

**Local Entrepreneurial Resilience and Culture: The Role of Social Values
in Fostering Economic Recovery**

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Abstract

This paper examines localities in terms of the impact of community culture on the resilience of their entrepreneurial activity. Drawing on a regression analysis of data covering localities in Britain for the period 2004-2011, it is found that an open and diverse culture is likely to aid the renewal and re-orientation of local entrepreneurial activity. Overall, the study indicates that local social values play an important role in fostering entrepreneurial resilience. It is suggested that future policy intervention may be best targeted at the education system, where the tolerance and skill-sets underpinning entrepreneurial resilience can be most effectively developed.

Keywords

Entrepreneurship; Resilience; Community culture; Localities

JEL Classification

M13 R12 Z1

Introduction

Although the precise definition of local or sub-national economic resilience can be contested, it is generally accepted that entrepreneurial activity has a key role to play (Martin, 2012; Martin and Sunley, 2015). However, entrepreneurial activity itself may be influenced by economic shocks, and some localities may be better able to retain a higher level of entrepreneurial activity than others, effectively displaying a greater degree of entrepreneurial resilience (Blanchflower, 2000). Although studies have examined economic resilience as a whole, there has been much less work considering the extent to which entrepreneurial activity itself displays resilience. Furthermore, local economic conditions have been found to have limited potential to explain persistent differences in new venture creation rates (Audretsch and Keilbach, 2004; Freytag and Thurik, 2007), with some suggesting that the underlying culture of places may also play a role in explaining these differences (Blanchflower, 2000; Freytag and Thurik, 2007; Beugelsdijk and Maseland, 2011).

Despite these developments, the particular cultural elements that influence entrepreneurial activity remain unclear, with existing studies of culture and entrepreneurship at the national level usually ignoring the

potential role played by more socio-spatial community cultures. They also tend to disregard differences found in entrepreneurial activity rates across regions (Armington and Acs, 2002; Bosma and Schutjens, 2011; Trettin and Welter, 2011), and their localities (Gould and Keeble, 1984).

This paper examines localities in terms of the impact of community culture on the resilience of entrepreneurial activity, with 'community culture' referring to the broader societal traits and relations that underpin places in terms of prevailing mindsets and the overall 'way of life'. The notion of community culture used in this paper principally refers to the social structure and features of group life within localities that can generally be considered to be beyond the economic life of such places, although this is not to say that one does not influence the other (Huggins and Thompson, 2015).

The key research questions the study seeks to address are: (1) To what extent is the community culture of localities associated with local entrepreneurial resilience during a period of economic crisis?; (2) What forms of community culture are most likely to influence local entrepreneurial resilience?; and (3) What forms of local entrepreneurial resilience are most likely to be impacted upon by community culture? The analysis is focused on examining indicators of entrepreneurship and culture

for localities (local authority areas) across Great Britain through the period 2004 to 2011, covering the financial crisis experienced during that period.

Local Economic and Entrepreneurial Resilience

The increasing connectivity of local economies to global markets means that they are likely to be increasingly vulnerable to exogenous shocks, with continuing economic success not assured (Hudson, 2010). This means that local economic development policy has shifted its emphasis away from a pure growth orientation to one associated with resilience (Dawley et al., 2010). This has led to the concept of economic resilience having heightened importance, although there is no accepted definition of what such resilience constitutes (Pendall et al., 2010; Martin, 2012; Martin and Sunley, 2015).

Martin (2012) considers the issue of we may attempt to empirically capture the resilience of localities and regions, suggesting that there are a number of different dimensions to the concept: *resistance* - the sensitivity or depth of reaction to a shock; *renewal* - the extent to which a place renews its previous growth path; *recovery* or bounce-back (Pendall et al., 2010) - speed and recovery from a shock; and *re-orientation* and adaption to a shock.

Studies such as Carree et al. (2002) have noted that resurgence in the small and medium sized enterprise sector (SME) is associated with many of the factors listed above. A vibrant SME sector may play a key role in providing the embedded diversity that helps dissipate shocks (Tolbert et al., 1998; Dawley et al., 2010). New businesses, in particular, may play an important role in generating radical innovations allowing new development paths to be accessed (Audretsch, 1995; Acs and Varga, 2005). Also, new firm formation may be the best method of exploiting knowledge (Audretsch, 1995), regardless of whether this is in the form of spinouts from existing businesses (Mitchell Franco and Filson, 2006), or originates from other sources of knowledge creation such as universities and research institutes (Garnsey and Heffernan, 2005). The benefits of such entrepreneurially-driven innovation may be seen in terms of greater adaptability rather than greater adaptation.

The SME sector and entrepreneurial activity may be a key element in determining local economic resilience, but both may also be influenced by wider economic conditions (Blanchflower, 2000). For example, studies have predicted that unemployment influences entrepreneurial activity in both a positive and negative fashion. When local unemployment levels are lower, opportunity-driven entrepreneurs are drawn into business ownership

through a prosperity pull, as increased aggregate demand raises the returns to entrepreneurial activity relative to those available through waged employment (Storey and Johnson, 1987; Blanchflower and Oswald, 1990). However, when unemployment is higher, those out of work may seek entrepreneurial activity as a refuge in the form of a recession push (Evans and Leighton, 1989; Blanchflower, 2000).

Where a local economy has the ability to retain or regenerate entrepreneurial activity in the face of an exogenous shock, this can be considered as a form of entrepreneurial resilience. Local economies may, for instance, display resistance as manifested by an ability to retain a strong SME sector. Alternatively localities may display a degree of bounce-back as captured by either the time taken for SMEs per head to return to pre-shock levels, or the renewal of the net birth rate to pre-shock levels. However, entrepreneurial resilience, like economic resilience, may be better regarded in a more adaptive dynamic manner, where the key element would be the impact on new firm creation (Dawley et al., 2010). An entrepreneurially resilient locality, as viewed from this perspective, would be one that endures a relatively small reduction in gross firm birth rates and takes advantage of the opportunities generated through the

destabilisation of the previous economic hierarchy, resulting in a positive reorientation of the local economy (Rae et al., 2012).

Community Culture and Entrepreneurial Resilience

In his seminal contribution, Tylor defines culture as 'that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society' (Tylor, 1871:1). At its most fundamental level, therefore, the concept of culture generally refers to the way in which people behave, often as a result of their background and group affiliation. Rather than concerning individual behaviour it relates to shared systems of meaning within and across ascribed and acquired social groups (Hofstede, 1980). Beugelsdijk and Maseland (2011) consider culture to be the collective identity of communities. Like culture, however, the meaning of the term community is ambiguous, often referring to either a morally valued way of life or social relations in a discrete geographical setting (Agnew 1989, Miller, 1992). In essence, community culture refers to the overarching or dominant mindsets that underlie the way in which places function in a broader societal sense (Huggins and Thompson, 2015).

Previous studies have identified a number of potential routes through which community culture may influence entrepreneurial activity. The first route considers the situation where a community culture fosters the development of individual characteristics associated with a higher probability of engaging in entrepreneurship (Davidsson, 1995; Uhlaner and Thurik, 2007). A second route by which community culture may influence entrepreneurial activity is where the underlying culture legitimises such activities (Jack and Anderson, 2002; Anderson and Smith, 2007). This induces a greater number of more marginal latent entrepreneurs to start businesses (Shapero and Sokol, 1982). The third route links dissatisfaction within social and economic activities to entrepreneurship. Here a marginalised group may choose to undertake entrepreneurial activities as a possible outlet for constrained or frustrated creativity (Noorderhaven et al., 2004).

Importantly, as well as influencing the quantity of entrepreneurs present in a locality, community culture is also likely to influence the nature of entrepreneurial activity. The type of entrepreneurship is likely to have an influence on the extent to which activity rates are maintained or reduced when a local economy is hit by a negative economic shock. Studies such as Benz (2009) and Hamilton (2000) consider the nature of entrepreneurial

career choice and highlight the role played by both pecuniary and non-pecuniary rewards, such as greater flexibility to accommodate other activities and the pleasure of being your own boss (Moskovitz and Vissing-Jorgensen, 2002). For some community cultures, the importance of these non-pecuniary rewards may be relatively greater, which would potentially make them less susceptible to changes in economic conditions as the threshold performance required is lowered (Gimeno et al., 1997).

Research conceptualising and empirically measuring community culture often draws inspiration from Hofstede's (1980) seminal work on developing different dimensions of place-based culture (see Klyver and Foley (2012) for a review). Although there are necessarily difficulties with transferring Hofstede's findings from an organisational to a place-based setting this work remains an important starting point for studying differences in community culture.

Overall, three key aspects of community culture from the literature can be considered to be of principal importance to this study: social cohesion; embracement of education; and social values and rules. The cultural aspect of social cohesion, related to greater homogeneity and bonding of the community, may be positively linked to entrepreneurship through greater trust and support (Davidsson and Honig, 2003). This relates to Durkheim's

(1893) notion of 'mechanical' and 'organic' solidarity social cohesion whereby trait similarities and interdependence amongst individuals results in a perceived unity, togetherness, and less likelihood of exclusion. However, it should be borne in mind that cohesiveness may also be found in more heterogeneous and diverse communities, whilst there is also the potential for cohesive groups to be too inwardly looking, with strong bonding ties limiting access to new ideas from outside a community (Portes and Landolt, 2000; Levie, 2007).

The notion of the embracement of education is most closely associated with Hofstede's (2001) long-term orientation cultural dimension. Societies able to transmit values regarding employment and education from one generation to the next are likely to develop institutions that create incentives for activities such as entrepreneurship (Bénabou and Tirole, 2006; Huggins and Thompson, 2014). Attitudes toward education are in many ways related to the extent to which individuals place a strong emphasis on self-sufficiency and making a contribution to society (Gregson et al., 1999).

Finally, Rodríguez-Pose and Storper (2006) note the importance of adherence to social values and rules for coordination purposes. However, entrepreneurs are often pictured as being risk takers (Macko and Tyszka,

2009), or at the very least those individuals in society willing to tolerate a greater level of risk (van Praag and Cramer, 2001). The adherence to social rules may not necessarily have a positive influence on resilience if entrepreneurship is born of dissatisfaction (Noorderhaven et al. 2004). During periods of decline the willingness and even desire to try something different may be a key factor to ensuring resilience both in terms of resistance and also re-orientation, where previously accepted rules are not necessarily fully applicable (Courvisanos, 2009). In terms of wider social values, it is unclear whether a more individualistic or collective cultural approach is more conducive to resilience, with there being potentially benefits from both cultural systems. Within more individualistic systems, although less trust may be built up within the community it may possess a greater propensity toward market activities. Alternatively, self-reliant communities drawing on pooled resources may have entrepreneurial activity which is more robust to exogenous economic shocks (resistant) and display a willingness to undertake entrepreneurial activities to fulfil the local community's needs (re-orientation) (Kamm et al., 1990; Casson, 1995; Corbett, 2005).

Data and Methods

In order to examine the entrepreneurial resilience of localities, the empirical analysis considers changes in entrepreneurial activity from the period prior to the economic crisis to the early stages of recovery. The changes are measured between 2004 and 2011, with 2004 representing a period of relative prosperity prior to the financial crisis, while data for 2011 captures Britain in a state of recession, but after the main initial shocks of the financial crisis have passed. As outlined above, the multifaceted nature of entrepreneurship, which may be present in all organisations (Binks et al., 2006), means that entrepreneurial resilience could be captured in a number of ways. However, a key measure of entrepreneurship is considered to be new venture creation, with studies such as Audretsch and Keilbach (2004) highlighting that whilst being heterogeneous in nature, start-ups are the ultimate manifestation of entrepreneurship. Based on this, the following analysis concentrates on the sustainability of the SME sector through net firm births (renewal) and gross new venture creation (re-orientation).

As we are interested in the resilience of entrepreneurial activity in its broader sense, we also consider firm deaths, reflecting the resistance

element of entrepreneurial activity. Finally, we consider an alternative measure based around those firms in sectors that are more knowledge intensive, in order to capture entrepreneurial and innovative activities in existing enterprises (Huggins et al., 2014)ⁱ.

The data used within this study is measured at the local authority district level, for which there are 380 local areas across Great Britain, providing access to a much wider range of data than alternative disaggregations such as regions or counties. For the analysis conducted within this study, two local authority districts are excluded, the City of London and the Isles of Scilly, since there is data availability issues in both cases.

As the size of the local economies varies across local authority areas, it is necessary to scale the entrepreneurial resilience measures to make the absolute changes comparable. This is common practice in studies of new firm formation (Fotopoulos, 2014) and reflects the administrative nature of the territorial areas under study, rather than statistically determined areas with similar populations. It also ensures consistency with major studies of entrepreneurship such as the Global Entrepreneurship Monitor (GEM), which report figures scaled in such a manner (Reynolds et al., 2002). Two alternative methods of scaling the dependent variables present themselves. Gross firm births, net firm births and gross firm deaths could

all be scaled as a proportion of the existing business stock (Fotopoulos and Spence, 2001; Johnson, 2004), described as the ecological approach (Audretsch and Fritsch, 1994). However, the danger here is that large changes could be found where the existing business community is relatively small or dominated by a relatively small number of large employers (Garofoli, 1992). Alternatively, the change in entrepreneurial activity could be scaled by the population of the local authority area (Lee et al., 2004; Bergmann and Sternberg, 2007). This approach is based around the premise that individuals create new ventures, and is described as the labour market approach (Audretsch and Fritsch, 1994). Given the potential benefits and limitations associated with each, both are included in the analysis. Entrepreneurial activity is likely to be affected by the economic conditions and structural factors present in a locality. This means that in order to establish the role played by community culture it will be first necessary to isolate other influences. This makes it appropriate to adopt a multivariate approach.

With regard to operationalising community culture, the analysis presented here draws on a series of secondary data sources relating to activities associated with the particular aspects of community culture. These measures are necessarily imperfect given that other external or

unobserved factors could influence them, rather than them being purely associated with the underlying community culture. In the absence of alternative measures such proxies have been used in a variety of studies (Paxton, 2002). Although the cross sectional nature of the data limits the extent to which causal inferences can be made, to partly overcome this the variables associated with community culture are captured as close as possible to the start of the study period. For the vast majority of the variables this means using data from 2004 or 2005, depending on availability. The exceptions are those drawn from the National Census, which was conducted in 2001, including the ethnic background and religious orientation. The other exceptions are those relating to days of absence from school, which is only available from 2007 onwards.

The indicators included in the analysis are shown in Table 1, representing engagement with the education system, religious and ethnic identitiesⁱⁱ, criminal activityⁱⁱⁱ, collectivism captured by trade union membership and political allegiance (further detail on the rationale for their inclusion can be found in Huggins and Thompson (2015)). Indices for each of the cultural indicators are formed using logged terms to reduce the influence of outliers and skewed distributions. As shown by Table 1, for a number of measures an inverse indicator is used in order to ensure alignment with the

theorised aspects of culture discussed in the preceding section and other indicators identified as belonging to the same cultural aspect as determined by the Principal Component Analysis (PCA), which is discussed below. For example, those localities with higher levels of embracement of education would be expected to be those with lower levels of school absenteeism, so the inverse of the absentee rate is used. Similarly higher crime rates would be associated with lower social values and rules. The Trade Union membership also loaded on this component, and to ensure the signs on the loadings were consistent the inverse is also used.

A PCA approach is used, with the results determining the grouping and weighting of indicators for the cultural components developed. A maximum likelihood approach is adopted using the varimax orthogonal rotation to ensure that the components obtained are not correlated and ensuring easier interpretation of the individual components. The factor scores are estimated using the Anderson-Rubin approach (Tabachnick and Fidell, 2007), and in order to determine the number of cultural components extracted Kaiser's (1960) criterion of selecting factors with eigenvalues of greater than 1 is applied.

PLEASE INSERT TABLE 1 ABOUT HERE

The other potential influences on entrepreneurial activity are drawn from studies that have previously investigated the factors influencing new firm formation, firm exits and net firm births. Although studies of UK entrepreneurship are given most attention (Fotopoulos, 2014; Fotopoulos and Spence, 2001), we also draw upon the wider literature on the determinants of firm formation (Lee et al., 2004). The other independent variables allowed to enter the regressions fall into two groups, these being: economic/labour force conditions; and industrial structure.

Those variables associated with economic and labour market conditions capture forces which may push individuals into entrepreneurship through necessity, as well as those that are associated with more opportunity driven entrepreneurship (Reynolds et al., 2002). These are likely to be important given that many new firms serve local markets when first formed (Thomas et al., 2013). As shown by Table 1, home ownership is included as a variable capturing the availability of collateral for individuals to use to acquire finance to fund start-up activities (Mason, 1991; Keeble and Walker, 1994). It also has a further role in representing the relative prosperity of an area, which may pull entrepreneurs into it (Ashcroft et al., 1991). Following Fotopoulos (2014), we use the proportion of people who own their homes outright as the measure of home ownership using data

drawn from the 2001 Census. Two further measures capturing demand conditions, which may pull individuals into entrepreneurship, are population and income growth (Lee et al., 2004; Armington and Acs, 2002). Local population growth is measured for the period 1998 to 2004 to capture the trajectory of the population leading up to the period of study. This data is drawn from the NOMIS mid-year population data.

The growth rate of mean gross weekly income between 2002 to 2004 is used to capture income changes. This data is drawn from the Annual Survey of Hours and Earnings (ASHE). Finally, unemployment is included, as a large number of studies have found a link between unemployment and new firm formation (Santarelli et al., 2009). Some have suggested a positive relationship, as the unemployed experience a recession push into entrepreneurship in order to create their own jobs (Evans and Leighton, 1989). Others, however, suggest a negative relationship as weaker demand conditions result in those locations with lower unemployment experiencing a 'prosperity pull' (Storey and Johnson, 1987), although empirical studies provide mixed evidence (Thurik et al., 2008). The measure of unemployment included here is the difference between the unemployment rate in 2010 (proportion of the population claiming Job

Seekers Allowance and other associated benefits based on NOMIS data) and that of the preceding five years.

As shown by Table 1, the second group of variables included are those associated with industry structure. Studies such as Mueller (2006) and Fotopoulos (2014) find evidence of entrepreneurial persistence. This may reflect the presence of role models and other relevant experience gained by employees in SMEs (Politis, 2008). This is measured by the proportion of firms that are small and medium sized (less than 250 employees – Business Demography data) in 2004. Rocha (2013) provides evidence from Germany that entrepreneurship is greater in clusters as the networks and knowledge spillovers present provide opportunities for firm formation. Although imperfect, we follow Fotopoulos (2014) in using measures of industry diversity and industry specialisation to account for these factors in 2004. Industry diversity is based on Theil's (1972) entropy measure, whereas a relative specialisation index is used to capture industry specialisation^{iv}. As studies have also found the composition of local industry to take a role in determining firm formation and exit rates (Storey and Johnson, 1987), we include the proportion of firms in the manufacturing sector in 2004 as a final industry structure influence. Studies such as, Fotopolous (2014), Fotopolous and Spence (2001) and Storey and Johnson (1987) find similar

determinants for entry and exit, and, therefore, the same independent variables are retained for all four dependent variables examined.

Results

The PCA rotated matrix for the community culture indicators is shown in Table 2. The Bartlett Test suggests that there is grouping of the data, with the Kaiser-Meyer-Olkin measure of sampling adequacy indicating that the patterns of correlation are relatively compact within the range 0.7 to 0.8, which Hutcheson and Sofroniou (1999) describe as good. Three components are extracted with eigenvalues of greater than 1, which explain a combined 71.7 percent of variance.

PLEASE INSERT TABLE 2 ABOUT HERE

The first component features those variables associated with more homogeneous populations including ethnic and religious similarity. This component is also related to lower immigration and greater identification with the country. Interestingly, the proportion of female employees who are in part time employment loads onto this component. This would suggest that localities with higher factor scores for this component may display characteristics associated with greater cohesiveness and potentially caring support, and which is labelled *social cohesion*.

Those indicators associated with greater investments and engagement with the educational system load onto the second component. This component, therefore, is related to Hofstede's (2001) long-term orientation and is labelled *embracement of education*. The final component includes those indicators associated with political allegiance, collectivism (trade unionism) and crime, and is labelled *social values and rules*.

Table 3 presents the bivariate correlations between the entrepreneurship, community culture and the other independent variables. There are correlations between the cultural components and some independent variables, in particular social cohesion is positively correlated with home ownership and negatively correlated with population growth. Although some larger correlation coefficients are estimated, the regressions that follow indicate little evidence of multicollinearity with the largest variance inflation factor of 2.39 being well below the accepted level of 5.

PLEASE INSERT TABLE 3 ABOUT HERE

Table 4 presents the regression analysis results relating to changes in net and gross firm births between 2004 and 2011. Concentrating initially on the change in the net firm birth rate, this provides an indication of overall

entrepreneurial renewal. The null of joint insignificance is rejected by the *F*-test. The regressions perform relatively well in terms of explaining the variation in changes in net firm births, with the R^2 statistic suggesting that approximately 37 per cent or more of the variation can be explained. The Likelihood Ratio tests (LR-tests) indicate that the key aspects of the underlying community culture present at the beginning of the period are found to be significantly related to changes in net firm births.

PLEASE INSERT TABLE 4 ABOUT HERE

Social cohesion is the cultural aspect which most consistently has a significant influence on entrepreneurial resilience when measured by net firm births. Greater social cohesion appears to negatively influence the entrepreneurial resilience of a local community. This is consistent with studies such as Levie (2007), which notes the important role played by those individuals entering localities in terms of the ideas they bring and opportunities they perceive. However, it is contrary to those studies suggesting the key role played by the embeddedness of local social ties (Davidsson and Honig, 2003).

Social values and rules also influence the change in net firm births when scaled by population. The results suggest that more collective and socially

disruptive localities are most likely to achieve resilient entrepreneurship when hit by an economic shock. As for social cohesion, this suggests that more socially and politically open local economies are best placed to endure an economic crisis in terms of the resilience of entrepreneurial activity. Openness and diversity appear to be at the heart of resilience, which is somewhat contrary to messages increasingly promoted by certain political factions in the UK and elsewhere.

Embracement of education is found to boost entrepreneurial resilience when the net firm birth measure is scaled by the existing business stock. This is consistent with those studies suggesting that education is an important component in the development and renewal of institutions promoting activities such as entrepreneurship (Bénabou and Tirole, 2006; Gregson et al., 1999).

In order to provide a better understanding of entrepreneurial resilience, it is useful to disaggregate net firm formation rates into its constituent parts. The change in gross firm formation may reflect the degree of entrepreneurial re-orientation. As with the net firm formation rates, community culture is found to have a significant influence on gross firm formation. Again social cohesion and social values related to more 'conservative ideals' are negatively associated with entrepreneurial re-

orientation and renewal. In terms of retaining entrepreneurship, the key to greater resilience appears to be related to the capability to access new ideas, knowledge and people.

The LR-tests indicate that the variables capturing economic and labour market conditions collectively influence the change in net and gross firm formation rates. Interestingly, those variables most closely associated with the demand conditions present in a locality - home ownership, population growth, and income growth - are all negatively associated with entrepreneurial resilience. This was similarly the case during the economic crisis that emerged from the dot-com crash in 2000, when localities with apparently high demand-side conditions suffered as a result of such bubbles of entrepreneurial activity (Huggins, 2008). This indicates that resilience, and in particular entrepreneurial resilience, does not necessarily stem from the past growth conditions enjoyed by a locality. It is at least partly influenced by the prevailing cultural attitudes towards the type and nature of economic and entrepreneurial activity present in a locality. There is also some evidence of the recession push (Evans and Leighton, 1989), with a positive link found between the change in unemployment and changes in the net and gross firm formation rates.

The LR-tests also indicate that industry structure has a relatively limited influence on both entrepreneurial renewal and re-orientation, with only the change in net firm births collectively influenced by the industry variables at the 5 percent level. The role model effect, based on the existing level of SMEs per capita, has a positive influence here (Mueller, 2006). Experience in manufacturing industries may not be the best preparation for new venture creation, given that the services sector has been increasingly linked to the resurgence of the SME sector (Carree et al., 2002), leading to a negative impact on gross firm births.

Although new entrepreneurial activity may help to ensure that an economy has adaptability, the high death rate of new firms makes the resistance of existing entrepreneurial activity important (Table 5). Localities with greater social cohesion are likely to experience an accelerated loss of existing entrepreneurial activity. This may reflect an inability of enterprises to reinvent themselves in the face of changing conditions (Rantisi, 2002). Although only significantly related to the change in firm death rates when scaled by population, social values of a more conservative nature are actually found to raise entrepreneurial resistance by lowering firm deaths. These localities may be viewed as more accepting of the prevailing

institutions, which may provide stability and support in times of economic uncertainty, persuading existing entrepreneurs to continue in business.

PLEASE INSERT TABLE 5 ABOUT HERE

Considering the fourth measure of entrepreneurship, the presence of knowledge-based firms, which might be seen as more tightly associated with innovative activity, the LR-test suggests that community culture has a significant influence upon entrepreneurial resistance. Once again, the need for local communities to be open to ideas and unbound by existing rules is evident from the negative links to social cohesion, and more inward looking social values. An important additional result is the positive link between embracement of education and the retention of knowledge based enterprises. The suggestion here is that a long term orientation (Hofstede, 2001), may be associated more with innovative entrepreneurial activity within existing businesses. This emphasises the importance of acknowledging that entrepreneurship can occur in all organisations not just SMEs or only through new venture creation.

A further round of regression models were undertaken to allow the cultural aspects to interact with economic and labour market conditions and SME presence. These models analyse the possibility that community culture

may moderate the influence of these other factors, which may push or pull individuals into entrepreneurial activity. Although the full models are not presented here due to space restraints, it can be reported that only a few significant relationships were found. In particular, the interaction between home ownership and community culture in the form of both social cohesion and social values rules is significantly related to entrepreneurial resilience as captured by firm births. Overall, however, the lack of significant associations found between the culture/economic condition interaction variables and entrepreneurial resilience suggests that rather than moderating other factors, community culture has a more direct relationship with local entrepreneurial resilience.

Conclusions

Entrepreneurship is likely to play a key role in the recovery of localities from any economic downturn, and may also limit the negative effects of the downturn in the first place. However, this entrepreneurial activity itself has to be resilient. This study has shown that an open community culture is likely to aid this, with the openness and diversity of local community cultures found to be positively associated with the renewal and re-orientation of local entrepreneurship. Although natural instincts suggest that openness will increase competition and leave enterprises vulnerable

to opportunistic outsiders, in the event of an economic downturn the results suggest the opposite is true.

Openness to new ideas also leads to local entrepreneurial activity that is more resistant to economic shocks. However, localities need to be willing to embrace these new ideas and knowledge, as well as having greater access to them. Within localities with more closed social values there is likely to be a greater reduction in new venture creation, although existing businesses are less likely to leave the market. The outstanding question is whether or not these existing businesses are innovative enough to adapt to the new environment and exploit new opportunities that periods of economic turbulence create. There is a danger that retention of existing SMEs may not lead to long-term entrepreneurial resilience.

From a policy perspective, the study suggests that policymakers should seek to foster an open local and regional community culture. Clearly, it is problematic to achieve cultural change in the short run, and the most appropriate mechanism is likely to be the education system. Therefore, policymakers should ensure that education and training emphasises tolerance, openness to new ideas and creativity, which is unconstrained by what went before. This is an important point, especially in the context of the UK where the community cultural aspects of education have become

an area of very sensitive political contention (Pearson, 2014). More prosaically, future resilience is likely to be associated with education systems that are more inter-disciplinary and have a greater emphasis on softer skills such as those associated with inter-personal communication and creative thinking (Parker, 2006).

In conclusion, whilst providing an insight into the types of community cultural that may influence local entrepreneurial resilience, this study is necessarily a starting point. Further studies should continue to seek to consider a wider definition of entrepreneurial activity, and analyses that seek to examine the experiences of localities and regions across different recessionary periods and at different stages of economic development will further our understanding of the link between culture, entrepreneurship and resilience. The cultural measures used in this study are necessarily imperfect due to the limitations of data availability. Additional measures of culture could provide further valuable insights, although the difficulty is that whilst studies based on qualitative methods or micro-level quantitative data are potentially highly valuable, in order to capture the impact of an economic downturn there would need to be a considerable longitudinal element to these studies. Lastly, entrepreneurial and economic success is clearly only one part of societal well-being, and further

research should consider encompassing a wider set of outcomes than is covered by this study.

References

Acs, Z. J., Varga, A. (2005) Entrepreneurship, agglomeration and technological change, *Small Business Economics*, **24**: no. 3, 323-334.

Agnew, J. (1989) The devaluation of place in social science. In Agnew, J., Duncan, J. (eds.). *The Power of Place*. Boston, Unwin Hyman, pp. 9-29.

Anderson, A. R., Smith, R. (2007) The moral space in entrepreneurship: an exploration of ethical imperatives and the moral legitimacy of being enterprising, *Entrepreneurship and Regional Development*, **19**: no. 6, 479-497.

Armington, C., Acs, Z. J. (2002) The determinants of regional variation in new firm formation, *Regional Studies*, **36**: no. 1, 33-45.

Ashcroft, B., Love, J. H., Malloy, E. (1991) New firm formation in the British counties with spatial reference to Scotland, *Regional Studies*, **25**: no. 5, 395-409.

Audretsch, D. B. (1995) *Innovation and Industry Evolution*, Cambridge MA, MIT Press.

Audretsch, D. B., Fritsch, M. (1994) The geography of firms births in Germany, *Regional Studies*, **28**: no. 4, 359-365.

Audretsch, D. B., Keilbach, M. (2004) Entrepreneurship capital and economic performance, *Regional Studies*, **38**: no. 8, 949-959.

Bénabou, R., Tirole, J. (2006) Belief in a just world and redistributive politics, *Quarterly Journal of Economics*, **121**: no. 2, 699-746.

Benz, M. (2009) Entrepreneurship as a non-profit-seeking activity, *International Entrepreneurship and Management Journal*, **5**: no. 1, 23-44.

Bergmann, H., Sternberg, R. (2007) The changing face of entrepreneurship in Germany, *Small Business Economics*, **28**: no. 2/3, 205-221.

Beugelsdijk, S., Maseland, R. (2011) *Culture in economics: history, methodological reflections and contemporary applications*, Cambridge, Cambridge University Press.

Binks, M., Starkey, K., Mahon, C. L. (2006) Entrepreneurship education and the business school, *Technology Analysis and Strategic Management*, **18**: no. 1, 1-18.

Blanchflower, D. G. (2000) Self-employment in OECD countries, *Labor Economics*, **7**: no. 5, 471-505.

Blanchflower, D. G., Oswald, A. J. (1990) Self-employment and the enterprise culture, *British Social Attitudes*, **7**, 127-143.

Bosma, N., Schutjens, V. (2011) Understanding regional variation in entrepreneurial activity and entrepreneurial attitude in Europe, *Annals of Regional Science*, **47**: no. 3, 711-742.

Carree, M., van Stel, A., Thurik, R., Wennekers, S. (2002) Economic development and business ownership: an analysis using data of 23 OECD countries in the period 1976-1996, *Small Business Economics*, **19**: no. 3, 271-290.

Casson, M. (1995) *Entrepreneurship and Business Culture: Studies in the Economics of Trust Volume 1*, Aldershot, Edward Elgar.

Corbett, A. C. (2005) Experiential learning within the process of opportunity identification and exploitation, *Entrepreneurship Theory and Practice*, **29**: no. 4, 473-491.

Courvisanos, J. (2009) Political aspects of innovation, *Research Policy*, **38**: no. 7, 1117-1124.

Davidsson, P. (1995) Culture, structure and regional levels of entrepreneurship, *Entrepreneurship and Regional Development*, **7**: no. 1, 41-62.

Davidsson, P., Honig, B. (2003) The role of social and human capital among nascent entrepreneurs, *Journal of Business Venturing*, **18**: no. 3, 301-331.

Dawley, S., Pike, A., Tomaney, J. (2010) Towards the resilient region?, *Local Economy*, **25**: no. 8, 650-667.

Durkheim, E. (1893) *The Division of Labour in Society*, New York: Macmillan.

Eurostat (2014) *Eurostat indicators of High-tech industry and knowledge-intensive services*, Luxembourg, European Commission.

Evans, D. S., Leighton, L. S. (1989) Some empirical aspects of entrepreneurship, *American Economic Review*, **79**: no. 3, 519-535.

Fotopoulos, G. (2014) On the spatial stickiness of UK new firm formation rates, *Journal of Economic Geography*, **14**: no. 3, 651-679.

Fotopoulos, G., Spence, N. (2001) Regional variations of firms births, deaths and growth patterns in the UK, 1980-1991, *Growth and Change*, **32**: no. 2, 151-173.

Freytag, A., Thurik, R. (2007) Entrepreneurship and its determinants in a cross-country setting, *Journal of Evolutionary Economics*, **17**: no. 2, 117-131.

Garnsey, E., Heffernan, P. (2005) High-technology clustering through and spin-out and attraction: the Cambridge case, *Regional Studies*, **39**: no. 8, 1127-1144.

Garofoli, G. (1992) New firm formation and local development the Italian experience, *Entrepreneurship and Regional Development*, **4**: no. 2, 101-125.

Gimeno, J., Folta, T. B., Cooper, A. C., Woo, C. Y. (1997) Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms, *Administrative Science Quarterly*, **42**: no. 4, 750-783.

Gould, A., Keeble, D. (1984) New firms and rural industrialization in East Anglia, *Regional Studies*, **18**: no. 3, 189-201.

Gregson, N., Simonsen, K., Vaiou, D. (1999) The meaning of work: some arguments for the importance of culture within formulations of work in Europe, *European Urban and Regional Studies*, **6**: no. 3: 197-214.

Hamilton, B. H. (2000) Does entrepreneurship pay? An empirical analysis of returns to self-employment, *Journal of Political Economy*, **108**: no. 3, 604-632.

Hofstede, G. (1980) *Culture's consequences: Internal differences in work related values*, Beverly Hills CA, Sage.

Hofstede, G. (2001) *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*, Second Edition, Thousand Oaks CA, Sage.

Hudson, R. (2010) Resilient regions in an uncertain world: wishful thinking or a practical reality?, *Cambridge Journal of Regions, Economy and Society*, **3**: no. 1, 11-25.

Huggins, R. (2008) The evolution of knowledge clusters progress and policy, *Economic Development Quarterly*, **22**: no. 4, 277-289.

Huggins, R., Thompson, P. (2015) Culture and place-based development: A socio-economic analysis, *Regional Studies*, **49**: no. 1, 130-159.

Huggins, R., Thompson, P. (2014) Entrepreneurial urban development: culture, institutions and economic evolution, *Leadership and Policy Quarterly*, **3**: no. 3, 103-126.

Huggins, R., Izushi, H., Prokop, D., Thompson, P. (2014) *The Global Competitiveness of Regions*, London, Routledge.

Hutcheson, G., Sofroniou, N. (1999) *The multivariate social scientist*, London, Sage.

Jack, S. L., Anderson, A. R. (2002) The effects of embeddedness on the entrepreneurial process, *Journal of Business Venturing*, **17**: no. 5, 467-487.

Johnson, P. (2004) Differences in regional firm formation rates: a decomposition analysis, *Entrepreneurship Theory and Practice*, **28**: no. 5, 431-445.

Kaiser, H. F. (1960) The application of electronic computers to factor analysis, *Educational and Psychological Measurement*, **20**: no. 1, 141--151.

Kamm, J. B., Shuman, J. C., Seegar, J. A., Nurick, A. J. (1990) Entrepreneurial teams in new venture creation: a research agenda, *Entrepreneurship Theory and Practice*, **14**: no. 4, 7-17.

Keeble, D., Walker, S. (1994) New firms, small firms and dead firms: spatial patterns and determinants in the United Kingdom, *Regional Studies*, **28**: no. 4, 411-427.

Klyver, K., Foley, D. (2012) Networking and culture in entrepreneurship, *Entrepreneurship and Regional Development*, **24**: no. 7/8, 561-588.

Lee, S. Y., Florida, R., Acs, Z. J. (2004) Creativity and entrepreneurship: a regional analysis of new firm formation, *Regional Studies*, **38**: no. 8, 879-891.

Levie, J. (2007) Immigration, in-migration, ethnicity and entrepreneurship in the United Kingdom, *Small Business Economics*, **28**: no. 2/3, 143-169.

Macko, A., Tyszka, T. (2009) Entrepreneurship and risk taking, *Applied Psychology*, **58**: no. 3, 469-487.

Martin, R. (2012) Regional economic resilience, hysteresis and recessionary shocks, *Journal of Economic Geography*, **12**: no. 1, 1-32.

Martin, R., Sunley, P. (2015) On the notion of regional economic resilience: conceptualization and explanation, *Journal of Economic Geography*, **15**: no. 1, 1-42.

Mason, C. (1991) Spatial variations in enterprise: the geography of new firm formation. In Burrows, R. (ed.). *Deciphering the Enterprise Culture*. London, Routledge, pp. 74-106.

Miller, B. (1992) Collective action and rational choice: place, community, and the limits to individual self-interest, *Economic Geography*, **68**: no. 1, 22-42.

Mitchell Franco, A., Filson, D. (2006) Spin-outs: knowledge diffusion through employee mobility, *Rand Journal of Economics*, **37**: no. 4, 841-860.

Moskovitz, T. J., Vissing-Jorgensen, A. (2002) The returns to entrepreneurial investment: a private equity premium puzzle?, *American Economic Review*, **92**: no. 4, 745-778.

Mueller, P. (2006) Entrepreneurship in the region: breeding ground for nascent entrepreneurs, *Small Business Economics*, **27**: no. 1, 41-58.

Noorderhaven, N., Thurik, R., Wennekers, S., van Stel, A. (2004) The role of dissatisfaction and per capita income in explaining self-employment across 15 European countries, *Entrepreneurship Theory and Practice*, **28**: no. 5, 447-466.

Parker, S. C. (2006) Learning about the unknown: how fast do entrepreneurs adjust their beliefs?, *Journal of Business Venturing*, **21**: no. 1, 1-26.

Paxton, P. (2002) Social capital and democracy: an independent relationship, *American Journal of Sociology*, **67**: no. 2, 254-277.

Pearson, A. (2014) Trojan Horse debate: We were wrong, all cultures are not equal, *The Telegraph*, online, retrieved 16 June 2014, <http://www.telegraph.co.uk/education/educationnews/10892606/Trojan-Horse-debate-We-were-wrong-all-cultures-are-not-equal.html>

Pendall, R., Foster, K. A., Cowell, M. (2010) Resilience and regions: building understanding of the metaphor, *Cambridge Journal of Regions, Economy and Society*, **3**: no. 1, 71-84.

Politis, D. (2008) Does prior start-up experience matter for entrepreneurs' learning? A comparison between novice and habitual entrepreneurs, *Journal of Small Business and Enterprise Development*, **15**: no. 3, 472-489.

Portes, A., Landolt, P. (2000) Social capital: promise and pitfalls of its role in development, *Journal of Latin American Studies*, **32**: no. 2, 529-547.

Rae, D., Price, L., Bosworth, G., Parkinson, P. (2012) Business inspiration: small business leadership in recovery?, *Industry and Higher Education*, **26**: no. 6, 473-489.

Rantisi, N. M. (2002) The local innovation system as a source of 'variety': openness and adaptability in New York City's garment district, *Regional Studies*, **36**: no. 6, 587-602.

Reynolds, P. D., Bygrave, W. D., Autio, E., Cox, L. W., Hay, H. (2002) *Global Entrepreneurship Monitor, 2002 Executive Report*, Babson Park, MA: Babson College, London Business School and Kauffman Foundation.

Rocha, H. O. (2013) *Entrepreneurship and Regional Development: The Role of Clusters*, Basingstoke, Palgrave Macmillan.

Rodríguez-Pose, A., Storper, M. (2006) Better Rules or Stronger Communities? On the Social Foundations of Institutional Change and Its Economic Effects, *Economic Geography*, **82**: no. 1, 1-25.

Santarelli, E., Carree, M., Verheul, I. (2009) Unemployment and firm entry and exit: an update on a controversial relationship, *Regional Studies*, **43**: no. 8, 1061-1073.

Shapero, A., Sokol, I. (1982) The social dimensions of entrepreneurship. In Kent, C. A., Sexton, D. I., Vesper, K. H. (eds.). *Encyclopedia of Entrepreneurship*. Englewood Cliffs, Prentice-Hall, pp. 72-88.

Storey, D. J., Johnson, S. (1987) Regional variations in entrepreneurship in the UK, *Scottish Journal of Political Economy*, **34**: no. 3, 161-173.

Tabachnick, B. G., Fidell, L. S. (2007) *Using multivariate statistics: 5th edition*, Boston, Allyn and Bacon.

Theil, H. (1972) *Statistical Decomposition Analysis: With Applications in the Social and Administrative Sciences*, Amsterdam: North Holland.

Thomas, B. C., Williams, R., Thompson, P., Packham, G. (2013) Use of the Internet and SME characteristics to expand scale and geographical scope of sales: the case of the United Kingdom, *International Journal of Technology Diffusion*, **4**: no. 3, 1-37.

Thurik, A. R., Carree, M. A., van Stel, A., Audretsch, D. B. (2008) Does self-employment reduce unemployment?, *Journal of Business Venturing*, **23**: no. 6, 673-686.

Tolbert, C. M., Lyson, T. A., Irwin, M. D. (1998) Local capitalism, civic engagement, and socioeconomic well-being, *Social Forces*, **77**: no. 2, 401-428.

Trettin, L., Welter, F. (2011) Challenges for spatially oriented entrepreneurship research, *Entrepreneurship and Regional Development*, **23**: no. 7/8, 575-602.

Tylor, E. B. (1871) *Primitive Culture*, Vol 2, New York, NY: Brentano's.

Uhlaner, L., Thurik, R. (2007) Postmaterialism influencing total entrepreneurial activity rates across nations, *Journal of Evolutionary Economics*, **17**: no. 2, 161-185.

Van Praag, C. M., Cramer, J. S. (2001) The roots of entrepreneurship and labor demand: individual ability and low risk aversion, *Economica*, **68**: no. 269, 45-62.

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Table 1: Measures Utilised by the Analysis

Measure	Source	Year(s)
<i>Community Cultures Measures</i>		
Proportion of population with NVQ4+ qualifications	Annual Population Survey (APS)	2004
Proportion of population with no formal education (inverse)	Annual Population Survey (APS)	2004
Primary school absenteeism, proportion of half day sessions (inverse)	Schools Statistics	2007
Secondary school absenteeism, proportion of half day sessions (inverse)	Schools Statistics	2007
Ethnic similarity (see endnote 2 for a definition)	Census	2001
Religious similarity (see endnote 2 for a definition)	Census	2001
Proportion of the population which is UK born	Annual Population Survey	2005
Proportion of the population perceiving themselves nationality of resident country	Annual Population Survey	2004
Female part-time employment as a percentage of all female employment	Annual Population Survey	2004
Non-sexual violent crimes per 1000 population (inverse) (see endnote 3 for a definition)	Notifiable Crimes Recorded by the Police	2004
Crimes by deception per 1000 population (inverse) (see endnote 3 for a definition)	Notifiable Crimes Recorded by the Police	2004
Trade union membership (inverse)	Annual Population Survey	2004
Proportion of the population voting for left of centre parties (inverse)	Electoral Commission	2005
<i>Entrepreneurial Resilience Measures</i>		
Change in Firm Births (Net and Gross)	ONS Business Demography	2004-2011
Change in Gross Firm Deaths	ONS Business Demography	2004-2011
Change on Knowledge-Based Firms	Interdepartmental Business Register	2004-2011
<i>Economic Condition Measures</i>		
Home Ownership (Proportion owning home outright)	Census	2001
Population Growth (Working Age)	Mid-year Population Estimates	1998-2004
Income Growth (Mean Full-Time Weekly Wage)	Annual Survey of Hours and Earnings	2002-2004

Unemployment Change (2010 compared to 2005-2009 average)	Claimant Count (NOMIS)	2005-2010
<i>Industry Structure Measures</i>		
SMEs per capita	UK Business: Activity, Size and Location	2004
Industry Diversity (see endnote 4 for a definition)	Annual Business Inquiry Employee Analysis	2004
Industry Specialisation -(see endnote 4 for a definition)	Annual Business Inquiry Employee Analysis	2004
Manufacturing presence	UK Business: Activity, Size and Location	2004

Table 2 – Principal Components Analysis of Community Culture Indicators

	Social Cohesion	Embracement of Education	Social Values and Rules	Extracted
Ethnic Similarity	0.949	-0.033	0.075	0.906
Percentage born in UK	0.936	-0.090	0.060	0.888
Religious Similarity	0.906	0.105	-0.071	0.836
Identify themselves as natives of country	0.881	-0.093	-0.096	0.795
Proportion of women in employment who are part-time	0.735	0.010	0.370	0.678
Proportion with NVQ Level 4+	-0.244	0.810	-0.088	0.724
Primary School Absences (inverse)	0.399	0.751	0.096	0.732
Proportion with no formal qualifications (inverse)	-0.035	0.705	0.272	0.573
Secondary School Absences (inverse)	-0.062	0.639	0.304	0.504
Trade Union Membership (inverse)	-0.252	-0.038	0.783	0.679
Proportion voting for left of centre parties (inverse)	0.090	0.381	0.712	0.660
Non-sexual violent crimes (inverse)	0.481	0.268	0.618	0.685
Crimes by deception (inverse)	0.446	0.325	0.595	0.659
Eigen Value	4.949	3.067	1.303	
Percentage of variance explained	38.068	23.590	10.023	
Bartlett's Test of Sphericity	3750.1	[78]	(0.000)	
Kaiser-Meyer-Olkin	0.780			

Notes: p-values in parentheses; degrees of freedom in squared brackets

Table 3 – Correlation Matrix of Dependent and Independent Variables

	1. Net Firm Births	2	3	4	5	6	7	8	9	10	11	12	13	14
2. Gross Firm Births	0.814 (0.000)													
3. Firm Deaths	-0.283 (0.000)	0.039 (0.454)												
4. Knowledge Intensive Firms	0.528 (0.000)	0.524 (0.000)	0.267 (0.000)											
5. Social Cohesion	-0.489 (0.000)	-0.344 (0.000)	-0.043 (0.401)	-0.561 (0.000)										
6. Embracement of Education	0.118 (0.022)	-0.040 (0.433)	-0.202 (0.000)	0.064 (0.214)	0.000 (0.999)									
7. Social Values and Rules	-0.166 (0.001)	-0.393 (0.000)	-0.170 (0.001)	-0.289 (0.000)	0.000 (0.996)	0.000 (0.997)								
8. Home Ownership	-0.419 (0.000)	-0.562 (0.000)	-0.241 (0.000)	-0.642 (0.000)	0.490 (0.000)	0.175 (0.001)	0.445 (0.000)							
9. Population Growth	0.092 (0.073)	0.000 (0.994)	-0.013 (0.801)	0.203 (0.000)	-0.543 (0.000)	-0.043 (0.399)	0.146 (0.004)	-0.241 (0.000)						
10. Income Growth	-0.195 (0.000)	-0.096 (0.062)	0.083 (0.106)	-0.139 (0.007)	0.134 (0.009)	-0.164 (0.001)	-0.047 (0.357)	0.038 (0.467)	0.009 (0.855)					
11. Change in Unemployment	0.224 (0.000)	-0.019 (0.717)	-0.156 (0.002)	0.091 (0.077)	-0.156 (0.002)	0.410 (0.000)	0.432 (0.000)	0.133 (0.010)	0.002 (0.973)	-0.174 (0.001)				
12. SMEs per capita	-0.008 (0.880)	-0.177 (0.001)	-0.379 (0.000)	-0.253 (0.000)	-0.125 (0.015)	0.488 (0.000)	0.353 (0.000)	0.314 (0.000)	0.184 (0.000)	-0.131 (0.011)	0.359 (0.000)			
13. Industry Diversity	-0.203 (0.000)	-0.175 (0.001)	-0.077 (0.136)	-0.382 (0.000)	0.478 (0.000)	-0.077 (0.134)	0.103 (0.045)	0.232 (0.000)	-0.233 (0.000)	0.115 (0.026)	0.022 (0.676)	-0.043 (0.404)		
14. Industry Specialisation	-0.049 (0.342)	-0.060 (0.244)	-0.241 (0.000)	-0.107 (0.037)	0.002 (0.967)	0.023 (0.657)	0.006 (0.905)	0.090 (0.081)	0.078 (0.129)	0.006 (0.912)	0.045 (0.388)	0.184 (0.000)	-0.043 (0.403)	
15. Manufacturing Presence	-0.025 (0.628)	0.014 (0.793)	0.227 (0.000)	0.030 (0.559)	0.026 (0.613)	-0.447 (0.000)	-0.045 (0.385)	-0.160 (0.002)	-0.115 (0.026)	0.046 (0.373)	-0.188 (0.000)	-0.404 (0.000)	0.356 (0.000)	-0.049 (0.339)

Table 4 – Regressions of change in net firm births 2004 to 2011

Scaling	Change in Net Firm Births		Change in Gross Firm Births	
	Existing Business Stock	Population	Existing Business Stock	Population
<u>Community Culture</u>				
Social Cohesion	-0.0149 (0.000)	-0.0627 (0.000)	-0.0093 (0.000)	-0.0367 (0.000)
Embracement of Education	0.0052 (0.001)	0.0082 (0.159)	0.0009 (0.603)	0.0103 (0.045)
Social Values and Rules	0.0000 (0.997)	-0.0126 (0.021)	-0.0047 (0.004)	-0.0195 (0.000)
Likelihood Ratio Tests of Joint Significance of Cultural Variables	76.02 [3] (0.000)	88.64 [3] (0.000)	29.31 [3] (0.000)	57.94 [3] (0.000)
<u>Economic Conditions</u>				
Home Ownership	-0.1072 (0.001)	-0.3901 (0.001)	-0.2268 (0.000)	-0.4397 (0.000)
Population Growth	-0.1483 (0.000)	-0.4691 (0.001)	-0.1762 (0.000)	-0.4457 (0.000)
Income Growth	-0.0485 (0.013)	-0.1197 (0.095)	-0.0295 (0.170)	-0.0453 (0.475)
Unemployment Change	0.0100 (0.021)	0.0458 (0.004)	0.0130 (0.007)	0.0328 (0.021)
Likelihood Ratio Tests of Joint Significance of Economic Conditions	43.47 [4] (0.000)	39.14 [4] (0.000)	74.30 [4] (0.000)	41.32 [4] (0.000)
<u>Industry Structure</u>				
SMEs per capita	-0.0054 (0.701)	0.1923 (0.000)	0.0055 (0.725)	0.0562 (0.223)
Industry Diversity	0.0509 (0.065)	0.0758 (0.453)	0.0400 (0.187)	0.1247 (0.164)
Industry Specialisation	0.0018 (0.885)	0.0247 (0.592)	0.0020 (0.882)	0.0185 (0.650)
Manufacturing presence	-0.0809 (0.108)	-0.1831 (0.322)	-0.1525 (0.006)	-0.3315 (0.043)
Likelihood Ratio Tests of Joint Significance of Industry Structure	4.39 [4] (0.356)	18.62 [4] (0.001)	8.71 [4] (0.069)	7.90 [4] (0.095)

Notes: p-values in parentheses; degrees of freedom in squared brackets

Table 4 - continued

Scaling	Change in Net Firm Births		Change in Gross Firm Births	
	Existing Business Stock	Population	Existing Business Stock	Population
Constant	-0.0110 (0.609)	-0.0448 (0.571)	0.0212 (0.370)	-0.0534 (0.446)
<i>N</i>	378	378	378	378
<i>R</i> ²	0.370	0.460	0.413	0.383
F-test	19.54 (0.000)	28.39 (0.000)	23.39 (0.000)	20.62 (0.000)

Notes: p-values in parentheses; degrees of freedom in squared brackets

Table 5 – Regressions of change in firm deaths and knowledge based firms 2004 to 2011

Scaling	Change in Gross Firm Deaths		Change in Knowledge Based Firms	
	Existing Business Stock	Population	Existing Business Stock	Population
<u>Community Culture</u>				
Social Cohesion	0.0008 (0.458)	0.0260 (0.000)	-0.0112 (0.000)	-0.0757 (0.000)
Embracement of Education	0.0008 (0.393)	0.0022 (0.476)	0.0084 (0.000)	0.0338 (0.000)
Social Values and Rules	0.0001 (0.890)	-0.0068 (0.018)	0.0005 (0.673)	-0.0282 (0.001)
Likelihood Ratio Tests of Joint Significance of Cultural Variables	1.32 [3] (0.723)	66.04 [3] (0.000)	84.29 [3] (0.000)	77.92 [3] (0.000)
<u>Economic Conditions</u>				
Home Ownership	-0.0211 (0.238)	-0.0481 (0.419)	-0.2184 (0.000)	-1.1062 (0.000)
Population Growth	0.0179 (0.411)	0.0247 (0.734)	-0.0382 (0.244)	-0.0368 (0.864)
Income Growth	0.0141 (0.214)	0.0743 (0.049)	-0.0280 (0.100)	-0.1157 (0.298)
Unemployment Change	0.0043 (0.085)	-0.0128 (0.128)	0.0022 (0.564)	0.0289 (0.244)
Likelihood Ratio Tests of Joint Significance of Economic Conditions	7.78 [4] (0.100)	7.14 [4] (0.129)	70.63 [4] (0.000)	45.82 [4] (0.000)
<u>Industry Structure</u>				
SMEs per capita	-0.0277 (0.001)	-0.1363 (0.000)	-0.0779 (0.000)	0.5986 (0.000)
Industry Diversity	-0.0418 (0.009)	0.0487 (0.360)	-0.0668 (0.006)	-0.4122 (0.009)
Industry Specialisation	-0.0278 (0.000)	-0.0065 (0.789)	-0.0063 (0.566)	-0.0077 (0.914)
Manufacturing presence	0.0695 (0.018)	-0.1480 (0.128)	0.0065 (0.881)	0.0951 (0.740)
Likelihood Ratio Tests of Joint Significance of Industry Structure	43.10 [4] (0.000)	26.46 [4] (0.000)	54.49 [4] (0.000)	59.64 [4] (0.000)

Notes: p-values in parenthesis; degrees of freedom in squared brackets

Table 5 - continued

Scaling	Change in Gross Firm Deaths		Change in Knowledge Based Firms	
	Existing Business Stock	Population	Existing Business Stock	Population
Constant	0.0397 (0.002)	-0.0089 (0.830)	0.1634 (0.000)	0.5434 (0.000)
<i>N</i>	378	378	378	378
<i>R</i> ²	0.220	0.371	0.598	0.597
F-test	9.40 (0.000)	19.65 (0.000)	49.39 (0.000)	49.32 (0.000)

Notes: p-values in parenthesis; degrees of freedom in squared brackets

ⁱ Based on the European Union definition (Eurostat, 2014).

ⁱⁱ To capture the influence that ethnic and religious groups may play in increasing cohesion, a similarity measure is created for each based on the squared deviations of the proportions belonging to each group from that associated with an equal distribution across groups. The following measure is used:

$$S_{e/r} = \frac{1}{\left(1 - \frac{1}{n}\right)} \sum_{i=1}^n \left(p_i - \frac{1}{n}\right)^2$$

Where *n* is the number of ethnic or religious groups considered and *p_i* is the proportion of the local population identifying with group *i*. The measure takes a value of 1 when all individuals in a population belong to a single group and 0 when the population is evenly divided amongst the groups. The ethnic groups considered are: White British; White Irish; Indian; Pakistani; Bangladeshi; Black Caribbean; Black African; Chinese; Mixed and others. The religious groups considered are: Christian; Buddhist; Hindu; Jewish; Islam; Sikh; Other religion; Lack of religion.

ⁱⁱⁱ Crimes are categorised as crimes by deception and non-sexual violent crimes. The need to aggregate certain crimes is necessitated by the different reporting conventions of Police

Authorities in England, Scotland and Wales. Crimes by deception include: theft from persons; domestic burglary; other burglary; vehicle theft; and theft from vehicles. Non-sexual violent crimes include: wounding endangering life; and robbery.

^{iv} The industrial diversity measure drawn from Fotopoulos (2014) is based on Theil's (1972) diversity entropy measure:

$$H_l = \sum_i (p_{li} / p_l) \ln(p_l / p_{li})$$

Where p_{li} is the proportion of all employment in Britain found in industry i in locality l (E_{li}):

$$p_{li} = E_{li} / \sum_l \sum_i E_{li}$$

p_l is the share of all employment in Britain found in locality l :

$$p_l = \sum_i p_{li}$$

A value of 0 indicates the presence of just one industry in the locality, higher values represent a more diverse industrial employment. In order to bound the diversity value within an interval [0, 1] H_l is divided by the natural log of the number of industries considered. The division of 15 industries employed by Fotopoulos (2014) is applied. Data on employment by industry is drawn from the Annual Business Inquiry for 2004 (ABI).

The industrial specialisation measure is formulated as follows:

$$SPEC_l = 1/2 \sum_i (E_{li} / E_l - E_{ni} / E_n)$$

Where E_l is all employment in the locality, E_{ni} is all employment in Britain within industry i and E_n is all employment in Britain. The index has a value of 0 when the locality has the same industrial structure as that found in Britain as a whole. It takes a value of 1 when only one industry is present in the locality.