Entrepreneurship and the Domains of Deprivation in Wales[1]

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The potential of self-employment and business ownership to rejuvenate deprived communities makes it highly attractive to policymakers. Utilising data from the Global Entrepreneurship Monitor (GEM) surveys of Wales in conjunction with the Welsh Index of Multiple Deprivation (WIMD) this study examines the relationship between early stage entrepreneurial activity and the different domains of deprivation. It is found that at the more deprived parts of Wales have much lower levels of entrepreneurial activity. This is due to a mixture of personal and environmental influences. At an individual level it is found that most domains of deprivation have a negative influence on entrepreneurship, however, it is found that a lack of services has the opposite impact, making individuals more likely to start a business, without the requirement for an existing business community.

1. Introduction

It has been suggested that entrepreneurship is a mechanism through which greater economic growth can be achieved via reduced unemployment (van Stel et al., 2005). This may be of particular importance for depressed and deprived communities. Studies have also found evidence that those out of work are more likely to start businesses than those in work, due to a lack of alternatives or simply a lower opportunity cost (Evans and Jovanovic, 1989; Brooksbank et al., 2007). However, a number of studies have suggested that higher levels of unemployment at the local, regional or national level reduce involvement in enterprise as potential entrepreneurs are put off by the lack of a market for their goods and services (Storey and Johnson, 1987; Blanchflower and Oswald, 1990; Taylor 1996; Brooksbank et al., 2007). This means that raising entrepreneurial activity within deprived areas as a form of self-help is difficult to achieve. A fact reflected through much lower levels of self-employment found in the most deprived parts of Great Britain (Kempson and Mackinnon, 2002).

Studies that have found or suggested the presence of a prosperity pull effect on entrepreneurial activity, have frequently suggested that the negative relationship between unemployment and business ownership is reflective of lower demand conditions. However, deprivation in a community can take a number of forms which may influence demand, and may not be captured completely by the unemployment rate. It is also not necessarily the case that all forms of deprivation will have the same impact on entrepreneurial activity. As well as low demand conditions potential entrepreneurs in deprived areas are also likely to be held back by a lack of: business

[1] Although data used in this work are collected by the GEM consortium, their analysis and interpretation are the sole responsibility of the authors.

skills (Taylor and Plummer, 2003), access to finance, mentoring support, local role models (Slack, 2005) high crime rates and appropriate premises (HM Treasury, 2005).

Whilst many of these factors are likely to be closely correlated with one another, areas of deprivation are not completely homogenous in nature. For example in Wales some of the most deprived areas can be found in the large relatively prosperous cities of Cardiff, and Swansea, in the industrial South Wales valley towns, and finally in some of the more remote rural parts of North and Western Wales (LGDU, 2005). Clearly the different elements of deprivation will effect these different areas in different manners.

This study attempts to investigate the impact that environmental factors related to deprivation have upon the probability that individuals will be actively involved in starting and managing a new venture in Wales. These environmental influences are controlled for by using the Welsh Index of Multiple Deprivation (WIMD) to identify those areas of Wales which are the most deprived. The WIMD itself is a composite measure based upon seven domains of deprivation: income; employment; health and disability; education, skills and training; housing; physical environment; and access to services; allowing for a more rounded measure of deprivation compared to uni-dimensional measures such as the unemployment rate alone. However, this also allows examination of the importance of each of these domains as an environmental factor influencing the propensity to start a business.

The main data utilised in this study is taken from the Global Entrepreneurship Monitor (GEM) studies of Wales for the years 2005, 2006 and 2007. This is supplemented with WIMD data from the Local Government Data Unit for Wales. In order to control for personal characteristics and therefore isolate the influence of environmental factors related to the area in which an individual lives, rare events binary logistic regressions are utilised (King and Zeng, 2001a; 2001b).

The remainder of the paper is structured as follows. Section 2 examines the literature relating to deprivation and entrepreneurial activity, starting with a brief overview of the large literature relating to the impact of unemployment on entrepreneurship before moving onto studies looking at entrepreneurship and deprived communities in a broader context. Section 3 introduces the GEM data and the WIMD, as well as providing an outline of the methodology utilised. Results are presented in Section 4 with conclusions drawn in Section 5.

2. Entrepreneurial activity in depressed and deprived communities

The issue of how to rejuvenate the more depressed and deprived communities in the UK is a long standing issue, with a number of approaches taken. However, many of these were relatively ineffectual as they were based on the main premise that the main problem was the issue of the quality of housing (Gripaios, 2002). Enterprise policy played little or no role until the 1970s (Greene et al., 2004), with the proportion of the population employed in smaller businesses falling until the 1970s (Storey, 1994). The development of flexible working patterns and methods, and the knowledge based economy (Audretsch and Thurik, 2001; Carree et al., 2002; Gripaios, 2002), however, produced a step change in support for small business (Greene et al., 2004). In order to promote economic growth policies have been developed to increase business formation (Bennett, 2006) and increase the growth of existing businesses (Aaron et al., 2006). However, the most depressed parts of the UK appear to have missed out on the benefits of entrepreneurship, with a much lower level of business ownership and

formation than the UK average (Kempson and Mackinnon, 2002). This has led to more recent community regeneration schemes now incorporate an enterprise element.

It is clear that successful entrepreneurship has the potential to help deprived areas through lowering entrepreneurship directly through residents creating their own employment, but also indirectly through multiplier effects throughout the community and other social contributions (Lyon et al., 2002; HM Treasury, 2005). How practical any attempt to solve the problems of deprived communities is through enterprise is however disputed. Porter (1995) suggests that the competitive advantages of the inner city provides business with the opportunity to succeed and regenerate areas if resources are not misallocated through government subsidisation of unsustainable businesses. However, on a purely practical note is it possible to get those living in deprived areas to engage in entrepreneurship, and secondly there are some problems relating to deprivation and social exclusion that it is unlikely that enterprise can quickly solve, such as high crime rates and poor public services (Blackburn and Ram, 2006). Third it may actually harm existing business ownership where government supported new businesses displace incumbents, or where those with a lack of entrepreneurial skills, acumen or inclination are drawn in by subsidies or propaganda lowering the average quality of entrepreneurs (Greene et al., 2004).

Even the relationship between unemployment and entrepreneurship in an area appears uncertain. One stream of literature has noted that those out of work are more likely to be forced into undertaking entrepreneurial activities, because of a lack of alternative employment opportunities (Blau, 1987; Evans and Jovanovic, 1989; Evans and Leighton, 1989; Grilo and Thurik, 2006). This would imply that business ownership and entrepreneurial activities would be expected to be higher in deprived and depressed communities, however, a counteracting force is suggested by authors such as Storey and Johnson (1987) and Blanchflower and Oswald (1990), that potential entrepreneurs are dissuaded from starting businesses in these areas because of a lack of demand for the products or service of their new enterprises.

Using UK data Taylor (1996) finds there to be a weak negative relationship between the self-employment rate and the unemployment to vacancy ratio. There is also found to be a higher level of business exits where local labour markets in the UK are weaker (Taylor, 2001). This negative cross section impact on self-employment from unemployment levels is also found at the national level (Blanchflower and Oswald, 1998). However, deprived communities may also have characteristics which encourage entrepreneurial activity such as cheap supplies of second hand capital and plentiful labour (Binks and Jennings, 1986).

These two counteracting forces mean that entrepreneurial activity appears to be positively related to personal unemployment, the necessity push of unemployment, but is negatively related to regional unemployment rates, the prosperity pull effect (Ritsilä and Tervo, 2002; Brooksbank et al., 2007). However, unemployment is a relatively crude measure of how deprived a community is with potentially low levels of true overlap (Whelan et al., 2002). It is also true that in many cases relatively large areas have been examined rather than concentrating on communities themselves.

Whilst the recession push effect suggests simply that individuals will be more likely to start businesses from a position of unemployment, this fails to take into account that unemployment in deprived areas will be closely linked to a number of other characteristics related to entrepreneurial activity. For instance potential entrepreneurs in deprived areas are also likely to be held back by a lack of business skills (Taylor and Plummer, 2003). Residents of deprived areas may also struggle to get advice on starting businesses as there may be poorer mentoring and support

agencies (HM Treasury, 2005) or where available advice and support may not fit with the conditions faced by entrepreneurs living in deprived areas (Oc and Tiesdell, 1999).

Given the relatively low level of business ownership in deprived areas, there will also be a lack of role models to follow (Slack, 2005), which may partially explain why children from these areas have been found to see entrepreneurship in a less positive fashion than children elsewhere (Curran, 1996). This may be a major impediment of enterprise development, with knowledge of other entrepreneurs positively associated with entrepreneurial activity (Arenius and Minniti, 2005), and many small and micro business owners expressing a desire for mentors to help with the early stages of business development (Fielden et al., 2000). This is likely to be case for Wales with a smaller proportion of the population living in more deprived areas knowing others who have successfully started businesses in the last two years (Jones-Evans et al., 2008).

For those contemplating start-ups in deprived areas low income levels will mean that personally they will be able to contribute less capital to their start-ups. Given that entrepreneurs are often reliant on informal sources of finance from friends and family, who are also less likely to be wealthy internal capital provision will be a problem (OECD, 2003). In terms of seeking external capital those living deprived areas are more likely to be social tenants and less likely to be homeowners. Where homes are owned they are more likely to be in the lower council tax bands. This means that those living in deprived areas are likely to struggle to raise finance, as they have lower levels collateral to use to get bank loans (Kempson and Mackinnon, 2002). In addition, banks may seek be less willing to lend to entrepreneurs in deprived areas due to their lack of experience in lending to these areas (HM Treasury, 2005).

Where individuals do have the skills, access to finance and inclination for business ownership other environmental factors may also impact upon the decision to start a business in a deprived community including high crime rates and the availability of appropriate premises (HM Treasury, 2005). The first of these factors may impose an additional cost in terms of security spending on top of those faced by entrepreneurs in other environments, as well as potentially limiting hours of business (Porter, 1995; OECD, 2003). Potential customers and employees may also be harder to attract to areas with high crime rates. The lack of appropriate premises can be a severe problem in deprived communities, as whilst there is often large amounts of commercial property available this may be poorly maintained and require considerable amounts of capital outlay to bring it up to standard (HM Treasury, 2005). Perhaps more importantly existing property may not be suited to the type of business being started, partly reflecting the fact that may deprived communities exist because industrial change has led to a decline in the industries which typically provided employment to the area in the past (Gripaios, 2002).

A lack of an existing business community and infrastructure could leave a single new business start isolated. It has been found that regeneration often requires the presence of an anchor business (HM Treasury, 2005), or a critical mass to be achieved to become sustainable (Porter, 1995; DTI, 2001). Without this latent entrepreneurs may be unwilling to start a new enterprise in an area. However, it is also worth noting that a lack of services, and low incomes does not necessarily mean a community lacks demand, but rather represents underserved markets. This may particularly be the case in low income, but densely populated inner city areas (Porter, 1995).

3. The Welsh Index of Multiple Deprivation (WIMD)

Within this study the WIMD, as calculated in 2005, is used to assign respondents in the GEM Wales sample to areas of low or higher deprivation. The WIMD is a measure initially developed by the Welsh Office (later the Welsh Assembly Government) with Oxford University. The measure is calculated for all Lower Super Output Areas (SOAs) in Wales. SOAs have an average population of 1,500 people, and therefore provide much greater detail on the variation in deprivation than measures based on geographical or electoral Wards, which vary greatly in the sizes of their populations.[i] The WIMD provides a measure of an area's relative deprivation based on seven domains:

- Income
- Employment
- Health and disability
- Education, skills and training
- Housing
- Physical environment
- Geographical access to services

Each of these domains has a weighted influence on the overall WIMD, with the income and employment having the largest influence (25 per cent of the index each), but other factors also having substantial influence (health, 15 per cent; education, skills and training, 15 per cent; geographical access to services, 10 per cent; housing, 5 per cent; and physical environment, 5 per cent). The index therefore provides a broad measure of how deprived an area is relative to others.

Whilst not including measures of crime, infrastructure, and transport links explicitly, the overall measure of deprivation is likely to isolate those areas where these factors are likely to have a negative impact on entrepreneurship. Similarly the WIMD does not explicitly model the presence of entrepreneurial role models, but by incorporating domains of income, employment and education those areas of high deprivation are also likely to be those areas with fewer individuals following careers to be aspired to be it in their own organisations or as managers (or other professionals) in larger corporations.

Each of the different domains of deprivation may have influences of differing strengths upon entrepreneurship. The individual domains and their potential influence on entrepreneurship are discussed in more detail below.

The income domain was based around the distribution of income, as captured by the social security benefits paid to the populations of each area including:

- Income support claimants (and their children and partners)
- Income-based Jobseeker's Allowance
- Working Families Tax Credit
- Disabled Person's Tax Credit.

These measures are combined through simple addition of the measures, presuming equal importance to each. Low income of an area is likely to have two negative impacts upon entrepreneurial activity, as residents are not only less likely to have the capital themselves or within their circle to start businesses (Slack, 2005; HM

Treasury, 2005), but a lack of potential custom is also likely to manifest itself through the prosperity pull effect (Storey and Johnson, 1987; Blanchflower and Oswald, 1990).

The employment domain, captures not only unemployment (those wishing to work, but being unable to locate a job), but to an extent also attempts to control for hidden unemployment where individuals are classified as long term sick, or disabled again using data from the benefits systems providing for these groups:

- Claimants of unemployment related benefits
- Claimants of Incapacity Benefit
- Severe Disablement Allowance (women under 60, men under 65)
- Participants on New Deal for Young People and Intensity Activity Period.

Again the measures are combined through simple addition to produce the employment domain of deprivation. It is unclear overall whether employment deprived areas will be more or less entrepreneurial than others, as described in the preceding section this is a question of balancing the recession push effect, which increases entrepreneurship with higher rates of unemployment (Blau, 1987; Evans and Jovanovic, 1989), against the prosperity pull effect, which lowers entrepreneurship in high unemployment areas (Storey and Johnson, 1987; Blanchflower and Oswald, 1990). Although after controlling for personal work status it is likely that employment deprived communities will have a lower rate of entrepreneurship (Brooksbank et al., 2007).

The health domain is developed from health service data on the incidence of:

- Limiting long-term illness
- Deaths
- Cancer incidence.

Factor analysis is used to combine these measures to provide an overall measure of deprivation in terms of health. The health domain may not be as strongly related to entrepreneurship as other measures of deprivation.

The education domain concentrates on the current educational achievements of the areas' populations using the average scores achieved at various stages of the educational process, and other education performance measures. However, to also account for existing skills and qualifications the proportion of adults with low or no qualifications are also included.

- Key Stage 2, average point scores (7 – 11 year olds)
- Key Stage 3, average point scores (11 – 14 year olds)
- Key Stage 4, average point scores (14 – 16 year olds)
- Proportion of adults with low or no qualifications
- Secondary school absence rates
- Proportion of 17 and 18 year olds not entering further or higher education.

As with the health domain factor analysis was utilised to combine these indicators into a single measure. At an individual level lower levels of education have been found to be negatively related to entrepreneurial activity (Delmar and Davidsson, 2000). Fewer attempts have been made to study the impact of lower levels of education as an environmental factor. A less skilled population may limit the types of

business that can be developed in three ways, firstly the demand for certain products may not exist, second and connected to this as fewer businesses will be started there will be less demand for businesses to serve other businesses. Finally the types of business that can be run may be limited by a lack of suitable employees particularly as employees are a vital source of innovation in the knowledge based economy (Porter, 1995; Taylor and Plummer, 2003). In general it finding employees with the correct skills is a major impediment to new firm growth and thus survival (Fielden et al., 2000).

The housing domain rather than examining the average value of houses which may be strongly influenced by temporary fluctuations in the relative demand and supply of housing for a particular area, concentrates on the quality of housing at the basic level using:

- Lack of central heating
- Overcrowding (excluding all student households).

These measures were assumed to have equal weighting and therefore were combined by simple addition. Housing deprivation is likely to negatively influence the entrepreneurial propensity in two manners. Firstly as a large proportion of UK businesses are run from the home, (WAG, 2004; Thompson et al., 2007) a lack of suitable or spacious accommodation is likely to lower entrepreneurial activity. Secondly poorer quality housing is likely to mean that less collateral is available to obtain external finance (Kempson and Mackinnon, 2002; HM Treasury, 2005). This may also be symptomatic of a lack of suitable commercial property.

The physical environment domain takes account of those factors which will influence the standards of living such as pollution. This domain does not account for the built environment, which is included more in the housing domain.

- Air quality
- Air emissions
- Living within 1 km of a waste disposal site
- Proportion of people living within 1 km of an Environment Agency regulated industrial source
- Proportion of people living in an areas with a significant risk of flooding

These measures were combined in three sets: air quality and emissions; waste disposal site and industrial source; and flooding. A poor physical environment is likely to depress the level of custom willing to enter the area, and therefore businesses may be more reliant on local custom than passing trade.

The access to services domain examines the major public and private service availability to an area:

- Access to food shop (10 minutes)
- Access to GP surgery (15 minutes)
- Access to primary school (15 minutes)
- Access to post office (15 minutes)
- Access to public library (15 minutes)
- Access to leisure centre (20 minutes)
- Access to NHS dentist (20 minutes)
- Access to secondary school (30 minutes)

The measures were combined using factor analysis. Access to services deprivation could potentially have a positive or negative impact upon entrepreneurial activity. Whilst a lack of competition obviously creates openings and opportunities to be exploited, as a lack of enterprise does not necessarily reflect a lack of demand (HM Treasury), it may be necessary for a critical level of business presence to develop or an anchor business to enter the community to encourage new businesses to be established to either serve the existing business or feed off the demand created (DTI, 1998).

The areas displaying the highest levels of overall deprivation are clustered in the large conurbations of Swansea and Cardiff, and also the old industrial areas of the South Wales Valleys. However, pockets of high levels of deprivation are also found in the South West and Northern parts of Wales.

A vast majority of the domains displayed similar patterns with the main exceptions being the housing and geographical access to services domains. In terms of the housing domain, the presence of deprivation in the larger urban areas of South Wales is indicated, but to a lesser extent than the other measures of deprivation. The domain also indicates a cluster of areas in the North East of Wales in Gwynedd and the Isle of Anglesey are also deprived. Understandably the domain of geographical access to services shows the reverse of many of the other domains, with higher levels of deprivation found in the more rural areas of Wales.

4. The Global Entrepreneurship Monitor Data and Methodology

The data utilised in the study is drawn from the Global Entrepreneurship Monitor (GEM) surveys for the UK undertaken in 2005, 2006 and 2007, providing a total sample of 15,385 respondents providing all required information. The GEM project is an international study providing comparable data on entrepreneurial activity and attitudes in a number of countries across the world (42 participants in 2007). For an exhaustive description of the GEM data collection and processing methodology see Reynolds et al. (2005). The survey in the UK takes the form of a stratified random sample collected from the population as a whole and conducted in the form of telephone interviews by a profession survey company IFF. Levie (2007) gives a more in-depth description of the data collection processes utilised within the UK.

The main measure of entrepreneurial activity utilised in the GEM study and utilised here is total early stage entrepreneurial activity (TEA). This measure identifies those in the earliest stages of starting a business and those running new businesses. Two component measures are utilised to calculate the TEA measure, nascent entrepreneurship and new business ownership. The first of these, nascent entrepreneurship, includes those who are undertaking activities to start a new business they will have ownership and managerial involvement with. To class as a nascent entrepreneur the business must not have paid profits or wages to employees, including the owner, for more than three months. New business owners are classified as those involved in running a business in which they have ownership and managerial roles, that has been running for between three and 42 months.

The TEA measure includes those identified as nascent entrepreneurs or new business owners, and after taking account of double counting is generally reported as a percentage of the working age population (18 to 64 years). This allows the GEM data to be utilised to identify groups or areas within the UK population that display higher or lower levels of early stage entrepreneurial activity.

In the case of this study it allows the comparison of those living in the most deprived areas of Wales, to those living in other communities in Wales. With deprivation measured using the WIMD and its individual domains as described in the preceding Section. The deprivation measures are utilised to split the lower layer super output areas into 10 groups of equal size for comparison to be undertaken. Given the nature of the super-output areas with regards to population size, this should roughly split the population into 10 equal groups. The 1st decile will include the 10 per cent of the areas/population that are least deprived, and the 10th decile the 10 per cent of the areas/population that are most deprived.

However, measures that look at entrepreneurial participation for deprived areas as a whole can not differentiate between the effects driven by the characteristics of the individuals themselves and the environment in which they are based. Individual characteristics have been found to have substantial influences on the probability of undertaking entrepreneurial activity. A number of characteristics associated with entrepreneurship will be unrelated or only weakly correlated with deprivation such as gender, and age. Where men are found to be consistently more likely to start businesses than women (Brush, 1992; Langowitz and Minniti, 2005), because of factors such as greater risk aversion (Galloway and Levie, 2001), greater financial constraints due to choice of business type (Haines et al., 1999), discrimination (Fay and Williams, 1991) and different roles played by women in the family group and society in general (Cohen, 1996).

The relationship between age and entrepreneurial activity is generally found to be an inverted U-shape, which reflects the balancing of the need to acquire capital (human, social and financial) for a business start (Kim, 2006) against the diminishing time period available to recuperate investments in time and capital (Lévesque and Minniti, 2006). To control for the inverted U-shaped relationship age and age^2/100 are included within the estimations.

Many personal characteristics which influence entrepreneurship are, however, likely to be closely linked to deprivation, such as: educational attainment, migration status (life-long resident, in-migrant from another region of the UK, or immigrant from another country), and household income band. Whether the causal direction of the relationship runs from deprivation of an area to individual's personal characteristics, or where individual characteristics are utilised to produce the measure of deprivation is unimportant. The issue is that without controlling for these characteristics any differences in entrepreneurship across areas of Wales with differing levels of deprivation will appear to be environmental factors, which may not necessarily be the case. The nature of the results will to a large extent dictate the appropriate policy measures to be undertaken to alleviate any lack of entrepreneurship.

The possibility of misattributing personal effects to environment can be shown with the example of educational attainment. Studies have shown that individuals with higher levels of educational attainment are more likely to be starting businesses (Delmar and Davidsson, 2000; Arenius and Minniti, 2005) as they are more likely to be able to identify and exploit business a wider range of business opportunities (Robinson and Sexton, 1994; Arenius and De Clercq, 2005). However, as deprivation is based in part on low levels of educational attainment, the population of deprived areas will be more likely to be less entrepreneurial. However, those with low qualifications living in deprived areas may be no more or less likely to be starting a business, than their equivalents in less deprived areas.

The availability of capital in the form of wealth and income, has been found to positively related to entrepreneurship due to the presence of liquidity constraints (Kihlstrom and Laffont, 1979; Evans and Jovanovic, 1989), however, in a similar fashion to educational attainment deprived areas are likely to have populations with lower household income. Whilst studies have suggested a lack of access to finance in deprived areas is a particular problem (HM Treasury, 2005; Slack, 2005), it is important to determine whether this is an additional effect on top of the normal low income liquidity constraints or whether it is just simply a more frequently met issue.

Levie (2007) finds that those with greater geographical mobility are more likely to be early stage entrepreneurs, as they can provide a fresh perspective of the resources available in an area. (Slack, 2005) suggests that geographical mobility in deprived areas tends to be lower than elsewhere, so again deprived areas will have lower rates of business start-up, but this is driven by the population rather than the area per se.

To control for these personal characteristics effects a binary logistic regression approach is utilised. Due to the relatively low proportion of sample undertaking early stage entrepreneurial activities the rare events logit (relogit) Bayesian technique developed by King and Zeng (2001a; 2001b) is utilised to correct for the bias found for estimating rare events when using the standard logit regression where the probability of the rare event occurring is underestimated. The underestimation occurs because the constant term is negatively biased, which typically introduces an upward bias to the slope coefficients to compensate.

Specifications will initially be run using the personal characteristics of the respondents to estimate the dependent variable of early stage entrepreneurship, along with a dummy for year of survey to capture any temporal variation in entrepreneurship in Wales. Models will then be run with the inclusion of the WIMD decile dummies, and each of the seven individual domains of deprivation in turn. Initially the specifications are run without household income, as this may be endogenously related to the ownership of a business, although given the relatively young ages of businesses in the study this is likely to be a relatively minor influence. Later specifications are run with household income include. A final specification is run utilising the Office for National Statistics (ONS) definition of the sparseness of Wards to help eliminate any factors associated with the urban or rural nature of the area, rather than actual deprivation although the two are likely to be closely related.

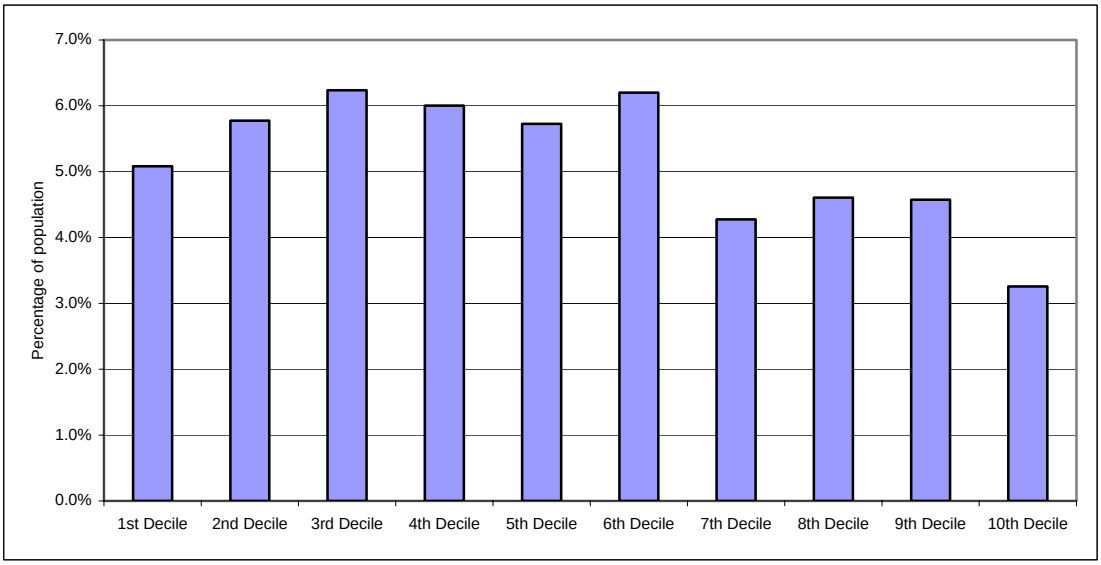
5. Results

Before investigating further the environmental effects of deprivation on the individual decision to become an early stage entrepreneur, it is worth first examining whether any substantial differences do exist in the early stage entrepreneurship rates for different parts of Wales. The Figure 1 below is generated from the average early stage activity rates fro those living in the 10 groups of Welsh communities split using the WIMD, for 2005 to 2007.

The figure clearly shows that early stage entrepreneurship is much lower for those living in more deprived communities, with only 3.3 per cent of those living in the 10 per cent of most deprived communities active as early stage entrepreneurs. This is only just over half the rate found for those living in the 3rd and 6th deciles (6.2 per cent). The figure also indicates that there is not a linear relationship between early stage entrepreneurship prevalence and deprivation, with only just over one in 20 of those living in the least deprived areas entrepreneurially active. However, it does

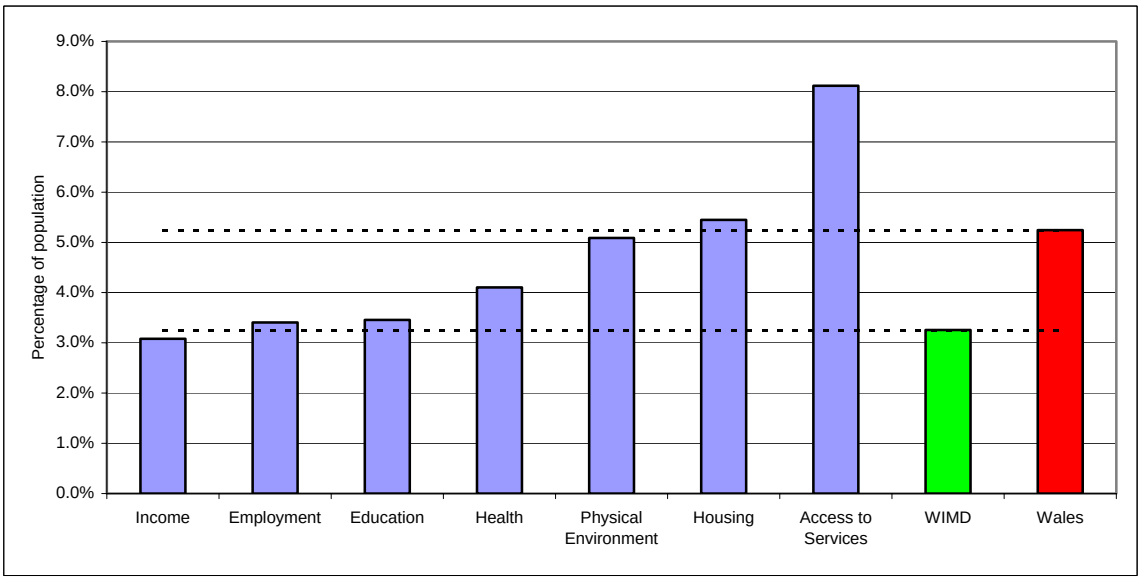
appear that after excluding the 1st decile those living in the 40 per cent of most deprived communities are less likely to be early stage entrepreneurs, with prevalence rates of less than 5 per cent, whilst the 2nd to 6th deciles have early stage prevalence rates nearer 6 per cent.

Figure 1 - Average Early Stage Entrepreneurship prevalence rates for Welsh areas by level of deprivation (WIMD), 2005 to 2007



Section 3 described how the different domains of deprivation could have quite different influences on the level of entrepreneurial activity. Figure 2 displays the early stage entrepreneurship prevalence rates for the most deprived 10 per cent of communities as measured by each domain.

Figure 2 - Average Early Stage Entrepreneurship prevalence rates for most deprived ten per cent of communities as measured by each Domain of Deprivation, 2005 to 2007



It is clear that the 10 per cent of most deprived communities measured under the WIMD have a much lower level of early stage entrepreneurship (3.3 per cent) than Wales as a whole (5.2 per cent). However, it is clear that the domains of deprivation have quite different influences.

Understandably the most deprived 10 per cent of the population as defined under the income and employment domains are less likely to be early stage entrepreneurs, as would be suggested by the prosperity pull effect where enterprise is suppressed by a low level of demand in these areas (Storey and Johnson, 1987; Blanchflower and Oswald, 1990). It appears from this analysis that the recession push effect (Blau, 1987; Evans and Jovanovic, 1989) has minimal influence in increasing the level of entrepreneurial activity in areas of high unemployment. Those domain of deprivation closely linked to high levels of unemployment and low income, education and health, also result in relatively low levels of entrepreneurship for the most deprived 10 per cent of communities.

From this analysis little relationship appears to exist between housing or physical environment deprivation and entrepreneurship. A lack of access to services, however, appears to be positively related to entrepreneurship. As noted earlier this may represent the greater availability of opportunities from a lack of competition, particularly where this may represent rural communities with a tradition of small business ownership.

The descriptive analysis above shows that clearly early stage entrepreneurship in Wales is lower in the most deprived communities, whether this is measured as multiple deprivation or through unemployment and income. However, what these results are unable to indicate is whether this is an environmental influence from living in a deprived area or the personal characteristics of those who live in deprived communities. In order to ascertain this multivariate analysis must be undertaken.

Table 1 presents the results of the rare events logits of early stage entrepreneurship. Firstly examining the base model without the inclusion of any measures of deprivation, it is found that men are more likely to be early stage entrepreneurs. An inverted U-shaped relationship between age and entrepreneurial activity is indicated by the presence of a positive coefficient on the age variable and a negative one on the age squared variable. Generally those with higher levels of qualifications are found to be more likely to be involved in early stage entrepreneurship, as would be expected to be the case if these individuals are more likely to be possess the skills to identify and exploit opportunities (Robinson and Sexton, 1994; Arenius and De Clercq, 2005). It also appears that the lower risk aversion of those with greater geographical mobility results in a higher level of entrepreneurial activity for those entering Wales from another region of the UK or even another country.

The results suggest that the personal characteristics that are likely to be in short supply in more deprived communities, high levels of education and geographical mobility, have a positive impact on the probability of an individual entering entrepreneurship. It is therefore of little surprise that early stage entrepreneurship was found to be less common in more deprived communities in Wales, however, it is unclear to what extent the distribution of these personal characteristics explain the differing levels of entrepreneurial activity across communities in Wales. The WIMD and the constituent domains of deprivation are utilised in turn to represent the environmental influence of deprivation on the probability of a respondent being an early stage entrepreneur. Each measure of deprivation is entered using dummies to present the deciles of communities, with the 5th decile excluded. This approach is

utilised to reflect the non-linear relationship found for deprivation entrepreneurial activity in the descriptive analysis. The 5th decile is chosen as the base case to represent those living in the 'typical' Welsh community, whilst not artificially inducing a significant difference by adopting the decile with the highest level of entrepreneurial activity. The dummy of most interest will of course be that representing the 10 per cent of communities which are most deprived.

The results suggest that the WIMD along with four domains of deprivation display statistically significant influences from living in the 10 per cent of most deprived communities in Wales compared to the 'typical' community. Those living in the most deprived communities under the WIMD, employment, physical environment and education domains are significantly less likely to be early stage entrepreneurs. These results would appear to confirm that lower local demand due to factors such as a poor environment and lower employment levels will prevent entrepreneurs from starting businesses. Using the overall WIMD, the odds-ratios suggest those in the most deprived communities are less than two thirds as likely to be early stage entrepreneurs as those living in the 5th decile communities (odds-ratio of 0.651).

On the supply side it is possible that the lower levels of education may also impose a barrier due to the low provision of potential employees and business partners to work within the business. Low education levels may also strip the community of role models to provide encouragement, again educational deprivation has the effect of reducing the probability of early stage entrepreneurship by around a third (odds-ratio of 0.670).

The deprivation domain of lack of access to services, however, is found to have a positive influence on the probability of being an early stage entrepreneur for those living in the most deprived communities. Respondents in the communities deprived of services are approaching being twice as likely to be early stage entrepreneurs as those living in the fifth decile (odds-ratio 1.835). This may represent a lack of competition, and a greater availability of business opportunities.

It may as noted previously also represent the greater likelihood of living in more rural locations with a stronger tradition of business ownership, to control for this we utilise the Office for National Statistics definition of population density which splits wards of Wales into those which are sparsely populated and those which are less sparsely populated. The addition of the sparseness variable has little influence on the other personal characteristic variables, so for preservation of space only the deprivation and sparseness variable are reported (Table 2).

Table 1 – Coefficients of rare events binary logistic equations of early stage entrepreneurship

		Model 0	WIMD	Income	Employ'	Health	Services	Housing	Environ'	Education
Gender	Male	0.6530 (0.000)	0.6565 (0.000)	0.6558 (0.000)	0.6589 (0.000)	0.6544 (0.000)	0.6737 (0.000)	0.6529 (0.000)	0.6523 (0.000)	0.6545 (0.000)
Experience	Age	0.1221 (0.000)	0.1219 (0.000)	0.1208 (0.000)	0.1208 (0.000)	0.1207 (0.000)	0.1190 (0.000)	0.1264 (0.000)	0.1222 (0.000)	0.1199 (0.000)
	$Age^2/100$	-0.1653 (0.000)	-0.1658 (0.000)	-0.1646 (0.000)	-0.1644 (0.000)	-0.1647 (0.000)	-0.1646 (0.000)	-0.1698 (0.000)	-0.1659 (0.000)	-0.1639 (0.000)
Educational Attainment (base category: A levels)	Doctorate	0.4773 (0.059)	0.4834 (0.056)	0.4748 (0.061)	0.4705 (0.063)	0.4547 (0.073)	0.4630 (0.067)	0.4933 (0.050)	0.4704 (0.063)	0.4631 (0.069)
	Masters	0.3408 (0.022)	0.3480 (0.021)	0.3331 (0.026)	0.3358 (0.026)	0.3230 (0.031)	0.3270 (0.029)	0.3462 (0.020)	0.3517 (0.018)	0.3169 (0.036)
	Bachelors	-0.0237 (0.834)	-0.0138 (0.903)	-0.0212 (0.852)	-0.0227 (0.842)	-0.0339 (0.765)	-0.0220 (0.846)	-0.0154 (0.892)	-0.0271 (0.810)	-0.0345 (0.761)
	GCSE	-0.2426 (0.034)	-0.2264 (0.050)	-0.2245 (0.052)	-0.2267 (0.049)	-0.2330 (0.042)	-0.2273 (0.048)	-0.2553 (0.026)	-0.2428 (0.034)	-0.2193 (0.057)
	Vocational Qualifications	0.0656 (0.626)	0.0823 (0.541)	0.0783 (0.561)	0.0754 (0.576)	0.0687 (0.609)	0.0872 (0.517)	0.0538 (0.689)	0.0688 (0.609)	0.0825 (0.540)
	Other Qualifications	0.0309 (0.897)	0.0418 (0.861)	0.0408 (0.864)	0.0435 (0.855)	0.0523 (0.826)	0.0503 (0.834)	0.0198 (0.934)	0.0206 (0.931)	0.0484 (0.840)
	No Formal Qualifications	-0.6688 (0.000)	-0.6289 (0.000)	-0.6228 (0.000)	-0.6199 (0.000)	-0.6408 (0.000)	-0.6284 (0.000)	-0.6940 (0.000)	-0.6680 (0.000)	-0.6136 (0.000)
Migration Status (base category: life-long residents)	In-Migrant	0.4315 (0.000)	0.4162 (0.000)	0.4216 (0.000)	0.4110 (0.000)	0.4031 (0.000)	0.3667 (0.000)	0.4274 (0.000)	0.4306 (0.000)	0.4026 (0.000)
	Immigrant	0.4370 (0.008)	0.4396 (0.008)	0.4437 (0.008)	0.4327 (0.009)	0.4288 (0.010)	0.4598 (0.006)	0.4248 (0.011)	0.4380 (0.008)	0.4219 (0.012)

Table 1 continued - Coefficients of rare events binary logistic equations of early stage entrepreneurship

		Model 0	WIMD	Income	Employ'	Health	Services	Housing	Environ'	Education
Welsh Index of Multiple Deprivation Deciles (base category: 5th decile)	WIMD 1st Decile		-0.2844 (0.077)	-0.0731 (0.653)	-0.3092 (0.056)	0.0509 (0.733)	-0.0728 (0.696)	-0.1052 (0.527)	-0.2190 (0.157)	-0.1584 (0.315)
	WIMD 2nd Decile		-0.0917 (0.546)	0.0825 (0.587)	0.0953 (0.506)	-0.0695 (0.651)	-0.0053 (0.977)	-0.1158 (0.480)	-0.2457 (0.103)	-0.0138 (0.926)
	WIMD 3rd Decile		0.0341 (0.818)	0.0705 (0.651)	-0.0819 (0.595)	-0.1143 (0.471)	-0.2388 (0.211)	-0.0408 (0.803)	-0.4236 (0.007)	0.1248 (0.392)
	WIMD 4th Decile		0.0337 (0.822)	0.2937 (0.051)	-0.0303 (0.840)	0.0199 (0.896)	0.0554 (0.758)	0.1124 (0.478)	-0.2552 (0.093)	-0.0617 (0.691)
	WIMD 6th Decile		0.0881 (0.549)	0.1336 (0.390)	-0.0861 (0.576)	-0.3258 (0.052)	0.0850 (0.630)	0.1711 (0.285)	-0.3633 (0.022)	-0.2667 (0.102)
	WIMD 7th Decile		-0.2850 (0.081)	0.0421 (0.794)	-0.1726 (0.270)	-0.4186 (0.016)	0.2698 (0.109)	0.0029 (0.986)	-0.2576 (0.091)	-0.2027 (0.208)
	WIMD 8th Decile		-0.1388 (0.393)	0.0199 (0.903)	-0.2588 (0.120)	-0.0383 (0.811)	0.1631 (0.338)	0.2284 (0.148)	-0.2416 (0.114)	-0.0901 (0.584)
	WIMD 9th Decile		-0.1212 (0.465)	-0.0331 (0.847)	-0.1544 (0.363)	-0.2207 (0.190)	0.3346 (0.039)	0.1995 (0.210)	-0.3749 (0.017)	-0.3101 (0.078)
	WIMD 10th Decile		-0.4407 (0.023)	-0.3636 (0.070)	-0.4391 (0.020)	-0.2915 (0.103)	0.6384 (0.000)	0.1263 (0.452)	-0.3167 (0.043)	-0.4162 (0.028)

1. p-values in parenthesis

Table 2 - Coefficients of rare events binary logistic equations of early stage entrepreneurship controlling for sparseness

		WIMD	Income	Employ'	Health	Services	Housing	Environ'	Education
	Sparse	0.3459 (0.000)	0.3747 (0.000)	0.3672 (0.000)	0.3734 (0.000)	0.1308 (0.239)	0.3747 (0.000)	0.4239 (0.000)	0.3519 (0.000)
Welsh Index of Multiple Deprivation Deciles (base category: 5th decile)	WIMD 1st Decile	-0.1922 (0.237)	0.0100 (0.951)	-0.2606 (0.107)	-0.0232 (0.878)	-0.0660 (0.724)	-0.0347 (0.836)	-0.2172 (0.160)	-0.0955 (0.546)
	WIMD 2nd Decile	-0.0157 (0.918)	0.1072 (0.480)	0.1207 (0.400)	-0.1331 (0.388)	0.0020 (0.991)	-0.0564 (0.732)	-0.2550 (0.091)	-0.0406 (0.787)
	WIMD 3rd Decile	0.0393 (0.791)	0.0663 (0.670)	-0.0928 (0.547)	-0.1603 (0.314)	-0.2372 (0.214)	0.0085 (0.959)	-0.4341 (0.006)	0.0889 (0.543)
	WIMD 4th Decile	0.0194 (0.897)	0.2976 (0.048)	-0.0405 (0.787)	-0.0236 (0.878)	0.0616 (0.731)	0.1313 (0.408)	-0.2781 (0.069)	-0.1126 (0.468)
	WIMD 6th Decile	0.1100 (0.455)	0.1701 (0.275)	-0.0612 (0.691)	-0.3236 (0.054)	0.0844 (0.633)	0.1713 (0.285)	-0.3534 (0.026)	-0.2327 (0.154)
	WIMD 7th Decile	-0.2231 (0.173)	0.0863 (0.594)	-0.1284 (0.412)	-0.3997 (0.021)	0.2641 (0.117)	-0.0394 (0.811)	-0.1980 (0.198)	-0.1503 (0.353)
	WIMD 8th Decile	-0.0531 (0.745)	0.0890 (0.588)	-0.1718 (0.304)	-0.0112 (0.945)	0.1513 (0.374)	0.1897 (0.233)	-0.1697 (0.271)	-0.0239 (0.885)
	WIMD 9th Decile	-0.0272 (0.871)	0.0495 (0.775)	-0.0804 (0.636)	-0.1798 (0.287)	0.3014 (0.068)	0.1495 (0.349)	-0.2936 (0.066)	-0.2469 (0.163)
	WIMD 10th Decile	-0.3394 (0.082)	-0.2688 (0.184)	-0.3460 (0.069)	-0.2421 (0.177)	0.5619 (0.001)	0.1217 (0.468)	-0.2219 (0.164)	-0.3416 (0.074)

1. p-values in parenthesis

Table 3 - Coefficients of rare events binary logistic equations of early stage entrepreneurship controlling for household income

		WIMD	Income	Employ'	Health	Services	Housing	Environ'	Education
Household Income Groups (base category: £30,000 - £49,999)	< £11,500	-0.3013 (0.043)	-0.2974 (0.046)	-0.2889 (0.051)	-0.3029 (0.040)	-0.3002 (0.041)	-0.3773 (0.011)	-0.3223 (0.028)	-0.2807 (0.058)
	£11,500 - £17,499	-0.1215 (0.348)	-0.1155 (0.374)	-0.1075 (0.407)	-0.1194 (0.354)	-0.1185 (0.355)	-0.1752 (0.173)	-0.1311 (0.307)	-0.1072 (0.407)
	£17,500 - £29,999	-0.0590 (0.565)	-0.0517 (0.614)	-0.0425 (0.678)	-0.0477 (0.639)	-0.0529 (0.602)	-0.0891 (0.382)	-0.0539 (0.595)	-0.0380 (0.711)
	£50,000 - £99,999	0.2260 (0.047)	0.2241 (0.049)	0.2197 (0.053)	0.1943 (0.087)	0.1918 (0.091)	0.2354 (0.039)	0.2061 (0.068)	0.2217 (0.052)
	£100,000 >	0.8975 (0.000)	0.9087 (0.000)	0.9184 (0.000)	0.8666 (0.000)	0.8180 (0.000)	0.9187 (0.000)	0.8927 (0.000)	0.9014 (0.000)
Welsh Index of Multiple Deprivation Deciles (base category: 5th decile)	WIMD 1st Decile	-0.3520 (0.030)	-0.1559 (0.342)	-0.3772 (0.021)	0.0074 (0.961)	-0.0388 (0.835)	-0.1984 (0.239)	-0.2238 (0.150)	-0.2484 (0.120)
	WIMD 2nd Decile	-0.1395 (0.361)	0.0275 (0.857)	0.0725 (0.614)	-0.0891 (0.563)	0.0236 (0.897)	-0.1586 (0.333)	-0.2314 (0.125)	-0.0534 (0.723)
	WIMD 3rd Decile	0.0095 (0.949)	0.0298 (0.849)	-0.1043 (0.500)	-0.1350 (0.396)	-0.2202 (0.249)	-0.0866 (0.597)	-0.4377 (0.005)	0.1004 (0.493)
	WIMD 4th Decile	0.0167 (0.912)	0.2772 (0.066)	-0.0434 (0.773)	0.0021 (0.989)	0.0669 (0.710)	0.0940 (0.554)	-0.2434 (0.111)	-0.0649 (0.676)
	WIMD 6th Decile	0.0927 (0.530)	0.1307 (0.400)	-0.0717 (0.642)	-0.3194 (0.057)	0.0781 (0.660)	0.1759 (0.272)	-0.3599 (0.023)	-0.2536 (0.120)
	WIMD 7th Decile	-0.2524 (0.123)	0.0602 (0.709)	-0.1468 (0.348)	-0.4069 (0.019)	0.2710 (0.109)	-0.0011 (0.995)	-0.2580 (0.091)	-0.1838 (0.254)
	WIMD 8th Decile	-0.1148 (0.483)	0.0314 (0.848)	-0.2353 (0.159)	-0.0283 (0.860)	0.1585 (0.352)	0.2488 (0.116)	-0.2325 (0.128)	-0.0616 (0.708)
	WIMD 9th Decile	-0.0897 (0.591)	0.0019 (0.991)	-0.1188 (0.484)	-0.1969 (0.244)	0.3086 (0.058)	0.2243 (0.158)	-0.3632 (0.021)	-0.2803 (0.113)
	WIMD 10th Decile	-0.3916 (0.044)	-0.3205 (0.111)	-0.3890 (0.040)	-0.2610 (0.146)	0.6180 (0.000)	0.1695 (0.313)	-0.2944 (0.060)	-0.3744 (0.050)

1. p-values in parenthesis

Table 4 - Coefficients of rare events binary logistic equations of early stage entrepreneurship controlling for sparseness and household income

		WIMD	Income	Employ'	Health	Services	Housing	Environ'	Education
	Sparse	0.3711 (0.000)	0.3997 (0.000)	0.3983 (0.000)	0.4144 (0.000)	0.1864 (0.095)	0.3719 (0.000)	0.4485 (0.000)	0.3821 (0.000)
Household Income Groups (base category: £30,000 - £49,999)	< £11,500	-0.3013 (0.043)	-0.2974 (0.046)	-0.2889 (0.051)	-0.3029 (0.040)	-0.3002 (0.041)	-0.3773 (0.011)	-0.3223 (0.028)	-0.2807 (0.058)
	£11,500 - £17,499	-0.1215 (0.348)	-0.1155 (0.374)	-0.1075 (0.407)	-0.1194 (0.354)	-0.1185 (0.355)	-0.1752 (0.173)	-0.1311 (0.307)	-0.1072 (0.407)
	£17,500 - £29,999	-0.0590 (0.565)	-0.0517 (0.614)	-0.0425 (0.678)	-0.0477 (0.639)	-0.0529 (0.602)	-0.0891 (0.382)	-0.0539 (0.595)	-0.0380 (0.711)
	£50,000 - £99,999	0.2260 (0.047)	0.2241 (0.049)	0.2197 (0.053)	0.1943 (0.087)	0.1918 (0.091)	0.2354 (0.039)	0.2061 (0.068)	0.2217 (0.052)
	£100,000 >	0.8975 (0.000)	0.9087 (0.000)	0.9184 (0.000)	0.8666 (0.000)	0.8180 (0.000)	0.9187 (0.000)	0.8927 (0.000)	0.9014 (0.000)
Welsh Index of Multiple Deprivation Deciles (base category: 5th decile)	WIMD 1st Decile	-0.2561 (0.118)	-0.0697 (0.674)	-0.3254 (0.046)	-0.0742 (0.627)	-0.0280 (0.881)	-0.1297 (0.444)	-0.2220 (0.153)	-0.1838 (0.252)
	WIMD 2nd Decile	-0.0591 (0.700)	0.0536 (0.727)	0.1005 (0.485)	-0.1611 (0.298)	0.0356 (0.846)	-0.0999 (0.544)	-0.2395 (0.112)	-0.0828 (0.584)
	WIMD 3rd Decile	0.0158 (0.915)	0.0250 (0.873)	-0.1152 (0.456)	-0.1886 (0.238)	-0.2173 (0.256)	-0.0378 (0.818)	-0.4478 (0.004)	0.0608 (0.679)
	WIMD 4th Decile	0.0013 (0.993)	0.2788 (0.065)	-0.0533 (0.723)	-0.0493 (0.749)	0.0766 (0.670)	0.1131 (0.477)	-0.2682 (0.081)	-0.1208 (0.437)
	WIMD 6th Decile	0.1164 (0.431)	0.1694 (0.278)	-0.0436 (0.778)	-0.3184 (0.058)	0.0769 (0.665)	0.1765 (0.271)	-0.3506 (0.028)	-0.2163 (0.186)
	WIMD 7th Decile	-0.1841 (0.262)	0.1081 (0.505)	-0.0954 (0.542)	-0.3861 (0.027)	0.2628 (0.120)	-0.0456 (0.783)	-0.1940 (0.208)	-0.1245 (0.442)
	WIMD 8th Decile	-0.0200 (0.903)	0.1077 (0.513)	-0.1370 (0.415)	0.0032 (0.984)	0.1412 (0.408)	0.2096 (0.188)	-0.1551 (0.315)	0.0131 (0.937)
	WIMD 9th Decile	0.0138 (0.935)	0.0939 (0.589)	-0.0337 (0.843)	-0.1499 (0.377)	0.2614 (0.115)	0.1717 (0.283)	-0.2766 (0.083)	-0.2088 (0.240)
	WIMD 10th Decile	-0.2783 (0.156)	-0.2153 (0.289)	-0.2814 (0.141)	-0.2033 (0.259)	0.5093 (0.003)	0.1643 (0.329)	-0.1935 (0.224)	-0.2886 (0.134)

1. p-values in parenthesis

The introduction of the sparseness variable reduces the significance of the deprivation variables, so that the WIMD, and the domains of employment and education are only significant negative for the 10 per cent of most deprived communities at the 10 per cent level. This is of no great surprise given the close relationship between many of the domains of entrepreneurship and inner city areas. Interestingly access to services remains significant at the 1 per cent level after controlling for the sparseness.[2] The positive effects of a lack of access to services therefore appears to be more strongly related to a greater availability of opportunities than a rural tradition of small business ownership.

One factor that has been noted as a potential barrier for those living in deprived communities is the availability of start-up finance (OECD, 2003). Whilst low levels of personal income may form a barrier in all communities, the lower wealth of friends and colleagues may an additional barrier to be overcome in deprived communities. To separate the personal from the environmental income influences, we allow household income to enter the regression (Table 3), initially we exclude sparseness from the regression.

Although the coefficients on the deprivation variables are reduced in size, those that were significant before the addition of the household income variable in the specification remain significant at the 5 per cent level. It therefore appears that those living in areas of deprivation as defined by poor employment prospects, and low educational attainment as well as the overall WIMD are significantly less likely to be early stage entrepreneurs, after controlling for a lack of income from an individual's household. However, it should be noted that whilst the 10 per cent of most deprived communities by income were initially less likely to be early stage entrepreneurs at the 10 per cent level, the coefficient is no longer significant in Table 3. This suggests that much of finance barrier is directly related to the level of income available within the household rather, than being a strong environmental factor. Table 4 allows both sparseness and household income to enter the regressions. Only the access to services domain remains significant.

6. Conclusions

This study has attempted to examine the influence of living within deprived communities upon the probability of being involved in early stage entrepreneurship. Whilst it was clearly found that those living in the most deprived communities were less likely to be involved in early stage entrepreneurship, it was found that certain domains of deprivation had stronger negative influences. Understandably those communities with high levels of deprivation under the employment, education and income domains were found to have lower levels of entrepreneurial activity, as would be the case under the prosperity pull effect (Storey and Johnson, 1987; Blanchflower and Oswald, 1990). However, when other characteristics were controlled for within a rare events logit setting the income domain was found to have less influence on the probability of being an early stage entrepreneur. This was particularly the case when controlling for household income. It therefore appears that concerns that finance may be harder to obtain within a deprived community may be to an extent over played. Whilst household income was found to have a significantly positive influence upon

[2] Similar results were found when utilising a measure which defined Welsh wards as either: urban; town and fringe; or village, hamlet and isolated dwelling.

entrepreneurship, living in an income deprived community has no significant influence beyond this.

Interestingly within Wales the lack of existing businesses or public services appears to play little role in dissuading prospective entrepreneurs. It would appear from this that there is no need to establish a critical mass of businesses to encourage new business starts within deprived areas of Wales, as the attraction of low competition appears to play a role.

Whilst many of the deprivation variables lost significance after controlling for the sparseness of the area, it may be improper to add this control, as the concentration of deprived communities within the most densely populated inner cities of Wales made this reduction in significance inevitable.

In terms of policy, the findings of this paper suggest that deprivation does have an environmental influence in suppressing the level of entrepreneurial activity. However, this is lessened by controlling for personal characteristics such as education, income and geographical mobility. One of the major factors associated with deprivation is likely to be lack of role models, due to a large extent by a lack of tradition of entrepreneurship. One method of overcoming this would be through the provision of forums for interaction between entrepreneurs, and with the public (Fielden et al., 2000).

The deprivation domain of education has a significant negative influence, the results would therefore suggest that entrepreneurial activity levels can be raised through the provision of programmes which will help raise the skills levels of the population, which will have a direct effect in raising the probability that an individual becomes and entrepreneur, but will also lessen the negative impact of the education deprivation, by providing more suitable employees (Porter, 1995). It is therefore not necessary that everyone is trained to specifically be a business owner, but that a greater number of the population are provided with the skills suitable for working in modern SMEs, such as IT skills (Fielden et al., 2000). However, where courses develop entrepreneurs in deprived areas such as the ‘New Entrepreneurship Scholarships’ it is essential to utilise these individuals as role models as in the ‘Enterprising Britain Awards’ (Slack, 2005; HM Treasury, 2005).

From the work here it is unclear to what extent specific finance provision is required for deprived areas, as although those with lower household incomes have a lower propensity to start businesses no significant influence is found for income deprivation. This would imply that policies to help those out of work or on low incomes to start businesses will be adequate, although Greene et al. (2004) highlight the dangers of raising entrepreneurship artificially in this manner, in terms of the quality of entrepreneurship.

A number of limitations and possible extensions exist. Firstly the Welsh nature of the data means that the findings may not be possible to generalise across the whole of the UK even never mind for other countries, where deprivation will have its own specific characteristics. For example whilst many deprived areas of the UK have large ethnic minority populations this is less of the case in Wales. Further whilst controls were made for personal characteristics no account was made for differing influences of personal characteristics in deprived communities. For example higher household incomes may have less impact on encouraging entrepreneurship in deprived communities if no market for the products or services of the firm will exist. This may be an area requiring attention in future work.

Further, this study simply examines the number/probability of being early stage entrepreneurs, without any consideration for quality. Whilst early stage

entrepreneurship is much lower in deprived communities, studies have already found some differences in the actual activities undertaken in terms of income, and industry sector (Kempson and Mackinnon, 2002). Future work would be advised to assess whether effective entrepreneurship differs even more greatly between areas of deprivation and other areas, than these simple 'head counts' suggest.

Whilst this study examined the impact of differing environmental concerns on the level of entrepreneurial activity using existing findings and theory to guide the understanding of the mechanisms which drive these relationships, there is clearly work to be conducted to look directly at the perceived barriers to entrepreneurship for residents of deprived areas, to determine whether these findings do comply with theory.

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[i] For more details of how the WIMD is calculated and the measures utilised within each of the domains see the Local Government Data Unit Wales website - http://www.dataunitwales.gov.uk, and the LGDU (2005) *Welsh Index of Multiple Deprivation 2005 Summary Report*, Local Government Data Unit.