix D).

Table 3.3: Average annual growth differentials between BGFs and non-exporting firms, by age (decimals)

Performance indicator	All firms	Less than 3 years old	4 to 6 years old	More than 6 years old
Turnover	-0.024***	-0.035**	-0.029**	-
Employment	-	-	-	-
Productivity	-0.023***	-0.034**	-0.026***	-
Capital	-	0.074*	-	-
R&D	0.054**	-	0.111***	-

Notes: All coefficients are elasticities. Results are robust to controlling for firm entry and exit and robust to restricting the sample of employing firms only.

3.3 High intensity versus low intensity born global firms

We compare the performance of high export intensity BGFs to low intensity BGFs. High-intensity BGFs are defined as those that are deriving more than 50 per cent of total sales from export sales. The results show that highly export intensive BGFs experience higher turnover and labour productivity growth over three years, however this additional growth is not sustained over the five year period (Table 3.5).

Table 3.5: Performance of high intensity born global firms compared to low intensity born global firms

Performance indicator	High intensity premium	
	3 year	5 year
Turnover	13.5*	-
Capital	-	-
Employment	-	-
Labour productivity	16.0**	-
Export sales	-	-

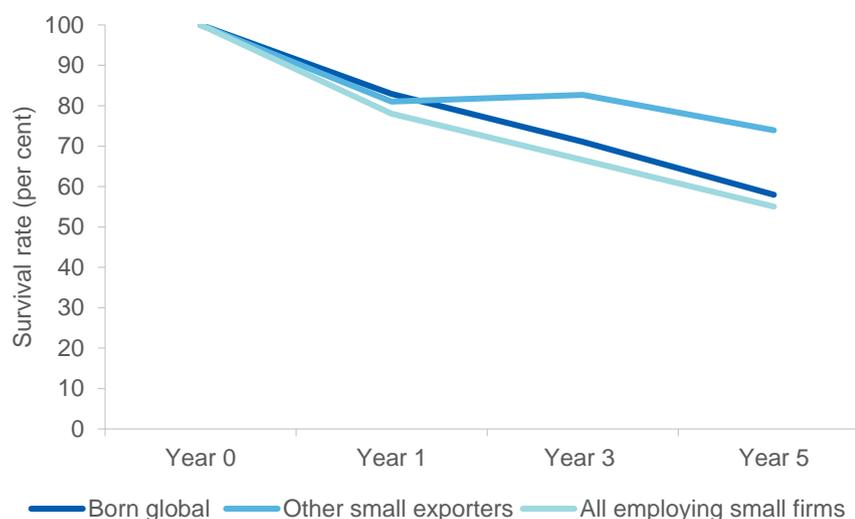
Notes: Restricted to four major industries: Manufacturing, Wholesale Trade, Retail Trade & Professional, Scientific and Technical Services. High intensity threshold is an export intensity of more than 50 per cent.

Source: BLADE (2019)

3.4 Survival analysis

Looking at all small firms born in 2010-11, BGFs have lower survival rates than other small exporters, however BGFs have higher survival rates than small firms in the greater employing business population (Figure 3.1).

Figure 3.1: Survival rates of born global firms, 2010-11



Source: BLADE (2019)

3.5 Financial ratios

This section uses the methodology of Rafi and Reynolds (2019) to explore how debt servicing ratios and other financial variables compare between BGFs and other exporters. All results are presented at Appendix E.

The debt servicing ratio (DSR) is defined as a firm's total interest expense divided by profits and cash reserves. The DSR for BGFs is lower than for other

exporters, and has been trending downwards for BGFs at the 75th percentile since 2013, though other exporters have experienced a longer-term downward trend from 2010 (Figure E.1). Earnings before profit and tax (EBIT) between BGFs and other exporters are at very similar levels in recent years, however for BGFs EBIT has been trending upwards, while EBIT has remained flat for other exporters (Figure E.2). The gearing ratio, which is a firm's total debt to total assets, is higher for BGFs and has been trending upwards for the 50th and 75th percentiles since 2013 (Figure E.3). The return on assets (ROA) ratio is a ratio of a firm's earnings (EBIT) to current and fixed assets (total assets). The ROA for BGFs is typically higher than for other exporters, however has been trending downwards since 2007 (Figure E.4).

4. Export status, firm age and performance

There has always been a strong research interest in the relationship between firm size and firm growth, guiding policymakers to view small firms as major contributors to net job creation. Traditionally, studies have failed to control for firm age, which has proved to be an important factor in the size-growth relationship (Bakhtiari, 2019a; Lawless, 2014; Haltiwanger et al., 2013). Grazzi and Moschella (2019) take a further step and use Italian firm-level data to demonstrate that export status is an additional and key dimension to interpreting the growth-size-age relationship. This section takes a similar approach in investigating the key role export status plays in the growth-size-age relationship for Australian firms. Tuhin & Swanepoel (2016) extensively explore the growth premium to exporters using Australian micro-data, although here we address the role of firm age directly.

Recent papers studying the performance of young exporters find younger exporters outperform more established exporters (Grazzi & Moschella, 2019; Berthou & Vicard, 2015). Grazzi and Moschella (2018) find the growth premium enjoyed by exporting firms declines with firm age, when controlling for size, industry and macro forces. Similarly, Berthou and Vicard (2015) explore the role of experience and size on export growth, and find the export growth premium of new exporters decreases over time. This section will provide commentary around whether young exporters outperform more established exporters in the Australian context.

4.1 The firm growth size-age-export status relationship

The relationship between firm growth, size, age and export status is tested using the following specification:

$$X_{i,t} = \beta_0 + \beta_1 \text{exporter}_{i,t} + \beta_2 \ln(\text{size})_{i,t-1} + \beta_3 (\ln(\text{size})_{i,t-1})^2 + \beta_4 \ln(\text{age})_{i,t-1} + \text{state}_i + \tau_t + \iota_i + \epsilon_{i,t}, \quad (5)$$

Where $X_{i,t}$ is a vector of growth outcomes for each firm i in period t .

Table 4.1 shows the results using turnover growth as the dependent variable. Using employment growth as the dependent variable produces similar results (Table F.1, at Appendix F). Consistent with previous research using the Australian micro-data, firm growth decreases with firm age and firm size (Bakhtiari, 2019a).

The premium to exporting, measured by employment growth, decreases with firm age for Australian exporters, with young exporters' employment growth outpacing that of non-exporting firms by 14.1 percentage points. Though larger in magnitude, these results are similar in direction to results found for Italian exporters (Grazzi & Moschella, 2018).² This is also found to be true for other measures of firm performance, such as the premium on turnover growth and labour productivity (Table 4.2). For example, the additional productivity growth experienced by young exporters compared to non-exporting young firms is 2.8 per cent, however the premium is only 1.8 per cent for older firms. Young exporters (aged 0 to 3 years) have the highest capital expenditure growth premium, though mature exporters (older than 6 years) have a higher growth premium than firms in the middle (aged 4 to 6 years). While there is a positive return to R&D expenditure growth for exporters, there is insufficient evidence to draw any conclusions regarding the relationship between age of exporter and R&D expenditure growth.

Table 4.1: Turnover growth, size, age & export status (decimals)

	All firms	Less than 3 years old	3 to 6 years old	More than 6 years old
Exporter	0.186***	0.219***	0.176***	0.151***
$\ln(size)_{i,t-1}$	-0.030***	-0.115***	0.005***	0.005**
$\ln(size)_{i,t-1}^2$	0.005***	-0.001	0.001**	0.002*
$\ln(age)_{i,t-1}$	-0.285***			
n	1,336,772	417,427	599,611	219,903
Adjusted R ²	0.055	0.031	0.005	0.004

Notes: All coefficients are elasticities. Results are robust to controlling for firm entry and exit and robust to restricting the sample of employing firms only.

Source: BLADE (2019)

² Grazzi and Moschella define firm growth as the change in unemployment, as they are unable to use the turnover variable. For the Australian case, we are able to verify results using both measures of firm growth.

Table 4.2: Average annual growth differentials between exporters and non-exporters, by age (decimals)

Performance indicator	All firms	Less than 3 years old	3 to 6 years old	More than 6 years old
Turnover	0.186***	0.219***	0.176***	0.151***
Employment	0.105***	0.141***	0.094***	0.076***
Productivity	0.021***	0.028***	0.014***	0.018***
Capital	0.052***	0.120***	0.023*	0.054**
R&D	0.024*	-	-	-

Notes: All coefficients are elasticities. Results are robust to controlling for firm entry and exit and robust to restricting the sample of employing firms only.

Source: BLADE (2019)

5. Response to exchange rate fluctuations

The study of export behaviour to exchange rate fluctuations started with Feenstra, Gagnon and Knetter (1996) and Goldberg and Verboven (2001) studying price behaviour in the international car market when official firm-level customs data became available. Recent focus on the firms role in international trade (Bernard et. al, 2007; Melitz, 2003) means more studies have used firm-level data to explore the relationship between export behaviour and exchange rate fluctuations (Grazzi & Moschella, 2018; Xu, Mao & Tong, 2016; Mayer, Melitz & Ottaviano, 2014; Chatterjee et al., 2013). These authors use firm-product-country data to analyse exchange rate fluctuations and firm export behaviour in Italy, China, France and Brazil, respectively. Most of this research is centred on studying how firms adjust their prices, volumes and product-mix in response to exchange rate fluctuations, except Grazzi and Moschella (2018) who are the first to study the performance of young and old exporters at the product-country level under exchange rate variation. They show that young exporters are more resilient to exchange rate fluctuations than older firms, using customs data for Italian firms between 2000 and 2007 and bilateral exchange rates.

The existing literature on the relationship between export performance and exchange rates in the Australian economy has been limited to the macro-level effects of exchange rate fluctuations, and the impact on broad industry groups such as manufacturing (Swift, 2007; Manalo et al., 2015). This leaves a significant gap in the knowledge of the firm-level response to exchange rate variation in the Australian context. Therefore, this section follows the lead of Grazzi and Moschella (2018) in studying the response of Australian exporters to exchange rates. A limitation faced in following Grazzi and Moschella's methodology is that the BLADE does not contain product-country detail. As such, the analysis is restricted to using a trade-weight indexed (TWI) real exchange rate, instead of bilateral exchange rates. Only annual export values for each firm can be accessed, and therefore export volumes and prices cannot be disaggregated. Given limited data (Australia's TWI exchange rate

appreciated for most years between 2001 and 2016), we could not examine the asymmetric effects of exchange rate fluctuations on export values.

5.1 Specification

We follow Grazzi and Moschella's use of a simple OLS regression framework. As an alternative to measuring the relationship between the change in export sales and the change in the real exchange rate simultaneously, we introduce a 12 month lag.

$$\Delta E_{i,t} = \beta_0 + \beta_1 \Delta TWI_{t-1} + \beta_2 (\text{Export_intensity})_i + \beta_3 \ln(\text{fte})_i + \chi_i + \epsilon_i \quad (6)$$

Where ΔE_t is the change (log difference) in firm level export value, ΔTWI_t is the change (log difference) in the real Australian trade weighted exchange rate, *Export_intensity* is the natural logarithm of export sales divided by total sales and χ_i is a set of industry and year dummies.

$$\Delta E_{i,t} = \ln(\text{exportvalue}_{i,t} - \text{exportvalue}_{i,t-1}) \quad (7)$$

$$\Delta TWI_t = \ln(TWI_t - TWI_{t-1}) \quad (8)$$

All coefficients in (6) are statistically significant. Firm size and export intensity are positively related to the growth in export sales and age is negatively related to export sale growth.

Later, equation (6) is also restricted to only BGFs, to determine whether BGFs are more or less sensitive to exchange rate fluctuations.

5.2 Results

The elasticity of export sales to the real exchange rate is -0.218, meaning that a one per cent appreciation in the Australian real TWI exchange rate is followed by a 0.218 per cent decline in export sales in the following year. This is similar to the -0.3 elasticity calculated using aggregate export volumes (RBA, 2016). This elasticity is also similar to the -0.282 elasticity found for Italian firms (Grazzi & Moschella, 2019), however it is important to note the analysis on Italian firms is restricted to manufacturing firms, while the analysis presented in this section is based on four industries that represent to bulk of Australia's exporting business population. Coefficients on industry effects indicate wholesale trade and retail trade firms are more resilient to exchange rate fluctuations.

Young firms (less than 3 years old) are more resilient to exchange rate fluctuations than firms between 3 and 6 years old, however mature firms (more than 9 years old) are the most resilient (Table 5.1). Additional analysis using a young dummy variable further confirms young firms are more resilient to exchange rates, consistent with findings from Grazzi and Moschella (2019) (Table G.1, at Appendix G).

The relationship between experience (number of years on export markets) and resilience to exchange rate fluctuations is U-shaped – less experienced firms (less than 3 years of export experience) are more resilient, but only to a certain point. Firms with between 3 to 6 years of experience are the least resilient to

exchange rate fluctuations, but firms with 6-9 years of experience are the most resilient. (Table 5.2).

The smaller the firm, the more resilient it is to exchange rate fluctuations. While micro (less than 5 employees) and other small (5 to 19 employees) firms behave similarly, there is a steep drop in the level of resilience for medium (20 to 199 employees) firms, and an even steeper drop for large (200 or more employees) firms (Table 5.3).

The coefficients on the regressions restricted to BGFs are generally not statistically significant across different BGFs (Table 5.4). Interestingly, the coefficient using the one year, 25 per cent threshold BGF definition is positive and statistically significant.

Table 5.1: Response to exchange rate fluctuations, by firm age

	Change in export sales (elasticity, one year lag)	n
All exporters	-0.218***	160,871
Less than 3 years	-0.396***	9,444
3-6 years	-0.448***	34,126
6-9 years	-0.188***	22,718
More than 9 years	-0.123***	94,583

Notes: 12 month average of quarterly Australian dollar trade-weighted index used.

Source: BLADE (2019); RBA (2019)

Table 5.2: Response to exchange rate fluctuations, by experience

	Change in export sales (elasticity, one year lag)	n
All exporters	-0.218***	160,871
Less than 3 years	-0.169***	29,332
3-6 years	-0.474***	30,892
6-9 years	-0.307***	36,319
More than 9 years	-	64,328

Notes: 12 month average of quarterly Australian dollar real trade-weighted index used.

Source: BLADE (2019); RBA (2019)

Table 5.3: Response to exchange rate fluctuations, by firm size

	Change in export sales (elasticity, one year lag)	n
All exporters	-0.218***	160,871
Micro (1-4)	-0.135***	57,110
Small (5-19)	-0.230***	53,138
Medium (20-199)	-0.404***	28,594
Large (200+)	-1.432*	633

Notes: 12 month average of quarterly Australian dollar real trade-weighted index used.

Source: BLADE (2019); RBA (2019)

Table 5.4: Response to exchange rate fluctuations, by BGF definition

Covariate	1 year	1 year, 25%	3 year, 25%	3 year, 100%
ΔTWI_{t-1}	a	0.375**	b	b
Export intensity	3.693***	2.658**	2.644***	2.189***
$\ln(\text{fte})$	0.725***	0.826***	0.789***	0.833***
n	16,864	5,038	12,956	2,865
R ²	0.42	0.40	0.43	0.38

Notes: 12 month average of quarterly Australian dollar real trade-weighted index used. ^aResult is positive but not statistically significant. ^bResult is negative but not statistically significant.

Source: BLADE (2019); RBA (2019)

6. Implications for entrepreneurship and exporting policies

The business entry rate, the share of born global exporters as well as the exporting business share in Australia has experienced a general downward trend and has only started to recover in more recent years (Figure 2.1). This slow recovery is concerning, given that entrepreneurship and the entry of new firms into the market are important drivers of job creation and long-term economic growth (Bakhtiari, 2019a). Moreover, a sub-optimal number of exporting firms are detrimental to economic growth given the evidence on the relative outperformance of exporting firms compared to similar non-exporting firms in Australia (Tuhin & Swanepoel, 2016).

While entering foreign markets are costly for firms (particularly small firms) in general, the cohort of BGFs defies this trend given their ability to start exporting from birth. Based on our analysis on the characteristics and performance of Australia's BGFs, we identify the following for further policy consideration to boost entrepreneurship and exporting activity.

Entrepreneurship and exports are important drivers of growth

The results of this study illustrate that BGFs outperform similar non-exporting firms in R&D expenditure growth and capital expenditure growth - necessary investments that can lead to innovation and improved business performance in the future. BGFs also experience higher survival rates than the small employing business population. The results also show that smaller, younger exporting firms are more resilient to exchange rate fluctuations than larger, older firms. There is therefore considerable policy potential to further encourage the wider cohort of small young firms to access international markets. Doing so will expose them to more innovative and competitive market dynamics that will lift business performance.

Consideration for size and age contingent policies is important

The growth premium to exporting decreases with firm age. More should be done to encourage mature exporting firms to stay competitive and become persistent exporters, while a focus on small young exporting firms will also pay dividends in terms of economic growth.

Effective targeting of BGFs

We identified BGFs in various industries, although they seem to be concentrated in four industries, namely the Wholesale Trade, Professional, Scientific & Technical Services, Retail Trade and Manufacturing industries. Although we found a reasonable share of BGFs in the 'Computer System Design and Related Services' industry, it would be wrong to assume that BGFs are mostly high-tech firms. The results also show that policies that aim to encourage very young firms to export should focus on micro firms given that BGFs are overwhelmingly employing less than five people. As judged by the characteristics of 3-year BGFs that are 100 per cent export intensive, it seems that the intentions of most BGFs are to remain micro in size. It is also important to point out that BGFs should not be associated with High Growth Firms (HGFs) given differences in their size and age profile. HGFs per definition have at least ten employees and achieve at least 20 per cent average annualised growth over three consecutive years, while BGFs are overwhelmingly micro in size and don't necessarily have an initial growth advantage in terms of employment or turnover.

Potential drivers of BGF performance

BGFs appear to be more capital intensive and R&D intensive than similar non-exporting firms, highlighting that access to finance might be an important ingredient to facilitate their growth. The results on the financial health of BGFs compared to other firms underscore that there are no significant alarm bells associated with BGFs. As such, appropriate and responsible lending to these firms should be encouraged.

Appropriate training for entrepreneurs are also important, given that the results show that principal managers of BGFs are on average older and have higher levels of educational attainment, compared to other small exporters.

BGFs are on average more likely to be home-based businesses and might therefore lack the appropriate networks to grow their businesses. Initiatives such as the Landing Pad program and SME Export Hub grants seem to be well placed given their ability to provide access to some of the world's most renowned hubs and to facilitate business collaborations.

The productivity of BGFs can be shaped and developed by programs such as the Entrepreneurs' Program (EP). The results of this study show that although BGFs experience less productivity growth in the beginning of the firm life cycle, they catch up as they mature and experience a productivity growth premium compared to other exporters. This is consistent with the broader findings from Bakhtiari (2019c), who finds entrepreneurs are quite unproductive upon entry, yet the productivity of those that survive makes a quantum leap and converges to that of mature firms. One reason behind the initial poor productivity performance might be that BGF strategies are lacking in the area of marketing, advertising and promotion, innovation and ICT – areas that could be improved via EP.

The results also point to the importance of digital business for BGFs. Their greater access to high speed broadband and mobile internet, greater use of high speed broadband, cybersecurity, data analytics, ecommerce, intelligent software systems, mobile internet etc. underscore the importance of reliable, secure and affordable access to digital infrastructure in Australia.

The evidence suggest that BGFs are more likely to target additional export markets. Policies such as the EMDG are therefore essential given that it empowers SMEs to develop export markets.

7. Conclusion

This research will assist policymakers to better target policies aimed at export promotion and entrepreneurship in Australia. The share of BGFs in Australia has been increasing recently, and in contrast New Zealand has not experienced the same post-GFC recovery in the born global share of exporters. Australian BGFs are overwhelmingly micro in size, concentrated in four industries, highly export intensive, more persistent on export markets later in life, but have similar rates of R&D activity and foreign ownership compared to overall exporters. Our results also show that the average and median export intensity of born global firms has risen sharply in recent years, whereas the trend for other exporters has remained flat.

In general, BGFs did not exhibit higher business performance on a range of measures compared to other exporting firms, except for a productivity premium experienced as the BGF matures. When comparing born global firm performance to the performance of non-exporting firms, BGFs have higher growth in R&D and capital expenditures, though have lower turnover and productivity growth. However, this result is sensitive to the BGF used, with a wider definition of BGFs concluding these firms outperform non-exporting firms on all performance metrics, particularly when BGFs are young. It is important to note that a robust control group will have to control for the self-selection of firms into exporting. Given that the results on the relative performance of BGFs are impacted by the rigour that is applied to constructing a control group, a

useful avenue for future research would be to extend our analysis and control for additional factors on business and growth dynamics of young non-exporting firms via a matching procedure to ensure these firms are as close as possible to the identified born global firms. Another limitation of our analysis is the inability to identify “true start-ups” in BLADE. As such, the results might be impacted by spin-outs and mergers as these firms are expected to have different characteristics compared to other new firms. As such, no major conclusions should be drawn from the results on the relative business performance between BGFs and non-exporting young firms. There is some evidence that BGFs with higher export intensities outperform BGFs with lower export intensities. BGFs experience lower survival rates than more mature exporters, but higher survival rates than the small employing business population. BGFs also have higher earnings and return on assets compared to more mature exporters.

Extending the work on the growth premium to Australian exporters (Tuhin & Swanepoel, 2016), it is found this export premium decreases with firm age. Therefore, policy interventions targeted at exporters should not ignore the role of firm age.

Our approach to Australian firm-level exchange rate analysis has found that smaller and younger firms are more resilient to exchange rate fluctuations than larger and mature firms. Less experienced exporters are also more resilient to exchange rate fluctuations. The relationship between export sales and exchange rates is less clear when restricting the analysis to BGFs. When more firm-level data becomes available in BLADE, we recommend extending this analysis by incorporating product-country destination level data to decompose the analysis into extensive (quantity) and intensive margins (unit prices).

Disclaimer

The results of these studies are based, in part, on ABR data supplied by the Registrar to the ABS under A New Tax System (Australian Business Number) Act 1999 and tax data supplied by the ATO to the ABS under the Taxation Administration Act 1953. These require that such data is only used for the purpose of carrying out functions of the ABS. No individual information collected under the Census and Statistics Act 1905 is provided back to the Registrar or ATO for administrative or regulatory purposes. Any discussion of data limitations or weaknesses is in the context of using the data for statistical purposes, and is not related to the ability of the data to support the ABR or ATO’s core operational requirements. Legislative requirements to ensure privacy and secrecy of this data have been followed. Only people authorised under the Australian Bureau of Statistics Act 1975 have been allowed to view data about any particular firm in conducting these analyses. In accordance with the Census and Statistics Act 1905, results have been confidentialised to ensure that they are not likely to enable identification of a particular person or organisation.

The results are based in part on tax data supplied by Inland Revenue to Statistics NZ under the Tax Administration Act 1994. This tax data must be used only for statistical purposes, and no individual information may be published or disclosed in any other form, or provided to Inland Revenue for administrative or regulatory purposes. Any person who has had access to the unit record data has certified that they have been shown, have read, and have understood section 81 of the Tax Administration Act 1994, which relates to secrecy. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data’s ability to support Inland Revenue’s core operational requirements

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Appendix A Data sources

Table A.1: Variables in the Business Longitudinal Analysis Data Environment

Variable	
Year	Financial year
State	State of business address
Postcode	Postcode of business address
Tolo	Type of legal organisation
ANZSIC 2006	4-digit ANZ Standard Industry Classification
Domestic Sales	Domestic sales from BAS
Export Sales	Export sales from BAS
Assets Non-Current	The derived non-current assets variable from BIT
Capital Purchases	Capital expenditure from BAS
Non Capital Purchases	Other expenditure from BAS
GST On Sales	GST payable from BAS
Taxable Income	Taxable income for current financial year from BIT
R&D Expenditure	R&D Expenditure from BERD where available
Turnover	Total Sales from BAS
Headcount	From PAYG
Employment	Number of employees (FTE derived) from PAYG
Wages	Total salary, wages and other payments from BAS
Cost Of Contractors	Total cost of contractors
Birth Date	Birth date or firm age (derived)

Source: [BLADE \(2019\)](#)

Table A.2: Topics covered in the Business Characteristics Survey (BCS)

Topic
Geographic markets
Business finance sought
Business innovation
Changes to business performance and activity
Barriers to innovation
Skills shortage and deficiency

Source: BCS (2019)

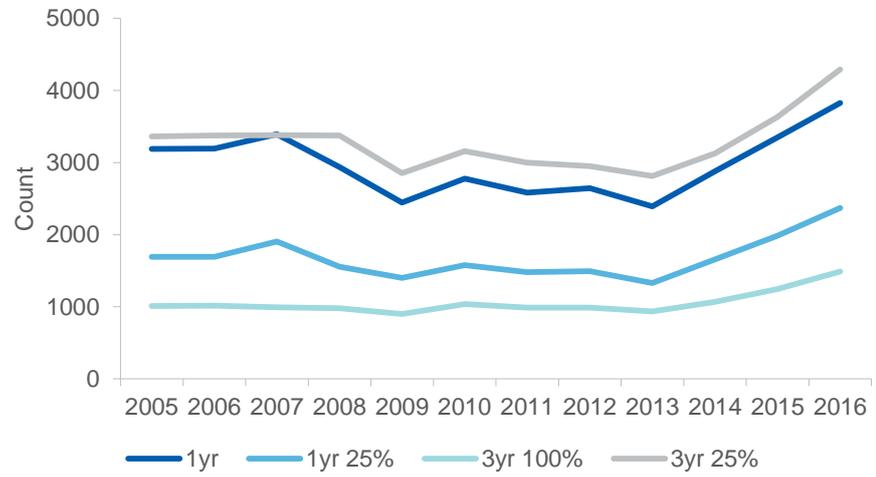
Table A.3: Topics covered in the Management capability module (MCM)

Key Performance Indicators
Use of data in decision making
Strategic plans
Skills
Supply chain
Environmental management
Principal Manager characteristics

Source: MCM (2019)

Appendix B Characteristics of born global firms

Figure B.1: Firm counts, by BGF definition



Source: BLADE (2019), Author's calculations

Table B.1: Characteristics, by BGF definitions

Characteristic	1 year ^a	1 year, 25%	3 year, 25% ^b	3 year, 100%
<i>Firm size share</i>				
Micro	63.3	75.3	75.0	85.1
Small	19.3	11.7	15.5	n/a
Medium/Large	n/a ^c	13.0	9.4	n/a
<i>Industry share</i>				
Wholesale Trade	23.5	29.8	24.8	36.7
PST	22.0	22.5	24.4	24.6
Retail Trade	15.3	13.3	11.7	11.5
Manufacturing	5.6	3.4	4.3	2.5
Other	33.6			
R&D active	5.1	4.05	4.33	0.87
<i>R&D expenditure</i>				
R&D mean	0.10	0.13	0.20	0.41
R&D median	0.01	0.00	0.11	0.36
<i>Foreign owned</i>				
Any	4.76	3.59	3.45	3.36
More than 50%	1.83	1.98	2.26	2.96
<i>Wages/turnover</i>				
Median	0.12	0.08	0.09	0.05
Mean	0.35	0.46	0.36	0.46

Notes: ^aBorn global entrants in 2015–16 ^bBorn global entrants between 2013-14 and 2015-16, with at least 25% export intensity

Source: BLADE (2019), Author's calculations

Appendix C Survey Results

Table C.1: Business Characteristics Survey, by BGF definition

Characteristic	1 year ^a	3 year, 25% ^b	3 year, 100%
Collaborative arrangements	No statistical difference	More likely to have joint research and development collaboration	No statistical difference
Home based business	More likely	More likely	More likely
Business focus	More likely to target additional export markets	More likely to target additional export markets	Less likely to focus on innovation measures; More likely to target additional export markets
Sought finance	No statistical difference	No statistical difference	No statistical difference
Competition	No statistical difference	No statistical difference	No statistical difference
Market share	No statistical difference	No statistical difference	No statistical difference
Business introduced any new or significantly improved goods/services	No statistical difference	More likely to introduced any new or significantly improved goods	No statistical difference
New to world	No statistical difference	No statistical difference	No statistical difference
New to Australia	No statistical difference	No statistical difference	No statistical difference
IT use in production/service operations	No statistical difference	No statistical difference	No statistical difference
IT use in Marketing	No statistical difference	No statistical difference	No statistical difference
Web presence	No statistical difference	No statistical difference	No statistical difference
Social media presence	No statistical difference	No statistical difference	No statistical difference
Counts	444	281	59

Notes: ^aStock of small born global firms from 2005-06 to 2015-16 ^bStock of small exporters from 2005-06 to 2015-16. Restricted to four major industries: Manufacturing, Wholesale Trade, Retail Trade & Professional, Scientific and Technical Services. ^cWeaker finding (statistically significant at 10%)

Source: BLADE (2019); BCS (2019)

Table C.2: Management Capability Module results, by born global definition

Characteristic type	1 year ^a	3 year, 25% ^b	3 year, 100%
New or improved marketing methods	Less likely	Less likely	Less likely
Strategy	Marketing, advertising and promotion, innovation and ICT less likely to be covered	Marketing, advertising and promotion, innovation and ICT less likely to be covered	Innovation less likely to be covered
Skill shortages or deficiencies in undertaking core business activities ^c	More likely in Marketing; less likely in finance professionals and IT support	Less likely in finance professionals	No statistical difference
Digital business ^d	Greater access to high speed broadband and mobile internet	Greater access to high speed broadband, mobile internet, cloud technology, internet of things and social media*	Greater access to high speed broadband, , mobile internet, data analytics, internet of things
<i>Principal manager</i>			
Age	Older	Older	No statistical difference
Education	Higher	Higher	Higher
Gender	No statistical difference	No statistical difference	More male*
Counts	110	81	27

Notes: ^aStock of small born global firms from 2005-06 to 2015–16 ^bStock of small exporters from 2005-06 to 2015–16. Restricted to four major industries: Manufacturing, Wholesale Trade, Retail Trade & Professional, Scientific and Technical Services. ^cShortage or deficiency in undertaking core business activities. ^dTo what extent were the following digital technologies important to the business? * Weaker finding (statistically significant at 10%)

Source: BLADE (2019); MCM (2019)

Appendix D Performance of BGFs

Table D.1: Average annual growth differentials between BGFs and other exporters, using 3 year, 25% export intensity BGF definition

Performance indicator	All firms	Less than 3 years old	4 to 6 years old	More than 6 years old
Turnover	-0.115***	-0.168***	-0.117***	-0.035**
Employment	-0.108***	-0.171***	-0.095***	-0.050***
Productivity	0.010*	0.036***	-0.005	0.024**
Capital	-0.028*	-	-	-
R&D	-	-0.100*	-	-

Notes: All coefficients are elasticities. Results are robust to controlling for firm entry and exit and robust to restricting the sample of employing firms only.

Source: BLADE (2019)

Table D.2: Average annual growth differentials between BGFs and other exporters, using 3 year, 100% export intensity BGF definition

Performance indicator	All firms	Less than 3 years old	4 to 6 years old	More than 6 years old
Turnover	-0.142***	-0.273***	-0.109***	-0.022
Employment	-0.134***	-0.219***	-0.108***	-0.078***
Productivity	-	-	-	0.051*
Capital	-	-	-	-
R&D	-	-	-	-

Notes: All coefficients are elasticities. Results are robust to controlling for firm entry and exit and robust to restricting the sample of employing firms only.

Source: BLADE (2019)

Table D.3: Average annual growth differentials between BGFs and non-exporting firms, 3 year, 25% export intensity BGF definition

Performance indicator	All firms	Less than 3 years old	4 to 6 years old	More than 6 years old
Turnover	-	0.048***	-0.026***	-
Employment	0.014***	0.030***	-	-
Productivity	-	0.020*	-0.027***	-
Capital	0.035**	0.102***	-	-
R&D	0.053***	-	0.080***	-

Notes: All coefficients are elasticities. Results are robust to controlling for firm entry and exit and robust to restricting the sample of employing firms only.

Source: BLADE (2019)

Table D.4: Average annual growth differentials between BGFs and non-exporting firms, 3 year, 100% export intensity BGF definition

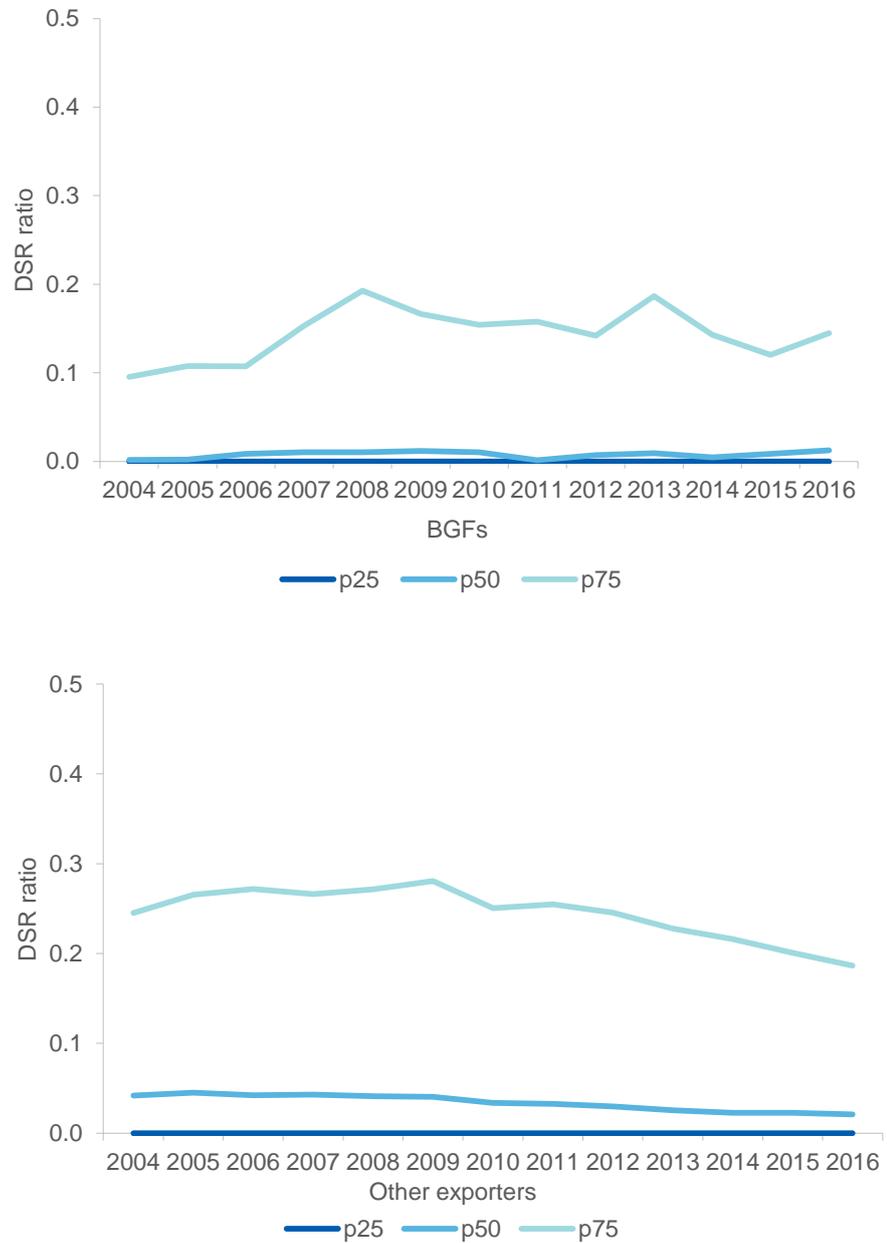
Performance indicator	All firms	Less than 3 years old	4 to 6 years old	More than 6 years old
Turnover	-0.042***	-0.078***	-0.045**	-
Employment	-0.023**	-0.042***	-0.020*	-
Productivity	-0.021*	-	-0.029*	-
Capital	-	0.123*	-	-
R&D	-	-	0.102*	-

Notes: All coefficients are elasticities. Results are robust to controlling for firm entry and exit and robust to restricting the sample of employing firms only.

Source: BLADE (2019)

Appendix E Financial ratios and performance

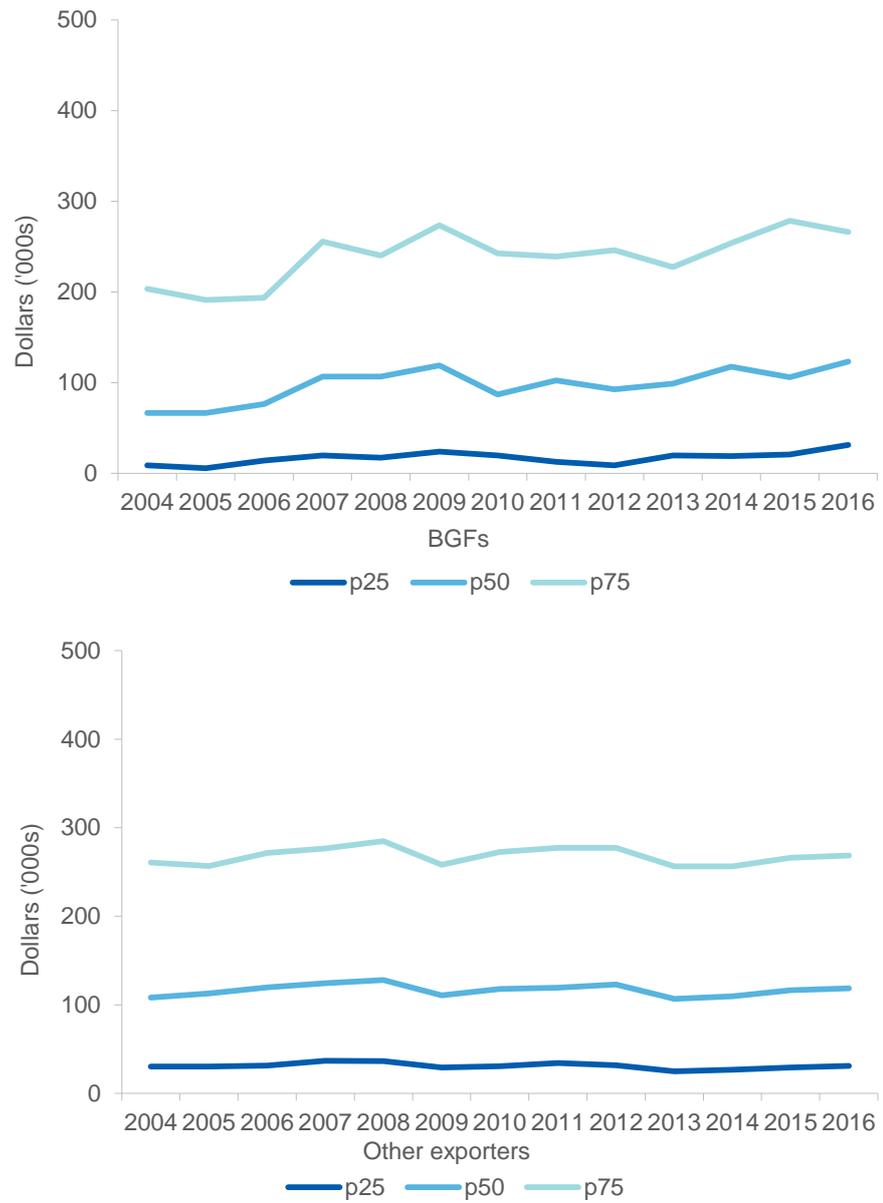
Figure E.1: DSR ratios for BGFs and other exporters at the 25th, 50th and 75th percentile



Notes: DSR is debt servicing ratio, which is the ratio of a firm's total interest expenses to their earnings and cash reserves. All dollar values are deflated using the Consumer Price Index.

Source: BLADE (2019)

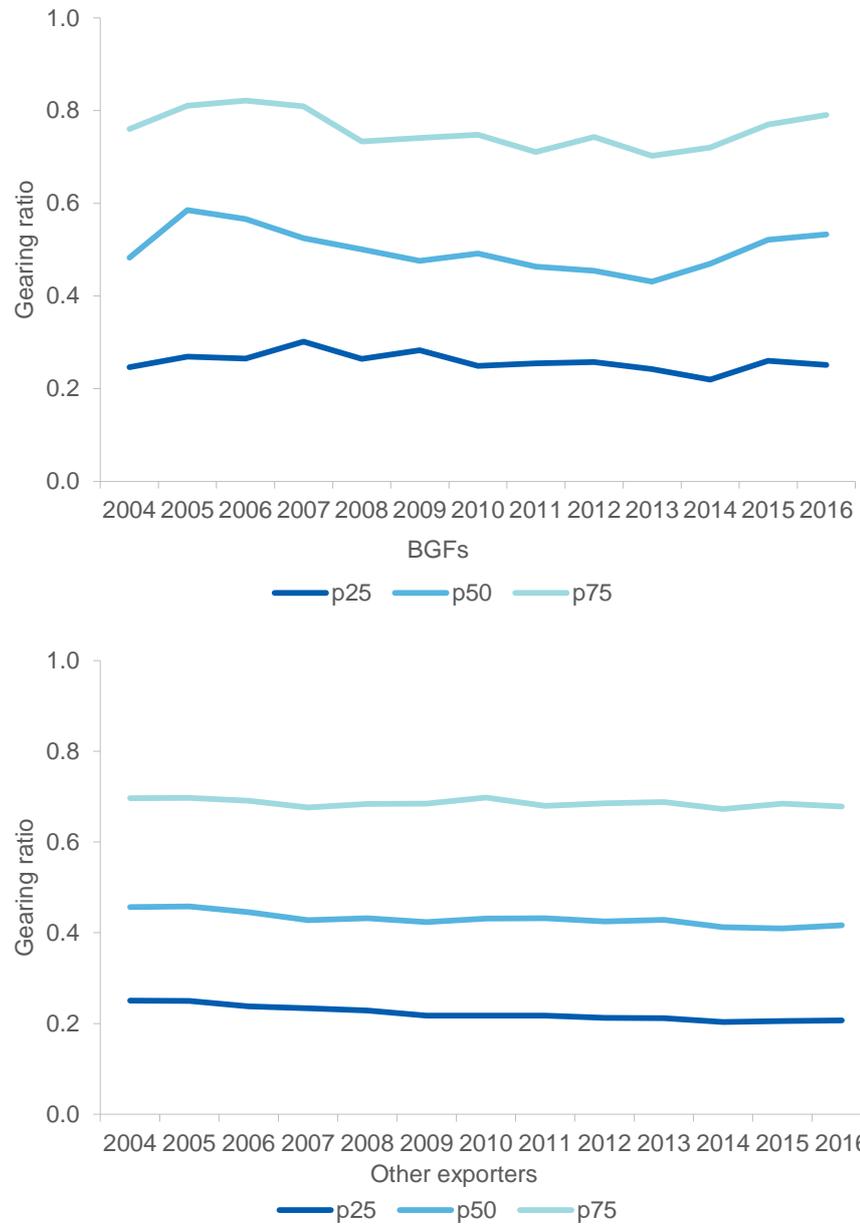
Figure E.2: EBIT for BGFs and other exporters at the 25th, 50th and 75th percentile



Notes: EBIT is earnings before interest and tax. All dollar values are deflated using the Consumer Price Index.

Source: BLADE (2019)

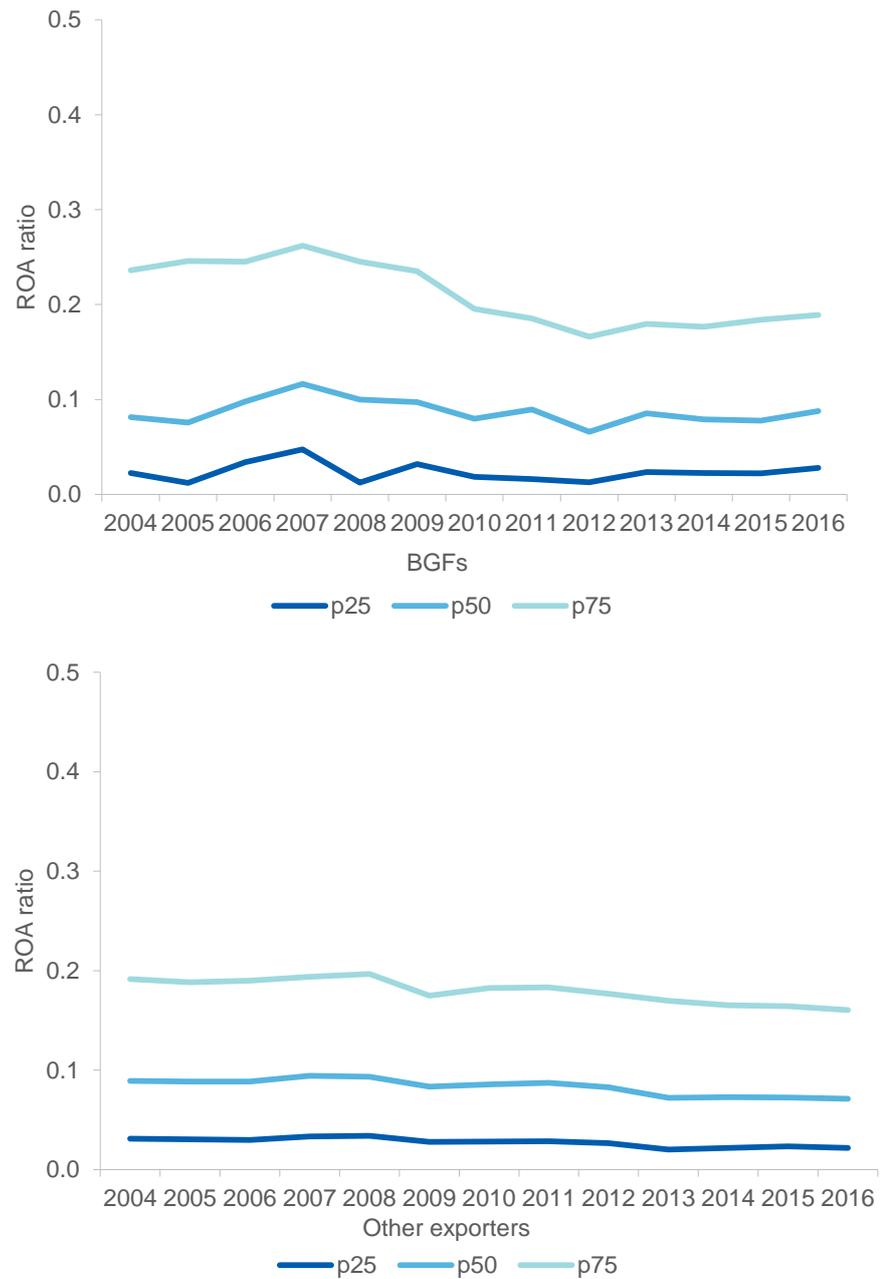
Figure E.3: Gearing ratio for BGFs and other exporters at the 25th, 50th and 75th percentile



Notes: Gearing ratio is a firm's total debt to total assets.

Source: BLADE (2019)

Figure E.4: ROA ratio for BGFs and other exporters at the 25th, 50th and 75th percentile



Notes: ROA ratio is a ratio of a firm's earnings (EBIT) to current and fixed assets (total assets) for a given year.

Source: BLADE (2019)

Appendix F Exporter dynamics

Table F.1: Employment growth, size, age & export status

	All firms	Less than 3 years old	4 to 6 years old	More than 6 years old
Exporter	0.105***	0.141***	0.094***	0.076***
ln(fte)	-0.203***	-0.285***	-0.172***	-0.135***
ln(fte) ²	0.051***	0.056***	0.045***	0.036***
ln(age)	-0.175***			
n	1,267,454	399,698	563,077	209,373
R ²	0.146	0.183	0.076	0.055

Notes: *** significant at 1 per cent, ** significant at 5 per cent, * significant at 10 per cent. n refers to the number of observations. Log-log model, all coefficients are elasticities

Source: BLADE (2019)

Appendix G

Exchange rates and export sales

Table G.2: Response to exchange rate fluctuations, with young firm dummy variable

Covariate	Coefficient
Young	0.089***
ΔTWI_{t-1}	-0.228***
Export intensity	4.634***
$\ln(\text{fte})$	0.668***
n	160,871
R ²	0.396

Notes: *** significant at 1 per cent, ** significant at 5 per cent, * significant at 10 per cent. n refers to the number of observations. Log-log model, all coefficients are elasticities

Source: BLADE (2019)