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Soft Information and the Geography of SME Bank Lending

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Abstract

This paper explores the geography of bank lending to SMEs and tests the argument that large institutions with complex organisational structures are better able to filter ‘hard’ information than ‘soft’ information. Mortgage lending is used as a control to illustrate the case of ‘hard’ and ‘soft’ information. Using data on individual bank lending to SMEs and mortgages by postcode area in Great Britain for the period 2013(2)-2014(4), the paper explains the spatial dispersion of SME lending in the UK in terms of geographical distance and supports the policy of establishing a geographically decentralized financial system as a counterbalance.

Keywords: Geography of SME lending, bank finance, functional distance

JEL Codes: G21, G290, L140

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1. Introductionⁱ

Location and proximity have emerged as important features in the geographical distribution of bank credit to Small and Medium sized Enterprises (SMEs). The geographical dimension to bank lending is underpinned by credit market theories of asymmetric information, agency, and uncertainty particularly regarding SMEs. This strand of literature highlights the geographical ‘closeness’ of banks to SMEs as the means of overcoming issues of informational asymmetries (Agarwal and Haswald, 2010; Hollander and Verriest, 2016). However, it distinguishes between two types of closeness, namely, ‘operational distance’ (the distance between bank branches and the borrower) and ‘functional distance’ (distance between bank branches and bank headquarters) (Alessandrini et al., 2009; Presbitero et al., 2014).

Operational distance relates to the informational asymmetry between the borrower and the bank branch that is mitigated by ‘relationship banking’. The closer the physical proximity of the borrower and the Relationship Manager (RM), the greater the effectiveness of relationship banking in gathering ‘soft information’. Similarly, it is argued that the wider the distance, the stronger the dependence on ‘hard information’ or ‘transactional banking’ (Berger and Udell, 2006).

The theoretical work of Stein (2002) attributes the effectiveness of relationship banking to the hierarchical organizational structure and the informational and agency distance between the senior managers at headquarters (HQ) and local RMs within the bank organizationⁱⁱ. Functional distance relates to the principal-agent problem between the local branch and senior management at headquarters (HQ). Senior managers at HQ depend on the filtered information from local RMs to make credit allocations. Large banks are hierarchical in organisation with centralised decision-making (Baker et. al., 1999). The authority of the allocation of financial

capital is separated from the information production and senior managers at HQ depend on the filtered information from local RMs to make credit allocations.

Stein (2002) further argues that the hierarchical structure would only harm soft-information intensive SME lending rather than a home mortgage loan for which the decision is based on "hard," verifiable information. The "organizational diseconomies" that prevent functionally distant branches from being the most efficient providers of the soft information-intensive, relationship-based SME lending, is different from the "scope inefficiency" associated with multiple activities (Berger et al, 1999). It also differs from the corporate politics explanation for the headquarters-bias in the access to internal capital markets that favours branch proximity to headquarters as in Stein and Scharsfstein (2000). The impact of "scope inefficiency" and corporate politics would uniformly apply to all loan products, independent of its soft-information intensity.

A supporting view from another strand of the literature that emphasises 'social connectedness', argues that the quality of soft information provided by local RMs increases with the physical closeness between local managers and senior managers at HQ. Cohen et al., (2008)ⁱⁱⁱ argue that proximity facilitates social connections as a channel of information transfer. Here, the term functional distance is not just synonymous with the frictions that arise from the communication of soft information within the bank organization, but also the social interconnectedness of the RM to the final decision maker. It is argued that the proximity of the decision maker within the bank organization to a local area and the RM increases the social embeddedness and sensitivity of the bank to the needs of the local economy and SME credit demand (Alessandrini et al, 2005).

However, in contrast to the distance matters finding of researchers, Petersen and Rajan (2002) argue that the greater capital intensity of lending with modern communication technology has

altered the way loan decisions are made. Technology has broken down the barriers of asymmetric information associated with SME lending and the need for the translation of ‘soft information’ which is inversely related to distance. Petersen and Rajan (2002) make the bold claim that by being able to access ‘hard information’, lenders are able to make more efficient credit decisions where distance matters less and also explains the trend in consolidation and branch-closure, through technological change.

A second strand to the literature on the geographical dimension of bank lending to SMEs relates to the condition of the banking community. It is argued that in good times, when banks can raise funds directly and cheaply in wholesale markets, the reliance on branches to raise deposits to meet local credit demand is less significant (Dewally and Shao, 2014). Under normal circumstances, the flow of loanable funds will depend on stable economic conditions. However, in a financial crisis, increased risk perception could influence the terms and willingness of bank lending. This could translate into selective deleveraging of bank lending, resulting in a ‘flight to quality’ or ‘flight to headquarters’. One version of ‘the flight to quality’ argument is that in response to a negative aggregate shock, banks contract their credit to smaller and riskier firms, and accommodate the credit demand of larger and safer firms (Lang and Nakamura, 1995; Bernanke et al., 1996). Banks could also display a ‘flight to headquarters’, even within a country (De Haas and Van Horen, 2013).

This paper brings these two strands of literature together to test for the empirical implications of the theoretical contribution of Stein (2002), by examining the availability of bank credit by geographical location in Great Britain. First, it reaffirms the geographical dimension in SME lending as a challenge to the Petersen and Rajan (2002) view. Second, it supports the Stein (2002) view that large institutions with complex organisational structures are less able to filter ‘soft’ information than ‘hard’ information. We use data on individual major British bank

lending to SMEs and personal mortgage lending by postcode area for 120 localities in Great Britain for the period 2013(2)-2014(4), a dataset disclosed by the British Bankers Association (BBA), for the first time, in 2013 on spatial dispersion of SME lending across Britain's postcode areas. The data for SME lending and mortgage lending consist of six major British banks. As the same bank makes both SME loans and personal mortgages in the specific postcode area, it is reasonable to assume that it would utilise its common organisational structure and informational technology. We hypothesize that the functional distance between the headquarters and the branch would negatively affect the soft-information intensive SME lending but not the hard-information dominated Mortgages.

We contribute to the existing literature regarding the impact of organization structure on the nature of information acquisition and the type of economic activities of banks. Previous studies have examined the impact across firms grouped into higher versus lower informational opaqueness according to certain standards or tested for the difference in the use of soft versus hard lending technologies by banks to firms. Our use of SME lending versus Mortgages by the same bank delivers a clear-cut comparison between different loan products characterised by soft information in the case of one, and hard information in the other. However, with the trend to transactional banking, using mortgage lending as a control, we expect to find that functional distance does not matter for either SME lending or mortgage lending.

To anticipate our results, we find that functional distance is negatively related to the change in SME lending, reaffirming the geographical dimension in SME lending in the UK, but has no impact on the change in mortgage lending. We interpret these results as a vindication of the conventional view that SME lending requires the transmission of 'soft' information within the decision chain of the organisation. It also supports the Stein (2002) view that large institutions

with complex organisational structures are less able to filter ‘soft’ information than ‘hard’ information.

This paper is organised in the following way. In the next section, we briefly review the literature on the geographical dimension in SME lending. In the third section, we present the data, its properties and the models for our econometric analysis. In the fourth section, we discuss the main results and tests for robustness. The final section concludes.

2. The geographical dimension

The regional segmentation of credit markets for SMEs is well-established in the literature (Dow and Rodrigues-Fuentes, 1997)^{iv}. The received wisdom is that SME lending requires the transmission of ‘soft information’ through the RM from the borrower to the decision-making centre of the bank. Soft information is largely local, and socially embedded, which requires the face-to-face interaction of the RM between the SME borrower and the bank credit decision-maker, which necessitates physical proximity. The location of bank branches near the SME borrower enables RMs to collect ‘soft information’ at a lower cost (Agarwal and Hauswald, 2010)^v.

In contrast to mortgage loans, where the decision is on ‘hard’ information, SME lending relies heavily on ‘soft’ information. However, Stein (2002) emphasises the organisational diseconomies of large complex firms on the efficiency of information transmission within the bank organization. Centralised decision-making and vertical organisational structures within the bank, creates the *ex-ante* incentives for branch managers to collect and transmit only certain types of information. As such, local managers face stronger frictions in the communication of soft information to the ultimate decision maker over longer distances. Faced with devoting

marginal resources to review soft information from geographically distant loan officers, senior managers discourage efforts to originate SME lending (Alessandrini et al., 2010).

It is typically argued that tougher credit conditions for SMEs stem from the inability of banks to absorb 'soft' information, the mainstay of relationship banking. Banks that specialise in 'transactional lending' based on 'hard information', find dealing with opaque SMEs costly to administer. Retail banks in the UK have transferred discretionary authority on lending from local branch officers to centralized decision makers at regional centres and headquarters (Pratt, 1998). This weakens the capacity of local branch officers to act on the soft information they produce. Accelerated branch closures during the 1990s and increased utilization of impersonal statistical modelling methods in the credit risk analysis has fuelled the accusation that relationship lending has increasingly been replaced by transactional lending and banks have moved from one type of lending relationship to another with SME financing being the victim^{vi}.

The greater dependence on soft information gives the geographic dimension stronger weight. However, Petersen and Rajan (2002) argue that technology, if not broken, certainly is breaking the tyranny of distance as far as SMEs are concerned. They contend that improved informational productivity has not eased the collection of soft information nonetheless it has enabled collection and distribution of more information, reducing the importance of the geographical distance in SME credit provision. Technology and the new statistical techniques in underwriting bank credit have reduced the costs of information and risk evaluation of loan applicants (Berger and Udell, 2007), and arguably, reduced the need for proximity (Chakravarty, 2006). It is the viability of a project rather than the physical proximity of the bank to the borrower that determines SMEs' access to bank credit (Klagge and Martin, 2005). These are persuasive arguments, nonetheless, we believe functional distance is important at least in three respects.

First, while reducing informational asymmetries, technological advances have not created an entirely frictionless environment for the dissemination of soft information. Technology cannot change the socially embedded nature of soft information (Flögel 2018). Further, bank size is an indicator of the layers of hierarchy and decision making which dilutes information efficiency at each stage (Allesandrini, et al, 2010, Degryse et al, 2009). Therefore, functional distance may be important in big banks hence we study all large UK banks.

Second, consolidation and branch closures in the UK has resulted in RMs covering a wider area than their locality of residence or traditional focus^{vii}. Theory assumes that the RM is located in the branch of the area of credit provision. In practice, the RM may be in one branch but cover a wider area of branches. This conflation of organisational distance and functional distance inhibits the effectiveness of soft-information transmission (Jiménez et al, 2009). Indeed, Flögel (2018) reports the findings of an ethnographic study of a German Savings bank along with in-depth interviews with five large banks, and four regional savings banks. This study questions the simplistic interpretation of functional distance but finds that the short functional distance of the local branches to HQ allow the communication of soft information to HQ. It is suggested that the submission of the riskier borrowers to headquarters for final approval and the negative impact of longer functional distance on the communication of soft information is the reason why these riskier borrowers are eventually rationed. Other studies reaffirm the geographical dimension with the spatial imbalances in the access to finance^{viii}. The theoretical underpinning of these papers is based on the notion that regular contact between the supplier of credit and the firm facilitates greater credit access and distance is an element in this.

Third, social embeddedness plays an even stronger role in economically deprived areas where the RM would not typically be located. The weight of functional distance is greater in deprived areas where the social and cultural characteristics of the region differ from the area where the

bank decision maker is located. The role of social interconnectedness (social capital) is important in the context of the impact of functional and organisational distances. Fukuyama (2000) states that social capital - the bond between individuals which underscores cooperation, trust and civil society - is 'important to the efficient functioning of modern economies and ... stable liberal democracy'. Economists have recognized the role of social capital in underpinning market transactions through the interaction with non-market factors such as trust; in the market for healthcare (Arrow, 1963); the development of large organisations (La Porta et al, 1997); economic growth (Knack and Zack, 2001); and financial development (Guiso, et al., 2004). The role of trust is to realize that economic activity entails social activity and invite interdisciplinary synthesis of contractual transactions. Consequently, a wide range of studies employ behavioural economics and social capital in analysing financial transactions. The main problem with this research agenda is the measurement of social capital. The literature uses voter turnout, blood donations, networks of race and ethnicity, and religious affiliation as measures. We use some of these measures to investigate the contribution of social capital to the geographical distribution of credit flows.

Support for the geographical dimension in SME bank credit in the UK is provided in Lee and Brown (2017). Using survey data on 40,000 UK SMEs, they find that innovative firms in the peripheral regions have a higher demand for bank finance but also have a higher rejection rate than non-innovative firms, or innovative firms in closer areas. Firms in the peripheral regions face a liability of distance that reinforces the geographical disparity in bank finance. Significant functional distance effects on credit constraints faced by SMEs in the UK are also reported in Zhao and Jones-Evans (2017). But, unlike their study, which examines the geographical segmentation of credit to SMEs across standard economic regions using survey information on the *demand side*, here we utilize data from the *supply side* and fine-tune the analysis to the postcode area. Since the data contains information on multiple banks that lend to the same

postcode area and the same bank lending in multiple postcode areas, we introduce locality-specific fixed effects and bank-specific fixed effects to disentangle credit supply and demand and to simultaneously control for the unobserved traits of banks and localities^{ix}. This overcomes the absence of economic indicators at the post-code level. While these locality-specific fixed effects and bank-specific fixed effects are not our main variables of interest, the failure to control for them may contaminate our results by creating omitted variables bias.

SME lending, the geography of bank finance, and relationship banking are intertwined in the UK. Bank mergers and branch closures have lessened the role of the RM who acquired ‘hands on’ understanding of the business needs and helped complete the online application for borrowers. Increasingly, banks in the UK have grown comfortable with small sized loans based on hard information. The use of ‘Specialist’ Relationship Managers are often reserved for high value borrowers. However recent research (Degryse et al., 2017), for Wales, shows that SMEs value the role of the RM in maintaining lines of credit during periods of financial stress and accept this service even at a higher cost. The mean turnover of SMEs in Wales is less than £500,000 and accordingly borrowing is on average £50,000.

Most studies use secondary data to study this issue; studies using primary data are few and far between. Brevoort and Wolken (2009) use the Survey of Small Business Finance for the USA and match the borrowers, credit providers and the geographic areas. They report that the mean distance between the SME and the credit provider has increased in 1993-2003 but provide no information on how this might have affected the type of financial product, its scale and price. Deakins et al., (2010), undertake verbal protocol analysis by interviewing loan officers to identify information asymmetries in the provision of bank finance to SMEs. They find evidence of good proposals (starts-ups) being rejected in manufacturing and new product development. Banks prefer existing relationships and hard information^x.

3. Data and econometric specification

Firstly, we identify the effect of functional distance on the supply of bank credit to SMEs. Secondly, we test if the dependence of the supply of bank credit on functional distance is itself a function of the soft information intensity of the loan products. In the second case, the soft information intensity of the loan products is a function of the proximity between local managers and senior managers at HQ regarding the allocation and cost of funds. Closer social connection due to shorter functional distance is hypothesized to enhance the transmission of private information that would otherwise be withheld (Uzzi and Lancaster, 2003).

Data is gathered from several data sources. The data on the geographic profile of lending to SMEs^{xi} and personal mortgages^{xiii} is collected from postcode lending data published on the websites of participating lenders. Since Q2 2013, six of the UK's major lenders agreed to publish the outstanding stock of lending statistics, in line with BBA methodology, across 9000 individual postcode sectors on a quarterly basis^{xiii}. The dataset was produced in response to the 2008-9 financial crisis, which allows the public to see how the banking and building society sectors are serving the wider economy, and the geographical spread of lending. The SME lending and personal mortgage dataset contains six participating banks: Barclays, Lloyds Banking Group, HSBC, RBS Group, Santander UK, and Clydesdale & Yorkshire Banks. The postcode attributed to a personal mortgage is determined by the correspondence address of the applicant. The postcode attributed to SME lending is derived from the business's primary trading location. Collectively, these institutions account for about 60 per cent of bank lending to SMEs, and 73 per cent of mortgage lending in Britain.

The definition of locality is the postcode area^{xiv}. In order to ensure that individual borrowing data should not be imputable directly, or in conjunction with other third party data, a set of

parameters were agreed with the Government to ensure the protection of customer confidentiality in compliance with data privacy rules. This makes postcode area level comparisons more meaningful than that at postcode sector level. Specifically, borrowing amounts outstanding for a postcode sector are not disclosed if: first, there are fewer than 10 borrowers active in the postcode sector, or second, borrowing within the postcode sector is highly concentrated amongst a small number of borrowers. In addition, individual participating lenders are not obliged to publish borrowing at postcode sector level if they hold less than 10 per cent of SME borrowing and 3 per cent of mortgages in a postcode sector. The frequency of non-disclosure may vary from quarter to quarter, which can make direct comparisons from quarter to quarter for some postcode sectors difficult. However, the postcode area has the advantage that since all data that is not disclosed because of these filters at postcode sectors is included in the postcode area level totals.

We include the figures for SME lending for the six banks stipulated above in each of 120 postcode areas in England, Scotland and Wales from 2013-Q2 to 2014-Q4^{xv} and include the figures for personal mortgage for the six banks across 120 postcode areas in the same period^{xvi}. For Lloyds Banking Group, we only include the figures for SME lending and personal mortgage across the same set of postcode areas during Q1, 2013 to Q4, 2013 since totals for Quarter 1 2014 onwards exclude balances related to TSB Banking Group plc, which was previously reported within the Lloyds Banking Group's submission. All figures are deflated by the 2005 base Consumer Price Index.

Equation (1) describes the baseline specification.

$$\Delta CR_{b,l,t} = \alpha + \beta LDIST_{b,l} + \delta SHARE_AREA_{b,l} + \vartheta SHARE_AREA_TOTAL_{b,l} + \theta_b + \omega_t + \pi_l + \varepsilon_{b,l,t} \quad (1)$$

The unit of observation is a bank-locality pair sample. Since we do not have the information on bank credit by recipient but by locality, we define locality as the destination of bank credit. The dependent variable in Equation (1) is the change in the outstanding stock of SME lending^{xvii} (Mortgage) by bank (b) in locality (l) during time t and $t-1$. The main variable of interest, functional distance, is measured by the physical distance between the branches of a specific bank (b) in a given locality (l) to its registered headquarters of the bank (i.e. $LDIST_{b,l}$)^{xviii}. To allow for local competitive pressure faced by a specific bank (b) and the importance of the locality (l) to a specific bank (b), we construct the ratio of branches of bank (b) to all bank branches within the locality (l) (SHARE-AREA), and the ratio of branches of bank (b) in locality (l) to the total number of branches of the bank in the UK as a whole (SHARE-AREA-TOTAL).

Since our data set contains information on multiple banks that lend to the same locality, we control for the demand for SME lending (mortgage) at each locality by adding locality-specific fixed effects (π_l). A key advantage of this approach is that it allows us to neatly control for shifts in credit demand at the local level. This compensates for the absence of economic variables at the post-code area level. The full set of locality fixed effects absorbs any locality-specific time-invariant characteristics that might influence loan outcomes. This means that we do not address the question of whether banks in general supply less to certain types of locality, such as ones that are riskier, less productive or with a higher degree of economic uncertainty. Moreover, since banks are active in multiple localities, following De Haas and Van Horen (2013), we include bank fixed effects (θ_b) to control for bank-specific time-invariant factors, either observable or unobservable, that may affect the supply of SME lending (mortgage). With locality fixed effects and bank fixed effects we are able to identify the extent to which the heterogeneity in the flow of SME lending (Mortgage) by individual banks is associated with differences in banks' closeness to borrowers in various localities^{xix}.

We add quarterly time fixed effects (ω_t) to capture the changes in general macro-economic conditions. Finally, ε_{blt} is the error term. Equation (1) is estimated for SME lending and Mortgages, separately. The estimated coefficient on $LDIST_{b,l}$ (β) reveals the impact of functional distance on SME lending (Mortgage).

The information regarding the branches of participating banks is derived from Experian's Shop*Point data on the location of branches of banks for England, Scotland & Wales up to 11/04/2013. Shop*Point gathers retail information on bank/building society and the postcode via site-surveyed Goad records plus records from data sources such as Thompson Directories and UK Companies House. The Experian's Shop*Point data is further cleaned by assigning the branches to the headquarters. For example, when Experian's Shop*Point indicates that the set of same branches belong to TSB Banking Group plc as well as Lloyds Banking Group, we assign them to Lloyds Banking Group. Using the postcode of branches of the bank and that of the registered address of the participating banks, we measure the physical distance in miles between each of branches of the bank in the postcode area and the headquarters of the bank, using *Bing Map*. The distance of each participating bank at the postcode area level is computed by taking the average of the physical distances of branches of the bank in each postcode area.

Consistent with a growing literature on the effect of social capital variables in explaining the variation of financial development across geographical space (Cohen et al., 2008, 2010; Guiso et al., 2004), we construct measures of locality-specific social capital variables and allow these to interact with the functional distance. Our use of the quality of social environment to proxy for the lending opportunities in local credit market is motivated by the recent literature that the local social capital in which the borrower operates has implications for the *ex-ante* incentives of local branch officers to originate bank loans (Hasan et al., 2017). Borrowers located in a

community characterised by a higher level of social capital are expected to show a higher moral self-conception. To the extent that social capital acts as a self-disciplinary mechanism and captures borrowing firms' trustworthiness, bank branch officers working in a local credit market characterised by a higher level of social capital would be more incentivized to communicate with borrowers to determine their needs and prospect for loans (Zak and Knack, 2001).

The estimated coefficient on the interaction term identifies the moderating effect of reciprocal trust and self-enforcement in the local community where the RMs and borrowers cohabit in the functional distance-lending relation. It serves to answer the question whether the higher lending opportunities nurtured by social capital at the locality level, might play an instrumental role in borrowers' access to bank loans.

$$\Delta CR_{b,l,t} = \alpha + \beta LDIST_{b,l} + \gamma SOC_CAP_l * LDIST_{b,l} + \delta SHARE_{AREA_{b,l}} + \vartheta SHARE_{AREATOTAL_{b,l}} + \theta_b + \omega_t + \pi_l + \varepsilon_{b,l,t} \quad (2)$$

We consider the following locality-specific measures of social capital (SOC_CAP_l): the diversification index of religious group (HHIREG), the diversification index of ethnic group (HHIETH), the ratio of non-Christian over total number of residents in each locality (MINREG), the ratio of non-white over total number of residents at each locality (MINETH), and the ratio of turnout over total electorates in each locality (TURNOOUT)^{xx}. Religious diversity may be negatively associated with local cohesion (Romanelli and Khessina, 2005). Similarly, ethnic homogeneity may increase social solidarity and social capital (Putnam, 2007), while ethnic diversity may be associated with lower levels of trust^{xxi}. In addition, voter participation is driven by social pressure and internal norms at the locality level (Guiso et al., 2004). We obtain data regarding religious and ethnic groups in each postcode area from the 2011 census, and data on voter turnout in each postcode from the general election in 2011. The

diversification index of religion is calculated as the Herfindahl-Hirschman Index (HHI) of the following groups: Christian, Buddhist, Hindu, Jewish, Muslim, Sikh, Other Religion, No Religion and Religion Not Stated. The diversification index of ethnicity is calculated as the HHI of the following ethnic groups: White, Mixed/Multiple, Black/African/Caribbean/Black British, and Other Ethnic. Because the measurements of social capital are time-invariant at locality level, its first-order impact on SME lending (Mortgage) is subsumed by the locality fixed effect. Other variables remain the same as that in Equation (1)^{xxii}. Equation (2) is estimated for SME lending and Mortgage, separately.

The definition and statistical description of all variables are presented in Table 1.

Table 1 here

4. Empirical Results

Table 2 presents the estimates of Equation (1). Columns 1 – 3 shows the results for bank lending to SMEs and column 4 – 6 shows the results for bank lending for mortgages^{xxiii}. Firstly, the negative and statistically significant coefficient on functional distance for SME lending provides strong support for distance as an explanatory factor supporting the geographical dimension in small-firm lending^{xxiv}. This result directly addresses the principal-agent issue of the transmission of soft information up the decision chain of the bank and the organizational diseconomies view of Stein (2002). However, from the results for mortgage lending, we can see that functional distance is not significant. Given that, the data includes the same banks that lend to SMEs, this raises doubts about the scope inefficiency hypothesis attributed to multiple activities that require different policies and procedures (Berger et al., 1999), and the corporate politics explanation for the headquarters-bias of the access to internal capital markets (Stein and Scharfstein, 2000).

Secondly, the local market condition variable matters for SME lending but not mortgage lending^{xxv}. The variable SHARE_AREA is negative and significant suggesting that local market dominance has a negative effect on the disbursement of marginal SME lending by banks. The clear message from this finding is that banks with higher market power in the local credit market would have lower SME lending, which is consistent with the finding by Boot and Thakor (2000). The importance of branch presence for mortgage lending is seen by the positive and significant effect of SHARE_AREA_TOTAL, while for SME lending it is not statistically significant. This result says that there is no specific area that banks favour regarding SME business, but such areas exist in the case of Mortgage business. Put differently, the stronger physical presence of a bank in a postcode area reflects the distribution strategy of the bank for mortgages rather than SME lending.

Table 2 here

We now turn to the results from estimating Equation (2). Here we introduce the interaction term between the locality-specific social capital variable and functional distance. The results are reported in Table 3. We can see that the main result of a negative effect of distance on SME lending is retained and the estimated coefficient on the interaction term is not statistically significant in the case of SMEs. We can also see that functional distance on mortgages is only significant at the 5% in the case where the locality-specific social capital variable is measured by the concentration of the major ethnic composition (Column 7)^{xxvi}. In addition, the flow of mortgage lending in a location with a relatively concentrated religious community is stronger with functional distance. While electoral turnout has no effect on either type of lending, a deeper analysis of the social capital effect shows that it is not a concentrated religious and

ethnic composition that matters for mortgage lending, but a more Christian and non-minority ethnic composition that is favoured.

Put together, the results suggest that the impact of a higher level of reciprocal trust and self-enforcement in the local community where the RMs and borrowers cohabit, on the relationship between functional distance and bank lending depends on the soft information intensity of loan products. In the case of SME lending, which relies heavily on soft information that is not credibly communicated over long distance, the negative impact of organizational frictions is overwhelming. Furthermore, the *ex-ante* incentives of financial contracts, fostered by stronger social capital in the local community, fails to mitigate such barriers.

Table 3 here

We conduct a battery of additional robustness tests to confirm our main results. First, we replace the bank and quarter fixed effects in Equation (1) and (2) with bank-quarter fixed effects to capture the impact of time-varying bank-specific characteristics, such as the change in the bank's balance-sheet condition and capital position. Thus, we can analyse the provision of credit by the same bank at the same quarter to multiple localities that differ in the closeness to the headquarters of the bank, with all time-varying bank characteristics being absorbed by bank-quarter fixed effects.

Second, since quarterly balance sheet data is unavailable for all the banks, we replace the bank-quarter fixed effects with the one-period lag of quarterly bank-specific time varying variables. These are the natural logarithm of total assets (LNTA), the ratio of other earning assets to total earning assets (OTHEREARNING), the ratio of non-interest income to total income (NONINTEREST), the ratio of consumer deposits to the sum of consumer deposits and money market funding (DEPOSITRATIO), and the ratio of equity to total assets (CAPITALIZATION). Equations (1) and (2), are re-estimated and reported in Tables 4 and 5, respectively.

Third, we replace the locality and quarter fixed effects in Equation (1) and (2) with locality-quarter fixed effects to account for the impact on lending of all observed and unobserved time-varying locality characteristics such as the riskiness of lending, quality of locality, investment opportunities, the strength of the borrower's bank relationships, and access to other types of market finance. If banks with a shorter functional distance from the locality are more responsive to improved investment opportunities and increased demand for bank credit in the locality, the estimated coefficient on functional distance will have an upward bias. This way we can analyse the bank lending to the same locality within the same quarter by multiple banks that differ in the closeness to the locality, with all time-varying locality heterogeneity in demand being absorbed by locality-quarter fixed effects. Our main results that functional distance is negatively related to the change in SME lending but has no impact on mortgage lending, holds in all robustness tests^{xxvii}. Table 4 also highlights an important result concerning bank size and SME lending. The significant negative effect of total assets on SME lending is a well-known result in the literature, where size is associated with hierarchical structures and organisational complexity (Alessandrini, et al., 2010). Large banks are more likely to operate under greater organisational frictions and less able to filter soft information^{xxviii}.

Table 4 here

We further address the concern about the heterogeneity of individual borrowers in each locality in terms of the demand for bank credit and the credit quality. In our specification, we use locality fixed effects as controls for demand, leaving functional distance to capture the organisational structure of the banks. The underlying assumption is that borrowers, in each locality, have similar demand for bank credit and similar credit quality, and view local branches as providers of a perfectly substitutable good (bank credit). This assumption can, be violated if borrowers with stronger demand for bank credit and better credit quality can self-select into

bank branches with shorter functional distance. If so, the effect of functional distance on SME lending/mortgages may be driven by borrower-bank specific loan demand factors. It is arguable that borrowers are more likely to materialize the preference toward certain types of bank branches if they are in a more competitive credit market. Motivated by these arguments, we test the extent to which our result on functional distance varies across the competitiveness condition of the local credit market. We introduce the interaction between the locality HHI (HHIBRANCH), a measure of local competition computed by the sum of the share of the branches of a specific bank in a locality of total branches of all banks in that locality, and functional distance into the Equation (1), re-estimate it for SME lending, and Mortgages.

The results are shown in Table 5, with column 1 for SME lending and column 2 for Mortgages. As seen, the estimated coefficient on the interaction terms are not statistically significant, but the estimated results on functional distance for SME lending and that for Mortgage remain as above. Putting these results together, the concern that functional distance for bank-loan supply would be contaminated by borrower-bank specific loan demand is unwarranted.

Table 5 here

Finally, we test for whether our results are sensitive to the London effect. Given the core position of London in the topological structure of the UK financial system, the use of physical distance as the proxy for the functional distance might be subject to a larger degree of imperfection. We remove the postcode areas that belong to London and re-estimate the model. The results of Equation (1) are presented in Table 6. Our main results survive in the subsample without London. Three further robustness tests are reported in the appendix.

Table 6 here

5. Conclusion

The conventional view of SME financing is based on supply-side constraints that arise from the ‘opacity’ of the borrower’s capacity to repay (De la Torre et al., 2010). This opaqueness undermines the ability of the banks to handle SME borrowers on a ‘hard’ information basis. Traditionally banks have had to adopt relationship banking as the means of mitigating the problems of dealing with ‘soft’ information.

The local presence of the bank branches *per se* may not necessarily lead to greater effectiveness of relationship banking since the difficulty of verifying soft information leads to the principal-agent problem when information production is delegated to lower levels, but decision making is retained at higher levels. The argument by Stein (2002) is that such agency problems are particularly severe in large complex organisations. Informational diseconomies result in frictions in the transmission of ‘soft information’ up the organisational chain. The hierarchical organizational structure reduces the incentive for loan officers in distant branches from headquarters to acquire and engage in soft-information intensive SME lending. With mortgages, the loan decision is made primarily on "hard" information.

Using a recently available dataset on lending by the major British banks to SMEs and personal mortgages in 120 postcode areas for the period 2013(2)-2014(4), this paper tests empirical implications of Stein (2002), accounting for bank and local heterogeneity. We study the impact of the functional distance between the headquarters and the branch on the soft-information intensive SME lending against hard-information intensive personal Mortgages. We also examine the differential impact of the prevailing geographically localized social environments favourable for the participation of financial contracts on the SME lending-functional distance and Mortgages-functional distance relationship. By using mortgage lending as a control in lending by banks to postcode areas we are able to examine the impact of

functional distance on SME lending, which is more saliently dependent on the intermediation of the Relationship Manager in the transmission of ‘soft information’.

This paper argues that since we find no evidence of a negative impact of functional distance on mortgage lending but find strong evidence for such an effect on SME lending, we provide supporting evidence for the geographical dimension in SME bank lending. The demise of relationship banking and the concentration of lending decisions to HQs has been one of the possible reasons for the spatial variation in SME lending in the UK.

Our results have important policy considerations concerning UK government interventions to enhance SMEs access to external finance. The major policy efforts at the national level have been delivered through the branch network and the professional experience of private sector banking institutions on a risk-sharing basis. However, other policy prescriptions focus on the restructuring of the UK banking system to be more locally focused and even consider the break-up of the UK large banks and the creation of regional banks, and the upgrading of local financial intermediaries such as Credit Unions (Flögel and Gärtner, 2018). While such prescriptions add to the policy mix, this paper focusses on the organizational structure and relationship-based SME lending activity of existing banks. This paper as well as others cited here lends support to the policy of establishing a geographically decentralized financial system with sizeable and well-embedded regional clusters of private institutions, public agencies and networks to counterbalance the withdrawal of bank credit from the regions of the UK.

ⁱ We acknowledge the helpful and constructive comments of three anonymous referees. All remaining errors are ours completely.

ⁱⁱ For a theoretical framework and application see Liberti and Mian (2009).

ⁱⁱⁱ Also, Cohen et al., (2010), and Engelberg et al., (2012)

^{iv} Even in economies with extensive branch banking (Dow, 1992)

^v The proximity of bank branches to borrowers creates incremental market power to the lending bank (Degryse and Ongena, 2005; Alessandrini et al., 2009).

^{vi} In contrast, Berger and Udell (2006) argue that large banks offer both relationship and transactional banking as a strategic mix.

^{vii} The demand for relationship banking remains strong even as RM activity has declined in the major British banks. Survey evidence indicates 42% of SMEs prioritize access to a RM in their choice of a bank and 54% seek a closer relationship with their bank, https://www.accenture.com/.../_acnmedia/pdf-16/accenture-unlocking-revenue-sme-banking.pdf

^{viii} See Alessandrini et al. (2009); Benvenuti et al, (2010); Özildirim and Önder, (2008); Martin and Sunley, (2015); Degryse et al., (2018); Zhao and Jones-Evans, (2016)

^{ix} Following the strategy of exploiting multiple lenders (banks) towards to the same firm (locality) in order to control for demand effects. See Khwaja and Mian (2008) and Jiménez et al., (2012).

^x The bias to hard information by the banks is evident in Mason and Stark (2004) who report that bankers place greater weight on financial information than Venture Capitalists and Business Angels.

^{xi} SME lending figures relate to borrowing through loans and overdrafts only.

^{xii} Figures cover Great Britain only.

^{xiii} Henry et al (2019) examine the geography of personal lending, but we believe we are the first to use it to examine SME lending.

^{xiv} There are 120 postcode areas in the UK Each area is divided into smaller postcode districts and each district is further divided into 9000 postcode sectors.

^{xv} Clydesdale & Yorkshire Banks do not report SME lending in q2, 2013 for Llandrindod Wells, Luton Sutton, Taunton, Truro, and Wolverhampton and are excluded from the dataset.

^{xvi} Clydesdale & Yorkshire Banks do not report personal mortgage lending in q2, 2013 for Torquay and are therefore excluded from the dataset.

^{xvii} The acceptance rate for new lending applications is only but one factor, shaping the change in the stock of lending over a given period. However, as described above, the full set of locality fixed effects will account for any other factors that influence loan outcomes. In so far as, the fixed effects do not capture locality specific heterogeneity that influence the change in SME credit, the potential bias in the estimate will depend on the covariance between the measure of functional distance and the other unmeasured factors. If the correlation between the functional distance and the other factors that affect the change in the stock of credit is zero, then the bias is zero. In all our results, the impact remains negative. We are grateful to an anonymous referee for this point.

^{xviii} Some banks may elevate the loan decision to regional HQs rather than registered HQ. This means that functional distance is mis-measured. The result is to bias the estimate of β downward if the correlation between the distance to regional HQ and registered HQ is positive. If the correlation is zero, the bias is zero. Only if the correlation is negative will there be a positive bias. This is a weakness in our study that we leave for future research. We thank two anonymous referees for pointing this out.

^{xix} Our identification is the different functional distance of different banks' branches given the same locality. Put differently, for banks which have branches in a given postcode area, the bank that has shorter distance between the postcode area and its headquarters has a higher net change in the outstanding stock of SME lending, compared to other banks.

^{xx} To identify *ex ante* incentives, Guiso et al. (2008) advocate the use of intergenerational values as measures of social capital, as these are not endogenous to the actions of economic agents.

^{xxi} This could occur because homogenous communities have similar tastes; the majority group are averse to heterogeneity, or because diverse communities find it more difficult to enforce a system of social sanctions (Alesina et al., 2003).

^{xxii} The locality-specific measure of social capital in the interaction term is mean subtracted using the average value across all postcode areas. Therefore, the first order effect of the functional distance in Equation (2) reflects the impact for the locality which has the average value of the social capital across all postcode areas.

^{xxiii} The reasoning for the locality, bank, and time fixed effects is discussed above regarding the specification of equation 1.

^{xxiv} A specific concern raised by an anonymous reviewer is that the functional distance for four of the six banks is similar, being head quartered in London. Each of the four banks in London have a different postcode and additionally, the functional distance of a bank in a given postcode area is the average physical distance between the full postcode of the headquarters of the bank and that of each branch of the bank in each postcode area. In a further robustness test, we remove one bank each time and re- estimate equation (1). The results remain qualitatively the same and are available on request.

^{xxv} We recognise that smaller challenger banks are active in SME lending and their exclusion from the sample can give rise to biased results. However, if the market shares of these challenger banks stay constant at each locality, the locality fixed effect capture the residual demand faced by other banks in our sample. Similarly, if the market shares at each locality has time variation, the locality*time fixed effect does the same.

^{xxvi} Longer distance seems to encourage Mortgages based on "hard," verifiable information for postcode areas which exhibit above national average value of social capital.

^{xxvii} To save space, we only report the results of the specifications, which control for bank-specific time varying variables. All other results of robustness tests are available from authors on request.

^{xxviii} We are grateful to an anonymous referee for this point.