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Self-efficacy and attitude to risk in the home-based self-employed: A longitudinal exploration

Key words: home-based, self-efficacy, attitude to risk, risk tolerance, Understanding Society

Abstract

Topic

Despite their economic and social contribution of home-based self-employment, the individuals who pursue this route to self-employment are often accorded less attention and respect than other forms of self-employment, being referred to in pejorative terms such as 'lifestyle entrepreneurs'. They are considered to lack confidence in themselves or their business, termed self-efficacy, and are risk averse, leading them to start a home-based business.

Aim

This study compares the self-efficacy and risk tolerance of home-based self-employed with others that are self-employed but who work at other locations, such as in dedicated commercial premises.

Methodology

Quantitative data are drawn from the large scale, longitudinal social studies database, Understanding Society. Variables at both the individual and household level, which is particularly important for home-based self-employment, are subject to multivariate analysis, allowing the intersectionality of variables to be explored.

Contribution

The study finds no difference between the self-efficacy and risk tolerance of the home-based self-employed and those based in other locations. However, it finds significant differences between the groups in personal, household and employment variables. The null finding is viewed as an exoneration of home-based self-employed, suggesting their choice to base their business at home is not a response to a lack of confidence or aversion to risk, but a rational choice based on their personal, household and employment circumstances.

Introduction

Home-based businesses represent the majority of businesses in most developed countries (Mason *et al*, 2011; Enterprise Nation, 2014; Mason *et al*, 2015), emphasizing the importance of home-based self-employment. Like other forms of self-employment, there has been considerable growth in home-based self-employment over the last decade, fueled by factors such as the 2008 global economic down-turn, widespread organizational restructuring/delaying, as well as the creation of new self-employment opportunities, involving, among others, knowledge workers increasingly making use of ICT in order to develop home-businesses at low cost (Betts & Huzey, 2009). Home based self-employment has been associated with increased business diversity and innovation (van Gelderen *et al*, 2008) and widening entrepreneurial opportunity (Wynarczyk & Graham, 2013; Vorley and Rodgers,

2014; Daniel et al, 2015). However, despite their prevalence and recognised contributions, home-based self-employment is accorded less attention and respect than those based in commercial premises, often referred to in disparaging terms such as life-style, pink-collar or kitchen table self-employment (Walker and Webster, 2004; Mason, 2009/10; Mason et al, 2015).

Home based self-employment has been associated with effectual and experimental approaches (Sarasvathy, 2001; Daniel et al, 2015) and limiting costs (Bryant, 2000; Phillips, 2002; van Gelderen et al, 2008), suggesting that the home-based self-employed may lack confidence in their ability to develop a successful business venture and intolerant of risk. A person's belief in their ability to perform the actions and address the challenges associated with attaining a desired outcome, such as becoming self-employed, is termed self-efficacy (Bandura, 2002). Self-efficacy of the self-employed has generated much interest and has been much studied (Barbosa et al, 2007; Hopp and Stephan, 2012; Densberger, 2014; Sweida and Woods, 2015; Dalborg and Wincent, 2015; Baron et al, 2016). However, we are unaware of previous studies that have considered the self-efficacy of home-based self-employed or explored their risk tolerance. We address this gap in current understanding of this important group of self-employed, by undertaking a study that compares the self-efficacy and risk tolerance of home-based self-employed with others that are self-employed but who work at other locations, such as in dedicated commercial premises. Rather than undertake a study of isolated traits, we follow studies that emphasize the embedded and intersectional nature of transitions to self-employment (Henley, 2007; Kloosterman, 2010; Jayawarna et al, 2014). Therefore, in addition to self-efficacy and risk tolerance, we consider the role of a range of personal, household and employment factors in the transition to home-based self-employment. The study draws a sample from the UK, large scale, longitudinal panel survey, Understanding Society (Buck and McFall, 2012; University of Essex, 2016). This contains data on a range of individual and household level factors and hence is ideal for our embedded and intersectional perspective.

The paper makes both an empirical and theoretical contribution. It draws from a major social science data source in the UK to provide an empirical understanding of the home-based self-employed. Extant studies of the characteristics of the self-employed do not distinguish between home-based and other self-employment (e.g. Clark and Drinkwater, 2010) confounding the two groups. This study is one of the few that shines a light on the important but under researched home-based self-employed. Our use of a longitudinal data source with a range of social, cultural and economic variables at both an individual and household level, the latter which is particularly salient for home-based self-employment, allows us to contribute to theory by moving beyond associations between variables and suggest causal pathways.

The paper commences with a review of relevant literature, considering prior studies of self-efficacy and risk tolerance in the self-employed and prior studies that explore home-based self-employment. The prior literature is used to propose a research model and derive a set of hypotheses. Further information is provided on the Understanding Society data set and the sample and variables selected. The findings of the statistical analysis are presented together with a discussion of how they relate to and extend existing understanding of home-based self-employment. The paper concludes by identifying the implications for policy and practice and noting limitations of the study and opportunities for future research.

Literature Review

Overview

Many studies have explored personal and contextual factors associated with self-employment and entrepreneurship (e.g. Barbosa et al, 2007; Frank et al, 2007; Jayawarna et al, 2014). Some contrast these factors with those associated with individuals in paid employment (e.g. Chen et al, 1998; Stewart et al, 1999), whilst others undertake comparisons such as between high and low growth entrepreneurs (Stewart and Roth, 2001; Miner and Raju, 2004) or between those stating entrepreneurial aspiration and those that actually become entrepreneurs (Henley, 2007). There is a growing recognition that routes to self-employment are socially embedded and intersectional (Jones and Ram, 2007; Kloosterman, 2010) and therefore require multivariate analysis. Factors that have been considered in intersectional studies include demographic, personality and behaviour, social including household, cultural and ethnic, economic and inter-generational (Henley, 2007; Jayawarna et al, 2014). More recent studies have also emphasised the need to consider a longitudinal

perspective, in order to reflect that the process of forming a new venture is not usually a single event, rather the influencing factors will manifest, develop and intersect over time, resulting in '*pathways to entrepreneurship*' (Jayawarna et al, 2014 p.282), supporting the need for longitudinal studies.

The Role of Self-Efficacy and Risk Tolerance

Self-efficacy is derived from social cognitive theory which views human behaviour as guided by forethought, and is described as a person's belief in their ability to perform the actions and address the challenges associated with attaining a desired outcome (Bandura, 2002). The belief in the ability to attain a desired outcome is a key element of forethought and hence self-efficacy has been found to be associated with other social cognitive variables. For example, individuals with higher self-efficacy have been found to set more challenging goals and to persist longer in pursuing those goals (Densberger, 2014). Strong self-belief about one's own abilities has also been associated with positive affective states, such as satisfaction and well-being, rather than negative ones such as anxiety (Luszczynska et al, 2005). Strong self-efficacy has also been associated with a wider range and more active coping strategies, such as more use of planning, and hence with more effective problem solving (Luszczynska et al, 2005).

High levels of self-efficacy have been associated with self-employment and entrepreneurship. For example, Densberger (2014) finds the entrepreneurs she interviews have high levels of self-efficacy: '*they have got piles of self-efficacy, and they are not afraid to use it*' (p.444). Whilst Culbertson et al (2011) found that students that expressed intentions to become entrepreneurs had higher levels of self-efficacy than those that intended to become employees. Despite the strong interest in self-efficacy in entrepreneurship and self-employment, we are unaware of previous studies that have considered the self-efficacy of home-based self-employed, nor compared it to that of the self-employed based outside the home.

Extant studies of self-employment suggest that the home-based self-employed may differ from other self-employed in their levels of self-efficacy. Home-based self-employment has been associated with an effectual approach (Daniel et al, 2015) and learning by doing (van Gelderen et al, 2008). Rather than achieving pre-defined goals, effectuation is associated with exploiting contingencies that arise and utilising the means at hand to achieve endogenous, emergent goals rather than predefined exogenous goals (Sarasvathy, 2001). A key element is limiting possible losses, termed affordable loss. Many home-based self-employed cite a primary reason for starting their business in the home as the ability to control or limit the costs involved (Bryant, 2000; van Gelderen et al, 2008; Mason et al, 2011), suggesting high aversion to loss and an effectual mind-set.

Two types of self-efficacy are often distinguished. Specific self-efficacy is concerned with undertaking action and addressing challenges relating to a specific task or domain. A number of the studies that have explored self-efficacy and self-employment or entrepreneurship have measured entrepreneurial specific self-efficacy. For example, Chen et al (1998) develop a multi-item measure of entrepreneurial self-efficacy based upon the actions required to start a business.

In contrast, general self-efficacy reflects a belief in being able to take action and address the challenges of a wide range of situations (Schwarzer and Jerusalem, 1995; Scholz et al, 2002). General self-efficacy has been found to be related to domain specific self-efficacy and is also considered to provide a broader and more stable sense of a person's ability to address challenging situations (Luszczynska et al, 2005). It is therefore more appropriate when exploring contexts that span multiple domains or spheres of activity. Home based businesses have been identified blurring a range of domains: spatial (work/family areas of the home), temporal (work/leisure time), emotional (home as workplace or a refuge from work) and are challenging as they require individuals to constantly navigate between or blend these domains (Nansen et al, 2010; Di Domenico et al, 2014). Broadly based self-efficacy therefore seems more appropriate for the study of home-based businesses. Hence, in what follows when we use the term self-efficacy we are referring to general self-efficacy.

Self-employment has also been linked with a tolerance for risk or even risk seeking behaviour. However results paint a mixed picture. In their meta-analysis of the topic, Stewart and Roth (2014) find that the self-employed are associated with higher risk tolerance. However, in another meta-analysis, Miner and Raju (2004) find that entrepreneurs are risk-avoidant. Some of the difference

may arise from the individuals and types of business studied. Caliendo et al (2009) differentiate pushed from pulled self-employed, and find it is the latter that have a higher risk tolerance. Other studies (e.g. Carland et al, 1995; Stewart et al, 1999; Miner and Raju, 2004) divide their sample according to the type of business, differentiating innovative and high growth businesses, which they term entrepreneurial, from those that show modest or no growth. Stewart et al (1999) find that the individuals forming high growth businesses have greater proclivity for risk than the '*modest majority*' (Jayawarna et al, 2014 p.305).

Studies have linked risk tolerance and self-efficacy. However, there have been differing perspectives on the nature of that relationship. Densberger (2014) views self-efficacy as an antecedent to risk tolerance, noting '*self-efficacy is what allows entrepreneurs to be comfortable taking risks*' (p.443). In contrast Barbosa et al (2007) consider risk tolerance as an antecedent to self-efficacy. Finally, Chen et al (1998) consider attitude to risk as part of their entrepreneurial specific self-efficacy measure.

Home-Based Self-Employment

Home-based businesses are defined as '*any business entity engaged in selling products or services into the market operated by a self-employed person, with or without employees, that uses residential property as a base from which its operation is run*' (Mason et al, 2011 p.629). A distinction can be made between home-based businesses where the majority of the work is undertaken in the home and those where work is undertaken from home, however, in many studies these are combined (e.g. Mason et al, 2011). Home-based businesses are highly heterogeneous and include craft production, personal and professional services, hospitality, caring services and trades such as carpentry and plumbing (Berke, 2005; Felstead et al, 2005; Mason, 2009/10). Growth of the gig economy may also be contributing to increased numbers of home-based businesses (Lucas, 2017). Where possible, many of these are making increased use of the internet to operate predominately online home-based businesses, allowing them to access suppliers and customers around the world (van Gelderen et al, 2008; Anwar and Daniel, 2017).

Drawing on a large sample from the Federation of Small Businesses, Mason et al (2011) have undertaken an oft cited analysis of the personal characteristics of the UK home-based self-employed. They find that whilst there is a slightly higher incidence of home-based businesses being wholly owned by women than the comparator group which was owners of small businesses that are not home-based (14% compared to 10% in the comparator group), the majority of home-based businesses are wholly owned by men (44%) or are jointly owned by men and women (33%). They also find that the home-based self-employed are not significantly older. The majority of the sample was under 55 years old (61%) which was similar for the comparator group. Deschamps et al (1998) compare online home-based self-employed with non-online home-based self-employed and found the former were more likely to be single or divorced. Since cause and effect were not explored, this may suggest living alone allows people to use their home for their business or that operating an online home-based business may be less conducive to a happy home-life and marriage. Other studies have linked being home-based self-employed with work-family conflict (Christensen, 1987; Baines, 2002; Laegran, 2008; Di Domenico et al, 2014). Additionally Mason et al (2011) find that the home-based self-employed are better educated, with over one third (34%) having a first or higher degree compared to 26% in the latter group.

Household factors have also been found to characterise the home-based self-employed. Home-based business households are described as having '*a distinctive geography*', with a significantly higher proportion of such businesses being based in rural rather than urban locations (Mason et al 2011, p.631). The lowest levels of home-based business households are found in areas of social deprivation. This has been ascribed to the nature of the housing stock being less suitable. Rented accommodation may also have restrictions on the ability to operate a business, suggesting that higher levels of home-based self-employment would be expected in owner occupied properties (Reuschke, 2016; Reuschke and Houston, 2016; Holliss, 2017). A negative association between home-based self-employment and social deprivation suggests the importance of household wealth. While the start-up costs of home-based self-employment are often low (van Gelderen et al, 2008; Daniel et al, 2015), funding is usually from personal sources such as personal funds, rather than bank or venture capital financing (De Clercq et al, 2013; Saridakis et al, 2014). This suggests the importance of personal funds, such as household savings. Home-based self-employment is often associated with being able to balance work with undertaking caring responsibilities, particularly for children leading to

the term 'mumpreneurs' (Ekinsmyth, 2011; Duberley and Carrigan, 2013). However, Mason et al (2011) found that '*to accommodate family needs*' was cited as a very important reason for starting a home business by less than a third of their sample (27.5%). Combining this relatively low incidence with the previously mentioned high incidence of being single or divorced (Deschamps et al, 1998) suggests home businesses are not the preserve of single- or two-parent families looking after children, but include many single people without children choosing this type of self-employment for other reasons. This contrasts with many qualitative studies of home-based self-employment that emphasise the challenges of balancing and blending family and work responsibilities (e.g. Nansen et al, 2010).

The nature of employment has also been found to be associated with home-based self-employment. Such employment has been particularly associated with knowledge work (e.g. Chalmers, 2008) and with the use of IT to undertake this work (Fairlie, 2006; Di Domenico et al, 2014; Anwar and Daniel, 2017). The high prevalence of knowledge work leads to a high incidence of managerial, professional and administrative occupations being found amongst home-based self-employed (Mason et al, 2011).

The event theory of self-employment (Shapero, 1975; Shapero and Sokol, 1982) considers self-employment as a response to life or employment events such as the acquisition of new skills or sources of finance or low job satisfaction and unemployment. Such events contribute to the common dichotomous characterisation of self-employment as pulled or pushed, despite studies showing that many individuals are influenced by a mixture of both (Vorley and Rodgers, 2014; Walkerman et al, 2015). Given the low levels of respect often accorded to home-based self-employment (Mason et al, 2011) it may be expected that it will often result from push influences. This accords with lower growth associated with such self-employment and the associations between lower growth, lower risk tolerance and pushed self-employment (Stewart et al, 1999; Calidendo et al, 2009).

Research Model and Hypotheses

The foregoing discussion of extant literature was used to develop the research model shown in Figure 1 and the related hypotheses. The model and the hypotheses were used to guide the empirical elements of the study.

The right hand side of the figure shows the two groups compared in the study: home-based self-employed and self-employed that operate in locations away from the home (binary dependent variable). The left hand side of the figure shows characteristics that extant literature suggests may intersect in pathways to self-employment and may differ between the comparison groups (independent variables).

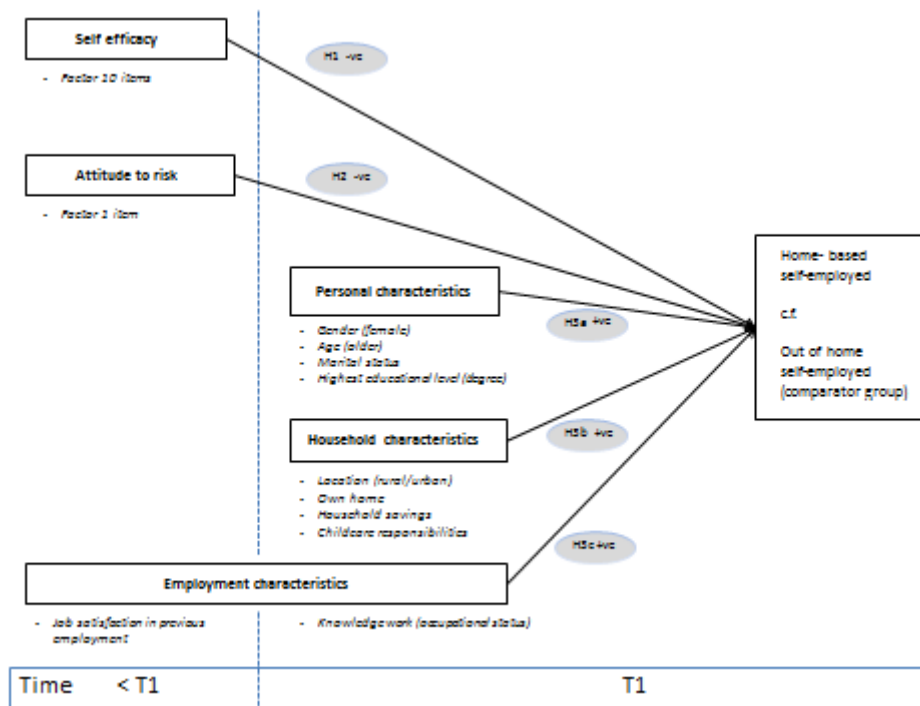


Figure 1: Research model

Considering the role of self-efficacy, as we have noted, despite the considerable interest in self-efficacy of the self-employed, we are unaware of previous studies that have explored this in the home-based self-employed. We therefore draw on studies that have linked home-based self-employment to an effectual and emergent approach (van Gelderen et al, 2008; Daniel et al, 2015) and those that identify the primacy of limiting costs (Bryant, 2000; van Gelderen et al, 2008; Mason et al, 2011) in order to suggest that home-based self-employed have less confidence in meeting exogenous goals than other self-employed and hence have lower levels of self-efficacy. This leads to our first hypothesis (H1):

H1 = Home based self-employed have lower levels of self-efficacy than self-employed operating from other locations.

Extant studies suggest that those operating innovative, high-growth businesses have a greater risk tolerance than those that operate lower growth businesses (Stewart et al, 1999; Densberger, 2014). Whilst not necessarily true (Mason et al, 2011), home-businesses are often perceived as low growth businesses, suggesting that the home-based self-employed will have lower levels of risk tolerance compared to the self-employed operating from other locations. Studies also suggest that there is a positive relationship between self-efficacy and risk (Chen et al, 1998; Barbosa et al, 2007; Densberger, 2014), with lower levels of self-efficacy being associated with lower risk tolerance. Since we have hypothesised that the home-based self-employed will show lower levels of self-efficacy than other self-employed, it is consistent to suggest that they will also show lower levels of risk tolerance than other self-employed. Given that extant literature provides no guidance on the nature of the relationship between self-efficacy and risk, we have made these separate characteristics in our research model. Hence our second hypothesis (H2) is:

H2 = Home based self-employed have lower tolerance of risk than self-employed operating from other locations.

The foregoing discussion of the literature suggests that the home-based self-employed will differ from other self-employed according to personal, household and employment characteristics, which are

captured in our third hypothesis (H3a,b,c). It is important to include these characteristics as variables in our statistical analysis in order to control for their influence when considering the role of our focal characteristics, self-efficacy and risk tolerance. However, given the limited number and currency of studies of home-based self-employed, they also provide valuable findings in their own right.

With regard to personal characteristics home-based self-employed are more likely to be female, single or divorced and better educated than the self-employed operating from other locations (Deschamps et al, 1998; Mason et al, 2011). However, no differences have been found in the ages of the two groups. These findings lead to the first part of our third hypothesis (H3a):

H3a = Personal characteristics of home-based self-employed differ from those of self-employed operating from other locations. In particular they are more likely to be female, single or divorced and better educated. There will be no difference between the ages of the two groups.

Household characteristics have been found to be associated with home-based self-employment. In particular, home-based self-employed have been found to be based in rural locations (Mason et al, 2011). Limited restrictions on operating a business from home associated with owner occupation (Reuschke, 2016; Holliss, 2017) leads us to suggest that home-based self-employment will be associated with home ownership. Also, the reliance on personal funds for such self-employment (e.g. Campell and De Nardi, 2009) suggests that home-based self-employment will be associated with the presence of household savings. Despite home-based self-employment being qualitatively associated with caring responsibilities (Ekinsmyth, 2011; Duberley and Carrigan, 2013), previous quantitative studies have not explicitly explored the link between the presence of children in a household and hence childcare responsibilities. Given the qualitative support for the link between caring for children and home-based self-employment, we suggest the home-based self-employed are more likely to have childcare responsibilities than other self-employed. Taken together, this leads to the second part of our third hypothesis (H3b):

H3b = Household characteristics of home-based self-employed differ from those of self-employed operating from other locations. In particular they are more likely to be in rural locations, be owner occupiers, have household savings and have childcare responsibilities.

Employment characteristics have also been found to differ between home-based self-employed and other self-employed. Extant literature shows that home-based work is associated with knowledge work (Fairlie, 2006; Chalmers, 2008; Di Domenico et al, 2014; Anwar and Daniel, 2017) and managerial, professional and administrative occupations (Mason et al, 2011). The event theory of self-employment suggests previous employment events can push or pull individuals into self-employment. This leads to the final part of our third hypothesis (H3c):

H3c = Employment characteristics of home-based self-employed differ from those of self-employed operating from other locations. In particular they are more likely to be undertaking knowledge based work and be pushed into self-employment by previous employment events.

Method

Understanding Society Survey

The study is based upon data drawn from the Understanding Society survey. This extends the long running British Household Panel Survey (BHPS) and includes data on approximately 40,000 UK households and the individuals within them (Buck and McFall, 2012; University of Essex, 2016). The survey has a longitudinal panel design. The first wave was started in January 2009 with subsequent waves released on an annual basis (University of Essex, 2016). As of June 2017, six waves have been released. Due to the large sample size, each wave of data collection is undertaken across overlapping 2 year periods. However, data collected from households and the individuals within them at the same point in the 2-year data collection cycle, resulting in annual observations. Data collection is from a combination of face to face interviews and self-completion questionnaires.

Panel studies are recognised to bring significant methodological advantages to intersectional and pathway to entrepreneurship studies (Davidsson and Gordon, 2012). These include reduced hindsight and memory decay bias and improved understanding of causality due to the separation in time of independent and dependent variables (Uhrig, 2008).

Due to the large amount of topics addressed by Understanding Society, content is divided into modules which are repeated with varying frequencies over the waves (Understanding Society, 2016). Certain modules such as basic demographics, employment, income and health are repeated every wave. Other modules are repeated at regular intervals (e.g. every other year) and others just once or twice.

The large sample size results in each wave being large enough to allow cross-sectional or cohort studies (Buck and McFall, 2012). The response rate for wave 1 was approximately 57% of households selected for interview and re-contact response rates for waves 2 and 3 were greater than 80% and 90% respectively (Buck and McFall, 2012). Wave 1, year 1 data from Understanding Society was compared to the Labour Force Survey 2009 (Burton et al, 2011). The sample distributions were found to be largely similar, with some slight variations. For example, the Understanding Society sample has a slightly higher proportion of females and a lower proportion of people in paid employment.

Sample Selection

Our key variable of interest, self-efficacy has only been fully measured in the Understanding Society survey in wave 5 (2013/14). Since addressing the ongoing challenges of self-employment may have an impact on self-efficacy, we wished to only consider self-efficacy measured at or before the start of self-employment (indicated as T0 in Figure 1). Hence in order to form a sample for all further analysis, individuals who had become self-employed in waves 5 and 6 were identified (indicated as T1 in Figure 1). The total sample size was 1,463 of whom 393 (27%) were home-based self-employed and 1,070 were self-employed elsewhere.

Variables

The dependent variable for our analysis was location of self-employment categorised into the binary variable: home-based (self-employed at or from home) and non-home-based (self-employed from all other locations). Other locations include separate business premises, client's premises and driving around.

Analysis commenced with an exploratory cross tabulation of a wide range of variables associated with self-employment and home-based self-employment in extant literature, including age, gender, marital status, geographic region, household income (e.g. Clark and Drinkwater, 2010; Mason et al, 2011, Jayawarna et al, 2014; Reuschke, 2016). A summary of this exploratory stage is provided in Table A1 in the appendix. The key variables of interest, self-efficacy and risk attitude, and those showing association with the dependent variable were taken forward to the second stage of the analyses.

Self-efficacy is measured according to the well accepted ten item general self-efficacy (GSE) scale (Schwarzer and Jerusalem, 1995). This uses a four point Likert scale (ranging from 1=not at all true, to 4=exactly true). Scores are averaged over the ten items, resulting in a range from 1 to 4 (SeTotal). Typical items are '*I can always manage to solve difficult problems if I try hard enough*' (Se1). Previous studies have demonstrated the high reliability, stability and construct validity of the GSE (Schwarzer et al, 1999; Leganger et al, 2000; Scholz et al, 2002) and it has been found to be applicable across a wide range of countries (e.g. Luszczynska et al, 2005). For the purposes of the binary logit regression, respondents were coded into two groups: higher self-efficacy (SeTotal \geq 3) and lower self-efficacy (SeTotal $<$ 3).

Attitude to risk is measured by a single item '*Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks*' (Scriska). A centred eleven point Likert scale was used (ranging from 0=avoid taking risks, to 10=fully prepared to take risks). Attitude to risk, which is viewed as a relatively stable trait, was measured in wave 1 (2009/10). Again, for our analysis risk was recoded into a binary variable: higher risk (Scriska \geq 7) and lower risk (Scriska $<$ 7).

Four personal characteristics were included in the analysis: gender, age, marital status and education. All were coded as binary variables. Gender was coded as male (=0)/female (=1). Age as younger (age <50) (=0) and older (age >=50) (=1). Marital status was coded as married (=0) and single/divorced/widowed (=1). Education was coded according to the highest qualifications with two categories: school level/further education (=0) and higher (degree plus) education (=1).

Four household level variables were included. If the household was in an urban (=0) or rural (=1) location. If the home was rented (=0) or owned (=1). If the household had no savings (=0) or had savings (=1). The final household variable was responses to the question '*who is responsible for childcare in the household?*' Responses were coded according to the binary scheme: partner/shared (=0) and self (=1).

Two employment variables were included. Occupational status was measured according to the Standard Occupational Classification 2000 (SOC2000). In order to reflect the association of knowledge work and home-based working, occupational status was coded according to the binary variable: non-manager /professional/ administrator (=0) and manager/ professional/ administrator (=1). In order to proxy for pushed or pulled self-employment, job satisfaction in their employment before they became self-employed (i.e. in wave 4 or 5 as appropriate) was used. Job satisfaction (Jobsat) was measured according to a centred seven point Likert scale (1= completely dissatisfied and 7= completely satisfied). This was recoded into a binary variable: not satisfied (Jobsat <=4 =0) and satisfied (Jobsat >=5 =1).

Statistical Analyses

Analysis of the key variables and those shown by the exploratory cross tabulations commenced with the production of a correlation matrix using Pearson and two-tailed significance tests for all the variables of interest (see Table A2 in the appendix). As indicated by the initial cross tabulations, several of the independent variables are positively correlated with home-based self-employment (for example, age, gender and marital status). A number of the variables are correlated with each other. For example, self-efficacy is found to be correlated with gender, age and marital status, with being female and divorced/widowed being negatively associated with self-efficacy and being older (>50) positively associated. Such cross-correlations support intersectionality and the need for multivariate analysis. The lack of any Pearson correlations at 0.9 or above suggests suitability for inclusion of factors in multivariate analysis (Tabachnik and Fidell, 2013).

Multivariate analysis was undertaken by means of binary logistic regression (Tabachnik and Fidell, 2013), with the binary dependent variable being if self-employment was home-based or not. Binary logistic regression is widely recognised as a robust multivariate technique capable of accommodating categorical and continuous independent variables, while requiring no assumptions about the underlying distribution of those variables. It has been used in a wide range of studies in the entrepreneurship domain (e.g. Baldock et al, 2006).

As noted previously, the study started with a relatively wide range of dependent variables. However, a common drawback of large variable sets is the reduction in the sample size when large numbers of variables are included. A well-established approach is to undertake a series of test multivariate binary logistic regressions in order to ascertain which are the most significant variables, termed drop variable methods (Tabachnik and Fidell, 2013). Four such test regressions were undertaken and the variables identified in Table 2 were identified as of central to the study's aim or showing the greatest levels of statistical significance.

Findings and Discussion

The incidence of 27% of home-based businesses in our sample of business start-ups is lower than the 36% found by Mason et al (2011) and significantly lower than the nearly 70% estimated in other studies (e.g. Kelley et al, 2012).

Table 1 shows the results of the binomial logit regression analysis which addresses our research hypotheses.

Table 1: Results of Binomial Logit Regression Analysis

Variable Categories	Variables	B	S.E.	Sig.	Exp(B)	
	Self-efficacy (3+)	-.206	.306	.499	.813	
	Risk tolerance (high)	.132	.243	.587	1.141	
Personal	Female	.234	.264	.374	1.264	
	Age 50+	.434	.271	.109	1.544	
	Divorced/widowed	.989	.454	.029	2.688	*
	Degree + qualification	.093	.255	.715	1.098	
Household	Rural	.048	.274	.862	1.049	
	Own home	.080	.278	.775	1.083	
	Have savings	.929	.274	.001	2.532	***
	Child carer	1.150	.394	.004	3.157	**
Employment	Job SOC2000 Manage/Pro/Admin	.615	.267	.021	1.850	*
	Satisfied in former job (high)	-.671	.255	.009	.511	**
	Constant	-1.450	.414	.000	.235	

R sq = 0.182, N = 362. Significance levels: *>.05; **>.01; ***.001

The coefficients for the key variables of interest, self-efficacy and risk tolerance are both statistically not significant. Hence both hypotheses H1 and H2 are not supported. Our null findings suggest that, as a group, the home-based self-employed have levels of self-efficacy and risk tolerance that are indistinguishable from those of the self-employed operating from other locations. This finding is an exoneration of the home-based self-employed. Rather than the timid bunch they are often portrayed as, that are forced to start their businesses in the home because they lack confidence in their own abilities and do not want to take risks, our findings suggest they are as equally self-efficacious and risk tolerant as other self-employed. Like the self-employed who start their businesses outside the home, home-based self-employed are a heterogeneous group. In both groups there will be individuals with low and high self-efficacy and risk tolerance.

With regard to personal characteristics, Table 2A in the appendix shows that age (over 50), gender (female) and education (degree level) are highly correlated with home-based self-employment. However, the logit regression shown in Table 2 shows that when other factors are considered they are no longer significant, supporting the intersectionality of factors. Age of starting self-employment is often found to be a balance between gaining sufficient work experience and accumulating necessary resources, particularly financial resources, and a reluctance or inability to give up paid employment when individuals have family commitments (Henley, 2007). The correlation matrix shown in Table A2 highlights the association of age (>50) with having savings, home ownership and professional status. These are all found to be more powerful explanatory factors than age in the logit model, suggesting that resource accumulation rather than age is important to the home-based self-employed, despite the low costs associated with this form of self-employment.

The lack of association with gender when a range of factors are considered, contrasts with the frequent portrayal of home-based self-employment as predominately female. Rather, our findings are in agreement with those of Mason et al, 2011, who find no association with gender. Prior research provides a mixed picture of the relationship between self-employment and higher education. Some prior studies have found that the self-employed are more likely to have had higher education (i.e. obtained a degree) than those in paid employment (e.g. Clark and Drinkwater, 2010). In contrast others find no relationship between self-employment and education (e.g. Jayawarna et al, 2014). These latter authors argue that those with a higher education have better employment prospects, creating an opportunity cost to self-employment. As with age, inclusion of multiple factors in our logit model shows education is less powerful than other variables such as professional status and having savings. Our finding that there is no difference between the home-based and other self-employed when a range of factors are considered, suggests that those with a higher education that become self-employed are equally likely to be home-based or be based outside the home. This adds to our

exoneration of the home-based self-employed, not only are they equally self-efficacious and risk tolerant, they are also equally educated and qualified as those self-employed based in other locations.

Of the four personal variables considered, our findings suggest that the home-based self-employed are more likely to be divorced or widowed than other self-employed, providing limited support for hypothesis H3a. Extant studies have associated home-based self-employment with being married or living as a couple, since the paid employment of one partner can help if the home-based self-employment does not provide sufficient income or if that income is variable (Bryant, 2000; van Gelderen et al, 2008). However, our results would suggest that home-based self-employment is attractive when there is not another wage earner to provide support. This may be due to the lower costs involved in starting and operating home-based businesses, allowing singletons to protect themselves from insufficient or variable incomes. Alternatively, it may be that other aspects of working from home become possible or more attractive to people living without a partner, for example, more space for their business, less distractions or the desire to fill time with a worthwhile activity.

With regard to household level variables, Table 2 shows that the location (rural) and home ownership are not significantly associated with home-based self-employment. While Mason et al (2011 p.631) find 'a rural-urban dimension', they also find a high proportion of home-based self-employment in 'affluent towns and cities...in Southern England'. The lack of significance of the rural/urban variable in our findings may reflect a proportion of both of these locations in our sample. That home ownership is not associated with home-based self-employment is a reassuring finding. Given the high incidence of living in rented accommodation, particularly amongst certain groups such as the young, those on low incomes or living in cities with high property costs, it is heartening to find that living in rented accommodation does not appear to be a barrier to home-based self-employment. Our findings show that there is a positive association between having household savings and being responsible for childcare and home-based self-employment, providing partial support for H3b. That being home-based appears to require the presence of savings is consistent with earlier studies that find such self-employment is funded from private sources rather than third parties such as banks and venture capital (Campell and De Nardi, 2009; Cassar, 2009). Previous studies have explored the link between childcare responsibility and self-employment often finding a negative association. For example, Jayawarma et al (2014) find 'childcare – a form of household (HH) labour...[negatively] mediates ... pathways to business creation' (p.282). In contrast, our study suggests that being home-based offers those with childcare responsibilities a pathway to self-employment. Interestingly, given being responsible for childcare is found to be significant, whilst gender is not, suggests that home-based self-employment may also provide a pathway to non-gendered caring roles, providing not only economic, but also social emancipation.

A positive significant association of home-based self-employment was found with occupational status and a negative significant association with job satisfaction in previous employment, providing support for hypothesis H3c. The home-based self-employed were more likely to describe their occupational status as manager, professional or administrator. This is consistent with extant studies that associate home-based self-employment, and home-based work more generally, with knowledge work (Chalmers, 2008). This is consistent with our findings of the home-based self-employed being equally educated and self-efficacious as other self-employed, rather than being constrained to low skilled occupations. The negative association of job satisfaction in previous employment with home-based self-employment suggests that push rationales may play a role, with those dissatisfied with their previous employment viewing home-based self-employment as a viable and better alternative. However, consistent with studies that find self-employment often results from a mixture of push and pull rationales (Vorley and Rodgers, 2014), the significance of household savings and childcare responsibilities suggest that pull rationales of having sufficient financial resources and being able to accommodate family needs also play a role in basing self-employment in the home. Previous studies have associated pushed self-employment with lower risk tolerance (e.g. Caliendo et al, 2009). That our sample was found not to have a significantly lower risk tolerance further supports the notion of a mixture of push and pull influences. Satisfaction with current employment was not included in the logit model, since it would only be known *ex post*, and could not therefore be taken as a true pull factor. However, this variable was included in the exploratory cross tabulation analysis shown in Table A1, and was found to be significantly higher for home-based self-employed, vindicating their decision.

Conclusion

It is often said that a null finding in a statistical study is as valuable as a significant finding. In the case of this study, we agree with that sentiment. As noted, home-based self-employment is often paid less attention and less respect than other forms of self-employment. Pejorative terms such as 'hobby businesses' suggest that the founders of such businesses lack confidence in their own abilities or their business ideas. This study finds that home-based self-employed are as equally self-efficacious and risk tolerant as those who base their self-employment in other locations.

Our findings suggest basing a business in the home is not a response to low self-efficacy and risk tolerance. According to these measures it is not a behavioural response, suggesting instead that it is a rational cognitive choice. This interpretation is consistent with other quantitative and qualitative studies of home-based self-employed in which the individuals describe how being home-based offered a number of advantages, including reducing costs so that they could invest more in the business itself and hence allow it to grow, eliminate commuting time, reduce the amount they needed to earn to cover business costs and hence the number of hours they needed to work (van Gelderen et al, 2008; Vorley and Rodgers, 2014; Reuschke, 2016).

The limited significance of the personal variables we explored suggests that there are a wide diversity of individuals that are home-based self-employed. Instead, household and employment variables appear to provide a stronger characterisation of this type of self-employment. Taken together these variables are consistent with qualitative studies that find that self-employment is the result of both push and pull influences. In the specific case of our study, home-based self-employment is likely to result from a push due to dissatisfaction with previous employment and the pull of being a knowledge worker, having access to private funds and being able to accommodate family needs.

Practice and Policy Implications

Studies of entrepreneurship and self-employment have identified various liabilities including smallness and newness when developing legitimacy (Zimmerman and Zeitz, 2002). Like other small businesses, the home-based self-employed often adopt impression management techniques to address these liabilities, including the additional '*liability of being home-based*' (Nagy et al, 2012; Überbacher, 2014). These techniques seek to effectively increase their legitimacy. We hope that our study will reduce the need for practitioners to adopt impression management techniques, as they are recognised as equally self-efficacious and risk tolerant as other self-employed.

Our study suggests that policy makers and business advisors should recognise that being home-based self-employed reflects a rational cognitive choice and does not signify limited growth potential or ambition. They should therefore provide similar support services as provided to other self-employed, whilst also recognising that the home-based self-employed may be more difficult to identify, particularly if they are trying to remain 'under the radar' due to concerns about working from home (Mason et al, 2011). Home based self-employment also has implications for the design of homes and towns. Forward thinking architects and town planners in the UK and internationally are recognising the growth in home-based self-employment, and home-based working more generally, and are looking at ways of enabling a wider range of business types to operate from home. Reuschke and Houston () for example, call for multi-use property designs and neighbourhood planning. Whilst such developments would widen the opportunity to base self-employment at home and could improve its image, it must be acknowledged that home-based self-employment has also been associated with a number of disadvantages or challenges, including increased workload and stress due to the difficulty of separating work and home life and social and professional isolation. The latter has led to the growth in formal co-working spaces, and the more informal re-purposing of other spaces such as coffee-shops as ad hoc meeting places (Fuzi, 2015) and self-storage facilities as business premises (Daniel and Ellis-Chadwick, 2016).

Limitations and Future Research

The limitations of the study should be acknowledged. Understanding Society has a large number of variables that would be relevant to this study. However, the size of our sample limited the number of variables that we could investigate within a single logit regression. As suggested by the lack of significant associations of personal variables in our study, there is a diversity of individuals drawn to

home-based self-employment. Within this heterogeneity, there may be sub-groups with similar characteristics. Future research could undertake cluster analysis on a sample in order to identify distinct groups. Identification of such groups could allow policy and business support to be better targeted on the characteristics and needs of each group and hence ensure the home-based pathway to self-employment is available to more people. The longitudinal nature of the Understanding Society dataset would also allow investigation of changing nature of personal traits, for example if and how self-efficacy and attitude to risk develop over extended periods of entrepreneurship.

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Appendix

Table A1: Variables investigated by exploratory cross-tabulations

Variables	Percentage of Home based self-employed (%)	Percentage of self-employed based elsewhere (%)	Percentage of all self-employed (%)
Self-efficacy/risk			
Risk taker: no low (0 to 1; n=672)	6	6	6
High risk taker (7 to 10)	44	46	46
Mean efficacy score 3+ (=931)	78	77	77
Personal			
Gender female	53***	32	38
Age <35	23***	31	29
Age 35-49	35	42	40
Age 50-64	31***	22	25
Age 65+	11***	5	7
Have children aged 4-15	21***	12	15
Mainly responsible for childcare (N=859)	16***	2	6
Married	53	52	52
Divorced/widowed	12**	7	8
Minority Ethnicity (not white British/Irish)	21	44	38
Degree+ educated	53***	40	44
Household			
Rural	29***	18	21
North of England	22	20	21
English Midlands	22	21	21
London & South East	30	39	37
Scotland, Wales, NI & SW England	26	20	22
Livingly comfortably/alright	64*	56	58
Own fully/mortgage/share ownership	70	65	67
Renting	28	33	32
Zero share of household(h/h) income monthly	31***	54	47
50%+ share monthly	28***	17	20
Zero Net h/h income monthly	1***	28	21
£2k+ Net h/h/ income monthly	75***	47	52
Have savings	32***	22	25
Employment			
High (mostly/completely) previous job satisfaction	27	22	23
High (mostly/completely) current job satisfaction	62***	41	46
Agriculture/Primary activity	11**	5	7
Manufacturing/construction	7**	24	19
Wholesale/Retail/Food/Accommodation	17	15	15
IT & Professional services	34**	28	30
Education/Arts/Health	25	20	22
Personal services	6	7	7
Manager	21***	13	15
Professional	43***	30	33
Administrative	6***	3	4
Trade	11***	21	18
Service	13	11	12
Operative	6***	23	18
Total n=	393	1070	1463
Significance scores: *>.05; **>.01; ***>.001			

Table A2: Correlation matrix for variables in logit regression model

		Home based	Self-efficacy	Risk tolerance	Female	Age (50+)	Marital status	Education	Rural	Own Home	Have savings	Child carer	Manager/ profess'l	Prev. job satisfaction
Home based	Pearson	1	.007	-.029	.188**	.103**	.073*	.094**	.014	.053	.116**	.196**	.217**	.047
	Sig.		.835	.450	.000	.001	.021	.002	.644	.051	.000	.000	.000	.071
Self-efficacy	Pearson	.007	1	.155**	-.088**	.012*	-.025**	.094**	.019**	.049	.085**	-.019**	.076**	.074*
	Sig.	.835		.000	.000	.016	.000	.000	.000	.144	.000	.001	.000	.023
Risk tolerance	Pearson	-.029	.155**	1	-.137**	-.115**	-.047**	.119**	.011	-.016	.003	-.022**	.064**	.077*
	Sig.	.450	.000		.000	.000	.000	.000	.101	.680	.706	.002	.000	.046
Female	Pearson	.188**	-.088**	-.137**	1	.001	.121**	.021**	-.002	.022	-.068**	.230**	.069**	-.002
	Sig.	.000	.000	.000		.826	.000	.000	.676	.470	.000	0.000	.000	.950
Age (50+)	Pearson	.103**	.012*	-.115**	.001	1	.289**	-.083**	.104**	.123**	.186**	-.238**	.017**	-.005
	Sig.	.001	.016	.000	.826		0.000	.000	.000	.000	.000	0.000	.006	.868
Marital status	Pearson	.073*	-.025**	-.047**	.121**	.289**	1	-.081**	.013**	-.055	-.003	-.099**	-.011	.032
	Sig.	.021	.000	.000	.000	0.000		.000	.010	.085	.616	.000	.080	.310
Education	Pearson	.094**	.094**	.119**	.021**	-.083**	-.081**	1	.001	.101**	.169**	.058**	.409**	.068*
	Sig.	.002	.000	.000	.000	.000	.000		.882	.001	.000	.000	0.000	.024
Rural	Pearson	.014	.019**	.011	-.002	.104**	.013**	.001	1	.074*	.058**	-.013*	.006	.013
	Sig.	.644	.000	.101	.676	.000	.010	.882		.016	.000	.012	.338	.663
Own home	Pearson	.053	.049	-.016	.022	.123**	-.055	.101**	.074*	1	.116**	.039	.078*	.059*
	Sig.	.051	.144	.680	.470	.000	.085	.001	.016		.000	.164	.024	.029
Have savings	Pearson	.116**	.085**	.003	-.068**	.186**	-.003	.169**	.058**	.116**	1	-.061**	.211**	.069*
	Sig.	.000	.000	.706	.000	.000	.616	.000	.000	.000		.000	.000	.036
Child carer	Pearson	.196**	-.019**	-.022**	.230**	-.238**	-.099**	.058**	-.013*	.039	-.061**	1	.034**	.041
	Sig.	.000	.001	.002	0.000	0.000	.000	.000	.012	.164	.000		.000	.136
Manager/ profess'l	Pearson	.217**	.076**	.064**	.069**	.017**	-.011	.409**	.006	.078*	.211**	.034**	1	.095**
	Sig.	.000	.000	.000	.000	.006	.080	.000	.338	.024	.000	.000		.005
Prev. job satisfaction	Pearson	.047	.074*	.077*	-.002	-.005	.032	.068*	.013	.059*	.069*	.041	.095**	1
	Sig.	.071	.023	.046	.950	.868	.310	.024	.663	.029	.036	.136	.005	

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).