Performance and Innovation in Women-Owned Home-Based Businesses

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1. Introduction

The economic underperformance of women-owned businesses and female entrepreneurs has received rigorous debate within the last two decades (Cabrera & Mauricio, 2017; Klapper & Parker, 2011). Empirical evidence has been presented from a multiplicity of national and cross-national contexts, both for and against what has been coined "the female underperformance hypothesis". Several prominent studies have demonstrated that the financial performance gap between men and women can be mediated when using multivariate quantitative analysis that controls for significant demographic differences between men and women-owned firms (Robb & Watson, 2012; Zolin et al., 2013). Studies have particularly highlighted differences in industrial sector (Sappleton, 2018), business size (Farhat & Migid, 2017), business age (Zolin et al., 2013) and of particular interest to this paper, business location (Lee & Marvel, 2014), as contributing to or explaining lower economic outcomes for women-owned businesses.

Concurrently, home-based businesses (HBBs) are receiving increasing academic and policy interest (Reuschke & Domecka, 2018), and have been strongly linked in the literature to the debates surrounding female business ownership (Anwar & Daniels, 2014). It is has been established that the need to balance work and family life is more likely to push female business owners into the home (Breen, 2009; Walker & Webster, 2004), and that this may come at the cost of the economic performance of their businesses (Loscocco & Bird, 2012; Thompson et al., 2009). Subsequently, home-based business ownership has been portrayed as a negative option for women who want or need to be financially successful, or who wish to develop their careers (Loscocco & Smith, 2004). Within the wider business literature, it has been found that women-owned enterprises may have lower business performance as they are tend to locate outside of major agglomerations, and it has been theorized that this is linked to their need to be closer to home, where women have disproportionate responsibilities (Rosenthal & Strange, 2012). However, this is yet to be tested for the home-based sector, despite the prominence of the discussions surrounding work-life balance and female entrepreneurs in the HBB literature.

This paper seeks to address the underperformance hypothesis directly, by linking this with the burgeoning home-based business literature and testing geographical theories relating to the spatial segregation of men and women-owned businesses. Although there are indications that women-owned HBBs underperform men-owned HBBs (Breen, 2009; Loscocco & Smith, 2004; Wang et al., 2009) this literature remains underdeveloped. Previous research on this topic has often utilized small and female only samples, compared women-owned businesses inside and outside the home, or presented descriptive statistics on the differences between

men and women-owned HBBs. While this has informed debates about the advantages and disadvantages of the home-based business sector, and how the sector may be gendered, there remains a research gap on how men and women-owned home-based businesses perform in terms of a variety of economic measures. Furthermore, although it has often been discussed that work-life conflict will interfere with the success of female business owners who work from home, firm demographic differences have rarely been controlled for. The objective of this study therefore, is to investigate if women-owned home-based businesses underperform men-owned home-based businesses.

The research aims and contribution of this paper are threefold. First, we compare the turnover, employment and innovation of women-owned HBBs to men-owned HBBs. We then test specifically whether female home-based business owners hire subcontractors as a substitute to taking on regular employees (Mason et al., 2011). Subcontracting staff do not appear in standard metrics of employment, and thus women-owned HBBs may have appeared smaller than men-owned HBBs in previous studies utilizing 'traditional' employment measures (Breen, 2009). Finally, since home-based businesses differ significantly in their location to externally-based businesses, we investigate whether women-owned home-based businesses are located differently from men-owned businesses, and whether this mediates gendered differences in performance. Several studies of externally based businesses have highlighted this 'spatial mis-match' in the locations of men and women-owned firms, and the implications of this for performance and innovation (Lee & Marvel, 2014; Marvel et al., 2015; Rosenthal & Strange, 2012). However, this has not previously been investigated for the home-based sector. The empirical analysis is based on the 2015 wave of the Longitudinal Small Business Survey (UKLSBS). The LSBS is the most recent UK firm-level dataset that allows home-based businesses to be identified, and therefore the sample provides a unique opportunity to study in-depth business performance in the home-based business sector by whether they are women-owned or men-owned.

Gendered narratives underpin home-based businesses; however, studies of their business performance are rare, and gender differences in economic outcomes remain unclear. The findings of this study contribute not only to the growing home-based business literature but also, through this lens, the broader debate on the so-called 'underperformance' of women-owned small businesses. We test an alternative, firm-level explanation for the underperformance of women-owned HBBs, which departs from assumptions that work-life balance inherently interferes with the success of women's business in the home. There have been recent calls within women's business and entrepreneurship research for studies representing the heterogeneity of female business owners in new, under-researched and everyday contexts and spaces (Henry et al., 2019). The home itself is a neglected business space, which has often been underrepresented in analyses and data sources (Mason, 2010). However, this research also contributes to calls to investigate business within its socio-spatial and geographic context, (Steyaert & Katz, 2004; Trettin & Welter, 2011; Welter et al, 2014; Welter, 2011), which previous research has indicated is highly relevant to both home-based business and non-home-based business performance (Audretsch & Dohse, 2007; Kane & Clark, 2018; Reuschke & Houston, 2017; Rosenthal & Strange 2012; Sayers, 2010).

2. Background, Theory, Hypotheses

2.1 The Performance Gap in Men- and Women- Owned HBBs

The empirical evidence for the low performance of women-owned HBBs remains underdeveloped, as although there are a number of studies that profile the characteristics of HBBs, this is rarely reported by gender of the business owner (Jain & Courvisanos, 2013; Mason et al., 2011). Home-based businesses run by women have often been presented as 'hobby' or non-growth businesses, although several studies have since indicated that women-owned HBBs have significant growth ambitions (Breen & Karanasios, 2010; Walker, 2004). Despite this, there is evidence that women-owned HBBs underperform in turnover comparative to externally based businesses led by women (Thompson et al., 2009), and Loscocco & Smith-Hunter (2004) find that although HBBs run by women bring less work-family conflict, they are less economically successful than women in commercial premises are. Studies that directly compare men and women are sparse in the HBB literature; however, Breen (2009) finds in a sample of HBBs in Australia, that women-owned HBBs employ, on average, less staff than men-owned HBBs. Wang et al., (2009) also find that in comparison to men, women-owned HBBs are more likely to be run part-time, female owners work less hours in their businesses and have lower business ages on average.

The main empirical link drawn in the literature between women's home-based businesses and their low performance, either comparative to other businesses run by women, or men-owned businesses, relates to work-life and work-family balance. It is well documented within the HBB literature that family, lifestyle and convenience are more common motivations for women to start and run a HBB than for men (Kalleberg & Leicht, 1991; Loscocco & Smith-Hunter, 2004; Thompson et al. 2009; Walker & Webster, 2004). Men-owned HBBs have been reported to be orientated towards wealth creation, and providing an income for their families (Breen, 2009). Several studies document the struggles and challenges specific to women-owned HBBs in terms of work-life balance (Loscocco & Smith-Hunter, 2004; Walker et al., 2008). Loscocco & Bird (2012) find that if businesses are primarily started by women to balance work and family, then the time spent scheduling in domestic duties reduces the time spent on the business and subsequently their earnings and capacity to take on employees (Acker, 2006; Jurik, 1998). They argue, "as long as women have primary responsibility for home, family, and community, they will not be able to fully realize their potential sales or compete with men" (p. 210). Loscocco & Hunter-Smith (2004) conclude therefore, "home-based ownership may be a positive option for women who do not experience a strong financial need" (p . 172). Whether they have growth ambition, synthesising the empirical literature on HBBs alone would lead to the conclusion that women-owned home-based businesses experience additional constraints to growth and performance.

However, the idea that women-owned businesses underperform in comparison to men-owned businesses is not unique to the home-based sector – studies debating the "female underperformance hypothesis" represent a vast body of work (Hughes et al, 2012). Reviews of this work have suggested that the majority of evidence leans towards support of the hypothesis that women-owned enterprises underperform in measures such as profit, growth, job creation, sales and survival (Cabrera & Mauricio, 2017; Fischer et al., 1993; Klapper & Parker, 2011). However, there are a significant number of studies that contest the hypothesis, presenting evidence that the distinct characteristics of men and women-owned firms explain a great deal of the financial performance gap, and in some cases, mediate gender effects

completely (Robb & Watson, 2012; Justo et al., 2015; Marco, 2012; Rietz & Henrekson, 2000; Zolin et al., 2013). As above, in both home-based and non-home-based businesses there is evidence that female entrepreneurs work less hours in their business (Fairle & Robb, 2009), are more likely to work part-time and have less entrepreneurial experience and resources (Thompson et al., 2009). In terms of firm level demographics, it is well-established for example, that women-owned businesses are smaller, and often younger than men's businesses, and are likely to remain smaller in growth terms (Farhat & Mijid, 2017; Gottschalk & Niefert, 2013; Robb & Watson, 2012). Women's businesses have also been found to be concentrated in less profitable, lower-paid industries - a process which is known as entrepreneurial segregation (Bird & Sapp, 2004; Sappleton, 2018). However, results from recent studies addressing underperformance in innovation activity in women-led businesses give more mixed results than for sales or employment based measures. As above, Marvel et al. (2015) find that there is no female underperformance in innovation activity when controlling for characteristics such as firm size and entrepreneurial resources, however Rosa and Sylla (2018) find that women-owned businesses are in fact more innovative, even when controlling for the same firm demographics. This evidence leads to the first hypothesis of this paper.

H1: When controlling for firm demographics, there are no significant differences in turnover, employment and innovation between men- and women- owned HBBs.

2.2 The Role of Location in Gendered Business Performance

There have been calls for more studies of women's entrepreneurship to highlight spatial and geographic perspectives that have received relatively less attention thus far in the gendered performance debate (Foss et al., 2019). A limited number of studies that have examined the female underperformance hypothesis have controlled for the effects of business location. This is an unexpected research gap given that the benefits businesses, particularly small businesses, can gain from locating within agglomerations, urban areas, and business or regional clusters, are very well documented and theorized. Large cities are conceptualised as entrepreneurial accelerators, providing a large customer base and opportunities for networking, tacit knowledge transfer and entrepreneurial 'buzz'. They also provide access to an extensive, skilled labour market and a range of commercial premises to accommodate growth of a business out of the home (Bathelt et al., 2004; Durmaz, 2015; Leibovitz, 2004; Martins, 2015; Shearmur & Doloreux, 2008; Storper & Venebles, 2004; Williams & Currid-Halkett 2011).

Three notable contributions to understanding of the role of location in the underperformance of women-owned businesses have been identified in the literature. Rosenthal & Strange (2012), Lee & Marvel (2014) and Marvel at al. (2015) all find that there are significant differences in where women and men choose to locate their businesses, and that this has significant implications for their business performance. Lee & Marvel (2014) and Marvel et al. (2015) find that women-owned businesses are less likely to be located in employee-clustered regions, which contributes significantly (alongside other firm demographics) to their lower firm performance in innovation, domestic sales and exports. The authors argue that if women have different reasons for starting firms and different goals (i.e. men pursue wealth creation and women pursue work-family balance) then women will place less emphasis on locating in areas where they can maximise revenue, and therefore will not benefit from agglomeration

economies to the same extent as men. Rosenthal & Strange (2012) similarly find that "the smaller presence of female entrepreneurial activity in the densest locations and in clusters means that both the productivity and opportunity advantages of cities may not be enjoyed proportionately by female entrepreneurs" (p. 766). They develop and test a theoretical model that female entrepreneurs have disproportionate responsibilities in the home, and therefore commute shorter distances and benefit less from agglomerations. They argue that the 'spatial segregation' by gender found in their study develops because women are discouraged from locating their businesses in major cities and agglomerations far from attractive residential areas.

A study of micro-businesses by Houston & Reuschke (2017) found that HBBs have the potential to grow in terms of both turnover and employment in urban areas, but not in rural locations. This confirms the hypothesis that HBBs may gain the same benefits as externally based businesses from locating within urban areas and agglomerations. Furthermore, there is some evidence from the HBB literature that indicates that women and men-owned HBBs have different locations. Reuschke & Mason (2015) found that women-owned HBBs in Scotland were highly concentrated into city suburbs, whilst Wang et al. (2009) found that women ran higher percentages of peripheral/rural HBBs. It is therefore plausible that the family-orientated motivations of women-owned businesses identified in the HBB literature could result in women-owned HBBs clustering outside major urban areas and into peri-urban and rural areas. The latter locations would be expected to have higher proportions of families, and would provide detached housing suitable to accommodate both family and business (Ekinsmyth 2011; 2013; Reuschke, 2016). Another possible driver which could lead women-owned HBBs to be located outside of agglomerations, is the lack of other opportunities for women in remote areas (Wynarczyk & Graham, 2013), as this may encourage small business ownership within the home as one of few options available (Thompson, 2009). In urban areas, women may be more inclined to choose regular employment over running a business (Hanson & Blake, 2005). Linking HBB performance, gender and location, two further hypotheses are formed.

H2: Women-owned HBBs are found in higher proportions outside of major urban areas

H3: Location mediates any gender-gap in turnover, employment or innovation performance

However, there is an alternative strand of thinking which suggests that smaller cities and towns (intermediate settlements) located near large urban areas can still provide urban business benefits, but without incurring the additional financial (high business rents and competitors) and life-style costs that come from locating in a city (Phelps, 2001; 2004). This is described by Renski (2008, p. 62) as a "balance between urbanisation and diseconomies", which can help business owners to "maximise success and well-being" – and the latter is almost always higher in rural areas in developed economies (Abreu et al., 2018). Hracs & Brydges (2019) detail how entrepreneurs outside of core cities can utilize temporary mobility's to overcome the disadvantages of remoter locations and smaller settlements, by travelling to nearby agglomerations when needed for events, conferences, meetings etc. However, Rosenthal & Strange (2012) find both that women-owned enterprises benefit less from nearby agglomeration and that they have significantly shorter commuting times. Folmer & Kloosterman, (2017) further find that women-owned businesses in residential

neighbourhoods in the Netherlands were more likely to form local business connections, including when controlling for home-based businesses. This indicates that women-owned HBBs may not be able to take advantage of temporary mobility and travel to the same extent or distance as men-owned HBBs when they are located in intermediate settlements. This leads to a further hypothesis that small cities and rural towns may create a business environment that is more restrictive for women-owned HBBs than men-owned HBBs.

H4: Women-owned businesses in small cities and rural towns have particularly low turnover performance

2.3 Subcontracting in the Home-Based Sector

In their seminal study of UK home-based businesses, Mason et al. (2011) suggest that HBBs may experience "jobless growth", increasing their turnover over time but not taking on any employees. The explanations for this particular strategy have revolved around the spatial restrictions of the home and residential neighbourhoods or simply owners who wish to grow their business but not to move into a commercial premise. However, others have suggested that home-based businesses can take on employees if they wish, who simply work from their own homes or coffee shops and co-working sites (Kapasi & Galloway, 2018; Reuschke & Houston, 2016). Linked with the jobless growth hypothesis is the suggestion that home-based businesses subcontract to other self-employed workers instead of taking on regular employees (Clark & Douglas, 2010; Gelderen et al., 2008, p 168.; Mason et al, 2011). Subcontracting and collaborative behaviour have been linked to the HBB sector in the literature, and particularly to online home-based businesses, where specific projects/skills are outsourced to other self-employed people via the internet (Hastings et al., 2018). This allows HBBs to "pay on result" and "maintain low risk start-up" (Anwar & Daniels, 2014; Gelderen et al., 2008 p. 168). In this case, jobless growth may therefore not be jobless at all – but subcontractors are not usually captured in standard metrics of business growth in employees.

Breen (2009) finds that women-owned HBBs employ less staff than their male counterparts. It is possible that this could be explained by women subcontracting out work rather than taking on regular employees. This may be a more common strategy if they experience higher barriers or restrictions to employment growth than men do. In particular, Brydges & Hracs (2019) find that hiring subcontractors may represent another strategy that businesses in rural areas can use either to overcome geographic marginality and sparse labour markets, and in some cases entrepreneurs may work with local intermediaries/agencies with branches or connections in bigger cities as a form of 'mediated mobility' to agglomerations. Consequently, if women-owned HBBs are concentrated into rural areas, they may be more likely to use subcontractors or agency staff, without the need to take on regular employees in the face of skilled labour shortages outside of the city (Reijonen & Kompupula, 2007). Wang et al. (2009) further reports that only 29% of HBBs in peripheral areas in Australia (more than half of which were women-owned) had taken on more staff in the last 2 years, whereas over half of their sample had grown significantly in turnover. Therefore, if subcontracting is not included as a measure of business performance, women-owned HBBs may appear to have lower job creation potential, when they simply create freelance jobs. Subsequently, the final hypothesis, addressing the link between location and gender, is derived.

H5: Women-owned HBBs are more likely to take on subcontractors as an alternative to regular employees

3. Methodology & Data

3.1. Data & Sample

The empirical analysis draws on data from the 2015 wave of the UK Longitudinal Small Business Survey (LSBS, 2015). The LSBS is a stratified random sample of Small- and Medium-Sized Businesses (SMEs) (0-249 employees) across the whole of the UK, and is one of few surveys that captures the home-based sector. The 2015 survey provides one of the largest firm-level samples of HBBs of any UK business survey to date and is a rich dataset for exploring multiple business performance indicators. Crucially, the LSBS includes unregistered businesses – businesses that are under the VAT threshold and have no employees -, which make up just under half of the home-based business sample, and are rarely included in business surveys due to the methodological challenge of sampling them. Based on the evidence that women's businesses are, as a whole, smaller than men's, the exclusion of unregistered businesses could mean that the women-owned business population is underrepresented in analyses. The total sample of SMEs included in the 2015 survey is 15,501. Of that total, 4,880 businesses described their registered business postcode as a home postcode in initial screenings or answered the question "Does your business have separate business premises to your or someone else's home address?" with no. The focus of this study is on the business performance of private enterprises of women versus men in the UK, therefore excluded are charities, social enterprises, and foreign companies. This gives a sample of 3,578 home-based businesses for this study, of which 21.5% (n=770) are women-owned.

3.2. Operationalisation and Models

3.2.1 Dependent Variables

Three performance measures were derived for this study – turnover, employment and innovation. Turnover has three categories: under £82,000 (below the VAT threshold), £82,000 - £249,999, and above £250,000, with the middle category taken as the reference for modelling. Rather than defining employment as directly employed staff, employment creation is operationalised in this study through combining directly employed staff with subcontracted staff. This variable has four categories: no subcontractors/no employees (taken as the reference), subcontractors/no employees; employees/no subcontractors; subcontractors & employees. Innovation is operationalised in the LSBS as having introduced new goods, services or processes in the last three years, and is coded as non-innovators as the reference category. [1]

3.2.2 Key Independent Variables

In the LSBS, gender is operationalised in terms of business ownership. A woman-owned business is a business which is majority (51% or more) owned by a woman, with all other businesses classified as men-owned businesses, which is the reference category. This is a standard, well-used classification of gender in studies of business performance (Diaz-Garcia

[1] Hughes (2001) suggests that an objective approach (e.g. R&D expenditure or patents) can underestimate innovation for the smallest firms, and exclude important non-technological innovations (Bodlaj, 2018), which is particularly important given that women tend to be underrepresented in the technology sector (Lee & Marvel, 2014). Hence, for this study the subjective/self-reported approach available in the LSBS is preferable.

& Brush, 2012; Henry et al., 2016). Location/settlement type is operationalised into four categories along the urban/rural continuum, which is drawn from the Urban-Rural Census Classification 2011, with guidance from the Unified Classification created for the Consumer Data Research Centre (O'Brien, 2016[2]). This classification has been utilized by other recent entrepreneurship studies identifying intermediate settlements (Abreu et al., 2018). The classification is accurately linked to each business by its full postcode. The variable has four categories: Large City or Conurbation (reference category); Small City/Urban Area; Rural Town & Fringe; Village, Hamlet or Isolated Dwellings. In order to control for possible London effects dominating the category Large City or Conurbation, the control variable London (reference category outside of London) for businesses based in the capital is included alongside location, with robust standard errors. All models are run with and without the London control[3]. Previous studies using the LSBS have demonstrated that London can have a significant impact on urban versus rural performance when not separated out in analyses (Phillipson et al., 2017).

3.2.3 Control Variables

The models include a series of business characteristics as control variables. Drawing on the literature review, business age is included, with start-ups identified as businesses operating for two years or less (Reuschke & Houston, 2017). Industrial sector is included, controlling for gendered entrepreneurial segregation (Sappleton, 2018). This is drawn from one-digit SIC industry codes, however these are collapsed in some of the models, due to small sample sizes in the interaction terms between industry and gender (Table 3 & 4). Other variables include: business exports (codes as yes/no), businesses with multiple owners and partners, business legal status (company/sole trader or partnership), whether the owners are from ethic minority backgrounds, and the online presence of the business (whether the business promotes or sells goods and services online). Furthermore, recognising the potentially significant relationships between the performance outcomes, employment (coded employer/non-employer) is included as a control when modelling turnover and innovation, turnover (coded under/over VAT threshold) is included when modelling employment and innovation, and subcontractors hired (coded no/yes) when modelling innovation. A description of all variables included in the analysis is shown in Table 2 of the Statistical Annexe.

3.2.4 Models

Separate multiple regression models are specified for each of the three performance measures.

The models are run with and without interaction terms between gender and all other independent variables in order to systematically test gender effects. Models are run with and without business location to test the association with the gender variable (addressing H2 & 3)[4]. Interaction terms between gender and business location will address H4 to explore whether women-owned HBBs in intermediate settlements (small cities and towns/fringe) have significantly lower turnover performance. The results from the turnover models (multinomial logistic regression) are reported in Table 3, employment models (multinomial

[2] Available at https://data.cdrc.ac.uk/dataset/population-density-and-urban-rural-classification.
[3] Models without London control are not shown in the statistical annexe due to space restrictions
[4] Models without business location are not shown in the statistical annexe due to space restrictions

logistic regression) in Table 4 and innovation models (binary logistic regression) in Table 5, within the Statistical Annexe.

3.3 Sample Description

The full sample description by gender can be found in Table 1 of the Statistical Annexe. In terms of the key performance indicators, women-owned HBBs have lower turnovers from their male counterparts, with 57.5% of women-owned businesses falling below the VAT threshold versus 53.6% of men-owned businesses. Men-owned HBBs also have higher percentages of businesses bringing in over £250,000 per annum (24.2% versus 22.4%). Against expectations from existing studies (Breen, 2009), women-owned HBBs perform better in terms of employment, have higher proportions of businesses with one to nine employees and are also more likely to have ten or more employees. Furthermore, 46.2% of women-owned HBBs have innovated in the last 3 years, versus 41.9% of men-owned HBBs. Descriptive gender differences in the hiring of subcontractors however, are minimal. Contrary to H2, women-owned businesses are not concentrated outside of major metropolitan areas, and in fact, business location in different settlement types demonstrates almost no proportional gender differences. Furthermore, when looking specifically at London, there are actually higher proportions of women-owned HBBs. The sample description also demonstrates that, in line with other studies of HBBs (Breen, 2009) and the wider small business literature (Robb & Watson, 2012; Sappleton, 2018) there are significant gender differences in industrial composition.

4. Results

Findings from the regression models are presented in Tables 3, 4 and 5. Findings are presented in Relative Risk Ratios (RRR) in Tables 3 and 4 and Odds Ratios in Table 5. Due to space restrictions, not all control variables and interaction terms from the final models are shown.

4.1 Gender & Business Performance

Table 3 displays results from the multinomial logistic regression model estimating turnover performance, and these results indicate no statistically significant differences in turnover between men and women-owned HBBs when accounting for firm demographics and other determinates of business performance. This is despite the descriptive results that indicate that women-owned HBBs have lower turnover overall than men-owned HBBs. The RRR of having turnover below the VAT threshold or above £250,000 versus the reference category (£82,000-£249,000), are close to equal for men and women, meaning that women-owned and men-owned HBBs do not significantly differ in their annual sales. It is instead business size, industry, and age that are associated with turnover. This shows support for H1, that when controlling for relevant business characteristics, women-owned HBBs do not underperform men-owned HBBs in turnover.

Table 4 displays results of the models estimating employment performance, using the combined dependent variable of subcontracting staff and regular employment. This model shows that the RRR of being a business that hires regular employees or regular employees and subcontractors, is significantly increased for women-owners compared to men-owners. As with the results for turnover (Table 3), business industry is significantly associated with employment. However, unlike the turnover model (Table 3), the inclusion of industry and

other firm demographics does not mediate the gender effect. The positive effect of women-owned businesses on employment is particularly strong for being a business employing regular employees, as the RRR of women-owned HBBs falling into this category are twice as high as men-owned HBBs. These results do show support for H1, that women do not underperform men in employment when controlling for firm demographics: quite the opposite, they outperform men-owned HBBs in terms of employment. The results also indicate that there is no support for H5 that women would be more likely to hire subcontractors, as there is no statistically significant difference between men and women-owned businesses hiring subcontractors instead of regular employees.

The results from the model estimating the odds of having introduced new goods, services or processes to the business in the last three years are presented in Table 5. The odds for women versus men innovating are almost equal. These results indicate that in support for H1, there are no significant gender differences in innovation activity when controlling for business characteristics. This is despite the descriptive analysis indicating women-owned HBBs are more innovative overall than their male-owned counterparts are. The innovation model has a significantly lower R2 value than the other models, indicating that the model does not explain as much of the variation in innovation activity as for turnover and employment. Therefore, more research may be needed to better understand the drivers of innovation in the home-based business sector, for both men and women.

4.2 Business Location

Business location is little associated with business performance in this study, and as such, no support for Hypotheses 2, 3 & 4 were found. It was hypothesised (H2) that women-owned HBBs would be concentrated into settlements outside of major agglomerations. Therefore, H3 predicted that location would play a part in mediating the underperformance of women-owned HBBs, i.e. that introducing location into the model would significantly reduce or neutralise any negative odds/RRR of women-owned businesses in turnover, employment and innovation. The sample description already showed that women-owned HBBs are not concentrated outside of major metropolitan areas and that gender differences in business location are very small. Turnover and innovation activity were not found to be statistically different when controlling for business characteristics in the multiple regression models, regardless of the inclusion of location. Moreover, in terms of employment size, women-owned HBBs outperform men-owned HBBs, and again this is not dependent on the business location in large cities, towns etc. It was also hypothesised (H4) that women-owned HBBs in peri-urban/fringe and rural towns may have particularly low financial performance, against the background that they may experience particular barriers to turnover or sales, for example due to more limited mobility/commuting (Rosenthal & Strange, 2012) or restricted access to extra-local networks (Folmer & Kloosterman, 2017). This was investigated through the inclusion of interaction terms between gender and business location. However, the interactions between gender and small city, and gender and rural town/fringe are not statistically significant, and therefore no support for this hypothesis was found.

5. Discussion

This study sought to provide new insights into gendered business performance within the home-based business sector. Using a sample of 3,578 home-based businesses from the 2015 Longitudinal Small Business Survey this study investigated if firm demographics and other

determinates of firm performance account for the apparent underperformance of women-owned HBBs identified in the literature thus far. In order to investigate business performance of the home-based business sector, multiple measures were used and traditional employment size measures expanded to include businesses hiring subcontractor or agency staff. Engaging directly with the "female underperformance hypothesis" in women's business and entrepreneurship research, the multivariate findings in this paper reveal that contrary to the HBB literature thus far (Breen, 2009; Loscocco & Smith, 2004; Wang et al., 2009) women-owned home-based businesses do not underperform in turnover, employment or innovation, but in fact outperform their male-owned counterparts in employment. The combined measure of employment incorporating regular employees and subcontracting staff was utilized to identify if women were more likely to take on subcontracting employees as a substitute for regular employees. However, the analysis revealed that women were significantly more likely to take on employees (regular employees or both subcontractors and regular employees), and that there is no statistically significant difference in women and men-owned HBBs taking on subcontractors as a substitute for regular employees.

A special emphasis was paid to the business location as existing studies had suggested that female business owners choose to locate their business outside of major cities (Rosenthal & Strange, 2012). A large body of literature also suggests that high performing businesses are located in large agglomerations and hence women-owned businesses may underperform as a result (Lee & Marvel, 2014; Marvel et al., 2015). However, against expectations, whether the home-based business is located in a large city, or a small city or town or village does not influence their performance. Furthermore, little or no relationship between gender, location and performance is identified. Women and men have very similar business locations, and location does not mediate the effects of gender on business performance. Again, this differs from findings from the wider business literature (Rosenthal & Strange, 2012), indicating a potential peculiarity of the home-based business sector in this regard, and a gap in understanding, not just why business owners choose to start and run a HBB, but also where (Bosworth & Newbury, 2015).

However, perhaps the most significant finding of this study is that women-owned HBBs outperform men-owned HBBs in terms of employment. This was demonstrated both in the descriptive analysis and the multivariate analysis including all controls for firm demographics, and as such, when men and women are running exactly the same 'type' of business, women are still more likely to be employers. This finding is at odds with both existing literature on HBBs (Breen, 2009) and many studies in the wider SME literature, which show that women-owned businesses tend to be smaller (Fairlie & Robb, 2009; Farhat & Migid, 2017; Rosa & Sylla, 2018). Findings of over-performance in women-owned enterprises are very rare in both sales and employment (Marco, 2012). It would be easy to interpret these findings as a highly positive result for female empowerment in business; that this study indicates that the home is not the restrictive environment for women that it has been portrayed as (Loscocco & Hunter-Smith, 2004; Walker & Webster, 2008). However, one possible explanation is that if women-owned HBBs are highly intertwined with their family situation, then they may be more likely to remain in the home long term – and if they want to grow the business, they must therefore do so within the home. Ekinsmyth (2011; 2013) found that many of the women-owned home-based businesses in her study of 'mumpreneurs' were happy to have employees work in their home or from their own homes, and a study by Reuschke & Houston

(2016), found that businesses which used home resources were just as likely to have up to three employees as other microbusinesses. This indicates that it is certainly possible to take on *some* employees whilst in the home, and it is clear women in this sample are doing just that. However, it is possible that men-owned businesses will move into commercial premises when they wish to take on employees rather than remaining in the home, and therefore would appear as non-employers in a HBB sample.

6. Further Research & Conclusion

The most important area for further investigation emerging from this study is how and when women and men choose to move their businesses out of the home, and whether this is linked to employee growth and other measures of performance. From a geographic perspective, it would be interesting to identify why urban location appears to have little effect on HBB performance, and whether this is reflected in the wider UK SME population. Alternatively, it may be that to identify location effects in HBBs, further research is required on multiple spatial scales– such as the regional level, and multi-level approaches to HBB performance could be pursued where a large enough sample of businesses is available. Finally, more research is still needed into the effects of firm demographics and the drivers of those differences in men and women-owned HBBs, particularly entrepreneurial industrial segregation, as this was such a strong predictor of performance in all measures in this study.

Overall, the findings from this study do not support the underperformance hypothesis of women-owned businesses compared to men. However, Diaz-Garcia & Brush (2012) stress that the gender inequality and issues that produce different firm demographics for men and women should not just be "explained away" or ignored. Although this study demonstrates that under the same business circumstances, men and women-owned HBBs have the same economic outcomes, and this is an important finding in its own right, it must also be recognised that the structural inequalities which push women into industries with lower turnovers, both exist and need to be addressed. On the other hand, in innovation it is the overall higher performance of women-owned businesses that firm demographics mediate. These somewhat contrary findings certainly lend support for multi-measure and multivariate approaches to the study of business performance. But perhaps more importantly, these results may be taken as support for those calling for the discourses that assume that women-owned businesses will always, by nature, have some deficit, to be re-considered and re-written (Marlow & McAdam, 2013; Yousafzai, 2018).

It should be acknowledged that the use of a cross-sectional sample has limitations: it provides only a snapshot of the business's economic status and will not capture changes over time or fluctuations in success. A cross-sectional design makes it difficult to establish causality, and the results presented here can detail associations between variables only. Further research into HBB growth using longitudinal data is still needed. Nonetheless, the findings highlight complex and specific processes within this particular business sector that have not previously been tested in studies of gendered business performance. These results contribute to the evidence base that suggests firm demographics account for gender differences in performance however; they certainly also indicate the need for further analysis to understand the gendered particularities of the home-based sector. The literature on female underperformance is often conflicting (Marco, 2012), and studies which capture this within different contexts - in this case, the home – are of great importance, particularly to further

understanding of the heterogeneity of women-owned businesses and female entrepreneurs (Henry et al., 2019).

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8. Statistical Annexe

Table 1. Sample description by gender of the business owner

Independent Variable	Men-Owned %	Women-Owned %	Total %	N
Ethnic Minority				
Ethnic Minority Owner(s)	3.5	95.0	3.8	138
Not Ethnic Minority Owned	96.5	5.0	96.1	3466
No. Owners/Partners				
Sole Owner	58.5	71.4	61.3	2250
Multiple Owners/Partners	41.5	28.7	28.6	1421
Two Owners/Partners	30.1	22.2	28.3	1041
Three or More Owners/Partners	11.4	6.5	10.3	380
Online Presence of Business				
No Goods/Services Sold or Promoted Online	31.9	21.4	29.6	1578
Promotes Business Online (No Online Sales)	42.3	45.6	43.0	1006
Sells Goods/Services Online	25.9	33.0	27.4	3671
Industry				
Agriculture and Other Primary	7.9	5.5	7.4	271
Manufacturing	4.5	3.2	4.2	155
Construction	21.3	5.7	17.9	658
Wholesale & Retail Trade	8.2	6.5	7.8	286
Transport	5.2	3.0	4.8	175
Accommodation/ Food	3.9	6.8	4.5	165
Information & Communication	8.5	5.8	8.0	290
Financial/ Insurance/ Real Estate	2.9	1.5	2.6	95
Professional & Scientific	19.4	22.4	20.0	735
Administration & Business Support	7.5	12.6	8.6	314
Education	4.1	7.5	4.8	176
Health/ Social Work	2.3	11.0	4.2	153
Recreation/ Arts/ Other Entertainment	2.6	3.3	2.8	102
Other Personal Services	1.9	5.2	2.6	96
Business Age				
Trading More Than 20 years	50.1	42.2	48.4	1775
Trading 10 – 20 years	20.9	22.0	21.1	775
Trading 3-10 years	25.0	30.5	26.1	958
Start-up (Trading 2 Years or Less)	4.03	5.3	4.3	158
Legal Status				
Sole Trader/ Partnership	46.2	46.1	46.2	1695
Company (Incorporated)	53.9	53.9	53.8	1976
Exporting				
Exports Goods/Services	16.1	13.4	15.5	567
Does Not Export	83.9	86.6	84.5	3094
Business Location				
Conurbation/ Large Urban Areas	26.4	27.3	26.6	975
Small City & Urban Area	38.3	37.0	38.0	1393
Rural Towns & Fringe	10.0	10.7	10.1	370
Village, Hamlets & Isolated Dwellings	25.3	25.1	25.3	925
London Location				
London	10.8	13.7	13.4	418
Outside London	89.2	86.3	88.6	3253
Business Size				
Non-Employer	65.1	56.9	63.4	2327
Employer	34.8	43.1	36.6	1344
1-9 Employees	21.8	23.5	22.2	814

10+ Employees	13.0	19.7	14.4	530
Subcontracting Staff				
Does not hire subcontractors	79.4	80.4	79.6	2921
Hires subcontractors	20.7	19.7	20.4	750
Turnover				
Below VAT (Under £82,000)	53.6	57.5	54.4	1776
£82,000 - £249,999	22.2	20.1	21.8	711
Above £250,00	24.2	22.4	23.8	778
Employment & Subcontractors				
No Staff/ No Subcontractors	54.4	47.3	52.9	1942
No Staff/ Subcontractors	10.7	9.6	10.5	385
Staff/ No Subcontractors	24.9	33.1	26	979
Staff/ Subcontractors	9.9	10.	9.9	365
Innovation				
Innovators	41.9	46.2	42.8	1566
Non-Innovators	58.1	53.8	57.1	2090

Note: Longitudinal Small Business Survey, 2015; UK SMEs with 0-249 employees, registered at a home address. Source: authors' compilation.

Table 2. Descriptive statistics for variables included in analysis

Dependent Variable	**Reference Category**	**Obs.**	**Mean**	**Std. Dev**	**Min.**	**Max.**
Employment	No staff & no subcontractors	3671	1.762	1.733	0	3
Turnover	£82,000 - £249,999	3265	1.306	0.830	0	2
Innovation	Non-Innovators	3656	0.428	0.495	0	1
Gender of Business Owner	Men-Owned (business is 50% or less owned by women)	3671	0.215	0.411	0	1
Ethnic Minority Ownership	Not wholly owned by owner(s) from minority ethnic group(s)	3608	0.054	0.226	0	1
No. Owners/Partners	Sole Owner	3671	0.491	0.676	0	2
Online Presence of Business	Business does not promote or sell its goods and services online	3671	0.978	0.755	0	2
Industry	Professional/Scientific	3671	4.657	3.866	0	13
Business Age	20 Years or more	3666	0.863	0.948	0	3
Legal Status	Sole Trader or Partnership	3671	0.538	0.499	0	1
Exporting	Business does not export goods or services outside of the UK	3661	0.155	0.362	0	1
Urban-Rural Settlement Type	Conurbation or large city/urban area	3663	1.340	1.123	0	1
London	Outside London	3671	0.114	0.318	0	1
Turnover (binary)	Under £82,000 (Below VAT)	3265	1.306	0.830	0	1
Employment (binary)	Non-employer	3671	0.366	0.482	0	1
Subcontractors (binary)	Does not hire subcontractors	3265	1.306	0.830	0	1

Note: Longitudinal Small Business Survey, 2015; UK SMEs with 0-249 employees, registered at a home address. Source: authors' compilation.

Table 3. Home-based businesses by turnover, relative risk ratios (ref cat. £82,000-£249,999)

Independent Variables (Ref. = Reference Category)	Model 1 (without interaction)				Model 2 (with interaction)			
	Under £82,000		£250,000 & Above		Under £82,000		£250,000 & Above	
	RRR	SE	RRR	SE	RRR	SE	RRR	SE
Women-owned (Ref Cat. Men-owned)	1.172	0.156	1.084	0.167	1.278	0.716	1.571	1.131
Business Location (Ref Cat. Conurbation/Large Urban Area)								
Small City/Urban Area	1.169	0.183	1.350	0.248	1.163*	0.202	1.532	0.319
Rural Town & Fringe	0.930	0.187	0.756	0.188	0.975	0.215	1.047	0.298
Village, Hamlet or Isolated Dwellings	0.727	0.125	1.001	0.201	0.722	0.139	1.197	0.273
London (Ref Cat. Outside London) [1]	0.827	0.167	1.310	0.302	0.720	0.168	1.434	0.381
Women-Owned X Small City or Urban Area	-	-	-	-	1.074	0.439	0.701	0.340
Women-Owned X Town or Peri-Urban/Rural Area	-	-	-	-	0.824	0.467	0.351	0.217
Women-Owned X Villages Hamlet or Isolated Dwelling	-	-	-	-	1.063	0.464	0.515	0.266
Women-Owned X London (Ref Cat. Outside London)	-	-	-	-	1.779	0.869	0.963	0.542
Industry (Ref Cat. Professional & Scientific)								
Agriculture & Other Primary	0.902	0.225	3.255***	0.877	0.768***	0.209	3.199	0.967
Manufacturing	0.719	0.209	2.553**	0.734	0.606*	0.187	2.218	0.698
Construction	1.311	0.230	4.326***	0.976	1.310***	0.245	3.979	0.981
Wholesale & Retail Trade	0.674	0.153	2.279***	0.488	0.596***	0.156	2.484*	0.598
Transport & Storage	1.052	0.269	2.561**	0.876	-	-	-	-
Accommodation & Food	0.690	0.201	2.673***	0.751	-	-	-	-
(Transport, Accommodation etc.)[2]	-	-	-	-	0.796**	0.182	2.248	0.618
Information & Communication	0.918	0.181	0.758	0.186	1.085	0.236	0.754	0.212
Financial & Insurance/ Real Estate	0.505*	0.159	2.289*	0.775	0.473*	0.163	2.102*	0.733
Administration & Business Support	1.107	0.222	3.162***	0.755	0.975***	0.231	2.767	0.793
Education	2.015*	0.600	0.509	0.274	2.670*	1.063	0.585*	0.448
Health & Social Work	2.338**	0.726	3.616**	1.364	-	-	-	--
Arts & Entertainment & Recreation	1.529	0.483	2.025	1.057	-	-	-	-
Other Personal Services	1.566	0.535	1.292	0.726	-	-	-	-
(Health, Arts, Other Personal Services etc.)[2]	-	-	-	-	1.336*	0.338	1.974*	0.682
Business Age (Ref Cat. Trading more than 20 years)								
Start-up (Ref Cat. Trading Two Years or Less)	1.627	0.223	0.773	0.130	1.506	0.231	0.731	0.138
10-20 Years	1.503	0.190	0.773*	0.113	1.536	0.220	0.740	0.128
3-10 years	1.542	0.387	0.501*	0.159	1.470	0.426	0.643	0.233
Employer (Ref Cat. Non-Employer)	0.827	0.167	4.725***	0.617	0.235	0.034	5.037***	0.726
No. Observations	3191				3191			
Log pseudolikelihood	-2216.648				-2190.390			
Wald Chi2 (df)	1042.84 (58)				1076.71(102)			
Pseudo R2	0.310				0.318			

*Note: Longitudinal Small Business Survey, 2015; UK SMEs with 0-249 employees, registered at a home address. Control variables that are not shown: ethnic minority owner(s), online presence of the business, no. of owners/partners, legal status, exports goods/services. Interaction terms between gender and other IVs not shown. *p≤0.05, **p≤0.01, ***p≤0.001. [1]Robust standard errors estimated (STATA command: VCE robust) .[2]Industry variable categories collapsed in Model 2. Source: authors' compilation.*

Table 4. Home-based businesses by staff and sub-contractors, relative risk ratios (ref cat. no staff/no subcontractors)

Independent Variables (Ref Cat. = Reference Category)	Model 1 (without interaction)						Model 2 (with interaction)					
	Subcontractors/ No Staff		No Sub-contractors/Staff		Sub-contractors & Staff		Subcontractors/ No Staff		No Sub-contractors/Staff		Sub-contractors & Staff	
	RRR	SE	RRR	SE	RRR	SE	RRR	SE	RRR	SE	RRR	SE
Women-owned (Ref Cat. Men-owned)	1.341	0.201	1.831***	0.224	1.621**	0.275	0.358	0.247	2.049	1.091	1.623	1.355
Business Location (Ref Cat. Conurbation/Large Urban)												
Small City/Urban Area	1.425	0.271	0.902	0.136	1.136	0.236	1.653*	0.245	1.083	0.184	1.159	0.270
Town or Peri-Urban/Rural Area	1.617	0.404	1.053	0.212	1.542	0.416	1.832*	0.373	1.142	0.263	1.602	0.490
Village, Hamlet or Isolated Dwellings	1.443	0.305	0.987	0.166	1.003	0.231	1.648*	0.305	1.146	0.211	1.053	0.265
London (Ref Cat. Outside London) [1]	1.968**	0.455	0.938	0.184	1.398	0.361	2.237**	0.600	1.139	0.259	1.673	0.500
Women-Owned X Small City or Urban Area	-	-	-	-	-	-	0.523	0.245	0.585	0.206	1.085	0.553
Women-Owned X Town or Peri-Urban/Rural Area	-	-	-	-	-	-	0.579	0.373	1.186	0.545	1.283	0.845
Women-Owned X Villages Hamlet or Isolated Dwellings	-	-	-	-	-	-	0.596	0.305	0.989	0.381	1.223	0.674
Women-Owned X London (Ref Cat. Outside London)	-	-	-	-	-	-	0.593	0.318	1.139	0.259	0.497	0.307
Agriculture & Other Primary[2]	3.014***	0.849	3.731***	0.909	5.932***	2.014	-	-				
Manufacturing	1.318	0.464	4.295***	1.045	2.232*	0.760	-	-				
Construction	2.539***	0.479	1.191	0.224	4.205***	0.990	-	-				
(Agriculture, Manufacturing, Construction etc.)[3]	-	-	-	-	-	-	1.716**	0.308	1.545*	0.260	2.876***	0.648
Wholesale & Retail Trade	1.151	0.326	3.692***	0.755	1.851*	0.564	-	-				
Transport & Storage	1.861*	0.543	2.159**	0.538	2.762**	0.959	-	-				
Accommodation & Food	0.620	0.344	7.633***	1.976	2.916**	1.160	-	-				
(Wholesale, Transport, Accommodation etc.)[3]	-	-	-	-	-	-	1.031	0.246	3.465***	0.639	2.181**	0.578
Information & Communication	0.732	0.177	1.066	0.237	1.055	0.289	0.618	0.164	0.956	0.235	0.966	0.290
Financial & Insurance/ Real Estate	1.554	0.594	1.928*	0.585	1.985	0.793	-	-	-	-	-	-
Administration & Business Support	1.026	0.278	3.280***	0.633	3.034***	0.803	0.738	0.241	2.604***	0.582	2.872***	0.842
Education	1.384	0.386	1.057	0.316	1.709	0.730	-	-				
Health & Social Work	0.581	0.288	4.155***	0.919	2.724**	0.956	-	-				
Arts & Entertainment & Recreation	1.008	0.391	1.323	0.425	1.851	0.809	-	-				
Other Personal Services	0.837	0.389	2.516**	0.813	2.426	1.213	-	-				
(Education, Health, Arts, Other Personal Services etc.)[3]	-	-	-	-	-	-	0.632	0.179	1.640*	0.337	1.267	0.402
Business Age (Ref Cat. Trading more than 20 years)												
Start-up (Ref Cat. Trading Two Years or Less)	0.976	0.154	0.889	0.115	1.180	0.210	0.939	0.163	0.863	0.123	1.159	0.230
10-20 years	1.066	0.155	0.879	0.111	1.078	0.178	1.003	0.165	0.850	0.121	0.964	0.183
3-10 years	1.046	0.314	1.019	0.248	1.189	0.395	1.020	0.357	1.056	0.296	1.310	0.493
Turnover Above £82,000 (Ref Cat. Below £82,000)	2.112***	0.270	7.366***	0.838	13.579***	2.622	2.236***	0.318	7.848***	1.048	11.98	2.729
No. Observations	3582						3582					
Log pseudolikelihood	-3274.086						-3286.515					
Wald Chi2 (df)	1202.74 (84)						1214.18 (123)					
Pseudo R2	0.210						0.207					

*Note: Longitudinal Small Business Survey, 2015; UK SMEs with 0-249 employees, registered at a home address. Control variables that are not shown: ethnic minority owner(s), online presence of the business, no. of owners/partners, legal status, exports goods/services. Interaction terms between gender and all other IVs not shown. *p≤0.05, **p≤0.01, ***p≤0.001. [1]Robust standard errors estimated (STATA command: VCE robust). [2]Ref Cat. Model 1: Professional & Scientific; Model 2: Professional & Financial etc. [3]Industry variable categories collapsed in Model 2. Source: authors' compilation.*

Table 5. Home-based businesses by innovation activity, odds ratios (ref cat. non-innovators)

Independent Variables	Model 1 (without interaction)		Model 2 (with interaction)	
(Ref Cat. = Reference Category)	OR	SE	OR	SE
Women-owned (Ref Cat. Men-owned)	0.998	0.099	1.626	0.831
Business Location (Ref Cat. Conurbation/ Large City or Urban Area)				
Small City/Urban Area	1.043	0.122	1.110	0.148
Rural Town & Fringe	1.099	0.174	1.125	0.202
Village, Hamlet or Isolated Dwellings	1.222	0.160	1.206	0.182
London (Ref Cat. Outside London)	0.870	0.134	0.940	0.167
Women-Owned X Small City or Urban Area	-	-	0.729	0.217
Women-Owned X Town or Peri-Urban/Rural Area	-	-	0.978	0.385
Women-Owned X Villages Hamlet or Isolated Dwelling	-	-	1.086	0.356
Women-Owned X London (Ref Cat. Outside London) [1]	-	-	0.703	0.268
Turnover (Ref Cat. £82-249,999)				
Under £82,000	0.994	0.125	1.043	0.150
£250,000 & Above	0.960	0.126	0.972	0.148
Employer (Ref Cat. Non-Employer)	1.169	0.124	1.212	0.150
Subcontracting (Ref Cat. No Subcontracting)	1.682***	0.168	1.671***	0.188
Industry (Ref Cat. Professional & Scientific)				
Agriculture & Other Primary	0.555**	0.110	0.597*	0.133
Manufacturing	0.922	0.189	0.970	0.219
Construction	0.352***	0.050	0.370***	0.056
Wholesale & Retail Trade	0.521***	0.088	0.586**	0.111
Transport & Storage	0.589*	0.122	0.635*	0.139
Accommodation & Food	0.497**	0.107	0.592*	0.151
Information & Communication	1.660	0.265	1.934***	0.348
Financial, Insurance, Real Estate	0.668*	0.165	0.679	0.182
Administration & Business Support	0.675*	0.103	0.688*	0.125
Education	0.640	0.124	0.692	0.164
Health, Social Work	1.149	0.251	1.199	0.400
Recreation, Arts & Other Entertainment	0.792	0.195	0.819	0.233
Other Personal Services	0.621	0.157	0.427*	0.150
Business Age (Ref Cat. Trading more than 20 years)				
Start-up (Ref Cat. Trading 2 years or less)	1.018	0.188	0.914	0.109
10-20 years	1.014	0.098	0.964	0.107
3-10 years	0.995	0.105	1.079	0.233
No. of Observations	3184		3184	
Log pseudolikelihood	-1935.7585		-1923.2302	
Wald Chi2 (df)	401.82(32)		423.92(63)	
Pseudo R2	0.1108		0.1166	

*Note: Longitudinal Small Business Survey, 2015; UK SME's with 0-249 employees, registered at a home address only. Control variables that are not shown: ethnic minority owner(s), online presence of the business, no. of owners/partners, legal status, exports goods/services, industry, business age. Interaction terms between gender and all other IVs not shown. *p<0.05, **p<0.01, ***p<0.001. [1]Robust standard errors estimated (command: VCE robust). Source: authors' compilation.*

9. Data Citation

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10. Reference List

Abreu, M., Oner, O., Brouwer, A. & van Leeuwen, E. 2019. Well-being effects of self-employment: A spatial inquiry. *Journal of Business Venturing,* 34**,** 589-607.

Acker, J. 2006. Inequality regimes: Gender, class, and race in organizations. *Gender & society,* 20**,** 441-464.

Anwar, M. N., Daniel, E. M. 2014. Online home based businesses: systematic literature review and future research agenda.

Audretsch, D. B. & Dohse, D. 2007. Location: A neglected determinant of firm growth. *Review of World Economics,* 143**,** 79-107.

Bathelt, H., Malmberg, A. & Maskell, P. 2004. Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress in human geography,* 28**,** 31-56.

Bird, S. R. & Sapp, S. G. 2004. Understanding the Gender Gap in Small Business Success: Urban and Rural Comparisons. *Gender and Society,* 18**,** 5-28.

Bosworth, G. & Newbery, R. 2015. Home-based businesses in rural England. *Regions Magazine,* 299**,** 6-9.

Breen, J. & Karanasios, S. 2010. Growth and expansion of women-owned home-based business. *International Business & Economics Research Journal,* 9**,** 33-45.

Breen, J., Victoria University.Centre for, T. & Services, R. 2009. Gender differences in home-based business ownership. *Small Enterprise Research: The Journal of SEAANZ***,** 124.

Brydges, T. & Hracs, B. J. 2019. The locational choices and interregional mobilities of creative entrepreneurs within Canada's fashion system. *Regional Studies,* 53**,** 517-527.

Cabrera, E. M. & Mauricio, D. 2017. Factors affecting the success of women's entrepreneurship: a review of literature. *International Journal of Gender and Entrepreneurship,* 9**,** 31-65.

Clark, D. N. & Douglas, H. 2010. Micro business: Characteristics of home-based business in New Zealand. *Small Enterprise Research,* 17**,** 112-123.

Díaz-García, M. C. & Brush, C. 2012. Gender and business ownership: Questioning "what" and "why". *International Journal of Entrepreneurial Behaviour & Research,* 18**,** 4-27.

Du Rietz, A. & Henrekson, M. 2000. Testing the female underperformance hypothesis. *Small Business Economics,* 14**,** 1-10.

Durmaz, S. B. 2015. Analyzing the quality of place: Creative clusters in Soho and Beyoğlu. *Journal of Urban Design,* 20**,** 93-124.

Ekinsmyth, C. 2011. Challenging the boundaries of entrepreneurship: The spatialities and practices of UK 'Mumpreneurs'. *Geoforum,* 42**,** 104-114.

Ekinsmyth, C. 2013. Managing the business of everyday life: the roles of space and place in "mumpreneurship". *International Journal of Entrepreneurial Behaviour & Research,* 19**,** 525-546.

Fairlie, R. W. & Robb, A. M. 2009. Gender differences in business performance: Evidence from the characteristics of business owners survey. *Small Business Economics,* 33**,** 375-395.

Farhat, J. & Mijid, N. 2017. Do women lag behind men? A matched-sample analysis of the dynamics of gender gaps. *Journal of Economics and Finance*, 1-28.

Fischer, E. M., Reuber, A. R. & Dyke, L. S. 1993. A theoretical overview and extension of research on sex, gender, and entrepreneurship. *Journal of Business Venturing,* 8, 151-168.

Folmer, E. & Risselada, A. 2013. Planning the Neighbourhood Economy: Land-Use Plans and the Economic Potential of Urban Residential Neighbourhoods in the Netherlands. *European Planning Studies,* 21, 1873-1894.

Foss, L., Henry, C., Ahl, H. & Mikalsen, G. H. 2019. Women's entrepreneurship policy research: a 30-year review of the evidence. *Small Business Economics,* 53, 409-429.

Gottschalk, S. & Niefert, M. 2013. Gender differences in business success of German start-up firms. *International Journal of Entrepreneurship and Small Business,* 18, 15-46.

Hanson, S. & Blake, M. 2005. Changing the gender of entrepreneurship. *A companion to feminist geography*, 179-193.

Hastings, D., Anwar, M. N. & Chowdhury, G. 2018. *Exploring the Collaborative Behaviours of Home-based Businesses in OECD Countries*.

Henry, C., Coleman, S., Foss, L., Orser, B., Welter, F. & Brush, C. 2019. Richness in Diversity: Towards more contemporary research conceptualisations of women's entrepreneurship. *Call for Papers - International Small Business Journal.*

Henry, C., Foss, L. & Ahl, H. 2016. Gender and entrepreneurship research: A review of methodological approaches. *International Small Business Journal,* 34, 217-241.

Houston, D. & Reuschke, D. 2017. City economies and microbusiness growth. *Urban Studies,* 54, 3199-3217.

Hughes, K. D., Jennings, J. E., Brush, C., Carter, S. & Welter, F. 2012. Extending women's entrepreneurship research in new directions. *Entrepreneurship Theory and Practice,* 36, 429-442.

Jain, A., Courvisanos, J. 2013. Home-based business in suburban peripheral regions and government policy: A case study of Casey, Melbourne, Australia. *Australasian Journal of Regional Studies,* 19, 295-318.

Jurik, N. C. 1998. Getting away and getting by: The experiences of self-employed homeworkers. *Work and Occupations,* 25, 7-35.

Justo, R., DeTienne, D. R. & Sieger, P. 2015. Failure or voluntary exit? Reassessing the female underperformance hypothesis. *Journal of Business Venturing,* 30, 775-792.

Kalleberg, A. L. & Leicht, K. T. 1991. Gender and organizational performance: Determinants of small business survival and success. *Academy of management journal,* 34, 136-161.

Kane, K. & Clark, W. A. V. 2018. Mapping the landscape of urban work: Home-based businesses and the built environment. *Environment and Planning A*.

Kapasi, I. & Galloway, L. 2018. Home-based businesses: An Exploration of Business Model. *Journal of Business Models,* 6, 63-78.

Klapper, L. F. & Parker, S. C. 2010. Gender and the business environment for new firm creation. *The World Bank Research Observer,* 26, 237-257.

Lee, I. H. & Marvel, M. R. 2014. Revisiting the entrepreneur gender-performance relationship: A firm perspective. *Small Business Economics,* 42, 769-786.

Leibovitz, J. 2004. 'Embryonic'knowledge-based clusters and cities: the case of biotechnology in Scotland. *Urban Studies,* 41, 1133-1155.

Loscocco, K. & Bird, S. R. 2012. Gendered Paths: Why Women Lag Behind Men in Small Business Success. *Work and Occupations,* 39**,** 183-219.
Loscocco, K. & Smith-Hunter, A. 2004. Women home-based business owners: insights from comparative analyses. *Women in Management Review,* 19**,** 164-173.
Marco, R. 2012. Gender and economic performance: Evidence from the Spanish hotel industry. *International Journal of Hospitality Management,* 31**,** 981-989.
Marlow, S. & McAdam, M. 2013. Gender and entrepreneurship: Advancing debate and challenging myths; exploring the mystery of the under-performing female entrepreneur. *International Journal of Entrepreneurial Behaviour and Research,* 19**,** 114-124.
Martins, J. 2015. The extended workplace in a creative cluster: Exploring space (s) of digital work in silicon roundabout. *Journal of Urban Design,* 20**,** 125-145.
Marvel, M. R., Lee, I. H. I. & Wolfe, M. T. 2015. Entrepreneur Gender and Firm Innovation Activity: A Multilevel Perspective. *IEEE Transactions on Engineering Management,* 62**,** 558-567.
Mason, C. & University of Strathclyde. Hunter Centre for, E. 2009. Home-based business: Challenging their Cinderella status. *Small Enterprise Research: The Journal of SEAANZ***,** 104.
Mason, C. M., Carter, S., Tagg, S. 2011. Invisible Businesses: The Characteristics of Homebased Businesses in the United Kingdom. *Regional Studies,* 45**,** 625–639.
Phelps, N. A. 2004. Clusters, dispersion and the spaces in between: For an economic geography of the banal. *Urban Studies,* 41**,** 971-989.
Phelps, N. A., Fallon, R. J. & Williams, C. L. 2001. Small firms, borrowed size and the urban-rural shift. *Regional Studies,* 35**,** 613-624.
Phillipson, J., Gorton, M., Maioli, S., Newbery, R., Tiwasing, P. & Turner, R. 2017. Rural business aspirations, obstacles and support: an analysis of the Longitudinal Small Business Survey 2015. *Enterprise Research Centre Research Paper*.
Reijonen, H. & Komppula, R. 2007. Perception of success and its effect on small firm performance. *Journal of Small Business and Enterprise Development,* 14**,** 689-701.
Reuschke, D. & Domecka, M. 2018. Policy brief on home-based businesses.
Reuschke, D., Houston, D. 2016. The importance of housing and neighbourhood resources for urban microbusinesses. *European Planning Studies,* 24**,** 1216-1235.
Reuschke, D. & Mason, C. 2015. Urban home-based businesses: how distinct are they and their owners? *Entrepreneurship in Cities*.
Robb, A. M. & Watson, J. 2012. Gender differences in firm performance: Evidence from new ventures in the United States. *Journal of Business Venturing,* 27**,** 544-558.
Rosa, J. M. & Sylla, D. 2018. A comparison of the performance of majority female-owned and majority male-owned small and medium-sized enterprises. *International Journal of Entrepreneurship and Small Business,* 35**,** 282-302.
Rosenthal, S. S. & Strange, W. C. 2012. Female entrepreneurship, agglomeration, and a new spatial mismatch. *Review of Economics and Statistics,* 94**,** 764-788.
Sappleton, N. 2018. Gender and business performance: The role of entrepreneurial segregation. *Women Entrepreneurs and the Myth of 'Underperformance': A New Look at Women's Entrepreneurship Research.* Edward Elgar Publishing Ltd.
Sayers, J. G. 2010. Home-based businesses in the city. *Small Enterprise Research,* 17**,** 165-176.

Shearmur, R. & Doloreux, D. 2008. Urban hierarchy or local buzz? High-order producer service and (or) knowledge-intensive business service location in Canada, 1991–2001. *The Professional Geographer,* 60**,** 333-355.

Steyaert, C. & Katz, J. 2004. Reclaiming the space of entrepreneurship in society: geographical, discursive and social dimensions. *Entrepreneurship & regional development,* 16**,** 179-196.

Storper, M. & Venables, A. J. 2004. Buzz: face-to-face contact and the urban economy. *Journal of economic geography,* 4**,** 351-370.

Thompson, P., Jones-Evans, D. & Kwong, C. 2009. Women and home-based entrepreneurship: Evidence from the United Kingdom. *International Small Business Journal,* 27**,** 227-239.

Trettin, L. & Welter, F. 2011. Challenges for spatially oriented entrepreneurship research. *Entrepreneurship & Regional Development,* 23**,** 575-602.

Van Gelderen, M., Sayers, J. & Keen, C. 2008. Home-based internet businesses as drivers of variety. *Journal of Small Business and Enterprise Development,* 15**,** 162-177.

Walker, E. & Flinders University of South Australia, T. 2003. Home-based businesses: Setting straight the urban myths. *Small Enterprise Research: The Journal of SEAANZ***,** 35.

Walker, E., Wang, C., Redmond, J. 2008. Women and work-life balance: is home-based business ownership the solution? *Equal Opportunities International,* 27**,** 258-275.

Walker, E. & Webster, B. 2004. Gender issues in home-based businesses. *Women in Management Review,* 19**,** 404-412.

Wang, C., Walker, E., Redmond, J. & Breen, J. Contributions of home-based businesses to regional economic development. Proceedings of 23rd ANZAM Conference 2009, Melbourne, 1-4 December, 2009.

Welter, F. 2011. Contextualizing entrepreneurship—conceptual challenges and ways forward. *Entrepreneurship theory and Practice,* 35**,** 165-184.

Welter, F., Brush, C. & De Bruin, A. 2014. The gendering of entrepreneurship context. *Institut für Mittelstandsforschung Bonn (Hrsg.): Working Paper,* 1**,** 14.

Williams, S. & Currid-Halkett, E. 2011. The emergence of Los Angeles as a fashion hub: a comparative spatial analysis of the New York and Los Angeles fashion industries. *Urban Studies,* 48**,** 3043-3066.

Wynarczyk, P. & Graham, J. 2013. The impact of connectivity technology on home-based business venturing: The case of women in the North East of England. *Local Economy,* 28**,** 451-470.

Yousafzai, S. Y., Fayolle, A., Lindgreen, A., Henry, C., Saeed, S. & Sheikh, S. 2018. *Women entrepreneurs and the myth of 'underperformance' : a new look at women's entrepreneurship research*.

Zolin, R., Stuetzer, M. & Watson, J. 2013. Challenging the female underperformance hypothesis. *International Journal of Gender and Entrepreneurship,* 5**,** 116-129.