Appendix 1:

Access to Finance for Creative Industry Businesses: Econometric Analysis from the UK Survey of SME Finances

Report Prepared for BIS and DCMS

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Introduction

Background

The term 'Creative Industries' (CI's) refers to those industries which have their origin in individual creativity and which have potential for wealth and job creation through the exploitation of intellectual property. This covers a wide range of activities including art, advertising, architecture, design, music, fashion, publishing, computer games and software development, the performing arts, film, TV and radio (DCMS, 2010a). A common factor across this sector is an emphasis on the talent and creativity of the people involved with these businesses. Many Creative Industry Businesses (CIBs) are therefore highly innovative with significant growth potential. In fact, CI's account for 6.2% of GVA and between 1997 and 2007 grew by 5% on average compared to 3% for the economy as a whole (DCMS, 2010b). The strength and originality of creative talent in the UK is also recognised internationally with the UK ranking third in the world for the exported value of creative services and sixth in the world for exports of creative goods (UNCTAD, 2008; CIA, 2005). However, uncertainty naturally accompanies doing something which is novel or unusual and which is so heavily reliant on talented individuals for success.

Indeed, uncertainty may be a particular issue for CIBs due to uncertainty about the demand for their products (Caves, 2000: who can predict the next hit film?) and uncertainty about the talent of the business owner (who can spot the next great artist?). At a time when banks and other finance providers are more risk averse, this uncertainty may present particular funding challenges for businesses in CI's. In particular, this uncertainty may lead to problems of adverse selection[1]. The implication is that the higher level of uncertainty in funding CIBs may give rise to more acute market failures (caused by adverse selection) and, consequently, lenders may require CIBs to provide more collateral in order to obtain funding. However, CIBs may lack business assets to offer as collateral leading to poorer access to finance relative to comparable non-CIBs[2].

Another potential cause of market failure is a misalignment of interests between the owners of CIBs and finance providers. This may give rise to problems of moral hazard where owners of CIBs are more motivated by the creative process than by pecuniary gain ('art for art's sake'; Caves, 2000). In this circumstance, finance providers may be more likely to ask

[1] In essence the problem is that the lender is unable to distinguish high risk from low risk borrowers. In that case it may be profit maximising for the lender to limit the supply of credit ('credit-rationing') rather than set interest rates at a level which clears the market. The reason for this is that raising the interest rate to clear the market may cause low risk borrowers to refrain from borrowing leaving behind a pool of higher risk borrowers resulting in lending being less profitable (adverse selection). In practice credit-rationing may mean there is less finance available to viable businesses.

[2] Rather than leading directly to rejection, a lack of business assets may result in lenders asking for personal security (e.g., a family home) instead. However, accepting the loan on these terms may put the business owner in the invidious position of risking losing their home; in these circumstances the business owner may prefer to turn down the loan offer. Either way, a lack of business assets to offer as collateral may lead to poorer access to finance.

for collateral from CIBs to ensure interests are aligned. Again, however, the issue of collateral may be an impediment to obtaining finance.

Whatever the causes of market failure, adverse selection or moral hazard, the consequences may be that CIBs are financially constrained resulting in lower growth. These potential consequences for growth are particularly important at a time when policy makers are looking to the private sector to lead economic recovery. In this context, the recent Finance Green Paper announced that the Departments for Business, Innovation and Skills (BIS) and Culture, Media and Sport (DCMS) would work together to understand whether CIBs 'are suffering more than others in accessing finance' (BIS/HMT, 2010). This research report is the result of this collaboration.

In terms of the general context, recent evidence points to the challenges faced by all types of Small and Medium Sized Enterprises (SMEs) in raising finance. The UK Survey of SME Finances (UKSMEF) 2009, conducted by BIS/IFF/Warwick Business School, found that following the credit crisis SMEs experienced:

- Higher incidences of loan rejection.
- Increased incidences of rejection due to a lack of collateral.
- Increased incidences of rejection due to the business operating in a sector considered too risky.
- Increased incidences of financial discouragement (i.e., businesses that did not apply for finance because they believed they would be turned down).

These findings highlight the tightening of lending criteria following the credit crisis as lenders became more risk averse in general. Against this background, a reasonable view is that access to finance among CIBs may have been particularly badly affected by a lack of collateral. Even in good times, finance providers may be more likely to ask CIBs for collateral due to greater issues of uncertainty/moral hazard; and to compound the problem the principal assets of these businesses is their owners' talent/creativity, perhaps manifested in the form of intellectual property, as opposed to tangible assets.

The main objective of this report is therefore to rigorously analyse the extent to which businesses in CI's have found it harder to raise finance, before and after the credit crisis, compared to otherwise similar businesses in other sectors of the economy. This analysis looks at both: businesses which applied for finance and were rejected; and businesses which did not apply for finance because they believed they would be rejected ('discouraged borrowers'). Comparisons of the likelihood of rejection between CIBs and comparable non-CIBs, relate directly to the issue of the severity of market failure in the supply of finance to CIBs relative to other businesses[3]. If CIBs have a higher likelihood of rejection than non-CIBs with similar risk profiles, then it suggests that finance providers are more risk averse towards CIBs due to greater problems of uncertainty/moral hazard[4].

[3] It is well known that market failure issues, rooted in problems of uncertainty/imperfect information and moral hazard, may adversely affect the supply of finance to small businesses in general. The point of the analysis in this report is to address the question of whether issues of market failure are more acute for CIBs compared to the rest of the small business population.

[4] Whilst there is a good basis in economic theory for these explanations, the interviews with finance providers conducted in the qualitative analysis provides them with empirical support. Other specific explanations for differences in rejection probabilities between CIBs and non CIBs with similar risk profiles include: i) CIBs may be bad at pitching their ideas to

The reason for also looking at discouraged borrowers is that owners of CIBs may be more likely to feel discouraged from applying for external finance due to the *perception* that they have a higher likelihood of rejection. These perceptions may result from a feeling that the nature of their business (uncertainty/non-pecuniary objectives) would make finance providers particularly risk averse towards them. So, comparisons of the likelihood of discouragement between CIBs and comparable non-CIBs show the indirect effects of market failure through business owners' perceptions of the supply conditions confronting them. Other reasons for looking at discouragement are that previous research has shown that: incidences of discouragement may be more prevalent than rejection (Fraser, 2009a); and discouragement may have a more adverse effect on business growth than rejection (Fraser, 2010).

An additional objective of this report is to examine the effects of differences in access to finance, as measured by differences in rejection and discouragement probabilities, on the growth of businesses in CI's. The reasons for this analysis are two-fold. Firstly, rejection/discouragement will only cause lower growth if they result in the business receiving less finance than is needed (implying the business is financially constrained). In instances where the business is not creditworthy, rejection/discouragement may be the better outcome; providing these businesses with more finance will not help them to grow. So, by looking at the effects of rejection/discouragement on small business growth in general, this analysis provides broad insights into issues of market failure in the overall market for small business finance. Secondly, analysis of the impacts on growth of *differences* in rejection/discouragement provides specific insights into the economic consequences of *more acute* market failures in the supply of finance to CIBs relative to other businesses.

The research uses both econometric and qualitative methodologies to fully understand the underlying reasons for differences in access to finance and growth between CIBs and non-CIBs. The econometric and qualitative analyses are complementary: rigorous econometric analysis of large samples of data provides a robust basis for informing policy decisions; case studies, on the other hand, provide an opportunity to delve deeper into issues than is possible with econometric analysis alone.

A brief description follows of how the econometric analysis in this report was conducted (the qualitative analysis is discussed in Appendix 2).

Econometric analysis

The econometric analysis consists of 3 stages:

1. Estimate models for the probability of financial rejection and discouragement for both CIBs and non-CIBs.

   This stage allows an examination of the <u>determinants of rejection/discouragement</u> and whether there are any <u>differences in these determinants</u> between CIBs and non-

finance providers; and ii) CIBs may reject the terms of the offer of finance including collateral requirements. However these specific reasons relate to the more general issue of uncertainty: poor pitching reduces confidence (increases uncertainty) in the talent of the business owner; and banks ask for more collateral when they are uncertain about the firm's ability to repay the loan.

CIBs. In particular, the determinants of rejection relate to factors used in finance providers' risk assessments of the business. The determinants of discouragement relate to factors which affect the business owner's perceived likelihood of rejection. Among the factors included in these models are: business assets/availability of collateral; credit ratings; financial relationships; and human capital. These models also provide the probabilities of rejection/discouragement used in the second stage.

2. Estimate differences in the probability of rejection/discouragement between CIBs and non-CIBs.

   The total difference in the probabilities of rejection (obtained from the first stage) is decomposed into the sum of an assessment difference and profile difference. The assessment difference is the difference in rejection probabilities holding risk profiles constant; this difference captures the effect of greater risk aversion towards CIBs on the probability of rejection. The assessment difference therefore relates directly to the issue of market failure since greater risk aversion may be rooted in issues of greater uncertainty/moral hazard associated with the supply of finance to CIBs. The profile difference, on the other hand, relates to the difference in rejection probabilities due to differences in risk profiles between CIBs and non-CIBs.

   Similarly, the total difference in the probabilities of discouragement is decomposed into the sum of a perceptions difference and profile difference. The perceptions difference is the difference in discouragement probabilities holding risk profiles constant. The perceptions difference relates to the issue of whether or not CIB owners are less likely to apply for finance because they have worse perceptions about supply conditions in the loan market than owners of comparable non-CIBs. It captures the indirect effects of market failure in the supply of finance to CIBs via CIB owners' perceptions of the supply conditions confronting them.

3. Estimate the relationship between financial rejection/discouragement and growth.

   This involves estimating the relationship between financial discouragement and growth controlling for other firm/owner characteristics. In particular, rejection/discouragement causes lower growth if and only if they result in the business receiving less finance than required. This analysis therefore provides a test of financial constraints on small business growth. Next, the assessment/perceptions differences in rejection/discouragement probabilities (obtained from stage 2) are input into the growth model to examine the impact of these differences on growth. This analysis therefore relates to the impact of market failure in the supply of finance on the growth of CIBs.

The remainder of this report is structured as follows. Following a description and summary analysis of the data in chapter 2, the results of stages 1 and 2 of the econometric analysis are detailed in chapter 3. The growth analysis (stage 3) is discussed in chapter 4. Chapter 5 brings together the joint findings of the econometric and qualitative analyses in conclusion. These joint findings form the basis for recommendations regarding improving access to finance for CIBs (presented in the joint summary before this report). The qualitative analysis itself, which was conducted by IFF Research Ltd, is provided in Appendix 2.

2
Data and summary analysis

Data

The source of the data used in the econometric analysis, the UK Survey of SME Finances (UKSMEF), is a series of surveys which provide detailed information on the characteristics of Small and Medium-Sized Enterprises (SMEs), their owners and experiences of obtaining finance (Fraser, 2005). The surveys are based on large, representative samples of UK businesses with less than 250 employees. UKSMEF was conceived and developed by the

Centre for Small and Medium-Sized Enterprises (CSME), Warwick Business School: the first survey was carried out by CSME in 2004 with funding from a large consortium of private and public sector organisations led by the Bank of England. A second survey was conducted by the University of Cambridge in 2007 and the third was again carried out by CSME in 2008 with funding from the ESRC and Barclays Bank. The most recent survey, UKSMEF 2009, was conducted by BIS/IFF/Warwick Business School. Two spin-off surveys, looking at the financing of ethnic minority businesses and social enterprises, were carried out in 2005 and 2006 by the DTI/Small Business Service. UKSMEF has provided a wealth of information for policy makers on a range of general and specific issues including female entrepreneurs, ethnic minority businesses and social enterprises.

The 2004, 2005, 2008 and 2009 surveys together form a longitudinal survey of 4,657 firms observed in up to 3 years (in 2004, 2008 and 2009 or 2005, 2008 and 2009)[5]. 1,845 businesses (40%) were observed in 2 or more years. In total there are 7,160 observations: 435 observations on CIBs; and 6,725 observations on non-CIBs. 314 of the CIB observations involve the use of, or application for, any type of finance (financial demands) encompassing overdrafts, term loans, leasing and hire-purchase agreements, invoice finance and equity finance. There are 5,306 non-CIB observations involving the demand for any type of finance.

Analysis is also presented based on the segmentation of Creative Industries into Content and Service sectors (of which there are 287 and 145 observations respectively[6]). This segmentation groups sub-sectors based on their commonality in two dimensions: the relative importance of technology in the creative process; and the degree to which outputs are technology dependent[7]. Based on the available data, Content sectors are comprised of: Software, Computer Games and Electronic Publishing (134 observations – referred to simply as 'Software' hereafter); Music and the Visual Performing Arts (97); Publishing (35); Video, Film and Photography (13); and Radio and TV (8) (the latter 3 sectors being grouped together under the heading 'Other Creative Content' due to the low sample sizes)[8]. These sub-sectors are characterised by relatively high levels of technology inputs/outputs. Service sectors consist of Advertising (36) and Architecture (109)[9]. These sub-sectors tend to have lower technology inputs/outputs.

It is noted at the outset that whilst these CI sub-sector groups follow established definitions, it might be informative to further disaggregate some of the groups in the analysis. Music and the Visual Performing Arts is a good example: separate analysis of music and visual

[5] The 2005 data, which relate to an Ethnic Minority Business (EMB) survey designed to boost the number of EMBs for analysis along with UKSMEF 2004, is included in the current analysis because: 1) it increases the number of CIB observations by 69; 2) it is possible to control for ethnicity in the analysis thereby removing any potential bias in the results caused by ethnicity; and 3) together, UKSMEFs 2004, 2005, 2008 and 2009 form a panel data-set tracking individual firms for up to 3 periods (2004/5, 2008 and 2009). This last point is particularly important for the econometric analysis since it means that panel data estimation techniques may be used to control for unobserved firm specific effects ('entrepreneurial talent').

[6] There are 3 observations in the overall CIB sample relating to antique businesses (classified by the Technology Strategy Board, 2009, as an 'artifact' sector).

[7] The rationale for this segmentation approach is set out in Technology Strategy Board (2009).

[8] The SIC 2003 codes which define these CI sub-sectors are set out in DCMS (2010a).

[9] The distribution of observations for the CI sub-sectors are as follows (pre-2008/2008-9): Software (34.2%/27.9%); Music/Visual Performing Arts (26.7/%18.5%); Other Creative Content (15.8%/10.3%); Advertising (7.9%/8.6%); and Architecture (13.9%/34.8%). Only Architecture has a significant difference in the proportions between pre-2008 and 2008-9.

performing arts businesses would undoubtedly offer better insights into access to finance for these different types of businesses. However, this is not possible due primarily to limitations in the SIC 2003 code definitions used to define the CI sub-sector groups; these codes are unable, for example, to separate out musicians from other individuals engaged in 'artistic and other literary creation and interpretation'[10]. The analysis therefore proceeds with the caveat that whilst the CI sub-sector analysis offers more insights than simply looking at outcomes for the average CIB, it may still mask variation in access to finance among different types of CIBs within these sub-sectors.

Summary analysis

The charts presented below report proportions, relating to firm/principal owner characteristics and financial relationships/outcomes, estimated on the CIB and non-CIB sub-samples respectively. Analysis of financial rejections is conducted on sub-samples with demands for the relevant type of finance. Formal statistical tests of differences in proportions between the CIB and non-CIB sub-samples are presented in tables accompanying the charts.

The summary and econometric analyses report *p*-values which show the exact level of statistical significance of the reported statistics. Small *p*-values provide evidence against the null hypotheses (that the difference in proportions or rejection/discouragement probabilities is zero). Based on conventional significance levels, statistics with *p*-values of 5% or below (*p*-value$\leq$0.05) indicate the statistic is statistically significant (i.e., the null hypothesis is rejected – the statistic is different from zero). Some of the reported statistics are significant at the 10% level but not the 5% level (0.05<*p*-value$\leq$0.10). These statistics provide weaker evidence against the null hypotheses (there is a bigger chance that the null hypothesis is true). All statistics with *p*-values bigger than 10% are reported as being statistically insignificant.

It is important to note that the summary analysis relates only to raw differences in proportions between the CIB and non-CIB samples. In particular, regarding the summary analysis of financial rejection/discouragement, this analysis does not claim that these differences are due to unwillingness among finance providers to fund CIBs *per se*. Identifying the reasons for these differences is the purpose of the econometric analysis presented in the next chapter.

A brief summary of the key findings of the summary analysis is reported next, followed by a more detailed look at the findings for business/owner characteristics and financial demands, rejection and discouragement (including charts and statistical tests for differences in proportions).

Summary

Business characteristics

- CIBs are smaller than non-CIBs and, in particular, have fewer business assets to use as loan collateral.

[10] This corresponds to a SIC 2003 code of 92.31.

- In particular, analysis of CI sub-sectors indicates that CIBs in Software and Architecture have significantly fewer assets than the average non-CIB.
- CIBs are younger on average, and have shorter financial relationships, than non-CIBs implying shorter business track records.
- There is little difference in risk ratings and instances of financial delinquency between the CIB and non-CIB sub-samples. If anything, CIBs appear to have slightly better risk ratings than non-CIBs.

Principal owner characteristics

- Owners of CIBs appear to be better educated, if not more experienced, than their non-CIB counterparts.
- Also owners of Software and Other Creative Content CIBs are younger than an average non-CIB owner.
- A lower proportion of CIBs have a female principal owner.
- The proportion of businesses with a Black principal owner is higher among CIBs, but there are lower proportions of businesses with an Indian or Pakistani principal owner among CIBs.

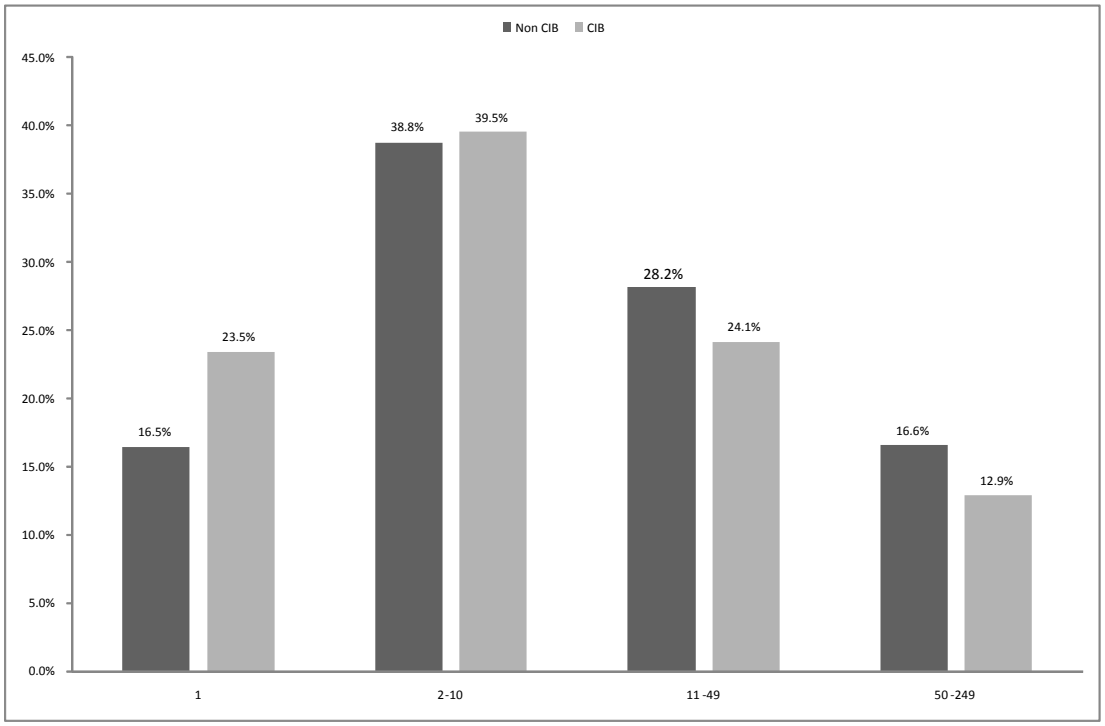
Financial demands and outcomes

- A lower proportion of CIBs than non-CIBs used or applied for debt finance (specifically in 2008); but a higher proportion of CIBs used or applied for equity finance (in 2008).
- In particular, Software and Other Creative Content CIBs have lower overall financial demands than non-CIBs.
- CIBs are more likely than non-CIBs to be denied an overdraft, leasing and hire-purchase agreement or equity finance. There are no significant differences in the likelihood of term loan rejection.
- Over time, there is a highly significant difference in rejection rates (for any type of finance) between CIBs and non-CIBs in 2008, a less significant difference in 2005 (after controlling for differences in ethnicity) and no significant difference in 2004 and 2009. This suggests that the gap in rejection rates between CIBs and non-CIBs may have widened briefly in 2008 but closed again in 2009.
- Also, CIBs were more likely than non-CIBs to feel discouraged from applying for term loans (specifically, in 2008) and equity finance (specifically, in 2004). Notably there are no significant differences between CIBs and non-CIBs in the rate of overdraft discouragement.
- Analysis by CI sub-sectors however indicates that only Software and Other Creative Content sectors have significantly higher rates of rejection/discouragement than non-CIBs. Other CI sub-sectors have statistically the same rates of rejection/discouragement as non-CIBs.

Business characteristics

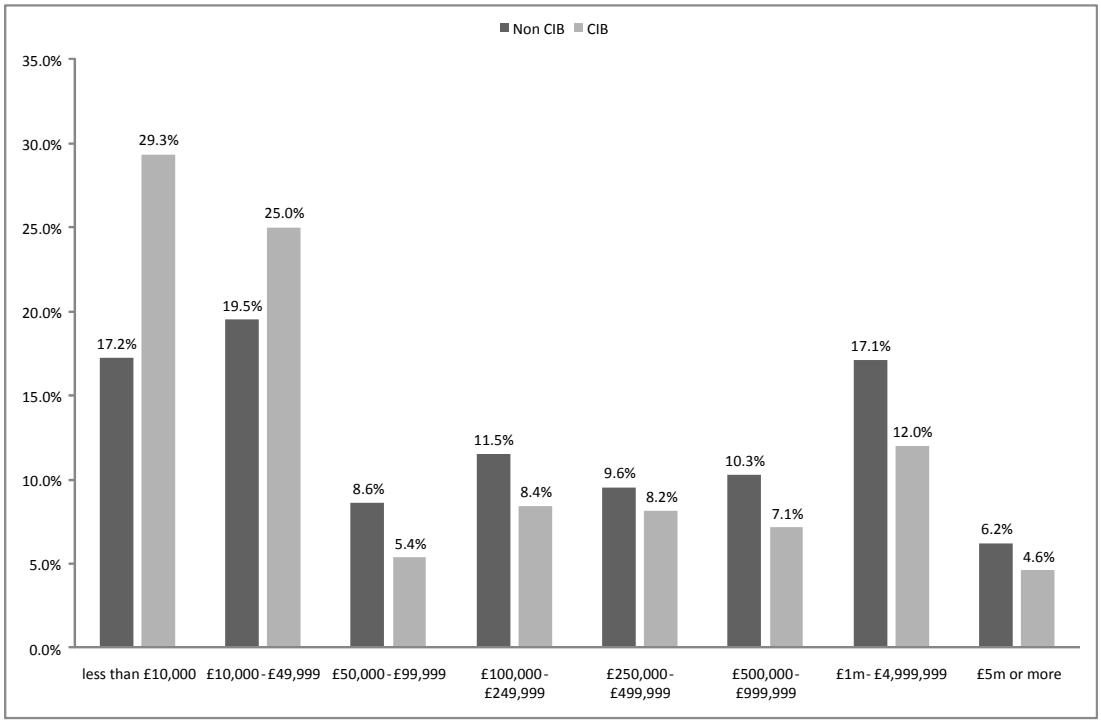
A full summary analysis of business characteristics of CIBs and non-CIBs (including financial relationships) is reported in the following charts. Formal tests of differences in the proportions in these charts are reported in Table 1.

Chart 1: Number of employees



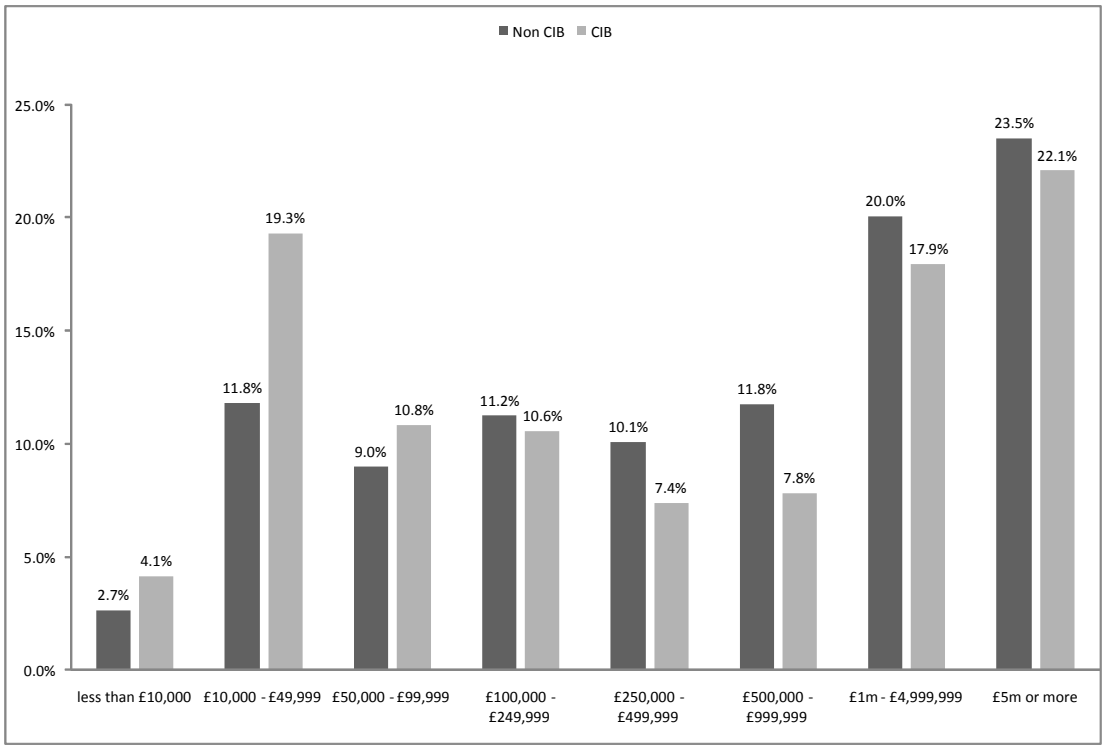
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 2: Business assets



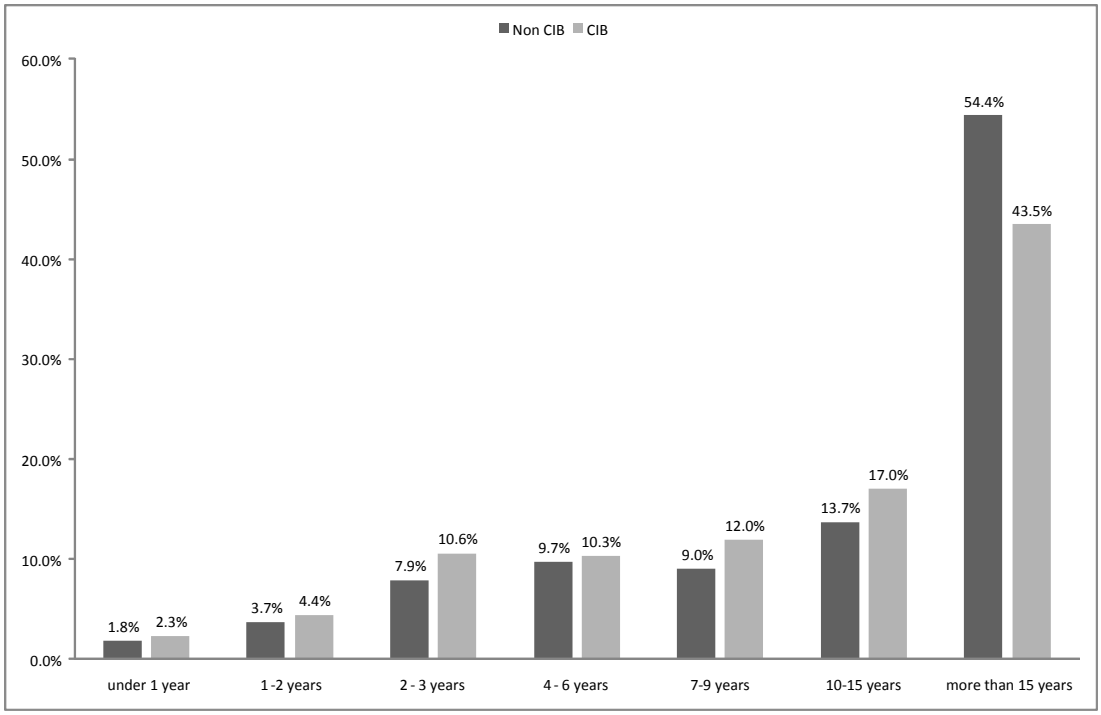
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 3: Sales



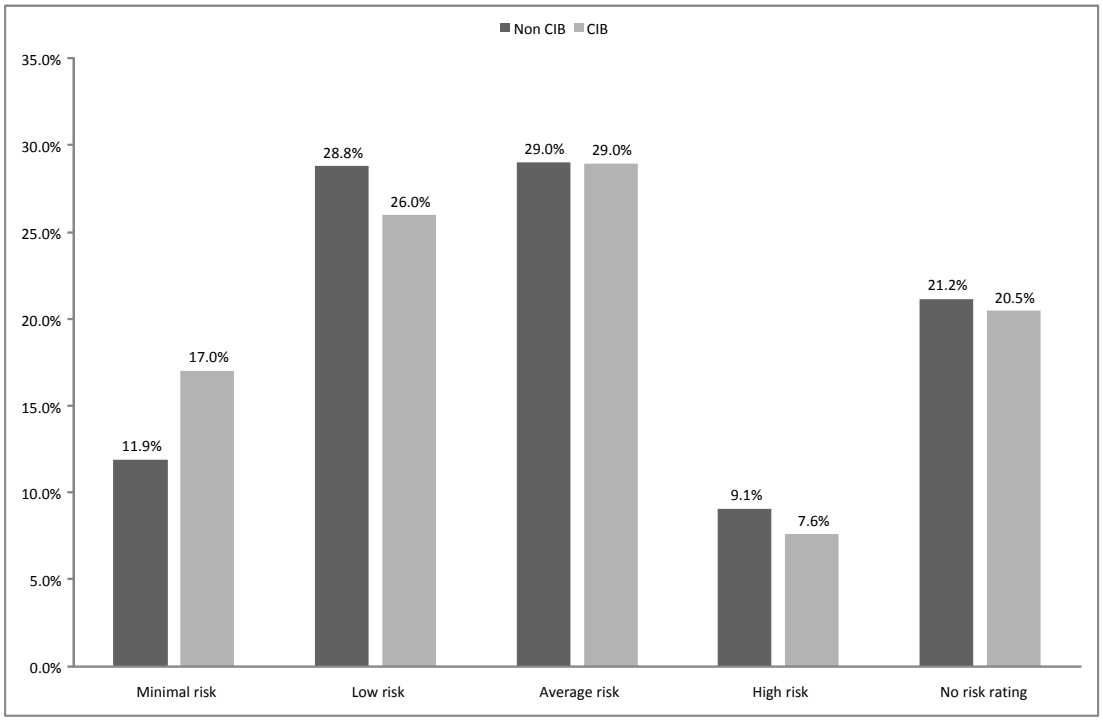
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 4: Business age



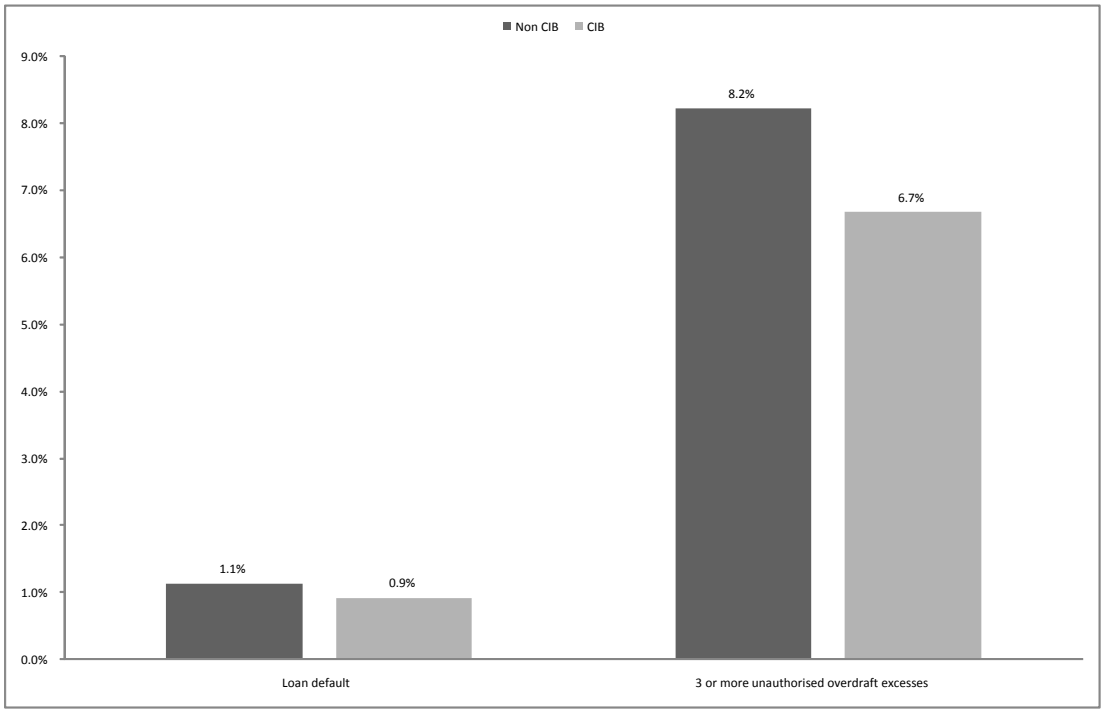
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 5: Dun and Bradstreet credit ratings



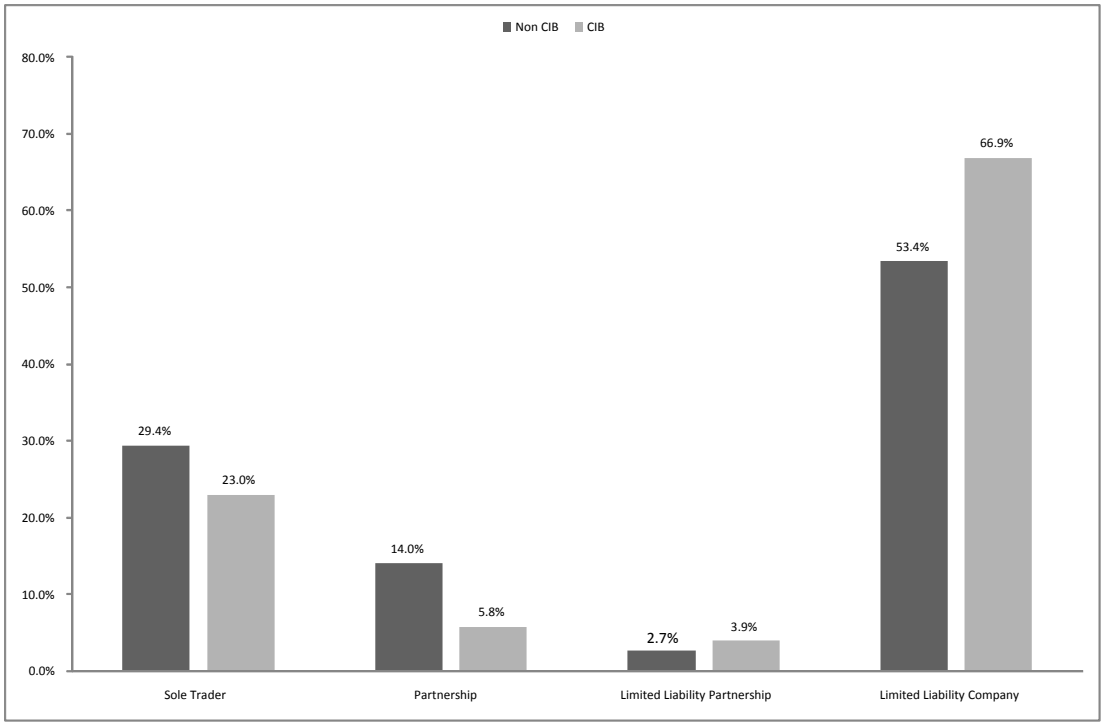
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 6: Financial delinquency



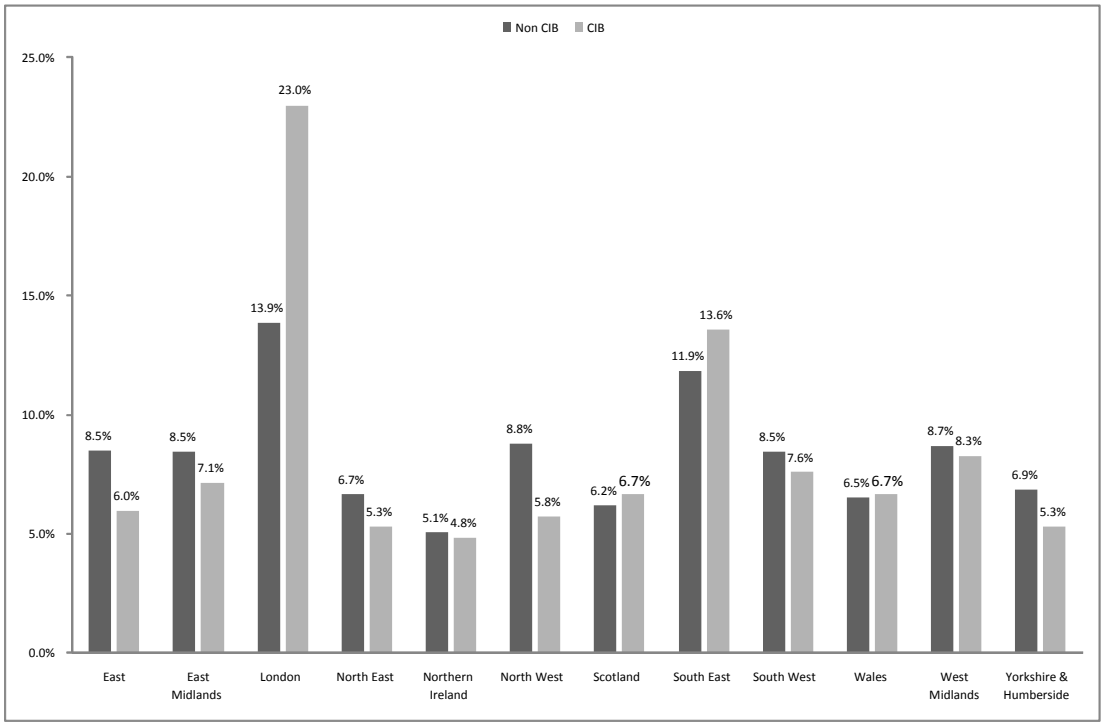
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 7: Legal form



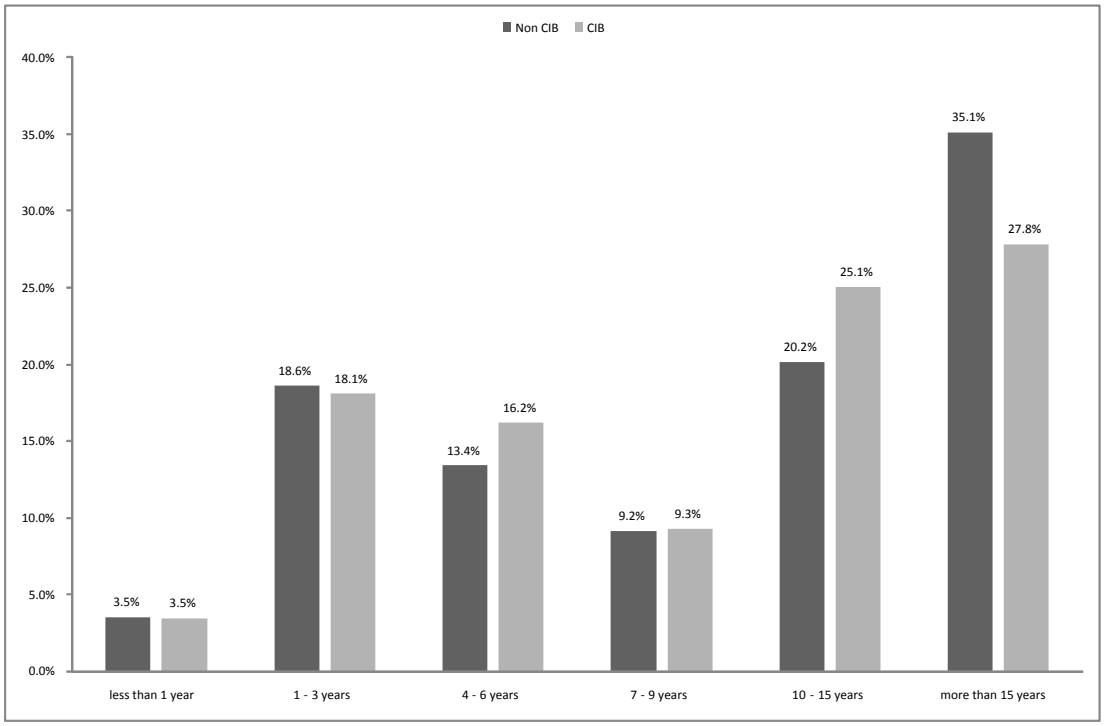
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 8: Region



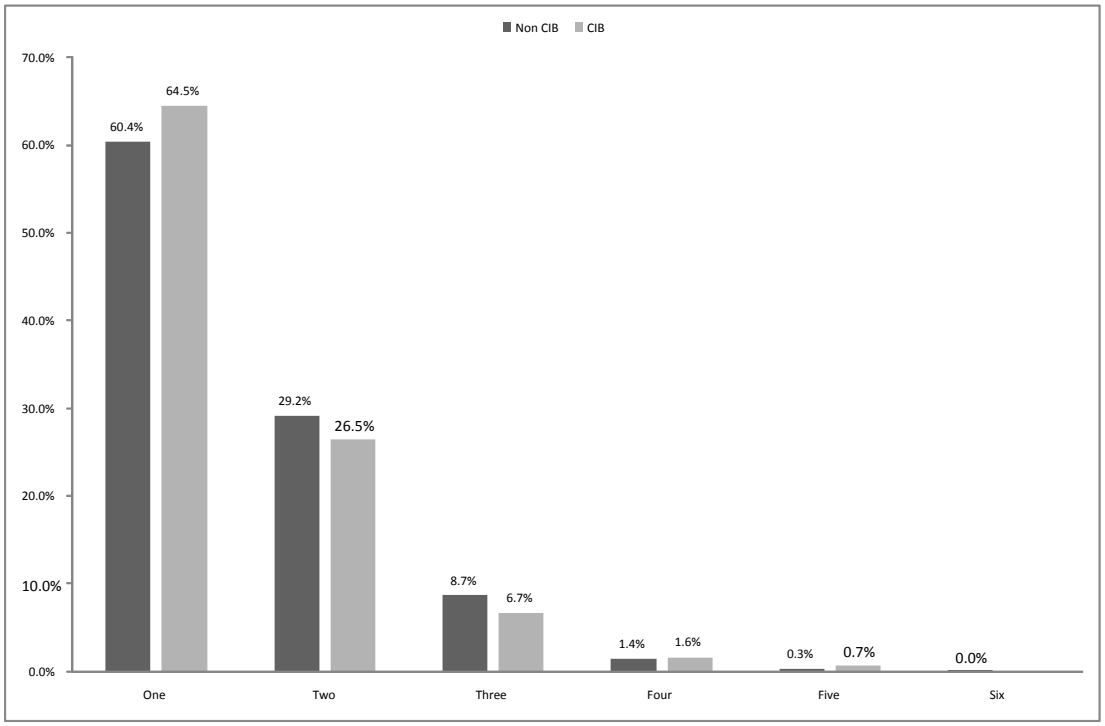
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 9: Length of relationship with main finance provider



Source: UKSMEF 2004, 2005, 2008, 2009

Chart 10: Number of finance providers



Source: UKSMEF 2004, 2005, 2008, 2009

Table 1: Difference in proportions between CIB and non-CIB sub-samples – firm characteristics

% points/100

Variable	Difference in proportions	*p*-value
No. of Employees		
1	0.0579	0.000
2-10	0.0240	0.000
11-49	-0.0345	0.000
50-249	-0.0473	0.000
Assets		
Less than £10,000	0.1023	0.000
£10,000 - £49,999	0.0330	0.000
£50,000 - £99,999	0.0015	0.023
£100,000 - £249,999	-0.0076	0.000
£250,000 - £499,999	-0.0142	0.000
£500,000 - £999,999	-0.0230	0.000
£1m - £4,999,999	-0.0593	0.000
£5m or more	-0.0327	0.000
Sales		
Less than £10,000	0.0137	0.002
£10,000 - £49,999	0.0335	0.001
£50,000 - £99,999	0.0142	0.000
£100,000 - £249,999	0.0099	0.000
£250,000 - £499,999	0.0031	0.000
£500,000 - £999,999	-0.0022	0.047
£1m - £4,999,999	-0.0184	0.001
£5m or more	-0.0538	0.000

Risk Rating		
Minimal risk	0.0510	0.006
Low risk	-0.0283	0.194
Average risk	-0.0008	0.973
High risk	-0.0150	0.255
No risk rating	-0.0070	0.726
Financial Delinquency		
Unauthorised Overdraft Excesses	-0.0156	0.244
Loan Default	-0.0021	0.683
Business Age		
Under 1 year	0.0113	0.001
1-2 years	0.0157	0.001
2-3 years	0.0234	0.000
4-6 years	0.0179	0.000
7-9 years	0.0100	0.000
10-15 years	0.0053	0.000
More than 15 years	-0.0837	0.000
Legal form		
Sole trader	-0.0638	0.002
Partnership	-0.0829	0.000
Limited liability partnership	0.0125	0.189
Limited liability company	0.1351	0.000
Region		
East	-0.0254	0.032
East Midlands	-0.0133	0.297

London	0.0913	0.000
North East	-0.0139	0.213
Northern Ireland	-0.0024	0.819
North West	-0.0304	0.009
Scotland	0.0047	0.705
South East	0.0171	0.311
South West	-0.0087	0.506
Wales	0.0012	0.920
West Midlands	-0.0041	0.765
Yorkshire and Humberside	-0.0160	0.153
Number of finance providers		
1	0.0327	0.147
2	0.0180	0.159
3	0.0112	0.136
4	0.0027	0.125
5	0.0007	0.131
6	0.0001	0.269
Length of relationship with main finance provider		
Under 1 year	0.0075	0.110
1-3 years	0.0200	0.090
4-6 years	0.0065	0.070
7-9 years	0.0017	0.038
10-15 years	0.0031	0.163
More than 15 years	0.0327	0.081

Source: UKSMEF 2004, 2005, 2008, 2009

The analysis of firm size indicates that CIBs are significantly more likely to have 10 or fewer employees than non-CIBs; and they are significantly less likely to have more than 10 employees. In terms of business assets CIBs are significantly more likely to have fewer than £100,000 in business assets than non-CIBs. CIBs are also significantly less likely to have £100,000 or more in business assets. Regarding sales, CIBs are significantly more likely to make sales of less than £500,000 than non-CIBs; and they are significantly less likely to make sales of £500,000 or more.

Looking at business age, CIBs are significantly more likely than non-CIBs to be aged 15 years or less. CIBs are also significantly less likely to be aged more than 15 years. Regarding risk ratings, CIBs are significantly more likely to have a minimal risk rating than non-CIBs. However, there are no significant differences in the proportions between CIBs and non-CIBs at higher risk ratings or among businesses without a risk rating. Also, there are no significant differences in the proportion of financially delinquent businesses between the CIB and non-CIB sub-samples.

CIBs are significantly less likely than non-CIBs to be set up as a sole trader or partnership and significantly more likely to be formed as a limited liability company. There is a significantly lower proportion of CIBs compared to non-CIBs located in the East of England and North West. In contrast, the proportion of CIBs located in London is significantly higher than the corresponding proportion of non-CIBs.

CIBs are significantly more likely than non-CIBs to have a main financial relationship which has lasted between 4 and 6 years; and they are significantly less likely to have a relationship which has lasted more than 15 years (which may be a reflection of the younger ages of CIBs). There are no significant differences in the number of finance providers used by CIBs and non-CIBs respectively.

Further analysis of differences in average firm size across CI sub-sectors is reported in the following table

Table 2: Differences in average firm size between CI sub-sectors and non-CIBs[(a)].

	Employees (*p*-value)[(b)]	**Assets (£) (*p*-value)**	**Sales (£) (*p*-value)**
Non-CIB average size	35.57 (0.001)	2,136,222 (0.000)	2,689,414 (0.000)
Creative Content sectors			
Music and Visual Performing arts	-23.94 (0.024)	-1,807,382 (0.000)	3,715,470 (0.515)
Software	-21.65 (0.040)	-1,598,520 (0.000)	-1,188,824 (0.002)
Other Creative Content	-16.03 (0.175)	-682,189 (0.227)	-746,294 (0.269)

Creative Service sectors			
Advertising	5.76 (0.681)	244,747 (0.765)	3,856,105 (0.083)
Architecture	-9.46 (0.392)	-1,291,491 (0.000)	-594,702 (0.133)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) The cell entries are estimated coefficients from regressions of firm size on dummy variables for CI sub-sectors and a constant. The coefficient on the constant is the average size of a non-CIB; the coefficients on the CI sub-sector dummies estimate the average difference in size for the respective sub-sectors relative to the non-CIB average.

(b) *p*-values based on robust standard errors.

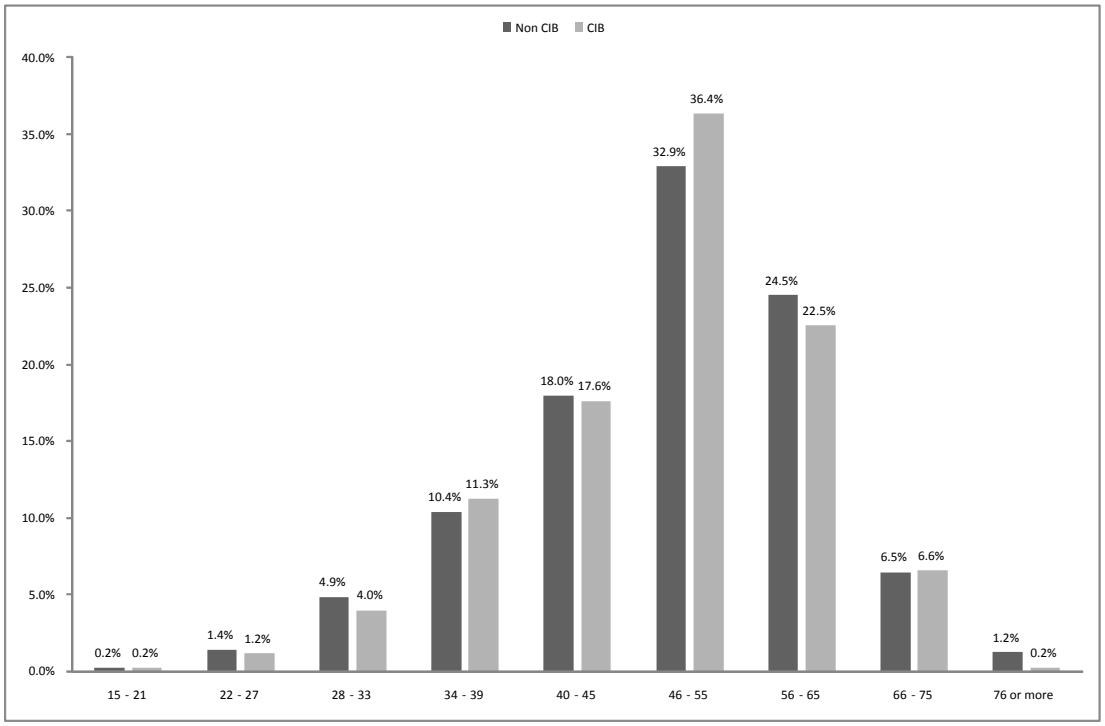
This table shows that the average non-CIB has: between 35 and 36 employees; £2.1m in assets; and makes sales of £2.7m per annum. Looking at Creative Content sectors, CIBs in Music/Visual Performing Arts have on average about 24 fewer employees than the non-CIB average and £1.8m fewer assets (the difference in sales is not statistically significant). CIBs in Software have about 22 fewer employees, £1.6m less assets and make £1.2m lower sales per annum than an average non-CIB. There are no significant differences in firm size among Other Creative Content sector businesses.

Regarding Creative Service sectors, businesses in the Advertising sector make about £3.9m more in sales per annum than an average non-CIB (this difference, however, is only statistically significant at the 10% level). In contrast architecture firms have £1.3m fewer assets than an average non-CIB.

Principal owner characteristics

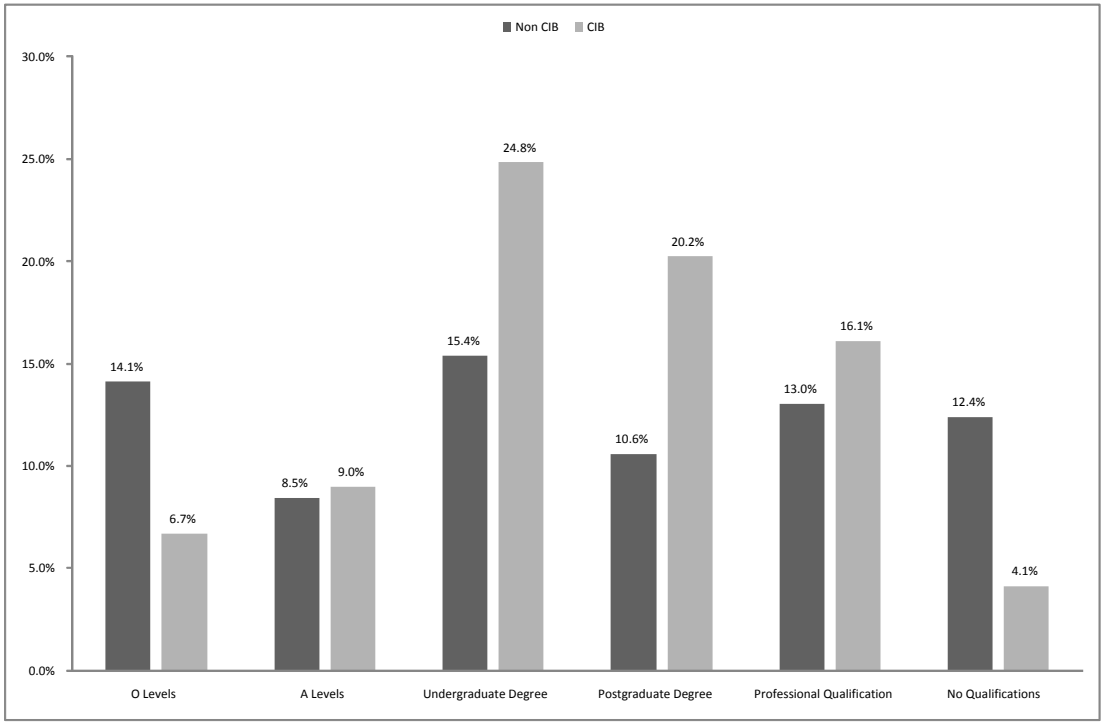
A summary analysis of the characteristics of the principal owners of CIBs and non-CIBs is reported in the following charts. Formal tests of differences in the proportions in these charts are reported in Table 3.

Chart 11: Owner's age



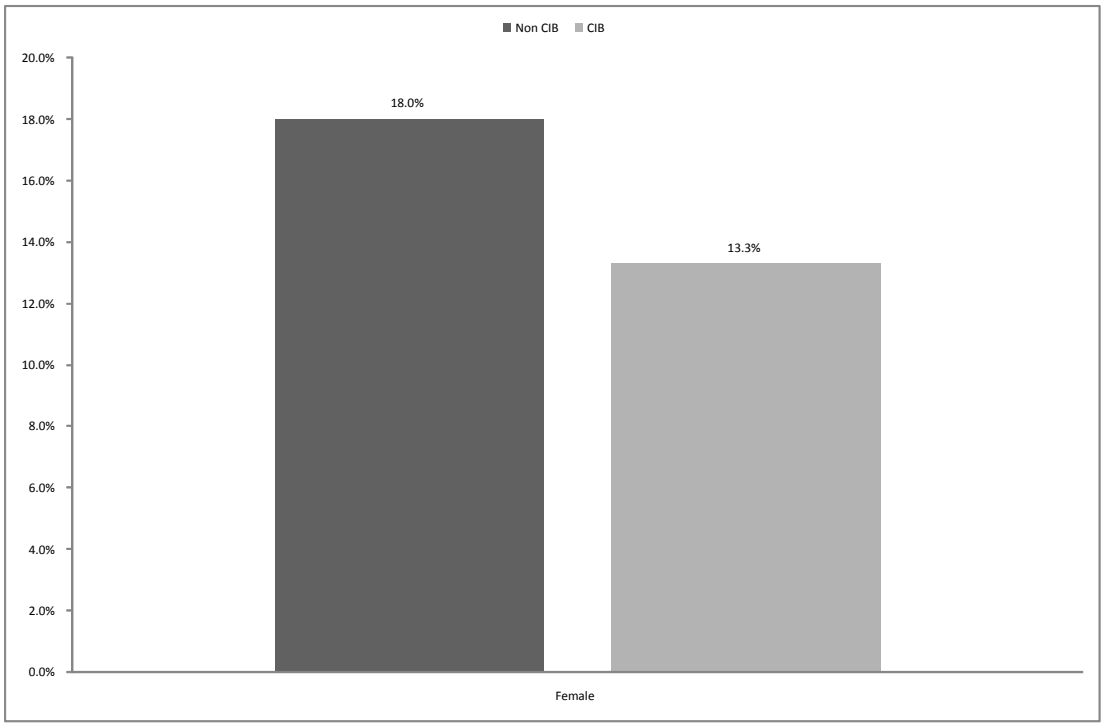
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 12: Owner's highest qualification



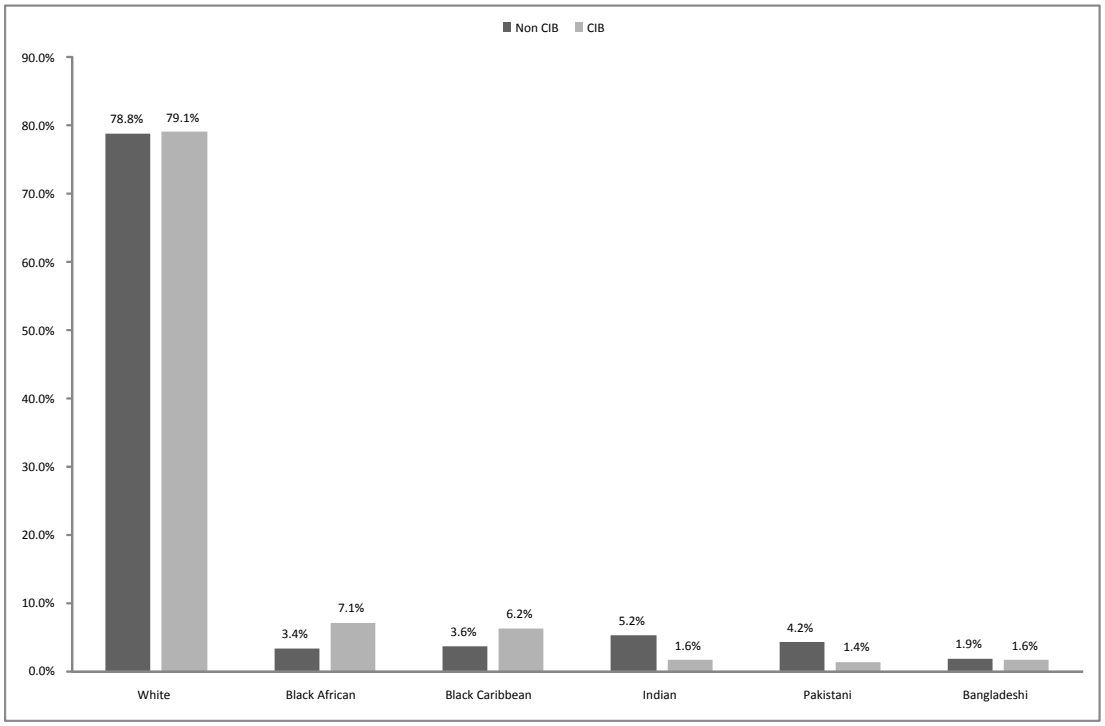
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 13: Owner's gender



Source: UKSMEF 2004, 2005, 2008, 2009

Chart 14: Owner's ethnicity



Source: UKSMEF 2004, 2005, 2008, 2009

Table 3: Difference in proportions between CIB and non-CIB sub-samples – owner characteristics

% points/100

Variable	Difference in proportions	*p*-value
Age		
15-21	0.0002	0.604
22-27	0.0010	0.598
28-33	0.0024	0.594
34-39	0.0035	0.590
40-45	0.0032	0.585
46-55	-0.0004	0.664
56-65	-0.0060	0.589
66-75	-0.0031	0.583

76 or more	-0.0008	0.579
Highest Qualification		
O-level	-0.0744	0.000
A-level	0.0052	0.707
Undergraduate degree	0.0944	0.000
Postgraduate degree	0.0966	0.000
Professional qualification	0.0307	0.072
No qualifications	-0.0826	0.000
Gender		
Female	-0.0470	0.011
Ethnicity		
Black African	0.0378	0.000
Black Caribbean	0.0258	0.009
Indian	-0.0361	0.001
Pakistani	-0.0286	0.003
Bangladeshi	-0.0025	0.706
White	0.0030	0.882

Source: UKSMEF 2004, 2005, 2008, 2009

Analysis of the principal owner's age and highest qualification relates to the human capital of the business owner. In this regard, there are no significant differences in the ages of owners of CIBs as compared to non-CIBs. However, compared to owners of non-CIBs, CIB owners are: less likely to have O-levels as their highest qualification; more likely to have an undergraduate/postgraduate degree or professional qualification; and less likely to have no qualifications at all.

Regarding minority and disadvantaged groups, there are a significantly lower proportion of female principal owners among CIBs compared to non-CIBs. The proportion of businesses with a Black African or Black Caribbean principal owner is significantly higher among CIBs. However, the proportion of businesses with an Indian or Pakistani principal owner is significantly lower among CIBs.

Additional analysis of the average age of business owners and comparisons with the average age in CI sub-sectors is presented in the following table.

Table 4: Differences in average owner age between CI sub-sectors and non-CIBs[(a)].

	Owner's age (*p*-value)[(b)]
Non-CIB average owner's age	50.18 (0.000)
Creative Content sectors	
Music and Visual Performing arts	0.69 (0.471)
Software	-2.66 (0.004)
Other Creative Content	-3.75 (0.014)
Creative Service sectors	
Advertising	1.80 (0.297)
Architecture	2.61 (0.006)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) The cell entries are estimated coefficients from regressions of the owner's age on dummy variables for CI sub-sectors and a constant. The coefficient on the constant is the average age of a non-CIB owner; the coefficients on the CI sub-sector dummies estimate the average difference in age for the respective sub-sectors relative to the non-CIB average.

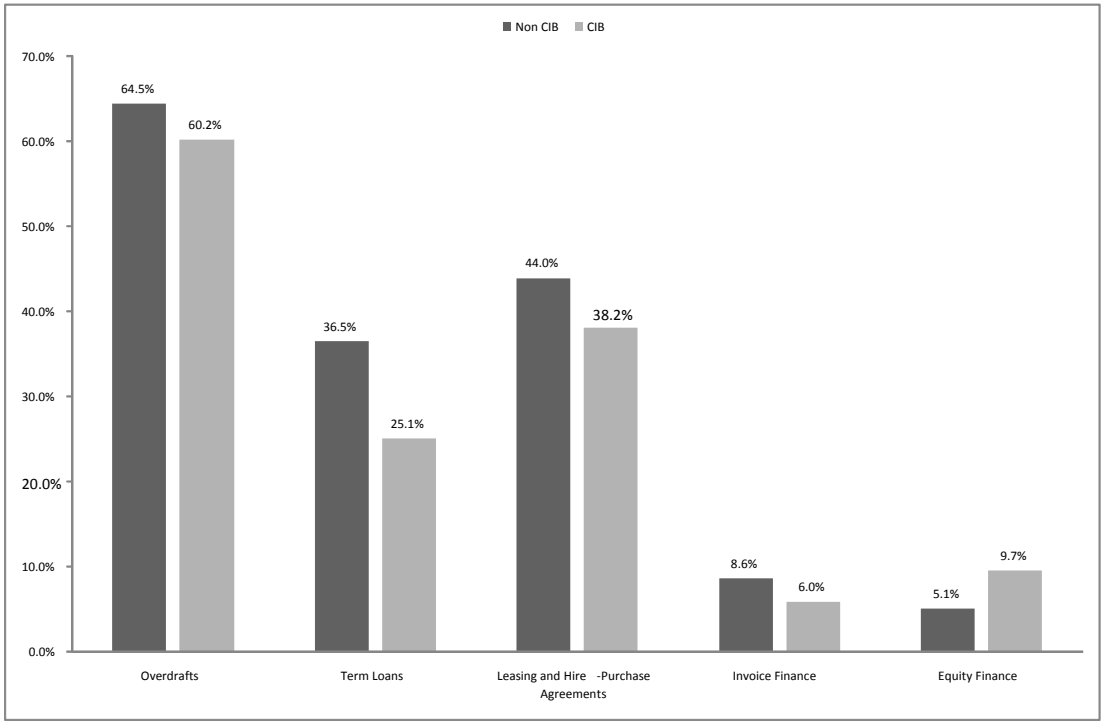
(b) *p*-values based on robust standard errors.

The average age of owners of non-CIBs is just over 50 years of age. In comparison the average age is: between 2 and 3 years less for owners of Software businesses; and between 3 and 4 years less for owners of CIBs in Other Creative Content sectors. Regarding Creative Service sectors, owners of architecture firms are between 2 and 3 years older than the owner of an average non-CIB.

Financial demands, rejection and discouragement

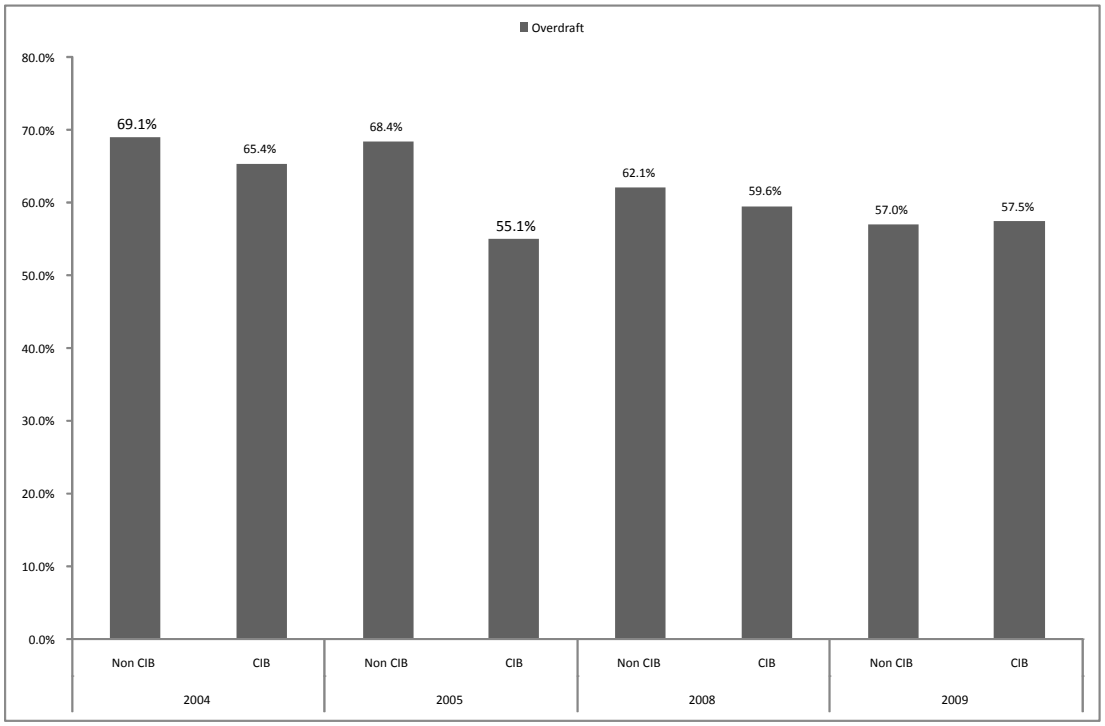
A summary analysis of financial demands, rejection and discouragement is reported in the following charts. Formal tests of differences in the proportions in these charts are reported in Table 5.

Chart 15: Financial demands



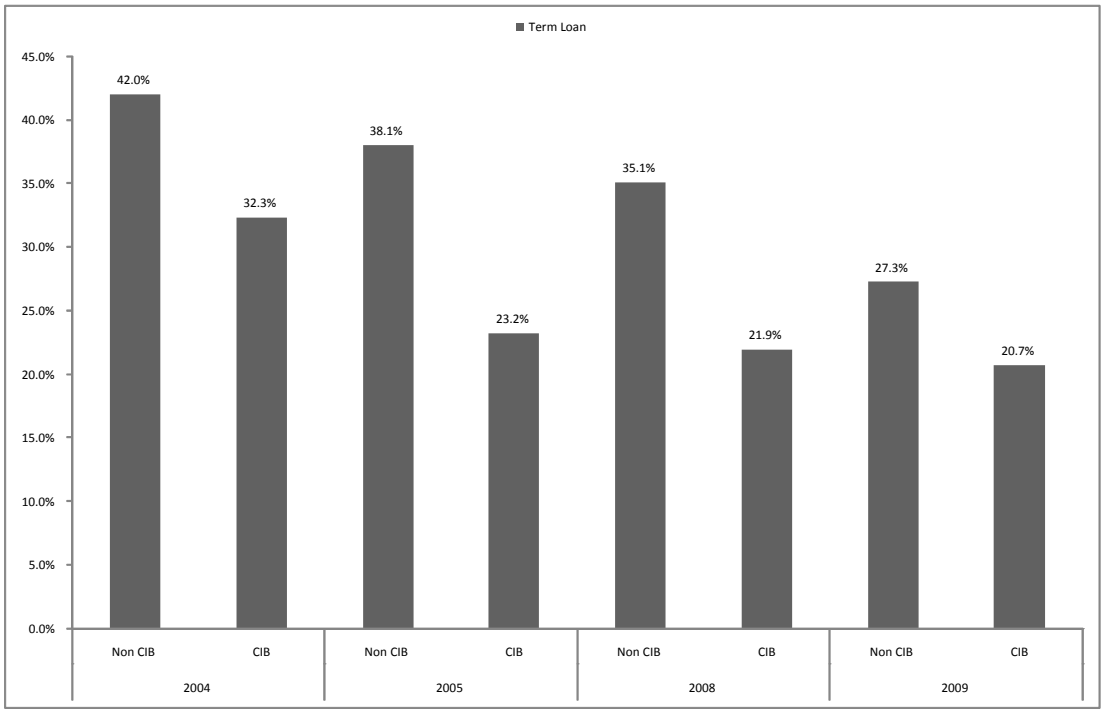
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 16: Overdraft demands by year



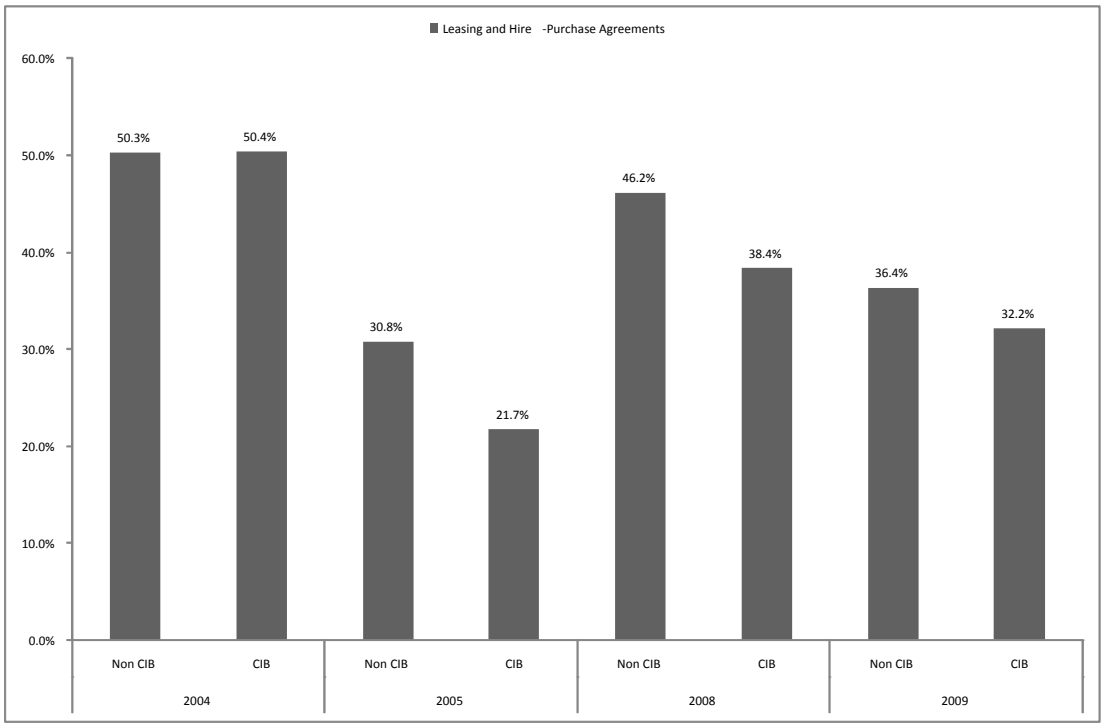
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 17: Term loan demands by year



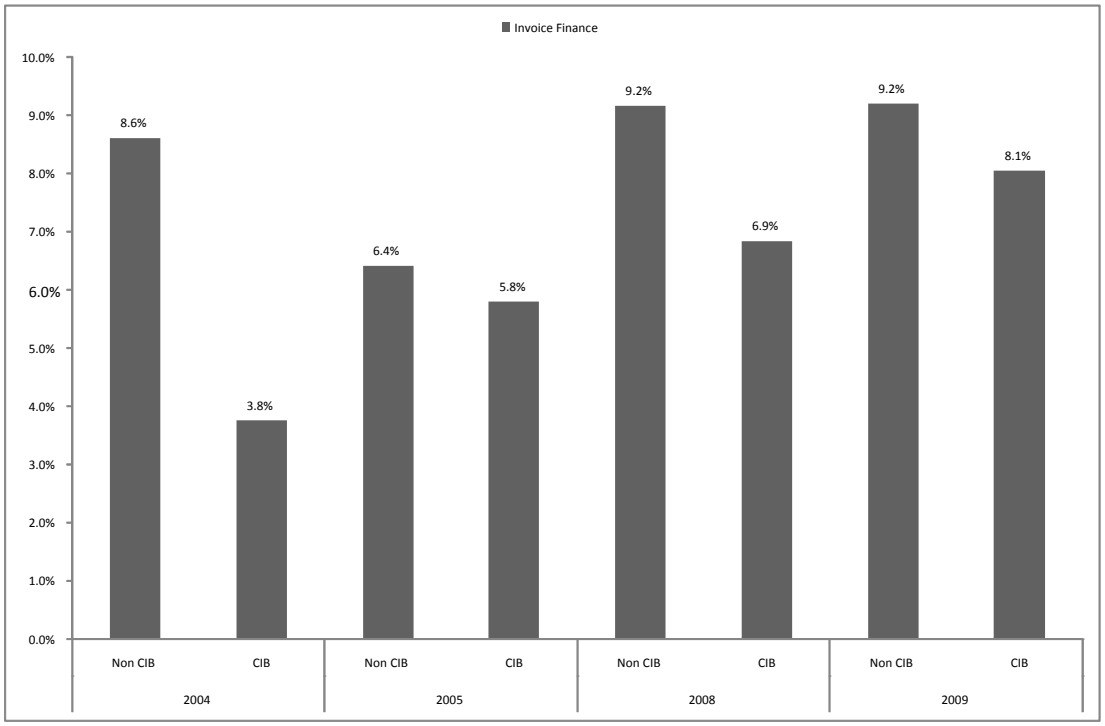
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 18: Leasing and hire-purchase agreement demands by year



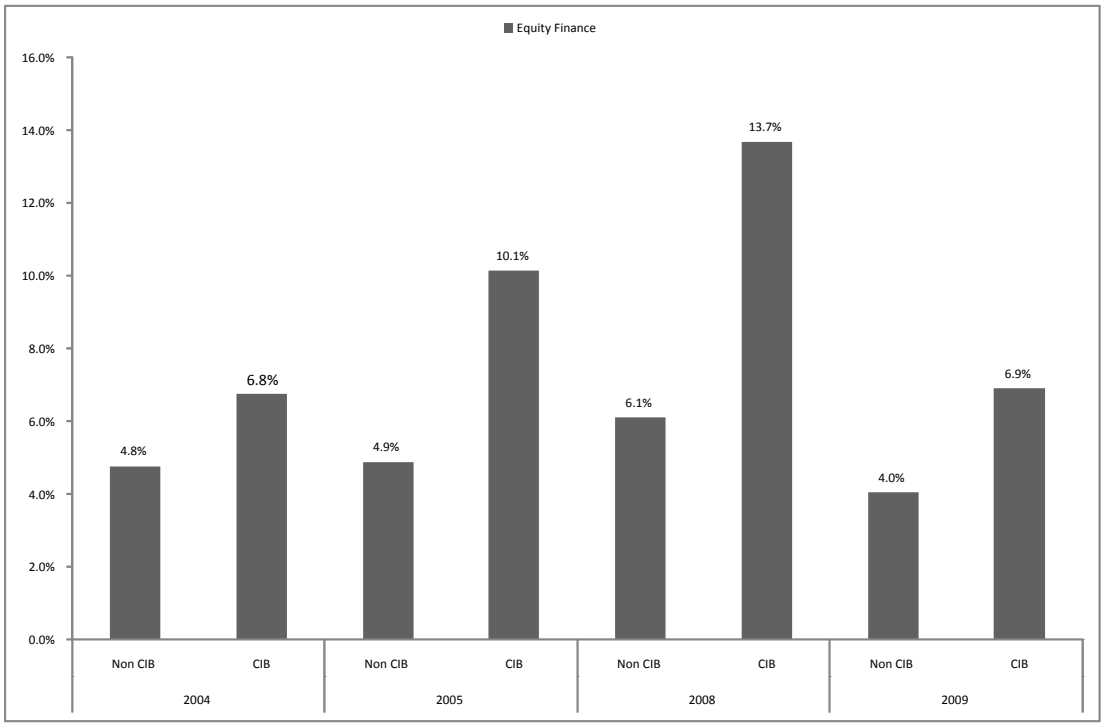
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 19: Invoice finance demands by year



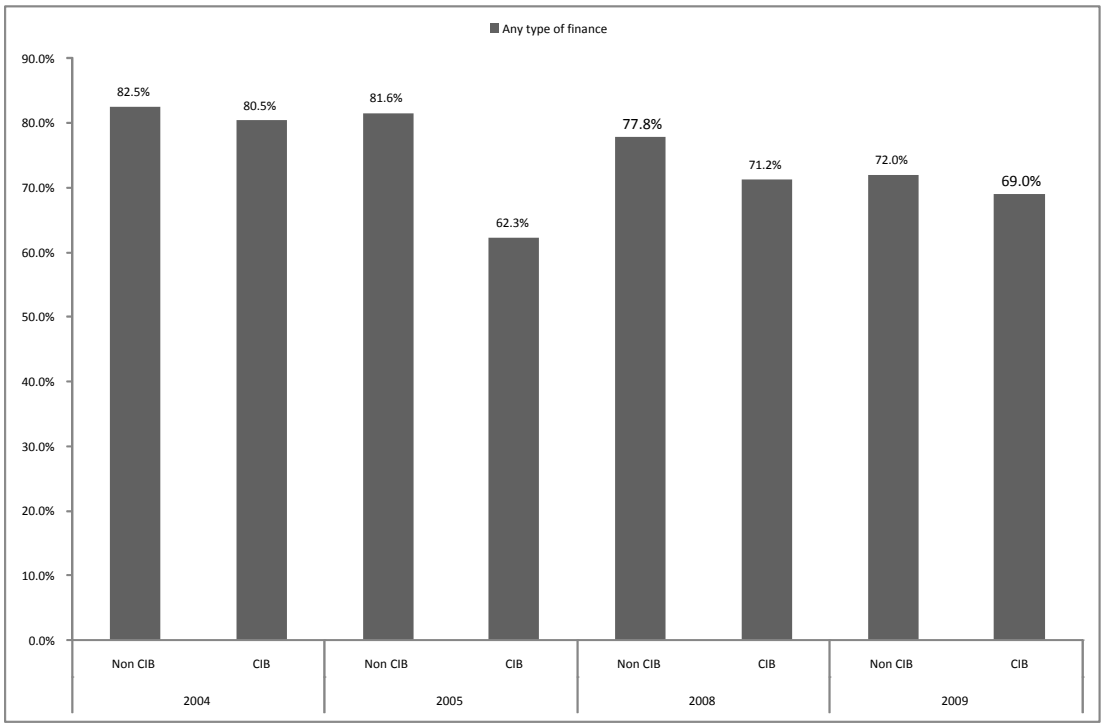
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 20: Equity finance demands by year



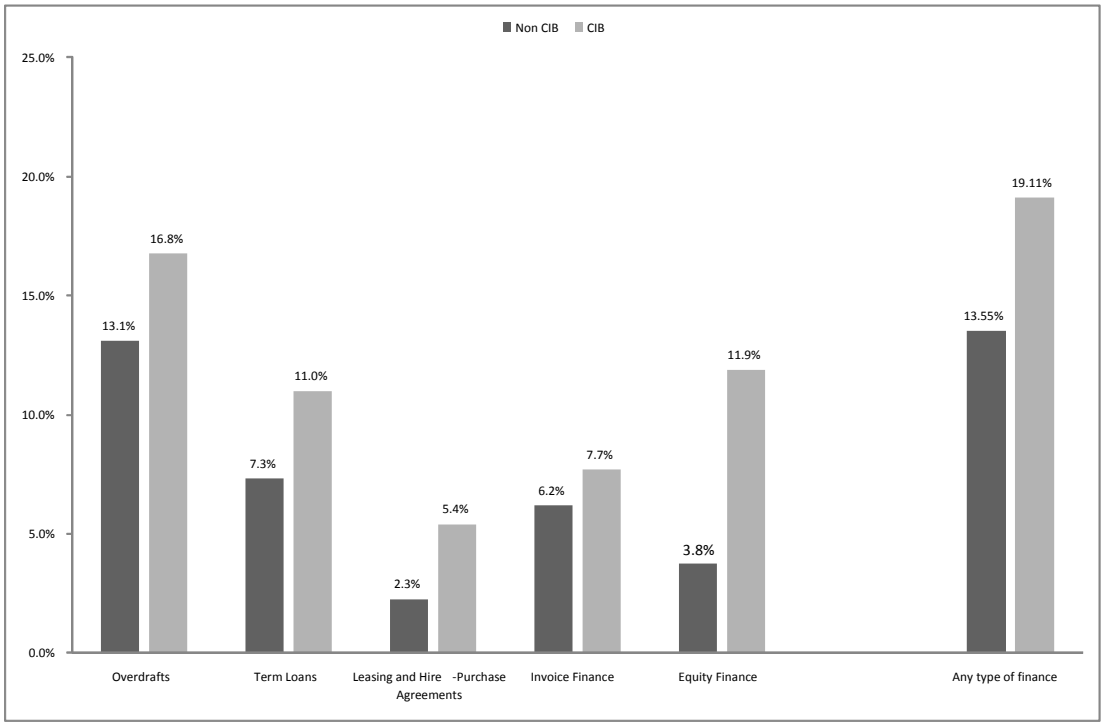
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 21: Any type of finance demands by year



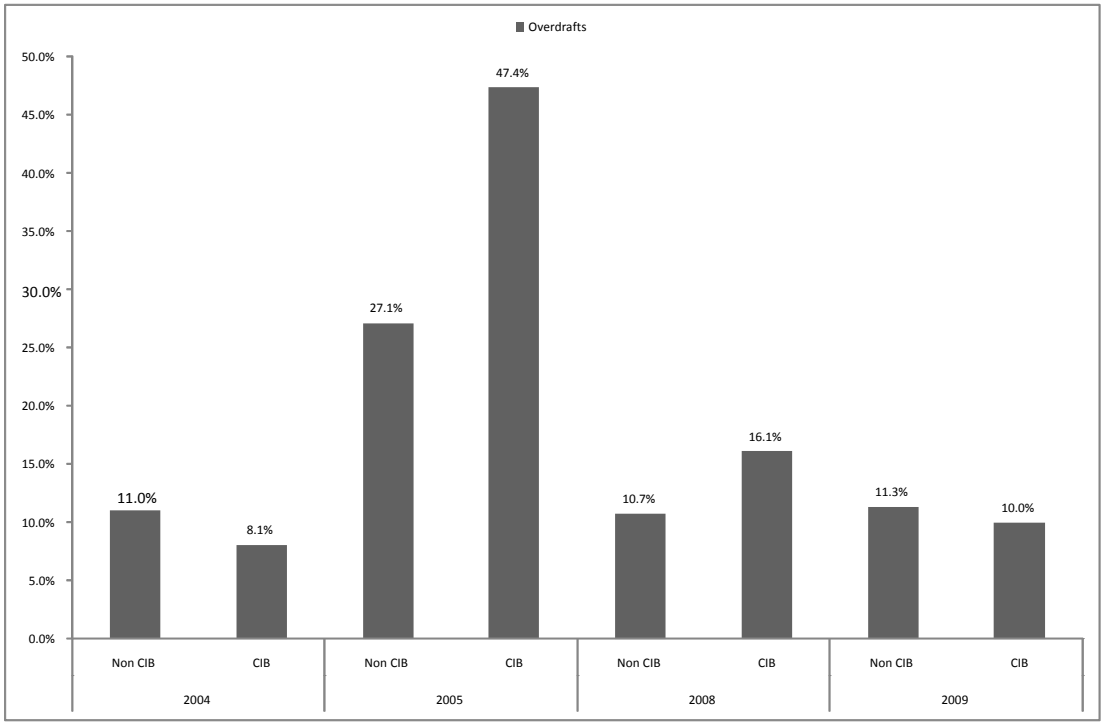
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 22: Financial rejections



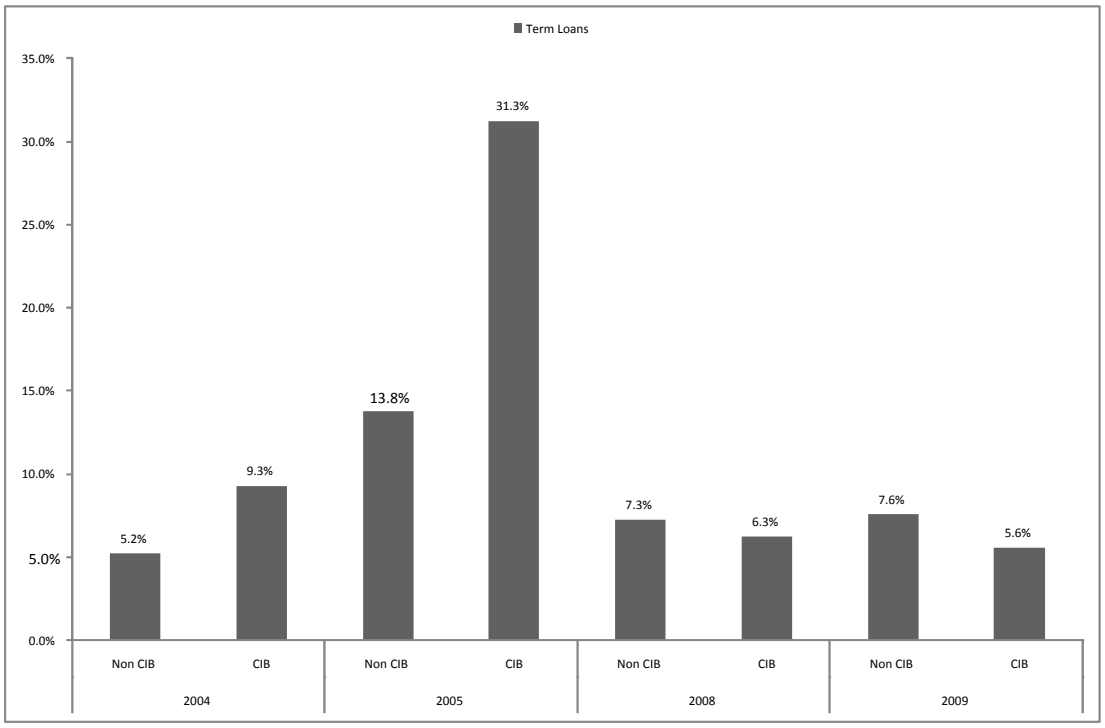
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 23: Overdraft rejection by year



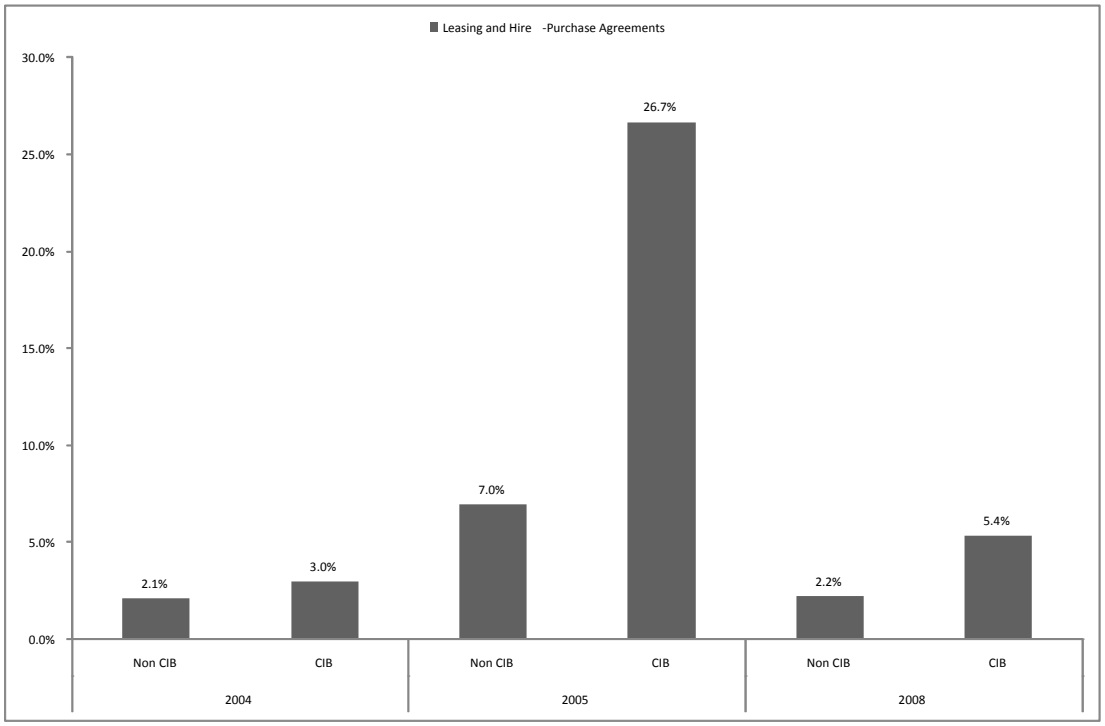
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 24: Term loan rejection by year



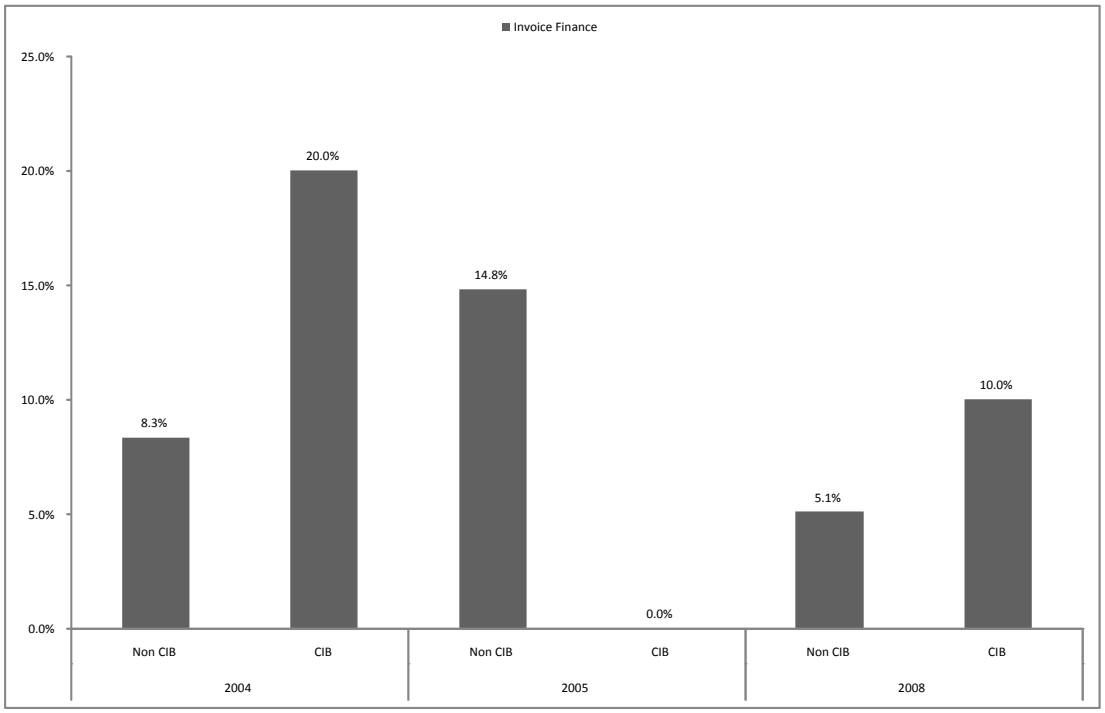
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 25: Leasing and hire-purchase agreement rejection by year



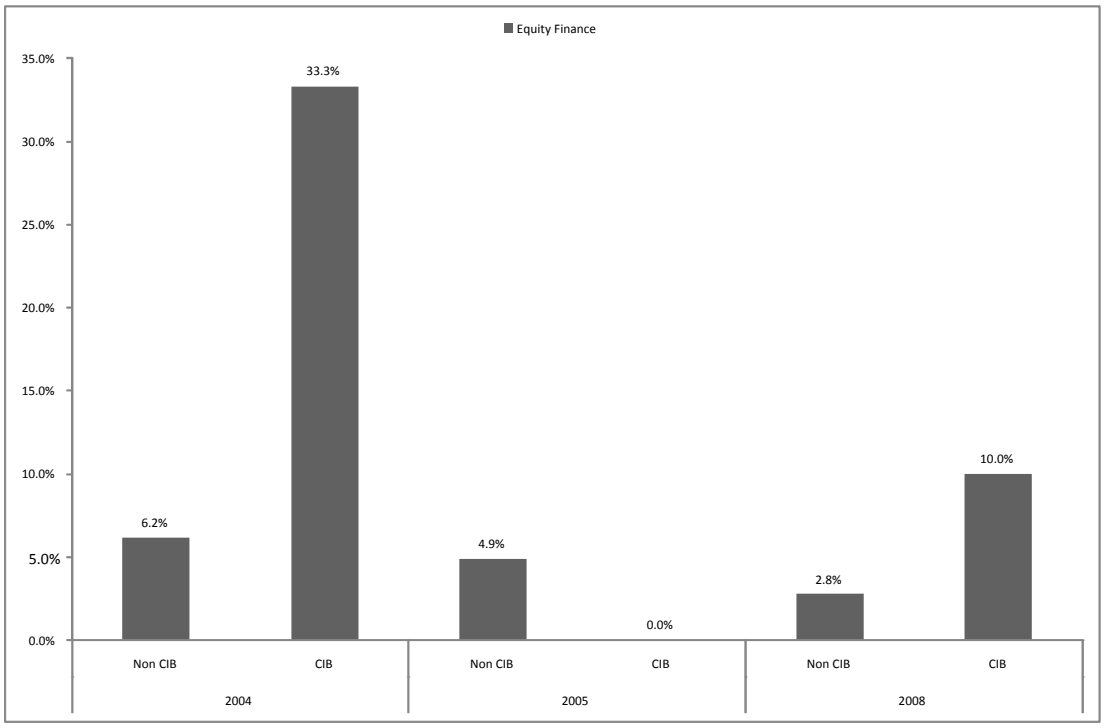
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 26: Invoice finance rejection by year



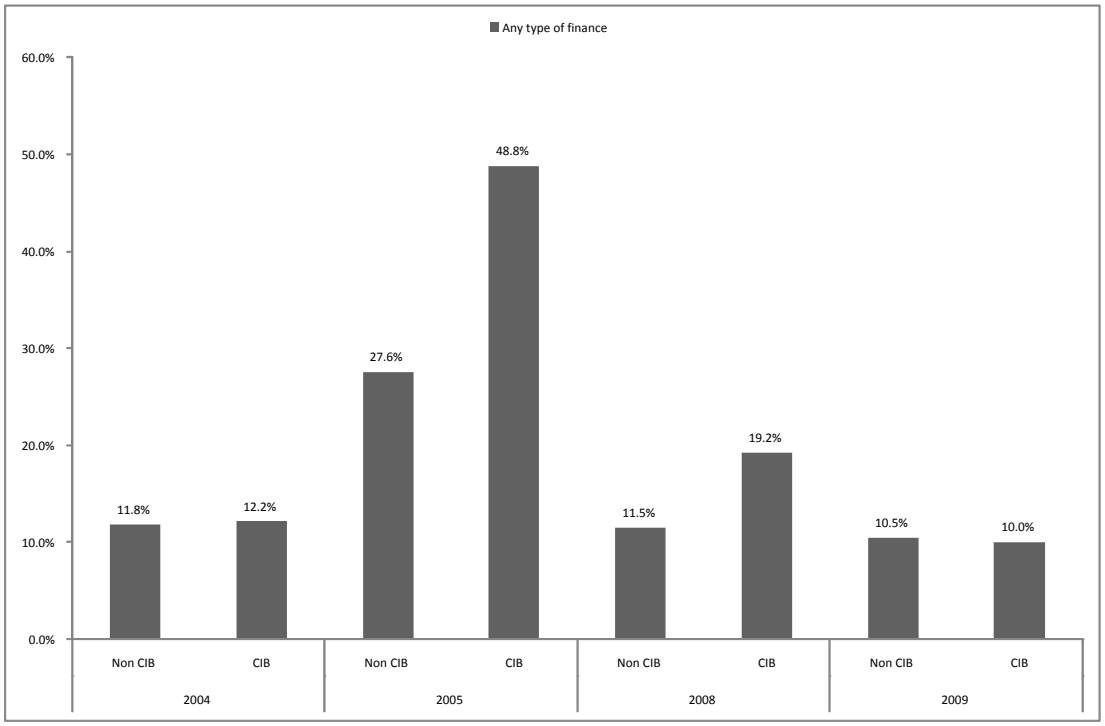
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 27: Equity finance rejection by year



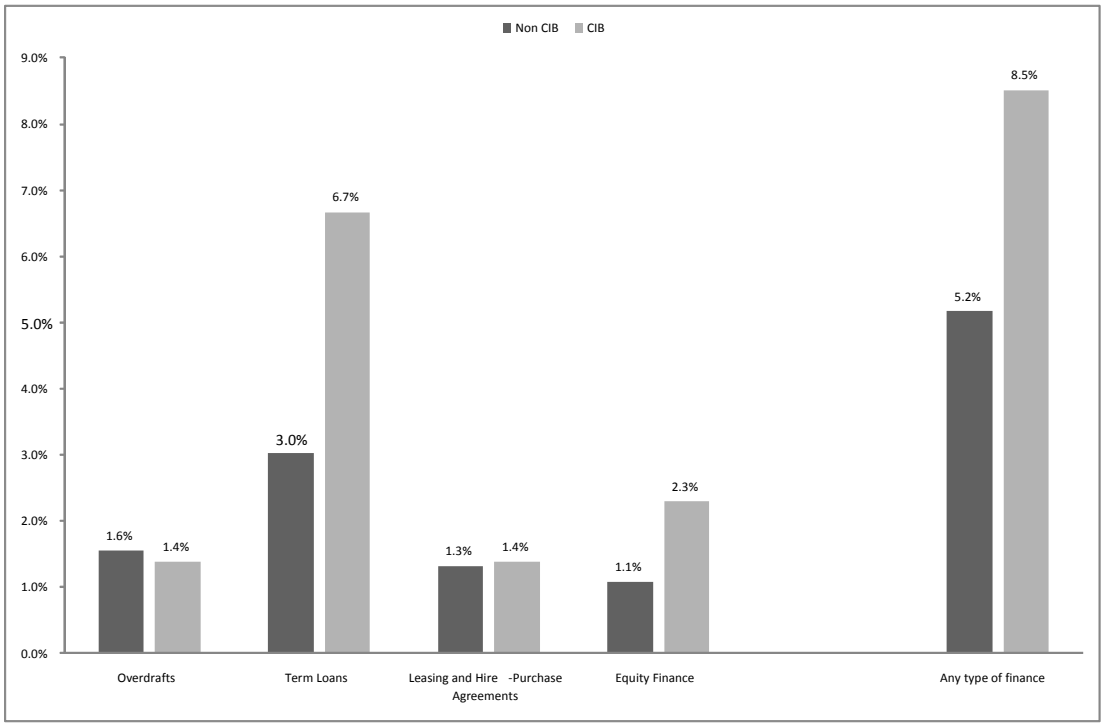
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 28: Any type of finance rejection by year



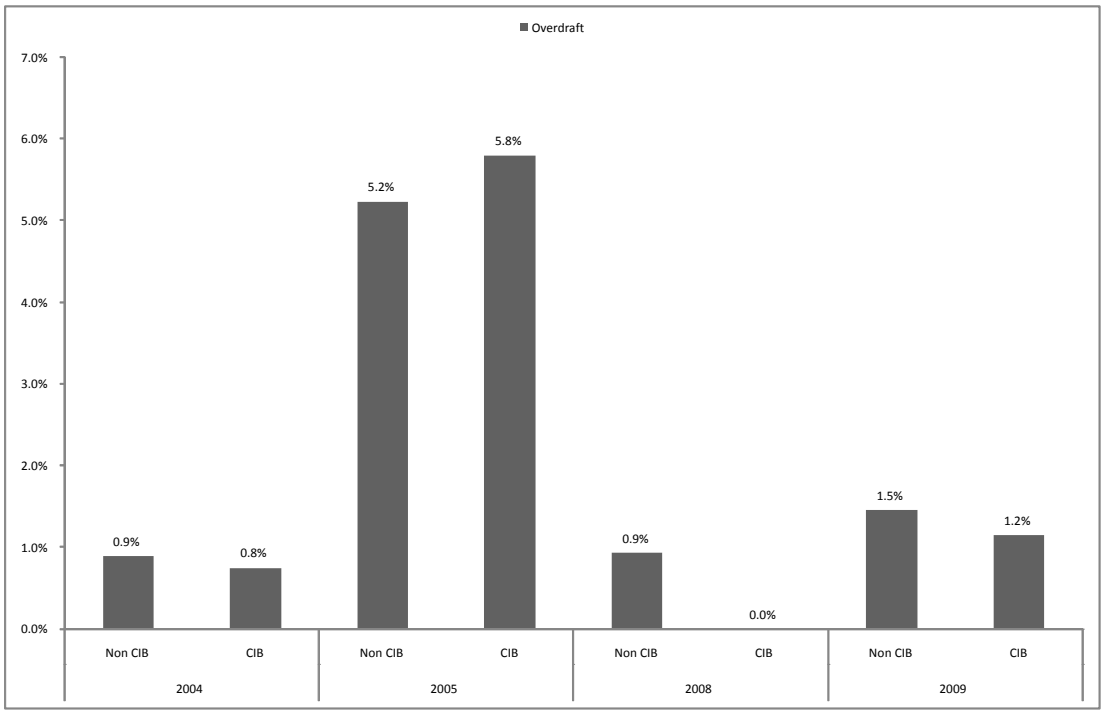
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 29: Financial discouragement



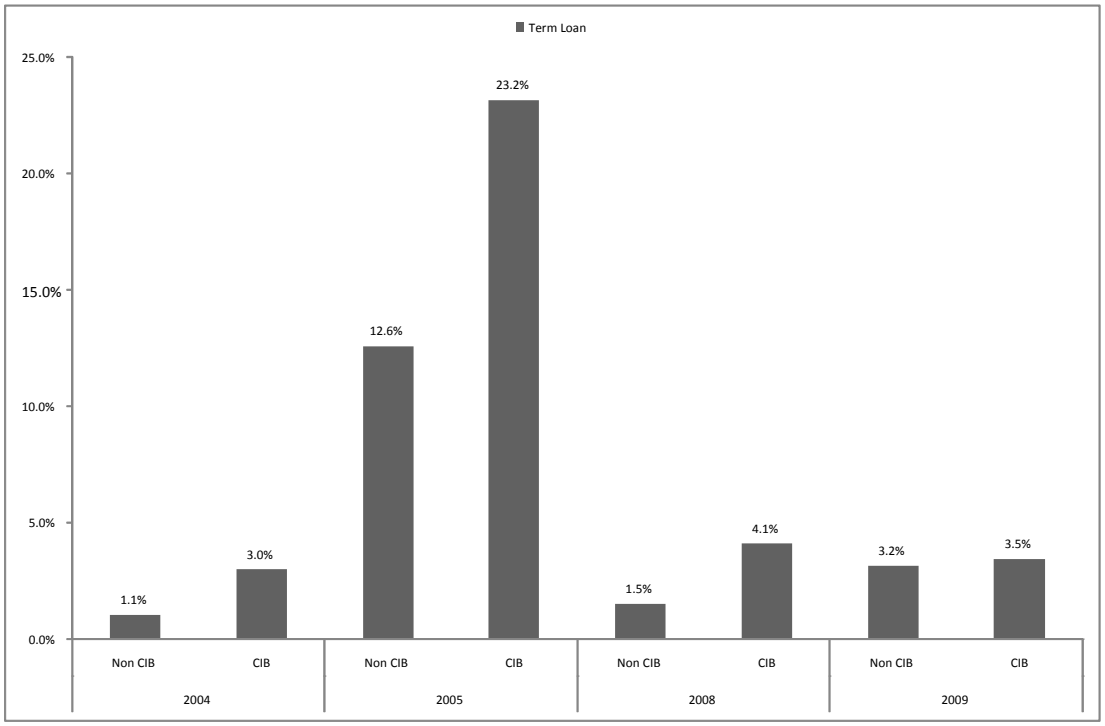
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 30: Overdraft discouragement by year



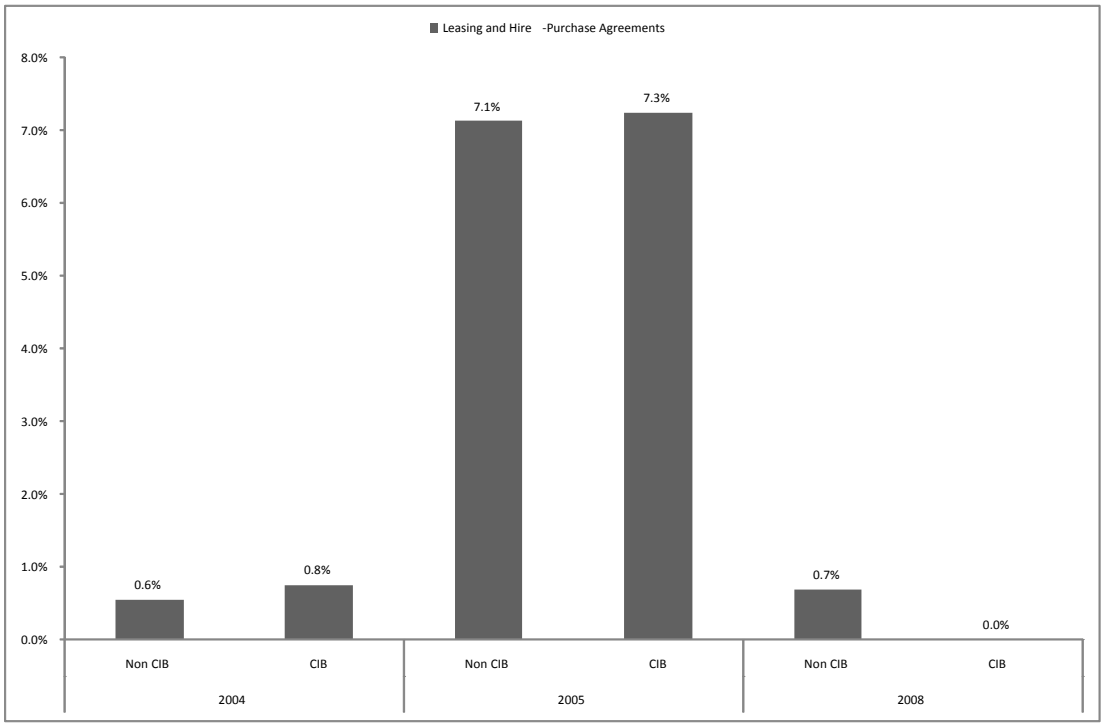
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 31: Term loan discouragement by year



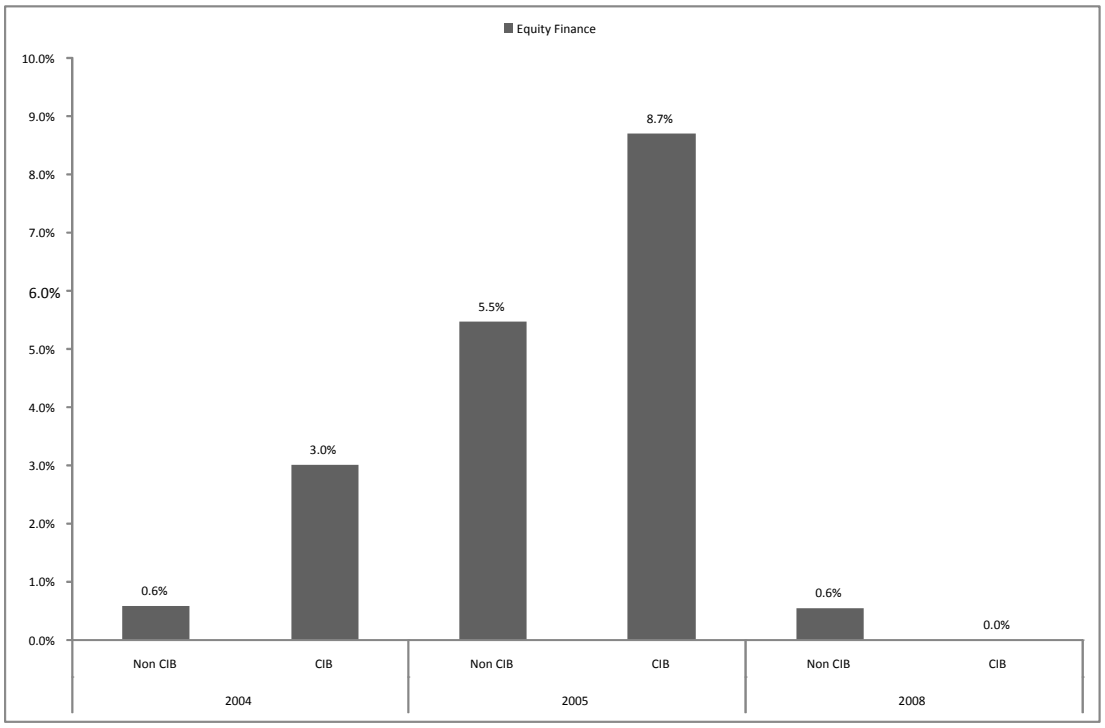
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 32: Leasing and hire-purchase agreement discouragement by year



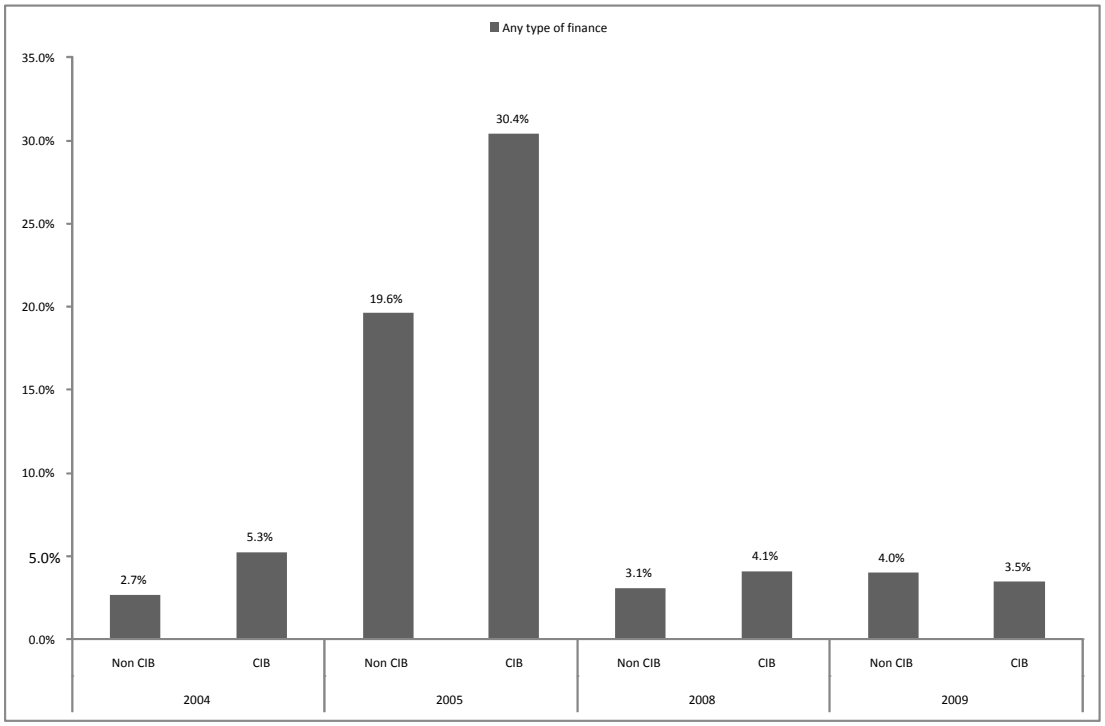
Source: UKSMEF 2004, 2005, 2008, 2009

Chart 33: Equity finance discouragement by year



Source: UKSMEF 2004, 2005, 2008, 2009

Chart 34: Any type of finance discouragement by year



Source: UKSMEF 2004, 2005, 2008, 2009

Table 5: Difference in proportions between CIB and non-CIB sub-samples – financial demands, rejection and discouragement

% points/100

Variable	Difference in proportions	*p*-value
Financial demands		
Overdrafts	0.0425	0.075
Term loans	0.1148	0.000
Leasing and hire-purchase agreements	0.0584	0.017
Invoice finance	0.0266	0.049
Equity finance	0.0453	0.000

Any type of finance	0.0672	0.001
Financial demands by year[(a)]		
Overdrafts		
2004	-0.0380	0.382
2005	-0.1207	0.049
2008	-0.0236	0.569
2009	0.0049	0.902
Term loans		
2004	-0.0893	0.030
2005	-0.1215	0.052
2008	-0.1400	0.001
2009	-0.0737	0.181
Leasing and hire purchase agreements		
2004	0.0010	0.982
2005	-0.0999	0.138
2008	-0.0847	0.042
2009	-0.0531	0.345
Invoice finance		
2004	-0.0487	0.045
2005	0.0250	0.902
2008	-0.0057	0.302
2009	0.0121	0.668
Equity finance		
2004	0.0207	0.320
2005	0.0435	0.113
2008	0.0559	0.001

2009	0.0297	0.244
Any type of finance		
2004	-0.0221	0.563
2005	-0.1940	0.000
2008	-0.0620	0.071
2009	-0.0258	0.551
Financial rejections		
Overdrafts	0.0369	0.094
Term loans	0.0368	0.168
Leasing and hire-purchase agreements	0.0316	0.018
Invoice finance	0.0150	0.762
Equity finance	0.0814	0.033
Any type of finance	0.0556	0.007
Financial rejections by year[a]		
Overdrafts		
2004	-0.0369	0.313
2005	0.0988	0.151
2008	0.0857	0.108
2009	0.0097	0.763
Term loans		
2004	0.0496	0.266
2005	0.0529	0.355
2008	0.0142	0.916
2009	0.0077	0.791
Leasing and hire purchase agreements[b]		

2004	0.0085	0.673
2005	0.0567	0.084
2008	0.0316	0.128
Invoice finance[b]		
2004	0.1076	0.399
2005	NA[c]	
2008	0.0839	0.527
Equity finance[b]		
2004	0.2132	0.019
2005	NA[c]	
2008	0.1841	0.110
Any type of finance		
2004	0.0002	0.996
2005	0.0910	0.076
2008	0.0894	0.017
2009	0.0049	0.920
Financial discouragement[d]		
Overdrafts	0.0017	0.782
Term loans	0.0363	0.000
Leasing and hire-purchase agreements	0.0006	0.922
Equity finance	0.0121	0.031
Any type of finance	0.0333	0.004
Financial discouragement by year[a]		
Overdrafts		
2004	-0.0021	0.831

2005	-0.0030	0.661
2008	NA[c]	
2009	0.0008	0.977
Term Loans		
2004	0.0262	0.104
2005	0.0198	0.206
2008	0.0332	0.010
2009	0.0153	0.776
Leasing and hire purchase agreements[b]		
2004	0.0022	0.802
2005	-0.0017	0.535
2008	NA[c]	
Equity finance[b]		
2004	0.0264	0.012
2005	0.0197	0.954
2008	NA[c]	
Any type of finance		
2004	0.0293	0.135
2005	0.0174	0.493
2008	0.0239	0.270
2009	0.0096	0.911

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences in proportions by year controlling for ethnicity

(b) No data on rejections/discouragement in 2009.

(c) Estimate not available due to lack of observations.

(d) No data on invoice finance discouragement.

A significantly lower proportion of CIBs than non-CIBs used or applied for: overdrafts, term loans, leasing and hire-purchase agreements, invoice finance and any type of finance. However, a significantly higher proportion of CIBs used or applied for equity finance. Recall that a significantly higher proportion of CIBs are set-up as limited liability companies: this is a pre-requisite for raising external equity.

Looking at general trends, the demand for debt finance was significantly lower in 2008 and 2009 compared to 2004 (reflecting the impact of the credit crisis/recession). In contrast, the demand for equity finance was higher in 2008 compared to 2004. Comparing CIB and non-CIB finance demands, CIBs had significantly lower demands for: overdrafts in 2005; term loans in 2004, 2005 and 2008; leasing and hire purchase agreements in 2008; invoice finance in 2004; and any type of finance in 2005 (controlling for ethnicity: see Table 5). In contrast, CIBs had significantly higher demands than non-CIBs for equity finance in 2008 (see Table 5).

The likelihood of rejection is significantly higher among CIBs for overdrafts, leasing and hire-purchase agreements, equity finance and any type of finance. However, there are no significant differences between CIBs and non-CIBs in the likelihood of term loan or invoice finance rejection.

Regarding general trends, across all types of finance, incidences of rejection in 2005 appear higher for both CIBs and non-CIBs compared to other years. This is because the 2005 sample relates to EMBs. In particular, previous research suggests that Black owned businesses have the highest rates of rejection followed by Bangladeshi and Pakistani owned firms with Indian and White owned businesses sharing the lowest rates of rejection (Fraser, 2009a). This may also partly explain apparent differences in rates of rejection between CIBs and non-CIBs in 2005 since there is a significantly higher proportion of Black owned businesses (with high rejection rates), and a significantly lower proportion of Indian owned businesses (with low rejection rates), among CIBs (see previous analysis of owner characteristics). Indeed, looking at any type of finance rejection in 2005, after controlling for ethnicity, there is only statistically weak evidence that CIBs have a different rejection rate compared to non-CIBs (see Table 5).

Also, looking at any type of finance rejection in other years, the difference in rejection rates between CIBs and non-CIBs is significant in 2008 but not in 2004 or 2009 (see Table 5). So, in summary there is a highly significant difference in rejection rates (any type of finance) between CIBs and non-CIBs in 2008, a less significant difference in 2005 and no significant difference in 2004 and 2009 (after controlling for differences in ethnicity). This suggests that the gap in rejection rates between CIBs and non-CIBs may have widened briefly in 2008 but closed again in 2009.

Regarding specific types of finance it is generally not possible to identify significant differences in rejection rates by year due to the low sample sizes for CIBs. There is however evidence of a significant gap in equity rejection rates in 2004 but not in 2005 or 2008 (there are no data on equity finance rejections in 2009).

CIBs are significantly more likely than non-CIBs to feel discouraged from applying for term loans, equity finance or any type of finance. There are no differences between CIBs and

non-CIBs regarding feelings of discouragement relating to applications for overdrafts or leasing and hire purchase agreements.

As with rejection rates, across all types of finance, incidences of discouragement in 2005 appear higher for both CIBs and non-CIBs compared to other years. Again, this is because the 2005 sample relates to EMBs. Indeed, previous research suggests that Black owned businesses also have the highest rates of discouragement followed by Bangladeshi and Pakistani owned firms with Indian and White owned businesses sharing the lowest rates of discouragement (Fraser, 2009a). However, across all types of finance and after controlling for ethnicity, there is little evidence that differences in discouragement rates between CIBs and non-CIBs are significant in any of the years looked at. The exceptions are significantly higher rates, among CIBs, of: term loan discouragement in 2008; and equity discouragement in 2004.

The summary analysis concludes with a brief look at differences in financial demands, rejection and discouragement between CI sub-sectors and non-CIBs.

Table 6: Difference in proportions between CIB sub-sectors and non-CIB sub-samples – financial demands, rejection and discouragement (any type of finance)[(a)].

% points/100

	Financial demands (*p*-value)[(b)]	**Financial rejection (*p*-value)** [(c)]	**Financial discouragement (*p*-value)**
Non-CIB average proportion	0.7889 (0.000)	0.1392 (0.000)	0.0517 (0.000)
Creative Content sectors			
Music and Visual Performing arts	-0.0367 (0.390)	-0.0579 (0.150)	-0.0002 (0.994)
Software	-0.1177 (0.002)	0.1165 (0.003)	0.0683 (0.002)
Other Creative Content	-0.1468 (0.011)	0.2779 (0.000)	0.2177 (0.000)
Creative Service sectors			
Advertising	0.0449 (0.509)	0.0946 (0.160)	-0.0247 (0.506)
Architecture	-0.0277 (0.490)	-0.0312 (0.413)	NA[(d)]

Source: UKSMEF 2004, 2005, 2008, 2009

(a) The cell entries for CI sub-sectors are estimated marginal effects from probit models of financial demands/rejection/discouragement with dummy variables for CI sub-sectors and a constant included as explanatory variables. These marginal effects estimate the average difference in proportions for the respective sub-sectors relative to the non-CIB average proportion. The non-CIB average proportion itself is obtained by applying the Gaussian transformation to the constant in the model.

(b) *p*-values based on robust standard errors.

(c) Estimated on the sub-sample with financial demands.

(d) There are no instances of financial discouragement among the architecture firms in the sample.

This analysis of financial outcomes is highly revealing. About 78.9% of non-CIBs have demands for any type of finance. Looking at differences from this proportion across CIB sub-sectors, only Software and Other Creative Content sectors have lower demands (the proportions with demands for any type of finance being 11.8% points and 14.7% points lower respectively). Similarly, looking at rejection rates, about 13.9% of non-CIBs with financial demands had their applications turned down. This proportion is 11.7% points higher among Software CIBs and 27.8% points higher in Other Creative Content sectors; the other CI sub-sectors have rejection rates which are statistically the same as for non-CIBs. Regarding rates of discouragement, about 5.2% of non-CIBs felt discouraged from applying for finance. This proportion is 6.8% points higher among Software CIBs and 21.8% points higher in Other Creative Content sectors (with, again, no significant differences noted for the other CI sub-sectors). In short, issues with access to finance, relative to non-CIBs, appear confined to CIBs in Software and Other Creative Content sectors.

Conclusions

Fewer assets and shorter track records with their finance providers may help to explain apparently poorer access to finance among CIBs. On the other hand CIBs appear to have slightly better credit ratings than non-CIBs and are run by more highly educated people (which would be expected, other things being equal, to improve access to finance).

Interestingly, despite a higher likelihood of overdraft rejection, CIBs are no more likely than non-CIBs to feel discouraged from applying for an overdraft. In contrast, despite there being no apparent difference in the likelihood of term loan rejection, CIBs are more likely than non-CIBs to feel discouraged from applying for a term loan.

A possible explanation for this finding is that CIBs believe they lack sufficient assets to offer as collateral on term loans (whereas banks are less likely to ask for collateral on an overdraft leading to fewer feelings of discouragement). Accordingly only CIBs with sufficient assets may choose to apply for term loans leading to lower levels of rejection (since they are less risky). Indeed, further analysis (not reported) shows that CIBs which used or applied for term loans have almost £1m more assets on average than those which neither used nor applied for term loans. On the other hand CIBs which used or applied for overdrafts do not have significantly more assets than those which neither used nor applied for overdrafts. Lower demand among CIBs for term loans, and higher demand for equity finance, also suggests that a lack of collateral may have influenced CIB financing decisions (particularly during the credit crisis).

Analysis across CI sub-sectors indicates that CIBs in Creative Content sectors tend to be smaller than an average non-CIB. Similarly owners of Creative Content sector CIBs (Software and Other Creative Content sectors in particular) tend to be younger than an average non-CIB owner. This all points to a higher risk profile among Creative Content sector CIBs which may contribute to poorer access to finance in this particular sector.

Indeed analysis of financial demands, rejection and discouragement across CI sub-sectors suggests that issues of lower financial demands and higher rejection and discouragement rates are confined to Software and Other Creative Content sectors. Access to finance among CIBs in Music/Visual Performing Arts and the Creative Service sectors, on the other hand, is similar to non-CIBs.

In short, the summary analysis indicates that CIBs have poorer access to finance than non-CIBs and these problems appear to be limited to Software and Other Creative Content sectors. The nature of these problems, whether they are due to higher risk profiles, or due to a greater unwillingness *per se* to supply finance to these CIBs, is explored in depth in the following chapter.

3

Analysis of financial rejection and discouragement

Background

The purpose of this chapter is to provide a robust and nuanced analysis of differences in financial rejection and discouragement probabilities between CIBs and on CIBs. In the first instance, models of rejection/discouragement probabilities for CIBs and non-CIBs are estimated and the differences in probabilities between CIBs and non-CIBs are then compared. The analysis in this chapter therefore encompasses the first two stages of the econometric analysis as described in the introduction (the third stage, relating to the growth analysis, appears in chapter 4).

Before estimating the models for rejection/discouragement probabilities, it is important to motivate the choice of variables used to explain these probabilities. In the context of financial rejection, the decision whether or not to supply funding is the outcome of a risk assessment made by a finance provider. The chapter therefore begins with a discussion of small business lending technologies since these businesses predominantly apply for and use debt finance (and so factors relating to these lending technologies would be expected to dominate the determinants of rejection).

Attention is then turned to the factors which affect financial discouragement. These factors relate to the business owner's perceived likelihood of rejection. Following this discussion, estimates of the models for CIB and non-CIB rejection/discouragement are presented and discussed. The chapter culminates with a detailed analysis of differences in rejection/discouragement probabilities controlling for the risk profile of the business.

Small business lending technologies

Lenders require information about borrowers' default risk in order to decide whether or not to provide loans and, if so, at what price. However, information in the market for small firms' credit is imperfect and asymmetric: usually it is assumed that business owners are better informed about their chances of success than outsiders (see e.g., Berger and Udell, 1998)[11].

[11] In contrast de Meza and Southey (1996) characterize entrepreneurs as being over-optimistic about their chances of success (see also Fraser and Greene, 2006). Bankers, on the other hand, can draw on their experience of lending to new

This information gap arises because small firms are recognised as being more informationally opaque than large firms (due to short track records and/or a lack of financial data about the firm) and the collection of private information relating to the firm and entrepreneur is costly (Ang, 1991). In this context, equilibrium credit rationing may arise where the finance provider is unable to verify the ex-ante default risk of the firm (leading to an adverse selection problem: Stiglitz and Weiss, 1981) or, for example, whether the entrepreneur will sustain an optimal level of effort after receiving finance (a moral hazard with hidden action problem: Watson, 1984).

Under information asymmetries lenders may require collateral on loans so that the entrepreneur bears the uncertainty of the venture. Whilst entrepreneurs with viable business plans may be willing to offer collateral (Bester, 1985), those with insufficient wealth may be unable to do so leading to financial constraints on the start-up and growth of promising (i.e., positive net present value) new ventures (Evans and Jovanovic, 1989). Insofar as CIBs have fewer assets than non-CIBs, and are subject to greater uncertainty, the problem of financial constraints may affect CIBs disproportionately (see empirical evidence in the previous and later sections).

Lenders have developed several lending technologies with the purpose of reducing information asymmetries and improving the efficiency of small business credit markets. These technologies can be divided broadly into two groups: transactions lending and relationship lending (see Berger and Udell, 2002). Transactions lending relies on the gathering and processing of 'hard' data about the firm/entrepreneur or the availability of collateral (asset based lending). Relationship lending, on the other hand, relies mainly on 'soft' information, such as the character and trustworthiness of the entrepreneur, which is gathered over time through a relationship between the firm/entrepreneur and a loan officer at the bank (Berger and Udell, 2002).

Credit scoring is a form of transactions lending which has grown in importance for small business lending since the mid 1990s (see Allen et al, 2004; Bank of England, 2004). Credit scoring involves the development of statistical models, using large samples of data on past borrowers, to predict the probability of default. Applicants' data can be fed later into the model to arrive at a credit score which then forms the basis for lending decisions. Typically the data used to predict defaults relates to financial ratios (encompassing profitability, leverage and liquidity) and information on credit histories/financial delinquency (see Allen et al, 2004, for an international survey of credit scoring models).

Credit scoring has a long history in consumer lending but its application to small business loans is relatively recent. Previously, the utility of credit scoring for small businesses was questioned due to the heterogeneity of small businesses (suggesting models with poor predictive power) and the limited availability of financial data for these firms (Rutherford, 1994/1995). In this regard, the key innovation was made in the US by Fair Isaac and Company (FICO) in the 1990s, who noted that personal information about the small business owner (e.g., income, personal assets, home ownership, outstanding debts and previous loan defaults/delinquencies – Mester, 1997) is highly predictive of the firm's repayment likelihood. However, anti-discrimination legislation prohibits the use of data on

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ventures to make better informed judgments about whether the business will be successful (enough, at least, to repay the loan).

the applicant's gender, race or religion to determine credit scores. Empirical evidence suggests that credit scoring may have increased the availability of finance to small firms (Berger et al, 2005). The use of information on personal data may be particularly important for CIBs since these businesses are younger on average than non-CIBs (and therefore have less data about the business).

Another scoring technique which is widely used by banks is behavioural scoring. This approach uses information about the performance of the applicant's current account (debit/credit turnover, overdraft excesses, returned cheques etc.) to predict loan repayment probabilities. Again, the use of information about the performance of the owner's personal current account may be a useful complement and/or substitute for data on the business account. As with credit scoring, behavioural scoring does not use information on the gender, ethnicity or religion of the applicant.

Relationship lending predates the recent trend towards transactional loans but remains an important lending technology for small firms. Under relationship lending, loan decisions are based on proprietary information about the firm/owner which is gathered over time through the firm/owner's various dealings with the lender. In contrast to transactions lending, relationships can produce soft information e.g., about the character and reliability of the business owner, which may be a useful complement or substitute where hard data is sparse or missing.[12]

Relationships have two dimensions: duration and concentration. Over time lenders are able to accumulate information about the capacity and reliability of the firm/owner in meeting its financial obligations (e.g., through the repayment history on previous loans or management of a current account). Equally, relationships which are concentrated in a single lender, which supplies the firm with several products at the same time, increases the precision and rate of flow of information to the finance provider. Concentration also generates stronger incentives for lenders to invest in relationships (Han et al, 2008a).

In theory, relationship lending improves the availability of finance (by reducing information gaps/lending costs) and may reduce the cost of borrowing depending on the degree of competition in the credit market (information monopolies allow finance providers to extract rents from the relationship so that borrowing costs may not fall: see e.g., Rajan, 1992). Empirical research suggests that longer and more concentrated banking relationships increase the availability of finance (Petersen and Rajan, 1994), lower interest rates (Berger and Udell, 1995) and reduce collateral requirements (Berger and Udell, 1995).

It might be expected that CIBs would benefit particularly from having strong financial relationships: these relationships may help mitigate the effects of having less collateral than non-CIBs; and allow the owners of CIBs to demonstrate their talent and the merits of their businesses. However, a counter-argument is that the nature of uncertainty for some CIBs is such that it is not alleviated by having longer financial relationships. Despite a string of previous hits, finance providers may remain uncertain about the success of an artist's next project (De Vany and Walls, 1996).

[12] Relationship lending may be a suitable alternative for 'non-standard' businesses such as social enterprises for which scoring techniques may be inappropriate (due to the absence of hard data and/or their divergence from the mainstream business population for which the scoring system was developed).

Discouraged borrowers

The discussion so far has been in terms of the factors which affect the availability of finance amongst businesses which have applied for loans. However, there has been increasing attention, amongst academics and policy makers, on small business owners who decide not to apply for finance in the first place, despite having viable business plans, because they believe they will be turned down by the finance provider. These individuals are known as discouraged borrowers (Kon and Storey, 2003). In Kon and Storey's formulation of the problem, discouraged borrowers exist because: i) there are costs (both financial and non-financial) associated with making loan applications; and ii) finance providers may make errors when screening applications, due to information asymmetries, such that viable businesses may be denied finance (Kon and Storey, 2003). If application costs and/or screening errors are sufficiently high then viable businesses may feel discouraged from applying for market finance, opting to use non-market finance instead, even though the value of the business would be higher if they were able to obtain market finance. In fact, some empirical studies indicate that incidences of discouragement are more prevalent than loan denials (Levenson and Willard, 2000) suggesting discouragement may be a greater issue for financial constraints amongst small firms.

The aim here is to begin to develop an empirical framework for analysing discouragement and understanding its relationship with financial rejection. The first point is that a key determinant of discouragement is the potential applicant's *perceived* likelihood of rejection; if they believe there is a strong chance that their application for finance will be rejected, it may simply not be worthwhile applying in the first place[13]. This assumes that business owners are themselves well informed about how finance providers assess finance applications. However, if business owners are ill-informed, this may lead to misperceptions about the likelihood of rejection; in that case they may under- or over-estimate their actual likelihood of rejection[14].

The perceived likelihood of rejection itself depends on the risk profile of the business. For example, larger, mature businesses may be less susceptible to discouragement as they have a lower risk profile. Perceptions may also vary across different groups of firms with the same observed risk profile. These differences may reflect underlying differences in finance providers' risk attitudes to the different types of firms. However, discouragement may not accurately reflect the state of affairs in the market where business owners misperceive their likelihood of rejection.

This discussion relates directly to the analysis of CIBs since their owners may feel discouraged, for example, by the belief that a lack of assets to offer as collateral will increase their likelihood of rejection. In addition, discouragement may be higher among CIBs compared to non-CIBs with the same observed risk profile (i.e., businesses with the same level of assets, experience etc) if CIB owners are aware that finance providers are more risk

[13] Technically, discouragement occurs if the perceived likelihood of rejection exceeds a threshold which depends on the net value of borrowing.

[14] This information problem relates to the demand-side. This is separate from the issue of a lack of information on the supply side which may give rise to financial constraints.

averse towards CIBs. However, CIB owners may also be prone to misperceptions about their likelihood of rejection depending on their level of financial awareness.

So, in summary, discouragement depends on the perceived likelihood of rejection which in turn depends on risk profiles[15]. Differences in discouragement reflect differences in risk profiles or, holding risk profiles constant, different perceptions about the state of supply in the loan market. Business owners may be prone to misperceptions about their likelihood of rejection depending on their level of financial awareness. In that case the demand-side view of the market, as reflected in the perceived likelihood of rejection, may be at odds with the actual likelihood of rejection.

Econometric model of rejection/discouragement probabilities

The UKSMEF data tracks individual businesses over time: it is a longitudinal/panel data-set. This is useful because it allows us to take into account unobserved firm specific effects ('entrepreneurial talent') when estimating the models. This, however, also presents econometric challenges since it means that the assumption of an independent error term (which underlies most standard econometric models) is invalid. In particular, these unobserved effects give rise to correlation between the observations for a given business. So, for example, a business may have consistently better access to finance (implying positive correlation) than other businesses with the same observed risk profile due to the greater (unobserved) talent of its owner.

The models are therefore estimated using a suitable panel data estimator, which allows for intra group correlation, for models with a discrete dependent variable (the rejection/discouragement variables are discrete valued taking the value of unity in instances of rejection/discouragement and zero otherwise). Specifically, a population averaged probit model is used to estimate the models in this report as it is an appropriate methodology for analysing differences in probabilities between sub-groups in a population[16].

Explanatory variables

[15] This risk profile also captures the effects of application costs. Observably riskier borrowers will be subject to more intense screening by finance providers leading to higher application costs/arrangement fees. Similarly they may be asked for collateral which also increases application costs due to the legal fees involved. In addition, risk profiles also relate to the non-financial costs of applying for loans. For example, the psychic costs of applying for loans may be higher for riskier borrowers if lenders are well informed about applicants' default risks (leading to a positive relationship between risk and discouragement). Conversely, imperfect information may raise the psychic costs for less risky borrowers since if lenders are ill-informed they have a greater chance of being turned down by mistake (and risky borrowers have a greater chance of having their applications approved by mistake); in this case there is a negative relationship between risk and discouragement.

[16] This is a particular instance of the Generalized Estimating Equations (GEE) technique (see Liang and Zeger, 1986). This approach models the marginal/population averaged expectation of the dependent variable as a function of the explanatory variables. In contrast conditional/subject specific approaches model the probability distribution of the dependent variable as function of the explanatory variables and a subject specific effect (e.g., fixed/random effects models). The population averaged model is appropriate where the objective of the analysis is to make inferences about group/subpopulation differences. Conditional approaches, on the other hand, are appropriate where the interest is in the effects of the explanatory variables on a particular subject (see Zorn, 2001).

The financial rejection equations include explanatory variables relating to the firm's creditworthiness. Following from the previous discussion of small business lending technologies, the variables relate to information which is used in transactions lending (principally, asset based lending and credit/behavioural scoring) and which capture the strength of financial relationships. These variables include: business and owner characteristics; business assets (availability of collateral); financial delinquency (missed loan repayments); credit scores and financial relationship variables (length of relationship and number of finance providers).

The coefficients in the rejection model indicate the sensitivity of finance providers' risk assessments to the different risk factors included in the model. This sensitivity is a function of the lending technology used in screening and finance providers' attitudes to risk. For example, lenders risk assessments may be sensitive to business assets where the availability of collateral is important due to uncertainty about the borrower's prospects. In that case, the probability of rejection would be negatively related to assets (since businesses with greater assets are able to offer more collateral). However, in instances where lenders are less risk averse, then the availability of collateral may be less important (implying a weaker relationship between assets and the likelihood of rejection). Differences in the coefficients, between the CIB and non-CIB models, are therefore indicative of differences in the degree of *risk aversion* finance providers have towards these businesses (and concomitant differences in the lending technologies used to screen CIB/non-CIB applications)[17].

The key variables in explaining discouragement relate to factors affecting perceptions about the likelihood of rejection. In essence these factors relate to the firm's risk profile and application costs. In this regard the discouragement equation includes: business and owner characteristics (for example, greater business assets and experience may reduce the perceived likelihood of rejection); sources of financial advice (advice may help to lower application costs/the perceived likelihood of rejection); and relationship variables (established relationships may lower application costs/the perceived likelihood of rejection[18]). Credit scores are also included to control directly for risk profiles. Han et al (2008b) have shown evidence with US data that high risk borrowers are more likely to be discouraged than low risk borrowers. This suggests discouragement may be an efficient self-rationing mechanism (i.e., risky businesses self-select out of the loan pool).

The coefficients in the discouragement model show how changes in risk profiles affect business owners' perceptions of the likelihood of rejection. For example, it would be expected that assets are negatively related to discouragement because the perceived likelihood of rejection is lower for businesses with more collateral to offer. However, business owners who perceive lenders apply tighter lending criteria to them, implying greater collateral requirements for a given level of risk, may feel a bigger increase in assets is

[17] Another way to think about this is that the probability of rejection is a function of the firm's risk profile and the sensitivity of the finance provider's assessment to this risk profile (i.e., risk aversion). Accordingly, for a given risk profile, differences in the likelihood of rejection will depend on differences in risk aversion. Fraser (2009b) considered a structural model of the likelihood of loan rejection based on the default risk distribution. This model showed that the increased likelihood of rejection following the credit crisis was split about 50/50 between an upward shift in the default risk distribution, on the one hand, and (holding risk constant) tighter lending criteria/increased risk aversion, on the other.

[18] Established relationships may help reduce the perceived likelihood of rejection not just among low risk businesses but even among struggling/risky businesses. For example, banks may be more willing to help turnaround the fortunes of struggling businesses with which they have an established relationship (see Bolton and Scharfstein, 1996).

required to produce a given decrease in the likelihood of rejection (implying an assets coefficient which is smaller in magnitude/closer to zero). In extreme cases, these owners may feel that they are likely to be rejected regardless of their ability to provide collateral (implying assets has no effect on discouragement). Differences in the coefficients of the discouragement models, between CIBs and non-CIBs, are therefore suggestive of differences in perceptions about the supply conditions (such as finance providers' risk attitudes) confronting the business owner.

Estimates from models for the probability of rejection and discouragement are presented in the following tables. All models are estimated for both CIBs and non-CIBs separately. Two rejection models are reported: the first is for any type of finance rejection (overdraft, term loan, asset finance (leasing and hire-purchase agreements), invoice finance or equity finance); and the second is for overdraft rejections. These models are estimated on sub-samples of businesses which have demands for the respective types of finance. There are insufficient observations to estimate separate rejection models for term loan, asset finance, invoice finance or equity finance applications.

Two discouragement models are also reported: the first is for any type of finance discouragement (not including invoice finance as discouragement data is not collected for this type of finance); and the second is for term loan discouragement. The discouragement models are estimated on the whole sample. There are too few incidences of discouragement regarding overdrafts, asset finance and equity finance to be able to estimate separate models for these types of finance.

Table 7: Determinants of the probability of any type of finance of rejection (marginal effects at sample means)

Explanatory variable	CIB model (marginal effect and *p*-value)		Non-CIB model (marginal effect and *p*-value)	
No. of Employees[(a)]				
1	-0.0357	0.177	-0.0040	0.859
2-10	-0.1282	0.004	-0.0049	0.787
11-49	-0.0377	0.191	-0.0028	0.869
Assets[(b)]				
£10,000 - £49,999	-0.0253	0.227	0.0358	0.035
£50,000 - £99,999	0.0048	0.925	0.0153	0.468
£100,000 - £249,999	0.0613	0.637	0.0112	0.543
£250,000 - £499,999	0.0730	0.484	0.0094	0.658
£500,000 - £999,999	-0.0456	0.033	0.0126	0.527
£1m - £4,999,999	-0.0089	0.808	0.0140	0.484
£5m or more	-0.0342	0.034	0.0058	0.821
Sales[(c)]				
£10,000 - £49,999	-0.0625	0.049	-0.0087	0.771
£50,000 - £99,999	-0.0190	0.630	-0.0309	0.253
£100,000 - £249,999	-0.0343	0.226	-0.0074	0.808
£250,000 - £499,999	-0.0512	0.034	-0.0300	0.269
£500,000 - £999,999	-0.0496	0.048	-0.0081	0.796
£1m - £4,999,999	-0.0889	0.044	-0.0408	0.136
£5m or more	-0.0817	0.064	-0.0193	0.501
Risk Rating[(d)]				
Low risk	-0.0070	0.867	-0.0019	0.918
Average risk	-0.0437	0.266	0.0393	0.067

High risk	0.1962	0.258	0.1156	0.000
No risk rating	0.0715	0.561	0.0557	0.086
Financial Delinquency				
Loan Default	0.7204	0.003	0.1602	0.004
Business Age[(e)]				
1-2 years	-0.0424	0.048	0.0162	0.700
2-3 years	-0.0472	0.049	0.0129	0.750
4-6 years	-0.0410	0.081	0.0113	0.775
7-9 years	0.0768	0.640	0.0089	0.826
10-15 years	-0.0436	0.243	0.0001	0.998
More than 15 years	-0.0618	0.450	-0.0264	0.483
Region[(f)]				
East Midlands	0.0456	0.792	0.0018	0.940
London	0.0622	0.700	0.0778	0.006
North East	-0.0294	0.567	-0.0237	0.272
Northern Ireland	-0.0320	0.514	-0.0120	0.638
North West	-0.0381	0.174	-0.0030	0.897
Scotland	0.0116	0.920	-0.0012	0.963
South East	0.0621	0.701	0.0240	0.300
South West	-0.0563	0.059	-0.0240	0.253
Wales	-0.0519	0.051	-0.0019	0.938
West Midlands	-0.0225	0.706	-0.0103	0.649
Yorkshire and Humberside	0.0588	0.764	-0.0243	0.263
Number of finance providers				
More than one	0.0591	0.091	0.0427	0.000
Length of relationship with				

main finance provider[g]				
1-3 years	-0.0294	0.470	-0.0479	0.018
4-6 years	-0.0476	0.070	-0.0684	0.000
7-9 years	-0.0563	0.024	-0.0722	0.000
10-15 years	-0.0711	0.098	-0.0697	0.000
More than 15 years	-0.0743	0.081	-0.1276	0.000
(Log) owner's age	-0.2104	0.017	-0.0085	0.697
Highest Qualification				
Undergraduate degree	-0.0615	0.040	-0.0060	0.623
Postgraduate degree	-0.0165	0.509	0.0017	0.908
Gender				
Female	-0.0047	0.891	-0.0233	0.039
Ethnicity[h]				
Black African	0.2456	0.377	0.1164	0.017
Black Caribbean	0.0974	0.611	0.0449	0.214
Indian	0.3412	0.440	-0.0409	0.048
Pakistani	0.2210	0.489	-0.0242	0.312
Bangladeshi	0.0272	0.846	-0.0374	0.179
Year[i]				
2005	-0.0382	0.217	0.0048	0.840
2008	0.1211	0.093	-0.0141	0.199
2009	0.0592	0.560	0.0161	0.316
NT	304		5,168	
$\chi^2(p-value)$	0.000		0.000	

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Effects are measured relative to businesses with 50-249 employees.

(b) Effects are measured relative to businesses with less than £10,000 in assets.

(c) Effects are measured relative to businesses with less than £10,000 in sales.

(d) Effects are measured relative to minimal risk rated businesses

(e) Effects are measured relative to businesses aged less than 1 year.

(f) Effects are measured relative to businesses located in the East of England.

(g) Effects are measured relative to businesses with financial relationships of less than 1 year.

(h) Effects are measured relative to businesses with a White principal owner.

(i) Effects are measured relative to 2004.

Looking at the marginal effects for assets, it is notable that CIBs in larger asset categories (£500,000-£999,999 and £5m or more) have lower probabilities of rejection than those with less than £10,000 in assets. In contrast assets appear to have no affect on the probability of rejection for non-CIBs. This suggests that risk assessments of CIBs are more sensitive to assets/the availability of collateral than risk assessments of non-CIBs. Equally CIBs which make larger sales have lower rejection likelihoods whereas there is no corresponding effect for non-CIBs. Regarding the effects of risk ratings themselves, there is no apparent relationship between CIB rejection probabilities and risk ratings whereas there is such a relationship for non-CIBs (in particular high risk CIBs are almost 12 percentage points more likely to be rejected for any type of finance than a minimal risk CIB). Previous loan defaults affect the likelihood of rejection for both CIBs and non-CIBs. However the effect for CIBs (an increase of 72 percentage points compared to CIBs with no loan defaults) is significantly higher than the effect for non-CIBs (an increase of 16 percentage points compared to non-CIBs with no loan defaults).

Older CIBs are less likely to experience rejection: for example, a CIB aged 2-3 years old is 4.7 percentage points less likely to be rejected than a CIB aged less than 1 year. However, business age has no affect on non-CIB rejection likelihoods. Regarding financial relationships, having more than one finance provider increases the likelihood of rejection, among both CIBs and non-CIBs (pointing to benefits for access to finance from having concentrated relationships). However, longer financial relationships appear to have a stronger effect in reducing the likelihood of rejection among non-CIBs than among CIBs. In other words, access to finance among CIBs does not appear to benefit from having longer financial relationships in the same way as they benefit non-CIBs. This finding points to a high level of uncertainty which is not alleviated by building up a track record with a finance provider.

The next set of determinants relate to owner characteristics. The results here show that older CIB owners are less likely to experience rejection whereas owner age has no effect on non-CIB rejection probabilities. CIB owners with an undergraduate degree are less likely to be rejected; again, there is no corresponding effect for non-CIB owners. On the other hand while female owners of non-CIBs are 2.3 percentage points less likely to experience rejection there is no gender effect among CIBs.

In summary finance providers' risk assessments of CIBs appear to be more sensitive to assets, sales, previous loan defaults, business and owners' age and owners' education compared to non-CIBs. In other words finance providers are more sensitive to the availability of collateral, and the business/ personal track records of CIBs and their owners,

compared to non-CIBs. On the other hand, good credit ratings seem to be much more important in determining the success of non-CIB finance applications. This suggests that credit ratings may have greater utility in risk assessments of non-CIBs; the implication is that credit ratings may be less useful in assessing CIBs due to greater uncertainty about these firms' prospects. Also, longer financial relationships appear to benefit non-CIBs more than they benefit CIBs in terms of better access to finance. The implication here is that the greater uncertainty associated with CIBs is not alleviated by building up a track record with a finance provider.

Table 8: Determinants of the probability of overdraft rejection (marginal effects at sample means)

Explanatory variable	CIB model (marginal effect and *p*-value)		Non-CIB model (marginal effect and *p*-value)	
No. of Employees[(a)]				
1	-0.0418	0.041	-0.0141	0.511
2-10	-0.1001	0.050	0.0099	0.602
11-49	-0.0203	0.473	0.0036	0.839
Assets[(b)]				
£10,000 - £49,999	-0.0263	0.124	0.0440	0.015
£50,000 - £99,999	-0.0262	0.059	0.0314	0.163
£100,000 - £249,999	0.0230	0.767	0.0059	0.755
£250,000 - £499,999	0.0280	0.712	0.0053	0.798
£500,000 - £999,999	-0.0263	0.061	-0.0064	0.722
£1m - £4,999,999	0.0354	0.642	0.0012	0.947
£5m or more	-0.0189	0.387	-0.0345	0.086
Sales[(c)]				
£10,000 - £49,999	-0.0430	0.053	-0.0193	0.463
£50,000 - £99,999	-0.0095	0.767	-0.0485	0.019
£100,000 - £249,999	-0.0136	0.602	-0.0410	0.074
£250,000 - £499,999	-0.0295	0.061	-0.0571	0.004
£500,000 - £999,999	-0.0356	0.077	-0.0325	0.201

£1m - £4,999,999	-0.0909	0.028	-0.0556	0.021
£5m or more	-0.0915	0.045	-0.0362	0.155
Risk Rating[(d)]				
Low risk	0.0006	0.988	0.0025	0.906
Average risk	-0.0071	0.847	0.0224	0.322
High risk	0.3456	0.177	0.0900	0.009
No risk rating	0.0142	0.845	0.0546	0.114
Financial Delinquency				
Loan Default	-0.0195	0.228	0.1137	0.000
(Log) Business Age	0.0050	0.707	-0.0149	0.015
Region[(e)]				
East Midlands	-0.0166	0.440	-0.0050	0.814
London	0.0224	0.697	0.0731	0.004
North East	-0.0186	0.505	-0.0117	0.580
North West	-0.0285	0.063	-0.0025	0.906
Scotland	-0.0181	0.544	0.0114	0.676
South East	0.0470	0.487	0.0182	0.392
South West	-0.0307	0.074	-0.0144	0.491
Wales	-0.0290	0.056	0.0122	0.621
West Midlands	-0.0213	0.286	-0.0128	0.523
Yorkshire and Humberside	0.0405	0.636	-0.0264	0.199
Number of finance providers				
More than one	0.0246	0.306	0.0388	0.000
Length of relationship with main finance provider[(f)]				

1-3 years	-0.0200	0.424	-0.0551	0.003
4-6 years	-0.0376	0.045	-0.0668	0.000
7-9 years	-0.0280	0.063	-0.0641	0.000
10-15 years	-0.0450	0.104	-0.0755	0.000
More than 15 years	-0.0514	0.126	-0.1333	0.000
(Log) owner's age	-0.1234	0.063	0.0050	0.821
Highest Qualification				
Undergraduate degree	-0.0353	0.061	0.0078	0.558
Postgraduate degree	-0.0097	0.633	0.0007	0.964
Gender				
Female	-0.0261	0.049	-0.0188	0.106
Ethnicity[(g)]				
Black African	0.3148	0.317	0.0779	0.088
Black Caribbean	0.1267	0.499	0.0243	0.465
Indian	0.2481	0.453	-0.0580	0.000
Pakistani	0.1648	0.583	-0.0254	0.251
Bangladeshi	0.0380	0.811	-0.0453	0.049
Year[(h)]				
2005	-0.0035	0.921	0.0004	0.986
2008	0.1072	0.090	-0.0124	0.271
2009	0.1022	0.334	0.0410	0.022
NT	253		4,193	
χ^2 (p – value)	0.000		0.000	

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Effects are measured relative to businesses with 50-249 employees.

(b) Effects are measured relative to businesses with less than £10,000 in assets.

(c) Effects are measured relative to businesses with less than £10,000 in sales.

(d) Effects are measured relative to minimal risk rated businesses

(e) Effects are measured relative to businesses located in the East of England.

(f) Effects are measured relative to businesses with financial relationships of less than 1 year.

(g) Effects are measured relative to businesses with a White principal owner.

(h) Effects are measured relative to 2004.

The results for overdraft rejections are generally similar to those for any type of finance rejection and will therefore be summarised more briefly. Again, the indication is that risk assessments of CIBs are more sensitive to assets/availability of collateral than for non-CIBs. As regards risk ratings, again these are significantly related to the probability of rejection for non-CIBs (high risk non-CIBs are 9 percentage points more likely to be denied an overdraft than a minimal risk non-CIB) but not for CIBs. An important contrast with the results for any type of finance rejection is that while older non-CIBs have a lower likelihood of rejection the same is not the case among CIBs. In other words, access to overdrafts among CIBs does not appear to benefit from longer business track records in the same way as they benefit non-CIBs. However, consistent with the analysis of rejections for any type of finance, longer financial relationships appear to have a stronger effect in reducing the likelihood of rejection among non-CIBs than among CIBs. Again the implication is that longer financial relationships do not alleviate the uncertainty associated with CIBs.

Risk assessments of CIBs for overdrafts are more sensitive to the age and qualifications of their owners compared to non-CIBs: older CIB owners and those with undergraduate degrees are less likely to be denied an overdraft. Again this indicates the greater importance of a personal track record for CIB owners in increasing the likelihood of obtaining finance (by implicitly, increasing confidence in the talent/ability of the owner).

The results for the discouragement models are presented in the following two tables.

Table 9: Determinants of the probability of any type of finance discouragement (marginal effects at sample means)

Explanatory variable	CIB model (marginal effect and *p*-value)		Non-CIB model (marginal effect and *p*-value)	
Assets[(a)]				
£10,000 - £49,999	-0.0020	0.404	-0.0036	0.445
£50,000 - £99,999	-0.0034	0.160	-0.0087	0.124
£100,000 - £249,999	-0.0032	0.132	-0.0150	0.001
£250,000 - £499,999	0.0130	0.407	-0.0116	0.052
£500,000 - £999,999	0.0316	0.373	-0.0203	0.000

£1m or more	-0.0015	0.627	-0.0211	0.000
Risk Rating[b]				
Low risk	0.6218	0.000	0.0070	0.564
Average risk	0.6412	0.000	0.0290	0.048
High risk	0.9745	0.000	0.0882	0.003
No risk rating	0.7080	0.004	0.0678	0.005
Number of finance providers				
More than one	0.0027	0.393	-0.0002	0.956
Length of relationship with main finance provider[c]				
1-3 years	-0.0011	0.781	-0.0109	0.070
4-6 years	-0.0032	0.273	-0.0167	0.002
7-9 years	0.0037	0.779	-0.0123	0.053
10-15 years	-0.0010	0.837	-0.0218	0.000
More than 15 years	-0.0002	0.969	-0.0333	0.000
(Log) experience	0.0057	0.131	-0.0013	0.609
Gender				
Female	-0.0037	0.202	-0.0069	0.126
Ethnicity[d]				
Black African	0.2080	0.161	0.0742	0.001
Black Caribbean	0.1211	0.297	0.0533	0.006
Indian	0.0434	0.472	-0.0139	0.022
Bangladeshi	0.5274	0.080	0.0161	0.343
Main source of financial advice				
Bank	0.0022	0.731	-0.0007	0.894
Accountant	0.0014	0.685	-0.0009	0.836

Business adviser	0.0004	0.945	-0.0112	0.167
Government agency	0.3923	0.145	-0.0044	0.765
Year[(e)]				
2005	0.0016	0.880	0.0043	0.651
2008	-0.0027	0.365	-0.0126	0.008
2009	-0.0022	0.352	0.0020	0.737
NT	424		6,535	
$\chi^2(p-value)$	0.000		0.000	

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Effects are measured relative to businesses with less than £10,000 in assets.

(b) Effects are measured relative to minimal risk rated businesses

(c) Effects are measured relative to businesses with financial relationships of less than 1 year.

(d) Effects are measured relative to businesses with a White principal owner.

(e) Effects are measured relative to 2004.

The first notable result is that while non-CIBs with greater assets are less likely to experience discouragement there is no relationship between assets and discouragement among CIBs. In the latter instance, this suggests that having greater assets makes no difference to the perceived likelihood of rejection; this is consistent with perceptions among CIB owners that lenders apply tighter lending criteria in evaluating their businesses. Consistent with Han et al (2008b) businesses with poorer credit ratings are more likely to experience discouragement. However, the effects here are much stronger among CIBs. This suggests that the perceived likelihood of rejection is much more sensitive to risk among CIBs. For example, an average risk CIB is over 64% points more likely to experience discouragement than a minimal risk CIB whereas the same effect among non-CIBs is only about 3% points.

Interestingly while longer financial relationships reduce the likelihood of discouragement among non-CIBs there is no corresponding effect among CIBs. This suggests that, unlike non-CIB owners, CIB owners do not expect a longer relationship to have any beneficial effect on the likelihood of rejection. The significantly higher probability of discouragement among Black business owners (non-CIBs) is consistent with findings reported in Fraser (2009a).

Table 10: Determinants of the probability of term loan discouragement (marginal effects at sample means)

Explanatory variable	CIB model (marginal effect and *p*-value)	Non-CIB model (marginal effect and *p*-value)
Assets[(a)]		

£10,000 - £49,999	-0.0017	0.326	-0.0004	0.862
£50,000 - £99,999	-0.0017	0.299	-0.0027	0.349
£100,000 - £249,999	-0.0022	0.201	-0.0064	0.004
£250,000 - £499,999	0.0068	0.446	-0.0050	0.066
£500,000 - £999,999	0.0126	0.509	-0.0106	0.000
£1m or more	0.0000	0.995	-0.0108	0.000
Risk Rating[b]				
Low risk	0.4577	0.002	0.0106	0.395
Average risk	0.5793	0.011	0.0236	0.144
High risk	0.9523	0.000	0.0806	0.069
No risk rating	0.7063	0.020	0.0561	0.076
Number of finance providers				
More than one	0.0003	0.857	-0.0027	0.206
Length of relationship with main finance provider[c]				
1-3 years	-0.0020	0.280	-0.0037	0.236
4-6 years	-0.0026	0.241	-0.0070	0.010
7-9 years	0.0010	0.865	-0.0031	0.386
10-15 years	-0.0021	0.357	-0.0090	0.003
More than 15 years	-0.0019	0.395	-0.0143	0.000
(Log) experience	0.0044	0.189	-0.0002	0.849
Gender				
Female	-0.0018	0.364	-0.0027	0.228
Ethnicity[d]				
Black African	0.1809	0.261	0.0239	0.039
Black Caribbean	0.1062	0.360	0.0171	0.061

Indian	0.0633	0.390	-0.0060	0.047
Bangladeshi	0.5955	0.082	0.0027	0.672
Main source of financial advice				
Bank	0.0007	0.837	-0.0014	0.615
Accountant	-0.0014	0.363	-0.0022	0.334
Business adviser	0.0009	0.852	0.0024	0.685
Government agency	0.2855	0.219	0.0066	0.498
Year[(e)]				
2005	-0.0002	0.965	0.0066	0.340
2008	-0.0008	0.726	-0.0039	0.193
2009	-0.0010	0.571	0.0096	0.067
NT	424		6,535	
$\chi^2(p-value)$	0.000		0.000	

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Effects are measured relative to businesses with less than £10,000 in assets.

(b) Effects are measured relative to minimal risk rated businesses

(c) Effects are measured relative to businesses with financial relationships of less than 1 year.

(d) Effects are measured relative to businesses with a White principal owner.

(e) Effects are measured relative to 2004.

The results for term loans are very similar to the previous findings for any type of finance discouragement and therefore do not warrant any further discussion. In summary therefore, the absence of a reduction in discouragement among CIBs with more assets and longer relationships is indicative of a more pessimistic outlook among CIB owners about their chances of obtaining finance. By implication, the perception among CIB owners is that lenders apply tighter lending criteria to them and that stable financial relationships are less beneficial. CIB owners are also much more likely than non-CIB owners to feel discouraged from applying for finance because they have a less than perfect credit rating.

Differences in the probability of rejection and discouragement

The aim now is to use the preceding models to derive estimates of differences in the likelihood of rejection and discouragement between CIBs and non-CIBs. The total difference

in the likelihood of rejection may be divided into the sum of two components: an assessment difference plus a profile difference[19].

Specifically, the assessment difference is the difference in rejection probabilities holding risk profiles constant; this difference captures the effect of greater risk aversion (sensitivity to risk) towards CIBs on the probability of rejection. To measure this difference, the risk profile is fixed (at the CIB average) and the assessment (as implied by the coefficients in the respective CIB/non-CIB rejection models) varies between that applied to a CIB and non-CIB respectively[20]. The assessment difference therefore relates directly to the issue of market failure since greater risk aversion may be rooted in issues of greater uncertainty/moral hazard associated with CIB finances.

The term 'assessment difference' is not meant to imply that finance providers use systematically different techniques in assessing CIBs compared to other firms: indeed CIBs are screened using the same technologies (e.g., asset based lending, credit scoring and relationship lending) as applied to other firms. However, given the same set of lending technologies, the outcomes of assessments may vary across comparable firms depending on the degree of risk aversion the finance provider has towards the type of business being assessed. So, essentially, assessment differences speak to differences in finance providers' attitudes to risk towards CIBs compared to non-CIBs with similar risk profiles[21].

The profile difference, on the other hand, relates to the difference in rejection probabilities due to differences in risk profiles between CIBs and non-CIBs. So in this case the assessment is fixed (at that applied to a non-CIB) and the risk profile varies[22].

Similarly, the total difference in the probabilities of discouragement is decomposed into the sum of a perceptions difference and profile difference. The perceptions difference is the difference in discouragement probabilities holding risk profiles constant. To measure this difference, the risk profile is fixed (at the CIB average) and business owners' perceptions of supply conditions in the loan market (as implied by the coefficients in the respective CIB/non-CIB discouragement models) varies between that applied to a CIB and non-CIB

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[19] See Burke, Fraser and Greene (2010) for an application of this methodology in the context of analyzing the impacts of written business plans on firm performance. In that case, the total difference in performance was decomposed into a response effect (reflecting the impact of business plans *per se*) and a profile effect (reflecting differences in performance due to the characteristics of the business/business owner).

[20] Denote the vector of business/owner characteristics (profile) of a CIB by X_1 and the profile of a non-CIB by X_0. Then the probability of rejection for a CIB is $Prob(X'_1\beta_1)$ where β_1 is the vector of coefficients from the CIB model. Similarly, $Prob(X'_1\beta_0)$ is the probability of rejection for a CIB were it to be assessed in the manner of a non-CIB (where β_0 is the vector of coefficients from the non-CIB model). Accordingly $Prob(X'_1\beta_1) - Prob(X'_1\beta_0)$ represents the assessment difference (the profile is fixed and the assessment, i.e., the $\beta's$, varies)

[21] However, the choice of lending technology may depend on the degree of risk aversion. For example, greater risk aversion may lead to a greater reliance on asset based lending. But in essence the difference in lending technologies in this case is caused by the difference in risk aversion. An obvious example of this is the increased importance of collateral following the credit crisis due to increased lender risk aversion (see Fraser, 2009b).

[22] The profile difference is given by $Prob(X'_1\beta_0) - Prob(X'_0\beta_0)$ where the latter probability is the probability of rejection for a non-CIB. Accordingly the total difference in the probability of rejection between CIBs and non-CIBs is the sum of the assessment and profile differences:

$$[Prob(X'_1\beta_1) - Prob(X'_1\beta_0)] + [Prob(X'_1\beta_0) - Prob(X'_0\beta_0)] = Prob(X'_1\beta_1) - Prob(X'_0\beta_0)$$

respectively[23]. The perceptions difference relates to the issue of whether CIB owners are less likely to apply for finance because they have worse perceptions about supply conditions in the loan market than owners of comparable non-CIBs. It captures the indirect effects of market failure in the supply of finance to CIBs via CIB owners' perceptions of the supply conditions/financing environment confronting them.

The profile difference in the discouragement analysis relates to the difference in discouragement probabilities due to differences in risk profiles/application costs between CIBs and non-CIBs. So, in this case, the perceptions of supply conditions in the loan market are fixed (to those of a non-CIB owner) and the risk profile varies.

In the following tables, estimates of total, assessment and profile differences in the likelihood of rejection are reported. After the tables for rejection, total, perception and profile differences in the likelihood of discouragement are reported. These differences in rejection/discouragement probabilities are reported at the sample means of explanatory variables and for given values of particular explanatory variables (holding the other variables at their sample means). This allows us to see the differences for an average CIB and to see how the differences vary depending on the CI sub-sector looked at and the particular profile of the business.

Table 11: Differences in probability of any type of finance rejection between CIBs and non-CIBs by firm characteristics [(a)].

% points/100

Firm characteristic	Total difference (*p*-value)[(b)]	Assessment difference (*p*-value)	Profile difference (*p*-value)
Difference at sample means	0.0555 (0.001)	0.0295 (0.026)	0.0260 (0.005)
Content sectors (all)	0.0988 (0.000)	0.0414 (0.035)	0.0574 (0.000)
Music and the Visual Performing arts	-0.0115 (0.642)	-0.0130 (0.604)	0.0015 (0.922)
Software	0.1275 (0.002)	0.0517 (0.086)	0.0759 (0.001)
Other Creative Content	0.2488 (0.000)	0.1251 (0.013)	0.1237 (0.000)
Service sectors (all)	-0.0170 (0.458)	0.0109 (0.613)	-0.0278 (0.016)

[23] The perceptions difference is directly analogous to the assessment difference in the rejection model. Again, it is given by $Prob(X'_1\beta_1) - Prob(X'_1\beta_0)$ except this time the $\beta's$, representing perceptions of supply conditions, are the coefficients from the discouragement model.

Advertising	0.0634 (0.260)	0.0586 (0.262)	0.0048 (0.862)
Architecture	-0.0467 (0.017)	-0.0068 (0.732)	-0.0399 (0.000)
No. of Employees			
1	0.1058 (0.000)	0.0796 (0.000)	0.0262 (0.004)
2-10	-0.0301 (0.027)	-0.0562 (0.000)	0.0261 (0.004)
11-49	0.1175 (0.000)	0.0912 (0.000)	0.0263 (0.004)
50-249	0.2157 (0.000)	0.1891 (0.000)	0.0266 (0.004)
Assets			
Less than £10,000	0.0841 (0.000)	0.0591 (0.000)	0.0250 (0.004)
£10,000 - £49,999	-0.0040 (0.799)	-0.0322 (0.009)	0.0283 (0.004)
£50,000 - £99,999	0.0787 (0.000)	0.0522 (0.000)	0.0265 (0.004)
£100,000 - £249,999	0.1639 (0.000)	0.1378 (0.000)	0.0261 (0.004)
£250,000 - £499,999	0.1789 (0.000)	0.1529 (0.000)	0.0260 (0.004)
£500,000 - £999,999	-0.0814 (0.000)	-0.1076 (0.000)	0.0263 (0.004)
£1m - £4,999,999	0.0527 (0.000)	0.0263 (0.053)	0.0264 (0.004)
£5m or more	-0.0222 (0.095)	-0.0478 (0.000)	0.0256 (0.004)
Sales			
Less than £10,000	0.3058 (0.000)	0.2793 (0.000)	0.0265 (0.006)
£10,000 - £49,999	0.0129 (0.376)	-0.0127 (0.311)	0.0256 (0.006)
£50,000 - £99,999	0.2849 (0.000)	0.2617 (0.000)	0.0232 (0.006)
£100,000 - £249,999	0.1849 (0.000)	0.1591 (0.000)	0.0258 (0.006)
£250,000 - £499,999	0.0163 (0.230)	-0.0070 (0.545)	0.0233 (0.006)
£500,000 - £999,999	0.0192 (0.195)	-0.0065 (0.614)	0.0257 (0.006)
£1m - £4,999,999	0.0038 (0.762)	-0.0185 (0.082)	0.0222 (0.006)
£5m or more	0.0205 (0.153)	-0.0041 (0.743)	0.0246 (0.006)
Profitability			
Loss	0.0196 (0.272)	-0.0090 (0.550)	0.0286 (0.007)

Risk Rating			
Minimal risk	0.0703 (0.000)	0.0454 (0.000)	0.0249 (0.000)
Low risk	0.0584 (0.000)	0.0338 (0.007)	0.0247 (0.000)
Average risk	-0.0486 (0.000)	-0.0782 (0.000)	0.0295 (0.000)
High risk	0.1809 (0.000)	0.1449 (0.000)	0.0360 (0.000)
No risk rating	0.1293 (0.000)	0.0982 (0.000)	0.0312 (0.000)
Financial Delinquency			
Loan Default	0.3572 (0.000)	0.3218 (0.000)	0.0353 (0.004)
Business Age			
Under 1 year	0.1777 (0.000)	0.1532 (0.000)	0.0245 (0.005)
1-2 years	-0.0727 (0.000)	-0.0985 (0.000)	0.0259 (0.005)
2-3 years	-0.0467 (0.000)	-0.0723 (0.000)	0.0256 (0.005)
4-6 years	0.0117 (0.459)	-0.0137 (0.244)	0.0255 (0.005)
7-9 years	0.2830 (0.000)	0.2578 (0.000)	0.0253 (0.005)
10-15 years	0.0472 (0.005)	0.0226 (0.073)	0.0245 (0.005)
More than 15 years	0.0816 (0.000)	0.0595 (0.000)	0.0221 (0.005)
Region			
East	0.0557 (0.001)	0.0387 (0.003)	0.0169 (0.028)
East Midlands	0.1198 (0.000)	0.1027 (0.000)	0.0170 (0.028)
London	0.0721 (0.000)	0.0509 (0.001)	0.0211 (0.031)
North East	0.0086 (0.535)	-0.0066 (0.542)	0.0152 (0.027)
Northern Ireland	-0.0102 (0.449)	-0.0263 (0.012)	0.0161 (0.027)
North West	-0.0489 (0.000)	-0.0656 (0.000)	0.0167 (0.028)
Scotland	0.0762 (0.000)	0.0594 (0.000)	0.0168 (0.028)
South East	0.1210 (0.000)	0.1025 (0.000)	0.0184 (0.029)
South West	-0.0878 (0.000)	-0.1030 (0.000)	0.0152 (0.027)
Wales	-0.1156 (0.000)	-0.1324 (0.000)	0.0168 (0.028)

West Midlands	0.0180 (0.231)	0.0018 (0.878)	0.0162 (0.027)
Yorkshire and Humberside	0.1614 (0.000)	0.1462 (0.000)	0.0151 (0.027)
Number of finance providers			
More than 1	0.0893 (0.000)	0.0588 (0.000)	0.0305 (0.002)
Length of relationship with main finance provider			
Under 1 year	0.1430 (0.000)	0.1141 (0.000)	0.0289 (0.004)
1-3 years	0.1232 (0.000)	0.0975 (0.000)	0.0256 (0.003)
4-6 years	0.0607 (0.000)	0.0374 (0.011)	0.0233 (0.003)
7-9 years	-0.0579 (0.000)	-0.0804 (0.000)	0.0225 (0.003)
10-15 years	0.0301 (0.065)	0.0067 (0.628)	0.0235 (0.003)
More than 15 years	0.0693 (0.000)	0.0513 (0.000)	0.0180 (0.003)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

The total difference in rejection probabilities, for any type of finance, is about 5.6% points for an average CIB. Over half of this difference (almost 3% points) is due to an assessment difference. This suggests that, looking over finances as a whole, finance providers are more risk averse in their assessments of CIBs, compared to otherwise similar non-CIBs, leading to a higher probability of rejection. The higher risk profile of the average CIB accounts for the remainder of the total difference in the rejection probability (i.e., the profile differences is 2.6% points).

However, analysis based on the 'average' CIB may be highly misleading given the diverse nature of firms in this sector. Accordingly it is important to look at how these differences vary across CI sub-sectors and other business/owner characteristics. Looking at CI sub-sectors first, CIBs in Content sectors are, in total, almost 10% points more likely to experience financial rejection than non-CIBs. The assessment difference is about 4% points and this indicates that part of the total difference is due to greater risk aversion towards CIBs in Content sectors relative to non-CIBs with similar risk profiles. The profile difference is almost 6% points, so a large part of the total difference in rejection probabilities is also due to CIBs in Content sectors having a higher risk profile than an average non-CIB.

An even closer inspection of Content sectors reveals that higher rejection probabilities are an issue for CIBs in Software and Other Creative Content industries only. Notably, CIBs in

Other Creative Content industries are almost 25% points more likely to be rejected than an average non-CIB (i.e., the total difference in rejection probabilities is 25% points). The assessment difference here is 12.5% points which indicates that CIBs in Other Creative Content Sectors are significantly more likely to be rejected than non-CIBs with similar risk profiles (pointing to issues of greater risk aversion towards these CIBs). Higher risk profiles among CIBs in Other Creative Content Sectors account for the other half of the total difference in rejection probabilities.

Looking at Software CIBs, the total, assessment and profile differences are about 12.8% points, 5.2% points and 7.6% points respectively. In particular, the positive assessment difference is again indicative that finance providers are more risk averse towards these CIBs than non-CIBs with similar risk profiles (although the *p*-value indicates that this assessment difference is only significant at the 10% level). On the other hand, there are no significant differences in rejection probabilities (total, assessment or profile differences) for CIBs in Music and the Visual Performing Arts. This suggests that finance providers are not especially risk averse towards these CIBs (zero assessment difference) and that their risk profiles are similar to the average non-CIB (zero profile difference).

Regarding Service sectors overall, the indication is that these CIBs have lower risk profiles than an average non-CIB (i.e., the profile difference is negative: -2.8% points). The assessment difference is not significantly different from zero indicating that finance providers are no more or less risk averse towards these CIBs compared to non-CIBs with similar risk profiles. A closer inspection of Service sectors indicates that it is architectural CIBs which have lower risk profiles than the average non-CIB (profile difference=-4% points) and this results in these CIBs actually having a lower total probability of rejection than non-CIBs (total difference=-4.7% points). There are no differences in the probability of rejection (total, assessment or profile) for CIBs in the Advertising sector.

In summary, the results for CI sub sectors suggest that problems of higher rejection probabilities compared to non-CIBs are limited to Content sectors and, in particular, Software and Other Creative Content sectors. Only some of this difference is due to these firms having higher risk profiles: the assessment differences suggest that finance providers are more risk averse towards these CIBs than non-CIBs with similar risk profiles. These results point to underlying problems of greater uncertainty/moral hazard affecting the supply of finance to these CIBs. In short, market failure issues appear to be more acute for CIBs in Software and Other Creative Content sectors compared to non-CIBs with similar risk profiles. However, there is no evidence that issues of market failure are more acute in the supply of finance to CIBs in Music and the Visual Performing Arts or Creative Service sectors.

Turning now to differences conditional on other firm characteristics, it is noted that there are significant differences in rejection probabilities by number of employees, assets and sales. Notably the largest differences appear to be among firms with: 50-249 employees (21.6% point total difference and 18.9% point assessment difference; £250,000-£499,999 in assets (17.9% point total difference and 15.3% point assessment difference); and less than £10,000 in sales (30.6% point total difference and 27.9% point assessment difference).

Looking at risk variables, perhaps unsurprisingly, it appears to be CIBs with a high risk Dun and Bradstreet risk rating that experience the biggest increase in the likelihood of rejection

compared to high risk rated non-CIBs (18.1% point total difference and 14.5% point assessment difference). Similarly, among businesses with previous loan defaults CIBs are almost 36% points more likely to experience rejection than non-CIBs with previous loan defaults, most of which (over 32% points) represents an assessment difference. Overall, this suggests that, among riskier firms, finance providers are particularly risk averse in assessing CIBs.

Regarding business age, as might be expected, there is evidence of risk aversion in assessing CIBs aged less than 1 year (15.3% point assessment difference); but also among CIBs aged 7-9 years (25.8% point). Similarly, finance providers appear to be more risk averse of CIBs with whom they have short financial relationships relative to comparable non-CIBs (there is an 11.4% point assessment difference among firms with financial relationships of less than one year).

There also appear to be differences in rejection probabilities across regions: there are large positive differences in rejection probabilities in the East Midlands, South East and Yorkshire/Humberside which seem to be mainly assessment differences. The indication is that finance providers as a whole may be more risk averse towards CIBs in these regions. In contrast, there are large negative differences in rejection probabilities in the South West and Wales: finance providers in these regions appear to look on CIBs more favourably than comparable non-CIBs.

Table 12: Differences in probability of any type of finance rejection between CIBs and non-CIBs by owner characteristics [(a)].

% points/100

Owner characteristic	Total difference (*p*-value)[(b)]	Assessment difference (*p*-value)	Profile difference (*p*-value)
Age			
15-21	0.5306 (0.000)	0.5037 (0.000)	0.0269 (0.004)
22-27	0.3767 (0.000)	0.3501 (0.000)	0.0266 (0.004)
28-33	0.2419 (0.000)	0.2155 (0.000)	0.0264 (0.004)
34-39	0.1667 (0.000)	0.1404 (0.000)	0.0263 (0.004)
40-45	0.0964 (0.000)	0.0702 (0.000)	0.0262 (0.004)
46-55	0.0287 (0.079)	0.0027 (0.850)	0.0260 (0.004)
56-65	-0.0268 (0.050)	-0.0527 (0.000)	0.0259 (0.004)
66-75	-0.0616 (0.000)	-0.0874 (0.000)	0.0257 (0.004)

76 or more	-0.0810 (0.000)	-0.1066 (0.000)	0.0257 (0.004)
Highest Qualification			
Undergraduate degree	-0.0403 (0.001)	-0.0663 (0.000)	0.0260 (0.005)
Postgraduate degree	0.0699 (0.000)	0.0439 (0.001)	0.0260 (0.005)
Gender			
Female	0.0671 (0.000)	0.0451 (0.001)	0.0220 (0.009)
Ethnicity			
Black African	0.1327 (0.000)	0.1098 (0.000)	0.0229 (0.030)
Black Caribbean	0.0925 (0.000)	0.0732 (0.000)	0.0193 (0.032)
Indian	0.3358 (0.000)	0.3231 (0.000)	0.0127 (0.036)
Pakistani	0.2487 (0.000)	0.2345 (0.000)	0.0143 (0.035)
Bangladeshi	0.1010 (0.000)	0.0879 (0.000)	0.0130 (0.036)
White	0.0214 (0.146)	0.0051 (0.692)	0.0163 (0.033)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

Table 12 reports differences in rejection probabilities, for any type of finance, by owner characteristics. The first key finding is that differences in rejection probabilities diminish with owner age. Regarding assessment differences in particular, this finding suggests that finance providers are less risk averse towards CIBs with older owners. The implication is that CIBs with more mature and experienced owners instil greater confidence in finance providers. Notably also, among businesses whose owners have an undergraduate degree, the likelihood of rejection is actually lower among CIBs. This suggests that an undergraduate degree may have a valuable role in reducing risk aversion towards CIBs (it may help to signal talent/credibility). Interestingly however, a postgraduate degree does not have the same effect: the total and assessment differences are positive indicating a higher likelihood of rejection and risk aversion. Possibly, this is because the time spent attaining a postgraduate degree represents too much time foregone gaining (more valuable) business experience. Rejection probabilities are significantly higher among ethnic minority CIBs compared to ethnic minority non-CIBs. The size and significance of the assessment differences here again point to greater risk aversion among finance providers towards ethnic minority CIBs, rather than profile differences, as being the main explanation for these differences in rejection probabilities.

Table 13: Differences in probability of any type of finance rejection between CIBs and non-CIBs at sample means and by risk type and year [a].

% points/100

Risk type	Total difference (*p*-value)[b]	Assessment difference (*p*-value)	Profile difference (*p*-value)
2004-9			
Difference at sample means	0.0555 (0.001)	0.0295 (0.026)	0.0260 (0.005)
Low risk	-0.0416 (0.000)	-0.0559 (0.000)	0.0143 (0.000)
Medium risk	0.0324 (0.023)	0.0062 (0.673)	0.0262 (0.000)
High risk	0.4256 (0.000)	0.3899 (0.000)	0.0357 (0.000)
2004			
Difference at sample means	-0.0087 (0.632)	-0.0269 (0.035)	0.0182 (0.071)
Low risk	-0.0449 (0.000)	-0.0537 (0.000)	0.0088 (0.006)
Medium risk	-0.0158 (0.266)	-0.0349 (0.011)	0.0191 (0.003)
High risk	0.4243 (0.000)	0.3914 (0.000)	0.0329 (0.001)
2005			
Difference at sample means	0.2058 (0.000)	0.0929 (0.079)	0.1129 (0.000)
Low risk	-0.0994 (0.000)	-0.1621 (0.000)	0.0628 (0.000)
Medium risk	-0.1005 (0.000)	-0.2028 (0.000)	0.1023 (0.000)
High risk	0.3228 (0.000)	0.2162 (0.000)	0.1066 (0.000)
2008			
Difference at sample means	0.0900 (0.001)	0.0889 (0.000)	0.0011 (0.906)
Low risk	-0.0175 (0.087)	-0.0225 (0.008)	0.0050 (0.199)
Medium risk	0.1466 (0.000)	0.1360 (0.000)	0.0107 (0.151)
High risk	0.4576 (0.000)	0.4382 (0.000)	0.0194 (0.103)

2009

Difference at sample means	-0.0029 (0.924)	-0.0139 (0.627)	0.0110 (0.434)
Low risk	-0.0350 (0.000)	-0.0369 (0.000)	0.0019 (0.546)
Medium risk	0.0245 (0.432)	0.0195 (0.505)	0.0050 (0.457)
High risk	0.4466 (0.000)	0.4352 (0.000)	0.0115 (0.353)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

The analysis of any type of finance rejection concludes by looking at differences in rejection probabilities by hypothetical risk types and year. A low risk firm is defined here as having: £5m or more in assets; a minimal risk Dun and Bradstreet credit rating; no previous loan defaults; a relationship of more than 15 years with its main finance provider; and an owner aged between 56 and 65 with an undergraduate degree. A medium risk firm has: between £100,000 and £249,999 in assets; an average risk Dun and Bradstreet credit rating; no previous loan defaults; a relationship of between 4 and 6 years with its main finance provider; and an owner aged between 34 and 39 with an undergraduate degree. A high risk firm has: fewer than £10,000 in assets; a high risk Dun and Bradstreet credit rating; a previous loan default; a relationship of less than one year with its main finance provider; and an owner aged between 22 and 27 with no undergraduate degree.

Across the whole sample period low risk CIBs have lower rejection probabilities than low risk non-CIBs. Indeed, the negative assessment difference indicates that finance providers are less risk averse towards low risk CIBs. Medium risk CIBs have higher rejection probabilities than medium risk non-CIBs but this is due to profile differences (relating to other business/owner characteristics outside of the definition of the risk types); there is no evidence that finance providers are any more or less risk averse toward medium risk CIBs (the assessment difference is insignificantly different from zero). However, among high risk businesses, CIBs have significantly larger rejection probabilities than non-CIBs (by almost 43% points). This is mainly due to an assessment difference implying that finance providers are significantly more risk averse towards high risk CIBs than high risk non-CIBs.

Looking at the findings over time, the estimates for 2005 (relating to the EMB booster sample) suggest that the patterns relating to differences in rejection probabilities are similar to other years. That is, there is evidence that finance providers are less risk averse towards low risk ethnic minority CIBs (negative assessment differences) but more risk averse towards high risk ethnic minority CIBs (positive assessment differences). However, there is also a large negative assessment difference for medium risk ethnic minority CIBs suggesting that finance providers are also less risk averse towards these businesses than towards medium risk ethnic minority non-CIBs.

There are also some interesting findings relating to the periods during and directly following the credit crisis (2008/9). In particular, low risk CIBs appear to have continued to be looked on favourably by finance providers in these years: total and assessment differences remain

negative (as they were in 2004). However, finance providers' attitudes towards medium risk CIBs appear to have deteriorated with these businesses experiencing positive total and assessment differences in rejection probabilities in 2008 (compared to negative assessment difference in 2004). In other words, whereas finance providers were less risk averse towards medium risk CIBs before the credit crisis, immediately following the credit crisis they appear to have become more risk averse towards these businesses. The likely explanation for this change is increased uncertainty about the prospects for CIBs in a recession (rather than lack of assets/collateral since the comparison is between CIBs and non-CIBs with the same level of assets). Interestingly, the (assessment) difference in rejection probabilities was zero in 2009 suggesting that finance providers had, by this time, become equally risk averse towards comparable non-CIBs.

A similar pattern is observed for the average CIB: the assessment difference is -2.7% points in 2004 but increases to 8.9% points in 2008 indicating increased risk aversion. As with medium risk CIBs, the assessment difference fell back to zero in 2009 suggesting non-CIB rejection probabilities had, by then, caught up with those of CIBs. So in all, this suggests that the credit crisis hit CIBs early on with risk aversion spreading towards other businesses later.

There is also evidence of increased risk aversion toward high risk CIBs following the credit crisis with total and assessment differences increasing on their already high levels before the credit crisis. However, unlike medium risk and average CIBs, the difference in rejection probabilities doesn't seem to have decreased in 2009. In other words, it seems that finance providers remained particularly risk averse towards high risk CIBs.

The following three tables present findings for differences in overdraft rejection probabilities. The discussion will be shorter here as many of the results reflect the previous findings for any type of finance.

Table 14: Differences in probability of overdraft rejection between CIBs and non-CIBs by firm characteristics [(a)].

% points/100

Firm characteristic	Total difference (*p*-value)[(b)]	Assessment difference (*p*-value)	Profile difference (*p*-value)
Difference at sample means	0.0284 (0.106)	0.0022 (0.866)	0.0262 (0.007)
Content sectors (all)	0.0801 (0.000)	0.0226 (0.194)	0.0574 (0.000)
Music and Visual Performing Arts	-0.0512 (0.002)	-0.0483 (0.005)	-0.0030 (0.844)
Software	0.1382 (0.000)	0.0531 (0.134)	0.0850 (0.000)
Other Creative Content	0.1983 (0.001)	0.0884 (0.041)	0.1099 (0.003)

Service sectors (all)	-0.0555 (0.000)	-0.0304 (0.024)	-0.0251 (0.023)
Advertising	-0.0248 (0.536)	-0.0378 (0.215)	0.0129 (0.713)
Architecture	-0.0653 (0.000)	-0.0281 (0.057)	-0.0372 (0.001)
No. of Employees			
1	0.0083 (0.621)	-0.0155 (0.230)	0.0238 (0.008)
2-10	-0.0470 (0.001)	-0.0746 (0.000)	0.0276 (0.006)
11-49	0.1289 (0.000)	0.1023 (0.000)	0.0266 (0.007)
50-249	0.2026 (0.000)	0.1765 (0.000)	0.0261 (0.007)
Assets			
Less than £10,000	0.0556 (0.004)	0.0330 (0.023)	0.0226 (0.013)
£10,000 - £49,999	-0.0611 (0.000)	-0.0884 (0.000)	0.0274 (0.011)
£50,000 - £99,999	-0.0894 (0.000)	-0.1154 (0.000)	0.0261 (0.011)
£100,000 - £249,999	0.0966 (0.000)	0.0733 (0.000)	0.0233 (0.012)
£250,000 - £499,999	0.1053 (0.000)	0.0821 (0.000)	0.0233 (0.012)
£500,000 - £999,999	-0.0387 (0.002)	-0.0606 (0.000)	0.0218 (0.013)
£1m - £4,999,999	0.1243 (0.000)	0.1015 (0.000)	0.0228 (0.013)
£5m or more	0.0258 (0.091)	0.0079 (0.487)	0.0179 (0.016)
Sales			
Less than £10,000	0.3055 (0.000)	0.2762 (0.000)	0.0294 (0.008)
£10,000 - £49,999	0.0147 (0.416)	-0.0120 (0.479)	0.0266 (0.010)
£50,000 - £99,999	0.3361 (0.000)	0.3147 (0.000)	0.0214 (0.014)
£100,000 - £249,999	0.3022 (0.000)	0.2792 (0.000)	0.0230 (0.013)
£250,000 - £499,999	0.1156 (0.000)	0.0958 (0.000)	0.0198 (0.016)
£500,000 - £999,999	0.0426 (0.022)	0.0180 (0.297)	0.0245 (0.012)
£1m - £4,999,999	-0.0513 (0.000)	-0.0721 (0.000)	0.0208 (0.015)
£5m or more	-0.0739 (0.000)	-0.0980 (0.000)	0.0241 (0.012)
Profitability			

Loss	0.0267 (0.201)	-0.0061 (0.708)	0.0328 (0.003)
Risk Rating			
Minimal risk	0.0241 (0.115)	-0.0002 (0.989)	0.0242 (0.001)
Low risk	0.0230 (0.134)	-0.0017 (0.892)	0.0246 (0.001)
Average risk	-0.0108 (0.452)	-0.0386 (0.001)	0.0279 (0.001)
High risk	0.2505 (0.000)	0.2138 (0.000)	0.0368 (0.000)
No risk rating	-0.0007 (0.967)	-0.0333 (0.014)	0.0327 (0.001)
Financial Delinquency			
Loan Default	-0.1130 (0.000)	-0.1546 (0.000)	0.0417 (0.000)
Business Age			
Under 1 year	-0.0584 (0.000)	-0.0882 (0.000)	0.0298 (0.006)
1-2 years	-0.0256 (0.123)	-0.0533 (0.000)	0.0277 (0.007)
2-3 years	-0.0107 (0.526)	-0.0375 (0.002)	0.0267 (0.007)
4-6 years	0.0090 (0.604)	-0.0163 (0.198)	0.0254 (0.008)
7-9 years	0.0222 (0.211)	-0.0023 (0.861)	0.0244 (0.008)
10-15 years	0.0345 (0.055)	0.0109 (0.415)	0.0236 (0.009)
More than 15 years	0.0562 (0.002)	0.0342 (0.014)	0.0220 (0.010)
Region			
East	0.0523 (0.003)	0.0341 (0.020)	0.0182 (0.020)
East Midlands	0.0075 (0.623)	-0.0101 (0.414)	0.0176 (0.021)
London	0.0246 (0.215)	-0.0013 (0.934)	0.0259 (0.012)
North East	0.0040 (0.786)	-0.0128 (0.281)	0.0167 (0.022)
Northern Ireland			
North West	-0.0855 (0.000)	-0.1034 (0.000)	0.0179 (0.020)
Scotland	-0.0146 (0.328)	-0.0341 (0.005)	0.0196 (0.018)
South East	0.1187 (0.000)	0.0984 (0.000)	0.0203 (0.017)
South West	-0.0656 (0.000)	-0.0820 (0.000)	0.0164 (0.023)

Wales	-0.1054 (0.000)	-0.1250 (0.000)	0.0197 (0.018)
West Midlands	-0.0059 (0.669)	-0.0225 (0.046)	0.0166 (0.022)
Yorkshire and Humberside	0.1509 (0.000)	0.1361 (0.000)	0.0148 (0.026)
Number of finance providers			
More than 1	0.0371 (0.052)	0.0060 (0.667)	0.0310 (0.005)
Length of relationship with main finance provider			
Under 1 year	0.0589 (0.015)	0.0235 (0.243)	0.0353 (0.003)
1-3 years	0.0706 (0.001)	0.0430 (0.012)	0.0276 (0.005)
4-6 years	-0.0290 (0.041)	-0.0539 (0.000)	0.0249 (0.006)
7-9 years	0.0115 (0.498)	-0.0136 (0.305)	0.0250 (0.006)
10-15 years	0.0099 (0.538)	-0.0139 (0.270)	0.0238 (0.007)
More than 15 years	0.0472 (0.002)	0.0310 (0.009)	0.0162 (0.012)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

The first notable difference, compared to the previous results, is that the total and assessment differences in overdraft rejection probabilities are statistically insignificant when evaluated for an average CIB over the whole sample period. In other words, there is no evidence that an average CIB found it harder to obtain an overdraft than a comparable non-CIB due to banks being more risk averse towards them. The only difference in rejection probabilities for a typical CIB is due to differences in their risk profile compared to a typical non-CIB (in other words, the average CIB has a higher risk profile).

However, analysis by CI sub-sectors indicates that overdraft rejection probabilities are significantly higher among CIBs in Other Creative Content sectors. The total difference in these rejection probabilities is 19.8% points which is made up of an 8.8% point assessment difference and an 11% point profile difference. The assessment difference, in particular, suggests that banks are more risk averse towards CIBs in Other Creative Content sectors, than non-CIBs with similar risk profiles, when assessing overdraft applications. This result points to more acute issues of market failure in the supply of overdrafts to CIBs in Other Creative Content sectors relative to comparable non-CIBs. On the other hand, banks appear to be less risk averse towards CIBs in: Music/Visual Performing Arts (assessment

difference=-4.8% points); and in Creative Service sectors, specifically Architecture (assessment difference=-2.8% points).

Looking at differences in overdraft rejection probabilities conditional on other firm characteristics, there are significant total and assessment differences for businesses of different sizes. As with any type of finance, the largest total/assessment differences seem to be experienced by CIBs with 50-249 employees. Also, there is evidence that greater assets does not necessarily reduce banks' risk aversion towards CIBs: for example, whereas the assessment difference is 3.3% points among businesses with less than £10,000 in assets, this difference is over 10% points among businesses with £1m-£4,999,999 in assets; the indication of this result is that banks are more risk averse towards CIBs in the larger asset category. On the other hand, among businesses with £5m or more in assets the results suggest that banks are no more or less risk averse towards CIBs than non-CIBs (the assessment difference is insignificantly different from zero). Regarding sales, banks appear to be less risk averse towards CIBs which make higher levels of sales: the assessment difference generally diminishes with sales and is even negative above £1m suggesting that banks may be less risk averse towards these CIBs than comparable non-CIBs.

In terms of risk ratings, again it appears that banks are more risk averse towards high risk rated CIBs than comparable non-CIBs (the assessment difference is over 21% points for this group). In contrast, among businesses with loan defaults, the assessment difference is negative suggesting banks are less risk averse towards CIBs with loan defaults when assessing them for overdrafts. There is no evidence that banks are more risk averse towards younger CIBs when assessing them for overdrafts. Indeed, the assessment differences for younger business ages appear to be negative, suggesting banks may even be less risk averse towards CIBs in these groups; it is only in the oldest age group (more than 15 years) that the assessment difference is positive suggesting greater risk aversion. Regarding financial relationships, there is also little evidence that CIBs with shorter relationships are assessed more strictly than comparable non-CIBs (although there do appear to be offsetting positive and negative assessment differences at relationship lengths of 1-3 years and 4-6 years respectively).

Table 15: Differences in probability of overdraft rejection between CIBs and non-CIBs by owner characteristics [(a)].

% points/100

Owner characteristic	Total difference (*p*-value)[(b)]	Assessment difference (*p*-value)	Profile difference (*p*-value)
Age			
15-21	0.4332 (0.000)	0.4078 (0.000)	0.0254 (0.008)
22-27	0.2925 (0.000)	0.2668 (0.000)	0.0256 (0.008)
28-33	0.1832 (0.000)	0.1574 (0.000)	0.0258 (0.008)
34-39	0.1246 (0.000)	0.0986 (0.000)	0.0259 (0.008)
40-45	0.0697 (0.000)	0.0436 (0.005)	0.0260 (0.008)
46-55	0.0157 (0.339)	-0.0105 (0.403)	0.0262 (0.007)
56-65	-0.0307 (0.017)	-0.0570 (0.000)	0.0263 (0.007)
66-75	-0.0617 (0.000)	-0.0881 (0.000)	0.0264 (0.007)
76 or more	-0.0800 (0.000)	-0.1065 (0.000)	0.0265 (0.007)
Highest Qualification			
Undergraduate degree	-0.0343 (0.010)	-0.0605 (0.000)	0.0262 (0.007)
Postgraduate degree	0.0350 (0.056)	0.0088 (0.521)	0.0262 (0.007)
Gender			
Female	-0.0446 (0.000)	-0.0663 (0.000)	0.0217 (0.015)
Ethnicity			
Black African	0.1901 (0.000)	0.1662 (0.000)	0.0239 (0.035)
Black Caribbean	0.1120 (0.000)	0.0927 (0.000)	0.0193 (0.047)
Indian	0.2828 (0.000)	0.2735 (0.000)	0.0093 (0.103)
Pakistani	0.1901 (0.000)	0.1763 (0.000)	0.0138 (0.071)
Bangladeshi	0.0958 (0.000)	0.0848 (0.000)	0.0110 (0.088)

White	-0.0181 (0.164)	-0.0349 (0.000)	0.0168 (0.057)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

As with any type of finance, total and assessment differences in overdraft rejection probabilities diminish with the owner's age suggesting that banks are less risk averse towards CIBs with older owners. Again, CIBs whose owners have an undergraduate degree are assessed more favourably than comparable non-CIBs (the assessment difference is minus six percentage points). However, unlike any type of finance rejection, banks appear to be less risk averse towards CIBs with female owners. There also appear to be significant assessment differences among EMBs suggesting greater risk aversion towards ethnic minority CIBs than comparable ethnic minority non-CIBs.

Table 16: Differences in probability of overdraft rejection between CIBs and non-CIBs at sample means and by risk type and year [(a)].

% points/100

Risk type	Total difference (*p*-value)[(b)]	Assessment difference (*p*-value)	Profile difference (*p*-value)
2004-9			
Difference at sample means	0.0284 (0.106)	0.0022 (0.866)	0.0262 (0.007)
Low risk	-0.0106 (0.047)	-0.0196 (0.000)	0.0090 (0.001)
Medium risk	0.0108 (0.502)	-0.0139 (0.343)	0.0247 (0.000)
High risk	0.4062 (0.000)	0.3640 (0.000)	0.0422 (0.000)
2004			
Difference at sample means	-0.0292 (0.085)	-0.0480 (0.001)	0.0188 (0.127)
Low risk	-0.0217 (0.000)	-0.0257 (0.000)	0.0041 (0.031)
Medium risk	-0.0681 (0.000)	-0.0825 (0.000)	0.0143 (0.016)
High risk	0.3201 (0.000)	0.2894 (0.000)	0.0307 (0.005)
2005			
Difference at sample	0.1673 (0.004)	0.0516 (0.282)	0.1157 (0.000)

means			
Low risk	-0.0131 (0.382)	-0.0595 (0.001)	0.0465 (0.000)
Medium risk	0.0982 (0.034)	-0.0109 (0.815)	0.1091 (0.000)
High risk	0.4209 (0.000)	0.2768 (0.000)	0.1441 (0.000)
2008			
Difference at sample means	0.0520 (0.030)	0.0459 (0.039)	0.0061 (0.599)
Low risk	-0.0005 (0.947)	-0.0032 (0.653)	0.0027 (0.191)
Medium risk	0.0579 (0.011)	0.0475 (0.023)	0.0104 (0.108)
High risk	0.4836 (0.000)	0.4581 (0.000)	0.0255 (0.050)
2009			
Difference at sample means	-0.0159 (0.577)	-0.0174 (0.437)	0.0015 (0.912)
Low risk	-0.0075 (0.374)	-0.0074 (0.359)	-0.0002 (0.932)
Medium risk	0.0049 (0.865)	0.0031 (0.911)	0.0018 (0.764)
High risk	0.4099 (0.000)	0.4012 (0.000)	0.0086 (0.451)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

Analysis by risk type and year suggest that banks, over the period 2004-9, were less risk averse towards low risk CIBs than low risk non-CIBs (the assessment difference is almost minus two percentage points) but more risk averse towards high risk CIBs than high risk non-CIBs. Also, there is evidence of increased risk aversion toward average/medium risk CIBs during the credit crisis: the assessment difference for these businesses increased from -4.8%/-8.25% points in 2004 to +4.6%/+4.75% points in 2008 (before falling back to zero in 2009). This represents a turnaround for these CIBs from more favourable treatment, compared to otherwise similar non-CIBs, in 2004 to less favourable treatment in 2008 (and to receiving the same treatment as non-CIBs in 2009, possibly as a result of increasing risk aversion towards other businesses following the credit crisis).

Risk aversion towards low risk CIBs also appears to have increased: the assessment difference for these firms has risen from -2.6% points in 2004 to no difference in 2008/9. Similarly the assessment difference for high risk CIBs has widened from just less than 30% points in 2004 to over 40% points in 2008/9.

What this indicates is that the gap in differences in rejection probabilities between CIBs and non-CIBs, caused by differences in lenders attitudes to risk, has closed for low and medium

risk firms but widened for high risk firms. But note that even though the gap has closed for low and medium risk CIBs, from their owners' perspective the situation has deteriorated, compared to non-CIBs, due to their relatively favourable treatment before 2008.

In summary, there appear to be significant variations in finance providers' risk attitudes towards CIBs as reflected in assessment differences in rejection probabilities. In some cases, as with Other Creative Content sector and high risk firms, finance providers appear to be more risk averse towards CIBs than comparable non-CIBs. In contrast, finance providers appear to look on low risk CIBs favourably relative to similar low risk non-CIBs. In other words, it is not the case that finance providers are universally more risk averse toward CIBs: in some cases even they are less risk averse toward CIBs. Further, the direction of tilt in risk aversion depends on the type of finance, and the time period, under consideration. This variation in results is hardly surprising given the diverse nature of CIBs. The utility of the preceding tables is that they provide a useful reference for differences in rejection probabilities and how these differences vary over specific firm types and time.

The following tables go onto look at differences in discouragement probabilities. Whereas the assessment differences in rejection probabilities spoke to differences in finance providers' risk attitudes to CIBs, the perception differences reported below suggest differences in how CIB owners *feel* they will be assessed by finance providers.

If business owners are well informed they would be aware of instances where finance providers were more/less risk averse towards them and this would be reflected in their perception differences. Indeed, if business owners are perfectly informed then their perceptions differences would be the same as their assessment differences. In contrast, misperceptions about the likelihood of rejection (among CIB and/or non-CIB owners) will give rise to discrepancies between assessment and perceptions differences. This is useful to bear in mind when looking at the following tables.

This analysis begins with discouragement regarding any type of finance before looking at term loan discouragement in particular.

Table 17: Differences in probability of any type of finance discouragement between CIBs and non-CIBs by firm characteristics [(a)].

% points/100

Firm characteristic	Total difference (*p*-value)[(b)]	Perceptions difference (*p*-value)	Profile difference (*p*-value)
Difference at sample means	0.0304 (0.000)	0.0103 (0.131)	0.0201 (0.000)
Content sectors (all)	0.0575 (0.000)	0.0183 (0.055)	0.0391 (0.000)
Music and visual performing arts	-0.0142 (0.155)	0.0023 (0.797)	-0.0165 (0.000)
Software	0.0691 (0.000)	0.0001 (0.994)	0.0690 (0.000)

Other creative content	0.1587 (0.000)	0.0921 (0.008)	0.0665 (0.000)
Service sectors (all)	-0.0223 (0.001)	-0.0061 (0.300)	-0.0163 (0.008)
Advertising	0.0058 (0.771)	-0.0071 (0.658)	0.0129 (0.532)
Architecture	-0.0315 (0.000)	-0.0057 (0.316)	-0.0258 (0.000)
Assets			
Less than £10,000	0.0218 (0.022)	0.0041 (0.541)	0.0178 (0.003)
£10,000 - £49,999	0.0071 (0.393)	-0.0099 (0.102)	0.0169 (0.003)
£50,000 - £99,999	-0.0212 (0.000)	-0.0368 (0.000)	0.0156 (0.002)
£100,000 - £249,999	0.0027 (0.677)	-0.0110 (0.034)	0.0137 (0.002)
£250,000 - £499,999	0.1149 (0.000)	0.1001 (0.000)	0.0148 (0.002)
£500,000 - £999,999	0.1853 (0.000)	0.1736 (0.000)	0.0117 (0.001)
£1m or more	0.0400 (0.000)	0.0277 (0.000)	0.0123 (0.002)
Risk Rating			
Minimal risk	-0.0193 (0.000)	-0.0292 (0.000)	0.0099 (0.000)
Low risk	0.0575 (0.000)	0.0458 (0.000)	0.0117 (0.000)
Average risk	0.0569 (0.000)	0.0396 (0.000)	0.0173 (0.000)
High risk	0.1232 (0.000)	0.0961 (0.000)	0.0271 (0.000)
No risk rating	0.0048 (0.560)	-0.0206 (0.001)	0.0254 (0.000)
Number of finance providers			
More than 1	0.0462 (0.000)	0.0261 (0.000)	0.0200 (0.000)
Length of relationship with main finance provider			
Under 1 year	0.0082 (0.386)	-0.0174 (0.014)	0.0256 (0.000)
1-3 years	0.0198 (0.025)	-0.0020 (0.759)	0.0218 (0.000)
4-6 years	0.0033 (0.642)	-0.0160 (0.005)	0.0192 (0.000)
7-9 years	0.0661 (0.000)	0.0450 (0.000)	0.0211 (0.000)

10-15 years	0.0430 (0.000)	0.0257 (0.000)	0.0172 (0.000)
More than 15 years	0.0625 (0.000)	0.0482 (0.000)	0.0143 (0.000)
Main source of financial advice			
Bank	0.0308 (0.000)	0.0101 (0.134)	0.0207 (0.000)
Accountant	0.0258 (0.002)	0.0052 (0.431)	0.0206 (0.000)
Business adviser	0.0324 (0.000)	0.0155 (0.013)	0.0168 (0.000)
Government	0.4453 (0.000)	0.4259 (0.000)	0.0195 (0.000)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

Looking at an average CIB (i.e., the row for differences 'at sample means'), whilst the probability of discouragement is higher for an average CIB this is due to differences in risk profiles rather than a difference in perceptions about the supply conditions facing the business. In other words, the owner of an average CIB is no more or less pessimistic about their chances of obtaining finance than an owner of a comparable non-CIB. This inconsistency with the assessment difference for an average CIB (which is positive) suggests there are misperceptions about the likelihood of rejection. Indeed, further analysis indicates that, on average, CIBs tend to under-estimate their likelihood of rejection[24]. The finding of a positive profile difference (just over 2% points), on the other hand, is unsurprising since the average CIB is smaller and younger, and therefore more susceptible to discouragement, than an average non-CIB[25].

In contrast to the results for the average CIB, the analysis reveals significant perceptions differences for certain types of CIB. In particular, owners of CIBs in Other Creative Content sectors are about 9.2% points more likely to feel discouraged than owners of non-CIBs with similar risk profiles. This suggests that these CIB owners are more pessimistic about their chances of obtaining finance than owners of non-CIBs with similar risk profiles. This pessimism would appear to be well grounded since the analysis of differences in rejection probabilities indicates that finance providers are more risk averse towards CIBs in Other Creative Content sectors relative to comparable non-CIBs. The size of the perceptions difference nonetheless is smaller than the corresponding assessment difference suggesting these CIB owners still under-estimate their likelihood of rejection.

The absence of positive perceptions differences for firms with fewer than £250,000 in assets (which were found to have positive assessment differences: see Table 11) suggests that owners of smaller CIBs under-estimate their actual likelihood of rejection. Whilst businesses with £250,000-£499,999 in assets have a large perceptions difference (10% points), this

[24] This analysis is available from the author on request.

[25] The average CIB has a higher risk profile and is therefore more likely to be rejected on account of this profile. Accordingly the perceived likelihood of rejection of an average CIB will also be higher reflecting their riskier average profile.

difference is smaller than the corresponding assessment difference (see Table 11) which again is consistent with these CIB owners under-estimating their actual likelihood of rejection. Businesses with £500,000-£999,999 in assets also have a large perceptions difference (over 17% points). This is greater than their assessment difference which nonetheless points again to misperceptions about the likelihood of rejection[26].

Differences by risk ratings are significant and they seem to be mainly due to genuine differences in perceptions about the supply conditions facing the business owner rather than differences in risk profiles. Owners of minimal risk CIBs appear to have a more positive outlook on the market: the perceptions difference for these firms is almost minus three percentage points implying their perceived likelihood of rejection is lower than among owners of comparable non-CIBs. This is smaller than the corresponding assessment difference for minimal risk rated CIBs; these CIB owners also seem to under-estimate their actual rejection probabilities. The perceptions differences for low and average risk rated CIBs are positive suggesting owners of these CIBs take a more pessimistic outlook on their chances of obtaining finance. However, these perceptions differences are greater than the corresponding assessment differences (see Table 11) suggesting that these CIB owners over-estimate their likelihood of rejection (and/or that the owners of comparable non-CIBs under-estimate their likelihood of rejection).

It is also notable that perceptions differences increase with the length of financial relationships suggesting CIB owners become more pessimistic over the course of these relationships. Again, inconsistencies between the perceptions differences at different relationship lengths and the corresponding assessment differences in Table 11 indicate the presence of misperceptions about the likelihood of rejection.

Table 18: Differences in probability of any type of finance discouragement between CIBs and non-CIBs by owner characteristics [(a)].

% points/100

Owner characteristic	Total difference (*p*-value)[(b)]	Perceptions difference (*p*-value)	Profile difference (*p*-value)
Experience			
Less than 1 year	-0.0481 (0.000)	-0.0690 (0.000)	0.0210 (0.000)
1-3 years	-0.0282 (0.000)	-0.0486 (0.000)	0.0204 (0.000)
4-6 years	-0.0035 (0.625)	-0.0235 (0.000)	0.0200 (0.000)
7-9 years	0.0145 (0.080)	-0.0054 (0.348)	0.0199 (0.000)
10-15 years	0.0355 (0.000)	0.0158 (0.015)	0.0197 (0.000)

[26] This time however these CIB owners seem to over-estimate their likelihood of rejection and/or owners of comparable non-CIBs under-estimate their rejection likelihood.

More than 15 years	0.0768 (0.000)	0.0574 (0.000)	0.0194 (0.000)
Gender			
Female	-0.0065 (0.258)	-0.0239 (0.000)	0.0174 (0.001)
Ethnicity			
Black African	0.2156 (0.000)	0.1998 (0.000)	0.0158 (0.011)
Black Caribbean	0.1463 (0.000)	0.1323 (0.000)	0.0140 (0.011)
Indian	0.1136 (0.000)	0.1086 (0.000)	0.0049 (0.011)
Bangladeshi	0.4692 (0.000)	0.4594 (0.000)	0.0098 (0.011)
White	-0.0092 (0.036)	-0.0167 (0.001)	0.0074 (0.011)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

Looking at owner characteristics a notable finding is that, among CIB owners, perceptions about the supply conditions confronting them deteriorate with experience. Perhaps due to over optimism brought about by inexperience (Fraser and Greene, 2006), CIB owners with less than 6 years of experience actually have a lower perceived likelihood of rejection than owners of comparable non-CIBs (i.e., the perceptions differences are negative). However, this outlook turns to pessimism among CIB owners with 10 years or more experience: these owners have a higher perceived likelihood of rejection relative to comparable non-CIBs leading to positive perceptions differences. A possible explanation for this deterioration is that previous bad experiences with finance providers have adversely affected their owners' outlook. In contrast, the earlier analysis of differences in rejection probabilities suggested that finance providers are actually less risk averse towards older CIB owners (see Table 12). If experienced CIB owners were aware of this they would surely be more optimistic about their chances of obtaining finance. There are also significant perceptions differences among EMBs. For example Black African CIB owners are almost 20% points more likely to feel discouraged than Black African owners of comparable non-CIBs.

Comparisons of the perceptions differences in Table 18 with the assessment differences in Table 12 provide further indications of the presence of misperceptions about the likelihood of rejection. In particular the perceptions differences for CIBs with female, Indian and White owners are smaller than the corresponding assessment differences; again, this is consistent with under-estimation of the actual likelihood of rejection by these CIB owners. Conversely, Black and Bangladeshi CIB owners seem overly pessimistic (the perceptions differences of these CIBs exceed their corresponding assessment differences).

In the following table differences in discouragement are reported for stylised risk types by year. In this instance a low risk firm is defined here as having: £1m or more in assets; a minimal risk Dun and Bradstreet rating; and a relationship of more than 15 years with its main finance provider. A medium risk firm has: between £100,000 and £249,999 in assets;

an average risk Dun and Bradstreet rating; and a relationship of between 4 and 6 years with its main finance provider. A high risk firm has: fewer than £10,000 in assets; a high risk Dun and Bradstreet rating; and a relationship of less than one year with its main finance provider[27].

Table 19: Differences in probability of any type of finance discouragement between CIBs and non-CIBs at sample means and by risk type and year [(a)].

% points/100

Risk type	Total difference (*p*-value)[(b)]	Perceptions difference (*p*-value)	Profile difference (*p*-value)
2004-9			
Difference at sample means	0.0304 (0.000)	0.0103 (0.131)	0.0201 (0.000)
Low risk	-0.0057 (0.000)	-0.0083 (0.000)	0.0027 (0.000)
Medium risk	-0.0005 (0.933)	-0.0106 (0.023)	0.0101 (0.000)
High risk	0.0388 (0.008)	0.0118 (0.243)	0.0269 (0.000)
2004			
Difference at sample means	0.0245 (0.005)	0.0203 (0.005)	0.0043 (0.115)
Low risk	-0.0045 (0.000)	-0.0052 (0.000)	0.0007 (0.001)
Medium risk	-0.0245 (0.000)	-0.0281 (0.000)	0.0036 (0.001)
High risk	0.0071 (0.560)	-0.0056 (0.580)	0.0126 (0.000)
2005			
Difference at sample means	0.1210 (0.000)	0.0334 (0.270)	0.0877 (0.000)
Low risk	-0.0172 (0.000)	-0.0291 (0.000)	0.0119 (0.000)
Medium risk	0.1013 (0.000)	0.0602 (0.015)	0.0411 (0.000)
High risk	0.3640 (0.000)	0.2674 (0.000)	0.0966 (0.000)
2008			
Difference at sample means	0.0014 (0.856)	0.0022 (0.764)	-0.0008 (0.808)

[27] Differences in the definition of risk types in the discouragement analysis compared to the financial rejection analysis reflect differences in the explanatory variables included in the respective models.

Low risk	-0.0029 (0.000)	-0.0031 (0.000)	0.0001 (0.573)
Medium risk	-0.0145 (0.000)	-0.0154 (0.000)	0.0009 (0.450)
High risk	-0.0238 (0.056)	-0.0279 (0.011)	0.0041 (0.283)
2009			
Difference at sample means	-0.0119 (0.235)	-0.0097 (0.293)	-0.0022 (0.644)
Low risk	-0.0055 (0.000)	-0.0055 (0.000)	0.0001 (0.872)
Medium risk	-0.0307 (0.000)	-0.0314 (0.000)	0.0007 (0.641)
High risk	-0.0919 (0.000)	-0.0958 (0.000)	0.0039 (0.384)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

Over the period 2004-9 the perceptions differences suggest that owners of low and medium risk CIB types have more optimistic perceptions about the supply conditions facing them than owners of comparable non-CIBs (their perceptions differences are negative). However, there is no apparent difference in perceptions among high risk types. This pattern is largely the same in 2008 and 2009 except that CIB high risk types also have negative perception differences (implying lower perceived rejection likelihoods relative to high risk non-CIBs) in these years. This would seem to indicate that, regarding access to a range of finances, the perceptions of owners of high risk non-CIBs have been worse affected by the credit crisis than those of high risk CIB owners. The differences in 2005, relating to the EMB sample present a different pattern with large positive perceptions differences, suggesting worse perceptions about supply conditions relative to comparable non-CIBs, observed for medium and high risk CIBs.

Regarding the correspondence between perceptions and assessment differences, it is notable that the perceptions differences for medium and high risk types are smaller than their respective assessment differences. Again, this is consistent with these CIB owners under-estimating their likelihood of rejection. Conversely, the perceptions difference for the low risk type is bigger than the corresponding assessment difference which may be due to these CIB owners over-estimating their likelihood of rejection.

Table 20: Differences in probability of term loan discouragement between CIBs and non-CIBs by firm characteristics [(a)].

% points/100

Firm characteristic	Total difference (*p*-value)[(b)]	Perceptions difference (*p*-value)	Profile difference (*p*-value)
Difference at sample means	0.0349 (0.000)	0.0209 (0.002)	0.0140 (0.000)
Content sectors (all)	0.0579 (0.000)	0.0312 (0.002)	0.0267 (0.000)
Music and visual performing arts	0.0022 (0.809)	0.0135 (0.102)	-0.0113 (0.001)
Software	0.0595 (0.000)	0.0126 (0.301)	0.0468 (0.000)
Other creative content	0.1549 (0.000)	0.1087 (0.004)	0.0461 (0.001)
Service sectors (all)	-0.0077 (0.175)	0.0020 (0.654)	-0.0097 (0.012)
Advertising	0.0069 (0.674)	-0.0018 (0.869)	0.0087 (0.495)
Architecture	-0.0125 (0.002)	0.0032 (0.435)	-0.0157 (0.000)
Assets			
Less than £10,000	0.0356 (0.000)	0.0233 (0.001)	0.0123 (0.002)
£10,000 - £49,999	0.0094 (0.168)	-0.0026 (0.637)	0.0121 (0.002)
£50,000 - £99,999	0.0024 (0.678)	-0.0085 (0.083)	0.0109 (0.002)
£100,000 - £249,999	0.0025 (0.600)	-0.0059 (0.152)	0.0085 (0.001)
£250,000 - £499,999	0.1068 (0.000)	0.0974 (0.000)	0.0094 (0.001)
£500,000 - £999,999	0.1506 (0.000)	0.1457 (0.000)	0.0048 (0.001)
£1m or more	0.0611 (0.000)	0.0547 (0.000)	0.0064 (0.001)
Risk Rating			
Minimal risk	-0.0050 (0.000)	-0.0084 (0.000)	0.0035 (0.000)
Low risk	0.0282 (0.000)	0.0215 (0.000)	0.0067 (0.000)
Average risk	0.0555 (0.000)	0.0446 (0.000)	0.0110 (0.000)
High risk	0.1021 (0.000)	0.0810 (0.000)	0.0211 (0.000)

No risk rating	0.0317 (0.000)	0.0126 (0.060)	0.0191 (0.000)
Number of finance providers			
More than 1	0.0414 (0.000)	0.0290 (0.000)	0.0124 (0.000)
Length of relationship with main finance provider			
Under 1 year	0.0583 (0.000)	0.0391 (0.000)	0.0192 (0.000)
1-3 years	0.0229 (0.002)	0.0067 (0.292)	0.0162 (0.000)
4-6 years	0.0132 (0.030)	0.0004 (0.947)	0.0129 (0.000)
7-9 years	0.0849 (0.000)	0.0683 (0.000)	0.0167 (0.000)
10-15 years	0.0423 (0.000)	0.0311 (0.000)	0.0112 (0.000)
More than 15 years	0.0548 (0.000)	0.0461 (0.000)	0.0087 (0.000)
Main source of financial advice			
Bank	0.0420 (0.000)	0.0291 (0.000)	0.0130 (0.000)
Accountant	0.0158 (0.007)	0.0033 (0.536)	0.0124 (0.000)
Business adviser	0.0351 (0.000)	0.0199 (0.003)	0.0153 (0.000)
Government	0.4178 (0.000)	0.4005 (0.000)	0.0174 (0.000)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

The term loan discouragement results are summarized briefly due to their similarity with the previous results for any type of finance. The first result to note is the significant perception difference at sample means. That is, the typical CIB owner has a higher perceived likelihood of rejection than a comparable non-CIB. Also, there is a positive perceptions difference for Creative Content sectors in general and Other Creative Content sectors in particular. This suggests that owners of these CIBs are more pessimistic about their chances of obtaining term loans than owners of comparable non-CIBs (so that they are less likely to apply for one in the first place).

As with any type of finance, term loan discouragement is higher at larger asset levels due to perception differences. Again, perceptions differences increase with risk ratings suggesting owners of high risk rated CIBs are cognisant of lenders' risk aversion towards them (recall the large assessment difference for high risk rated firms reported earlier in this section).

Both short (less than 1 year) and long (above 6 years) financial relationships are associated with positive perceptions differences. This convex relationship suggests that while perceptions of the likelihood of obtaining loans may initially improve as the CIB builds up a track record with the lender, as the relationship gets longer (above 6 years) these perceptions deteriorate (i.e., CIB owners become more pessimistic about their chances of obtaining loans).

Table 21: Differences in probability of term loan discouragement between CIBs and non-CIBs by owner characteristics [(a)].

% points/100

Owner characteristic	Total difference (*p*-value)[(b)]	Perceptions difference (*p*-value)	Profile difference (*p*-value)
Experience			
Less than 1 year	-0.0282 (0.000)	-0.0426 (0.000)	0.0143 (0.000)
1-3 years	-0.0156 (0.000)	-0.0298 (0.000)	0.0141 (0.000)
4-6 years	0.0042 (0.481)	-0.0098 (0.034)	0.0140 (0.000)
7-9 years	0.0207 (0.005)	0.0067 (0.218)	0.0139 (0.000)
10-15 years	0.0418 (0.000)	0.0279 (0.000)	0.0139 (0.000)
More than 15 years	0.0879 (0.000)	0.0741 (0.000)	0.0138 (0.000)
Gender			
Female	0.0100 (0.079)	-0.0019 (0.709)	0.0120 (0.000)
Ethnicity			
Black African	0.2501 (0.000)	0.2377 (0.000)	0.0123 (0.000)
Black Caribbean	0.1770 (0.000)	0.1661 (0.000)	0.0109 (0.007)
Indian	0.1497 (0.000)	0.1460 (0.000)	0.0037 (0.007)
Bangladeshi	0.5281 (0.000)	0.5210 (0.000)	0.0070 (0.007)
White	-0.0009 (0.815)	-0.0071 (0.106)	0.0061 (0.007)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

Perceptions differences are negative for business owners with less than six years of experience and significantly positive for those with more than 10 years of experience. Again

this suggests that initial optimism among CIB owners about their chances of obtaining loans is replaced with a pessimistic outlook as they gain experience. Ethnic minority CIB owners also have a higher perceived likelihood of rejection than their non-CIB counterparts. These perceptions are consistent with the relatively high actual rejection rates for these businesses reported earlier in this section.

Table 22: Differences in probability of term loan discouragement between CIBs and non-CIBs at sample means and by risk type and year [(a)].

% points/100

Risk type	Total difference (*p*-value)[(b)]	Perception difference (*p*-value)	Profile difference (*p*-value)
2004-9			
Difference at sample means	0.0349 (0.000)	0.0209 (0.002)	0.0140 (0.000)
Low risk	-0.0005 (0.000)	-0.0009 (0.000)	0.0004 (0.000)
Medium risk	-0.0001 (0.988)	-0.0053 (0.104)	0.0052 (0.000)
High risk	0.1240 (0.000)	0.1009 (0.000)	0.0231 (0.000)
2004			
Difference at sample means	0.0215 (0.001)	0.0201 (0.001)	0.0014 (0.280)
Low risk	-0.0003 (0.000)	-0.0004 (0.000)	0.0001 (0.005)
Medium risk	-0.0077 (0.000)	-0.0086 (0.000)	0.0010 (0.003)
High risk	0.1012 (0.000)	0.0948 (0.000)	0.0064 (0.002)
2005			
Difference at sample means	0.1200 (0.000)	0.0550 (0.054)	0.0650 (0.000)
Low risk	-0.0015 (0.068)	-0.0033 (0.000)	0.0018 (0.000)
Medium risk	0.0393 (0.027)	0.0185 (0.283)	0.0208 (0.000)
High risk	0.3983 (0.000)	0.3196 (0.000)	0.0787 (0.000)
2008			
Difference at sample means	0.0169 (0.038)	0.0178 (0.026)	-0.0009 (0.631)

Low risk	-0.0002 (0.000)	-0.0002 (0.000)	0.0000 (0.565)
Medium risk	-0.0030 (0.158)	-0.0034 (0.110)	0.0003 (0.328)
High risk	0.0833 (0.000)	0.0803 (0.000)	0.0030 (0.163)
2009			
Difference at sample means	-0.0023 (0.811)	0.0006 (0.944)	-0.0029 (0.452)
Low risk	-0.0011 (0.000)	-0.0011 (0.000)	0.0000 (0.539)
Medium risk	-0.0208 (0.000)	-0.0218 (0.000)	0.0009 (0.268)
High risk	-0.0206 (0.228)	-0.0263 (0.091)	0.0057 (0.116)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

The preceding table presents differences in term loan discouragement probabilities by hypothetical risk types and by year. Over the period 2004-9 low risk CIB owners had a lower likelihood of discouragement (due mainly to a lower perceived likelihood of rejection relative to comparable non-CIB owners). There are no significant differences in the perceptions of medium risk business owners. However, owners of high risk CIBs have a higher perceived likelihood of rejection relative to their non-CIB counterparts as implied by the positive perceptions differences found here. This contrasts with the earlier analysis of discouragement across a range of finances ('any type of finance') which found negative perceptions differences among owners of high risk CIBs. Indeed, the results presented above are more consistent with the analysis of differences in rejection probabilities which found that finance providers are more risk averse towards high risk CIBs than towards comparable non-CIBs.

There is no clear indication that the credit crisis has systematically affected perceptions among CIB owners. However, for 2009, the perception difference is negative for high risk firms (albeit on the margins of statistical significance). The suggestion here is that the outlook of owners of high risk non-CIBs (regarding their chances of obtaining loans) became more pessimistic following the credit crisis than those of owners of high risk CIBs.

Conclusions

In this chapter, models of rejection and discouragement probabilities have been developed and estimated on samples of CIBs and non-CIBs. These models have highlighted differences in the determinants of rejection between CIBs and non-CIBs; notably the greater importance of assets/availability of collateral and business/personal track records in reducing the probability of rejection among CIBs. These models were also used to derive estimated probabilities of rejection and discouragement so that differences in these probabilities between CIBs and non-CIBs could be analysed.

The total difference in rejection probabilities was decomposed into an assessment difference and a profile difference. The assessment difference compares the likelihood of rejection for a CIB with what this likelihood would be if the same business (at least regarding observed characteristics) were to be assessed like a non-CIB. Essentially, assessment differences relate to differences in finance providers' attitudes to risk towards CIBs compared to non-CIBs with similar risk profiles. The profile difference, on the other hand, captures the difference in rejection probabilities which is due to differences in risk profiles.

Likewise, the total difference in discouragement probabilities was decomposed into a perceptions difference and a profile difference. The perceptions difference compares the likelihood of discouragement for a CIB with what this likelihood would be if an observationally equivalent business had the same perceptions about supply conditions in the loan market as a non-CIB owner. Essentially, the perceptions difference relates to the issue to the issue of whether or not CIB owners are less likely to apply for finance because they have worse perceptions about supply conditions in the loan market than owners of comparable non-CIBs. It captures the indirect effects of market failure in the supply of finance to CIBs via CIB owners' perceptions of the supply conditions confronting them.

The results indicate that there are significant variations in finance providers' risk attitudes towards CIBs as reflected in assessment differences in rejection probabilities. In some cases, as with Software, Other Creative Content sectors and high risk CIBs, finance providers appear to be more risk averse towards CIBs than comparable non-CIBs; and regarding high risk CIBs this gap appears to have widened following the credit crisis. This risk aversion is rooted in issues of greater uncertainty/moral hazard regarding CIB finances. In other words, problems of market failure which affect small business finances in general may be particularly acute for the aforementioned types of CIB. In contrast, finance providers appear to look on Creative Service sector and low risk CIBs favourably relative to non-CIBs with similar risk profiles. That is, whilst market failure issues in the supply of finance to CIBs may affect particular sectors, the problem is certainly not systemic.

In the discouragement analysis, owners of low and medium risk type CIBs were found to have a lower likelihood of discouragement (due mainly to a lower perceived likelihood of rejection relative to comparable non-CIB owners resulting in negative perceptions differences). However, owners of Other Creative Content sector CIBs and high risk CIBs (the latter regarding term loans only) have a higher perceived likelihood of rejection relative to their non-CIB counterparts as implied by the positive perceptions differences found here. The implication is that these CIB owners have worse perceptions about the supply conditions confronting them than owners of comparable non-CIBs.

Comparisons of perceptions differences with their corresponding assessment differences point to misperceptions among business owners about the likelihood of rejection. In particular the analysis indicates a general tendency for CIB owners to under-estimate their actual likelihood of rejection. These misperceptions may relate to underlying issues of a lack of financial understanding, in particular regarding how financial applications are assessed.

So in short, there is evidence of market failure affecting the supply of finance to Software, Other Creative Content sector and high risk CIBs both directly, through an increased probability of rejection, and indirectly (for Other Creative Content CIBs) via an increased

probability of discouragement. The effect of these differences in rejection/discouragement probabilities on business growth is the subject of the next chapter.

4

The effects of financial rejection and discouragement on business growth

Background

The purpose of the analysis in this chapter is to measure the impact of differences in rejection and discouragement probabilities on sales growth. In essence this part of the analysis addresses the issue of whether differences in access to finance between CIBs and non-CIBs matter in terms of reduced business performance.

The reasons for this analysis are two-fold. Firstly, rejection/discouragement will only cause lower growth if they result in the business receiving less finance than is needed (implying the business is financially constrained). In instances where the business is not creditworthy, rejection/discouragement may be the better outcome; providing these businesses with more finance will not help them to grow. So, by looking at the effects of rejection/discouragement on small business growth in general, this analysis provides broad insights into issues of market failure in the overall market for small business finance. Secondly, analysis of the impacts on growth of *differences* in rejection/discouragement provides specific insights into the economic consequences of *more acute* market failures in the supply of finance to CIBs relative to other businesses.

The analysis presented in this chapter is based on a test of financial constraints developed in Fraser (2010). This basically involves a regression of sales growth on dummy variables for whether the business has experienced financial rejection or discouragement, controlling for other determinants of growth[28]. The key prediction of the economic model, which forms

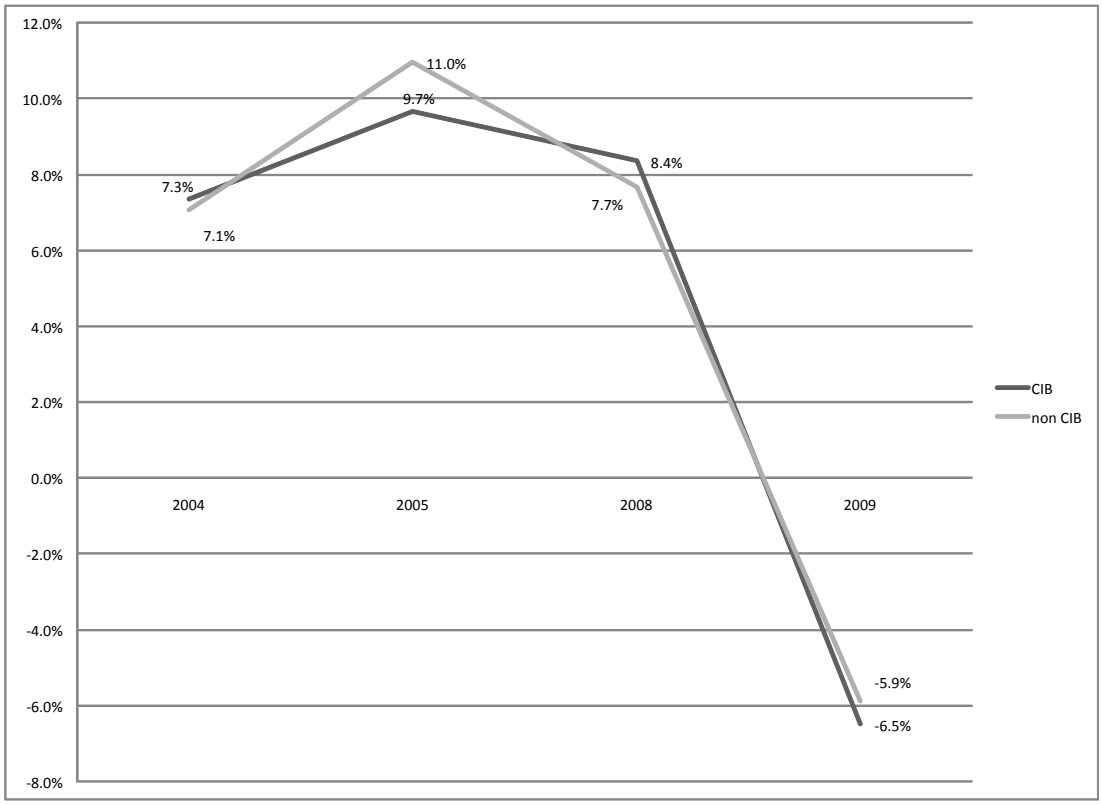
[28] These other determinants include business size, age and the owner's human capital (see e.g., Evans, 1987; and Fraser, 2010).

the basis for this test, is that rejection and discouragement are negatively related to growth if and only if they result in a sub-optimal level of investment[29].

This model is estimated using a Generalised Method of Moments (GMM) estimator for panel data[30]. This allows us to control for unobserved heterogeneity (relating, for example, to entrepreneurial talent) and endogeneity of the financial regressors (see below). A brief summary analysis of CIB/non-CIB growth is presented in the next section. Following this, the estimates for the growth model are presented and discussed. The chapter concludes by looking at the impacts on growth of differences in rejection and discouragement probabilities between CIBs and non-CIBs.

Sales growth

Chart 35: Sales growth



Source: UKSMEF 2004, 2005, 2008, 2009

Growth appears to be slightly higher among CIBs in 2004 and 2008 but lower than non-CIB growth in 2005 (relating to the EMB sample). Both CIBs and non-CIBs experienced a large

[29] The basis for this test is grounded in a rigorous theoretical model of dynamic entrepreneurial investment decisions under uncertainty developed in Fraser (2010). The model was developed to examine the relative importance of financial constraints and control aversion (psychological constraints) on growth.

[30] The estimator is known as System GMM and was developed by Arellano and Bover (1995) and Blundell and Bond (1998).

drop in sales in 2009 although CIBs appear to have been worse affected. Overall this chart suggests that CIBs and non-CIBs experienced similar growth rates in the period 2004-9.

Effects of financial rejection and discouragement on sales growth

The following table presents estimates of the GMM model relating sales growth to financial variables and other determinants of growth. In the data, businesses can be in one of 4 (mutually exclusive) financial states:

1) Applied successfully for external finance.
2) Applied unsuccessfully for external finance.
3) Did not apply because the owner felt discouraged.
4) Did not apply because there was no demand for external finance.

There are therefore three finance dummy variables included in the growth regression recording incidences of financial rejection, discouragement and no demand respectively. Consequently, the base category, the state against which the effects of these financial variables are measured, is state 1) i.e., a business which applied successfully for funding. The financial variables are endogenous since the decision of whether or not to apply for finance is non-random[31]; this issue partly motivates the choice of a GMM estimator.

In the following estimates, the effects of the finance variables are broken down by type of finance (overdrafts, term loans and equity finance) in order to allow a clearer indication of the sources, if any, of financial constraints. An additional variable measuring control aversion is included to examine the relative importance of psychological constraints on growth[32]. A desire for independence is often the main reason for starting a business and this frame of mind may make business owners reluctant to share control with, or subject themselves to scrutiny by, outsiders (Cressy, 1995). In these circumstances business owners may be happy to trade lower growth in return for retaining greater control of the business. The estimation was carried out on the full sample of CIBs and non-CIBs[33].

[31] Unanticipated shocks to growth are likely to affect application decisions and the outcome of these decisions (i.e., whether or not the application is successful). As a consequence, the financial variables are likely to be correlated with the error term in the sales growth model.
[32] 'Control aversion' is a dummy variable taking the value of unity if the owner's main reason for starting their business was to fulfil a desire for independence, and they subsequently had no demand for external finance, and equal to zero otherwise.
[33] The GMM estimator requires a large number of observations for valid results. There are therefore insufficient observations to be able to validly estimate separate growth models for the CIB and non-CIB sub-samples.

Table 23: Estimates of the effects of financial rejection and discouragement on sales growth

Explanatory variable	Marginal effect	*p*-value
Overdrafts		
Rejected	-0.7711	0.002
Discouraged	-0.0522	0.945
No demand	-0.5815	0.040
Term Loans		
Rejected	0.4929	0.234
Discouraged	-0.9181	0.041
No demand	-0.3685	0.293
Equity finance		
Rejected	1.3380	0.537
Discouraged	1.1627	0.096
No demand	-0.2424	0.280
Control aversion	-0.4404	0.044
Loss (lack of internal finance)	-0.1933	0.000
Log sales (previous year)	0.4593	0.004
Log sales (previous year) squared	-0.0358	0.000
Log employment	0.5315	0.000
Log business age	-0.1248	0.102
Log business age squared	0.0170	0.149
Female owner	-0.0956	0.008

Human capital (*p*-value)	0.294
Ethnicity (*p*-value)	0.297
Sector (2 digit SIC: *p*-value)	0.000
NT	5,710
Chi-squared (*p*-value)	0.000
Hansen (*p*-value)	0.393
No. of instruments	218

Source: UKSMEF 2004, 2005, 2008, 2009

A key finding is that businesses denied overdrafts grew more slowly than otherwise similar businesses which received an overdraft. As a consequence of this lower growth, the sales of businesses denied overdrafts are over 50% lower than that of otherwise similar businesses which received an overdraft [exp(-0.7711)-1)×100%=-53.7%]. Businesses with no demand for overdrafts also experienced lower growth: consequently, their sales are 44% lower than otherwise similar businesses which received an overdraft [exp(-0.5815)-1)×100%=-44.1%]. However overdraft discouragement has no apparent effect on sales/sales growth.

Conversely, neither term loan rejections nor a lack of demand for term loans affects growth. However, businesses which did not apply for a term loan due to discouragement experienced lower growth, again leading to a divergence in sales compared to otherwise similar businesses which received term loans. Indeed, the sales of discouraged borrowers are 60% lower compared to otherwise similar businesses which received term loans [exp(-0.9181)-1)×100%=-60.1%].

Notably businesses that felt discouraged from applying for equity finance grew faster relative to otherwise similar businesses which received equity finance, leading to sales which are over 3 times higher [exp(1.1627)-1)×100%=219.9%]. In this case discouragement is associated with improved performance which suggests that the businesses in the sample are typically not suitable for equity finance; one reason for this may be a lack of investment readiness.

Regarding psychological constraints, businesses with control averse owners experienced lower growth than otherwise similar businesses whose owners are not control averse, leading to sales which are over a third lower [exp(-0.4404)-1)×100%=-35.6%]. This suggests the effect of psychological constraints on sales/sales growth is sizeable and similar in magnitude to the effects of a lack of overdraft finance.

In summary, this analysis suggests small businesses in general experienced financial constraints due to a lack of overdraft finance. This supports the inclusion of working capital loans under the Enterprise Finance Guarantee. The problem regarding term loans appears to be discouragement. The implication of the results is that a high perceived likelihood of rejection discouraged business owners from applying for term loans leading to lower investment and growth. Enterprise Finance Guarantee also have an important role here in providing business owners with greater confidence that their loan applications may be successful even if they lack sufficient collateral or operate in a sector considered risky by lenders. Also, supporting communications between banks and businesses may help lessen perceptions that banks are unwilling to lend in any circumstances.

There is no evidence of financial constraints arising due to a lack of equity finance. If anything, the results suggest a lack of investment readiness rather than supply side constraints. Also, control aversion is an important demand side factor lowering growth. Underlying this is a desire for independence which is the major motivating factor for most entrepreneurs, more so than profit *per se*. There may be little that policy makers can do directly to lessen control aversion. Indeed, even if policy-makers could reduce entrepreneurs' desire for independence (or, at least, make them more willing to share control with external investors), it might have undesirable consequences such as dampening entrepreneurial spirit.

Impacts of differences in rejection/discouragement on CIB growth

The culmination of the econometric analysis involves looking at the impacts of differences in access to finance on CIB growth. This analysis involves combining the estimates of differences in financial rejection and discouragement probabilities from the previous chapter, with the estimates of the effects of rejection and discouragement on growth discussed in this chapter. It relates directly to the issue of the consequences of differences in access to finance on the performance of CIBs[34].

The estimates in the table below are estimates of differences in growth between CIBs and otherwise similar non-CIBs resulting from differences in their rejection/discouragement probabilities[35]. This table shows differences in growth due to differences in rejection and discouragement probabilities separately as well as the total difference in growth due to the combined effects of differences in rejection and discouragement probabilities. These results are reported for: an average CIB; by CI sub-sectors; and for the low, medium and high hypothetical risk types defined in the previous chapter[36].

[34] Of course, there are cultural and social reasons why differences in access to finance might matter. However, analysis of cultural/social impacts is beyond the scope of this report, not least due to a lack of data.

[35] The relevant differences in rejection/discouragement probabilities to use in this analysis are the assessment/perception differences reported in the previous chapter. This is because these differences relate to differences in rejection/discouragement probabilities between CIBs and otherwise similar non-CIBs (whereas total differences include profile differences between CIBs and non-CIBs).

[36] The statistics for growth differences have unknown sampling distributions because they are formed by multiplying together estimates for differences in rejection/discouragement probabilities (which themselves have an unknown distribution) with estimates of the effects of rejection/discouragement from the growth model. Accordingly, a bootstrapping procedure (Efron, 1979) was used to compute standard errors/*p*-values for the growth differences. This involves re-sampling the data many times and computing the statistics on each new sample to build up an empirical sampling distribution for the statistics, from

Table 24: Differences in growth due to differences in financial rejection and discouragement probabilities

% points/100

	Total impact (*p*-value)[(b)]	Impact of overdraft rejection (*p*-value)	Impact of term loan discouragement (*p*-value)
2004-9			
Difference at sample means	-0.0209 (0.105)	-0.0017 (0.811)	-0.0192 (0.077)
Content sectors (all)	-0.0461 (0.017)	-0.0175 (0.129)	-0.0286 (0.076)
Music and Visual Performing Arts	0.0248 (0.163)	0.0372 (0.010)	-0.0124 (0.145)
Software	-0.0526 (0.027)	-0.0410 (0.054)	-0.0116 (0.318)
Other Creative Content	-0.1680 (0.006)	-0.0682 (0.037)	-0.0998 (0.057)
Service sectors (all)	0.0216 (0.020)	0.0235 (0.008)	-0.0018 (0.429)
Advertising	0.0308 (0.152)	0.0291 (0.128)	0.0017 (0.798)
Architecture	0.0187 (0.062)	0.0216 (0.024)	-0.0030 (0.155)
Low risk	0.0159 (0.002)	0.0151 (0.004)	0.0009 (0.014)
Medium risk	0.0155 (0.036)	0.0107 (0.128)	0.0048 (0.058)
High risk	-0.3733 (0.000)	-0.2807 (0.006)	-0.0927 (0.033)

Source: UKSMEF 2004, 2005, 2008, 2009

(a) Differences evaluated at sample means of all explanatory variables except for the variable given in the 'firm characteristics' column.

(b) *p*-values obtained from bootstrapped standard errors.

Looking at an average CIB, the joint impact of differences in overdraft rejection and term loan discouragement probabilities is to reduce CIB growth by about 2 percentage points relative to a comparable non-CIB (although the *p*-value for this difference is slightly above 10%). There is no difference in growth due solely to differences in overdraft rejection probabilities. However, the impact on its own of differences in the probability of term loan

which standard errors/*p*-values can be obtained. It took about 3 hours of CPU time to obtain each row of statistics in Table 24 (based on re-sampling the data 200 times). For this reason, the analysis of growth differences is limited to looking at the average business, CI sub-sectors and stylised risk types.

discouragement is to lower average CIB growth by 1.9 percentage points (significant at the 10% level).

As before, the results for the average CIB may be misleading given the diverse nature of businesses in this sector. Accordingly the next set of results looks at impacts by CI sub-sectors. Looking at the impact of differences in rejection/discouragement probabilities on the growth of CIBs in Content Sectors (all), the total impact is a reduction in growth of 4.6% points with a 2.9% point reduction due to the higher likelihood of term loan discouragement. The reduction in growth due to the higher likelihood of rejection for these CIBs is not statistically significant.

However, looking more closely at Content sectors reveals that, while the total impact for CIBs in Music and the Visual Performing Arts is not significant, the impact due to differences in the probability of overdraft rejection is a growth *increase* of 3.7% points. This reflects the finding in the previous chapter that CIBs in this sector have a lower likelihood of overdraft rejection than non-CIBs with similar risk profiles. The implication is that these CIBs have more favourable access to overdrafts than comparable non-CIBs and grew faster relative to these non-CIBs as a result.

The story is different for CIBs in Software and Other Creative Content sectors. In particular, the total impact of differences in rejection/discouragement probabilities on the growth of Software CIBs is a reduction of 5.3% points (relative to non-CIBs with similar risk profiles). The impact of differences in overdraft rejection probabilities alone is a reduction in growth of 4.1% points (although the impact of differences in term loan discouragement probabilities is not significant). Regarding Other Creative Content sector CIBs, the magnitude of the impacts are even larger. The total impact of differences in rejection/discouragement probabilities is to reduce growth by 16.8% points relative to comparable non-CIBs. Here, the reduction in growth due to differences in overdraft rejection probabilities alone is 6.8% points and the reduction due to differences in term loan discouragement probabilities alone is almost 10% points. These findings reflect the impact of the poorer access to finance experienced by these Content sector CIBs relative to comparable non-CIBs.

Regarding Service sector CIBs, the impacts for the Advertising sector are not significant. This reflects the earlier finding that these CIBs have access to finance similar to comparable non-CIBs. However, the total impact and impact due to differences in overdraft rejection probabilities for CIBs in Architecture are positive implying these CIBs grew faster than non-CIBs with similar risk profiles. This reflects the previous finding that these CIBs enjoyed more favourable access to finance (specifically, lower rejection probabilities) than comparable non-CIBs.

The next group of results relate to growth differences by hypothetical risk types. Among low risk businesses growth differences are positive i.e., low risk CIBs grew faster than comparable low risk non-CIBs due to differences in rejection/discouragement probabilities. This reflects the relatively favourable access to finance experienced by these CIBs (see previous chapter). A similar pattern emerges for medium risk CIBs and again reflects the earlier finding that these CIBs have lower rejection/discouragement probabilities than comparable non-CIBs.

However, the results for high risk CIBs show that they grew much slower than comparable non-CIBs. The estimated total impact of differences in rejection and discouragement probabilities is a reduction in growth of over 37 percentage points; and the impacts of differences in rejection and discouragement probabilities in their own right are reductions in growth of 28 percentage points and 9 percentage points respectively. These large impacts are a consequence of the significantly higher rejection and discouragement probabilities among high risk CIBs relative to comparable high risk non-CIBs (see previous chapter).

Conclusions

The purpose of the analysis in this chapter is to measure the impact of differences in rejection and discouragement probabilities on sales growth. In essence this part of the analysis directly addresses the issue of whether differences in access to finance between CIBs and non-CIBs result in reduced business performance.

The analysis is based on a test of financial constraints developed in Fraser (2010). This basically involves a regression of sales growth on dummy variables for whether the business has experienced financial rejection or discouragement controlling for other determinants of growth. The key prediction of the economic model, which forms the basis for this test, is that rejection and discouragement are negatively related to growth if and only if they result in a sub-optimal level of investment.

This analysis suggests small businesses experienced financial constraints due to a lack of overdraft finance. In contrast, the problem regarding term loans appears to be discouragement. The implication of the results is that a high perceived likelihood of rejection discourages business owners from applying for term loans leading to lower investment and growth. There is no evidence of financial constraints arising due to a lack of equity evidence. If anything, the results suggest a lack of investment readiness rather than supply side constraints. Also, control aversion is an important demand side factor lowering growth. Underlying this is a desire for independence which is the major motivating factor for most entrepreneurs.

The analysis culminated by looking at the impacts of differences in access to finance on CIB growth. This analysis involves combining the estimates of differences in financial rejection and discouragement probabilities from the previous chapter, with the estimates of the effects of rejection and discouragement on growth shown in this chapter. This analysis relates directly to the consequences of more acute problems of market failure in the supply of finance to CIBs.

The findings suggest there is weak statistical evidence that an average CIB may have experienced lower sales growth relative to comparable non-CIBs as a consequence of poorer access to finance. The reduction in growth due to higher rejection/discouragement probabilities is much larger in magnitude for Software and Other Creative Content CIBs reflecting the significantly poorer access to finance experienced by these CIBs relative to comparable non-CIBs. However, there are no adverse consequences for the growth of Service sector CIBs reflecting the fact that their access to finance is at least as favourable as that of comparable non-CIBs.

There is stronger evidence that high risk CIBs grew more slowly than comparable high risk non-CIBs due to poorer access to finance. However, low and medium risk CIBs grew faster than comparable non-CIBs because their access to finance was more favourable. This diverse range of impacts on growth reflects the variation in conditions of access to finance across the CI sector. Again this highlights the dangers of making generalisations about the experiences and outcomes of CIBs compared to non-CIBs.

5
Conclusions

The report began by arguing that uncertainty/moral hazard issues may be a greater issue for CIBs leading to more acute problems of market failure in the supply of finance to CIBs relative to other businesses. It is not possible to isolate whether it is uncertainty or moral hazard which is driving the results and so these issues need to be considered together. However, the econometric analysis appears to support the general argument, among Software and Other Creative Content (Publishing; Video, Film and Photography; and Radio and TV) sector CIBs at least, as there are significant differences in the probability of rejection between these Content sector CIBs and non-CIBs with similar risk profiles. The suggestion is that finance providers are more risk averse towards these CIBs due to greater issues of uncertainty/moral hazard and, consequently, they require greater levels of security. In other words, the supply of finance to Software/Other Creative Content sector CIBs is adversely affected by more acute issues of market failure relative to comparable non-CIBs.

The case studies (in Appendix 2) enabled a close-up look at these issues. For example, the owners of the software firms interviewed spoke of how a lack of tangible business assets led to a lack of finance. In some cases, this left the business owners to fund the business out of their personal finances. This restricted growth and even led to redundancies in some cases. Similarly, interviews with owners of film/video businesses highlighted requests for (personal) security that the owners were either unable or unwilling to comply with. For one TV and online video production firm, the resulting lack of finance led to the redundancies of all six of its employees; now the owner says she 'staffs-up' as required when projects come in.

Equally there are significant differences in the probability of discouragement between Other Creative Content sector CIBs and non-CIBs with similar risk profiles. The implication here is that owners of Other Creative Content CIBs are aware of finance providers' risk aversion towards them and are less likely to apply for loans as a consequence[37]. In this case, discouragement represents an indirect effect of market failure on access to finance via business owners' *perceptions* of the market conditions confronting them[38]. Interestingly, the case studies also highlighted instances where owners of publishing and film businesses felt discouraged from applying for finance because they felt their lack of assets would result in them being turned down anyway.

The qualitative analysis was able to speak directly to the issue of finance providers' attitudes towards the risks of lending to CIBs. In this regard, interviews with finance providers (also in

[37] Although, as noted previously, it seems that CIB owners tend to under-estimate their actual likelihood of rejection leading to perceptions differences which are less than the corresponding assessment differences.
[38] The awareness of business owners in this context is not to be confused with good information on the supply-side. If finance providers were well informed about borrowers' default risk there would be no issue of market failure in the first place.

Appendix 2) drew attention to issues of greater uncertainty about the demand for CIB products: “Banks don’t discriminate against the creative industries, but they do discriminate against people who they think can’t repay. It may just be in our eyes that there are more of them in the creative industries.” The root cause of this greater uncertainty among CIBs is that nobody knows, for example, how well a new book or film will sell.

This uncertainty still applies even if the business has had major success in the past. The following comments made by a venture capitalist are particularly telling in this regard: “I’ve known the producers [of the ‘King’s Speech’] a long time, and the film has been a huge performance hit for them, but with their next two or three productions you don’t know if they will be hits, so you can’t predict revenue streams.” By implication, the likelihood of rejection may not improve even with a track record of success. Consistent with this, the econometric analysis indicated that longer financial relationships do not reduce the likelihood of rejection or discouragement among CIBs (whereas non-CIBs’ access to finance improves with longer relationships). In other words, longer financial relationships do not appear to alleviate the uncertainty associated with the supply of finance to CIBs.

The interviews with finance providers also highlighted the issue of uncertainty about the talent of the CIB owner: “If somebody comes to us and tells us they are a great musician or a great film maker, how are we in a position to make a call on that?” In this light, it is possible to better understand one of the findings of the econometric analysis which pointed to the greater importance of owner characteristics in reducing the likelihood of rejection among CIBs. Finance providers may have greater confidence in the talents of CIB owners who are older/more experienced and who have formal qualifications in their CVs.

A related issue, highlighted by the interviews with finance providers is that CIB owners are often viewed by finance providers as lacking credibility. Equally, the interviews with CIB owners suggested a mixed awareness, and understanding, of finance. This is consistent with the econometric analysis which suggests CIB owners misperceive their likelihood of rejection. This mixed level of understanding/misperceptions may reflect a natural tendency for owners of CIBs to come from arts based backgrounds and to have limited financial knowledge. Again, however age/experience may add a degree of gravitas to finance applications and increase finance providers’ confidence in the business owner. Also, a specific finding of the qualitative analysis is that owners of visual performing arts businesses are the most financially aware as they spend a lot of their time applying for grants. This might help to improve access to finance for these CIBs.

Moral hazard/non-pecuniary business motives are also an issue highlighted by the interviews with finance providers: “Banks don’t fund people to paint pictures.” In addition, the qualitative analysis supports the view that owners of CIBs are control averse; control aversion is linked with a desire for independence and non-pecuniary business motives. A concomitant risk identified by the interviews with finance providers is that the success of the business is tied to the vision/talent of a single key individual (increasing the risk that the business will be run to fulfil the personal/non-pecuniary objectives if its owner).

Whether the root causes of market failure lie in uncertainty or moral hazard, a symptom of market failure is that finance providers are more likely to ask for collateral. In this regard, a notable finding which is common to both the econometric and qualitative analyses is that the availability of collateral is a greater issue for access to finance among CIBs than non-CIBs.

What the case studies were able to reveal in more detail was that, rather than leading directly to rejection, a lack of business assets often resulted in lenders asking instead for personal security from CIB owners. In these circumstances the owners usually preferred to turn down the loan offer rather than find themselves in the invidious position of possibly losing their homes. Either way, the underlying issue is the same: a lack of business assets led to poorer access to finance for some CIBs.

On a specific collateral issue, the interviews with finance providers indicate that they find lending to music businesses with back catalogues attractive as these assets are viewed as good security. In contrast the intellectual property held by software firms is viewed as lower quality security because it quickly becomes obsolete. This is entirely consistent with the econometric analysis which found that CIBs in Music/Visual Performing Arts have access to finance which is similar to comparable non CIBs whereas Software CIBs have relatively poor access to finance[39].

The econometric analysis also looked at the consequences of market failure in the supply of finance on CIB growth. The findings here point to quite a severe curtailment of growth among CIBs in Software and Other Creative Content sectors due to poorer access to finance. As noted previously, the qualitative analysis also highlighted several individual cases (notably in Software and Publishing) where, in the opinion of the business owner, finance rejections resulted in lower growth.

To reiterate, there is a great deal of consistency between the econometric and qualitative analyses. The essence of this joint analysis is that: there are more acute problems of market failure in the CI sector on average (rooted in uncertainty/moral hazard issues) relative to other comparable businesses; these problems affect Software and Other Creative Content sectors in particular; and market failure has adverse consequences for the growth of these CIBs.

[39]Subject to the caveat made previously that the grouping together, by necessity, of music and visual performing arts businesses may mask variation in the financial outcomes for these CIBs.

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Annex

Table A1: Creative Industry sectors used in the econometric analysis

Sector	SIC 2003 code
Advertising	74.40
Architecture	74.20
Video Film and Photography	92.11
	92.12
	92.13
Music and Visual Performing Arts	22.14
	92.31
	92.32
	92.34
Publishing	22.11
	22.12
	22.13
	22.15
	92.40
Software, Computer Games and Electronic Publishing	72.21
	72.22
Radio and TV	92.20

Source: DCMS (2010a), Creative Industries Economic Estimates: Technical Note.