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abstract

This article demonstrates that housing influences decisions to start businesses or become self-employed. Housing characteristics can facilitate or hinder business start-ups, and the mechanisms depend on whether the business start-up takes place in people's homes or not. Hitherto, economic geography has largely viewed housing as a system that accommodates and filters the workforce across space and neglected that housing is an economic resource to individuals. Using longitudinal micro-data for the United Kingdom and a sample that accounts for the endogeneity of housing to employment/entrepreneurship, the study finds that home-based self-employment is facilitated by housing wealth, outright ownership, detached houses, and large dwellings and is undermined by living in flats. Private rented accommodation enables entries into self-employment that are not based in people's homes. Housing thus provides financial security and space, on the one hand, and shapes flexibility needed for entrepreneurship, on the other hand. Areas for future research arising from this study relate to the role of housing over the individual entrepreneur's life course and area effects on entrepreneurship and self-employment that relate to the spatial variation of housing supply.

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This article argues that it is not possible to fully understand people's decisions to start up their own businesses or become self-employed without understanding the housing choices and housing resources available to them. Economic geography has incorporated housing supply into models of urban development (Glaeser, Gyourko, and Saks 2006; Florida and Mellander 2010; Koster, van Ommeren, and Rietveld 2016) and new firm formation (Reynolds, Storey, and Westhead 1994), and investigated how housing, neighborhood choice, and residential segregation impact on job access and the creation of spatial mismatch (Houston 2005; Green and Owen 2006). Yet these literatures provide an incomplete view of housing's role in economic geography. Housing is reduced to a system that accommodates the workforce, and filters workers with different skill sets and income to different locations. The utility of housing as an economic resource to individuals has not been investigated. This article goes beyond the existing *workforce container* model, specifically in understanding the role of housing in shaping self-employment and entrepreneurial choices.

A new literature has emerged on home-based businesses (HBBs) where the business is run from people's homes or the homes are used as a base. This literature, mainly published in management journals (e.g., *International Small Business Journal, Women in Management Review,* and *Small Enterprise Research*) pays little attention to the location and characteristics of housing and is disconnected from the body of literature on new firm formation and entrepreneurship in geography. Running a business from the home applies to *new* information technology occupations and *old* occupations such as child care, farming, and hotel service (e.g., Bed and Breakfast) alike. Despite their numerical significance and distinct spatial nature through connecting home with business location and work life, HBBs have not been studied in economic geography (Mason, Carter, and Tagg 2011 is an exception). This article unites the previously disconnected literature on HBBs and the geography literature on new firm formation and entrepreneurship.

The main aim of this article is to contribute to knowledge about the roles of housing for understanding self-employment and business start-ups. It asks, first, whether there are features of housing that facilitate or hinder self-employment and business

start-ups. Connections between housing and business choices are most apparent for HBBs, since the home is the location or base of the business. The economics literature suggests that the spatial fixity and insufficient variation in the range, quality, and cost of housing impact on labor market outcomes in a number of ways. Thus, there may also be effects of housing on business start-ups that are not based in people's homes. The businesses that operate in nondomestic premises presumably also require more space as well as finance and/or may have negative spillovers (e.g., car repairs). This article therefore asks, second, whether housing features impact on HBB start-ups differently than those that are not home-based. The interest in this article is on any kind of self-employment across various industries where people start working for themselves as opposed to working for an employer. Subcontractors, however, who work for one *employer,* are not the focus of this study, since they are similar to employees.

Empirically, this article tests the effects of financial, physical, and spatial characteristics of housing and housing tenure (owning/renting)[1] on entries into self-employment by using longitudinal microdata for the United Kingdom. The longitudinal study design allows the sequence of associated phenomena to be identified, which would be impossible with cross-sectional data. Factors influencing entry into self-employment are modeled separately by whether the newly self-employed use the home as business location or not.

The next section discusses existing findings on housing in relation to self-employment, new firm formation and HBBs in literature on labor economics, housing economics, geography, and management. On this basis, the empirical model for this analysis is derived in the section that follows. The data and measurements are described in the first subsection. Central to the empirical analysis is the endogeneity of housing to employment, namely, the high correlation of housing tenure with employment outcomes (Battu, Ma, and Phimister 2008). This analysis deals with this statistical problem following the *treatment effect* approach used in health research and labor economics (Panis and Lillard 1994). This approach and the sampling are described in the second subsection. Empirical findings are presented and interpreted in the final section. The concluding section summarizes and discusses the empirical findings, their contribution to the literature, and opportunities for future research.

Literature Review and Hypotheses

Housing can have different functions and provide different resources for (would-be) entrepreneurs and the self-employed. For making connections between housing choices and people's self-employment and entrepreneurial decisions, three housing features or dimensions are relevant. First, housing is a financial asset for homeowners (Smith and Searle 2010). Second is housing tenure, which captures more than just financial aspects of housing and includes a range of aspects in relation to security and risk; social status, social class, social mobility, and family background; and self-determination and independence, and culture (Dietz and Haurin 2003; Dupuis and Thorns 1996)—all of which feature in the entrepreneurship and self-employment literature to describe motivation and personal traits of entrepreneurs as well (Parker 2004). Third are physical and spatial features of housing, for instance, space available.

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[1] Housing tenure is the legal status of housing occupancy. The four most common types are owning the home outright, owning the home with a mortgage, social rented housing, and private rented housing.

Housing as a Financial Asset for Individuals

Most literature in the field has regarded housing—if at all—as a financial asset that is a proxy of personal wealth. Empirical findings are not only variable but also ambiguous in terms of interpretation.

Microstudies have used housing equity, that is, the difference between the market value of the residential property and the outstanding debt on this property, as an indicator of household assets alongside other assets for testing whether there are financial constraints (credit rationing) for business start-ups or self-employment entry. Similarly, house price appreciation in the local area has been used as a proxy of housing equity increase (decrease). Some studies found a positive effect of housing equity or house price appreciation on self-employment (Evans and Leighton 1989; Black, de Meza, and Jeffreys 1996; Taylor 1996; Robson 1998; Disney and Gathergood 2009; Fairlie and Krashinsky 2012), although others did not find empirical evidence for the impact of housing equity or other indicators of personal wealth on self-employment (Robson 1996; Hurst and Lusardi 2004). Studies that found a housing equity effect most often argued that this means that business owners who own their own home can secure finance for their business through the mortgage market (Black, de Meza, and Jeffreys 1996; Henley 2005; Disney and Gathergood 2009). Others also assumed that this could be a *wealth effect* (Taylor 1996), which means in the economic literature that entrepreneurs use self-finance instead of external finance for the business start-up and thus wait until they saved enough wealth for entering entrepreneurship (Parker 2004).

Reasons for these differing results may relate to problems of *endogeneity*, since housing wealth is endogenous to entrepreneurial decisions, unobserved variable bias, or different measures of business start-ups (e.g., businesses that are registered for the value-added tax or microlevel self-employment data). Time period effects may also be relevant, since finance through the mortgage market mirrors the economic cycle. For example, this type of finance for business purposes peaked in the 2000s in countries with deregulated mortgage markets such as the United Kingdom, whereas this source of funding has been less accessible for the self-employed since then (Reuschke and Maclennan 2014a).

Existing research in this area has not differentiated whether the start-up is based in people's homes or not. The HBB literature argues that motivations for running a business from home are primarily related to cost minimization from low overheads (Loscocco and Smith-Hunter 2004; Mason, Carter, and Tagg 2011; Vorley and Rodgers 2014; Daniel, Di Domenico, and Sharma 2015). Business start-ups outside people's homes cluster in industries that are likely to require more start-up capital than an HBB (cf. Mason, Carter, and Tagg 2011). Thus, for non-home-based start-ups, housing equity could be a means for securing external funding, although the start-up of HBBs is more likely to be self-financed.

Housing Tenure

Housing tenure (owning/renting) features in the labor economics and housing economics literature as one factor influencing employment outcomes. Some argue that home ownership and social housing may inhibit labor mobility and thus negatively impact on labor market participation (Oswald 1996; Hughes and McCormick 2000; Dohmen 2005; Blanchflower and Oswald 2013). International evidence also suggests that outright home ownership facilitates early exit from the labor market (Stephens et al. 2010). Self-employment has not been considered in existing research, even though self-employment makes up a considerable proportion of the workforce across

Organization for Economic Cooperation and Development countries (Parker 2004; Hatfield 2015).

Only a few studies incorporated housing tenure in models of new firm formation or self-employment. Findings are inconclusive, and explanations of observed housing tenure effects are sparse. Positive associations between home ownership and new firm formation or self-employment were found in both aggregate and microstudies (Whittington 1984; Reynolds, Storey, and Westhead 1994; Henley 2004; Reynolds, Storey, and Westhead 1994; Jayawarna, Rouse, and Macpherson 2014). Furthermore, Henley (2004, 2007) found that private renters are more likely to become self-employed, whereas social housing tenants[2] are less likely to be self-employed. It is speculated that an observed positive effect of outright ownership on self-employment is a *wealth effect* (Jayawarna, Rouse, and Macpherson 2014) and that social housing may hinder self-employment, since social renters typically have reduced credit ratings (Henley 2004).

A general problem of these studies arises from the fact that housing tenure is not exogenous to self-employment status as was tested by Henley (2004). These studies therefore may have picked up different risks attitudes or spatial mobility behaviors rather than housing tenure effects. Outright home ownership may also measure social class (intergenerational transfer of wealth and knowledge). Similarly, studies that controlled for the endogeneity of housing tenure in relation to unemployment did not find support for the hypothesis that home ownership increases unemployment (Van Leuvensteijn and Koning 2004; Battu, Ma, and Phimister 2008). Results, however, still vary with respect to the impact social housing has on unemployment (Battu, Ma, and Phimister 2008; Dujardin and Goffette-Nagot 2009).

The use of the home for business purposes is often restricted by tenancy agreements both in private and social housing. For example, in the United Kingdom, it is not until recently that some housing associations allow their tenants to use space in the home for running a business (Reuschke and Maclennan 2014b). Homeowners, in contrast, are usually free in their decisions of how to use their homes, unless special local planning restrictions apply to the attached land or parking spaces. Furthermore, private renters do not have the security of tenure in the United Kingdom and are often faced with involuntary mobility (Bone 2014; Clapham et al. 2014). There is also likely to be a space issue inherent in social housing. These are housing circumstances that may also run counter to an HBB because if people have to move, the new home may not be suitable for running an HBB.

Taken together, it is therefore expected that home ownership facilitates home-based self-employment, whereas both the private rented sector and the social housing sector hinder the use of the home as a business location. With respect to a business start-up that is not based in the home, and thus requires a certain amount of start-up capital, a plausible argument in the literature is that social renters may be constrained due to credit rating.

Physical and Spatial Characteristics of Housing

Both physical and spatial features of housing structure individual and household activities and patterns of social action (Saunders and Williams 1988) and thus could also be expected to influence self-employment and entrepreneurial activities (e.g., space in the house is needed for HBBs). The impact of physical characteristics of housing on employment outcomes features in the literature on poverty and social

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[2] In the United Kingdom, social rented housing includes housing rented from a local authority or housing association.

deprivation. However, self-employment has not been discussed in this literature, and effects on employment outcomes are not rigorously tested. There is some evidence that poor housing conditions, such as small rooms and overcrowding, or insecure housing impact on child development and adults' health, which may limit people's ability to gain employment and higher earnings (Saunders and Williams 1988; Tunstall et al. 2013).

The importance of dwelling size for entrepreneurship is suggested by some HBB studies. Using the UK membership survey of the Federation of Small Businesses (FSB), Mason, Carter, and Tagg (2011) found that many HBB entrepreneurs use a distinct room in their home for their businesses; Walker (2003) in relation to HBBs in Australia noted, "HBBs were most definitely not operating from their kitchen table." It can therefore be hypothesized that dwelling size is relevant for setting up HBBs. The owner-occupation effect on self-employment observed in some research might therefore be a dwelling size effect rather than a wealth/finance access effect.

Employees working from home has gained much attention in research and policy in the late 1990s and 2000s when Information and Communication Technologies (ICTs) enabled remote working, and firms started to introduce telecommuting as a means to cut overhead (office space and infrastructure). On the policy side, concern was raised that much of the available housing is not suitable for working from home and that dwelling design remains a barrier to flexible ways of working (European Commission 1998). It was suggested that semidetached and detached houses may be best suited for working at home, since they offer the possibility of an extension or the conversion of living space into workspace, for instance, converting a garage into a workroom. Conversely, terraced houses or apartments (flats) were seen as constraints on expansion (Green Shaw, Strange Shaw, and Trache 2000). In this respect, it is notable that in the FSB study by Mason, Carter, and Tagg (2011), one-fifth of the surveyed HBB owners work from attached or external premises (e.g., a garden building) or an extension to the house. It is therefore hypothesized that house type has an independent effect on HBB start-ups. More precisely, it is expected that (semi-)detached houses have a positive effect on HBB start-ups, although these are inhibited by apartments and terraced houses.

The self-employed or entrepreneurs who work from external/commercial business premises may (occasionally) work from home, but since the operation of the business is geographically distinct from the home, it is expected that dwelling size and dwelling type do not influence their start-up decisions.

Data and Empirical Specification
Data and Self-employment Definition

The empirical analysis is based on two large longitudinal microdata sets: the British Household Panel Survey (BHPS) and the UK Household Longitudinal Study (UKHLS or "Understanding Society"). The great advantage of these data compared to cross-sectional data sets is that the sequencing of events can be identified, and therefore transitions can be explored.

The BHPS ran from 1991 to 2008 and was succeeded by the UKHLS in 2009. At the time of the present analysis, three waves of the UKHLS were available. The second wave of the UKHLS is, in effect, Wave 19 of the BHPS sample, even though the gap between the interview in Wave 18 and Wave 19 is slightly higher than 12 months (Knies 2014). Linking both surveys allows tracking of people for up to 20 years. In both surveys, all household members aged 16 and over are interviewed each successive

year. If individuals leave their original households, they are captured as a new household, and are interviewed along with all other adult members of the new household.

In this article, self-employment entry is defined as moving into self-employment between subsequent waves (t to $t + 1$). The self-employment status relies on the self-reported employment statement of the respondents for the main job. It has to be noted, however, that most companies in the United Kingdom are run by *employed* directors. Thus, some directors may classify themselves as employed rather than self-employed. All other people who run their own businesses as sole proprietors or in partnerships would classify themselves as self-employed. As only 29 percent of all UK businesses were companies in 2013/2014 (Department for Business, Innovation and Skills 2014), the applied measurement will capture the vast majority of business activities.

Furthermore, subcontractors are excluded from the self-employment definition to achieve a better match with the concept of entrepreneurship. These can be identified in the BHPS since Wave 7 and onward. Those self-employed workers, who work in the construction industry are male and have a general certificate of secondary education as their highest educational attainment, are most likely to be subcontractors based on analysis of pooled Waves 7–20. The self-employed with those characteristics across Waves 1–6 were assumed to be subcontractors, too, and therefore excluded from this analysis.

Whether an entry into self-employment is home-based or not is defined through commuting information. Those self-employed workers who work at home or from their own home are considered as HBBs in this study. The latter category includes those who use their home as a base but travel out to do work. Given the sample size, a distinction between HBBs that operate in the home and those that use the home as a base cannot be made in this study. Becoming a home-based self-employed worker is thus defined as someone who was not self-employed at t but was self-employed (excluding subcontractors) and mainly worked from home/at home in the subsequent wave. Accordingly, those who were not self-employed at t but in self-employment in the subsequent wave (excluding subcontractors) and who did not work mainly from home/at home are defined as non-home-based self-employment entries.

Model Specification and Sample

Longitudinal data are clustered data, since repeated observations are used at different points in time for the same individual. This within-individual dependence can be modeled by incorporating cluster-specific intercepts (random intercepts) into the regression model. A random-intercept logistic regression model is specified using a generalized linear model formulation that can be written as

$$\text{logit}\{\Pr(y_{ij} = 1 | x_{ij}, \zeta_j)\} = \beta_1 + \beta_2 x_{2j} + \beta_3 x_{3ij} + \beta_4 x_{2j} x_{3ij} + \zeta_j,$$

with fixed effects for the coefficients x_{ij} and an individual-specific random effect ζ_j (Rabe-Hesketh and Skrondal 2012). The response variable y_{ij} is 1 if the person enters self-employment (home-based or non-home-based) between subsequent waves and 0 otherwise. The responses are independently Bernoulli distributed.

$$\text{logit}(\pi_{ij}) = \beta_1 + \beta_2 x_{2j} + \beta_3 x_{3ij} + \beta_4 x_{2j} x_{3ij} + \zeta_j,$$

$$y_{ij} | \pi_{ij} \sim \text{Binomial}(1, \pi_{ij}).$$

The model assumes that the random intercepts ζ_j are independent and identically distributed across individuals j and are independent of the covariates x_{ij}. A random-intercept model is preferred as the interest of this article is in both within-individual and between-individual effects (and not just changes in individuals over time on the probability of self-employment entry). Further, the generalized linear model formulation is preferred, since robust standard errors that account for temporal dependencies of residuals can be obtained through fitting the model in Stata using the gllamm command.[3]

Housing decisions are endogenous to individual labor market transitions (Battu, Ma, and Phimister 2008). Thus, the failure to take account of this endogeneity of housing to self-employment entry would result in biased estimates of housing effects in random intercept models. One econometric possibility that cannot be investigated in this article is a fixed effects panel version of the specified model. A fixed effects model would eliminate all observations where the housing tenure remains the same in adjacent waves. This is inconsistent with the conceptual framework of this research, since remaining in the same tenure (housing situation) is something this study has to incorporate, as this is the reality of most people. People do not change their housing situation very often. Instead, this study exploits the longitudinal and multilevel nature of the BHPS and the Understanding Society, and the wealth of information available in these data sets. A series of variables in relation to the individual, partner, area, and business are incorporated in the models to measure housing effects and disentangle these from other individual choices and traits.

The most often used approach in the literature to address endogeneity of housing to employment outcomes is to use an instrumental variable (IV) for home ownership that is exogenous to the dependent variable (i.e., that determines home ownership but not employment outcomes). However, this approach cannot be applied in the present analysis, since no suitable IV(s) can be found that are highly correlated with the endogenous covariate (which it replaces) and not with self-employment entry. Only two variables were found that are associated with housing tenure but not with self-employment: lack of adequate heating and a leaky roof. However, their explanatory power for home ownership is very small, and therefore one essential requirement for using the IV approach is not fulfilled. Insufficient association of the IV with endogenous covariate can increase the standard error (Bollen 2012). Flatau et al. (2003) use individuals' age as the IV for home ownership. This is indeed the best predictor of home ownership, but age is also highly correlated with self-employment entry. Van Leuvensteijn and Koning (2004) employ regional share of homeowners, but this is also correlated with self-employment. Munch, Rosholm, and Svarer (2006) use home ownership of parents, which is unfortunately not given in the data sets used for the present study. Coulson and Fisher (2009) use percentage of households in the Metropolitan Statistical Area (USA) living in multifamily housing, state marginal tax rate on mortgage payments, and sex of the two first-born children. These cannot be used as effects of house type, and having a mortgage versus living in another housing tenure are tested in this study.

Therefore, an approach has to be applied in which individuals are selected to whom the endogeneity does not apply. This was achieved following the treatment effect approach applied by Battu, Ma, and Phimister (2008) for testing the effect of home ownership on employment and unemployment duration. Here, home ownership is the treatment effect, and the authors estimate the probability of unemployment duration

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[3] The number of integration points was set at 30 (Rabe-Hesketh and Skrondal 2012).

(and job duration) for a sample of individuals with multiple periods of unemployment and varying housing tenures (using periods/spells as unit of analysis). Similarly, for the present analysis, a sample of individuals was generated who enter self-employment over the 20-year study period at least twice and who were in different housing tenures prior to the self-employment entry. Housing tenure is highly correlated with dwelling space and house type so that accounting for the endogeneity of housing tenure also tackles the endogeneity problem of these other characteristics of housing. The treatment effect approach has been applied by other labor economists (e.g., Panis and Lillard 1994) and was shown to solve the need to find an instrument in duration models (Abbring and Van den Berg 2003). The present study does not use duration data, but the approach is similar in that periods of self-employment are counted, and the housing tenure before a new period of self-employment is measured and then compared across self-employment periods.

Robustness checks were conducted by comparing results for a full sample with those for the endogeneity-controlled sample. In the full model, social housing has a significant negative effect, and house type effects exist for those who start up a business outside their homes. These effects are different in the endogeneity-controlled sample indicating that the problem of endogeneity of housing to employment could be addressed in this study. After controlling for endogeneity of social housing to unemployment, Dujardin and Goffette-Nagot (2009) also did not find an effect of social housing on unemployment. Moreover, house type effects were expected for home-based start-ups but are not logical for non-home-based start-ups, so they are more likely to show a wealth/social class effect.

Selecting only those observations of individuals of working age (16–64 years old) results in a sample of 2,015 observations from 131 individuals. Excluding subcontracting, this sample gives $n = 111$ entries into home-based self-employment and $n = 146$ entries into non-home-based self-employment.

Various housing-related covariates are used for testing the effect of housing on self-employment entry. A fine differentiation of housing tenure and house type is used, and the number of people per room was derived (total number of people in the household divided by total number of rooms in the dwelling) as an indicator of dwelling space. A consistent measure of housing equity cannot be derived for the linked BHPS and UKHLS surveys. Instead, the self-estimated market value of the house (for owner-occupiers) is used, and a variable indicating the annual change in house value derived as an indicator of housing equity changes.[4] In all models, moving house is used as a control to account for simultaneously moving house and entering self-employment (*reverse sequencing*).

In addition, and in line with existing self-employment/entrepreneurship studies, a set of personal/household features is included in the models: age, sex, highest qualification, equivalized monthly gross household income,[5] presence of children in the household, and whether respondents were in paid employment prior to the self-employment entry (Le 1999; Henley 2004; Parker 2004; Taylor 2004).[6] Household income is available, since continuous variables but missing values, including zero and negative

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[4] A limitation of this proxy is that people with an increased house value may use the rise in housing wealth to borrow money for investing into the property.

[5] Equivalization is a standard method that adjusts household income to account for different demands on resources by considering the household size and composition (Horsfield 2012).

[6] Existing research also points to the relevance of ethnicity for self-employment/entrepreneurship (Schuetze and Antecol 2006). However, observations of foreign-born people are too small in the BHPS to include this information in the model.

values, are high. Given the sample size, five dummies were derived using the twenty-fifth, fiftieth, and seventy-fifth percentile as a cutoff and including dummies for missing values as well as zero and negative values. Further, the partner's employment status is included, since recent research stresses the importance of social capital/income of the spouse for business start-ups (Matzek, Gudmunson, and Danes 2010; Carter 2011).[7]

Inherited entrepreneurial capital and parental role models for business creation were found to influence individuals' entrepreneurial choices (Dunn and Holtz-Eakin 2000; Chlosta et al. 2012). This is captured in the modeling framework through information on the father's and mother's employment status at the respondent's age of 14.

The level of capital needed for a business start-up varies by industry, and HBBs cluster in some industries. Industry is included in the model through the Standard Industry Classification (SIC) of the occupation of the self-employed (i.e., not the business). Different coding schemes were used throughout the BHPS/UKHLS, which were recoded into the SIC92. Here, cultural and creative occupations are included in the category *other community, social and personal services*. Note that the BHPS/UKHLS as household panel data sets collate information about individuals, and no information about the business is available.

Three period dummies are included in order to control for variations in self-employment entry over time.[8] The first period comprises the years 1991 and 1992 where the housing markets and mortgage funding in the United Kingdom contracted. The second period stretches from 1993 to 2008—a period of economic growth with rising house prices. The two UKHLS Waves 2009/2010 and 2010/2011 indicate the recent postcrisis period.

A selection of area variables were linked with the BHPS/UKHLS data to control for area effects. Previous studies found that the spatial variations in new firm formation are influenced by the number of new firms, number of workers in small firms, income growth, population density, and local composition of age and qualification (Reynolds, Storey, and Westhead 1994; Armington and Acs 2002; Fritsch and Falck 2007; Bönte, Falck, and Heblich 2009; Cheng and Li 2011; Andersson and Koster 2011; Audretsch et al. 2012). Findings are mixed in relation to unemployment (cf. Fritsch and Storey 2014). Some research found that new firm formation rates, particularly opportunity-driven firm formation, and small business growth are higher in urban locations (Keeble and Walker 1994; Bosma and Sternberg 2014). HBBs were found to be more prevalent in rural areas in the United Kingdom (Mason, Carter, and Tagg 2011).

The housing stock also varies geographically with a higher percentage share of (semi-)detached houses in rural areas than urban areas and some pockets with a high density of apartments in London, Glasgow, and seaside towns (Dorling and Thomas 2004). Private renting is high in London and a few other cities, that is, areas where house prices are high but also in rural areas, particularly in Scotland (ibid.).

Given the small sample size, only those variables at local authority/district level could be used in this study that were readily available for the whole of the United Kingdom (note that most variables are only available for Great Britain[9]) and for which a long time series going back to 1991 could be constructed. Local authority data for the

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7 Note that the BHPS/UKHLS are household surveys and therefore no information is available for partners who do not live in the same household as the respondents. Also, often not all adult household members filled in personal questionnaires so that in a significant number of cases, information about the spouse is missing. This is accounted for through a dummy variable.

8 Year dummies were also tested. Results for the housing variable effects are the same.

9 This is why the regional unemployment rate is not included in the models. For local authorities, the unemployment rate goes only back to 2004. A longer time series can be generated for the regional unemployment rate but only for Great Britain.

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stock of registered businesses and newly registered businesses are available since 1994 onward. For the study years 1991–1993, the 1994 values were imputed, and for all other years, the average annual values linked to each sample year, respectively. This is appropriate, since the models measure differences between local authorities (and not time changes within local authorities). All models include a binary urban–rural classification, a variable for annual population change,[10] local business stock per 1000 inhabitants, and new businesses per 1000 inhabitants. The models therefore account for larger-scale differences in self-employment, HBBs, and housing supply; population growth and changes in local demand for goods and services; and firm density and local variation in new firm formation.

Separate models are specified for an entry into home-based self-employment and non-home-based self-employment. Housing tenure, house type, and dwelling space are highly correlated, that is, owner-occupiers more often live in (semi-)detached houses, although renters are more likely to live in apartments that are usually smaller than (semi-)detached houses and are therefore included in separate models.

Results

Table 1 displays results for an entry into home-based self-employed between subsequent waves t to $t + 1$, conditional on not having been self-employed at t. Models 1 and 2 test the effect of house value and are therefore limited to homeowners. Table 2 reports findings for self-employment entries that are not home-based; the models are otherwise identical to those in Table 1. The covariates are measured at t, that is, prior to the transition into self-employment (from employment or out of work) with the exception of two variables. The *moved house* variable is measured between t and $t + 1$ in order to control for a simultaneous residential move between subsequent waves. The variable *change in estimated house value* is measured between $t - 1$ and t and thus measures whether an increase/decrease in individual house value subsequently influence the probability of entering self-employment.

Financial Aspects

Testing first effects of individuals' house value on self-employment reveals differences in how housing impacts on self-employment by whether people use their homes as locations for their businesses or not. Among homeowners, the value of the house has a positive effect on entries into home-based self-employment. In other words, controlled for age, those living in more expensive houses are more likely to use their home for self-employed work. An increase in house value, hence an increase in housing equity, does not subsequently increase the probability of people using their homes for self-employed work (Table 1).

As regards non-home-based self-employment entry, neither the self-estimated value of the house nor a recent change in this value shows a significant influence (Table 2). The homeowner models (Models 1 and 2) also do not show a significant increase in residential moves, which could be a way to release housing wealth. This was further tested by controlling for residential moves prior to the transition into self-employment (between $t - 1$ and t) but the coefficient was also not significantly increased among homeowners (not displayed).

Thus, the findings suggest that housing wealth is associated with HBB start-ups. However, no evidence could be found that people start a business—both home-based or

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[10] Annual data are based on population estimates between the population census years (1991/2001/2011).

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Table I

Home-based self-employment entry t to t + l.

Covariates—measured at t if not stated otherwise	Model 1 (homeowners)		Model 2 (homeowners)		Model 3		Model 4		Model 5	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
House value (log)	0.459***	0.170	—		—		—		—	
Change in house value t − 1 to t	—		−0.003	0.002	—		—		—	
Housing tenure (omitted: owner with mortgage)										
Owner outright	—		—		0.680***	0.264	—		—	
Social renter	—		—		−0.385	0.459	—		—	
Private renter	—		—		0.421	0.362	—		—	
Other	—		—		−0.007	0.511	—		—	
Persons per room							−1.038*	0.598		
House type (omitted: detached house)										
Semidetached house	—		—		—		—		0.030	0.257
Terraced house	—		—		—		—		−0.382	0.344
Flat	—		—		—		—		−1.068*	0.657
Other									−0.555	0.569
Age	0.011	0.012	0.023*	0.013	0.009	0.011	0.007	0.011	0.013	0.011
Sex (female)	0.231	0.305	0.266	0.319	−0.100	0.265	−0.015	0.256	0.010	0.266
Degree (yes)	0.542*	0.325	0.415	0.353	0.438	0.306	0.353	0.280	0.364	0.311
When respondent was age 14, father was self-employed	0.243	0.390	0.218	0.382	0.347	0.337	0.248	0.345	0.283	0.326
When respondent was age 14, mother was self-employed	0.867*	0.473	1.048***	0.490	0.593	0.393	0.693*	0.398	0.839***	0.381
In paid employment at t	−0.727	0.484	−0.787	0.491	−0.782*	0.411	−0.808***	0.406	−0.769*	0.410
Employment of partner (omitted: no partner)[1]										
Employee	0.484	0.366	0.629*	0.380	0.480	0.313	0.446	0.304	0.408	0.318
Self-employed	0.557	0.421	0.637	0.436	0.554	0.400	0.531	0.413	0.470	0.418
Not in employment	0.001	0.408	0.141	0.438	−0.270	0.354	−0.091	0.355	−0.209	0.371
Household with dependent child	0.100	0.275	0.264	0.290	0.529**	0.246	0.681**	0.283	0.377	0.261
Monthly gross household income (equivalized) (omitted: <p25)[1]										
p25–< p75	0.282	0.415	0.314	0.416	0.102	0.314	0.279	0.351	0.177	0.356
p ≥ 75	−0.566	0.565	−0.289	0.558	−0.441	0.471	−0.215	0.497	−0.417	0.504

(continued)

Table I

(Continued)

Covariates—measured at t if not stated otherwise	Model 1 (homeowners)		Model 2 (homeowners)		Model 3		Model 4		Model 5	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Industry (omitted: real estate, renting, and business activity)[2]										
Agriculture/fishing/mining	0.922	0.574	0.898	0.600	0.585	0.777	0.894	0.774	0.056	0.648
Manufacturing	0.843*	0.510	0.880*	0.534	0.218	0.474	0.256	0.464	0.264	0.477
Construction	-1.596**	0.651	-1.635***	0.618	-1.673**	0.659	-1.672**	0.760	-1.752	0.647
Wholesale and retail trade	-0.815	1.011	-0.651	0.966	-0.885	0.908	-0.948	0.918	-0.966	0.918
Hotels and restaurants	1.769*	0.965	1.297	1.060	1.250**	0.615	1.241*	0.665	1.530**	0.730
Transport and communication	1.202**	0.484	1.216***	0.475	0.670	0.472	0.958**	0.455	0.873*	0.452
Public admin and defense	0.384	0.606	0.526	0.592	0.262	0.652	0.280	0.579	0.319	0.530
Education	-0.693	0.760	-0.484	0.749	-0.199	0.615	-0.112	0.611	-0.084	0.626
Other community, social, or personal services	0.325	0.593	0.362	0.589	0.100	0.516	0.100	0.492	0.136	0.522
Moved house t to t + 1	-1.253**	0.620	-1.074	0.764	-0.966**	0.385	-0.793**	0.382	-0.928**	0.397
Rural (yes)	-0.309	0.318	-0.333	0.318	-0.015	0.291	-0.037	0.268	-0.101	0.307
Local population change	0.211	0.238	0.150	0.337	0.289	0.219	0.254	0.219	0.221	0.248
Local business stock per 1,000 residents	0.011	0.016	0.013	0.017	0.013	0.015	0.015	0.016	0.008	0.017
Local new businesses per 1,000 residents	-0.261	0.173	-0.202	0.154	-0.212	0.144	-0.233	0.148	-0.169	0.160
Time period (omitted: 1993–2008)										
1991–1992	-0.118	0.694	-0.271	0.670	-0.512	0.657	-0.529	0.645	-0.510	0.637
2009/2010–2010/2011	0.837	0.587	0.936*	0.557	1.212**	0.508	1.301***	0.493	1.335**	0.540
N level 1 observations	722		672		985		981		963	
N level 2 observations	118		116		130		129		130	
Log likelihood	-217.948		-208.942		-287.337		-285.344		-278.021	

BHPS/UKHLS 1991–2010/2011.

Random-intercept logistic regression fitted in generalized linear model; robust standard errors. Significant level: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

[1]Dummies for missing values not displayed.

[2]Standard Industry Classification 92; not all industry sectors displayed due to few counts/large standard errors in some industries.

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Table 2

Non-home-based self-employment entry t to t + 1.

Covariates—measured at t if not stated otherwise	Model 1 (homeowners)		Model 2 (homeowners)		Model 3		Model 4		Model 5	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
House value (log)	−0.173	0.158	—		—		—		—	
Change in house value t − 1 to t	—		−0.194	0.209	—		—		—	
Housing tenure (omitted: owner with mortgage)										
Owner outright	—		—		−0.401	0.297	—		—	
Social renter	—		—		0.122	0.374	—		—	
Private renter	—		—		0.630**	0.305	—		—	
Other	—		—		0.514	0.715	—		—	
Persons-per-room	—		—		—		0.379	0.346	—	
House type (omitted: detached house)										
Semidetached house	—		—		—		—		−0.444	0.319
Terraced house	—		—		—		—		−0.296	0.330
Flat	—		—		—		—		0.052	0.486
Other	—		—		—		—		0.200	0.511
Age	−0.008	0.015	−0.004	0.016	−0.001	0.012	−0.005	0.011	−0.009	0.012
Sex (female)	0.010	0.377	0.153	0.440	−0.052	0.300	−0.050	0.295	−0.073	0.303
Degree (yes)	0.534	0.440	0.444	0.492	0.358	0.381	0.442	0.365	0.448	0.373
When respondent was age 14, father was self-employed	−0.019	0.471	−0.231	0.528	−0.309	0.340	−0.288	0.340	−0.200	0.348
When respondent was age 14, mother was self-employed	0.200	0.734	0.315	0.792	0.182	0.628	0.134	0.616	0.184	0.640
In paid employment at t	0.134	0.386	0.140	0.402	−0.059	0.357	−0.045	0.351	−0.168	0.378
Employment of partner (omitted: no partner)[1]										
Employee	0.335	0.432	0.482	0.486	0.573*	0.321	0.548*	0.306	0.721**	0.339
Self-employed	0.476	0.522	0.674	0.587	0.728*	0.413	0.655*	0.397	0.778**	0.398
Not in employment	0.645	0.565	0.721	0.642	0.548	0.384	0.392	0.375	0.612	0.389
Household with dependent child	−0.202	0.343	−0.292	0.385	−0.476*	0.264	−0.570**	0.279	−0.439	0.282
Monthly gross household income (equivalized) (omitted: <p25)[1]										
p25–< p75	0.248	0.509	0.317	0.561	0.007	0.350	−0.114	0.340	−0.063	0.358
p ≥ 75	−0.108	0.578	−0.241	0.630	−0.059	0.436	−0.226	0.418	−0.164	0.455

(continued)

(Continued)

Table 2

Covariates—measured at t if not stated otherwise	Model 1 (homeowners)		Model 2 (homeowners)		Model 3		Model 4		Model 5	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Industry (omitted: real estate, renting, and business activity)[2]										
Manufacturing	−1.577*	0.833	−1.819*	0.971	−0.919*	0.565	−0.902*	0.552	−0.787	0.575
Construction	−0.320	0.626	−0.255	0.663	−0.059	0.478	0.005	0.474	−0.02	0.468
Wholesale and retail trade	−0.348	0.641	−0.656	0.628	0.224	0.556	0.221	0.556	0.328	0.573
Hotels and restaurants	0.319	0.563	0.762	0.689	0.182	0.614	0.100	0.579	0.354	0.588
Transport and communication	−0.511	0.938	−0.292	0.939	−0.220	0.816	−0.328	0.812	−0.180	0.818
Public admin and defense	−1.940*	1.014	−1.880*	1.047	−1.693*	1.016	−1.763*	0.993	−1.400	0.999
Education	−0.827	0.684	−0.847	0.728	−0.299	0.561	−0.258	0.556	−0.139	0.562
Health and social work	—		—		−1.097	0.799	−1.037	0.811	−1.017	0.794
Other community, social, or personal services	−0.049	0.630	−0.072	0.655	−0.359	0.582	−0.273	0.555	−0.372	0.565
Moved house t to t + 1	0.087	0.406	0.231	0.476	0.285	0.262	0.451*	0.251	0.439*	0.264
Rural (yes)	−0.118	0.427	−0.217	0.481	0.020	0.324	0.011	0.316	−0.182	0.347
Local population change	0.315	0.367	−0.866	0.651	0.190	0.312	0.193	0.304	0.231	0.302
Local business stock per 1,000 residents	−0.024	0.028	−0.027	0.030	−0.015	0.020	−0.011	0.019	−0.006	0.020
Local new businesses per 1,000 residents	0.311*	0.192	0.317	0.207	0.202	0.133	0.173	0.130	0.129	0.140
Time period (omitted: 1993–2008)										
1991–1992	−0.771	0.685	−0.703	0.714	−0.060	0.464	−0.018	0.467	−0.029	0.472
2009/2010–2010/2011	0.887	0.595	0.909	0.618	0.620	0.538	0.613	0.530	0.694	0.511
N level 1 observations	722		672		985		981		963	
N level 2 observations	118		116		130		129		130	
Log likelihood	−242.402		−223.215		−363.386		−364.606		−356.176	

BHPS/UKHLS 1991–2010/2011.

Random-intercept logistic regression fitted in generalized linear model; robust standard errors. Significant level: ***p < 0.01, **p < 0.05, *p < 0.1

[1] Dummies for missing values not displayed.

[2] Standard Industry Classification 92; not all industry sectors displayed due to few counts/large standard errors in some industries.

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not—because they have experienced an increase in their personal housing wealth, which they could use for business purposes as was suggested by some previous studies.

Housing Tenure

The findings further confirm that housing tenure influences self-employment choices, controlled for age and other factors. However, it is not that home ownership facilitates home-based self-employment, whereas social and private renting hinders home-based self-employment, as was expected from the literature. Using a fine differentiation of housing tenure reveals that outright ownership increases the probability of home-based self-employment, whereas owners with a mortgage do not differ from social and public renters (Table 1). This finding also contradicts studies that argue that outright ownership decreases labor market participation (Stephens et al. 2010). Thus, it is not a fact that homeowners are free to use home space for business purposes. It is rather likely that low housing costs in outright ownership facilitate home-based self-employment.

Housing tenure effects are also true for self-employment entries that are not home-based. It was hypothesized from the literature that social housing tenants face credit constraints and are therefore less likely to set up a business that is not home-based (as this requires a certain amount of start-up capital). For other housing tenures no impact on an entry into non-home-based self-employment was expected from the literature review. However, social renters do no differ in their probability of entering self-employment outside their homes from owners with a mortgage (Table 2). Instead, non-home-based entries into self-employment are more likely if people are private renters. Given that factors simultaneously shaping self-employment and housing tenure decisions (e.g., risk attitudes) are controlled for, as well as whether people moved, a logical explanation is that private rented accommodation offers people the necessary flexibility to become self-employed. Private renters do not have their assets tied up in bricks and mortar. Thus, instead of investing in housing, they can invest in a business. Moreover, even if monthly rent payments are high (and similarly high to mortgage repayments including interest rates), an *exit* is easy so that the housing situation for private tenants could be downsized quickly if money is needed for the business. Barriers to exit are higher in home ownership with a mortgage because of transaction costs.

Physical and Spatial Features

Dwelling space as measured by persons-per-room influences home-based self-employment as hypothesized from the literature review. The negative coefficient in Table 1 indicates that the lower the person-per-room ratio, the higher the probability of starting a business from home. Conversely, the regression coefficient is positive in the non-home-based model (Table 2), indicating that people who start HBBs tend to have more dwelling space per person than others with a non-home-based self-employment entry.

For HBBs, the house type is also important as was expected from the literature (Table 1). Living in a flat hinders home-based self-employment, whereas a detached house, controlled for age and other factors, is most likely to facilitate start-ups in people's homes. However, there is no significant negative effect of terraced houses or a positive effect of a semidetached house on home-based self-employment as was mentioned in the telecommuting literature. The fact that the detached house stands

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out as enabler of home-based self-employment is most likely due to the ease of extension and the provision of supplementary space. The house type has no effect on whether people start up a business outside their homes (Table 2).

A residential move was used as control for the possibility that individuals may change their housing situations because they want to start their own businesses (e.g., purchasing a bigger house). This control variable shows that people are not simultaneously moving and starting an HBB. It is well known from the housing literature that homeowners are less likely to move than renters. After controlling for housing tenure, those who become self-employed but not home-based are also not more or less likely to have moved (Table 2, Model 3). However, negative values for residential moves for those starting HBBs and positive values for those entering self-employment that is not based in homes suggest that the spatial mobility behavior tend to be different between these two groups.

Broader Contrasts between Home-based and Non-home-based Self-employment

Since a sample was used for this study, which takes the endogeneity of housing to employment/entrepreneurship into account, the remaining covariates in the models are used as controls and do not allow general conclusions about the population. This may be the reason why some variables, such as age and sex, do not reproduce well-established findings of existing research (cf. Parker 2004). However, it is also likely that modeling self-employment choices by home-based location produces different results with respect to some key characteristics of self-employment.

The economic geography literature highlights the importance of personal employment experiences for new firm formation. However, this does not show up in the models. For HBB start-ups, the findings suggest rather the opposite, that is, people were most likely out of work (unemployed or inactive) before becoming self-employed working from home. For non-home-based start-ups, the employment situation of the partner appears to be of great relevance (Table 2). People in households with dependent children are also more likely to become home-based self-employed (Table 1), and this effect tends to be negative in non-home-based start-ups (Table 2). Interaction effects with gender were tested but are not significant (not displayed). Household circumstances thus appear relevant for both start-up types—home-based and non-home-based—as suggested by recent entrepreneurship studies that investigate entrepreneurs in a household context (Carter 2011). However, the mechanisms seem to be slightly different, pointing at the relevance of individuals' life course for entrepreneurship.

There are also industry effects. In the sample, home-based self-employment entries are more likely for those working in the hotel and restaurant, transport and communication, and manufacturing sectors, and less likely in the construction sector. Non-home-based self-employment entries in this sample cluster in real estate, renting, and business activity (the comparison group in Table 2), and are less likely in manufacturing and public administration and defense.

Time period effects can be observed for home-based self-employment, with people becoming more likely to start a business from home since the great financial crisis of

2007–2009. Area characteristics are largely not significant in the models but indicate that local new firm formation is of greater importance for non-home-based start-ups.

Summary and Conclusions

This article has investigated housing in relation to self-employment, and whether and how it influences self-employment entry. The existing literature on new firm formation and entrepreneurship has regarded housing—if at all—as a financial asset through which entrepreneurs can secure external finance or which is part of the entrepreneur's aggregate wealth accumulation to self-fund a business start-up. The empirical findings of this study show that this view is somewhat narrow, since it neglects the variety of economic resources housing provides to individuals. Using longitudinal microdata and a sample that accounts for the endogeneity of housing to employment/entrepreneurship, this study reveals that besides financial features, housing tenure and physical and spatial characteristics of housing are important for understanding people's self-employment choices and business location choices. The statistical approach used in this article allows drawing the conclusion that housing characteristics can facilitate or hinder business start-ups, although some housing characteristics do not influence self-employment choices. The mechanisms depend on whether the business start-up takes place in people's homes or not. These key findings have wider implications for understanding new firm formation and economic growth.

Home-based self-employment is facilitated by housing wealth, outright ownership, detached houses, and large dwellings, and is undermined by living in apartments. For others with a start-up that is non-home-based, it is private renting that has a positive influence. This study has not found evidence for owned homes being relevant for business start-ups as a source for securing funding for the business as suggested in earlier research. In line with economic studies showing that entrepreneurs' personal wealth/inheritances increase firm survival (cf. Parker 2004), housing equity as a potential financial source for the business perhaps becomes relevant for the funding of small businesses later in their cycle.

The revealed housing tenure effects fundamentally challenge some views in research and policy about home ownership making people immobile and hence less adaptable to local labor market change and that the insecurity inherent in the UK private rented sector (tenancy agreements are often limited to 3–6 months) has negative societal outcomes. The findings of this study suggest that outright ownership together with housing wealth provides financial security for HBB start-ups. This is more than simply an effect of wealth accumulation suggested by some economic studies, but rather a secure way to experiment with self-employment and trying out new ideas (van Gelderen, Sayers, and Keen 2008).[11] As shown with respect to entries into non-home-based self-employment, a deregulated private rented market such as in the United Kingdom, with very quick and easy entries and exists, fits the purpose of would-be entrepreneurs, despite its inherent insecure nature. Positive aspects of private rented accommodation have been discussed in the housing economics literature with respect to spatial mobility (Maclennan and Pryce 1996; Kemp and Keoghan 2001).

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[11] In England and Wales, 31% of all households own their home outright (Population Census 2011, own calculation).

Findings of this research add to this the flexibility it provides for self-employment and entrepreneurship. Different segments of the private rented sector, such as furnished and unfurnished accommodation, have not been investigated in this study. This would provide further insights into what aspects of the private rented sector facilitate entrepreneurship—hence economic growth.

One relevant aspect for understanding the relationship between housing and self-employment outcomes is the personal life course (including age) of the entrepreneur. The flexibility inherent in the private rented sector seems to be most favorable at an earlier life stage, perhaps for those young would-be entrepreneurs who are often described as ambitious and highly motivated to grow a business. Purchasing a home, particularly at an early life stage, is rather counteractive to entrepreneurship. This agrees with the fact that the prime age for entrepreneurship and self-employment is 30–40 (Parker 2004). The relatively high initial cost of buying a home (e.g., deposit) results in some individuals modifying their *investment portfolios* by favoring housing at the expense of other investment options (Dietz and Haurin 2003). Homeowners who bought their homes with a mortgage also face the risk of mortgage default and so may not increase their aggregate household risk through a business start-up. The employment situation of the partner (income but also security) is crucial for managing households' risk of entering entrepreneurship/self-employment. Having paid off, the mortgage opens up new possibilities in people's lives, including home-based self-employment. More information is needed on how the relationship between housing and self-employment outcomes plays out geographically and whether the private rented sector in other countries (under different regulation regimes) produces different outcomes.

This article estimated the influence of individual housing characteristics on an entry into home-based/non-home-based self-employment. The finding that HBBs are facilitated by detached houses gives them a suburban locational distribution in cities. An area of further research deriving from this research is the study of housing-related area effects on entrepreneurship and self-employment. Do areas dominated by detached houses and associated low population density impact on entrepreneurial and self-employment choices? Do tenement/apartment areas enhance entrepreneurship, and how is this influenced by settlement structure and density and networks? Economic geography has modeled new firm formation at various spatial scales using indicators related to the business environment, labor markets, agglomeration/network effects, and population growth/demand (Andersson and Larsson 2014; Fritsch and Storey 2014). These may be mediated by housing stock and people's preferences to live in certain house types/neighborhoods. It is likely that there are area effects resulting from the demand created by the housing structure/built environment, for instance, gardening, transport, and dog walking in detached house/low-density areas.

This is the first article that modeled self-employment entry by whether the entry is home based or not, in order to understand housing resources available for the would-be self-employed. Findings show that the two groups should be analyzed separately in future research. This may alter current understanding of where start-ups take place, in which industries, at what point in their lives, and under which household circumstances people decide to become self-employed or start up a business.

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