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## Neither true-friend nor fairweather friend: Relationship banking and SME borrowing under Covid-19

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# Cardiff Economics Working Papers



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# **Neither True-friend nor Fairweather friend: Relationship Banking and SME borrowing under Covid-19**

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## **Abstract**

A growing literature addresses the costs and benefits associated with relationship banking, particularly for smaller firms, but with much of this work focused on normal trading conditions. Covid-19 provides an ideal testbed to explore the resilience of relationship banking. We examine whether the presence of closer pre-Covid ties between SMEs and their banks helps in accessing funds in the Covid-19 pandemic period. Then are ties between relationship bankers and SME borrowers a case of ‘true love’ or rather are the parties more akin to ‘fair-weather friends’? Data from the UK *SME Finance Monitor* from 2018Q2-2020Q3 is used to examine this question. Our analysis suggests that relationship banking was important for the acquisition of bank credit pre-Covid-19 but was of limited influence in post-Covid-19 lending behaviour. Banks treated SMEs that had a good relationship with them in the same way as those that did not and with public interventions to support lenders material in this.

**Key Words:** Covid-19, Relationship Banking, SMEs

**JEL Codes:** G21, G28, G40,

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## 1. Introduction

Research has examined the costs and benefits for firms associated with closer relationship banking. This has explored how far those businesses that enjoy closer relationships with their lenders receive better loan conditions (Rajan, 1992; Boot and Thakor, 2000; Petersen and Rajan, 1994, 1995). Some argue that firms in closer relationships might be expected to gain more favourable treatments because banks use client information gained to retain these firms' longer term. Conversely there can be an issue that a tighter relationship breeds dependence and that banks might take advantage of private information *ex post* to impose more disadvantageous loan conditions.

Notwithstanding Berger et al. (2021) suggest that the 'brighter side' of relationship banking tends to prevail in terms of more favourable loan conditions (Berger and Udell, 1995, Degryse and Ongena, 2005, 2008). However, they show that much of our understanding about relationship banking is based on normal economic conditions and then with questions on the value of relationship banking during times of economic stress. Then is it the case that the knowledge gained by the bank about the SME borrowers in the good times through customer relationship managers translates into benefits for relationship borrowers during bad times? In the Global Financial Crisis (GFC), Berger et al. (2021) concluded that those firms with closer relationships with their banks benefited (see also Beck et al., 2018). The crisis resulted in constraints on bank liquidity and was therefore a specific supply side shock. Clearly, the current Covid-19 pandemic allows a more rounded appraisal of the resilience of relationship banking with huge pressures being placed on small firms, and with retail banks better placed to provide services to SMEs than they were during the GFC.

Initial work by Berger et al. (2021) suggests, at least in the US, that there is a 'dark side of relationship lending' prevailing during the COVID-19 crisis. Firms in closer relationships with their banks were shown to be disadvantaged in terms of loan contract terms compared to other firms. Berger et al. concluded that: "Banks do not appear to be friends indeed with their relationship borrowers in need" but with "limited pockets of support for the bright side of relationships for smaller firms and smaller banks". Can such conclusions in the US case be generalised and is there any 'bright side' evidence for relationship banking for smaller firms elsewhere.

We seek to address how far relationship banking helps UK SMEs in accessing funds in the Covid-19 pandemic period? This concerns how far the expected 'positive' outcomes for SMEs from relationship banking are resilient to economic shocks, and with the shock context being provided by the Covid-19 pandemic. More prosaically we seek to investigate whether

ties between relationship bankers and SME borrowers are a case of ‘true love’ or rather are the parties more akin to ‘fair-weather friends’, and with the possibility that retail banks are perhaps unable to maintain closer relationships through the Covid-19 pandemic. Other questions also emerge here. The UK and devolved UK administration response to assisting small firms during the pandemic has tended to focus more on loan support to industries worst affected. However, some industries perhaps less impacted by the loss of output through the pandemic period have also required finance for working capital and in some cases for new innovation and then business expansion. So, there is also a question of where UK Government largesse has been limited to selected ‘more pandemic proof’ industries, whether the UK retail banks have intervened to assist SMEs in these industries particularly with firms in these industries where they have had closer relationship ties.

Our findings suggest that relationship banking is important for the acquisition of bank credit in the pre-Covid-19 period, but that it played very little part in the post-Covid-19 lending behaviour of the banks. While banks treated SMEs that had a closer relationship with them in the same way as those that did not, the closer relationship appears to fare better for SMEs operating in the industries suffering more because of Covid-19. In contrast to Berger et al. (2021) we find little evidence for a ‘dark side’ to the SME-bank relationship.

The remainder of the paper is structured as follows. The second section introduces the literature on relationship banking but focuses on the more specific contextual issue of relationship banking in the UK and how the outcomes for lender and borrower are affected by economic shocks. We review evidence in respect of small firm relationship banking and research that has examined the impacts of Covid-19 on relationship banking. The third section outlines our main hypotheses. We then describe the data employed, the empirical strategy and then develop a series of econometric models through which we might understand how events through the Covid-19 pandemic have affected the probability of loan approvals for SMEs. In section four we show the results. The conclusions discuss the practical ramifications of the findings for SMEs and retail banks, and limitations of the study and a strategy for taking next steps in this research.

## **2. Context and Literature**

### *2.1 Costs and benefits of relationship banking in times of economic stress?*

An existing literature reveals the importance of relationship banking in treating with market failures facing SMEs in the external finance market. SMEs can offer relatively little hard

information for banks in terms of detailed financial statements, market prices for traded securities, and public credit ratings. The soft information behind relationship lending may then be more valuable relative to hard information (Liberti and Petersen, 2019). Consequently, the literature on the role and value of relationship banking reinforces the supposition that a strong borrower-bank relationship reduces the likelihood of SMEs being credit constrained. Such a relationship also eases loan conditions and non-price terms on loan contracts (Bharath et al., 2007; Hainz and Wiegand, 2013). It might also enable the efficient absorption of new information as the relationship matures. This potentially permits a loosening of terms and conditions of the loan covenant *ex-post* (Rajan and Winton, 1995; Boot, 2000; Park 2000). A stronger firm borrower-bank relationship has also been shown to result in longer loan maturities (Demiroglu and James, 2010). Such benefits are not without cost (Baas and Schrooten, 2006). SMEs pay for relationship lending through a higher cost of credit and higher fees. SMEs may also endure harsher terms as banks exercise market power over the private information they accumulate during the bank-borrower relationship and “hold up” their relationship customers (Rajan, 1992)

The GFC provided a catalyst for investigations into the effects of relationship banking on SME lending in a period of economic stress. Bolton et al. (2016) examined post GFC lending to Italian firms. They found that because firms reliant on relationship banking are those most exposed to business cycle risk, that these same firms paid a higher borrowing cost in the form of an insurance premium to secure funding in times of crisis. This is supported by Degryse et al. (2017) who find that SMEs in Wales that had a close firm borrower-bank relationship were less credit constrained post-GFC but paid a higher price in fees and cost of credit. Using data for 21 countries, Beck et al. (2018) find that firms that have more relationship banks in their vicinity are less likely to be credit constrained in the downturn of the business cycle. This applies particularly to small and informationally opaque firms.

An emerging literature also explores the role of trust in cementing the ‘relationship’ in relationship banking (Uzzi and Lancaster, 2003). Degryse et al, (2021) use a UK wide survey of SME firms to explore the role of ‘trust’ in enabling the credit market. They construct a survey-based measure of trust-based relationship banking and examine the effect of the operational autonomy of the Relationship Manager (RM) for the strength of the trust-based relationship in the banks’ screening system. They find evidence that trust-based relationship banking helped to reduce the credit constraints faced by SMEs in the decade following the GFC. Trust is therefore an important ingredient in the development of relationship banking and

mutual trust between the SME borrower and the RM provides an advantage in securing bank credit in the post-GFC decade. However, do the advantages of such relationships hold up in all cases of severe shocks hitting SME borrowers? The Covid-19 pandemic presents the opportunity to investigate this.

## *2.2 Recent UK context for relationship banking*

Our analysis has some pre-Covid UK contextual elements which need to be understood. Institutional developments in UK branch banking have created a geographical concentration in decision-making that is based in the strategic centres of banking institutions. This has been shown to have depreciated the importance of tacit and personalized local knowledge in the underwriting of bank credit toward SMEs (Zhao and Jones-Evans, 2017). Work in the UK examining the geographical dimension of bank credit availability has focussed on the role of the dissemination of ‘soft’ information between the SME, the bank branch and then decision making at bank HQs (the latter of which may be far distant from the SME borrower). The removal of bank branches and local relationship managers is a critical link in this chain which when removed can affect SME access to credit. Indeed, branch closures across the UK are a symptom of a trend to concentrate loan decision making to HQs – a trend hastened by the GFC. Degryse et al. (2018) find that the centralisation of banking corporate lending decisions has had a deleterious effect on bank credit availability in areas furthest from the bank HQ<sup>1</sup>. SMEs developing good customer-loan relationships with their banks found that they were able to maintain lines of credit even in times of financial stress. In consequence in some of the more needy parts of the UK economy, relationship banking has been identified as a means of attenuating regional differences in bank credit availability.

There are a series of additional issues to consider in respect of the Covid-19 crisis and UK SME demand for and the supply of loan finance. Our analysis covers the period to 2020 Q3. Critical context for the supply side to SME loans and credit facilities was a series of public interventions to assist smaller firms through the first part of the lockdown from March-June 2020. Indeed, the pandemic saw many small firms moving away from conventional forms of external finance towards government supported loans and grants. Consequently 2020 as a whole saw levels of SME borrowing exceeding that occurring during the GFC. The report *Small Business Finance Markets 2020/21* (British Business Bank, 2021) estimated that SME term lending for 2020 was of the order £104bn. Of this over half was connected to two British

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<sup>1</sup> See also Zhao et al. (2021) on the geographical implications of SME bank credit and the distance to bank HQ.

Business Bank (the government owned business development bank) schemes where commercial loans offered by retail banks were supported by the UK Government.

First, during March 2020 the government announced a Coronavirus Business Interruption Loan Scheme (CBILS). This was available for firms of up to £45m sales. To qualify there was a need for a viable business proposal which would have proceeded had it not been for Covid-19. Critical here was that the agents were the retail banks (who applied their own interest rates) but with the UK Government guaranteeing 80% of the amounts loaned (between £5,000 and £50m) and with the government paying the first year of loan interest. As of February 2021, the value of these loans had reached around £20bn.

The CBILS initiative was quickly followed in May 2020 by the Bounce Back Loan Scheme (BLS) which was available for small firms affected by the pandemic but not previously in difficulty. The monies available here were smaller than under CBILS with from £2,000 to £50,000 available. In a critical difference to CBILS, it was the UK government that set the interest rate at 2.5% and guaranteed 100% of the monies involved. As of February 2021, around £45bn had been loaned under this scheme.

Notwithstanding the presence of these UK-wide schemes during the first lockdown period from March-June 2020, further funding was to become available to aid business recovery and repayment holidays were announced as the pandemic continued into 2021. Other public sector interventions in 2020 also addressed working capital problems being faced by SMEs such as the Coronavirus Job Retention Scheme (CJRS – furlough scheme). In addition, across the UK were a varied tapestry of more local schemes to assist small firms and with some of this SME support in terms of direct grants as opposed to loans brokered through the retail banks. The devolved nation of Wales provides a good example of the breadth of SME support (see Economic Intelligence Wales, 2020). For Wales by October 2020 an estimated £1.7bn had been offered to small firms through CBILS and BLS, but with an additional £92m being offered through the Welsh Government controlled Development Bank of Wales via its Coronavirus Wales Business Loan Scheme. Similarly, while there was grant support from the UK government to Welsh enterprise through the furlough scheme and the Self Employment Income Support Scheme (SEISS) of around £2.2bn, this was supplemented by grants assistance managed through the Welsh Government Economic Resilience Fund of close to £1bn and with much of this support through Non-Domestic Rates grants.

The upshot is that UK lenders were provided with a commodious lifeboat in terms of their lending activities with smaller firms. One question then is how far the presence of the lifeboat affected loans to service relationship customers, and with the prospect that banks were



also able to offer more facilities to firms in more distant relationships with them. There is also the intriguing question of what might have occurred without the presence of the UK Government loan guarantee schemes had the main lenders been left to their own devices.

### *2.3 Relationship banking and Covid-19*

Outside the UK the empirical research on bank lending during the pandemic provides evidence that borrowers generally did not fare as well during the crisis. International studies find reduced loan growth (Colak and Oztekin, 2020) and higher interest rate spreads (Hassan et al., 2020). The change in lending behaviour during Covid-19 appears to relate to bank-specific situations. Banks with heavy exposure to firm's liquidity insurance provisions appear to have tightened loan conditions on large, syndicated loans (Kapan and Minoiu, 2021). Chodorow-Reich et al. (2020) also reveal that SMEs obtained shorter loan maturities, faced wider spreads, and higher collateral conditions than larger firms.

The empirical evidence on the impact of relationship banking on the access to bank credit is more limited. Hassan et al. (2020) argue that the pandemic resulted in a widening of spreads in global syndicated loans, but that firms having a strong bank relationship were able to soften the increase in spreads.

Berger et al. (2021) find that relationship borrowers tended to pay a higher interest cost, posted stronger collateral, and obtained shorter maturities on loans during the COVID-19 crisis. The positive impact of relationship on loan contract terms were confined to smaller relationship borrowers and relationship borrowers at smaller banks<sup>2</sup>. They conclude that it is the darker side of relationship banking which prevailed with US lending banks involved with public sector interventions to assist firms (in the US case the Paycheck Protection Programme).

There has been limited UK research examining the effect of the Covid-19 pandemic on the role of relationship banking for SME finance. Here, we investigate whether the closeness of the bank-SME relationship enhances the probability that SME requests for loans are successfully approved. We examine differences in the likelihood of successful approval between small firms and medium firms. We also study the change in impact between the pre- and post-Covid 19 period. Finally, we test for the impact differentials for SMEs operating in the industries more badly affected by Covid-19.

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<sup>2</sup> Berger et al., (2021) acknowledge the absence of the smallest banks in the sample since the data does not include loans below \$1 million and "small business loans" and excludes banks with under \$100 billion in assets.

### 3. Hypothesis Development, Data and Modelling Strategy

The post-GFC literature on bank lending, relationship banking and SMEs suggest a series of cascading hypotheses. The first is that relationship banking aids credit acquisition by SMEs.

*Hypothesis 1:* SMEs that have a strong lending relationship with their main bank will have a higher likelihood of obtaining bank credit when demanded.

The empirical literature generally suggests that smaller firms are more likely to feel the costs and benefits consequent on relationship lending. To the above, we add the following hypothesis:

*Hypothesis 2:* The impact of a closer relationship on successfully securing access to bank credit is more pronounced for small sized firms relative to medium ones.

We now come to our main Covid-19 related hypothesis which comes in two parts. First, SMEs that have a stronger lending relationship with their main bank will benefit more than others in the Covid-19 crisis. Second, as a subsidiary hypothesis we speculate that the impact would be more pronounced for smaller SMEs compared to medium ones.

*Hypothesis 3:* SMEs that have a stronger lending relationship with their main bank will suffer less from the constraint in accessing bank credit in the Covid-19 period.

Finally, the impacts of Covid-19 varied by industries. SME borrowers operating in the industries experiencing higher negative shocks would be particularly in need, and the value of relationship banking would be more pronounced for them.

*Hypothesis 4:* The change in the impact of a stronger lending relationship in the post-Covid 19 is more pronounced for SMEs operating in the industries suffering from greater shocks from Covid-19.

Our dependent variable is a binary variable indicating success in accessing bank credit by SME applicants. We approach this using two standard methods for a binary regression model: the linear probability model (LPM) and the probit model. With the LPM  $y = (0,1)$  is given by:

$$E(y|Z) = Pr(y = 1|Z) = Z'\beta \quad (1)$$

The parameters  $[\beta]$  are estimated using Ordinary Least Squares (OLS) and the estimated coefficient on each of variables in  $Z$  can be interpreted as the change in the probability that  $y=1$  for one unit change in the specific variable, holding constant the other explanatory variables. While this model is easy to estimate and interpret, in its unrestricted form it can produce values

for the probability outside the [0,1] domain. For this reason, the logit or probit model is preferred.

The probit model analytically represents the binomial probabilities  $\Pr(y = 1)$  and  $\Pr(y = 0)$  in terms of the cumulative standard normal distribution function  $\Phi(\cdot)$  as follows:

$$\Pr(y = 1|Z) = \Pr(y^* \geq 0) = \Phi(Z'\beta) \quad (2)$$

where  $Z$  is the vector of explanatory variables that generates  $y^*$  and  $\beta$  is the vector of response parameters of  $Z$ . The coefficients ( $\beta$ s) are estimated by maximum likelihood and their corresponding standard errors are asymptotically efficient. However, these coefficients give the impact of the explanatory variables on the latent variable  $y^*$ . The marginal effect of the explanatory variables on the probabilities of the occurrence of  $y = 1$  can be derived via the transformation from the coefficient to a probability.

The main data for this paper comes from the *SME Finance Monitor*. This quarterly survey questions 4,500 SMEs about their borrowing events in the past 12 months as well as their future borrowing intentions. The data has been used by banks, government, the Bank of England, and industry bodies to inform the debate on key issues regarding SMEs' access to finance. The interview respondent was the person in charge of managing the business finances. This paper will examine the data from 2018Q2-2020Q3. The sampling weight for each respondent assigns the probability of selection and has been applied in the quantitative analysis to ensure the data analysis reflects the population accurately.

### 3.1 Dependent variable

Our measure of the existence of a credit constraint is derived from the experience of SMEs that have applied from the main bank for a bank credit facility (either bank loan or bank overdraft) over the past 12 months. We denote SMEs as free from credit constraint (*ACCESS*) and take the value of 1 if the final outcome is “*you were offered the facility you wanted and took it*”, and those as credit constrained and take the value of 0 if the final outcome is any of, “*you took the bank credit after issues, for example with the terms and condition*”, “*you took a different finance product from your main bank*”, “*you were offered finance by the main bank but decided not to take it*” and “*you were turned down for finance by your main bank*”. Being rejected for credit is indicative of a credit rationing outcome, other outcomes which we also categorised as the presence of credit constraints pertain to different degrees of financial friction between the SME and its main bank.

### 3.2 Independent variables

We aim to quantify the effect of relationship banking on the prospects for securing bank credit under ‘normal’ and ‘stressful’ periods. The survey elicits several responses to two specifically relevant questions. The first identifies the type of relationship the SME borrower has with its main bank. The second identifies the degree of trust the borrower has in the bank. The SME-bank relation is measured by the binary variable *RELATION*. While the duration of bank-borrower relationship and the scope of business have been widely used as the measure of relationship banking in the literature, this is contaminated by the market power implied in bank-borrower relationships and carries limited information value of the relationship strength (Degryse et al., 2021). A longer duration may reflect higher switching cost and lower competitiveness in the credit market for SMEs. The duration *per se* does not necessarily indicate the frequency and proactive communication method which are fundamentally important for the value of relationship banking. Similarly, the larger scope of business ties between the main bank and the SME borrowers might result from product bundling and cross selling practiced by the main bank which is likely derived from the lower bargaining power facing by SME borrowers (Zhao et al., 2013).

Mutual trust between the SME borrower and the Relationship Manager is an important ingredient in the development of relationship banking (Degryse et al., 2021). Fairness is one of the key factors affecting the development of mutual trust (Sun et al., 2021). By analogy, the perception of fairness in their dealings with the bank influences their judgment of mutual trust and relationship quality. Taking this line of reasoning, the binary variable (*TRUST* – see Table 1) allows the investigation of the impact of trust on the credit constraint facing SMEs. Also, it helps to correct the possible perception bias in the measure of the strength of the relationship and the presence of the credit constraint in the loan application.

The variable *SUMSME* distinguishes between small and medium-sized SMEs. The size of the borrowing firm signals economic strength, resilience, and collateral capacity. We expect smaller firms to be disadvantaged relative to the medium-sized ones in securing bank credit. We expect that the value of relationship banking would be particularly relevant for small firms. A Covid-19 dummy variable (*POST*) identifies loan applications made during the period of the pandemic shock. It takes the value of 1 for loan applications made in 2020Q1 onwards and 0 otherwise. Regarding the degree of industry exposure to the negative shock, we use the industry-specific index of the first-order reduction in output from the immediate Covid-19 shock (see Pichler et al. 2021). The measure allows for both the supply shock faced by each

industry, workers not being able to perform their activities at home, and difficulties adapting to social distancing measures and demand shocks resulting from changes in consumer preferences to minimize risk of infection.

The variable *INSHOCK* identifies if the principal activity of the loan applicant is in an industry with a higher than median level output shock during the COVID-19 period, 0 otherwise. This is a superior measure to alternatives that reflect economic activity – such as business closures, revenue declines, and numbers of employees working – since these may be endogenous to the credit decision. A vector of firm-level characteristics teases out factors that are associated with banks’ industrial practices regarding risk evaluation in the provision of bank credit. The vector of firm-specific controls also serves to mitigate the concerns of selection bias. By excluding discouraged applicants, the data may be a systematically truncated sub-sample of all SMEs rather than a random sample<sup>3</sup>.

The borrower risk indicators included in our analysis can be categorised into three groups. First, characteristics reflecting the observable riskiness of the firm; second characteristics banks would rely on to assess the riskiness of the firm; and third, characteristics that are perceived by banks as carrying higher risk *ex ante*.

The first of these is measured by the dummy variable *HIGHRISK*, derived from Dun & Bradstreet, indicating whether the risk rating groups of the respondents is at average and above<sup>4</sup>. The risk rating is related to the predictive scores on the likelihood of financial distress in the forthcoming twelve months and carries the information regarding the creditworthiness and probability business failure. With the second, the variable *INDUSTRY* is a dummy variable that indicates the principal activity of the respondents. As argued by Rajan and Zingales (1998), industry-specific technological features such as the initial project scale, the gestation period, the cash harvest period, and the requirement for continuing investment are important determinants of firms’ demand for external financing and signal the affordability of debt

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<sup>3</sup> Adding controls for the demand for bank credit is an appropriate solution to the selection-bias if the selection takes place according to the observable variables. Indeed, there is no selection problem if every variable influencing selection is controlled in the outcome equation since selection bias is equivalent to an omitted variable bias (Heckman, 1979). In the case where sample selection is dependent on the unobservables, and when the unobservables in the selection equation are correlated with the unobservables in the outcome equation, the common practice for correction is to estimate the demand for external finance equation and the outcome of application simultaneously using a bivariate probit model. This is part the robustness tests contained in the supplementary material in the Appendices.

<sup>4</sup> The risk ratings of Dun & Bradstreet are constructed using information regarding the nature of business, negative actions such as court actions or the failure to pay debts, and data on individual company directors.

obligations for SMEs. With the third, we follow Ongena et al. (2013) and argue that information opacity drives ex-ante riskiness of SMEs which is mitigated by the longevity of its existence. The variable *AGE* captures the age of the firm.

Other variables are *LEGAL* denoting the legal form of the SME. This signals the veracity of the quantity and the quality of information within the firm financial statements<sup>5</sup>. In the absence of transparent disclosure, SMEs are less able to send credible signals to banks. Moreover, unaudited statements have a much higher risk of material misstatement (Allee and Yohn, 2009; Ongena et al., 2013). *REGION* dummies capture regional specific characteristics. *FIRSTTIME* is a binary variable that indicates the status of the application to the bank. It has been shown (Cole, 1998) that banks are more likely to extend credit to SMEs with whom they have had pre-existing transactions since “learning by lending” conveys private information about SMEs’ near-term financial performance. Banks perceive further loans to be less risky, conditional on past experiences with viable and trustworthy small businesses (Diamond, 1991). Variables are also included to pick up on the exclusiveness of the SME and bank relationship (*EXCLUSIVE*) and to examine the extent to which loan approvals might be impacted when the SME switched to its current main bank in the past 3 years (*SWITCHER*). Since information sharing among multiple bank relationships would lead to the free-riding of information production, the exclusivity of bank-borrower relationship influences the main banks’ incentives to gather private information and monitor borrowers. It also makes banks more willing to ensure a steady flow of credit to firms, during recessions (Gobbi and Sette, 2014; Sette and Gobi, 2015). *SWITCHER* accounts for the empirical finding that relationship banking needs frequent, repeated and personal interaction between the main bank and the SME borrowers (Degryse et al., 2017). Since the switch relates to the event in the past 3 years, and the Covid-19 pandemic was not unanticipated by both the bank and the SME borrowers, the variable *SWITCHER* could also help to mitigate the self-selection concern that SME borrowers may choose main banks on the expected access to bank credit in the future (Beck et al., 2018).

Finally, we introduce the dummy variable *TYPE* to account for the difference between bank loans and bank overdraft, two types of bank credit, which are different products with contract terms that may not be comparable.

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<sup>5</sup> In the UK, the stringency of regulation of financial reporting differs across different legal statuses. While it is not required for a sole trader to register or file accounts and returns with Companies House, the Limited Company form, and Limited Liability Partnership (LLPs) are required to register and file accounts and annual returns.

The definition of the variables used are summarised in Table 1. We test for collinearity among the independent variables, calculating the variance inflation factor (VIF) for each of independent variables of our empirical model<sup>6</sup>. None of our independent variables has a VIF value higher than the threshold of 10 suggesting the correlation among the independent variables is not an issue (Kutner et al., 2004).

**Table 1:** Definition of variables

Name of the variables	Definition of the variable
<b><u>Dependent variables</u></b>	
$ACCESS_{f,i,r,t}$	Access to bank credit (bank loan or overdraft) provided by the main bank in last 12 months.
<b><u>Independent variables</u></b>	
$RELATION_{f,i,r}$	= 1 if “We have a strong working relationship with our bank and feel we can approach them whenever we need to”. 0 otherwise
$TRUST_{f,i,r}$	= 1 if score is above 6 out of 10 “to what extent would you say that you trust your main bank to treat you fairly?”, 0 otherwise.
$SUMSME_{f,i,r}$	= 1 if the respondent has a yearly turnover smaller than £7.5m and number of employees smaller than 50, 0 otherwise.
$POST_t$	= 1 if the application was made Q1, 2020 and after, 0 otherwise.
$INSHOCK_{f,i}$	= 1 if the principal activity operating in the industry faced higher than the median level of the shock during the Covid-19 period, 0 otherwise. The level of the negative shock for the industry is extracted from Pichler et al (2021)
$AGE_{f,i,r}$	3 categorical dummies for the age of the establishment of the SME. 1 = length is < 6 years; 2 = 6-10 (inclusive), 3 = > 10 years
$LEGAL_{f,i,r}$	4 categorical dummies for the legal status of the SME, “Sole Proprietorship”, “Partnership”, “Limited Liability Partnership (LLP)”, and “Limited Liability Company.”
$INDUSTRY_i$	9 categorical dummies for the principal activity of the SME defined according to SIC 2007.
$REGION_r$	11 categorical dummies for the economic region where the SME is located
$HIGHRISK_{f,i,r}$	= 1 if Dun & Bradstreet risk rating average and above, 0 otherwise.
$FIRSTTIME_{f,i,r,t}$	= 1 if first-time applicant for bank credit from the main bank when the application was made, 0 otherwise.
$SWITCHER_{f,i,r}$	= 1 if change main bank in the past 3 years, 0 otherwise.
$EXCLUSIVE_{f,i,r}$	= 1 if uses only one financial institution for the business, 0 otherwise.
$TYPE_{f,i,r,t}$	Two categorical dummies; 1 = bank loan, 2 = overdraft

<sup>6</sup> Details available on request.

The basic characteristics of the data used in the estimation is shown in Table 2<sup>7</sup>.

**Table 2:** Characteristics of the data used in the estimation.

Variable	No. Obs	Mean	Std. Dev.
<i>ACCESS</i>	1,549	0.777	0.416
<i>SUMSME</i>	1,270	0.169	0.375
<i>RELATION</i>	1,549	0.469	0.499
<i>TRUST</i>	1,549	0.760	0.427
<i>INSHOCK</i>	1,549	0.162	0.369
<i>HIGHRISK</i>	1,403	0.506	0.500
<i>FIRSTIME</i>	1,537	0.418	0.493
<i>SWITCHER</i>	1,549	0.041	0.198
<i>EXCLUSIVE</i>	1,549	0.979	0.142

The distribution of credit access over the pre-Covid-19 and post-Covid-19 periods is shown in Table 3. This reveals that loan applications in the post-Covid period are approximately one-half of the pre-Covid period, but the ratio of access to rejections is 5.7 compared with 2.8 in the pre-Covid-19 period. The main reason for the lower number of loan applications in the post-Covid-19 is that the period is not complete. The Q3 of 2020 is the maturity of the second wave and the second lockdown was announced in Q4 (31 October). The more revealing statistic is that the post-Covid-19 period witnessed a higher frequency of credit access relative to rejections.

**Table 3:** Cross tabulation between the pre versus post Covid 19 and the approval

	post-Covid-19 coded 1 and 0 otherwise		
ACCESS coded as 1, 0 otherwise			
	0	1	Total
0	263 (17.0%)	82 (5.3%)	345 (22.3%)
1	736 (47.5%)	468 (30.2%)	1,204 (77.7%)
Total	999 (64.5%)	550 (35.5%)	1,549

Note: the table contains the comparison for those who applied bank credit toward their main bank in the pre- and post-Covid period and outcome of the application. Definition of variables can be found in Table 1.

<sup>7</sup> While the total number of responses in the *SME Monitor* is 45,000, the usable observations are 1549 once the data is condensed to the definition of the dependent variable.



## 4. Results

### 4.1 Model specification and estimation

The base line model to test Hypotheses 1 and 2 is specified in equations (3)-(4) below:

$$ACCESS_{f,i,r,t} = \alpha_2 + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \vartheta CONTROL_{f,i,r} + \varepsilon_{f,i,r,t} \quad (3)$$

$$ACCESS_{f,i,r,t} = \alpha_2 + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \xi SUMSME_{f,i,r} * RELATION_{f,i,r} + \vartheta CONTROL_{f,i,r} + \varepsilon_{f,i,r,t} \quad (4)$$

The subscript  $f, i, r, t$  refers to SME  $f$ , industry  $i$ , region  $r$  and at time  $t$ . The interaction term in equation (4) addresses the differential impact of a stronger relationship with the main bank for smaller versus medium SMEs.

The base line model to test Hypothesis 3 is specified in equation (5) below:

$$ACCESS_{f,i,r,t} = \alpha_2 + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \pi POST_t * RELATION_{f,i,r} + \vartheta CONTROL_{f,i,r} + \varepsilon_{f,i,r,t} \quad (5)$$

Where the interaction term  $POST_t * RELATION_{f,i,r}$  is to examine the change in the impact of a stronger relation with the main bank in the post-Covid-19, compared to pre-Covid-19 period. The base line model to test the second part of Hypothesis 3 is specified in equation (6) below:

$$ACCESS_{f,i,r,t} = \alpha_2 + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \xi SUMSME_{f,i,r} * RELATION_{f,i,r} + \pi POST_t * RELATION_{f,i,r} + \varpi POST_t * SUMSME_{f,i,r} + \zeta POST_t * SUMSME_{f,i,r} * RELATION_{f,i,r} + \vartheta CONTROL_{f,i,r} + \varepsilon_{f,i,r,t} \quad (6)$$

Where the triple interaction term  $POST_t * SUMSME_{f,i,r} * RELATION_{f,i,r}$  captures whether the change in the impact of a stronger relation with the main bank post-Covid-19, compared to the pre-Covid-19 period is more significant for small firms, relative to medium-sized ones.

The base line model to test Hypothesis 4 is specified in equation (7) below:

$$\begin{aligned}
ACCESS_{f,i,r,t} = & \alpha_2 + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \\
& \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \pi POST_t * RELATION_{f,i,r} + \pi INSHOCK_{f,i} * \\
& RELATION_{f,i,r} + \vartheta CONTROL_{f,i,r} + \varepsilon_{f,i,r,t}
\end{aligned} \tag{7}$$

Where the interaction term  $INSHOCK_{f,i} * RELATION_{f,i,r}$  captures whether the change in the impact of a stronger relation with the main bank in the post-Covid-19, compared to pre-Covid-19 period is more significant for SMEs operating in the industry suffering a higher negative Covid-19 shock.

#### 4.2 Empirical results

Table 4 presents the results from the LPM model to address the impact of a stronger relationship with the main bank. The results show that a strong SME-borrower-bank relationship increases the likelihood of securing credit from the main bank. Trusting the bank to treat the borrower fairly has an even stronger positive effect on the likelihood of securing funds. The *POST* dummy variable shows that the post-Covid-19 period was one that had SME borrowers being more likely to obtain funds than in the pre-Covid-19 period. We can also see that smaller firms are disadvantaged relative to medium sized firms in obtaining bank credit from their main bank. Also, SMEs operating in the industries with higher negative exposure to the Covid-19 shock were strongly disadvantaged in obtaining credit. Finally, the results show that a borrower that had recently switched to the main bank from another bank was significantly disadvantaged in terms of the likelihood of securing funds. There is weak evidence that if the firm was a first-time borrower, that they were more likely to obtain funds and similarly positive if the funds were in the form of a bank loan rather than overdraft. The results from the probit estimation mirror those from the LPM presented in the Appendices<sup>8</sup>.

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<sup>8</sup> We accept that a full analysis of the loan decision needs to consider the demand side. A SME must decide whether to apply for external finance and from which external finance provider if it decides to apply. This means some firms self-select by deciding not to apply for external finance since they prefer to finance themselves through other means. Since the dependent variable is not observed for part of the sample estimated coefficients in the outcome equation may be biased. To deal with we estimated the demand for external finance to predict the likelihood of selecting into the sample and loan decisions to predict the outcome of the application, simultaneously, using a bivariate probit model to estimate the application and decision equations. The correlation between the two equations indicates the presence of such self-selection problem and the extent to which self-selection appears to be statistically significant. Our findings in this respect are shown in the Appendix and show that self-selection carries little impact on estimates of coefficients on the main variables of interest in the decision equation.

**Table 4:** The estimated results of the LPM

	(1)	(2)	(3)	(4)
<i>RELATION</i>	0.148*** [0.036]	0.165*** [0.039]	0.172*** [0.038]	0.168*** [0.039]
<i>TRUST</i>	0.254*** [0.053]	0.229*** [0.059]	0.215*** [0.057]	0.213*** [0.056]
<i>POST</i>	0.301*** [0.051]	0.326*** [0.059]	0.303*** [0.060]	0.340*** [0.062]
<i>INSHOCK</i>	-0.219** [0.089]	-0.240** [0.098]	-0.240** [0.096]	-0.242** [0.094]
<i>SUMSME</i>	-0.143*** [0.050]	-0.125** [0.052]	-0.126** [0.051]	-0.119** [0.051]
AGE-(6-10) years) (Reference AGE < 6 years)	-0.018 [0.068]	-0.092 [0.072]	-0.091 [0.070]	-0.082 [0.070]
AGE-(10+)	0.020 [0.065]	-0.025 [0.068]	-0.015 [0.069]	-0.014 [0.069]
Partnership; (Reference category: Sole Proprietorship)	-0.036 [0.065]	-0.046 [0.069]	-0.058 [0.069]	-0.063 [0.069]
Limited Liability Partnership	0.195* [0.117]	0.204* [0.121]	0.186 [0.114]	0.169 [0.108]
Limited Liability Company	-0.094* [0.054]	-0.085 [0.058]	-0.093* [0.055]	-0.088 [0.054]
<i>HIGHRISK</i>		-0.022 [0.054]	-0.017 [0.053]	-0.025 [0.052]
<i>FIRSTIME</i>			0.082* [0.049]	0.093* [0.049]
<i>SWITCHER</i>			-0.245*** [0.095]	-0.247** [0.100]
<i>EXCLUSIVE</i>			0.089 [0.204]	0.094 [0.195]
<i>TYPE</i>				0.097* [0.055]
Industry Dummies	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes
N	1270	1150	1140	1140
R-sq	0.244	0.236	0.253	0.261

Note: The parameters presented are estimated average marginal effects. The figures in bracket are based on the unconditional linearized standard errors. The estimation utilizes the sampling weight provided by SME Finance Monitor. The definition of variables can be found in Table 1. \*\*\*, \*\*, and \* refer to the significant level of 1%, 5% and 10%, respectively.

Table 5 presents the estimated results of the impact of a stronger relationship for the access to bank credit for smaller SMEs, compared to Medium SMEs (Hypothesis 2). Panel A shows the estimated results from the LPM, and Panel B shows the marginal effect derived from the probit model. In panel A, the estimated coefficient on the interaction term between RELATION and SUMSME is statistically significantly positive and indicates the higher value of the closer relationship for smaller SMEs in enhancing the likelihood of having a successful access to bank credit. The results on the impact differential between smaller and relatively larger SMEs derived from the probit model (as seen in Panel B) paint the similar picture. In essence, smaller-sized firms that had a stronger firm-borrower-bank relationship could leverage the relationship to offset the negative size element and have a similar level of likelihood of accessing bank credit provided by the main bank as medium-sized firms without the closer relationship. Looking at the estimated results on other covariates derived from LPM in Panel A, we find that they are qualitatively like Table 4.

**Table 5:** The impact of relation on smaller SMEs versus medium SMEs

	(1)	(2)	(3)	(4)
<b>PANEL A: LPM</b>				
<i>RELATION</i>	0.090** [0.041]	0.105** [0.047]	0.122*** [0.044]	0.122*** [0.044]
<i>TRUST</i>	0.258*** [0.053]	0.234*** [0.059]	0.221*** [0.057]	0.218*** [0.056]
<i>POST</i>	0.295*** [0.051]	0.322*** [0.058]	0.299*** [0.059]	0.335*** [0.062]
<i>INSHOCK</i>	-0.207** [0.089]	-0.226** [0.098]	-0.227** [0.095]	-0.230** [0.094]
<i>SUMSME</i>	-0.179*** [0.058]	-0.165*** [0.061]	-0.159*** [0.060]	-0.150** [0.060]
<i>SUMSME*RELATION</i>	0.168** [0.072]	0.169** [0.078]	0.140* [0.076]	0.128* [0.076]
AGE-(6-10) years) (Reference AGE < 6 years)	-0.020 [0.068]	-0.095 [0.072]	-0.094 [0.070]	-0.084 [0.070]
AGE-(10+)	0.021 [0.065]	-0.026 [0.068]	-0.015 [0.069]	-0.014 [0.068]

Partnership; (Reference category: Sole Proprietorship)	-0.039 [0.065]	-0.048 [0.069]	-0.058 [0.068]	-0.063 [0.068]
Limited Liability Partnership	0.197* [0.119]	0.210* [0.124]	0.191* [0.116]	0.174 [0.110]
Limited Liability Company	-0.089 [0.054]	-0.079 [0.058]	-0.087 [0.055]	-0.082 [0.054]
<i>HIGHRISK</i>		-0.024 [0.053]	-0.018 [0.052]	-0.026 [0.051]
<i>FIRSTIME</i>			0.077 [0.049]	0.088* [0.049]
<i>SWITCHER</i>			-0.230** [0.095]	-0.234** [0.100]
<i>EXCLUSIVE</i>			0.097 [0.197]	0.102 [0.189]
<i>TYPE</i>				0.094* [0.054]
R-sq	0.249	0.242	0.257	0.264
<b>PANEL B: Probit Model</b>				
The impact of relation on small versus medium firms	0.173*** [0.069]	0.153** [0.072]	0.131* [0.072]	0.119* [0.072]
Industry Dummies	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes
N	1270	1150	1140	1140

Note: Results in panel A are from the LPM and in panel B from the Probit model. The parameters presented are average marginal effects. While the Probit regression uses the same specifications as LPM, to save space, we only present the estimated result of the variation of the impact of relation on smaller SMEs compared to medium ones. The figures in bracket are based on the unconditional linearized standard errors. The estimation utilizes the sampling weight provided by *SME Finance Monitor*. The definition of variables is in Table 1.

Table 6 presents the tests for Hypothesis 3. Panel A shows the estimated results from the LPM, and Panel B shows the marginal effect from the Probit model.

**Table 6:** The impact of relation in the post-Covid period compared to pre-Covid period.

	(1)	(2)	(3)	(4)
<b>PANEL A: LPM</b>				
<i>RELATION</i>	0.236*** [0.049]	0.244*** [0.052]	0.251*** [0.051]	0.251*** [0.051]
<i>TRUST</i>	0.254*** [0.052]	0.226*** [0.058]	0.212*** [0.056]	0.209*** [0.056]
<i>POST</i>	0.359*** [0.059]	0.378*** [0.067]	0.354*** [0.068]	0.397*** [0.071]
<i>INSHOCK</i>	-0.232*** [0.088]	-0.244** [0.098]	-0.243** [0.095]	-0.246*** [0.094]
<i>SUMSME</i>	-0.143*** [0.049]	-0.130** [0.051]	-0.131*** [0.050]	-0.124** [0.050]
<i>POST*RELATION</i>	-0.221*** [0.066]	-0.206*** [0.072]	-0.206*** [0.070]	-0.218*** [0.071]
AGE-(6-10) years) (Reference AGE < 6 years)	-0.013 [0.068]	-0.087 [0.072]	-0.086 [0.069]	-0.075 [0.069]
AGE-(10+)	0.029 [0.065]	-0.015 [0.069]	-0.005 [0.070]	-0.004 [0.069]
Partnership; (Reference category: Sole Proprietorship)	-0.055 [0.064]	-0.068 [0.069]	-0.079 [0.069]	-0.086 [0.069]
Limited Liability Partnership	0.194 [0.120]	0.206 [0.125]	0.187 [0.117]	0.169 [0.112]
Limited Liability Company	-0.099* [0.054]	-0.092 [0.058]	-0.099* [0.054]	-0.094* [0.053]
<i>HIGHRISK</i>		-0.019 [0.054]	-0.014 [0.053]	-0.022 [0.052]
<i>FIRSTIME</i>			0.080 [0.050]	0.092* [0.050]
<i>SWITCHER</i>			-0.250*** [0.090]	-0.254*** [0.096]
<i>EXCLUSIVE</i>			0.092 [0.205]	0.099 [0.196]
<i>TYPE</i>				0.104* [0.054]
R-sq	0.254	0.245	0.262	0.272
<b>PANEL B: Probit Model</b>				
The impact of relation in the post versus pre Covid period	-0.163*** [0.065]	-0.156** [0.070]	-0.164** [0.069]	-0.169** [0.068]
Industry Dummies	Yes	Yes	Yes	Yes

Regional Dummies	Yes	Yes	Yes	Yes
N	1270	1150	1140	1140

Note: As in Table 5.

Panel A in Table 6 reveals that the interaction term  $POST*RELATION$  is negative and strongly significant. This suggests that there was a decrease in the strength of relationship in accessing bank credit in the post-Covid period. The result of the Probit model in Panel B also lends support to this. Superficially, this would seem to support the ‘dark side’ finding of Berger et al. (2021). However, the negative parameter on  $POST*RELATION$  must be balanced against the positive parameter on  $RELATION$  in the pre-Covid period. Consequently, having a close relationship with the bank makes little difference to the likelihood of funds being successfully secured since the main bank treats SME borrowers with closer relationships the same as those without such a relationship. We can see that the positive parameter on  $POST$  which reflects the strength of government interventions to make credit available through the banking system, dominates the role of relationship in the post-Covid period, which shows that closer relationship with the bank was of secondary importance in the Covid-period.

The subsidiary hypothesis that explores the size advantage in closer relationships in accessing bank credit in the post-Covid period is explored by including the triple interaction term  $SUMSME*RELATION*POST$ . This was not statistically significant and shows that the decrease in the value of relationship in the post-Covid period is independent of the size of the SME<sup>9</sup>.

Next, we explore the difference in the impact of relation for SMEs in industries facing higher negative shocks from Covid-19 (Hypothesis 4). In Table 7 columns (1) - (4) we show the estimated results of equation (7), while column (5)-(8) present the estimated results of the model which also allows for the change in the impact of relation between smaller SMEs and medium SMEs in the post-Covid period. The results show that while relation has a diminishing effect for facilitating SMEs’ access to bank credit in the post-Covid 19 period, firms operating in the badly affected industries fare better from a closer relationship than those in less affected industries. The LPM results show that the interactive term between  $INSHOCK$  and  $RELATION$  is not statistically significant at the 10% level in 5 out of 8 specifications. The results of the Probit model, confirm the statistically significantly lower decrease in the impact of  $RELATION$  for SMEs having higher industrial exposure to Covid-19.

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<sup>9</sup> The results are shown in Table 2A of the Appendix

Finally, selection bias in the estimation is an issue that cannot be ignored. We tackle this head on and present the results in the appendix (Table 3A). We show that selection bias has had little impact on the variables of interest for this study.



**Table 7:** The impact of relation on SMEs operating in industry suffering higher negative shock in the post-Covid period

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>PANEL A</b>								
<i>RELATION</i>	0.236*** [0.049]	0.243*** [0.052]	0.251*** [0.051]	0.251*** [0.051]	0.151** [0.061]	0.163** [0.063]	0.177*** [0.060]	0.183*** [0.059]
<i>TRUST</i>	0.257*** [0.052]	0.230*** [0.058]	0.216*** [0.056]	0.213*** [0.056]	0.262*** [0.052]	0.236*** [0.058]	0.224*** [0.056]	0.220*** [0.056]
<i>POST</i>	0.375*** [0.060]	0.392*** [0.068]	0.370*** [0.068]	0.409*** [0.071]	0.339*** [0.071]	0.354*** [0.073]	0.334*** [0.074]	0.377*** [0.076]
<i>INSHOCK</i>	-0.265** [0.104]	-0.279** [0.115]	-0.282** [0.113]	-0.280** [0.111]	-0.267*** [0.101]	-0.281** [0.112]	-0.283*** [0.109]	-0.281*** [0.107]
<i>SUMSME</i>	-0.138*** [0.050]	-0.122** [0.052]	-0.123** [0.051]	-0.117** [0.051]	-0.198*** [0.076]	-0.195** [0.087]	-0.189** [0.085]	-0.175** [0.084]
<i>POST*RELATION</i>	-0.275*** [0.064]	-0.264*** [0.069]	-0.270*** [0.066]	-0.276*** [0.064]	-0.224*** [0.081]	-0.246*** [0.079]	-0.244*** [0.078]	-0.245*** [0.077]
<i>SUMSME*RELATION</i>					0.216** [0.094]	0.203* [0.104]	0.183* [0.102]	0.172* [0.101]
<i>SUMSME*RELATION*POST</i>					-0.126 [0.139]	-0.046 [0.140]	-0.069 [0.133]	-0.081 [0.134]
<i>POST*SUMSME</i>					0.058 [0.107]	0.069 [0.116]	0.067 [0.110]	0.057 [0.108]
<i>RELATION*INSHOCK</i>	0.135 [0.103]	0.143 [0.120]	0.160 [0.114]	0.143 [0.115]	0.162 [0.102]	0.189* [0.113]	0.195* [0.108]	0.171 [0.110]
AGE-(6-10) years) (Reference AGE < 6 years	-0.009 [0.068]	-0.082 [0.072]	-0.080 [0.069]	-0.070 [0.069]	-0.006 [0.068]	-0.080 [0.072]	-0.078 [0.069]	-0.069 [0.069]
AGE-(10+)	0.031 [0.065]	-0.012 [0.069]	-0.000 [0.070]	0.000 [0.069]	0.034 [0.065]	-0.009 [0.068]	0.003 [0.070]	0.003 [0.069]

Partnership; (Reference category: Sole Proprietorship)	-0.048 [0.066]	-0.061 [0.071]	-0.071 [0.070]	-0.079 [0.070]	-0.046 [0.066]	-0.058 [0.071]	-0.068 [0.070]	-0.075 [0.070]
Limited Liability Partnership	0.195 [0.119]	0.208* [0.124]	0.189 [0.116]	0.171 [0.110]	0.195 [0.122]	0.210 [0.128]	0.192 [0.120]	0.175 [0.114]
Limited Liability Company	-0.096* [0.054]	-0.090 [0.058]	-0.097* [0.055]	-0.092* [0.053]	-0.092* [0.053]	-0.085 [0.057]	-0.090* [0.054]	-0.086 [0.053]
<i>HIGHRISK</i>		-0.022 [0.054]	-0.017 [0.053]	-0.024 [0.052]		-0.021 [0.052]	-0.014 [0.051]	-0.021 [0.050]
<i>FIRSTIME</i>			0.082* [0.049]	0.094* [0.049]			0.076 [0.049]	0.088* [0.048]
<i>SWITCHER</i>			-0.249*** [0.089]	-0.253*** [0.095]			-0.232*** [0.088]	-0.237** [0.094]
<i>EXCLUSIVE</i>			0.094 [0.209]	0.100 [0.199]			0.116 [0.199]	0.119 [0.191]
<i>TYPE</i>				0.101* [0.054]				0.096* [0.054]
R-sq	0.256	0.247	0.264	0.273	0.262	0.254	0.270	0.277
<b>PANEL B: Probit regression</b>								
The impact of relation on the SMEs in industry suffering higher shock versus lower shock in the post-COVID	0.158* [0.092]	0.158 [0.102]	0.169* [0.097]	0.161* [0.098]	0.171* [0.087]	0.203** [0.091]	0.209** [0.088]	0.201** [0.089]
The change in the impact of relation on small firm versus medium firm in the post COVID, compared to pre-period					-0.153 [0.134]	-0.081 [0.134]	-0.078 [0.131]	-0.060 [0.130]
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1270	1150	1140	1140	1270	1150	1140	1140



## **Conclusion**

The objective of this paper was to identify whether the strength of the SME borrower-Bank relationship in terms of credit acquisition held in bad times as well as good. The research on the post-GFC period suggests that this indeed was the case. However, the GFC was a shock to the banking system which affected the supply of credit. The Covid-19 shock is arguably exogenous to both borrowers and banks, with borrowing firms bearing the brunt of the problem and with capacity to generate cash flow much reduced. This may turn to pose different incentives and constraints on banks that result in a ‘dark side’ of the relationship. The evidence from the US suggests that the corporate need for a friend indeed was not there. We investigate the problem from a UK perspective and centre the analysis on SMEs facing more serious problems in the credit market.

Our results indicate that relationship banking was important for the acquisition of bank credit in the pre-Covid 19 period, but it played very little part in the post-Covid-19 lending behaviour of the banks. Banks treated SMEs that had a stronger relationship with them in the same way as those that did not in the post-Covid period. The impact of relation on small compared to medium sized firms was stronger in the pre-Covid-19 period. The difference in the impact does not seem to become stronger in the post-Covid-19 period since the diminishing impact of relationship on accessing bank credit appears to uniformly apply to SMEs of all size classes. While relationship banking plays very little part in the post-Covid-19 lending behaviour of the banks, SMEs operating in industries which suffered more significant Covid-19 shocks appeared to benefit more.

We point to a government-led credit regime that prompted banks to support both friend and stranger alike. When the ‘lifeboat’ was sufficient to rescue both friends and strangers alike, the value of relationship banking becomes insignificant. Whenever the larger negative shock facing SMEs shoestrings the size of the lifeboat, the value of the stronger relationship is restored.

There are a series of further conclusions and questions that follow from our analysis. First this initial evidence points to a ‘light’ as opposed to ‘dark’ side to relationship banking. Indeed, elements of our evidence point to the value of the UK Government interventions developed via the British Business Bank in the Spring of 2020. In some respect the benefits of the guaranteed loans interventions have been seen by both firms in close relationships with banks and those who have not enjoyed those relationships previously. There is a challenge for further work to explore how far the conclusions hold for the remaining period of the pandemic.

Our analysis ceases in the third quarter of 2020, but with poor economic conditions continuing into the first half of 2021. Then what might occur once the pandemic ceases and more normal conditions prevail? In the post-shock period might the close ties between SMEs in a closer relationship with their bank be tested more heavily. Many UK SMEs will exit the crisis with high levels of debt and with only a proportion of the debt underwritten by public sector guarantee. The possibility for a post crisis ‘dark side’ cannot be wholly discounted and with concerns growing during 2021 on the vulnerability of SMEs in some sectors of the economy as the UK job furlough scheme is wound up.

A further issue relating to relationship banking structures more generally is what the Covid-19 pandemic could mean for physical bank branches and the processes of bank decision making on loans. The pandemic period might have changed SME behaviour in respect of processes and linkages with their local branch networks which have been found to be important determinants in defining the depth of relations between banks and SMEs. Our expectation is that changed SME and individual personal banking behaviours promoted by lockdowns will work to speed the process of bank branch closures and with this having longer term effects on the ability of banks to maintain closer relationships with firms.

We accept that there are some limits to our analysis. Uppermost is the source data and the construction of independent variables picking up on the quality of relationships between SMEs and their banks. Here this has been constructed as a binary variable formed from opinions in a survey of small firms. Clearly there are different degrees of the quality of a relationship between a firm and its bank that cannot be picked up in such an independent variable. As was highlighted above it will be of interest to explore changes in the perception of the relationship quality during the whole of the pandemic period, and through into economic recovery.

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## Appendix

This appendix presents supplementary material to the main text dealing with the estimation but first it describes the data obtained from the *SME Monitor*. To qualify for an interview, SMEs had to meet the following criteria: 1) be not majority owned by another company; 2) not run as a social enterprise or a not-for-profit organisation; and 3) having a turnover of less than £25m. Overall quotas were set by size of business (as measured by the number of employees). To ensure a balanced sample, the overall region and sector quotas were then allocated within each employee size band to ensure that SMEs of all sizes were interviewed in each sector and economic region. Quotas were set overall to reflect the natural profile by sector, but with some amendments to ensure that a robust sub-sample was available for each sector. The weighting regime has been applied to ensure that each individual quarter is representative of all SMEs while the total interviews conducted in a 4-quarter period gross to the total of The Department for Business, Innovation and Skills (BIS) 2015 SME data. The interview respondent was the person in charge of managing the business finances.

Turning to the estimation, Table 4 in the min paper presents the results from LPM, however the literature also presents the probit regression as more suited to binary dependent variables. Angrist and Pischke (2009) argue that LPM could give a good approximation for the non-linear Conditional Expectation Function (CEF) and given the lack of knowledge *ex-ante* regarding the data generation process, using a linear LPM may be a better choice since it is more transparent. Other merits associated with the LPM relate to the computational simplicity, the ease of interpretation, the estimated coefficients without the need to transform them into "marginal effects", and the avoidance of misspecification of the function linking the latent unobserved continuous variable  $y^*$  to the dichotomy  $y$  that is ultimately observed in an econometric model (Giles, 2012). Here we present the results of the base case estimated by the Probit model in Table 1A as an alternative to the LPM estimates presented in the text (Table 4). The results are qualitatively common.

Table 1A: The estimated results of the Probit model

	(1)	(2)	(3)	(4)
<i>RELATION</i>	0.169*** [0.037]	0.172*** [0.037]	0.177*** [0.036]	0.177*** [0.036]
<i>TRUST</i>	0.242*** [0.051]	0.219*** [0.056]	0.205*** [0.053]	0.200*** [0.053]

<i>POST</i>	0.298*** [0.046]	0.319*** [0.049]	0.303*** [0.050]	0.323*** [0.049]
<i>INSHOCK</i>	-0.242*** [0.092]	-0.273*** [0.097]	-0.277*** [0.094]	-0.271*** [0.094]
<i>SUMSME</i>	-0.139*** [0.048]	-0.123** [0.050]	-0.120** [0.049]	-0.113** [0.048]
AGE-(6-10) years) (Reference AGE < 6 years)	-0.013 [0.063]	-0.084 [0.066]	-0.077 [0.065]	-0.070 [0.065]
AGE-(10+)	0.025 [0.060]	-0.016 [0.061]	0.002 [0.064]	0.002 [0.063]
Partnership; (Reference category: Sole Proprietorship)	-0.040 [0.064]	-0.054 [0.068]	-0.066 [0.067]	-0.072 [0.068]
Limited Liability Partnership	0.137* [0.079]	0.127 [0.078]	0.107 [0.078]	0.100 [0.077]
Limited Liability Company	-0.093* [0.052]	-0.087 [0.055]	-0.093* [0.051]	-0.090* [0.050]
<i>HIGHRISK</i>		-0.019 [0.047]	-0.006 [0.046]	-0.013 [0.045]
<i>FIRSTIME</i>			0.076* [0.044]	0.085* [0.044]
<i>SWITCHER</i>			-0.221** [0.106]	-0.225** [0.112]
<i>EXCLUSIVE</i>			0.110 [0.174]	0.108 [0.169]
<i>TYPE</i>				0.079* [0.044]
Industry Dummies	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes
N	1270	1150	1140	1140
Prob > F = 0.0000				

Note: As in Table 4 in the main text.

In Table 2A we present the results on the difference in the change in the impact of a stronger relation with the main bank for smaller SMEs relative to medium ones, in the post-Covid compared to the pre-Covid period (Hypothesis 2 part 2). Panel A shows the estimated results from the LPM and Panel B shows the marginal effect derived from the probit model. We see that the Covid-19 period has not led to the statistically significant change in the impact

differentials between smaller and medium SMEs. The decreases in the value of relation in the post-Covid period applies uniformly to both smaller and medium SMEs.

**Table 2A:** The change in the impact of relation on small firms versus medium firms in the post-Covid compared with the pre-Covid period

	(1)	(2)	(3)	(4)	(5)
<b>PANEL A: LPM</b>					
<i>RELATION</i>	0.170*** [0.061]	0.153** [0.061]	0.165*** [0.064]	0.180*** [0.060]	0.186*** [0.060]
<i>TRUST</i>	0.220*** [0.059]	0.258*** [0.052]	0.231*** [0.058]	0.218*** [0.057]	0.216*** [0.056]
<i>POST</i>	0.290*** [0.064]	0.324*** [0.069]	0.340*** [0.071]	0.319*** [0.072]	0.365*** [0.074]
<i>INSHOCK</i>	-0.140** [0.066]	-0.230*** [0.087]	-0.238** [0.096]	-0.239** [0.093]	-0.242*** [0.092]
<i>SUMSME</i>	-0.128 [0.078]	-0.199*** [0.076]	-0.197** [0.086]	-0.191** [0.085]	-0.176** [0.083]
<i>POST*RELATION</i>	-0.117 [0.078]	-0.149* [0.076]	-0.158** [0.079]	-0.154** [0.076]	-0.167** [0.075]
<i>SUMSME*RELATION</i>	0.198** [0.100]	0.215** [0.094]	0.202* [0.104]	0.181* [0.102]	0.170* [0.101]
<i>SUMSME*RELATION*POST</i>	-0.195 [0.133]	-0.170 [0.140]	-0.095 [0.143]	-0.119 [0.134]	-0.125 [0.132]
<i>POST*SUMSME</i>	0.054 [0.108]	0.054 [0.108]	0.063 [0.117]	0.060 [0.112]	0.051 [0.109]
AGE-(6-10) years) (Reference AGE < 6 years)		-0.010 [0.068]	-0.086 [0.072]	-0.084 [0.069]	-0.074 [0.070]
AGE-(10+)		0.033 [0.065]	-0.013 [0.068]	-0.001 [0.070]	0.000 [0.069]
Partnership; (Reference category: Sole Proprietorship)		-0.052 [0.065]	-0.066 [0.070]	-0.076 [0.069]	-0.082 [0.069]
Limited Liability Partnership		0.194 [0.122]	0.208 [0.129]	0.191 [0.121]	0.173 [0.114]
Limited Liability Company		-0.096* [0.052]	-0.087 [0.057]	-0.093* [0.054]	-0.088* [0.053]
Industry Dummies	No	Yes	Yes	Yes	Yes
Regional Dummies	No	Yes	Yes	Yes	Yes
<i>HIGHRISK</i>			-0.017 [0.053]	-0.010 [0.052]	-0.018 [0.051]
<i>FIRSTIME</i>				0.074 [0.049]	0.087* [0.049]
<i>SWITCHER</i>				-0.235*** [0.089]	-0.239** [0.095]

<i>EXCLUSIVE</i>				0.113 [0.196]	0.117 [0.188]
<i>TYPE</i>					0.100* [0.054]
R-sq	0.191	0.260	0.252	0.267	0.275
<b>PANEL B: Probit Model</b>					
Probit regression					
The difference in the impact of relation on small versus medium firms in the post versus pre Covid period	-0.202 [0.147]	-0.191 [0.141]	-0.119 [0.139]	-0.118 [0.134]	-0.100 [0.133]
Industry Dummies	No	Yes	Yes	Yes	Yes
Regional Dummies	No	Yes	Yes	Yes	Yes
N	1270	1270	1150	1140	1140

Note: As in Table 6

Finally, a full analysis of the loan decision needs to consider the demand side. An SME must decide whether to apply for external finance and from which external finance provider if it decides to apply. This complicates the analysis of the outcome decision because some firms self-select by deciding not to apply for external finance, preferring to finance themselves through retained earnings either in the belief that they will be turned down, or face unfavourable terms and conditions in the loan contract. Since the dependent variable is not observed for part of the sample and the selection process is not random, the estimated coefficients in the outcome equation may be biased. A method to deal with this problem is to estimate the demand for external finance to predict the likelihood of selecting into the sample and loan decisions to predict the outcome of the application, simultaneously, using a bivariate probit model to estimate the application and decision equations (Cavalluzzo et al. 2002; Longhofer et al., 2005). The correlation between the two equations indicates the presence of a self-selection problem and the extent to which self-selection is statistically significant.

**Table 3A:** Estimated results via bivariate probit model

<b>PANEL A</b>
$ACCESS_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \varepsilon_{f,i,r,t}$
$NEED_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \varepsilon_{f,i,r,t}$

<i>SUMSME</i>	-0.039 [0.057]
<i>RELATION</i>	0.211*** [0.055]
<i>TRUST</i>	0.173*** [0.072]
<i>POST</i>	0.406*** [0.067]
<i>INSHOCK</i>	-0.177** [0.085]
The likelihood-ratio test for the correlation between the residuals of the two probit models	0.230
Number of obs = 1,294	
Design df = 1,288	
F(5,1284) = 9.74	
Prob > F = 0.0000	
<b>PANEL B</b>	
$ACCESS_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \vartheta POST_t * RELATION_{f,i,r} + \varepsilon_{f,i,r,t}$ $NEED_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \vartheta POST_t * RELATION_{f,i,r} + \varepsilon_{f,i,r,t}$	
The impact of relation in the post-COVID versus pre-period	-0.272*** [0.098]
The likelihood-ratio test for the correlation between the residuals of the two probit models	0.598
Number of obs = 1,294	
Design df = 1,288	
F( 6, 1283) = 10.17	
Prob > F = 0.0000	
<b>PANEL C</b>	
$ACCESS_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \pi SUMSME_{f,i,r} * RELATION_{f,i,r} + \sigma' CONTROLS_{f,i,r} + \varepsilon_{f,i,r,t}$ $NEED_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \pi SUMSME_{f,i,r} * RELATION_{f,i,r} + \sigma' CONTROLS_{f,i,r} + \varepsilon_{f,i,r,t}$	
The impact of relation on small firms versus medium firms	0.195* [0.106]
The likelihood-ratio test for the correlation between the residuals of the two probit models	0.147
Number of obs = 1,294	
Design df = 1,288	

F( 6, 1283) = 7.04	
Prob > F = 0.0000	
<b>PANEL D</b>	
$ACCESS_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i}$ $+ \tau SUMSME_{f,i,r} + \alpha POST_t * SUMSME_{f,i,r}$ $+ \pi SUMSME_{f,i,r} * RELATION_{f,i,r} + \varphi SUMSME_{f,i,r} * RELATION_{f,i,r}$ $* POST_t + \vartheta POST_t * RELATION_{f,i,r} + \varepsilon_{f,i,r,t}$	
$NEED_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i}$ $+ \tau SUMSME_{f,i,r} + \alpha POST_t * SUMSME_{f,i,r}$ $+ \pi SUMSME_{f,i,r} * RELATION_{f,i,r} + \varphi SUMSME_{f,i,r} * RELATION_{f,i,r}$ $* POST_t + \vartheta POST_t * RELATION_{f,i,r} + \varepsilon_{f,i,r,t}$	
The impact of relation on small versus medium firm in the post-COVID compared to pre-period	-0.283 [0.226]
The likelihood-ratio test for the correlation between the residuals of the two probit models	0.794
Number of obs = 1,294	
Design df = 1,288	
F( 9, 1280) = 6.96	
Prob > F = 0.0000	
<b>PANEL E</b>	
$ACCESS_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i}$ $+ \tau SUMSME_{f,i,r} + \alpha POST_t * SUMSME_{f,i,r}$ $+ \pi SUMSME_{f,i,r} * RELATION_{f,i,r} + \varphi SUMSME_{f,i,r} * RELATION_{f,i,r}$ $* POST_t + \vartheta POST_t * RELATION_{f,i,r} + \omega INSHOCK_{f,i} * RELATION_{f,i,r}$ $+ \varepsilon_{f,i,r,t}$	
$NEED_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i}$ $+ \tau SUMSME_{f,i,r} + \alpha POST_t * SUMSME_{f,i,r}$ $+ \pi SUMSME_{f,i,r} * RELATION_{f,i,r} + \varphi SUMSME_{f,i,r} * RELATION_{f,i,r}$ $* POST_t + \vartheta POST_t * RELATION_{f,i,r} + \omega INSHOCK_{f,i} * RELATION_{f,i,r}$ $+ \varepsilon_{f,i,r,t}$	
The impact of relation on small firms versus medium firms in the post-COVID compared to pre-period	-0.248 [0.177]
a likelihood-ratio test for the correlation between the residuals of each of the two probit models	0.899
Number of obs = 1,294	
Design df = 1,288	
F( 10, 1279) = 7.14	
Prob > F = 0.0000	
<b>PANEL F</b>	

$ACCESS_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \alpha POST_t * SUMSME_{f,i,r} + \pi SUMSME_{f,i,r} * RELATION_{f,i,r} + \varphi SUMSME_{f,i,r} * RELATION_{f,i,r} * POST_t + \vartheta POST_t * RELATION_{f,i,r} + \omega INSHOCK_{f,i} * RELATION_{f,i,r} + \varepsilon_{f,i,r,t}$ $NEED_{f,i,r,t} = \text{Constant} + \beta RELATION_{f,i,r} + \gamma TRUST_{f,i,r} + \delta POST_t + \rho INSHOCK_{f,i} + \tau SUMSME_{f,i,r} + \alpha POST_t * SUMSME_{f,i,r} + \pi SUMSME_{f,i,r} * RELATION_{f,i,r} + \varphi SUMSME_{f,i,r} * RELATION_{f,i,r} * POST_t + \vartheta POST_t * RELATION_{f,i,r} + \omega INSHOCK_{f,i} * RELATION_{f,i,r} + \varepsilon_{f,i,r,t}$	
The impact of relation on SMEs operating in industry suffering higher shock compared to it experiencing lower shocks in the post-COVID period	0.158 [0.152]
The likelihood-ratio test for the correlation between the residuals of the two probit models	0.899
Number of obs	1294
Design df	1288
F(10, 1279) = 7.14 Prob > F = 0.0000	

Note: the table contains the estimated results via the simultaneous estimation of the probit regression of the demand for external finance (the dependent variable is NEED), and the probit regression of the outcome of the bank credit application toward the main bank (the dependent variable is ACCESS). The probit regression models used for each panel are presented. The figures in brackets are based on the unconditional linearized standard errors. The estimation utilizes the sampling weight provided by SME Finance Monitor. The definition of variables can be found in Table 1. \*\*\*, \*\*, and \* refer to the significant level of 1%, 5% and 10%, respectively.

Table 3A shows our findings of the bivariate probit model. The estimated marginal effect on the main variables of interest, derived from the simultaneous estimation of the application for external finance<sup>10</sup> and the decision equations, are similar to those obtained from the estimates on the loan decision single-equation model. This suggests that self-selection carries little impact on estimates of coefficients on the main variables of interest in the decision equation. Moreover, the estimated correlation coefficient between the residuals of the two probit equations is not statistically significantly different from zero, which indicates that the selection correction via the simultaneous estimation of the two probit regressions is not necessary (Cameron and Trivedi, 2009).

<sup>10</sup> The dependent variable of the demand for external finance equation (i.e., NEED) is derived from the answer to the question that “In the past 12 months, has the business had a need for external funding, in addition to any it may already have”. It takes value of 1 if the answer is “Yes” and 0 for “No”.

## Appendix References

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