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Gender and Bank Lending after the Global Financial Crisis:
Are Women Entrepreneurs Safer Bets?

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Abstract

Using gender as a theoretical framework, we analyse the dynamics of bank lending to small and medium sized enterprises (SME) in the aftermath of the 2008 Global Financial Crisis. Using six waves of the SME Finance Monitor survey, we apply a formal Oaxaca-Blinder decomposition to test whether gender impacts upon the supply and demand for debt finance by women. Reflecting established evidence, we found women had a lower demand for bank loans; contradicting accepted wisdom however, we found that women who did apply were more likely to be successful. We argue that feminised risk aversion might inform more conservative applications during a period of financial uncertainty which may be beneficial for women in terms of gaining loans. However, we also uncover more subtle evidence suggesting that bank decisions may differ for women who may be unfairly treated in terms of collateral but regarded more positively when holding large cash balances.

1. Introduction

Since the 1990s, there has been a growing interest in the influence of gender upon women's entrepreneurial activities (Henry, Foss and Ahl, 2016; Marlow and Martinez-Dy, 2018). A dedicated theme emerging from this critique has been access to business funding to support entrepreneurial endeavours (Marlow and Patton, 2005; Carter, Shaw, Lam, et al., 2007; Coleman and Robb, 2015). Given the market vulnerability of small and medium sized enterprises (SMEs), attaining access to appropriate forms of finance can be challenging (Roberts, 2015). A well-rehearsed debate suggests women business owners are further disadvantaged by discriminatory gendered ascriptions which potentially affect both the supply and demand of business funding; this in turn, impacts upon venture sustainability and growth (Marlow and Patton, 2005; Alesina and Lotti, 2008; Colman and Robb, 2009). We add a new

dimension to this debate by critically analysing the impact of the 2008 global finance crisis (GFC) upon bank lending practices to women business owners in the UK.

After 2008, the GFC had a far-reaching impact upon the small firm finance landscape (Cowling, Liu, and Ledger, 2012; Vermoesen, Deloof, and Laveren, 2013). Such effects have persisted beyond the GFC into a subsequent world recession (Jones-Evans, 2015; Lee, Sabeen, and Cowling, 2015). This period of turbulence was associated with 'extremely tight credit conditions' (Piacentini; 2013: 24) for small firm borrowing through either retracted lending or higher financing costs (Duarte, Gama, and Gulamhussen, 2018). Given the catastrophic effect of the GFC, it is critical to delve more deeply into the effects of this event from a more nuanced perspective.

To contribute to this debate therefore, we develop a number of research objectives which aim to explore how gender influences access to bank lending for women business owners during the context of the GFC. Thus, our first research objective focuses upon the demand-side of the credit market. It is suggested that women have a greater propensity for risk aversion which may constrain lower levels of demand for business finance (Croson and Gneezy, 2009; Huang and Kisgen, 2013). We also consider how behaviours may shape the capital structures of male and female businesses in this context. It is expected that this tendency for risk-aversion would be exacerbated during periods of financial uncertainty (Prugl, 2012). Our second objective explores supply side issues regarding whether women business owners have equal access to loans, and whether this has been affected by the GFC. The broad evidence suggests that generically, women use smaller amounts of start-up capital (Fairlie and Robb, 2009; Cesaroni, Sentuti, and Buratti, 2015) and experience higher liquidity constraints in terms of income and personal wealth (Rybczynski, 2015). We would therefore, expect the GFC to have a greater influence upon access to loans which may in turn, exacerbate notions of risk and contribute to discouragement (Cowling, Liu, Minniti et al, 2016; Rostamkalaie, Nitani and Riding, 2018). Our final research objective explores issues of gender discrimination against women applying for loans in the post GFC era. In so doing, we also acknowledge substantial changes in the technology utilised within contemporary banking in developed economies to inform loan decisions (Frame and White, 2014). To explore these objectives, we draw upon data from six waves of the UK SME Finance Monitor survey from 2011 to explore patterns of lending during this period. We apply a formal Oaxaca-Blinder decomposition to test whether differences in the supply and demand for debt finance might be explained by variance in the firm profile or whether gender based discrimination is evident.

Our contribution is broadly two fold. Theoretically, we add a more nuanced analysis to the prevailing logic that in terms of access to bank funding, women are universally disadvantaged by gendered ascriptions. We challenge this axiom when arguing that in a context of financial recession, prototypical forms of femininity actually become advantageous as banks seek to hedge risks by favouring more conservative lenders. Additionally, we are one of few studies to acknowledge the growing importance of algorithms as an objective sorting device which can favour female lenders. Thus, we draw upon theoretical arguments and empirical evidence to over-turn existing prejudicial assumptions that women are less attractive borrowers once context is factored into the argument. In addition, we suggest there may be a 'virtuous circle' created here in that the reputation of women borrowers will be enhanced as they prove to be 'better bets' for banks whilst growing dependence upon algorithms should reduce gender discrimination [we acknowledge that attention must be afforded to the construction of algorithms to address biased measures]. On the basis of an enhanced reputation as borrowers, we suggest this effect will persist beyond recessionary periods and so, there will be a lasting benefit for women business owners seeking debt finance. Empirically, we employ a novel method (Blinder–Oaxaca decomposition) to separate the gender differences in credit demand and supply that are explained by the institutional, individual and behavioural characteristics of businesses run by men and women, from those attributed to gender discrimination. Consequently, we present evidence which contradicts the current axioms regarding gender, women and bank lending and so, encourage future research to explore whether a recessionary effect has prompted a broader change in the perception of women borrowers.

The paper is structured as follows. In the next section we briefly outline our foundational theoretical framing regarding gender and its impact upon entrepreneurial activity with a focus upon funding issues. We then present our empirical data and the descriptive statistics, followed by regression results on our loan demand and supply models by applying a decomposition analysis to isolate potential gender discrimination in loan markets. We discuss the implications of our arguments when concluding in the final section.

2. Theoretical Framework and Hypotheses

2.1 Gender, entrepreneurship and bank lending

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Unlike sex, which is associated with biological categorisation (Kaiser, 2012)[1], gender has no substantive form. Yet, it is universally acknowledged as a fundamental identity marker which makes human subjects mutually intelligible with a spectrum of characteristics captured within notions of masculinity and femininity (Oakley, 1979; Butler, 2004). Although gender is enacted as a multiplicity, such that individuals exhibit diverse and often, melded gender identities and behaviours (Linstead and Pullen, 2006), there is a persistent association between masculinity/male and femininity/female with a continuum between this binary (Bowden and Mummery, 2013). In addition to being a sense making device, gender attributes value to human action merely by the ascription of masculinity or femininity which universally, devalues the latter (Bradley, 2007; Lindsey, 2015). Simply put, stereotypical feminine characteristics whether articulated by men or women, are deemed to be of lower value than those associated with masculinity (Fine, 2010). Whilst such degrees of valorisation are context driven, gendered spaces, activities and characteristics associated with femininity are deemed of lesser value (Bowden and Mummery, 2014). Drawing upon this very brief review, we summarise that human activities are embedded within contextualised gendered norms which inform social orders; that which is associated with the feminine however, is afforded a lower value informing discriminatory practices.

It terms of entrepreneurship, it has been acknowledged that the preferred entrepreneurial profile reflects masculine traits such competitiveness, aggression and risk taking (Ahl, 2006; McAdam, 2012, Jennings and Brush, 2013). This has informed a 'masculinised discourse' within entrepreneurship which generates a preferred entrepreneurial prototype which privileges men and disadvantages women (Ahl, 2006, Marlow, Carter and Shaw, 2008). Analysing the performance of matched weighted samples of firms suggests there is no essential entrepreneurial deficiency attributable to owner sex (Robb and Watson, 2012). Rather, gendered ascriptions constrain women's accrual of entrepreneurial capital and legitimacy limiting their entrepreneurial potential and evaluations of their capabilities (Calas, Smircich and Bourne, 2009; Marlow and Martinez-Dy, 2018). Consequently, as an outcome of structural and tacit discrimination, there are fewer women entrepreneurs *per se* – within Europe they represent around 25% of firm owners (30% of self-employed) (Deloittes, 2016); they are more likely to own younger, marginal firms in lower performing sub-sectors of the service industry and are over-represented as owners of home-based part-time ventures

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[1] There is now some debate regarding sex as a binary biological category given debates around intersex individuals such that it might be argued that there are multiple sex categories (Fine, 2017)

(McAdam, 2012; Carter et al., 2015). Not surprisingly, given this operating profile, women are also more likely to depend upon informal sources of funding such as savings, credit and family support (Anyadike-Danes, Hart and Du, 2015; Roberts, 2015; Lim and Suh, 2019).

In addition to such constraints, which encourage dependency upon informal funding, women are deemed to have a lower toleration for risk in terms of financial behaviour across a range of activities including investment, stock trading, salary enhancement, business funding and general money management (Barber and Odean: 2001; Beckman and Menkhof: 2008; Hastings, Madrian and Skimmyghorn, 2013). In the context of entrepreneurship, risk toleration is a central issue given the uncertainty of entrepreneurial outcomes (Block, Sander and Speigel, 2015). Consequently, feminised notions of financial risk-aversion have been disadvantageous in terms of business finance so for example, Speelman, Clark-Murphy, and Gerrans (2013) found that gender and risk tolerance were the dominant factors in explaining investment behaviours with women favouring lower risk options.

In relation to the most frequently used form of finance, bank lending, gendered differences in risk tolerance have been identified for latent and actual entrepreneurs (Verheul et al., 2012). As such, risk-aversion influences demand for bank loans whereby women business owners exhibit greater reluctance to assume debt (Croson and Gneezy, 2009; Huang and Kisgen, 2013; Carter et al., 2015). Accordingly, the picture painted by prevailing evidence regarding demand suggests a scenario where a number of factors coalesce to channel women towards dependency upon informal funding, whilst those who do seek formal funding may be more cautious in their ambitions, given feminised risk aversion. Despite the body of evidence exploring these arguments (Carter, et al., 2007; Coleman and Robb, 2009; Freel, Carter, Tagg et al., 2012; McAdam, 2012; Roberts, 2015) there is an assumption of a static model of lending which fails to factor in differential contexts shaping loan conditions. So for example, we know very little about how the impact of the GFC affected attitudes to lending (Cowling, Liu, and Ledger, 2012). Thus, to contribute to this debate we suggest two competing hypotheses which recognise potential constraints upon informal funding during this period encouraging demand to switch to formal funding but this may be tempered by feminised risk aversion.

H1a: Women business owners will have a lower demand for bank loans due to relatively lower risk tolerance and so, unwillingness to take on debt in periods of economic crisis

H1b: Women business owners will have a higher demand for bank loans due to their inability to finance their businesses from internal sources in periods of economic crisis

2.2 Loan supply

The theory of bank loan supply in the presence of asymmetric information pertaining to funding application approvals demonstrates some consensus (Besanko and Thakor, 1987; Melnik and Plaut, 1986; Sharpe, 1990; Stiglitz and Weiss, 1981). Extensions to general theories of the bank decision-making process have been made to include the effects of long-term relationships (Uchida, Udell, and Yamori, 2012; Beck, Behr and Madestam, 2014) and a repeated, dynamic process of lending over time (Stiglitz and Weiss, 1983). Banks make lending decisions both in terms of whether to make an offer to the firm and, if so, under what conditions. They draw upon observable characteristics (associated with risk of non-repayment) verifiable given the distribution of 'good' and 'bad' borrowers, and their opportunity cost of capital. Efforts are made to induce borrowers to reveal their quality and invest greater commitment to a successful outcome with more favourable consideration for collateral supported loan applications. Importantly, both are initially unobservable to the bank. Commonly identified risk factors that influence the bank lending decision, and the loan price, include venture age (Hyytinen and Pajarinen, 2007), size (Beck and Demirguc-Kunt, 2006), the availability of collateral or guarantee (Coco, 2000; de Rassenfosse and Fischer, 2016; Leeth and Scott, 1989) and length of the venture-bank relationship (Berger and Udell, 1995; Han, Zhang and Greene, 2017).

At a theoretical level, there should be no observable differences between male and female owned businesses *per se* in respect of their ability to access bank loans if business characteristics are similar. However, due to broader structural socio economic discrimination, women as a category have access to lower levels of collateral and/or entrepreneurial capital to support loan applications (Marlow and Patton, 2005; McAdam, 2012). These factors, plus, their poor fit with the masculinised entrepreneurial prototype ensures that women business owners seeking finance may be more likely to experience overt and tacit forms of discrimination (Coleman and Robb, 2015; Saparito et al., 2012). So for instance, an analysis of 7,800 lines of venture credit in Italy revealed that loan officers applied higher collateral requirements and tighter credit limits upon women entrepreneurs (Bellucci, Borisov, and Zazzaro; 2010). Thus, tacit discrimination informs internalised assumptions of female deficit (Fine, 2010). Gendered ascriptions are also a powerful signalling device to potential investors

(Eddleston et al., 2016). Alsos and Ljunggren (2016) found that during the search for investment, women were more likely to adopt 'compensation strategies' such as involving men in the bidding team in an effort to overcome the deficit associated with femininity whereas, ' male entrepreneurs seem to have a lesser need to use compensatory signalling strategies' (Alsos and Ljunggren, 2016:18).

It is suggested that such negative connotations will become more salient during periods of uncertainty that prompt greater caution amongst lenders (Thebaud and Sharkey, 2016). As such, when assessing applications from women entrepreneurs during such periods, lenders demand higher levels of collateral and seek more convincing signals of competency to overcome the status deficit associated with femininity. Consequently, we might expect subjective discrimination biases to be more influential during a period of economic distress when lenders perceive women loan applicants as less adept financial managers.

Yet, this negative picture is not universal; recently, Cole (2013) and Isaksson and Quoreshi (2015) find that women business owners are more likely to be granted loans; it has been suggested that this may be related to greater risk-aversity such that they present stronger applications and/or ask for smaller loans. Indeed, reflecting the contemporary shift regarding the desirability for prudence within capital markets and the public narrative of female caution, this combined discourse generates a context where women may be more likely to be offered a loan whereby conservative applications become more attractive in a context of economic distress.

Regarding loan supply, we propose two competing hypotheses;

H2a: Women business owners will have a higher probability of loan rejection as they lack savings and assets to post against bank loans and are subject to gender discrimination; this probability increases during periods of economic distress.

H2b: In the absence of discrimination women business owners will have a lower probability of loan rejection as they are more risk averse and hence, more likely to achieve a successful project outcome; this probability increases during periods of economic distress.

2.3 The effect of GFC

The collapse of Lehman Brothers in September 2008 accelerated the onset of a global banking crisis (EIB, 2015). Consequently, balance sheets were severely weakened restricting funds for lending as banks, regulators, and governments made large provisions for losses (Ivashina and Scharfstein, 2010). In the small firm lending market, access to credit became more restrictive; when loans were offered, conditions were more onerous (EIB, 2015); lending rates increased, collateral requirements were higher, and lines of credit were reduced (Fougere et al., 2012; Vermoesen, Deloof, and Laveren, 2013). The GFC, and the economic downturn that it induced on a global scale, also had firm level effects. In periods of reduced demand for the products and services of smaller firms, many scaled down growth plans (Cowling et al., 2015) leading to a reduction in the demand for investment capital. This occurred alongside a more general downturn in firm performance over the recessionary cycle (Smallbone et al.,2012), although it has been suggested that there have been differential effects, with new firms experiencing more pronounced declines in performance (Grilli, 2011).

Given our previous debate regarding gendered aspects of the supply of, and demand for, bank loans, we argue that our general hypotheses hold, but they will be magnified in the post-GFC environment. As noted, if funding applications are of similar quality, the sex of the owner should be immaterial. Gendered analyses of discrimination (Marlow and Patton, 2005; Carter et al., 2007; Beck et al., 2014; Cesaroni and Sentuti, 2016) however, suggest that the status bias within the loan application process critically disadvantages women entrepreneurs and this be exacerbated during times of financial crisis. This assumption however, does not acknowledge the shifting tenor of debate regarding the association between excessive machismo, masculinity and reckless investment behaviour, and the GFC which, it is being suggested would not have arisen had women, with assumed greater prudence, been more influential during this era (Basch, 2009; Kay and Shipman, 2009). Captured by the reflection, 'If Lehman Brothers had been Lehman Sisters' there are suggestions that the financial crash might have been avoided had the investment activities of reckless men been constrained by their more cautious female counterparts (Sunderland, 2009). Thus, whilst feminised risk aversion has previously deemed disadvantageous in the context of financial management there is now almost a *volte face* regarding the desirability of female responsibility as a restraint upon masculinised recklessness. It is interesting to see women now dubbed the 'Sheriffs of Wall

Street' (Scherer, 2010)[2]. Whilst substantive evidence for alleged feminised prudence remains limited and essentialised notions of risk aversity are questionable (Marlow and Swail, 2014; Fine, 2017), the prevailing discourse has been influential in positioning women as a desirable cautious presence within the realms of financial management (Broadbridge and Simpson, 2011; Prugl, 2012).

In addition to shifting gendered perceptions of desirable investment and borrowing practices, the increasing use of technology for credit scoring to assess loan applications is potentially influential in reducing discriminatory practices. As such, banks are deploying innovative new lending technologies to capture the hard information required to inform lending decisions (Baum, Caglayan, and Ozkan, 2009; Goh and Kauffman, 2013). Frame and White (2014), in a detailed review conclude that technological change has fundamentally altered the nature of banks services and products. Specifically, the ability to use advanced statistical techniques to credit score lending applications in consumer and business markets has increased exponentially as computing power and software have advanced. Such advanced risk measurement systems are increasingly common becoming a statutory requirement by national and international banking regulators as key tools in stress testing of financial institutions. This generates a swifter and ostensibly more objective lending decision process.

Whilst for banks and smaller ventures, the empirical evidence suggests that the adoption of IT based technologies in the loan market has had little discernible impact on the volume of credit available at the portfolio or individual firm level (McNulty, Murdock & Richie, 2013). It may however, be fuelling a more efficient decision process. Indeed, several studies (Einav, Jenkins & Levin, 2013; Hernando & Nieto, 2007; Ciciretti, Hasan & Zazzara, 2009) found that shifts to IT based lending technologies and internet banking have increased bank profits. This implies that the quality of lending has either remained constant or increased, and the banks cost of lending has fallen. With the advent of hard information-based lending procedures and technologies, we suggest that such changes may prove advantageous to women previously detrimentally affected by status bias if subjective assessments of an applicant's 'fit' with stereotypical notions of preferred borrowers are diminished.

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[2] A note of caution here; whilst there has been much poplar debate and aspersions regarding the desirability of women occupying more influential positions in the investment industry, their jobs have been subject to higher levels of cuts during the recession, they are still a small minority in top positions in leading investment firms while the evidence for alleged feminised prudence is based upon gendered stereotypes and myth with little substantive evidence to support such claims.

We argue that contemporary debate surrounding small firm bank lending within developed economies must acknowledge recent shifts in the financial environment and the use of IT within funding decisions. Specifically, we offer a more informed notion of how developments in loan assessments may challenge previous gendered biases applied to women business owners applying for debt funding. The approach in this study, using a decomposition approach, not only allows us to identify whether there are significant gender based differences in patterns of loan demand and the willingness of banks to meet these loan requests, but adds greater insight by seeking to quantify just what proportion of these two decisions (the entrepreneur and the bank) can be meaningfully explained by gender based differences in personal characteristics, firm specific characteristics and lending behaviours. The greater the unexplained element of these two decisions, the more imperative it is to identify alternative explanations for such observations.

3. Data and Variables

3.1 Sample

This section describes the data source and the survey method from which the data is derived, followed by a discussion on both the dependent and independent variables used in the analysis. The data corresponds to six waves of the SME Finance Monitor surveys conducted by BDRC Continental. The first survey wave was in July 2011, with subsequent waves undertaken in November 2011, March 2012, May 2012, November 2012 and the most recent in March 2013. In total this represents 30,183 completed surveys. In order to qualify for interview, firms had to meet the following criteria in addition to the quotas by size, sector, and region:

- not 50%+ owned by another company
- not run as a social enterprise or as a not for profit organisation
- turnover of less than £25m
- The respondent was the person in charge of managing the business's finances. No changes have been made to the screening criteria in any of the waves conducted to date.

Quotas were set by size of business and by number of employees. The classic B2B sample structure over-samples the larger firms compared to their natural representation in the small firm population. In order to generate robust sub-samples of larger firms, fewer interviews were

conducted with zero employee ventures. Each quarter's sample matched that of the previous quarter results as closely as possible. Quotas were set to reflect the natural profile by sector, but with some amendments to ensure that a robust sub-sample was available for each sector. Thus, fewer interviews were conducted in Construction and Property/Business Services to allow for interviews in other sectors to be increased, in particular for Agriculture and Hotels. The weighting regime was initially applied separately to each quarter. The six quarters were then combined and grossed to the total of 4,548,843 firms, based on BIS data. This ensured that each individual wave is representative of all firms whilst the total interviews conducted are also weighted to the total of all firms.

3.2 Dependent variables

Panel A of Table 1 shows the definition of dependent variables, which capture demand for, and bank supply of, external finance. Both variables are binary and static in nature. Demand for finance is defined as whether entrepreneurs reported having sought/applied for finance for their ventures in the previous twelve months. Supply of finance is defined as whether the firm obtained (all or part of) the finance required. On average between July 2011 and March 2013, 23.7% SMEs sought debt finance.

3.3 Explanatory variables

Explanatory variables for the supply and demand of finance are generally related to the development stage of the venture and the degree of information opacity between the venture and finance suppliers, which have been shown to be significant by prior studies. Panel B of Table 1 defines the explanatory variables by these four groups. Firm characteristics include venture size, legal status, sector, age, and performance. Size is measured by employee number and sales turnover. The former defines a business as micro- (up to nine employees), small- (10 to 49 employees) and medium-sized (50 to 249 employees) enterprise, and the latter is grouped into nine bands with an upper limit of £9.99 million. Legal status is defined by four categories including sole trader, partnership, LLP and Limited liability. Sector is defined as nine one-digit SIC codes. Age is defined in six categories from <12 months old to >15 years old. We have two measures of performance available; first, the annual profit/loss of the firm and second, a fast-growth identifier variable.

Owner characteristics and human capital measures consist of (highest) formal educational qualification, prior business experience, and whether or not the entrepreneur holds a financial

qualification. Firm-level risk indicators include the Experian risk classification which has four categories: Minimal, Low, Average and Above Average. It is based upon a mix of three core metrics; the cash volume of debt; the term structure of debt, and; incidences of legal proceedings for non-payment of outstanding debts. In addition, there are six independent measures of financial delinquency including non-payment of loans, unauthorised overdraft borrowing, refused cheques, County Court Judgements, late payment of tax and trade credit restrictions.

We also consider additional control variables regarding source of finance, business activities and possible credit support provided for finance application. Regarding the source of finance, we consider whether or not the venture is using personal equity. Business activities concern operating behaviours including innovation, the development of new process and products and the degree of internationalisation (whether the venture exports products overseas). The availability of business plans is used as a proxy for financial security or credit support for the application.

[INSERT TABLE 1 HERE]

3.4 Descriptive statistics

Table 2 reports the descriptive statistics of dependent and independent variables by owner sex. The proportion of loan applications is 23.5% and 24.1% for male and female business owners, respectively. Amongst those who applied for finance, 89.8% of men have attained at least part of the loan for which they applied; the number is slightly higher at 90.4%, for women. Nonetheless, the differences in the likelihood of loan demand and successful application are in both cases statistically insignificant.

[INSERT TABLE 2 HERE]

Figures 1 and 2 demonstrate the dynamics of loan demand and supply over the six waves of the Finance Monitor data. The two key dynamics in terms of both loan demand and supply are (a) that they rose over time as more loans were requested and a higher proportion were granted, and, (b) that both demand and supply became more stable and less subject to variation quarter to quarter (except for loan demand for male entrepreneurs in earlier 2013). This suggests that the market is moving back onto a stable equilibrium path after the obvious mismatch between supply and demand for loans in the immediate aftermath of the financial crisis and the first two years of recession (as identified by Cowling, Liu, and Ledger, 2012).

However, it can be seen that women entrepreneurs become more active in seeking finance over time after the recession and in turn, the likelihood of a successful application for women exceeds that of male peers with the improvement of the economic environment.

Fig 1: Historical Loan Demand by Gender

[INSERT FIG 1 HERE]

Fig 2: Historical Loan Supply by Gender

[INSERT FIG 2 HERE]

In terms of business characteristics, our data show that women-owned businesses are on average, smaller and younger; as owners, women have less entrepreneurial experience but higher levels of education. These characteristics suggest a higher degree of business risk for such firms with a greater possibility of financial delinquency. However, a striking difference is that women owned firms seeking finance are more likely to be high growth, and innovative. This supports the notion that owner sex does not impair entrepreneurial competency (Robb and Watson, 2012). Rather, whilst gendered ascriptions appear to limit women's opportunities to create ventures with scope for innovation and growth which require formal funding (Marlow and McAdam, 2015), when they do negotiate such barriers they are more likely to attain funding. In other words, women may be less likely to create innovative growth ventures (Anyadike-Danes, et al., 2015) but if they do so, and apply for bank funding, they are more likely to be successful.

4. Empirical results

As a preliminary analysis, we first model the demand for, and supply of, external debt finance between July 2011 and March 2013, the third and fourth years since the GFC, using gender as an independent variable. By definition, the outcome of a finance application is only recorded if a firm actually sought finance (Cosh et al., 2009). As both of the dependent variables are by construction binary variables, a probit model with selection[3] is used and the maximum likelihood coefficient estimates are shown in Table 3[4]. We use this econometric method, to test for sample selection effects given the possible non-randomness of loan application decisions. For the identification to be valid, the model requires that the selection

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[3] See Van de Ven and Van Pragg (1981) for an introduction of the model.
[4] As an alternative, we also fitted the data using the logit model and the results are not significantly different from the probit estimations.

(i.e. demand) equation includes at least one variable that is not included in the main probit (i.e. supply) equation. Here we use 12 geographical region indicators as the demand-specific variables in the model as they are found to be significantly associated with loan demand but have no explanatory power for loan supply. The chi-test of independence between the selection and main equations is rejected at 5% level, indicating the existence of selection bias and the validity of our model.

Women entrepreneurs are less likely to apply for finance (β = -0.11, $p < 0.05$) but are more likely to be successful once a loan application has been submitted (β = 0.15, $p < 0.1$). In marginal terms (results not reported), this translates to probability differentials of -1.8% and 1.5% for loan demand and supply, respectively. Generally speaking, loan demand increases with venture size and age. Further, loan demand is generally unrelated with the risk profile of a firm, or the degree of financial delinquency. In the case of loan supply, it is found that finance is generally advanced to firms that are more mature, have high credit rating and lower degrees of financial delinquency.

To make sure that the low demand for finance by female entrepreneurs is not a result of women being more likely to be discouraged from the credit market, Model 2 of Table 3 formally tests the conditional probability of discouragement given that a firm is in need of external finance. Here we define a discouraged borrower as a firm that needed external finance, but did not apply as it was assumed that either the financing costs[5] were too high, or the application would be rejected. Our results show that the lower application rate by women is caused by their genuine lower demand for external finance (β = -0.18, $p < 0.01$). Once the lower demand is controlled for, women are actually less likely to be discouraged (β = -0.16, $p < 0.01$), by a marginal probability of 2.3% compared to men. It is worth noting, that credit discouragement is significantly affected by risk rating and financial delinquency (e.g. unauthorized overdraft and court judgement), suggesting riskier small business borrowers have objectively assessed their credit risk and made rational financing decisions accordingly.

[INSERT TABLE 3 HERE]

However, it is the primary objective of this study to investigate the existence of possible gender discrimination in small venture debt funding, i.e. the difference in the likelihood of

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[5] The costs include both direct costs including interest charge and collateral requirement, and indirect costs including (a) restrictions/conditions imposed to the loan, (b) potential loss of firm control; (c) time spent on the application and (d) complicated application process or bank literature.

loan demand and supply that is not explained by group differences between female and male owned small firms plus, business and owner characteristics, as identified in Table 3. A commonly used empirical model for such comparison is the Blinder–Oaxaca decomposition (Blinder 1973; Oaxaca 1973). The full details of the model specification can be found in Appendix A.

Table 4 reports the results for Blinder–Oaxaca decomposition for loan demand. The predicted likelihood for male entrepreneurs applying for finance is 18.2% and the probability for women, 14.6%, both significant at 1% level. The overall difference of 3.6% is also significant at 1% level, indicating that male owners have a notably higher credit demand than female owners. Around half of this overall difference (1.92%, $p < 0.01$) is attributed to the model predictors, which means that given the business and owner characteristics, women would have a lower propensity to seek bank finance in the first place. The unexplained part, never the less, shows that a male entrepreneur is 1.7% more likely to apply for finance ($p < 0.05$) even if he runs exactly the same business as a comparable female entrepreneur. The latter coefficient estimate is a clear sign that lower loan demand by women entrepreneurs is also driven by other factors unrelated to personal and firm specific demographics.

[INSERT TABLE 4 HERE]

We use the same model to decompose the differences in the probabilities that the entrepreneur successfully attains the required loan. In order to capture the conditionality of loan supply, we adjust the model for the inverse mills ratio calculated from a probit model for loan demand, similar to the model used in Table 3. Partly consistent with the pilot analysis, the probability of securing at least part of the loan required conditional on loan application is 84.5% for male entrepreneurs and 5.5% higher (90.0%) for women, but the difference is not statistically significant. The difference is neither explained by firm- or owner-level characteristics, nor by possible discrimination in the small venture loan market.

5. Robustness checks

We have identified significant gender differences in both the financing decisions and outcomes by SME borrowers. We proposed three potential channels through which such differences arise, namely the effect of GFC, the availability of collateral, and entrepreneurial risk-aversion. In this section, we conduct further checks to explore the mechanisms of the

gender difference, using information from the existing data set. The full regression results are reported in Tables 5 to 8.

We are not able to check the direct effect of GFC since our data only covers post-crisis periods. Instead, we use the quarterly GDP (inflation-adjusted) growth for each of the six survey waves (Model 1, Table 5) to proxy for the broader macroeconomic environment. Here we find no gender difference in terms of credit demand, but women-owned businesses are more likely to be approved finance during lower GDP growth periods, indicating that more conservative risk attitudes among women entrepreneurs may be influential upon bank financing decisions during an economic downturn. Such an effect is not found using simple year indicators (Model 2, Table 5). Further, we find a negative effect of the interaction between women-owned business and profit on credit demand (Model 1, Table 6). This shows that financing constraints has a stronger demand-side effect for women than men.

[INSERT TABLE 5 HERE]

We use three proxies for collateral availability. First, we use a direct indicator whether or not any security was provided during the loan application (Model 2, Table 6). We find that applications with security are more likely to succeed, but also a significantly negative interaction between women and security provision. This suggests that a one-dollar-value of collateral provided by a women entrepreneur is seen as less valuable than an equivalent, male entrepreneur. However, when we use the firm's credit balance (held in current and deposit accounts) as a proxy for loan guarantee (Model 3, Table 6), we find that women-owned businesses with higher cash balance are more likely to be approved. The combined result shows that lenders tend to assign different values to alternative forms of collateral provided by women, this is potentially a result of gender discrimination and warrants further investigations in future research. Finally, we also use the firm's legal form to proxy for collateral (Model 4, Table 6) due to the different obligations by limited and unlimited companies but find no significant gender difference.

[INSERT TABLE 6 HERE]

Risk preference is proxied first, using the number of financial institution (Model 1, Table 7) and then external advice sources a firm used (Model 2, Table 7). We contend that multiple banking relationships are favoured by more risk-averse entrepreneurs, because they allow a desirable sharing of borrowing risks and prevent exploitation by a single bank (Foglia, Laviola

and Reedtz, 1998). Seeking professional advice helps to bridge the information gap between small business borrowers and lenders and thus, also signals the risk-aversion of entrepreneurs. However, we find contrasting results for these two measures. As expected, the odds of successful loan application by women increases with the number of advice sources used. However, female applicants using more banks are less likely to be approved. This can be explained by the implicit signals conveyed by multiple banking relationships, in the sense that a firm only switches from its main bank, owing to internal problems (which the main bank may observe), to alternative banks which have less information about the firm. In so doing, the firm may face an adverse selection problem, because banks unfamiliar with the firm's quality are more likely to refuse the loan application. Risk-aversion may also be proxied by the use of non-bank debt, such as that from friends and family, or soft finance (Model 3, Table 7), but the coefficient estimates are insignificant. We do not find any gender difference in finance demand using any of the three measures of risk-aversion (results not reported given space constraints).

[INSERT TABLE 7 HERE]

To further examine the mechanism of potential gender biases in the credit market, we empirically test whether or not there exists any synergy between collateral availability and risk-aversion for female borrowers, under alternative macroeconomic conditions. We choose security provision and the number of external advice sources as the proxy for collateral and risk preference, respectively based on the explanatory power of the variables in determining credit supply and interact them with gender and economic indicators (quarterly real GDP growth). The result is reported in Table 8. Despite the values of coefficient estimates due to possible measurement issues and the complexity in interpreting higher-order interactions, our finding highlights the complementarity between the collateral and risk-aversion channels. Here, we show that loan applications by more risk-averse women who are willing to pledge collateral are more likely to succeed, but this effect is more evident during low-growth rather than high-growth periods.

[INSERT TABLE 8 HERE]

6. Discussion and limitations

Within this paper, we have critically evaluated the dynamics of bank lending to SMEs in the period of economic downturn following the GFC adopting a gendered perspective to

analyse the supply and demand of bank lending to women entrepreneurs. As a background to our analysis, we have noted contemporary debates regarding the influence of gender upon women's entrepreneurial propensity and activity (Henry et al., 2015; Jennings and Brush, 2013; Marlow and Martinez-Dy, 2018). There is consensus that women, as a category, are socio-economically disadvantaged by gendered ascriptions (Fine, 2017). Unsurprisingly, such disadvantage is reproduced in the context of entrepreneurial activity; women are deemed a poor 'fit' within the masculinised discourse of the discipline (Ahl, 2006) whilst structural gendered constraints limit their potential to accrue critical entrepreneurial resources (Marlow and McAdam, 2013). Additionally, there is a perceptual status bias against women entrepreneurs informing expectations that they, and their firms, will demonstrate performance deficits due to an essentialised lack of entrepreneurial competence. Research challenging assumptions of feminised deficits (Ahl, 2006; Ahl and Marlow, 2012; Robb and Watson, 2012) suggests that if afforded equal access to key entrepreneurial resources, such as finance, women have the same likelihood of creating and managing sustainable entrepreneurial ventures as their male counterparts. Consequently, access to finance for women entrepreneurs really matters, both as an issue of equality and also, as a pathway to enhance the competitive performance of an economy (McAdam, 2012; Coleman and Robb, 2015).

There is however, mixed evidence regarding women's access to lending; given certain characteristics such as: owning younger ventures, concentration in lower order services, having less entrepreneurial experience, lower levels of personal income and wealth plus, the status deficit of femininity (McAdam, 2012), we would expect such characteristics to negatively affect both demand and supply issues. Yet, the evidence is somewhat contradictory; given that women are associated with greater risk aversion (Marlow and Swail, 2014) they may offer more conservative lending applications so, present 'safer bets' which act to counter discriminatory lending decisions. To explore such contradictory arguments, we have analysed how the recent global financial crises and ensuing economic uncertainty impacts upon the relationship between gender, women and SME bank lending. So for example, we note the emergence of contemporary arguments pertaining to the desirability of feminised caution regarding generic financial management plus, the importance of IT changes in bank lending systems and practices. This contemporary and contextualised analysis informs our research objectives which focused upon: the supply of loans to women and effects of the GFC; demand for loans and effects of the GFC; shifts in banking practices and finally, the influence of gender discrimination upon supply and demand.

From these research objectives, we developed a number of hypotheses tested using the UK SME Finance Monitor data; Table 9 summarises our empirical findings with regard to these hypotheses. In terms of our first hypothesis relating to the influence of gender upon women's demand for bank loans in the post GFC era, we found women entrepreneurs were less likely to seek finance but if they did make such an application, they were marginally more likely to be successful. This appears somewhat counterfactual for as noted above, women owned ventures are less likely to present a preferred profile for successful applications. We suggest this somewhat contradictory result arises from gendered risk aversity in that women are more likely to submit conservative, but stronger applications presenting fewer risk factors. In effect, risk aversion prompts higher quality at the expense of quantity and within the current climate, this combination becomes advantageous. Again, contrary to received wisdom we also found women were less likely to be discouraged borrowers; rather, when they felt external finance was required they applied for it and were likely to be successful. Thus, in the aftermath of the GFC, it may be necessary to revisit notions of discouragement and how they are actualised - there may be overlaps here with risk issues or levels of caution related to a more realistic assessment of the firm profile in terms of a positive loan decision.

[INSERT TABLE 9 HERE]

Our second hypothesis related to supply issues and the influence of discrimination in a post-GFC era. Using a Blinder - Oaxaca decomposition, we find that women entrepreneurs are 2% more likely to secure at least part of the loan in comparison to their male counterparts. Whilst not significant, this analysis does enable us to control for several factors relating to firm characteristics and importantly, it also enables us to eliminate discrimination issues. On this basis, we find that discrimination is not a factor in the loan decision process.

Regarding the impact of gender upon the supply and demand of bank lending to women, as we have noted, previous evidence is somewhat mixed. Drawing upon gender theory *per se* (Fine, 2010 and 2017; Oakley, 2015) mapped onto an analyses of women as disadvantaged entrepreneurial actors, discriminatory outcomes regarding funding would be intuitively expected. And indeed, there is strong historical evidence for this outcome (Thebaud and Sharkey, 2016) and also, when discriminating in terms of forms of finance, women are barely visible as recipients of equity finance or as users of aspects such as factoring or leasing (Roberts, 2015; Alsos and Ljunggren, 2016; Coleman and Robb, 2015). Within this paper however, we narrow the focus to bank lending, given its position in finance pecking order, and

contextualise our analysis when acknowledging the impact of the GFC and the ensuing economic downturn. Given previous evidence, in such a context, we might expect the status deficit attached to women entrepreneurs, greater risk-aversity plus a range of detrimental personal and venture characteristics to have an exaggerated effect upon supply and demand issues. What we have found however, is that women are slightly more likely to be successful in their applications for funding.

This suggests that the merit of the application and the quality of the business is less likely to be percolated through a negative discriminatory gendered lens during the assessment process. Indeed, drawing upon the post-crises discourse regarding gendered attitudes towards risk, investment and responsibility (Broadbridge and Simpson, 2011; Prugl, 2012) discriminatory assumptions may now be counterpoised such that feminised ascriptions of prudence have been positively re-evaluated. We suggest that this discourse has accompanied the increasing use of IT and computer based algorithms in the lending process as banks have sought to cut their cost base. In short, if constructed upon neutral foundation, credit scoring algorithms (which are in increasingly common usage) should diminish the scope for human actor gender bias within the lending decision. We do not suggest that gender is inconsequential; clearly, allegedly neutral algorithms can reproduce human biases, socialisation processes shape attitudes to risk, structural disadvantages constrain women's opportunities to accrue entrepreneurial competencies whilst a masculinised discourse generates a context unsympathetic to their presence. What we do suggest however, is the need to acknowledge recent shifts in the perception of risk, the financial environment and the far reaching impact this has had upon bank restructuring and relatedly, the influence of IT upon lending decisions.

This paper has a number of limitations; we only focus upon debt funding in the UK. There is considerable scope to transpose these arguments and analyses to other developed economies, such as the US, to explore these arguments in more detail and scope. Whilst bank loans make the greatest contribution to SME finance, we acknowledge the need to explore how discrimination and gender mesh to impact upon women's access to other forms of business finance and how these might be affected by the GFC. Moreover, we cannot comment on trends in loan repayment – whether higher risk aversion translates into lower levels of delinquency for example, so longitudinal work to explore this issue would be informative. This is a particularly important strand of future research for as has been noted (Prugl, 2012), feminised female prudence has been lauded as a particularised, essential quality of women

despite the lack of evidence to support such assumptions. So by elevating women to the higher echelons of financial management or indeed, offering women entrepreneurs greater access to loans during times of financial constraint, this could be setting them up to fail. Applying unsupported expectations to women as a category, during a period of down-turn, may not prove to be beneficial. This situation requires careful monitoring into the future particularly as despite the rhetoric of enhanced voice and visibility for women within financial management there is little evidence for an enhanced presence at the most senior levels in the profession (Catalyst, 2011; Post and Byron, 2015). Consequently, the trends we identify require critical analysis and future monitoring.

It would also be useful to repeat this analysis in a range of other economies where credit scoring technology is used to differing degrees to assess how it influences gendered issues in terms of discrimination and loan outcomes. Given the fundamental reconstruction of world banking post-GFC, and particularly state ownership of failing banks, for which our data is unable to account, future work may wish to consider differences in gender outcomes by bank type. It could also be worth conducting a replication study to test whether gender patterns in bank financing return to their previous situation when the economy finally reaches a period of stable and consistent growth. In this sense data limitations and the passage of time prevent us from investigating these interesting avenues.

7. Conclusion

Our critical contribution is to suggest that whilst women entrepreneurs are less likely to apply for bank lending, if they do apply, women are more marginally more likely to be successful. This effect is enhanced if women have greater levels of collateral whilst remaining risk averse which positions them as 'ideal borrowers' in that they have do not over extend whilst having a strong fall back resource. In so doing, our study goes beyond a simple gender dichotomy of the small business –bank relationship in respect of loan transactions. Specifically, we are able to add richness and depth to our understanding of potential differences in (i) the rate of loan applications, (ii) the incidence of borrower discouragement, and, (iii) the way in which banks make their loan allocation decisions. Specifically, we are able to isolate and observe potential gender effects on the loan demand and supply decision arising from the way in which businesses are configured, the way in which their capital structures are organised, and the types of projects for which loan funds are sought. Further, we are able to examine how gender based differences in risk tolerance not only shape the way

men and women approach investment projects, but how banks respond to these more risk-based behavioural characteristics. We also extend previous work in that we can look deeper into potential hidden discriminatory practices by banks given that explicit discrimination based simply on gender is unlawful. Our results show no headline gender discrimination, even with differences in application rates, but additional more subtle evidence that a pound of collateral offered by a female loan applicant is treated less favourably than a pound of collateral offered by a male applicant. Yet these negative gender collateral effects can be overturned if a female holds a substantial cash reserve in her business account. Thus, banks weight 'serviceability, the ability to generate enough cash to pay the interest and capital repayments, more highly for female loan applicants and collateral, less so.

Consequently, we argue, somewhat paradoxically, that higher levels of risk aversion, deemed disadvantageous to entrepreneurial ambitions, may actually benefit women entrepreneurs seeking funding as they present 'safer bets' in the contemporary era. But after looking deeper into the way in which banks arrive at their final loan decision, we uncover some new insights. Specifically, female loan applications suffer a relative disadvantage when offering collateral as security against a loan, but have a relative advantage if they have accumulated a large cash reserve in the business. This implies that even when the final loan decision observed shows no gender based discrimination, potential differences in the way women and men configure their businesses and behave in respect of capital structure might mean that certain behaviours are rewarded and punished and this has a gender aspect to it.

Yet, we add the codicil that over the longer term, this may not necessarily be beneficial if women are associated with higher rates of default and failure. This tendency, combined with the increasing use of credit scoring algorithms does however, suggest a contemporary feminised benefit. As such, a potential entrepreneurial disadvantage, that of risk aversion, is reformulated as advantageous during a period of economic uncertainty. How such issues shape banking estimates of the true risk of lending requires far greater consideration (Delis, Hasan, and Tsionas, 2015).

Finally, acknowledging the context of market conditions and recognising heterogeneity amongst borrower profiles is essential to progress prevailing debate regarding the impact of gender upon women business owner's access to bank finance. In an era where caution has been re-valued, women entrepreneurs may reap unexpected and positive rewards; a key contribution of our analysis will be to offer impetus for future research which critically

evaluates whether the advantages arising during a recessionary period can challenge a long term gendered status detriment. In other words, will there be a legacy for women which repositions them as safer bets regardless of the economic context? If this effect is emerging, this will undermine the current foundational assumptions regarding gender, women and bank-lending requiring far reaching revisions of such arguments. Finally, there is, however, a paradox here; if risk aversity generates a feminised advantage attractive to banks, the quality which generates the advantage prevents women from taking advantage of it! Thus, further longitudinal analysis is required to fully evaluate the potential of this suggested advantage and to what extent 'trickle down' effects, whereby as more women do gain bank loans, act as encouragement for others to borrow who might ameliorate levels of risk through collateral levels.

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Table 1: Variable definitions

Panel A: Dependent variables		
Group	Variable Name	Definition
Demand for finance		
	SOUGHT	= 1 if applying finance in the past 12 months; 0 otherwise
	DISCOURAGED	= 1 if discouraged borrower; 0 otherwise
	NEED	= 1 if needing external finance; 0 otherwise
Supply of finance		
	GOT	= 1 if firm receive at least part of the finance applied for; 0 otherwise

Panel B: Independent variables		
Group	Variable Name	Definition
Firm-characteristics		
Size	*EMPS*	Micro (0 – 9 employees), Small (10 – 49 employees), Medium (50 – 249 employees)
	SALES_BAND	1=<£25,000, 2=£25-49,999, 3=£50,000-74, 999, 4=£75,000-99,999, 5=£100,000-499,999, 6=£500,000-999,999, 7=£1m-1.99m, 8=£2m-4.99m, 9=£5m-9.99m
Legal status	*LEGAL*	1= Sole Proprietor, 2=Partnership, 3= Limited Liability Partnership, 4= Limited Liability
Industry sector	*SECTOR*	1=Primary, 2= Manufacturing, 3=Construction, 4=Wholesale/Retail, 5=Hotels/Catering, 6=Transport & Communications, 7=Business Services, 8=Health, 9=Other Community
Age	*FIRM_AGE*	1= <12 months, 2= 1-2 years, 3= 2-5 years, 4=6-9 years, 5=10-15 years, 6=>15 years
Performance	*PROFIT*	The actual profit/loss of the firm during the past 12 month, in £ mil.
	FAST_GROWTH	=1 if firm grew by 30% or more; 0 otherwise
Owner characteristics		
Gender	*WLED*	= 1 if firm is a women-led business; 0 otherwise
Education	*ONWER_EDUC*	1=None, 2=GCSE, 3= A level, 4= HNC, 5=BTEC, 6=Professional, 7=Degree, 8=Post-graduate Degree, 9=Other
Prior experience	*OWNER_EXP*	1= <12 months, 2= 1-3 years, 3= 4-6 years, 4=7-9 years, 5=10-15 years, 6=>15 years
Financial Qualification	*FIN_QUAL*	=1 if owner has a financial qualification; 0 otherwise
Time indicators	*WAVE1*	= 1 if July-2011 Survey; 0 otherwise
	WAVE2	= 1 if November-2011Survey; 0 otherwise
	WAVE3	= 1 if March-2012 Survey; 0 otherwise
	WAVE4	= 1 if May-2012 Survey; 0 otherwise
	WAVE5	= 1 if November-2012 Survey; 0 otherwise
	WAVE6	= 1 if March-2013 Survey; 0 otherwise
Risk indicators		
Experian Credit Rating	*RISK*	= 1if minimal, 2 if low risk, 3 if average risk and 4 if above average risk
Financial Delinquency		
Missed loan repayment	*FD_LR*	= 1 if missed loan repayment; 0 otherwise
Unauthorised overdraft facility	*FD_OD*	= 1 if had unauthorised overdraft facility; 0 otherwise
Bounced cheques	*FD_BC*	= 1 if bounced cheques; 0 otherwise
County court judgement	*FD_CCJ*	= 1 if has County Court Judgement; 0 otherwise
Late tax		
Trade credit restrictions	*FD_TAX*	= 1 if missed tax payments; 0 otherwise
None	*FD_TCR*	= 1 if has trade credit restrictions; 0 otherwise
	FD_NONE	= 1 if no financial delinquency; 0 otherwise
Additional Control Variables		
Source of funds	*OWN_EQUITY*	= 1 if entrepreneur uses own equity; 0 otherwise
Business activities	*INNOVATOR*	= 1 undertook innovation activities; 0 otherwise
	NEW_PROCESS	= 1if introduced new or significantly improved process; 0 otherwise
	NEW_PRODUCTS	= 1 if introduced new or significantly improved products; 0 otherwise
	EXPORTER	= 1 if business export products or services overseas; 0 otherwise
Credit support	*BUSINESS PLAN*	= 1 if has a formal written business plan; 0 otherwise

Table 2: Variable Descriptive Statistics

		(1) Male (N = 19,838*)		(2) Female (N = 7,151*)		(1) – (2)
Panel A: Dependent variables						
Group	Variable Name	Mean	Std Dev	Mean	Std Dev	Mean
Demand for finance	*SOUGHT*	0.235	0.424	0.241	0.428	
	DISCOURAGED	0.061	0.239	0.069	0.254	*
	NEED	0.335	0.472	0.351	0.477	
Supply of finance	*GOT*	0.898	0.303	0.904	0.294	
Panel B: Independent variables						
Firm-characteristics						
Size	*EMPS*					
	Micro (0 – 9)	0.514	0.500	0.613	0.487	***
	Small (10 – 49)	0.343	0.003	0.294	0.005	***
	Medium (50 – 249)	0.143	0.002	0.092	0.003	***
	SALES_BAND					
	<£25,000	0.130	0.336	0.190	0.393	***
	£25,000 - £49,999	0.093	0.291	0.111	0.315	**
	£50,000 - £74,999	0.054	0.227	0.074	0.261	***
	£75,000 - £99,999	0.042	0.199	0.054	0.227	***
	£100,000 - £499,999	0.146	0.353	0.203	0.402	***
	£500,000 - £999,999	0.194	0.395	0.097	0.295	***
	£1m - £1.99m	0.102	0.302	0.090	0.287	***
	£2m - £4.9m	0.084	0.278	0.063	0.242	***
	£5m - £9.9m	0.047	0.211	0.024	0.153	***
Legal status	*LEGAL*					
	Sole proprietorship	0.296	0.456	0.268	0.443	
	Partnership	0.064	0.245	0.195	0.396	***
	Limited liability partnership (LLP)	0.078	0.268	0.026	0.160	***
	Limited liability(LTD)	0.562	0.496	0.512	0.500	***
Industry sector	*SECTOR*					
	Primary	0.072	0.258	0.073	0.260	
	Manufacturing	0.100	0.300	0.080	0.272	***
	Construction	0.246	0.431	0.091	0.288	***
	Wholesale / retail	0.087	0.281	0.107	0.310	***
	Hotels / catering	0.061	0.240	0.134	0.341	***
	Transport & communications	0.086	0.281	0.070	0.255	***
	Business services	0.163	0.369	0.162	0.369	
	Health	0.050	0.218	0.163	0.370	***
	Other community	0.135	0.342	0.119	0.324	***
Age	*FIRM_AGE*					
	<12 months	0.041	0.197	0.057	0.232	***
	1-2 years	0.050	0.219	0.063	0.243	***
	2-5 years	0.141	0.348	0.186	0.389	***
	6-9 years	0.118	0.322	0.157	0.364	***
	10-15 years	0.137	0.343	0.159	0.366	***
	15+ years	0.514	0.500	0.378	0.485	***
Performance	*PROFIT* (£mil)	0.189	0.550	0.125	0.377	***
	FAST_GROWTH	0.118	0.323	0.145	0.352	***
Owner characteristics						
Education	*ONWER_EDUC*					
	None	0.218	0.413	0.101	0.302	***
	GCSE	0.101	0.301	0.136	0.343	***
	A level	0.059	0.237	0.089	0.285	***
	HNC	0.051	0.219	0.054	0.226	
	BTEC	0.114	0.318	0.101	0.301	***
	Professional qualification	0.110	0.313	0.131	0.337	***
	Degree	0.110	0.313	0.162	0.369	***
	Post graduate degree	0.078	0.267	0.115	0.319	***
	Other	0.006	0.079	0.008	0.091	

Table 2 (Continued)

Prior experience	OWNER_EXP					
	<12 months	0.021	0.142	0.033	0.179	***
	1-2 years	0.067	0.249	0.090	0.286	***
	2-5 years	0.081	0.272	0.116	0.320	***
	6-9 years	0.070	0.255	0.093	0.290	***
	10-15 years	0.136	0.343	0.166	0.372	***
	15+ years	0.600	0.490	0.489	0.500	***
Financial Qualification	FIN_QUAL	0.400	0.490	0.345	0.476	***
Risk indicators						
	RISK					
Experian Credit Rating	Minimal	0.148	0.355	0.146	0.353	
	Low	0.244	0.430	0.188	0.391	***
	Average	0.246	0.431	0.273	0.445	***
	Above average	0.276	0.447	0.288	0.453	*
	Not known	0.085	0.280	0.106	0.307	***
Financial Delinquency						
Missed loan repayment	FD_LR	0.013	0.112	0.013	0.112	
Unauthorised overdraft	FD_OD	0.059	0.236	0.073	0.260	***
Bounced cheques	FD_BC	0.058	0.235	0.072	0.258	***
County court judgement	FD_CCJ	0.013	0.114	0.011	0.103	**
Late tax	FD_TAX	0.074	0.261	0.090	0.286	***
Trade credit restrictions	FD_TCR	0.040	0.196	0.035	0.184	***
None	FD_NONE	0.823	0.382	0.793	0.405	***
Additional Controls						
Source of funds	OWN_EQUITY	0.094	0.291	0.099	0.298	
Business activities	INNOVATOR	0.460	0.498	0.527	0.499	***
	NEW_PROCESS	0.420	0.494	0.483	0.500	***
	NEW_PRODUCTS	0.203	0.403	0.227	0.419	**
	EXPORTER	0.131	0.338	0.092	0.289	***
Credit support	BUSINESS PLAN	0.412	0.492	0.462	0.499	***

Note: Except for *GOT* (N = 5,016 and 1,746 for male and female, respectively), where data is only collected for firms that applied for finance.

Table 3: Loan Demand, Supply and Discouragement: Probit Models with Sample Selection

| | | Model 1 | | | | Model 2 | | | |
| | | GOT\|SOUGHT | | SOUGHT | | DISCOURAGE\|NEED | | NEED | |
Group	Variable Name	Coefficient	Std Error	Coefficient	Std Error	Coefficient	Std Error	Coefficient	Std Error
Gender	*WLED*	0.151*	0.086	-0.105**	0.045	-0.156**	0.064	-0.184***	0.042
Firm Characteristics									
Size	*EMPS*								
	Small (10-49)	0.296**	0.128	-0.138***	0.049	-0.059	0.070	-0.095**	0.047
	Medium (50-249)	0.415**	0.192	-0.014	0.075	-0.129	0.128	-0.089	0.077
Turnover	*SALES_BAND*								
	£25,000 - £49,999	-0.038	0.104	0.121**	0.059	-0.160**	0.073	0.067	0.049
	£50,000 - £74,999	-0.297**	0.136	0.342***	0.073	-0.063	0.097	0.160**	0.064
	£75,000 - £99,999	0.094	0.148	0.229***	0.081	-0.076	0.122	0.128*	0.072
	£100,000 - £499,999	-0.179	0.122	0.359***	0.065	-0.008	0.089	0.233***	0.058
	£500,000 - £999,999	-0.296	0.275	0.418***	0.085	0.020	0.113	0.290***	0.084
	£1m - £1.9m	-0.235	0.213	0.452***	0.098	-0.043	0.145	0.306***	0.089
	£2m - £4.9m	-0.253	0.235	0.466***	0.095	0.041	0.163	0.130	0.097
	£5m - £9.9m	-0.209	0.294	0.306**	0.141	-0.177	0.156	0.272*	0.143
Legal status	*LEGAL*								
	Partnership	0.152	0.144	0.088	0.057	-0.013	0.079	0.114*	0.060
	LLP	0.497**	0.245	-0.056	0.117	-0.123	0.159	-0.063	0.105
	LTD	0.028	0.107	-0.075	0.052	-0.001	0.070	0.010	0.047
Industry sector	*SECTOR*								
	Manufacturing	-0.066	0.189	-0.107	0.090	-0.035	0.130	-0.127	0.081
	Construction	-0.170	0.147	-0.137**	0.065	-0.045	0.100	-0.134**	0.060
	Wholesale / retail	0.108	0.171	-0.084	0.073	0.119	0.108	0.034	0.067
	Hotels / catering	-0.534***	0.156	-0.128*	0.076	0.154	0.110	-0.093	0.069
	Transport & com	-0.097	0.176	-0.111	0.084	0.022	0.114	-0.104	0.074
	Business services	0.043	0.149	-0.212***	0.066	-0.107	0.101	-0.171***	0.060
	Health	0.123	0.204	-0.307***	0.089	-0.086	0.144	-0.274***	0.081
	Other community	-0.142	0.205	-0.368***	0.101	-0.231	0.146	-0.250***	0.089
Age	*FIRM_AGE*								
	1-2 years	0.165	0.163	-0.001	0.107	-0.378***	0.126	-0.369***	0.091
	2-5 years	0.411**	0.164	0.056	0.097	-0.313***	0.119	-0.338***	0.084
	6-9 years	0.588***	0.178	0.138	0.103	-0.475***	0.127	-0.315***	0.090
	10-15 years	0.668***	0.203	0.198*	0.105	-0.495***	0.137	-0.311***	0.093
	15+ years	0.289	0.187	0.293***	0.101	-0.576***	0.132	-0.324***	0.091
Performance	*PROFIT* (£1 mil)	0.330	0.240	-0.064	0.062	-0.727***	0.177	-0.205***	0.065
	FAST_GROWTH	-0.041	0.108	0.060	0.058	0.025	0.081	0.051	0.054
Owner Characteristics									
Education	*OWNER_EDUC*								
	GCSE	0.075	0.143	0.039	0.075	0.037	0.095	0.169***	0.063
	A level	0.359**	0.172	-0.031	0.083	0.250**	0.107	0.166**	0.075
	HNC	-0.093	0.172	-0.068	0.089	-0.108	0.123	0.006	0.076
	BTEC	-0.178	0.142	-0.066	0.074	0.054	0.093	0.098	0.060
	Professional	-0.215	0.148	-0.039	0.080	-0.003	0.108	0.115*	0.068
	Degree	0.080	0.151	-0.004	0.082	0.040	0.100	0.101	0.068
	Postgraduate	0.083	0.181	-0.090	0.091	0.083	0.117	0.148*	0.078
	Other	0.139	0.407	-0.129	0.156	0.356	0.223	0.057	0.157

Table 3 (Continued)

Prior experience	OWNER_EXP							
	1-2 years	-0.308	0.211	0.214	0.133	0.023	0.161	0.169	0.111
	2-5 years	-0.092	0.224	0.102	0.133	-0.012	0.166	0.141	0.111
	6-9 years	-0.203	0.240	0.121	0.140	0.135	0.172	0.199*	0.118
	10-15 years	-0.097	0.226	0.201	0.132	0.056	0.167	0.189*	0.112
	15+ years	0.069	0.217	0.203	0.128	0.026	0.163	0.166	0.109
	FIN_QUAL	0.167*	0.090	-0.048	0.046	-0.022	0.063	-0.017	0.040
Time Indicators								
	WAVE2	-0.226*	0.121	-0.157**	0.064	-0.155*	0.092	-0.124**	0.057
	WAVE3	-0.190	0.134	0.673***	0.067	0.199**	0.090	0.229***	0.057
	WAVE4	-0.062	0.142	0.587***	0.064	0.352***	0.084	0.242***	0.055
	WAVE5	-0.251**	0.128	0.593***	0.065	0.407***	0.086	0.212***	0.057
	WAVE6	-0.421***	0.137	0.581***	0.068	0.416***	0.092	0.244***	0.059
Risk Indicators								
Experian Credit Rating	RISK							
	Low	-0.351*	0.202	-0.009	0.089	0.061	0.111	0.094	0.079
	Average	-0.442***	0.156	-0.051	0.083	0.197*	0.104	0.041	0.075
	Above average	-0.503***	0.151	0.002	0.085	0.344***	0.105	0.157**	0.076
	Not known	-0.744***	0.161	0.050	0.091	0.266**	0.114	0.156*	0.082
Financial Delinquency								
	FD_LR	-0.371**	0.187	0.081	0.166	0.000	0.140	0.119	0.161
	FD_OD	-0.320**	0.126	0.401***	0.094	0.184*	0.096	0.648***	0.088
	FD_BC	-0.141	0.119	0.036	0.094	-0.141	0.092	0.011	0.089
	FD_CCJ	-0.247	0.176	-0.119	0.170	0.243*	0.139	0.181	0.153
	FD_TAX	0.111	0.125	0.047	0.100	-0.231**	0.097	0.114	0.090
	FD_TCR	-0.560***	0.130	0.008	0.113	0.358***	0.102	0.308***	0.108
	FD_NONE	0.265**	0.123	-0.131	0.094	-0.404***	0.094	-0.293***	0.090
Fund source	OWN_EQUITY	-0.247**	0.099	0.230***	0.063	0.321***	0.083	0.393***	0.060
Business activities	INNOVATOR	0.135	0.192	0.122	0.102	0.025	0.155	-0.049	0.100
	NEW_PROCESS	-0.267	0.180	0.026	0.094	0.065	0.142	0.184**	0.092
	NEW_PRODUCTS	-0.089	0.103	-0.077	0.062	0.192**	0.079	0.104*	0.058
	EXPORTER	-0.228**	0.115	0.042	0.066	-0.018	0.088	0.062	0.064
Credit support	BUSINESS PLAN	-0.214***	0.078	0.152***	0.040	0.116**	0.054	0.121***	0.037
Regression Diagnostics								
	N Obs		26,989				26,989		
	Censored		20,227				17,315		
	Uncensored		6,762				9,674		
	Wald χ2 (64)		1,354.69				1,639.48		
	Prob >χ2		0.00001				0.00001		
	LR Test if Independence χ2 (1)		6.040				18.300		
	Prob >χ2		0.020				0.001		

$*\ p < .10$; $**\ p < .05$; $***\ p < .01$. Asymptotic robust standard errors reported. Weights applied. 11 UK regional dummies are used as exclusion restrictions. Base categories: EMPS = Micro (0-9 employees); SALES_BAND = £0 – £24,999; LEGAL = Sole proprietorship; SECTOR = Primary; FIRM_AGE = 0 – 1 year; OWNER_EDUC = No qualification; OWNER_EXP = 0 – 1 year; RISK = Minimal.

Table 4: Blinder-Oaxaca Decomposition Results

		Prob(SOUGHT)				Prob(GOT|SOUGHT)			
		Overall Effect				Overall Effect			
		Coefficient	Std Error			Coefficient	Std Error		
	Male-led SMEs	0.1816***	0.0044			0.8447***	0.0098		
	Female-led SMEs	0.1456***	0.0059			0.8996***	0.0347		
	Male – Female	0.0360***	0.0074			-0.0550	0.0361		
	Endowment Effect	0.0189***	0.0045			-0.0122	0.0114		
	Discrimination Effect	0.0171**	0.0072			-0.0428	0.035		
		Individual Effect				Individual Effect			
		Endowment		Discrimination		Endowment		Discrimination	
Group	Variable Name	Coefficient	Std Error	Coefficient	Std Error	Coefficient	Std Error	Coefficient	Std Error
Firm Characteristics									
Size	*EMPS*								
	Small (10-49)	-0.0002**	0.0001	-0.0003	0.0003	-0.0003	0.0002	0.0006	0.0008
	Medium (50-249)	-0.0000	0.0000	0.0000	0.0001	0.0003*	0.0002	-0.0001	0.0002
Turnover	*SALES_BAND*								
	£25,000 - £49,999	0.0018**	0.0009	0.0013	0.0023	0.0003	0.0018	-0.0009	0.0028
	£50,000 - £74,999	0.0014**	0.0006	-0.0002	0.0014	-0.0004	0.0007	0.0025	0.0024
	£75,000 - £99,999	0.0004	0.0003	-0.0013	0.0008	-0.0004	0.0006	0.0022	0.0017
	£100,000 - £499,999	-0.0011*	0.0006	0.0008	0.0017	0.0002	0.0012	0.0069	0.0043
	£500,000 - £999,999	0.0008***	0.0003	-0.0005	0.0005	0.0000	0.0001	-0.0003	0.0014
	£1m - £1.9m	0.0002	0.0002	-0.0003	0.0004	0.0000	0.0002	0.0000	0.001
	£2m - £4.9m	0.0002**	0.0001	-0.0001	0.0002	-0.0000	0.0001	0.0000	0.0006
	£5m - £9.9m	0.0002**	0.0001	-0.0001	0.0001	-0.0000	0.0002	0.0003	0.0002
Legal status	*LEGAL*								
	Partnership	-0.0011	0.0008	0.0004	0.0008	-0.0028	0.0029	-0.0001	0.002
	LLP	-0.0000	0.0001	-0.0003	0.0003	-0.0006	0.0009	0.0004	0.0008
	LTD	0.0003	0.0003	-0.0001	0.0029	0.0002	0.0011	-0.0018	0.0053
Industry sector	*SECTOR*								
	Manufacturing	0.0002	0.0002	-0.0011	0.0013	0.0001	0.0004	0.0033	0.0026
	Construction	-0.0069**	0.0032	0.0009	0.0014	-0.0081	0.0056	0.0059**	0.0028
	Wholesale / retail	0.0009	0.0008	-0.0006	0.0022	-0.0021	0.0028	0.0122*	0.0064
	Hotels / catering	0.0010*	0.0006	0.0009	0.0008	0.0049***	0.0018	0.0008	0.0019
	Transport & com	-0.0011	0.0007	0.0004	0.0009	-0.0019	0.0014	0.0011	0.0013
	Business services	0.0005	0.0006	0.0026	0.0041	0.0001	0.0006	0.0066	0.0069
	Health	0.0075***	0.0020	0.0020	0.0020	0.0003	0.0023	0.0048*	0.0025
	Other community	0.0050***	0.0016	0.0046	0.0031	0.0008	0.0013	0.0003	0.0032
Age	*FIRM_AGE*								
	1-2 years	-0.0000	0.0002	0.0059**	0.0028	0.0001	0.0007	-0.0014	0.0021
	2-5 years	-0.0005	0.0008	0.0136**	0.0064	-0.0029	0.0031	0.0023	0.0055
	6-9 years	-0.0004	0.0004	0.0082*	0.0042	-0.0025	0.0032	0.0010	0.0046
	10-15 years	-0.0002	0.0004	0.0073**	0.0036	-0.0012	0.0035	-0.0027	0.0046
	15+ years	0.0053***	0.0019	0.0116**	0.0052	0.0066*	0.0036	0.0004	0.0068
Performance	*PROFIT* (£1 mil)	-0.0001	0.0001	0.0024**	0.0011	0.0006	0.0006	-0.0035	0.0025
	FAST_GROWTH	-0.0004	0.0004	0.0011	0.0015	0.0002	0.0006	0.0004	0.0022
Owner Characteristics									
Education	*OWNER_EDUC*								
	GCSE	0.0001	0.0002	-0.0001	0.0020	-0.0000	0.0004	0.0071*	0.0038
	A level	0.0001	0.0004	0.0008	0.0015	-0.0021	0.0016	0.0008	0.0027
	HNC	-0.0001	0.0002	-0.0012	0.0011	0.0003	0.0005	0.0028	0.0018
	BTEC	-0.0014	0.0015	0.0016	0.0022	-0.0035	0.0026	0.0016	0.0027
	Professional	0.0002	0.0004	0.0024	0.0021	-0.0001	0.0007	-0.0006	0.0024
	Degree	0.0002	0.0013	0.0029	0.0030	-0.0006	0.0011	0.0105**	0.0045
	Postgraduate	0.0011	0.0012	0.0001	0.0022	-0.0005	0.002	0.0033	0.003
	Other	0.0000	0.0001	0.0004	0.0004	0.0001	0.0008	-0.0000	0.0001

Table 4 (Continued)

Prior experience	*OWNER_EXP*							
	1-2 years	-0.0012	0.0009	-0.0144**	0.0056	0.0024	0.0022	0.0064	0.0065
	2-5 years	-0.0004	0.0007	-0.0146***	0.0055	0.0004	0.0009	0.0036	0.0055
	6-9 years	-0.0002	0.0003	-0.0078**	0.0035	-0.0003	0.0008	-0.0001	0.004
	10-15 years	-0.0005	0.0005	-0.0131**	0.0053	0.0002	0.0011	0.0041	0.0083
	15+ years	0.0036	0.0025	-0.0291***	0.0107	0.0011	0.0028	0.0050	0.0164
	FIN_QUAL	0.0006	0.0006	-0.0005	0.0024	0.0024	0.0022	0.0064	0.0065
Time Indicators								
	WAVE2	-0.0002	0.0003	-0.0005	0.0022	-0.0006	0.001	-0.0001	0.0017
	WAVE3	-0.0021	0.0014	0.0027	0.0025	-0.0000	0.0004	0.0040	0.0038
	WAVE4	-0.0013	0.0012	-0.0024	0.0021	-0.0011	0.0013	-0.0046	0.0038
	WAVE5	-0.0010	0.0012	-0.0002	0.0021	0.0000	0.0001	-0.0045	0.0039
	WAVE6	0.0013	0.0011	-0.0004	0.0020	-0.0001	0.0006	-0.0013	0.0031
Risk Indicators								
Experian Credit Rating	*RISK*							
	Low	-0.0000	0.0000	0.0027	0.0018	-0.0002	0.0009	0.0012	0.003
	Average	0.0002	0.0003	0.0080*	0.0047	0.0007	0.0019	0.0084	0.0061
	Above average	0.0000	0.0001	0.0144*	0.0076	-0.0010	0.0025	0.0067	0.0089
	Not known	0.0001	0.0002	0.0040	0.0027	-0.0021	0.0028	0.0012	0.0033
Financial Delinquency								
	FD_LR	0.0000	0.0001	-0.0001	0.0005	-0.0003	0.001	0.0002	0.0007
	FD_OD	0.0018***	0.0007	-0.0007	0.0011	-0.0005	0.0007	0.0052*	0.0031
	FD_BC	0.0000	0.0000	-0.0007	0.0011	0.0003	0.0005	0.0028	0.0021
	FD_CCJ	-0.0001	0.0002	0.0008*	0.0005	-0.0007	0.0006	-0.0001	0.0004
	FD_TAX	-0.0000	0.0001	-0.0004	0.0011	-0.0004	0.0006	0.0022	0.002
	FD_TCR	0.0001	0.0003	-0.0017**	0.0007	0.0017	0.0019	0.0017	0.0015
	FD_NONE	0.0005	0.0004	-0.0179	0.0166	0.0003	0.0013	0.0208	0.0146
Fund source	*OWN_EQUITY*	0.0000	0.0002	0.0002	0.0007	0.0004	0.0005	0.0015	0.0016
Business activities	*INNOVATOR*	-0.0020	0.0018	0.0194*	0.0105	-0.0018	0.0023	-0.0182	0.0174
	NEW_PROCESS	-0.0004	0.0013	-0.0171**	0.0086	0.0029	0.0026	0.0239	0.0159
	NEW_PRODUCTS	0.0010	0.0009	-0.0010	0.0025	0.0009	0.0011	-0.0027	0.0035
	EXPORTER	0.0001	0.0002	-0.0001	0.0010	-0.0004	0.0007	-0.0016	0.0016
Credit support	*BUSINESS PLAN*	-0.0021***	0.0007	0.0020	0.0029	0.0008	0.001	0.0045	0.0045

$*$ p $< .10$; ** p $< .05$; *** p $< .01$. Asymptotic robust standard errors reported. Weights applied. Inverse mills ratio adjustment applied to predict Prob(GOT|SOUGHT). Base categories: *EMPS* = Micro (0-9 employees); *SALES_BAND* = £0 – £24,999; *LEGAL* = Sole proprietorship; *SECTOR* = Primary; *FIRM_AGE* = 0 – 1 year; *OWNER_EDUC* = No qualification; *OWNER_EXP* = 0 – 1 year; *RISK* = Minimal.

Table 5: Robustness Check – The Effect of Macroeconomic Conditions

	Proxies for macroeconomic conditions			
	Model 1 Quarterly GDP growth (QGDP, %)		**Model 2** Year dummies (2011, 2012, 2013, base category = 2011)[1]	
	Prob(GOT|SOUGHT)	Prob(SOUGHT)	Prob(GOT|SOUGHT)	Prob(SOUGHT)
Variable Name	Coefficient	Coefficient	Coefficient	Coefficient
WLED	0.348**	0.007	0.029	-0.038
	(0.174)	(0.082)	(0.137)	(0.069)
QGDP	-0.463***	-0.269***		
	(0.139)	(0.066)		
*WLED*QGDP*	-0.503*	-0.188		
	(0.270)	(0.127)		
2012			-0.062	0.709***
			(0.126)	(0.051)
2013			-0.341**	0.675***
			(0.155)	(0.069)
*WLED * 2012*			0.157	-0.083
			(0.177)	(0.089)
*WLED * 2013*			0.245	-0.095
			(0.299)	(0.123)
Control variables	Yes	Yes	Yes	Yes

$*\ p < .10;\ **\ p < .05;\ ***\ p < .01$. Asymptotic robust standard errors in parentheses.

Notes:

1. Assuming the further away from the crisis, the better the economic environment.

Table 6: Robustness Check – The Effect of Financing Constraints and Collateral Availability

Variable Name	Proxy for financing constraints	Proxies for collateral availability		
	Model 1 Profit/loss (£mil) (*PROFIT*)	**Model 2** Security provided to support application (*SECURITY*, 0,1)[1]	**Model 3** Credit balance (*CBALANCE*)[2]	**Model 4** Legal status (*LEGAL*)[3]
	Prob(SOUGHT)	Prob(GOT)	Prob(GOT|SOUGHT)	Prob(GOT|SOUGHT)
	Coefficient	Coefficient	Coefficient	Coefficient
WLED	-0.087*	0.138	0.158	0.232*
	(0.049)	(0.111)	(0.102)	(0.139)
PROFIT	-0.018			
	(0.067)			
*WLED * PROFIT*	-0.350**			
	(0.175)			
SECURITY		2.299***		
		(0.217)		
*WLED*SECURITY*		-0.867**		
		(0.401)		
CBALANCE (£10k – £100k)			-0.011	
			(0.120)	
CBALANCE (> £100k)			-0.037	
			(0.219)	
*WLED * CBALANCE* (£10k – £100k)			-0.020	
			(0.228)	
*WLED * CBALANCE* (> £100k)			1.013***	
			(0.369)	
Partnership				0.180
				(0.161)
LLP				0.833**
				(0.381)
LTD				0.059
				(0.117)
*WLED * Partnership*				-0.109
				(0.260)
*WLED * LLP*				-0.714
				(0.503)
*WLED * LTD*				-0.152
				(0.188)
Control Variables	Yes	Yes	Yes	Yes

$*\ p < .10$; $**\ p < .05$; $***\ p < .01$. Asymptotic robust standard errors in parentheses.

Notes:

1. *SECURITY* only available for firms applying for finance (=1 if security provided to support finance application, and 0 otherwise) so no selection effect considered.

2. *CBALANCE* measures the business' cash holding in current and deposit account, which is a proxy for the security pledged against the borrowing. Base category = £0 to £10,000.

3. Limited companies are only secured to the extent of equity whilst unlimited companies are obliged to pay the entire liability regardless of equity value

Table 7: Robustness Check – The Effect of Risk Preferences

	Proxies for risk preferences		
	Model 1 Number of financial institutions used (*BANKUSED*)[1]	**Model 2** Number of external advice sources used (*ADVICEUSED*)[2]	**Model 3** Whether used, or intend to use funds from friends and family (*SOFTFIN*)[3]
	Prob(GOT|SOUGHT)	Prob(GOT)	Prob(GOT|SOUGHT)
Variable Name	Coefficient	Coefficient	Coefficient
WLED	1.086**	0.119	0.219**
	(0.554)	(0.119)	(0.097)
BANKUSED	-0.266		
	(0.267)		
*WLED * BANKUSED*	-0.910**		
	(0.466)		
ADVICEUSED		-0.037	
		(0.116)	
*WLED * ADVICEUSED*		0.350*	
		(0.193)	
SOFTFIN			-0.262**
			(0.126)
*WLED *SOFTFIN*			-0.353
			(0.232)
Control variables	Yes	Yes	Yes

$*$ $p < .10$; $**$ $p < .05$; $***$ $p < .01$. Asymptotic robust standard errors in parentheses.

Notes:

1. Up to 5 banks used (mean = 1.03).

2. Up to 4 sources used (mean = 0.2). The variable is only observed for finance applicants so unconditional probit is used.

3. Owners relying more heavily on soft finance are supposed to be more risk-averse.

Table 8: Robustness Check – The Joint Effect of Collateral Availability, Risk Preferences and Macroeconomic Conditions

Variable Name	Prob(GOT) Coefficient
WLED	0.459*
	(0.252)
SECURITY	2.320***
	(0.526)
ADVICEUSED	0.152
	(0.267)
QGDP	-0.429**
	(0.200)
WLED * SECURITY	-0.577
	(0.651)
WLED * ADVICEUSED	-0.494
	(0.466)
WLED * QGDP	-0.560
	(0.390)
SECURITY * ADVICEUSED	0.628
	(0.769)
SECURITY * QGDP	0.524
	(0.812)
ADVICEUSED * QGDP	-0.321
	(0.432)
WLED * SECURITY * ADVICEUSED	17.242***
	(3.344)
WLED * SECURITY * QGDP	-0.612
	(1.089)
WLED * ADVICEUSED * QGDP	1.267*
	(0.758)
SECURITY * ADVICEUSED * QGDP	-1.136
	(1.174)
WLED * SECURITY * ADVICEUSED * QGDP	-18.419***
	(4.003)
Control variables	Yes

$*$ $p < .10$; ** $p < .05$; *** $p < .01$. Asymptotic robust standard errors in parentheses.

Note: Both *SECURITY* and *ADVICEUSED* are only observed for finance applicants so unconditional probit is used.

Table 9: Summary of hypotheses and empirical findings

Hypothesis	Gender Effect	
	Sought Finance	Got Finance
H1a	Yes	
H1b	No	
H2a		No
H2b		Yes

Figure 1: Historical Loan Demand by Gender (Weighted)

(%)

% of SMEs Applying for Bank Finance

Legend: - - Male —— Female

(x-axis: Jul-11, Nov-11, Mar-12, May-12, Nov-12, Mar-13; y-axis: 0 to 25)
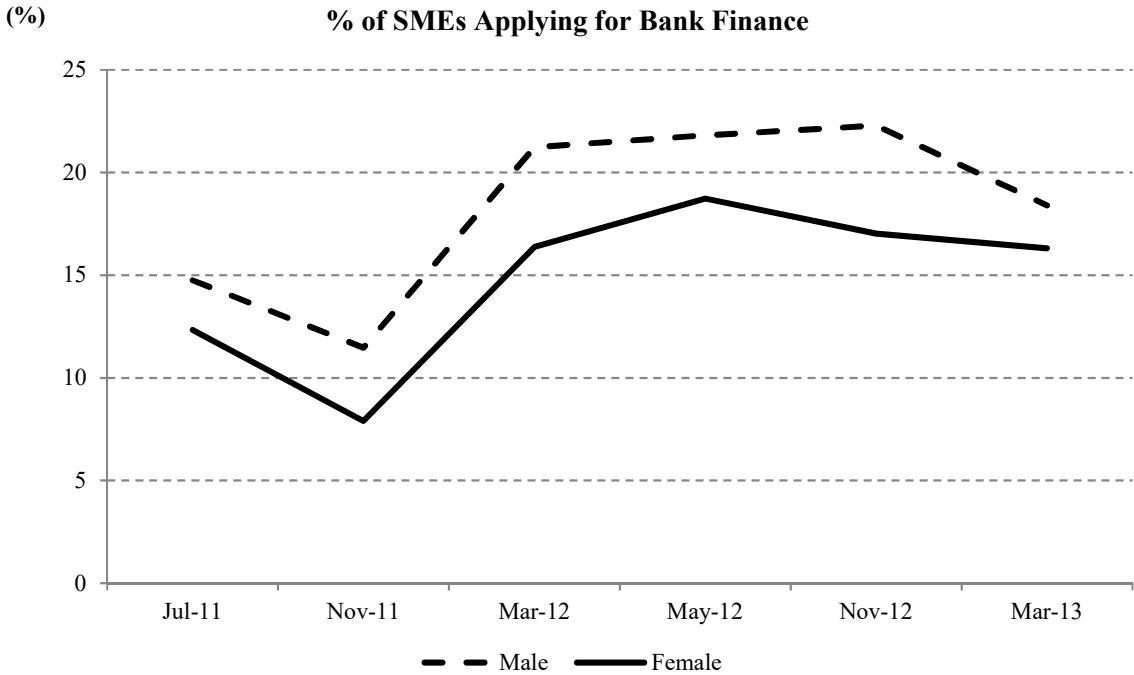
Figure 2: Historical Loan Supply by Gender (Weighted)

(%)

% of SMEs Receiving at Least Part of Finance Applied

Legend: - - Male —— Female

(x-axis: Jul-11, Nov-11, Mar-12, May-12, Nov-12, Mar-13; y-axis: 60 to 95)
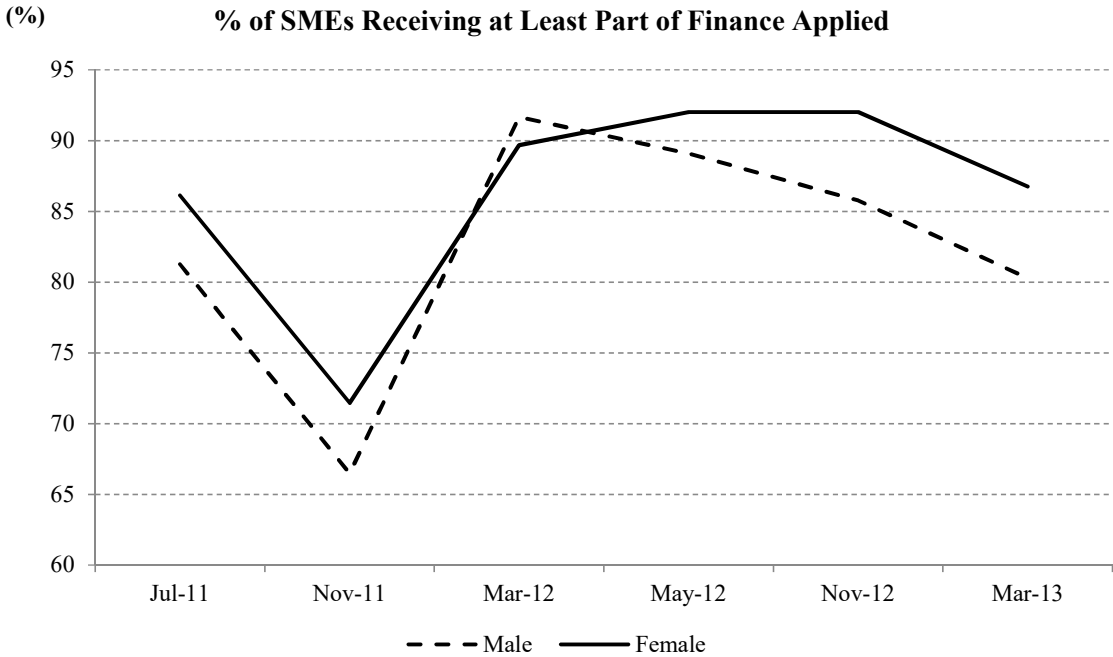
Appendix A: Details of the Blinder-Oaxaca Decomposition

In the context of this study, let Y_F and Y_M denote the outcome variables for models estimating the probabilities of demanding loans or loan application being granted for male and female owned ventures, respectively; and X a vector of predictors for Y. We are interested in how much of the mean outcome difference,

$$\Delta = E(Y_M) - E(Y_F) \tag{1}$$

where $E(Y)$ is the predicted outcome variable from a linear probit model, is accounted for by group differences in the predictors X.

Further let β be the coefficient estimates from the model, it can be shown that following the standard assumptions of linear regressions, the mean outcome difference Δ can be written as:

$$\Delta = E(Y_M) - E(Y_F) = E(X_M)'\beta_M - E(X_F)'\beta_F \tag{2}$$

Now, if we introduce a 'non-discriminatory' coefficient vector β^* embedded in the coefficient estimates β, that accounts for the part of mean outcome probability differences explained by the predictors, Eq (2) can be rearranged as:

$$\Delta = \left[E(X_M) - E(X_F)\right]'\beta^* + \left[E(X_M)'(\beta_M - \beta^*) + E(X_F)'(\beta^* - \beta_F)\right] \tag{3}$$

Eq (3) can be seen as a twofold decomposition where the first component,

$$Q = \left[E(X_M) - E(X_F)\right]'\beta^* \tag{4}$$

is defined as the 'quantity effect' referring to the part of the outcome differential explained by group differences in X. In turn, the second component,

$$U = E(X_M)'(\beta_M - \beta^*) + E(X_F)'(\beta^* - \beta_F) \tag{5}$$

can be seen as the unexplained part usually attributed to discrimination[6], as it depicts the differences in the sensitivities to predictors for different groups. The non-discriminatory coefficient vector β^* is suggested in previous studies either to be equal to the coefficient estimates of one of the groups (e.g. male) assuming that discrimination is only directed towards the other group (e.g. female), or a weighted average of group coefficient estimates β_M and β_F, or the coefficients from a pooled regression. In this study, we define β^* as the coefficients from pooled probit regressions on loan demand and supply[7].

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[6] It should be noted that the unexplained component U also captures all the other potential effects of differences, for example, in omitted variables.

[7] We also attempt other specifications of β^* and the results are not significantly different from each other.