Did firm age, experience, and access to finance count?

SME performance after the global financial crisis

Abstract

This paper examines the relationships between firm age and entrepreneurs experience on SME performance after the 2008/09 global financial crisis. We find that in general the crisis had a long-lasting scarring effect on the SME sector, but there is evidence of some recovery in performance. Interestingly, the well-established, and negative, firm age-growth relationship still holds, but entrepreneurial experience did not have any substantive effects on small business performance. Our findings suggest that the severity of the crisis meant that previous entrepreneur experiences had little value in this unique and uncertain environment. However, young firms still accounted for a disproportionately high share of growth, especially among the fastest growing firms.

Keywords: firm age; entrepreneurs experience; job dynamics; sales dynamics; financial crisis

1. Introduction

Small business growth is a topic of interest and relevance in many different areas of economics and management studies given the significance of small and medium enterprises (SMEs) in job creation, innovation and economic growth (Acs & Storey, 2004; Audretsch & Keilbach, 2004; Audretsch et al., 2008; Davila, et al., 2003; Lerner, 1999, 2002). Until recently, and following on from the seminal work of Birch (1979), the prevailing orthodoxy was that smaller firms grew faster than larger firms and that younger firms grew faster than older firms (Davidsson et al, 2010; Evans, 1987; Geroski & Gugler, 2004; Yasuda, 2005), although there were some dissenting views (largely the early US work of Davis, Haltiwanger and Shuh, 1996). Yet more recently this former size-growth evidence base has been empirically challenged and the balance of evidence suggests that, at the minimum, the (negative) age-growth relationship dominates the (negative) size-growth relationship (Neumark, Wall, and Zhang, 2009; Haltiwanger, Jarmin, and Miranda, 2013; Anyadike-Danes et al, 2014) relationship, although some researchers (e.g. Coad et al., 2013 and 2014) maintain that growth is well approximated by a random process equivalent to the 'toss of a coin'.

Although numerous studies have been conducted on small firm growth, our understanding about the phenomenon is far from complete (Davidsson et al., 2010). One under-researched, albeit important and relevant area concerns the growth performance of SMEs in periods of economic disequilibrium, as well as the actions taken to weather the economic downturn and the effectiveness of such actions. In particular, do well-established relationships such as that between young firms and superior growth, typically observed in stable macroeconomic conditions, hold in such unique economic circumstances or are they over-turned? Equally,

does entrepreneurial experience become increasingly important when uncertainty and risk characterise the external environment?

The global financial and economic crisis (GFC), which began in September 2007, has posed major challenges to larger and smaller firms alike. The UK is amongst the countries that have been hit the most deeply by the crisis, contributing to a fall of 6.4 per cent in GDP in the subsequent six quarters that constituted the official recession (December 2007 to June 2009). This equates to around three years of post-war trend level economic growth for the UK economy (Cowling et al, 2012). On the one hand, due to large contractions in the general demand for goods and services, the recession poses a greater threat to smaller firms given larger firms' competitive advantage derived from scales of economy and scope (Dass, 2000; Porter, 1980). On the other hand, it is generally believed that the small business sector of the economy is more dynamic and opportunistic than the large firm sector, and that periods of disequilibrium and economic instability are precisely the times when the best entrepreneurs are able to take advantage of new opportunities as large firms and the public sector withdraw from markets (Acs and Storey, 2004; Grilli, 2010). This is an entrepreneurial quality effect, in effect separating the wheat from the chaff (Kitson, 1995).

However, even five years after the onset of the GFC, UK GDP is 3.31 per cent lower than its pre-recession figure. Whilst avoiding further contractions since 2012, the UK economy is still facing serious challenges and the economic forecast has continued to be dampened, especially in the presence of Eurozone's debt crisis (BCC, 2012). Yet even for the more resilient firms, achieving sustainable growth over the long run when market demands continue to contract and the economy continues to be mired in a low-growth period, can be problematic. This is especially true if such within-recession resilience was a result of using higher pre-recession profit to fund investment and/or absorb the loss during the recession (Wikham, 2010). Obviously, the longer the period of low growth and instability lasts, the

more unlikely retained profit will be able to support future business growth. More importantly, in order to achieve a desirable growth whilst maintaining the capability to adapt when the upswing comes and realising opportunities for long-term value creation, entrepreneurs have to incur higher short-term costs and adopt a more progressive strategy, which will also impair growth performance or even business survival if such practice is not companied by any improvement of macro-economic conditions.

Thus it is the intention of this paper test whether two well-established empirical facts relating to SMEs and growth retain their validity in a prolonged period of macroeconomic instability and low growth. We use a longitudinal data set for the UK, which spans the period from December 2010 to June 2012 the 2nd and 3rd years of recession since the 2008/09 financial crisis, to address 2 key questions:

- Does the negative firm age – growth relationship still hold after the GFC?
- Does entrepreneurial experience help sustain superior growth after the GFC?

In doing so, we hope to add to our general understanding of what really happens to the SME sector when the economy is recovering extremely slowly from the GFC and a severe economic downturn. This context is particularly interesting and unique (Figure 1) as economic recessions in the UK do not normally last this long (NIESR, 2012). This will enable us to consider the growth performance dynamics of the SME sector and also identify areas government actions that might be appropriate.

Insert Figure 1 Here

The rest of the paper is organised as follows. In the next section we review some of the key literature relating to SME growth. Section 3 presents out data and discusses key variables to be used in our analysis. Section 4 presents the results of our empirical analyses. Section 5 explores the significance and relevance of the results of our study and draw out the implications for policy-makers and practitioners. The last section concludes the paper.

2. Literature Review

The growth of small firms has been the focus of numerous theoretical and empirical studies in entrepreneurship research (McKelvie & Wiklund, 2010; Coad, 2009). Despite this substantial research volume, theoretical development remains fragmented and slow (Davidsson & Wiklund, 2000; Wiklund et al., 2009) and empirical evidence highly inconsistent (Storey, 1994; Shepherd & Wiklund, 2009)[1]. In this study, we particularly focus on the effect of firm age and entrepreneurial experience on small business performance as the economy steps out of one of the most severe recessions in decades.

2.1. Age and business performance

It is a general convention by politicians and small business advocates that SMEs contribute, sometimes disproportionately, to job creation and this perception is supported by a number of empirical studies (Birch, 1979, 1987; Neumark et al, 2011). Firm age is usually ignored or treated as a variable closely related to firm size by early empirical work (Coad et al, 2013). However, more recent studies (Coad et al, 2013; Davis et al, 1996; Haltiwanger et al, 2013; Haltiwanger & Krizan, 1999) have challenged this approach and content that firm age should be included as a separate variable when examining firm performance.

Literature on small business survival suggests that younger businesses in their formative years are more likely to be concerned with survival than growth if they do not fail within the first few years of starting up (Cowling, 2006). Therefore, growth should be observed in more matured businesses which have passed the 'survival mode' (Audretsch and Mahmood 1994; Watson, 2012). On the other hand, older firms may also suffer from 'liabilities of age', such as the owners' lower commitment and involvement compared to young firms (Churchill and Lewis, 1983), and a firm's performance is usually found to be diminishing as the firm ages

[1] The nature of empirical evidence has been found to be dependent on the inclusion or exclusion of exiting firms in the estimation sample, and whether sample firms were below or above the minimum efficient scale (Teruel-Carrizosa, 2010).

(Chandler and Hanks, 1993 and 1994; Durand and Coeurderoy, 2001; Nunes, 2013; Yasuda, 2005). From a learning perspective, however, business performance is likely to improve as both the firm and entrepreneurs become more aged and thus experienced (Vassilakis, 2008).

The seminal work by Haltiwanger et al (2013) attempts to reconcile the conflicting empirical findings. They argue that whilst both size and age should be considered, it is age that is playing a more critical role in employment growth dynamics. They found that once firm age is controlled for, the negative relationship between size and growth would disappear. Their findings essentially counter traditional theoretical and empirical work that focuses only on size by assuming that being small is the key to job creation, and attribute the debate on size and growth to potential omitted variables bias that can occur by not controlling for firm age. They highlight the importance of business start-ups, in the sense that young firms are essential sources of growth, which just happened to be small firms in most cases. Therefore, with potential measurement issues resolved, firm growth should be negatively associated with age.

However, less has been said about the effect of firm age and cyclical performance of small businesses during an economic downturn, where *a priori* expectation is that resource availability plays a more vital role in small business performance. One recent exception is Fort et al. (2013), who advanced the work of Haltiwanger et al (2013) by differentiating between small businesses of varying ages. They find that young and small firms are more sensitive to cyclical shocks than larger firms, and have experienced considerably more severe decline in employment during the latest recession.

2.2. Entrepreneur experience and business performance

A survey of recent literature on small business performance has shown that human capital is in general positively linked to success (Unger et al, 2011). Cowling (2006) divided entrepreneurial human capital (EHC) into two categories: formal and informal. The former is

commonly proxied by the entrepreneur's education level, and the latter usually by variables such as entrepreneur age, health, family, and prior experience. In terms of formal human capital, there is fairly strong empirical support, across a number of empirical studies, for the notion that businesses with more educated entrepreneurs experience faster early stage growth (Cowling, 2002; Dimov & Shepherd, 2005; Rauch et al, 2005). However, empirical evidence on the impact of informal human capital is far less conclusive (Cowling, 2006). This is probably due to the fragmented measures of informal human capital used in the previous literature. For example, whilst there is virtually no evidence found between performance and the age of entrepreneur, some studies have found a positive relationship between experience and small business performance (Burke et al, 2000; Honig, 1998; Watson et al, 2003; Westhead et al, 2005; Zarutskie, 2010).

Economic recession represents a typical environmental shock faced by small business owners. Unlike large firms, small firms respond differently when confronted by the challenges of an economic downturn (Latham, 2009). On the one hand, compared to larger firms, recession poses a greater threat to smaller firms given larger firms' competitive advantage derived from scales of economy and scope (Dass, 2000; Porter, 1980). Therefore, survival is the primary concern for small businesses during the recession (at least during the short-run) and to achieve this, SMEs have to undergo cost-cutting but at the risk of reducing their capacity and thus the ability to adapt adequately when recovery comes (Kitching et al., 2011). On the other hand, the structural and organisational flexibility of small firms (Dean et al., 1998; Reid, 2007; Smallbone, et al., 2012) may provide leverage to SMEs during the economic turmoil against larger firms. To this end, periods of disequilibrium create new opportunities for entrepreneurs (Parker et al., 2012; Schumpeter, 1942) to pursue growth-oriented strategies and they are more likely to adopt a revenue-generating strategy (Latham, 2009) by incurring higher costs in the short-run so as to retain the capability to adapt when

the upswing comes and realise opportunities for long-term value creation (Kitching et al., 2011).

3. Method

This section describes the data source for this study and the survey method from which the data is derived, followed by a discussion on both the dependent and independent variables in the analysis.

3.1. Sample

This study is intended to analyse existing data from two previous survey sources which cover information of small businesses in immediately after, and over the next two years that followed the 2008/09 financial crisis.

The benchmark data is derived from the UK Small Business Survey (SBS) in 2010, commissioned by the Department for Business, Innovation and Skills (BIS). The SBS survey has been conducted on a biannual basis[2] since 2010 and as a follow up to the 2007/8 Annual Small Businesses Survey (ASBS), the SBS 2010 involved a large-scale telephone survey conducted between July and September 2010, exactly one year after the official recession ended. The main purpose of the survey is to "monitor key enterprise indicators and how these have changed in comparison to previous surveys" and "to gauge SME intentions, needs, concerns and the obstacles to fulfilling their potential" (BIS, 2010). A total of 4580 SMEs (businesses with fewer than 250 employees) were interviewed using a stratified random sample selection method evenly across thirteen regions in the UK and the samples were randomly drawn across all commercial sectors of the economy to ensure that the sample is representative of the UK small business population. Amongst this sample of SMEs, 33 per cent are micro enterprises (1 to 9 employees), 33 per cent are small enterprises (10 to 49

[2] Before 2008, the equivalent Annual Small Business Survey was conducted annually.

employees), 17 per cent are medium enterprises (50 to 249 employees) and the rest 17 per cent have no employees.

Conducted by the UK Department for Business, Innovation & Skills, a sample of employer (i.e. firms with at least one employee) SMEs entering the SBS 2010 were re-contacted in a series of 'Business Barometer' surveys to determine how well or badly they have performed in the previous year, and to assess their levels of business confidence going forward. In each of the six 'Business Barometer waves[3]', starting from December 2010 to June 2012 with intervals of two to three months, an average of 500 (non-repeating) SMEs were re-surveyed using questions similar to the SBS 2010. The 'matching' of the SBS 2010 and 'Business Barometer' surveys yield a cross-sectional data set of 3,167 SMEs. The composition of SMEs is fairly similar to the benchmark SBS sample, with 42 per cent being micro enterprises, 37 per cent small enterprises and 21 per cent medium enterprises. By their setting, both data sets only include surviving businesses.

3.2. Dependent variables

The growth literature has put too little emphasis on the measurement of growth (Delmar, 1997) and measures such as sales, employment, profit, asset and so on are used extensively throughout the literature (Weinzimmer et al, 1998). Only recently has growth started to be treated as a multidimensional, heterogeneous and complex construct (Achtenhagen et al., 2010; Leitch et al., 2010). We follow the suggestions by Delmar (1997) to use multiple growth measures, namely the annual percentage changes in employment (*EGROWTH*) and sales (*SGROWTH*), to ensure some extent of comparability with previous studies, as well as to reflect the theoretical consideration of growth from different perspectives. Moreover, we choose sales and employment as our measures of growth because they are the primary channels through which small businesses contribute to the economy (Acs and Storey, 2004;

[3] The six waves are: December 2010, February 2011, August 2011, November 2011, February 2012 and June 2012. No firms were re-surveyed in more than one Barometer wave.

Audretsch et al, 2008; Cowling, 2006), making them two natural candidates and mostly used variables for growth measures (Achtenhagen et al, 2011; Delmar, 1997; Unger et al, 2011; Weinzimmer et al, 1998). In both cases, the performance variables are winsorised at the 1 per cent level to remove the effect of outliers.

3.3. Explanatory variables

Independent variables in this study can be classified into business- and entrepreneur-level characteristics, as well as indicators on SME access to finance. We also include six time indicators (*WAVE1* to *WAVE6*) to match the timing of the six 'Business Barometer' surveys.

The main business characteristics include firm size, age, sector, region, corporate structure, and so on. Firm size is measured by employee numbers (*EMP*). Business age is reported in the dataset as banded variables (up to 3 years, 4 to 10 years and more than 10 years, labelled as *AGE_3LESS*, *AGE_4TO10* and *AGE_10MORE*, respectively). Variables on corporate structure include whether or not a business is family owned (*FAMOWN*) or incorporated (*CORP*).

Owner/entrepreneur characteristics measure the firm's human capital and consist of owner age (*OAGE*), gender (whether or not the business is women led, *WLED*), race (whether or not the business is minority group led, *MLED*), prior experiences and level of education. An experienced employer (*EXP*) is defined as having previously set up a business, charity or been self-employed. The level of education (*DEGREE*) is measured by whether or not the owner has a university degree or above (postgraduate or doctoral degrees). Although a very rough proxy, owner age can also be reflective of entrepreneurial experience, both contextual and non-contextual. The availability of financial resources is an important facilitator of small business growth (Beck & Demirguc-Kunt, 2006), and depending on the outcome of finance seeking, a firm can be fully funded from either external or internal sources (*FULLACCESS*), partially constrained (*PARTACCESS*) or fully constrained (*NOACCESS*).

3.4. Empirical Methodologies

The primary objective of this study is to investigate the growth performance of the small business sector, and the determinants of growth outcomes. Since both growth measures (percentage changes in employment and sales) are by construction continuous variables, an OLS model with adjustments made for robustness of the standard errors[4] is adopted. In order to address the possible endogeneity of the regressors, lagged firm size (*EMP*) and performance[5] are used where applicable as additional regressors in the models. Further, to address the possible heteroscedasticity of growth rate distributions, quantile regression models are used to test the effect of age and experience on different growth rate quantiles for the Barometer sample.

4. Results

This section first reports sample descriptive statistics for the variables and then the empirical results from multivariate regression analyses.

4.1. Descriptive statistics

Table 1 reports the descriptive statistics of dependent and independent variables for both the whole sample and by three firm age bands. In order to be consistent with the barometer survey data, companies with no employees are excluded from our analysis, resulting in a sample of 2,991 firm-level observations for our benchmark, SBS 2010, analysis, whereas the sample size from business barometers is 2,830. Since most of the variables are dummies variables, it is worth noting that the mean of each dummy is equivalent to the percentage of observations where the variable takes a value of one.

From the SBS 2010 data, the average employment and sales growth are 1.3 and -1.1 per cent, respectively. However, in the next two years that followed, employment growth has

[4] We also try to allow for cluster effects (by sector) in our analyses as robustness checks but that does not change our findings substantially.
[5] Lagged performance is only available when using the Barometer data set.

dropped by 1 percentage point whilst sales performance increases to 0.1 per cent, but still significantly below the pre-recession level of 5.2 per cent (Cowling et al., 2015). The opposite growth patterns in employment and sales show that entrepreneurs view employment as an investment rather than performance measure, in the sense that they have viewed the recession as an opportunity to expand their business to take advantage of a return to economic growth when the market demand rises. Moreover, it is obvious that whilst the growth of older firms is modest or even negative, it is the youngest firms (less than 3 years old) that have achieved exceptional growth over the post-recession period. A standard mean-comparison test shows that the average performance of young firms is significantly higher for both employment and sales. Also the difference in the distribution of sales performance measures using both data sets is statistically significant according to the Fligner-Policello test. It can be seen that younger firms are on average smaller with younger owners, more growth-oriented, less likely to export and more financially constrained. For both SBS and Barometer samples, the correlation coefficients between size, firm and owner age are small enough (results not reported but available upon request) to rule out the possibility of collinearity between these variables.

Figure 2 and Figure 3 illustrate how the employment and sales growth have evolved after the GFC, for firms of different age groups. Consistent with prior conjectures, younger firms in general have better, but more variable, performance in terms of both employment and sales growth. However, there is significant time variance regarding the performance differentials for different age groups. It is found that the youngest firms have the best relative performance during the short-term after the recession officially ended (as depicted by 2010 SBS and the first few waves of Barometer surveys). As the economy moves further from the recession, the comparative advantage of younger firms becomes less prominent, and even transposed.

Insert Figure 2 Here

Insert Figure 3 Here

Insert Table 1 Here

4.2. Multivariate regression results

The starting point was to econometrically model the dynamics of business sales and employment growth during the post-recession periods. Regressions using the SBS 2010 data are used as benchmarks and those using the barometer data enable a closer look at growth dynamics and the effect of age and experience on post-recession performance.

Table 2 reports the coefficient estimates for both sales and employment growth equations. Model 1 is the benchmark employment growth model using data derived from SBS 2010. It can be seen that, business age has no effect on employment performance immediately after the recession. We use the logarithm of employee numbers in the regressions to pick up the possible non-linearity between business size and performance. The coefficient estimate (β = -2.92, $p < 0.01$) suggests that firm size is negatively related to employment growth, but at a decreasing marginal rate. We include lagged sales growth (employment growth in sales growth equation) as a control variable and find it significantly and positively correlated with employment change (β = 0.46, $p < 0.01$). Except for entrepreneurial growth orientation (β = 3.08, $p < 0.01$), neither human capital nor access to finance variables significantly influence SME employment growth immediately after the recession.

Employment growth two years after the GFC (Model 2) has some notable differences especially with respect to business age. On average, the oldest firms have a lower rate of growth in employment (β = -9.23, $p < 0.05$), indicating that as the economic environment improves, the sensitivity of firm age on employment growth becomes stronger and supports the liability of age argument. The availability of financial resources is more important for employment growth during the economic recovery and firms that failed to secure any external finance required create significantly fewer (β = -5.58, $p < 0.05$) jobs than other firms.

Insert Table 2 Here

Specifications 3 and 4 of Table 2 report the coefficient estimates for small business sales performance immediately after (Model 3) and over the next two years after the 2008/09 crisis (Model 4). For both specifications larger firms are likely to have higher sales growth, but with decreasing marginal effect. Unlike employment, there is an explicit sector effect in sales performance, where firms in construction recovered most slowly from the recession (β = -3.75, $p < 0.05$).

Regarding sales growth in the following two years, it is found that businesses that export outside the UK outperform those who do not export by more than 2 percentage points in terms of sales growth. Firms with better access to external finance also performed better. The positive coefficient estimates on both firm size and access to finance suggests that resource availability is a very important driver of sales growth as the economy gradually recovers. Similarly though, younger and exporting firms tend to have better sales performance, but it is firms in transport, retail & distribution and services that suffered the most when economic recovery remained slow and unclear. Similar to the employment performance, growth orientation is the only important owner/entrepreneur characteristic that is significantly and positively associated with sales growth in both within- and post-recession periods.

OLS models only capture the average effect of the explanatory variables on the conditional mean of the outcome variable. However, there is extensive evidence that growth rates can be extremely volatile and its distribution (variance) appears to be heteroskedastic (Bottazzi and Secchi, 2013; Reichstein et al, 2010), so growth can be inappropriately characterised by OLS without accounting for the full conditional distributional properties of the growth process (Coad et al, 2014). As a robustness check, we use quantile regressions to further test the effect of business age and owner experience across different parts of the growth rate distribution. Table 3 reports the coefficient estimates of the same variables in Table 2 for

SME employment and sales performance two years after the GFC using the Business Barometer Survey data across five quantiles of the growth distribution. Note that the 50% quantile, or the median of both sales and employment growth in our data set is dominated by zeroes (stable performance), regression results at this particular quantile should thus be viewed and interpreted with caution.

For both employment and sales growth, the effect of firm age differs considerably, where the strong negative effect identified in the OLS models is only found in higher quantiles of the performance distributions, and the difference is statistically significant. The OLS effect of firm age deviates substantially from the median estimates, suggesting that young SMEs are contributing disproportionally to the performance of high-growth firms. In sharp contrast, resource availability proxied by employee numbers and access to external finance has a strong influence towards lower growth rate quantiles. This indicates that size and age may influence small business performance through difference channels. It could also imply that for poorer performing businesses where survival is a more imminent concern, the availability of both internal (labour) and external (finance) resources outweighs the potential benefits of a young firm. Consistent with the OLS results, entrepreneurial experience has no effect on growth but growth orientation is an important growth determinant for all but one quantile.

Insert Table 3 Here

5. Discussion

We focused our growth analysis on firm age and entrepreneurial experience and their potential effects on small business performance during a unique period when the economy continued to be characterised by low growth and uncertainty five years after the onset of the deepest UK recession since the 'Great Depression' in the 1930s.

Generally speaking and in line with the growth of UK GDP, the decreasing trend in sales growth for UK SMEs ceased from the beginning of 2011. However, this improvement in

sales performance is extremely limited and the average growth of 0.1 per cent is much lower than the pre-recession level of 5 per cent reported in Cowling et al. (2015). Although on average higher than both the within- and pre-recession figures, small business performance measured by employment growth appears much more volatile and hard to predict, giving rise to the conclusion that employment and sales may have different relevance to entrepreneurs as measures of small business performance. The high growth rate of employment immediately after the recession and a declining trend in the subsequent years as compared to sales growth is a possible sign of labour hoarding amongst the small business sector, where increasing employee numbers during an economic turmoil is seen by entrepreneurs from a strategic perspective as an investment in preparation for the demand rise in the upcoming recovery, rather than a pure measure of business performance.

In terms of the question as to how many firms are still capable of achieving growth after the recession (Figures 2 and 3), we note that in general and despite the lack of finance and other resources (as depicted by smaller firm size and higher likelihood of financial constraints) younger firms appear to be more resilient and have picked up growth momentum more quickly than their older counterparts, particularly those aged 10 years or above. This is consistent with the 'liability of age' hypothesis. As the economy recovers, such comparative advantage in growth reduces or even disappears. This is especially true for growth performance in employment. Our analysis shows that on average firms over ten years old underperformed other firms by approximately 10 percentage points on employment and 5 percentage points on sales. This is due to the exceptionally high growth rate of young firms especially those aged 3 years or less, as show in Figures 2 and 3, indicating that it is the younger, business start-ups that contribute the most to the economic growth during a pro-longed recession. We find that whilst the crisis is likely to have a profound negative impact on the small business sector for a relatively long time, the well-established, and negative,

firm age-growth relationship still holds. This finding is particularly interesting given that the literature suggests that younger and smaller firms are found to be more sensitive to cyclical shocks. In other words, these firms are expected to suffer more during periods of economic crisis. Our results might suggest that the 'liability of age' dominates the financial frictions that are more profound for young firms, particularly in periods of crisis. This would be in line with bureaucratic firm decision-making processes acting as a constraint of larger SME compared to the relative agility and speed of entrepreneurial decision-making in response to unanticipated shocks. Never the less, one should interpret the above findings with caution because our sample by nature (survey data) does not include non-surviving businesses.

Moreover, consistent with Haltiwanger et al (2013), when business age is controlled for, firm size is no longer a significant determinant of SME growth performance, except for sales growth several years after the GFC (Specification 4, Table 2), when resource availability proxied by firm size plays a vital role as the economy was recovering slower than expected. This positive size-performance relation is found in a number of empirical studies, for example, Sapienza and Grimm (1997) and Zhao et al. (2011). Further analyses over different quantiles of the growth performance distribution show that there is a trade-off between size and age. We find that younger firms contribute disproportionally to business performance particularly at higher growth quantiles, but this negative age-performance sensitivity is offset and then dominated by the positive effect of firm size at lower growth quantiles. This could be the case when better performing firms have already achieved the optimal firm size and growth of the firm is more than enough to satisfy the firm's resource requirement, whilst poorer performing firms tend to rely more heavily on the availability of both labour and capital resources to support their growth.

In terms of business and entrepreneur characteristics, we find business characteristics more important in determining small business performance. We also that there is a positive synergy

between sales and employment growth. This positive relationship is generally irrespective of macroeconomic environment. What this does suggest is that any policy levers that stimulate either job growth or sales growth will be likely to create a positive economic multiplier. Unlike periods of economic growth when industry sector plays a very minor role in the determination of employment and sales growth (Cowling et al., 2015), we provide further support to recent studies (Bank of England, 2010; ONS, 2011) that SMEs in certain sectors are more resilient whilst some others are more prone to the economic downturn. We note that firms in construction continued to experience significant declines in sales even after the official end of the recession. However, when recovery emerged it is firms in transport, retail & distribution, and services that were found to be the slowest in picking up the growth momentum.

Entrepreneur characteristics play a very minor role in SME growth performance over the sample period, except for the strongly significant effect of entrepreneurial growth orientation. Entrepreneurial experience has little impact on SME post-recession performance. The result suggests that entrepreneurs were struggling to draw any inferences from previous experiences and apply them to a business context with little resemblance to the past. This finding is also in line with the conjecture that small business growth may be nothing more than a random walk (Coad et al, 2014). This general finding poses some important policy questions. On the one hand, it could suggest that because the average quality of the entrepreneur is low, then they do not have the ability to undertake actions to ameliorate the impacts of the crisis. Certainly, the literature on entrepreneurial learning and speed of adjustment suggests that learning, if it occurs at all, is slow. Equally, it could simply be that in the face of an economic crisis macroeconomic forces overwhelm the relatively marginal contribution of the entrepreneur, even if they were talented. A third option is that entrepreneurial orientation captures important, but unobservable to us, characteristics of entrepreneurs which are

associated with firm growth. For policy-makers, each potential explanation has different implications. If the poor quality entrepreneur argument holds, then the obvious policy action is to seek to increase the human capital of the entrepreneurial population. If the EO argument holds, then there is no obvious policy remedy, at least until we unravel what lies behind EO and separates out those entrepreneurs with growth aspirations and those without. If the overwhelming macroeconomic forces argument holds, then it is the overall government policy response to an economic crisis that matters for the entrepreneurial population.

Our empirical results add further evidence regarding the debate over the difference between small business growth measures, as reflected in the different employment and sales performance sensitivity to firm and owner characteristics. SME sales performance appears to be influenced by a wider set of factors (legal form, sectors, export, etc.), but no such pattern was found for employment growth. To sum up, firms appear to have based their employment decisions purely on entrepreneurial growth orientation, which is closely and negatively associated with firm age in many cases (Cowling et al, 2015). Again, it suggests that entrepreneurs tend to treat employment as a form of resource (Penrose, 1959) and sales as a measure of performance. Therefore, employment growth is more likely a result of strategic considerations independent of factors associated with business and macroeconomic conditions, whilst sales growth is a more objective measure of performance affected by various exogenous factors.

6. Conclusion

This study draws on previous research on small business growth and undertakes a 'big picture' analysis on the growth performance of SMEs after one of the greatest financial crises of the global economy. We use the percentage change in employment and sales as two alternative measures of small business growth and estimate a set of regressions that explain small business performance immediately after the 2008/09 financial crisis (using UK SBS

data collected in mid-2010) and over an extended period up till mid-2012 (using data from six 'business barometer' surveys), respectively. We find clear evidence that younger firms grew faster on average than older firms, but entrepreneurial experience had no identifiable growth effect.

Our overall findings suggest in general, the recession has a long-lasting negative effect on the small business sector. There is evidence of recovery in small business performance the further we are away from the crisis, however the progress is shown to be extremely slow and limited especially in terms of sales performance. Unlike periods in a more stable, and growing macroeconomic environment, higher growth is primarily and consistently found in growth-oriented, young firms with no financial constraints, irrespective of either size or entrepreneurial human capital. Further, the fact that the growth performance of SMEs is unevenly distributed across sectors indicates that certain types of SMEs are indeed more resilient than others in a recession. Beyond this, the slow recovery of the small business sector in a volatile economic environment calls for a comprehensive package of post-recession policy support. Future entrepreneurship policies should provide sustainable motivation for small business growth, since successfully achieving growth as a young firm may reinforce entrepreneurs' intention to grow, leading to further favourable performance.

Potentially interesting future research topics could aim at addressing the limitations of this study given the use of secondary, multi-wave cross-sectional survey data. The current study excludes non-surviving or exiting firms and sole proprietors (firms with no employees), so our results could be subject to selection bias. A natural extension of the present research is to look at the effects of the same variables on business survival, or alternative performance measures, such as productivity. Moreover, the cross-sectional data does not allow us to draw meaningful and robust inference on the dynamics of firm growth over time, so a re-

investigation of the research questions using data in a longitudinal and panel setting would further advance our understanding on the interaction between business age and performance.

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References

Achtenhagen, L, Naldi, L, Melin, L (2010) Business growth - Do practitioners and scholars really talk about the same thing? *Entrepreneurship Theory and Practice*, 34(2): 289-316.

Acs, Z, Storey, D (2004) Introduction: entrepreneurship and economic development. *Regional Studies*, 38: 871-877.

Anyadike-Danes, M and Bjuggren, CM, Gottschalk, S, Hölzl, W, Johansson, D, Maliranta, M, Myrann, AG (2014), An International Cohort Comparison of Size Effects on Job Growth (April 13, 2014). IFN Working Paper No. 1019.

Audretsch DB, Bönte W, Keilbach, M (2008) Entrepreneurship capital and its impact on knowledge diffusion and economic performance. *Journal of Business Venturing*, 23: 687-698.

Audretsch DB, Keilbach, M (2004) Does entrepreneurship capital matter? *Entrepreneurship Theory and Practice*, *28*(5): 419-429.

Audretsch, DB, Mahmood, T (1994). Firm selection and industry evolution: The post-entry performance of new firms. *Journal of Evolutionary Economics*, 4(3): 243–260.

Beck, T., Demirguc-Kunt, A. (2006). Small and medium-size enterprises: access to finance as a growth constraint. *Journal of Banking and Finance*, 30(11), 2931-2943.

Benner, J, Tushman, L (2003). Exploitation, exploration, and process management: the productivity dilemma. *Academy of Management Review*, 28(2), 238–56.

Birch, D (1979). The job generation process. Report, program on neighborhood and regional change. MIT, Cambridge, MA.

Birch, D (1987). Job creation in America. New York: Free Press.

British Chambers of Commerce (2012) Quarterly economic survey: Q1 2012, Summary. Available at: http://www.britishchambers.org.uk/policy-maker/economic-data/quarterly-economic-survey (accessed 18 Dec 2013).

Burke, A, Fitzroy, F, Nolan M (2000) When less is more: distinguishing between entrepreneurial choice and performance. *Oxford Bulletin of Economics and Statistics*, 62: 565-587.

Chandler, G, Hanks, S (1993) Measuring the performance of emerging business. *Journal of Business Venturing*, 8: 391-408.

Chandler, G, Hanks, S (1994) Market attractiveness, resource-based capabilities, venture strategies, and

venture performance. *Journal of Business Venturing*, 9: 331-349.

Churchill, NC, and Lewis, VL (1983). The five stages of small business growth. *Harvard Business Review*, 61(3):30–50.

Coad, A (2009). The growth of firms: a survey of theories and empirical evidence. Edward Elgar, Cheltenham, UK.

Coad, A, Frankish, J, Nightingale, P, Roberts, R (2014), Business experience and start-up size: Buying more lottery tickets next time around? *Small Business Economics*, 43(3): 529-547.

Coad A, Segarra A, Teruel M (2013), Like milk or wine: Does firm performance improve with age? *Structural Change and Economic Dynamics*, 24(March): 173-189

Cowling, M, Liu, W, Ledger, A, Zhang, N (2015). What really happens to small and medium-sized enterprises in a global economic recession? UK evidence on sales and job dynamics. *International Small Business Journal*, 33(5): 488-513.

Cowling, M, Liu, W, Ledger, A (2012) Small business financing in the UK before and after the financial crisis. *International Small Business Journal*, 30 (7): 778-800.

Cowling, M (2002) The contribution of the self-employed to employment in the EU. London: Small Business Service.

Cowling, M (2006) Early Stage Survival and Growth. In: Parker S., Handbook of Entrepreneurship Research: The Life Cycle of Entrepreneurial Ventures. pp. 477-504. Berlin: Springer

Dass, P (2000). Relationship of firm size, initial diversification, and internationalization with strategic change. *Journal of Business Research*, 48: 135-146.

Davila, A, Foster, G & Gupta, M (2003). Venture capital financing and the growth of startup firms. *Journal of Business Venturing,* 18(6): 689-708.

Davidsson, P., Achtenhagen, L., & Naldi, L. (2010). Small firm growth. *Foundations and Trends in Entrepreneurship 6*(2), 69–166.

Davidsson, P, & Wiklund, J (2000) Conceptual and empirical challenges in the study of firm growth. In: D. Sexton & H. Landstro¨m (Eds.), The Blackwell handbook of entrepreneurship (pp. 26–44). Oxford, MA: Blackwell.

Davis, SJ, Haltiwanger J, Schuh S (1996). Job creation and destruction. Cambridge, MA: MIT Press.

Dean, TJ, Brown, RL, Bamford, CE (1998) Differences in large and small firm responses to environmental context: strategic implications from a comparative analysis of business formations. *Strategic Management Journal*, 19: 709-728.

Delmar, F (1997) Measuring growth: methodological considerations and empirical results. In: Donkels R., Miettinen A., Entrepreneurship and SME Research: On its Way to the New Millennium. Ashgate, Aldershot, UK, pp. 190-216.

Dimov, DP, Shepherd, DA (2005) Human capital theory and venture capital firms: exploring 'home runs; and 'strike outs'. *Journal of Business Venturing*, 20: 1-21.

Durand, R, Coeurderoy, R (2001) Age, order of entry, strategic orientation and organizational performance. *Journal of Business Venturing*, 16: 471-494.

Evans, DS (1987) The relationship between firm growth, size and age: estimates for 100 manufacturing industries, *Journal of Industrial Economics* 35(4): 567–581.

Fort, TC, Haltiwanger, J, Jarmin, RS, Miranda, J (2013). How firms respond to business cycles: the role of firm age and firm size. *IMF Economic Review* 61(3): 520–559.

Geroski, P, Gugler, K (2004) Corporate growth convergence in Europe. *Oxford Economic Papers* 56, 597–620.

Gibrat, R, (1931) Les Inégalités Économiques. Paris: Librairie du Recueil Sirey.

Grilli, L (2010) When the going gets tough, do the tough get going? The pre-entry work experience of founders and high-tech start-up survival during an industry crisis. *International Small Business Journal*, 29(6), 626-647.

Gupta, AK, Smith, KG, Shalley, CE (2006) The interplay between exploration and exploitation. *Academy of Management Journal*, 49(4), 693–706.

Haltiwanger, J, Krizan, CJ (1999) Small business and job creation in the United States: the role of new and young businesses, in Zoltan Acs (ed.), Are Small Firms Important? Their Role and Impact, Norwell, MA: Kluwer Academic.

Haltiwanger, J, Jarmin, R, Miranda, J (2013) Who creates jobs? Small vs. large vs. young. *Review of Economics and Statistics*. 95(2): 347-361.

He, Z-L and Wong, P-K (2004) Exploration vs. exploitation: an empirical test of the ambidexterity hypothesis. *Organization Science*, 15(4), 481–94.

Honig, B (1998) What determines success? examining the human, financial, and social capital of Jamaican micro-entrepreneurs. *Journal of Business Venturing*, 13: 371-394.

Kitson, M (1995) Seedcorn or chaff? Unemployment and small firm performance. ESRC Centre for Business Research, Cambridge University, Working Paper No.2.

Kitching, J, Smallbone, D, Xheneti, M, Kasperova, E (2011) Adapting to a fragile recovery: SME responses to recession and post-recession performance. In: 34th Institute for Small Business and Entrepreneurship (ISBE) Annual Conference: Sustainable futures: enterprising landscapes and communities; 9-10 Nov 2011, Sheffield, U.K.. ISBN 9781900862233

Latham, S (2009) Contrasting strategic response to economic recession in start-up versus established software firms. *Journal of Small Business Management*, 47(2): 180–201.

Leitch C, H F, Neergaard H (2010) Entrepreneurial and business growth and the quest for a 'comprehensive theory': Tilting at windmills? *Entrepreneurship Theory and Practice*, 34(2): 249–260.

Lerner, J (1999). The government as venture capitalist: The long-run impact of the SBIR Program. *Journal of Business*, 72(3): 285-318.

Lerner, J. (2002). Boom and bust in the venture capital industry and the impact on innovation. *Federal Reserve Bank of Atlanta Economic Review*, 4, 25-39.

McKelvie, A, Wiklund, J (2010) Advancing firm growth research: a focus on growth mode instead of growth rate. *Entrepreneurship Theory and Practice,* 34 (2): 261 – 288.

Moscarini, G, Postel-Vinay, F (2012) The contribution of large and small employers to job creation in

times of high and low unemployment. *American Economic Review* 102(6): 2509-2539

National Institute for Economic and Social Research (2012) How Recessions Compare. London.

Neumark, D, Wall B, Zhang J (2011) Do small businesses create more jobs? New evidence for the United States from the National Establishment Time Series. *Review of Economics and Statistics*, 93(1): 16–29.

Nunes, P, Gonçalves, M, Serrasqueiro, Z (2013) The influence of age on SMEs' growth determinants: empirical evidence. *Small Business Economics*, 40(2): 249-272.

Parker, S, Congregado, E, Golpe, A (2012) Is entrepreneurship a leading or lagging indicator of the business cycle? Evidence from UK self-employment data. *International Small Business Journal*, 30 (7): 736-753.

Porter, M E (1980). Competitive strategy: techniques for analyzing industries and competitors. New York: The Free Press.

Rauch, A, Wiklund, J, Lumpkin, GT, Frese, M (2009) Entrepreneurial orientation and business performance: an assessment of past research and suggestions for the future. *Entrepreneurship Theory and Practice*, 33: 761-787.

Reid G (2007) *The Foundations of Small Business Enterprise*. London: Routledge

Reichstein T, Dahl, M S, Ebersberger, B and Jensen, M B (2010). The devil dwells in the tails: A quantile regression approach to firm growth. *Journal of Evolutionary Economics* 20, 219–231.

Sapienza, H, Grimm, C (1997) Founder characteristics, start-up process and strategy/structure variables as predictors of shortline railroad performance. *Entrepreneurship, Theory and Practice*. 22(1): 5-24.

Schumpeter, J (1942) Capitalism, Socialism and Democracy. New York: Harper and Row.

Shepherd, DA, Wiklund, J (2009) Are we comparing apples with apples or apples with oranges? Appropriateness of knowledge accumulation across growth studies. *Entrepreneurship Theory and Practice*. 33(1): 105-123.

Smallbone, D, Deakins, D, Battisti, M, Kitching, J (2012) Small business response to a major economic downturn: Empirical perspectives from New Zealand and the United Kingdom. *International Small Business Journal*, 30 (7): 754-777.

Storey D (1994) *Understanding the Small Business Sector*. London: Routledge.

Teruel-Carrizosa, M. (2010). Gibrat's law and the learning process. *Small Business Economics, 34*(4), 355-373.

Unger, J, Rauch, A, Frese, M, Rosenbusch, N (2011) Human capital and entrepreneurial success: A meta-analytical review. *Journal of Business Venturing*, 26: 341-358.

Vassilakis, S (2008). Learning-by-doing. In: Durlauf, SN, Blume, LE (Eds.) The New Palgrave Dictionary of Economics, 2nd ed. Palgrave Macmillan.

Watson, J (2012) Networking: Gender differences and the association with firm performance. *International Small Business Journal*, 30(5): 536-558.

Watson, W, Stewart, W.H, BarNir, A (2003) The effects of human capital, organizational demography, and interpersonal processes on venture partner perceptions of firm profit and growth. *Journal of Business Venturing*, 18: 145-164.

Weinzimmer, LG, Nystrom, PC, Freeman, SJ (1998) Measuring organizational growth: Issues, consequences and guidelines. *Journal of Management*, 24: 235-262.

Westhead, P, Ucbasaran, D, Wright, M (2005) Decisions, actions, and performance: do novice, serial, and portfolio entrepreneurs differ? *Journal of Small Business Management*, 43: 393-417.

Wickham, M. 2010. London's labour market in the recent recession, GLA Economics Working Paper 44. GLA: London

Wiklund, J, Patzelt, H, Shepherd, D (2009) Building an integrative model of small business growth. *Small Business Economics,* 32 (4): 351–374.

Yasuda, T (2005). Firm growth, size, age and behavior in japanese manufacturing. *Small Business Economics* 24(1), 1–15.

Zarutskie, R (2010) The role of top management team human capital in venture capital markets: Evidence from first-time funds. *Journal of Business Venturing*, 25(2): 155-172.

Zhao, Y, Li, Y, Lee, SH, Chen, LB (2011). Entrepreneurial orientation, organizational learning, and performance: evidence from China. *Entrepreneurship Theory and Practice, 35*(2): 293-317.

Table 1

Variable Definition and Sample Descriptive Statistics

		(1) SBS 2010					(2) Business Barometers				
		All (N = 2,991)		Age: less than 3 (N = 144)	Age: 4 to 10 (N = 616)	Age: more than 10 (N = 2,231)	All (N = 2,830)		Age: less than 3 (N = 132)	Age: 4 to 10 (N = 522)	Age: more than 10 (N = 2,176)
Variable	**Definition**	**Mean**	**Std. Dev.**	**Mean**	**Mean**	**Mean**	**Mean**	**Std. Dev.**	**Mean**	**Mean**	**Mean**
Small business performance											
EGROWTH	% Change in employee numbers over the past 12 months	1.27	26.31	14.25	5.82	-0.49	0.19	29.25	8.60	3.54	-1.13
SGROWTH	% Change in sales over the past 12 months	-1.14	19.88	7.21**	0.57	-1.94	0.06	17.48	4.16*	0.80	-0.37
Business characteristics											
EMP_{t-1}	Number of employees 12 months ago	29.76	41.01	10.94	17.41	33.87	31.16	40.29	14.73	17.93	35.20
AGE_3LESS	Firm less than 3 years old (0, 1)	0.05	0.21	–	–	–	0.05	0.21	–	–	–
AGE_4TO10	Firm between 4 and 10 years old (0, 1)	0.21	0.40	–	–	–	0.18	0.39	–	–	–
AGE_10MORE	Firm more than 10 years old (0, 1)	0.74	0.43	–	–	–	0.77	0.42	–	–	–
CORP	Firm is incorporated (0, 1)	0.85	0.36	0.74	0.83	0.86	0.87	0.33	0.78	0.85	0.88
FAMOWN	Firm is family owned (0, 1)	0.56	0.50	0.51	0.53	0.57	0.56	0.50	0.61	0.51	0.57
EXPORTER	Firm exports (0, 1)	0.26	0.44	0.15	0.24	0.27	0.28	0.45	0.16	0.25	0.30
ENG	Firm located in England (0, 1)	0.76	0.43	0.71	0.77	0.76	0.81	0.39	0.73	0.84	0.81
SCOT	Firm located in Scotland (0, 1)	0.06	0.24	0.10	0.07	0.06	0.06	0.25	0.08	0.08	0.06
WALES	Firm located in Wales (0, 1)	0.02	0.14	0.03	0.02	0.02	0.02	0.13	0.01	0.02	0.02
NI	Firm located in Northern Ireland (0, 1)	0.16	0.37	0.16	0.15	0.17	0.11	0.31	0.18	0.06	0.11
PRIM&MANU	Primary & manufactory sectors (0, 1)	0.15	0.36	0.06	0.12	0.19	0.21	0.41	0.10	0.14	0.25
CONSTRU	Construction sector (0, 1)	0.09	0.28	0.11	0.10	0.08	0.11	0.31	0.22	0.13	0.10
TR&D	Transport, retail & distribution sectors (0, 1)	0.31	0.46	0.41	0.33	0.30	0.26	0.44	0.39	0.29	0.25
SERVICES	Business and other services sectors (0, 1)	0.43	0.50	0.41	0.46	0.43	0.40	0.49	0.29	0.44	0.40

Table 1 (continued)

		(1) SBS 2010					(2) Business Barometers				
		All (N = 2,991)		Age: less than 3 (N = 144)	Age: 4 to 10 (N = 616)	Age: more than 10 (N = 2,231)	All (N = 2,830)		Age: less than 3 (N = 132)	Age: 4 to 10 (N = 522)	Age: more than 10 (N = 2,176)
Variable	**Definition**	**Mean**	**Std. Dev.**	**Mean**	**Mean**	**Mean**	**Mean**	**Std. Dev.**	**Mean**	**Mean**	**Mean**
Owner/Entrepreneur characteristics											
OAGE	Owner's age	50.15	10.74	42.85	46.40	51.47	52.21	10.35	46.80	48.74	53.41
WLED	Women-led business (0, 1)	0.14	0.35	0.21	0.17	0.13	0.13	0.33	0.11	0.15	0.12
MLED	Ethnic minority-led business (0, 1)	0.07	0.25	0.16	0.10	0.05	0.03	0.18	0.10	0.05	0.03
EXP	Employer with prior experience (0, 1)	0.26	0.44	0.30	0.29	0.25	0.28	0.45	0.27	0.36	0.26
DEGREE	Employer with college degree or above (0, 1)	0.50	0.50	0.45	0.52	0.50	0.49	0.50	0.49	0.48	0.50
ORIENTATION	Firm aiming to grow in the next 2-3 years (0, 1)	0.77	0.42	0.90	0.82	0.75	0.74	0.44	0.76	0.77	0.73
Access to external finance											
FULLACCESS	Firm acquired all the finance sought (or no need) (0, 1)	0.88	0.32	0.79	0.83	0.90	0.91	0.28	0.85	0.84	0.93
PARTACCESS	Only acquired part of the finance sought (0,1)	0.02	0.15	0.03	0.02	0.02	0.02	0.13	0.01	0.02	0.02
NOACCESS	Acquired no finance sought (0, 1)	0.10	0.30	0.18	0.15	0.08	0.07	0.26	0.14	0.14	0.06

* $p < .05$; ** $p < .01$ for one-tailed Fligner-Policello robust rank order test for difference in growth performance distributions between firms less than 3 years old and firms more than 10 years old. The 2010 SBS covers UK SME performance up till September 2010 and the Business Barometers cover the period between December 2010 and June 2012.

Table 2
Post-recession Employment and Sales Growth

	Employment Growth		Sales Growth	
	Model 1	**Model 2**	**Model 3**	**Model 4**
Business Characteristics				
$ln(EMP_{t-1})$	-2.921***	-0.587	1.015***	0.538**
	(0.408)	(0.468)	(0.276)	(0.249)
AGE_4TO10	-3.704	-5.982	-4.792*	-2.529
	(4.478)	(4.760)	(2.680)	(2.208)
AGE_10MORE	-6.417	-9.229**	-6.310**	-3.873*
	(4.355)	(4.581)	(2.576)	(2.086)
$SGROWTH_{t-1}$	0.464***	0.302***		
	(0.035)	(0.039)		
$EGROWTH_{t-1}$			0.269***	0.096***
			(0.020)	(0.018)
CORP	0.528	1.468	0.559	-1.621*
	(1.428)	(2.030)	(0.915)	(0.926)
FAMOWN	-0.006	-0.475	-1.084	-1.768**
	(0.944)	(1.162)	(0.766)	(0.715)
EXPORTER	-1.057	1.234	1.371	2.297***
	(1.009)	(1.230)	(0.853)	(0.750)
SCOT	3.131	1.832	-0.408	0.985
	(2.004)	(2.267)	(1.421)	(1.236)
WALES	-3.799	-0.831	-0.091	-1.006
	(3.236)	(2.701)	(2.219)	(1.659)
NI	0.594	3.378*	-0.391	-1.471
	(1.158)	(1.918)	(0.930)	(1.060)
CONSTRU	-2.388	-2.816	-3.753**	-2.427
	(2.190)	(2.298)	(1.736)	(1.621)
TR&D	-2.549*	-1.621	-0.309	-1.827**
	(1.363)	(1.456)	(0.989)	(0.887)
SERVICES	-1.100	0.599	0.256	-2.879***
	(1.324)	(1.521)	(1.046)	(0.884)
Owner/Entrepreneur characteristics				
OAGE	-0.075*	-0.058	-0.028	-0.033
	(0.044)	(0.056)	(0.033)	(0.034)
WLED	-1.160	-1.142	0.507	-1.134
	(1.424)	(1.826)	(0.992)	(0.869)
MLED	0.157	-4.240	-0.611	-1.746
	(2.239)	(2.749)	(1.614)	(2.457)
EXP	1.774*	-0.985	0.259	-0.789
	(1.070)	(1.179)	(0.808)	(0.702)
DEGREE	0.357	0.522	-0.509	-0.448
	(0.949)	(1.174)	(0.730)	(0.694)
ORIENTATION	3.079***	6.101***	3.110***	4.980***
	(0.982)	(1.268)	(0.778)	(0.754)
Access to finance			-0.028	
PARTACCESS	0.462	-2.040	0.845	2.645
	(3.625)	(4.709)	(3.110)	(3.443)
NOACCESS	-2.205	-5.577**	-3.894***	-3.381**
	(1.865)	(2.289)	(1.276)	(1.438)
Time indicators				
WAVE2		-0.973		0.678
		(2.053)		(1.228)
WAVE3		-0.430		1.045
		(1.837)		(1.113)
WAVE4		-2.379		1.519
		(1.989)		(1.169)
WAVE5		-2.295		1.661
		(1.719)		(1.082)
WAVE6		-0.812		1.842*
		(1.881)		(1.108)
N	2,991	2,830	2,991	2,830
R^2	0.167	0.073	0.156	0.071
F statistics	24.09***	5.56***	13.65***	7.14***

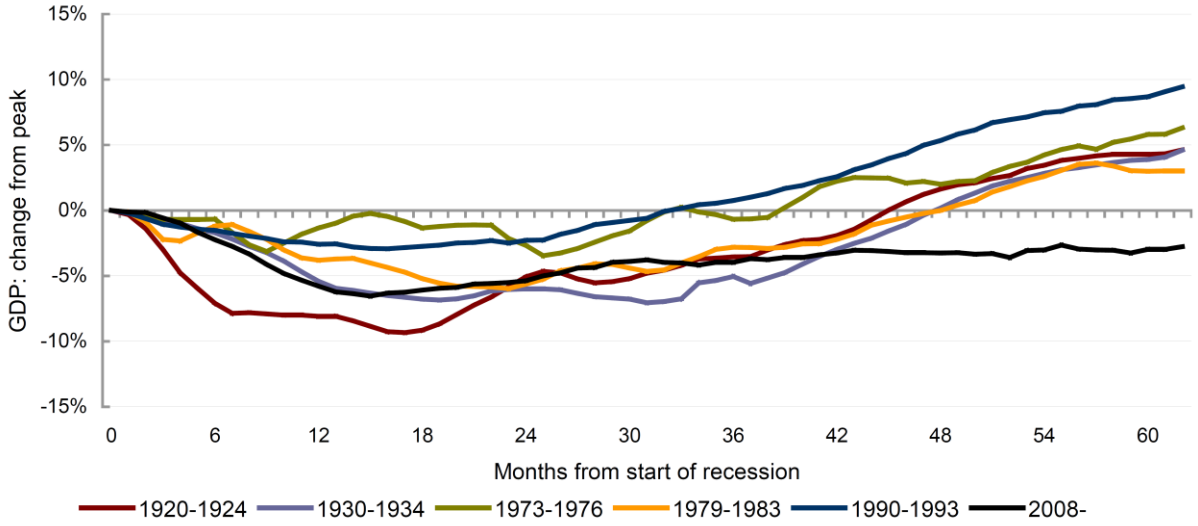
* $p < .10$; ** $p < .05$; *** $p < .01$. Asymptotic robust standard errors reported in the parentheses. The 2010 SBS (Models 1 & 3) covers UK SME performance up till September 2010 and the Business Barometers (Models 2 & 4) cover the period between December 2010 and June 2012. *PRIM&MANU* is the reference group for the sector dummies. The lagged growth variables ($SGROWTH_{t-1}$ and $EGROWTH_{t-1}$) are not available in the SBS data (Models 1 &3) and the current growth rates are used instead.

Table 3
Quantile Regressions: Employment and Sales Growth Two Years after the Crisis

	Employment Growth					Sales Growth				
	10% Quantile	25% Quantile	50% Quantile	75% Quantile	90% Quantile	10% Quantile	25% Quantile	50% Quantile	75% Quantile	90% Quantile
Business Characteristics										
$ln(EMP_{t-1})$	4.073***	0.539	-0.010	-0.037	-2.180***	2.864***	1.212***	0.089	0.187	-0.830*
	(0.733)	(0.425)	(0.045)	(0.250)	(0.624)	(0.551)	(0.327)	(0.091)	(0.195)	(0.487)
AGE_4TO10	2.846	-1.942	-0.134	-6.443	-3.448	-2.799	1.030	0.075	-3.444	-9.606
	(4.101)	(4.580)	(0.726)	(5.849)	(3.323)	(5.190)	(2.396)	(0.655)	(3.398)	(6.481)
AGE_10MORE	3.000	-1.132	-0.191	-9.833*	-12.549***	-1.661	0.671	-0.223	-5.777*	-12.807**
	(3.919)	(4.345)	(0.729)	(5.694)	(3.296)	(4.968)	(2.227)	(0.595)	(3.265)	(6.147)
$SGROWTH_{t-1}$	0.225***	0.248***	0.310***	0.143***	0.192***					
	(0.042)	(0.031)	(0.068)	(0.024)	(0.037)					
$EGROWTH_{t-1}$						0.121***	0.091***	0.037**	0.098***	0.135***
						(0.026)	(0.015)	(0.016)	(0.017)	(0.039)
CORP	2.083	-0.786	-0.020	1.582**	3.906*	-6.797***	-2.093	-0.135	0.213	0.654
	(2.608)	(1.840)	(0.165)	(0.747)	(2.295)	(1.849)	(1.300)	(0.243)	(0.504)	(1.541)
FAMOWN	0.178	-1.264	0.024	-0.789	0.425	-3.049**	-1.899**	-0.092	-0.267	-0.572
	(1.833)	(0.993)	(0.137)	(0.630)	(1.357)	(1.512)	(0.845)	(0.203)	(0.565)	(1.156)
EXPORTER	2.677	1.664*	0.067	1.713**	1.798	1.804	1.708*	0.500*	3.728***	5.862***
	(1.936)	(1.006)	(0.173)	(0.791)	(1.573)	(1.480)	(0.894)	(0.296)	(0.762)	(1.480)
Owner/Entrepreneur Characteristics										
OAGE	0.063	0.122**	-0.000	-0.080**	-0.231***	0.029	0.008	0.003	0.006	-0.119*
	(0.092)	(0.048)	(0.005)	(0.032)	(0.069)	(0.071)	(0.040)	(0.007)	(0.027)	(0.069)
WLED	-1.021	0.070	0.023	0.394	1.738	-1.320	0.147	-0.046	-0.273	-1.852
	(3.020)	(1.770)	(0.157)	(0.818)	(2.587)	(2.208)	(1.153)	(0.198)	(0.547)	(1.487)
MLED	0.341	0.529	0.091	-0.248	-2.638	-8.110	-3.612	0.060	0.138	2.627
	(5.276)	(3.103)	(0.437)	(1.535)	(3.847)	(7.278)	(3.991)	(0.533)	(1.547)	(6.600)
EXP	-1.284	-0.527	0.003	0.615	0.575	-0.038	0.079	-0.042	-0.188	-2.128*
	(1.979)	(1.163)	(0.125)	(0.695)	(1.450)	(1.742)	(0.870)	(0.193)	(0.519)	(1.103)
DEGREE	4.403**	1.448	0.019	0.277	1.026	-1.247	-0.711	-0.056	0.139	1.262
	(1.950)	(1.104)	(0.123)	(0.658)	(1.442)	(1.558)	(0.794)	(0.183)	(0.495)	(1.210)
ORIENTATION	3.513*	4.613***	0.120	3.009***	9.247***	5.001***	4.171***	0.440	4.500***	6.726***
	(1.917)	(1.315)	(0.165)	(0.609)	(1.667)	(1.544)	(1.207)	(0.309)	(0.522)	(1.147)
Access to finance										
PARTACCESS	-1.703	-6.253*	-1.630	-4.472***	2.450	-3.666	-3.888	-0.765	-1.244	32.563
	(6.648)	(3.603)	(1.855)	(1.525)	(10.454)	(3.923)	(2.712)	(1.757)	(2.659)	(20.970)
NOACCESS	-6.894**	-8.868***	-1.092	-1.390	-3.869*	-5.326	-6.700***	-0.630	-1.428	-3.281
	(3.091)	(2.116)	(1.338)	(1.052)	(2.200)	(3.263)	(1.712)	(0.871)	(1.012)	(2.475)
Sector Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,991	2,991	2,991	2,991	2,991	2,830	2,830	2,830	2,830	2,830
Pseudo R^2	0.130	0.084	0.017	0.060	0.142	0.097	0.064	0.028	0.065	0.096

* $p < .10$; ** $p < .05$; *** $p < .01$. Standard errors (and hence *t* statistics) are bootstrapped, using 250 replications. The analyses use Business Barometers data that covers the period between December 2010 and June 2012.

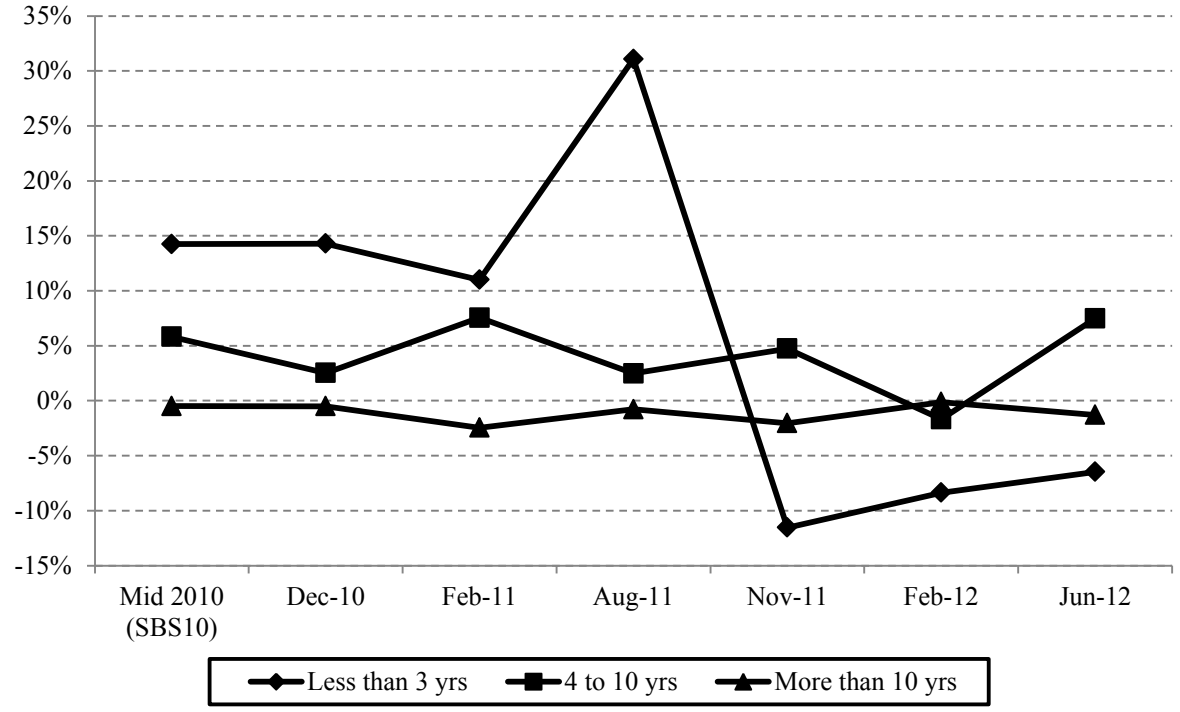
Fig 1: UK economic recessions: How recessions compare



Source: National Institute for Economic and Social Research (2013)

Figure 2

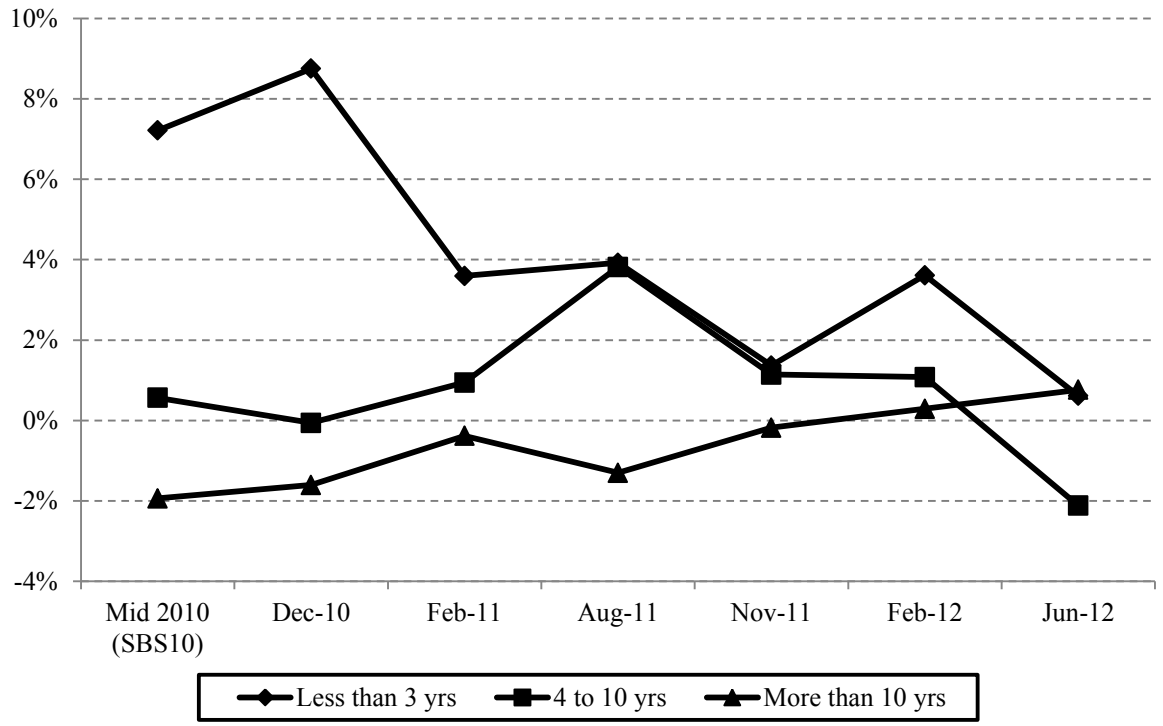
Employment growth during and immediately after GFC for different age groups



*Source: Authors own calculation based on SBS 2010 and Business Barometer surveys

Figure 3

Sales growth during and immediately after GFC for different age groups



*Source: Authors own calculation based on SBS 2010 and Business Barometer surveys