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start-up decision: An econometric
analysis of gender differences using GEM
data**

Stephen, Roper and Jonathan M., Scott

University of Warwick, Teesside University

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GENDER DIFFERENTIALS IN ACCESS TO FINANCE FOR BUSINESS START-UP IN THE UK – AN ECONOMETRIC ANALYSIS OF GEM DATA¹

By

Professor Stephen Roper & Dr Jonathan Scott

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Professor Stephen Roper

Aston University

Aston Business School, Aston Triangle, Birmingham B4 7ET

Tel: +44 121 204 3216 E-mail: s.roper@aston.ac.uk

Dr Jonathan Scott

Aston University

Aston Business School, Aston Triangle, Birmingham B4 7ET

Tel: +44 121 204 3287 E-mail: j.m.scott@aston.ac.uk

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The Research Director, Aston Business School, Aston University,
Birmingham B4 7ET

Telephone No: (0121) 204 3000 Fax No: (0121) 204 3326 <http://www.abs.aston.ac.uk/>

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Abstract

This paper uses an econometric approach to analyse gender differences in access to finance for business start-up based on the Global Entrepreneurship Monitor (GEM) 2004 database. We find that females are around 7.5 pp more likely to perceive financial barriers to business start-up than males, which reduces start-up rates by 1.7-3.8 pp. Being female also has an additional direct effect on each start-up indicator not linked to financial barriers. This suggests that females in the general UK population perceive stronger financial barriers to business start-up than UK males, and this may be discouraging them from seeking external financial support for business start-up.

Keywords: Access to finance; Start up; SMEs; Gender; Econometric

1. Executive summary

Recent policy initiatives in the UK have tried to support women's enterprise given consistent evidence of lower levels of involvement in enterprise among women in the UK. Previous research in this area has emphasised the complexity of the issues relating to business finance and particularly the difficulty of trying to isolate and characterise any specific gender effects. In this study we use an econometric approach to analyse gender differences in access to finance for business start-up in the UK, using data from the UK Global Entrepreneurship Monitor (GEM) 2004. There are two main research questions. First, how important is gender in shaping individuals' access to finance for business start-up? And secondly, how important are any such financial constraints on subsequent start-up?

In the working age population, men responding to the UK GEM survey were more likely to be highly qualified; more likely to have a stronger financial profile (i.e. are in the upper quartiles of the distribution of household incomes); and to have benefited from relevant working and training experiences than women respondents. In general terms the UK GEM data also provide considerable support for the notion that women may perceive stronger financial barriers to business start-up than men.

Following some econometric testing, our primary evidence on gender effects on business start-up activity in the UK comes from Probit models, of the probability that individuals perceive financial barriers to business start-up and the probability of start-up itself and suggest three main conclusions in relation to gender and perceived financial barriers. Women are less likely to be involved in start-up activity, running a business, and we find that women are 75 pp more likely to have financial barriers to start-up and that this in turn, reduces start-up rate by 1.7-3.8 pp. Other factors also prove important in increasing business start-up rates in the UK with strong and consistently positive effects from having a background of self employment or, as an employer and experiencing enterprise training at college or university. Being female also has a direct negative effect on start-up probability over and above its effect on perceived financial barriers. The UK GEM

data therefore suggests that gender has both direct and indirect negative effects on business start-up rates, with the indirect effect operating through perceived financial barriers to start-up. This is consistent with the model of ‘discouraged borrowers’ suggested by Kon and Storey, (2003).

The UK GEM data also provides some information on individuals’ own reasoning for why they did not obtain finance and their justification for this lack of success. There is a broad similarity between the reasons given by women and men for their lack of success in gaining funding, with the nature of the business, business size and the cost of finance predominating. Some more subtle differences are evident however, with women emphasising the cost of finance and males suggesting that business size was a more important factor in their failure to gain financial support.

From a policy perspective the key points here are that women’s start-up rates in the UK are being reduced by (a) the perception among the general population of females of stronger financial barriers to start-up, and (b) females’ unwillingness to seek external finance for business start-up. Addressing this issue is likely to require measures designed to redress the current perception that it is more difficult for UK women to obtain business finance, and to encourage potential women entrepreneurs to be more ambitious in seeking such support. Successfully addressing these issues alone will not, however, fully close the gap between start-up rates among men and women. We still find a further gender gap in our analysis which we cannot explain in terms of financial shortages. Why the perceptions and behaviours of potential female entrepreneurs and female business leaders differ from those of their male counterparts is therefore a key question for future research.

2. Introduction

The availability of finance for business start-up has attracted much attention over recent years and stimulated the development of a number of focussed policy initiatives in the UK. A particular focus of recent initiatives has been to try to support women’s enterprise given consistent evidence of lower levels of involvement in enterprise among women. Previous research in this area has emphasised the complexity of the issues relating to business finance and particularly the difficulty of

trying to isolate and characterise any specific gender effects. Is it the case, for example, that lending institutions discriminate either deliberately or unwittingly against entrepreneurs who are women? Or, are women entrepreneurs simply more reluctant to seek business finance? Other factors linked to background or experience may also be important in shaping men's and women's access to finance.

In this study we use an econometric approach to analyse gender differences in access to finance for business start-up using data from the Global Entrepreneurship Monitor 2004 data for the UK. There are two main research questions. First, how important is gender in shaping individuals' access to finance for business start-up? And secondly, how important are any such financial constraints on subsequent start-up? This paper is part of a larger study funded by the UK Small Business Service which also includes analysis of the Household Survey of Entrepreneurship, the Annual Survey of Small Businesses and UK Survey of SME Finances in terms of access to finance for existing businesses.

Our focus here therefore is not in providing a detailed description of the UK GEM 2004 Survey results which is available elsewhere (Harding, 2004). Our objective instead is to explore whether adopting an econometric approach to the survey analysis can shed additional light on the relationship between gender and access to finance allowing for as wide a range of other factors as possible.

The remainder of the paper is organised as follows. Section 3, provides a brief overview of previous studies relating to small business finance and more specifically the role of gender in shaping individuals' access to business finance. Section 4 provides a brief overview and description of the UK GEM 2004 database, although detailed description of the data can be found in Harding (2004). Section 5 focuses on gender differentials in individuals' perceptions of financial barriers to business start-up and Section 6 focuses on the impact of gender differentials in perceived financial barriers on start-up itself. Section 7 draws the results of the study together and suggests some possible policy implications and directions for future research and survey development.

3. A Selective overview of previous evidence

In this section we provide a selective review of recent academic and UK policy related research on access to finance generally for smaller firms and more specifically gender differences. Our objective here is not to provide a comprehensive review of the relevant literatures but to highlight the key issues which have emerged from previous studies. These provide the basis for the inclusion of specific variables in the models estimated later in the paper and also shape our discussion of access to finance by men and women.

3.1 Issues in small business finance

Financial constraints are, of necessity, a major issue for small firms and start-up companies but once firms are established it is possible to over-emphasise the importance of financial constraints. The UK Government's Policy Action Team (PAT 14) articulated the difficulties faced by some businesses in accessing bank finance – due primarily to their age, experience, track record or business structure. However, access to finance is often over-shadowed by other problems when businesses actually start up, with finance cited as a problem by fewer than two per cent of respondents to the UK Small Business Research Team's quarterly survey. Kotey (1999) is helpful however, in emphasising that business growth can be constrained and failure can be caused by financing constraints, and that there are both supply and demand side factors involved in shaping small firms' access to finance.

On the supply side, Cosh and Hughes (2003) found that loans from banks provide the funding for around two thirds of UK businesses and the largest source for over 25 per cent of firms. By the end of 2004, term lending by banks had grown to nearly £35bn (16 per cent growth in 2004) and overdraft lending had grown to nearly £10bn (9 per cent growth) (British Bankers' Association, 2004). However, Kotey (1999) notes that banks are less likely to lend long-term to SMEs due to risk (which is in itself caused by SMEs "lack[ing] a track record of performance on the basis of which

their credit rating could be assessed”) and cost (“administrative costs, potential interest income and to the risk of default”) and on account of collateral unavailability.

On the demand side, Fraser (2005) reported that some 2.9m UK SMEs (80 per cent) have used external finance in the last three years and that the main sources of finance for start-ups are personal savings (65 per cent), bank loan (10 per cent) and friends/family loan (6 per cent). He also found that approximately 900,000 businesses (24 per cent) use term loans and that obtaining finance is reported as a major problem at start up by some 10 per cent of businesses. This generalised view of the difficulty in obtaining finance for start-up reflects a number of issues relating both to start-ups’ ability to attract finance, as well as their willingness to consider different types of business financing.

Research by Hamilton and Fox (1998) provides insight into the financing preferences of entrepreneurs and, “supports the view that the financing decisions of small firm owners are based on a demand-side pecking order of finance types. The resulting financial structures reflect a desire to minimise intrusion into the firms and are not entirely the consequence of persistent deficiencies in the provision of finance to small firms.” Essentially similar evidence is provided by Howorth (2001) whose evidence suggests that entrepreneurs tend to seek finance first from their own resources, friends and families, and then from other sources such as banks. Indeed, the money from family and friends is often essential (and often regarded as quasi-equity by the banks) to unlock support from commercial institutions. Thus the issue of entrepreneurs desiring maintenance of the control of their business is also a highly relevant consideration when thinking about barriers to access to bank finance for entrepreneurs.

More generally, Winker (1999) examined the causes of finance constraints and found these to be influenced by firm age and size. Cressy and Toivanen (2001) also emphasise that, “better borrowers get larger loans and lower interest rates; collateral provision and loan size reduce the interest rate paid ... the bank is shown to use qualitative as well as quantitative information in the structuring of loan contracts to small businesses.” A somewhat contrary view is emphasised by Chandler and Hanks (1998) who note that, “there is some feeling among scholars that competent founders will find a way of coming up with necessary resources and capital.” Kon and Storey (2003)

developed a theory of discouraged borrowers, in that there are cases of potential borrowers from banks who may offer perfectly reasonable business proposals but who “do not apply for a bank loan because they feel they will be rejected.”

Relatively few studies have undertaken econometric analyses of GEM UK data and we are aware of none that examine gender differentials in access to finance using econometric techniques. One notable exception is Levie (2007: 143) who undertakes bivariate and multivariate analysis on GEM data and found that: “business activity varies with migrant status and ethnicity. Multivariate analysis suggests that migration increases the odds of engaging in new business activity, that the independent effect of ethnicity is marginal, and that being a recent ethnic minority migrant decreases the odds, after controlling for other individual level factors. At the regional level, a preliminary analysis suggests that gross migration flow has a higher correlation with new business activity than other commonly used regional demographic or economic development measures.”

3.2 Financing Start-up – the evidence on gender differences

A useful starting point here is the review of the literature on women’s entrepreneurship by Carter et al., (2001). Carter et al., (2001) start by reflecting the general tenor of the literature on small business start-up, i.e.:

“... a preoccupation with start-up permeates the female entrepreneurship literature, but is particularly noticeable within the more descriptive analyses. Within this literature there is a widespread and generally unquestioned acceptance that start-up is more difficult for women. A key debate, however, is whether the barriers encountered by women at start-up have a long-term effect on business performance or whether these constraints dissipate after start up has been successfully negotiated”. (p29)

The same general point is emphasised by other writers. Marlow and Watson (2006), for example, argue that, “female owned enterprises are more likely to be undercapitalised in a variety of forms from the outset, locate in crowded sectors and so under perform over time.” Another particularly revealing quotation from other authors is that, “not only does policy appear to concentrate on areas traditionally associated with men in self employment, but the systems of finance and advice are also firmly oriented towards them, leaving women to face a range of barriers when engaging with self employment” (Warren-Smith and Jackson 2004).

More recent reports published by the UK Small Business Service emphasise different aspects of the finance issue. The Annual Survey of Small Businesses for 2004 for example, suggests that obtaining finance was an obstacle for 15.5 per cent of all small firms but for 16.2 per cent of women-led enterprises (Small Business Service, 2006). The UK Survey of SME Finances (UKSMEF) emphasises another gender related issue, noting that “female-owned businesses pay significantly higher margins on term loans than male-owned businesses (2.9 versus 1.9 percentage points over Base)” (Fraser, 2005: 18).

Carter et al., (2001) stress that access to finance is only one aspect of the wider set of issues which surround start-up by women. They identify a number of studies that focus on finance for start-up and “the social systems that endowed women with a lack of business credibility.” In particular, they quote Hisrich and Brush (1986: 17), who note that there is a perception that women are “not as serious as men about business”,

“For a woman entrepreneur who lacks experience in executive management, has had limited financial responsibilities, and proposes a non-proprietary product, the task of persuading a loan officer to lend start-up capital is not an easy one. As a result, a woman must often have her husband co-sign a note, seek a co-owner, or use personal assets or savings. Many women entrepreneurs feel strongly that they have been discriminated against in this financial area.”

The empirical evidence cited in Carter et al., (2001) on the actual importance of barriers to finance for women is conflicting, although there is a general feeling that women may be disadvantaged in their ability to raise start-up finance (Schwartz, 1976; Carter and Cannon, 1992; Johnson and Storey, 1993; Koper, 1993; Van Auken et al., 1993; Carter and Rosa, 1998). Carter and Rosa (1998), based on survey of 600 firms equally split by gender, found that there are, “quantifiable gender differences in certain areas of business financing, although intra-sectoral similarities demonstrate that gender is only one of a number of variables that affect the financing process.”

Four specific themes emerge from the literature identified by Carter et al., (2001) which might provide an explanation for these difficulties:

(i) **Collateral** – “the financial guarantees required for external financing may be beyond the scope of most women’s personal assets and credit track record” (Carter et al., 2001 – they refer to Hisrich and Brush, 1986; Riding and Swift, 1990). Verheul and Thurik (2001) focussed on 2,000 entrepreneurial start-ups in 1994 in the Netherlands (25 per cent of which were women) and concluded that women had less capital when starting the business but that there was no difference in the type of capital and that “the proportion of equity and debt capital (bank loans) in the businesses of women entrepreneurs is the same as in those of their male counterparts.” Marlow and Carter (2006) found that debt aversion was constraining many women from starting businesses.

(ii) **Networks** – “finance for the ongoing business may be less readily available for women-owned firms than it is for men-owned enterprises, largely due to women’s inability to penetrate informal financial networks (Olm et al., 1988; Aldrich, 1989; Green et al., 2001).” (Carter et al., 2001).

(iii) **Discrimination** – “female entrepreneurs’ relationships with bankers may suffer because of sexual stereotyping and discrimination (Hisrich and Brush, 1986)” (Carter et al., 2001). Ennew and McKechnie (1998) suggest that, “discrimination occurs amongst lenders at a more unconscious

level.” More recently, Carter et al., (2007) have documented tantamount discrimination by banks, in that men and women are treated differently in banks’ lending criteria and processes.

(iv) **Financing preferences** – it may be that the financial preferences of women and men owner-managers are different. However, a recent study, drawing upon the results from a 400-firm telephone survey by Barclays Bank, found that: “Gender appears to make little difference to the choice of finance source utilised – most settle for personal savings, but there is little difference across each source” (Irwin and Scott, 2006).

4. Evidence from UK GEM 2004

The UK Global Entrepreneurship Monitor Survey 2004 was a structured telephone survey of individuals in the UK with around 22,000 responses. Detailed analysis and description of the data is provided in Harding (2004). Our focus here is on two key sets of variables collected as part of the GEM survey. The first relates to individuals’ perceived financial barriers to business start-up and is based on the responses to a question posed to all respondents, ‘Excluding money from family and friends, would a lack of external funding prevent you from starting up a business?’ This provides a fairly straightforward indication of the perceived lack of business finance and potential psychological or motivational barriers that this might induce to business start-up. In the population of respondents, women were more likely to perceive such financial barriers to business start-up than men, although this difference was not statistically significant (Table 1).

In terms of individuals’ participation in business start-up, UK GEM 2004 provides three indicators. These are individuals’ responses to the following questions:

1.Start-up: Are you, alone or with others, currently trying to start a new business, including any type of self-employment or selling any goods or services to others?

2. Running Business: You are, alone or with others, currently the owner of a business you help manage; or you are self-employed or selling any goods or services to others.

3. Expected Start-up: You are, alone or with others, expecting to start a new business, including any type of self-employment, within the next three years.

TABLE 1 & 2 ABOUT HERE

The UK GEM data suggests that the proportion of women engaged in each type of business start-up activity was significantly lower than that of men (Table 1), confirming findings from Carter et al., (2001) and Carter and Shaw (2006), that levels of women starting businesses are lower than men. The GEM database also provides a number of indicators which can usefully be used as control variables in the modelling with some variables being significantly different between males and females (Table 2). As a prelude to the multivariate analysis it is beneficial to have an understanding of the basic characteristics of the underlying GEM data. A number of the key characteristics of the sample of GEM respondents, which are representative of the whole working age population by gender, are first, that there is no significant distinction between the regional composition of the sample of GEM respondents between men and women. Four regions (South East, West Midlands, London and the Eastern region) account for around two-thirds of the national sample. Second, a higher proportion of male respondents have university degrees (36.7 per cent), while school qualifications such as 'A' levels and GCSEs are more common as the highest qualifications among women. Lower levels of qualification are equally common. Third, women respondents were more likely to be in lower quartiles of the national distribution of household income than males. Fourth, male respondents were more likely to be working full-time and to be either self-employed or an employer than women. Finally, men were more likely than women to have received enterprise training and participated in work experience programmes. The suggestion is that in the working age population men responding to the UK GEM survey were more likely to be highly qualified; more

likely to have a stronger financial profile (i.e. are in the upper quartiles of the distribution of household incomes); and have benefited from relevant working and training experiences than women respondents. Each of these factors is likely to have a positive effect on business start-up aside from any underlying gender differences, which reflects Cressy and Toivanen's (2001) assertion that those perceived as "better borrowers" perform more strongly for example, in terms of loan size and interest rates (despite the view of Chandler and Hanks (1998), that the money follows entrepreneurs with real potential).

5. Perceived financial barriers to business start-up

Our main aim in this section is to see whether, controlling for individuals' background characteristics, gender influences the perceived financial barriers to business start-up in the UK. Our approach is based on a series of probit models of the probability of perceiving financial barriers to business start-up (Table 3). Significant coefficients are in bold type in the table and two alternative formulations of the model are presented dropping the insignificant variable 'Enterprise Training at school' in the second model. Our results here are straightforward, consistent and statistically robust. Even adjusting for a range of background characteristics, being female increases the probability that an individual will perceive financial barriers to business start-up by around 7.5 percentage points. These findings are supported by previous research which identified financing constraints for women (Carter and Rosa, 1998; Carter and Shaw, 2006; Small Business Service, 2006). The actual causes of these differences are not pinpointed by the data, but as Carter et al., (2001) suggested these may stem from any combination of problems related to collateral, networks, discrimination or financing preferences.

TABLE 3 ABOUT HERE.

Our analysis also suggests a number of other factors which prove important in determining the probability that an individual will perceive financial barriers to business start-up in the UK. The most consistent effects were as follows. First, respondents in the Eastern region of England were 3-7 pp less likely to perceive financial barriers to business start-up. No other regional differences were statistically significant. Second, individuals with a degree were more likely to perceive financial barriers to business start-up than those with lower level qualifications (by 3-8 pp). Third, those in higher income households were less likely to perceive financial barriers to business start-up. Fourth, older individuals were less likely to perceive financial barriers to business start-up. Fifth, those working part-time or not working were less likely to perceive financial barriers to business start-up than the reference group (i.e. those in full-time employment). In general terms therefore, the UK GEM 2004 data provide strong support for the notion that women may perceive stronger financial barriers to business start-up than men.

6. Effects on Business Start-up

The aim of this section is to investigate the potential role of perceived financial barriers to business start-up on business start-up itself. If such perceived financial barriers to business start-up are important in influencing business start-up, then the fact that perceived financial barriers to business start-up are concentrated among women may be contributing to lower start-up rates among women. If perceived financial barriers to business start-up are not a factor in shaping business start-up then differential access to finance is likely to be less important in explaining lower start-up rates among women (e.g. Table 1). The implications of ‘discouraged borrowers’ has been discussed in Kon and Storey (2003) and is influenced by potential borrowers perceiving financial barriers to start-up and, therefore, not seeking loans.

Identifying the impact of perceived financial barriers to business start-up on business start-up raises some classic econometric and statistical issues. In particular, the obvious approach is to estimate a model for business start-up and include a dummy variable which takes value 1 if an

individual perceives financial barriers to business start-up. The coefficient on this ‘treatment’ term would then suggest the significance of perceived financial barriers to business start-up in the business start-up decision. In fact, however, unless perceived financial barriers to business start-up are randomly distributed across the population – and the previous section suggests they are not – this approach will yield potentially biased estimates of the importance of perceived financial barriers. Instead, an approach is needed which corrects for so called sample selection, allowing for any connection between the factors determining perceived financial barriers to business start-up and business start-up.

TABLE 4 & 5 ABOUT HERE.

This is simply dealt with using a bivariate probit model estimating simultaneously Part A – for the perceived financial barriers to business start-up – and Part B for business start-up itself (Table 4). Here the main parameter of interest is the disturbance correlation coefficient. If this is significant it suggests the need to simultaneously examine the determinants of perceived financial barriers to business start-up and business start-up. If this is not significant, it suggests the validity of estimating single equation probit models for business start-up. Table 4 reports three bivariate probit models for the three business start-up indicators discussed earlier. In each case the disturbance correlation is insignificant suggesting the validity of examining business start-up using single equation probit models. These are given in Table 5 with significant coefficients are in bold type.

Our primary evidence on gender effects on business start-up activity therefore comes from the single equation Probit models in Table 5. These suggest three main conclusions in relation to gender and perceived financial barriers. First, women are less likely to be involved in start-up activity, running a business and expected start-up activity than men (which highlights findings from much previous literature, as summarised in Carter et al., (2001), and Carter and Shaw (2006) that women are less likely to start businesses than men). Start-up rates for women are 1.7 pp lower than that for men, with expected start-up rates reduced by 3.5 pp (Table 5). Second, perceived financial

barriers to business start-up have a negative effect on business start-up (1.3 pp) and the probability of expected start-up (3.8 pp). The negative finance effect on start-up is around the same size as the direct gender effect. Third, the probability that an individual is running a business is not significantly influenced by perceived financial barriers to business start-up (Table 5).

Other factors also prove important in increasing business start-up rates with strong and consistently positive effects from: having a background of self employment or as an employer and experiencing enterprise training at college or university. No factors have a consistent negative effect other than being a woman.

TABLE 6 ABOUT HERE.

In general the UK GEM data suggests that gender has both direct and indirect negative effects on business start-up rates, with the negative effects operating through perceived financial barriers to start-up. Women are more likely to perceive financial barriers to start-up and these are likely to reduce start-up rates. In addition, there is a direct gender effect on start-up rates even allowing for education, locational and personal characteristics. Authors such as Hisrich and Brush (1986) and more recently Ennew and McKechnie (1998) argue strongly and consistently that gender affects access to finance (and therefore by implication, start-up rates) because of discrimination or gender differentials in banks' lending criteria and their processes (Carter et al., 2007).

GEM 2004 also provides some information on individuals' own reasoning for why they did not obtain finance and their justification for this lack of success. Sample sizes here are relatively small, however, as they relate only to a sub-group of those involved in enterprise activity in the survey. It is not possible therefore to model the effects of gender on these perceptions of success but descriptive data is given in Table 6. There is a broad similarity between the reasons given by women and men for their lack of success in gaining funding with the nature of the business, business size and the cost of finance predominating. Some more subtle differences are evident with women emphasising the cost of finance and males suggesting that business size was a more important factor

in their failure to gain financial support. Women's emphasis on the cost of finance highlights Fraser's (2005) finding that women face higher interest rates on term loans than men, as well as women experiencing problems such as undercapitalisation and lack of collateral (Marlow and Watson, 2006; Verheul and Thurik, 2001; Carter et al., 2001; Carter and Shaw 2006). More recently, Marlow and Carter (2006) found that "debt aversion" was one of the major barriers to women accessing finance.

7. Concluding Remarks

The UK GEM 2004 data proves interesting in terms of assessing gender effects on individuals' access to finance and its impact on start-up. In particular, we find that being a woman increases the probability than an individual will perceive financial barriers to business start-up by 7.5 pp with this, in turn, reducing start-up rates by 1.7-3.8 pp (supported by Carter and Rosa, 1998; Carter and Shaw, 2006; Small Business Service, 2006) despite sustained debate about the causes of these barriers, whether discrimination or not. Being female also has an additional direct effect on each of our start-up indicators. These results derived from the models allow us to decompose the difference between men's and women's start-up rates into a direct 'gender' effect, an indirect effect due to the effect of gender on perceived financial barriers and a 'residual' or unexplained effect. The relative sizes of these effects then provide an indication of the importance of the overall finance effect. Table 7 summarises the results for the three start-up indicators considered earlier. In the case of start-up, for example, the start-up rate for males is 2.8 percentage points higher than that for women. Of this difference, the models suggest that 1.7 percentage points can be explained by the direct gender effect with a further 1.0 percentage point being explained by the indirect gender effect due to perceived financial barriers. Here 0.1 percentage point remains of the difference in start-up rates between genders remains unexplained. For the other two business activity indicators the impact of perceived financial barriers on the difference in start-up rates suggested by the models is somewhat smaller (Table 7), and the theory of 'discouraged borrowers' (Kon and Storey, 2003).

TABLE 7 ABOUT HERE

From a policy perspective the key points here are that women's start-up rates in the UK are being reduced by (a) the perception among the general population of stronger financial barriers to start-up among females, and (b) their unwillingness to seek external finance for business start-up. Addressing this is likely to require measures designed to redress the current perception – evident in the GEM survey – that it is more difficult for women to obtain business finance and to encourage potential women entrepreneurs to be more ambitious in seeking external finance (rather than being 'discouraged borrowers' as in Kon and Storey, 2003). Successfully addressing these issues alone will not, however, fully close the gap between start-up rates among men and women. We still find a further gender gap in our analysis which we cannot explain in terms of financial shortages, although prior evidence points towards discrimination (Hisrich and Brush, 1986; Ennew and McKechnie, 2001) and differential treatment for men and women in banks' lending criteria and processes (Carter et al., 2007).

In this paper we have focussed on our analysis of the GEM 2004 data. As indicated earlier, this analysis is part of a larger project which also investigated access to finance for start-up using the Household Survey of Entrepreneurship and access to finance for business growth using two other large scale surveys. As with the GEM analysis, these other analyses also suggest the importance of 'demand-side' factors as the primary factor in shaping differential access to business finance between males and females. In other words, the econometric analysis suggests that it is the perceptions and behaviours of potential female entrepreneurs and the leaders of female-led businesses which are the primary factor in shaping differential access to finance rather than the behaviour of the suppliers of business finance. Why the perceptions and behaviours of potential female entrepreneurs and female business leaders differ from those of their male counterparts is, therefore, a key question for future research.

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Table 1: Perceived Financial Barriers to Start-up and Business Start-up Indicators by Gender

	Women per cent	Men per cent
Perceived financial barriers to start-up	64.1	57.3
Involved in business start-up	3.1	5.9
Current business owner	6.7	15.8
Expected business start-up	7.2	11.8

Notes: Figures in bold are significantly different at the 5 per cent level. See the data annex for variable definitions etc.

Source: GEM 2004

Table 2: Sample Characteristics: By Gender

	Women	Men
	per cent	per cent
A. Highest Educational Level		
Degree or higher	31.6	36.7
'A' Levels	22.4	20.4
GCSE or equivalent	25.7	22.8
Other vocational quals.	9.1	8.8
No formal qualifications	11.2	11.3
B. National Household Income Distribution		
Lower quartile	20.5	14.0
2nd quartile	25.3	24.8
3rd quartile	24.6	28.1
4th quartile	29.5	33.1
C. Age		
Age in years	40.5	40.3
D. Working Status		
Full-time (30 or more hours)	46.4	78.6
Part-time (8-29 hours)	25.3	6.2
Not working (8 or less hours)	28.3	15.2
E. Employment Status		
Employee	90.9	80.7
Self-employed	6.0	12.8
Employer	3.1	6.5
F. Enterprise Training and Work Experience		
Enterprise training at school	11.4	13.7
Enterprise training at college/university	15.8	21.4
Work experience at school	34.1	35.0
Work experience at college/university	12.0	14.0

Notes: Figures in bold are significantly different at the 5 per cent level. See the data annex for variable definitions etc.

Source: GEM 2004

Table 3: Probit models of Perceived Financial Barriers to Business Start-up

	Model 1		Model 2	
	Marginals	T Stat	Marginals	T Stat
Variables of Interest				
Women	0.075	8.664	0.075	8.729
Controls				
Eastern Region	-0.026	-2.068	-0.026	-2.053
Degree or higher	0.030	2.828	0.031	2.928
'A' Levels	-0.039	-3.254	-0.037	-3.176
Other vocational quals.	0.037	2.429	0.039	2.551
HH Income: 2nd quartile	-0.055	-4.028	-0.054	-3.960
HH Income: 3rd quartile	-0.041	-2.897	-0.041	-2.887
HH Income: 4th quartile	-0.122	-8.549	-0.121	-8.479
Age in years	-0.006	-16.439	-0.006	-16.647
Part-time (8-29 hours)	-0.042	-3.248	-0.041	-3.180
Not working (8 or less hours)	-0.054	-4.459	-0.054	-4.473
Enterprise training at school	0.017	1.342		
Work experience at school	0.023	2.384	0.025	2.704
Work experience at college/university	-0.060	-4.897	-0.058	-4.834
Constant	0.405	18.962	0.407	19.087
No of observations	14710		14736	
Chi Square	634.76		639.10	
Estrella	0.0307		0.0304	
per cent Correct	64.2		64.4	

Notes: Marginal values suggest the increase in the probability of perceiving finance shortages when moving from dummy variable values of 0 to 1. Marginal values for the age variable are at variable means. Sample observations are weighted.

Source: GEM 2004

Table 4: Bivariate Probit Models of Shortage of Start-up Finance and Start-up

	Model 1		Model 2		Model 3	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Part A: Perceived Financial Barriers Probit						
Constant	1.076	16.389	1.085	16.539	1.075	16.313
Women	0.233	8.858	0.234	8.878	0.234	8.877
Eastern	-0.119	-3.246	-0.118	-3.251	-0.113	-3.101
Degree or Higher	0.064	2.471	0.065	2.495	0.059	2.255
HH Income: 2nd quartile	-0.110	-2.403	-0.124	-2.726	-0.114	-2.474
HH Income: 3rd quartile	-0.054	-1.175	-0.061	-1.328	-0.050	-1.081
HH Income: 4th quartile	-0.262	-5.779	-0.273	-6.046	-0.267	-5.882
Age in years	-0.017	-14.870	-0.017	-14.892	-0.017	-14.912
Part time working	-0.122	-3.497	-0.123	-3.546	-0.098	-2.810
Work experience at school	0.024	0.844	0.023	0.811	0.021	0.745
Work experience at college/university	-0.167	-4.807	-0.167	-4.813	-0.159	-4.557
B. Business Start-up Models						
	Start-up		Running a business		Expected Start-up	
Constant	-1.510	-3.143	-1.401	-2.651	-1.005	-2.932
Lack of Finance	-0.174	-0.327	-0.294	-0.567	0.128	0.307
Women	-0.215	-3.379	-0.099	-1.588	-0.253	-5.859
London	-0.051	-0.867	-0.084	-1.440	0.203	4.678
Eastern	-0.282	-3.472	-0.019	-0.229	-0.195	-3.025
West Midlands	-0.272	-3.345	-0.008	-0.099	-0.186	-3.020
Yorks and Humber	-0.259	-1.738	-0.347	-2.283	-0.317	-2.811
North West	-0.376	-3.346	-0.011	-0.117	-0.179	-2.299
North East	-0.296	-1.640	-0.253	-1.193	-0.245	-1.929
Scotland	-0.254	-2.359	-0.117	-1.052	-0.255	-3.013
Age in years	-0.003	-0.673	-0.006	-1.599	-0.011	-2.837
Self-employed	0.773	13.720	2.752	21.629	0.357	7.001
Business Owner	0.539	6.651	3.191	19.792	0.383	5.491
Enterprise training at college/university	0.164	3.075	0.335	6.042	0.252	6.304
Work experience at school	-0.126	-2.418	-0.297	-5.382	0.088	2.423
Work experience at college/university	0.387	6.233	0.004	0.065	0.184	3.932
C. Disturbance Correlation						
RHO(1,2)	0.012	0.038	0.219	0.714	-0.222	-0.877
Observations	11577		11580		11456	
Log Likelihood	-9354.15		-9268.1		-10823.7	

Notes: Sample observations are weighted.

Source: GEM 2004

Table 5: Probit Models of Business Start-up Indicators

	Model 1: Start-up		Model 2: Running Business		Model 3: Expected Start- up	
	Marginals	T-stat	Marginals	T-stat	Marginals	T-stat
Constant	-0.130	-23.760	-0.203	-11.735	-0.144	-11.092
Women	-0.017	-4.955	-0.010	-1.962	-0.035	-6.691
Perceived Financial Barriers	-0.013	-3.526	0.007	1.383	-0.038	-6.565
South East			0.008	1.246	0.045	6.020
London	0.001	0.349	-0.004	-0.590	0.076	8.282
Eastern region	-0.014	-3.454				
Wales	-0.013	-1.746			-0.020	-1.291
North West	-0.020	-4.124				
North East	-0.017	-2.111				
Scotland	-0.011	-1.911	-0.028	-2.822	-0.010	-0.793
Degree or higher			-0.035	-4.097		
'A' Levels			-0.041	-6.029	0.009	1.311
GCSE or equivalent			-0.026	-3.450		
Other vocational quals.			-0.018	-2.097	0.006	0.634
HH Income: 2nd quartile			0.062	4.230		
HH Income: 3rd quartile			0.039	3.037		
HH Income: 4th quartile	-0.007	-2.070	0.056	4.419	-0.013	-2.435
Age in years			-0.001	-2.502	-0.001	-7.598
Self-employed	0.106	9.887	0.802	67.580	0.071	6.026
Business Owner	0.069	5.182	0.896	90.865	0.084	4.884
Enterprise training at school					0.013	1.581
Enterprise training at college/university	0.018	3.620	0.049	5.813	0.040	5.122
Work experience at school	-0.008	-2.371	-0.030	-5.868	0.014	2.364
Work experience at college/university	0.037	5.729			0.026	3.158
n	11906		11601		11434	
chi squared	416.52		5534.89		492.19	
Estrella	0.034		0.481		0.031	

Notes: Marginal values suggest the increase in the probability of perceiving finance shortages when moving from dummy variable values of 0 to 1. Marginal values for the age variable are at variable means. Sample observations are weighted.

Table 6: Percentage indicating reasons for their lack of success in obtaining finance

	Women per cent	Men per cent	All per cent
Not investor ready	15.6	17.1	16.6
Nature of the business	32.0	33.8	33.3
Inadequacies in the business plan	15.7	16.2	16.1
Business too small	23.9	31.7	29.1
Fear of debt	21.2	24.3	23.3
Unwillingness to share ownership	17.8	14.0	15.2
Cost of finance too high	34.6	27.0	29.5
Weak management team	8.8	8.7	8.7

Source: GEM 2004

Table 7: Decomposition of differences in start-up rates

	Start-up	Running Business	Expected Start-up
Start-up rates (per cent)			
Women	3.1	6.7	7.2
Men	5.9	15.8	11.8
Difference	-2.8	-9.1	-4.6
Contribution (per cent)			
Direct gender effect	-1.7	-1.0	-3.5
Indirect gender effect (via finance)	-1.0	-0.1	-0.3
Other factors (residual)	-0.1	-8.0	-0.8

Source: GEM 2004, for derivation see text