



BANK OF ENGLAND

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International banking and liquidity risk transmission: lessons from the United Kingdom

Robert Hills,⁽¹⁾ John Hooley,⁽²⁾ Yevgeniya Korniyenko⁽³⁾ and
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Abstract

This paper forms the United Kingdom's contribution to the International Banking Research Network's project examining the impact of liquidity shocks on banks' lending behaviour, using proprietary bank-level data available to central banks. Specifically, we examine the impact of changes in funding conditions on UK-resident banks' domestic and external lending from 2006–12. Our results suggest that, following a rise in the liquidity shock measure, UK-resident banks that grew their balance sheets quicker relative to their peers pre-crisis, decreased their external lending by more relative to other banks, and increased their domestic lending. When we account for country of ownership, we find that the same pattern was true for both UK-owned and foreign-owned banks, but more pronounced for UK-owned banks' domestic and foreign-owned banks' external lending. These results are robust to splitting the data into real and financial sector lending, the use of more granular bilateral country loan data and controlling for the various banking system interventions made by governments in 2008–09.

Key words: Liquidity shock, global financial crisis, cross-border and domestic lending.

JEL classification: G21, G18, E51, E52, E44.

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1. Introduction

In this paper, we study the impact of a liquidity shock, associated with the financial crisis of 2008-2009, on UK-resident banks' lending behaviour and loan commitments. We use the Bank of England's proprietary bank-level dataset, which covers every UK-resident bank. The comprehensive nature of our dataset allows us to uniquely examine how this liquidity shock was propagated by the UK banking system, both in terms of which bank characteristics made banks most vulnerable to the shock, but also in terms of transmission to both domestic and external lending.

This study represents the United Kingdom's contribution to a wider project by a network of central banks. As set out in Buch and Goldberg (2014), central banks typically have access to confidential bank data for their own country at the level of the individual institution. This level of granularity can enormously enhance our understanding of how the banking system operates. But the scope is limited by the fact that each central bank does not have access to individual bank data for any other country. The International Banking Research Network has been created to mitigate these limitations as far as possible by pursuing a co-ordinated research agenda across countries.

In the case of the United Kingdom, a number of recent papers have used these data to explore different aspects of UK-resident banks' lending behaviour pre- and post-crisis. Rose and Wieladek (2014) document that foreign nationalised banks operating in the United Kingdom cut back domestic lending by more, relative to external lending, as a result of the government help they received in their home countries, a phenomenon they refer to as 'financial protectionism'. Hoggarth, Hooley and Korniyenko (2013) explore why the UK lending of foreign-owned branches was much more cyclical during the crisis than that of foreign-owned subsidiaries or UK-owned banks, finding that both demand and supply factors were important (in particular that foreign branches were more reliant on fickle forms of funding, especially from abroad). Finally, Aiyar, Calomiris, Hooley, Korniyenko and Wieladek (2014a) use regulatory data to examine the impact of changes to regulatory capital requirements on cross-border loan supply by UK banks. Specifically on the funding side, Aiyar (2011) looks at the transmission of an external liquidity shock, finding that the shock to foreign funding during the financial crisis caused a substantial pullback in UK-resident banks' domestic lending to the real economy.

The rest of the paper proceeds as follows. Section 2 describes the key features of the UK dataset. Section 3 describes the adjustments we have made to the group’s benchmark analytical framework to account for the specific features of UK data and the UK banking sector, and presents the headline results. Section 4 concludes.

2. Data and Stylised Facts for the United Kingdom

2.1 The UK banking sector and regulatory environment

The UK banking system is notable in that foreign banks have a relatively large presence; there is a very high concentration in terms of banking system assets; and the banking system is highly globalised. Davies, Richardson, Katinaite and Manning (2010) give a longer-run perspective of how the UK banking system evolved into a structure “with large balance sheets, significant functional and geographical diversity and complexity, a high level of leverage, and extensive network interconnectivity.”

Foreign banks account for nearly half of total banking system assets in the United Kingdom, amounting to around 250% of GDP. A foreign bank can operate either as a branch (branches’ assets account for 180% of GDP) or a subsidiary (75% of GDP), where subsidiaries are separately capitalised entities.

The UK banking system’s diversity in type and size means that it can be susceptible to external shocks. Hoggarth, Hooley and Korniyenko (2013) document that foreign branches were the most significant contributor to the boom and the bust in bank lending before and after the global financial crisis. Similarly, the fact that the average UK-regulated bank lends to roughly 50 countries means that regulatory changes in the United Kingdom may have an impact on lending far beyond its borders (Aiyar, Calomiris, Hooley, Korniyenko and Wieladek, 2014a). Between 1997 and 2006, the United Kingdom became one of the largest and most interconnected nodes in the global banking network (McGuire and Tarashev, 2009).

The microprudential supervisory regime in the United Kingdom has a number of distinctive features. For instance, regulators *varied* bank-specific capital requirements, otherwise known as

minimum trigger ratios¹, to address operational, legal or interest rate risks, which were not accounted for in Basel I (Francis and Osborne, 2012). Individual financial institutions were subject to different capital requirements over time, which were reviewed at least every 18-36 months. Several papers have examined the impact of these microprudential regulatory changes on actual capital ratios (Francis and Osborne, 2012), domestic lending (Bridges, Gregory, Nielsen, Pezzini, Radia and Spaltro, 2014), credit substitution from foreign branches (Aiyar, Calomiris and Wieladek, 2014b) and cross-border bank lending (Aiyar et al, 2014a). In addition, the Financial Services Authority introduced a new bank-specific liquidity regulation in 2010 – the Individual Liquidity Guidance, similar to the internationally-agreed standard Liquidity Coverage Ratio (Banerjee and Mio, 2014). In 2013, a new regulatory framework came into force, which included an explicit macroprudential element (Murphy and Senior 2013).

2.2 Bank-level data

The key features of our individual bank dataset are described in detail in Annex A2 of Hoggarth, Hooley and Korniyenko (2013) and Appendix 2 of Aiyar et al (2014a). Broadly, the data are based on the statistical returns submitted, on a quarterly basis, to the Bank of England by the entire population of UK-resident deposit-takers, including building societies. The raw reporting data were adjusted by the authors on a best endeavours basis, as described in Hoggarth, Hooley and Korniyenko (2013), to account for the following: i) breaks in time series associated with the changes in reporting standards; ii) loan securitisations; iii) mergers and acquisitions, and iv) exchange rate movements. All of the variables (except ‘log real assets’, as explained below) are winsorised at the 1st and 99th percentiles, to reduce the effect of outliers.

All data are unconsolidated – they refer to individual authorised banks, irrespective of whether they are part of larger banking groups. A bank is categorised as ‘UK-owned’ if its ultimate parent is incorporated in the United Kingdom, and otherwise as ‘foreign-owned’. The full dataset consists of 386 banks, of which 74 are UK-owned banks and 312 are foreign-owned banks’ branches and subsidiaries. In this paper, we use a sample starting in 2006 Q1 and ending in 2012 Q4.

¹ A trigger ratio is the technical term for capital requirement, since regulatory intervention would be triggered if the bank capital to risk-weighted asset ratio fell below this minimum threshold.

In the baseline analytical framework of the overall project, which is based on Cornett, McNeil, Strahan and Tehararian (2011), the main identification assumption is that the effect of the liquidity shock on bank assets can be identified by comparing institutions with different balance sheet characteristics (a ‘difference-in-difference’ panel regression).

(i) *Dependent variables*

Depending on the specification, the dependent variable is either the flow of total external and domestic lending; or the flow of private credit, commitments and liquid assets. In all cases, these are scaled by total assets in the previous period.² To study whether bank and non-bank lending are affected to different degrees, both external and domestic lending are split into interbank and non-bank lending, again scaled by total assets in the previous period. Given the large number of foreign banks in the United Kingdom, we also re-estimate the model split by bank ownership (UK-owned banks versus foreign). So the dependent variables in the various specifications are:

- the change in total loans during the quarter t , divided by end of period $(t-1)$ assets ($\Delta Loans_{it}$)
- the change in loans, subdivided according to the (domestic/foreign) residence of the borrower during quarter t , scaled by $(t-1)$ bank assets ($\Delta DomesticLoans_{it}$, $\Delta ForeignLoans_{it}$)³
- the change in total private credit (i.e. excluding lending to the government), defined as the sum of the flow of commitments, domestic and external lending during the quarter t , divided by end of period $(t-1)$ assets ($\Delta Credit_{it}$)
- the change in liquid assets, defined as the sum of the flow of cash and UK government bonds, at t , divided by end of period $(t-1)$ assets ($\Delta LiquidAssets_{it}$)
- the change in commitments, defined as the total amount of overdraft, loan, acceptance and other facilities outstanding at t , divided by end of period $(t-1)$ assets ($\Delta Commitments_{it}$)
- the change in loans subdivided according to the (domestic/foreign) residence of the borrower, split into interbank and non-bank lending during quarter t , scaled by $(t-1)$ bank assets ($\Delta DomesticLoansInterbank_{it}$, $\Delta DomesticLoansNonbanks_{it}$, $\Delta ForeignLoansInterbank_{it}$, $\Delta ForeignLoansNonbanks_{it}$)

² Information on internal market flows is only available at an aggregate level.

³ The change in foreign loans refers to the cross-border claims of UK-resident banks, Bank of England Form CC. For details see Appendix 1.

(ii) *Balance sheet characteristics*

For balance sheet characteristics, we have used the commitment ratio (total commitments divided by total assets); the capital ratio (total capital divided by total assets); log real assets (the log of a bank's total assets in levels, deflated by CPI inflation, which we loosely interpret as 'size')⁴; core funding (time and sight deposits from domestic residents, divided by total liabilities less capital); and holdings of liquid assets (holdings of cash and gilts divided by total assets). So the independent variables are:

- fraction of a bank's portfolio of assets that is liquid⁵ ($LiquidAssetsRatio_{i,t-1}$)
- ratio of total commitments divided by total assets ($CommitmentRatio_{i,t-1}$)
- fraction of time and sight deposits from domestic residents, divided by total liabilities less balance sheet capital ($CoreDepositsRatio_{i,t-1}$)
- bank's total capital to asset ratio ($CapitalRatio_{i,t-1}$) log of total assets in levels, deflated by CPI inflation ($LogRealAssets_{i,t-1}$)

2.3 Liquidity variable

For our liquidity variable LIB_OIS_t , we use the LIBOR-OIS spread in sterling, which measures the difference between LIBOR, the 3-month unsecured interbank lending rate, and the OIS, an interest rate swap rate derived from the overnight rate. We interpret this variable as a metric of interbank liquidity, subject to the caveat that it is probably a better indicator of liquidity contractions than expansions, since it is constrained by a lower bound of zero.⁶

During the global financial crisis, a number of governments around the world intervened into their banking systems directly to limit the spread of the crisis. Given the size of the official sector interventions in the United Kingdom and significant presence of foreign banks that were supported by their home authorities in the United Kingdom, it is particularly important to control for such interventions to ensure that our results are not biased. We therefore supplement our

⁴ Clearly, other bank attributes could be important in explaining bank behaviour during this period, such as the risk-taking behaviour of banks. While we cannot measure risk-taking precisely, to the extent that too-big-to-fail subsidies are responsible for such risk-taking behaviour, this will be picked up in this 'log real assets' variable.

⁵ Holdings of cash and gilts.

⁶ Given the openness of the UK financial system, the LIBOR-OIS spread in the United Kingdom and United States moved in similar ways during the period under review, with a contemporaneous correlation of 0.92 (eg see Chart 2 of Hoggarth, Hooley and Korniyenko 2014); we have therefore chosen not to re-run our regressions with the US LIBOR-OIS spread.



database with data from Rose and Wieladek (2014) who provide a list of official sector interventions into the banking system, split into three categories: (1) nationalisation (where the stake of the government approaches 50% of equity); (2) public capital injections (where the injection relative to existing capital was small); and (3) liquidity insurance schemes.

2.4 Stylised Facts

Table 1 gives the main summary statistics for the UK database. As analysed in more detail in Hoggarth, Hooley and Korniyenko (2013), UK-owned banks are much more domestically orientated than foreign banks (particularly compared with branches of foreign-owned banks), as they primarily lend to the UK economy (more than two-thirds of total assets) and within that about half is lent to households and firms. Many foreign banks (particularly branches) serve primarily as a funding facility for their affiliated overseas offices (accounting for over a third of their cross-border lending), as well as for lending to foreign non-bank companies in the United Kingdom. It is therefore not surprising, that while, over the period analysed, all banks grew their total assets rapidly, UK-owned (foreign) banks grew domestic (foreign) lending to a greater extent. The median UK-owned bank holds more liquid assets than the median foreign-owned bank, and holds 67% of liabilities in the form of customers' deposits. Interestingly, foreign banks have a higher loan commitments ratio than UK-owned banks. UK-owned banks' lending growth was less volatile over this period than that of foreign-owned banks, both domestically and abroad.

3. Empirical Method and Regression Results

3.1 Analytical approach

A difference-in-difference panel regression requires conditioning on both the *ex ante* characteristics of the individual bank, and demand conditions common to all banks. Our main regression specification is as follows, analogous to baseline specification (3) in Buch and Goldberg (2014):

$$\begin{aligned} \Delta Y_{it} = & \gamma_i + \mu_t + (\beta^0 + \beta^1 LIB_OIS_t) X_{i,t-1} \\ & + (\alpha^0 + \alpha^1 LIB_OIS_t \cdot X_{i,t-1} + \alpha^2 \cdot X_{i,t-1} + \alpha^3 LIB_OIS_t) F_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

Y_{it} is a set of the variables measuring lending of bank i at time t . Depending on specification, this is either the flow of total, external and domestic lending; or the flow of private credit, commitments and liquid assets. $X_{i,t-1}$ is a vector of control variables that captures the degree to which a bank is exposed to liquidity risk through ex ante balance sheet composition and market access.

These variables are additionally interacted with the sterling LIBOR to OIS spread (LIB_OIS_t), which is used as a measure of overall liquidity in the financial system. The interaction terms shows how banks with different (structural) balance sheet characteristics adjust their credit extension in response to funding risks. Both time and bank fixed effects, γ_i and μ_t , respectively, are used in all the specifications, which means that the coefficient estimates for a given variable should be interpreted relative to a bank's own time-invariant and cross-sectional (relative to other banks) average of that variable.

The rise in the *LIBOR-OIS* spread coincides with official sector interventions in the banking sector. To mitigate omitted variable bias, we include information on these interventions in the form of a dummy variable. We add interaction terms between the variables described above and a measure of official sector interventions into the banking system F_{it} , which we name 'facilities'. The dummy variable (which is time-varying) takes a value of one if a bank experienced one or more of these three intervention types in a given period, and zero otherwise. A formal test of whether the effects of private measures of liquidity risk through balance sheet channels are biased indicators of bank-specific liquidity constraints during periods characterised by use of official sector interventions is via the coefficient α^1 , while the overall sensitivity of loans to liquidity risk operating through balance sheet characteristics in periods of official sector interventions use is captured by $\beta^1 + \alpha^1$. More generally, official support can influence lending directly in relation to the balance sheet composition, α^2 , or through changing the overall effects of the LIBOR-OIS spread (α^3).

The analysis proceeds as follows. We first estimate model (1) with the different dependent variables. To study whether bank and non-bank lending are affected to different degrees, we re-estimate model (1) with both external and domestic lending split into interbank and non-bank,

again scaled by total assets. Given the large number of foreign banks in the United Kingdom, we also re-estimate model (1) by bank ownership (domestic and foreign).

Next, we see whether there are threshold effects, by splitting the banks by quartile according to the characteristics included in the control variables, and interacting them with the funding stress variable.

To interpret our estimated coefficient as a loan-supply effect, it is important to control for loan demand. Loan demand common to all banks will be picked up by the presence of the time fixed effects in model (1). It is more difficult to control for bank-specific loan demand. To explore the extent to which this might be a problem, we add a third dimension to the model, splitting external lending by country, and within that by interbank and lending to non-banks.⁷

In this three-dimensional set-up we aim to estimate the following benchmark model (2), with lending by UK-resident bank i to country c at time t as the dependent variable:

$$\Delta Y_{i,t}^c = \gamma_i + \mu_t^c + (\beta^0 + \beta^1 \cdot LIB_OIS_t) X_{i,t-1} + (\alpha^0 + \alpha^1 \cdot LIB_OIS_t X_{i,t-1} + \alpha^2 X_{i,t-1} + \alpha^2 LIB_OIS_t) F_{it} + \varepsilon_{i,t}^c \quad (2)$$

In specification (2), the dependent variable is a claim of bank i on a resident of country c at time t . This comprises bilateral cross-border lending by all UK-resident banks. $X_{i,t-1}$ is a matrix of bank-specific characteristics described previously. μ_t^c is a matrix of country-specific time fixed effects to account for demand shocks in each country. γ_i is a matrix of bank fixed effects.

Similar to Aiyar et al (2014b), we use matrix μ_t^c (the country-specific time fixed effect) as a way of asking whether the same country in the same time period borrowing from multiple UK-affiliated banks experiences a larger decline in lending from the bank facing a relatively larger liquidity shock, conditional on its balance sheet characteristics and government support. This term is therefore the direct analogue of the firm-specific fixed effect methodology pioneered by Khwaja and Mian (2008) to absorb changes in demand conditions. Since the comparison is across banks for the same country in a given time period, all demand shocks in country c at time t should be absorbed by this term.

3.2 Bank-level regression results

⁷ The specification here is similar to that used in Aiyar et al (2014a).

(i) *Full sample*

Table 2 Panel A summarises the results for the full sample of UK-resident banks. The results for log real assets, in particular, are noteworthy.⁸ We find that, the more a bank increased the size of its balance sheet relative to other banks and its historical average, the more it decreased lending relative to other banks in the face of a liquidity shock – particularly so for external lending.

Specifically, the results suggest that, for a 1pp increase in the LIBOR-OIS spread, a bank whose balance sheet is twice as large relative to its own historical average and its peer group would contract total lending as a share of its balance sheet by around 37% more than the average bank, primarily cutting its external lending by 47% more.⁹ For such a bank, on the other hand, domestic lending is increased by about 11% more than the average, and liquid assets rise as well.

How might we interpret this? Clearly, the LIBOR-OIS and log real assets interaction could reflect various omitted variables which are not captured in our regression. For example, banks that grew their balance sheet quickly relative to their historical average and their peers might have been more aggressive risk-takers. But it is difficult to know this with certainty from these results.

There is also some evidence that commitments were particularly important: banks with higher level of commitments cut their domestic and total lending by much less. Specifically, for a 1pp liquidity shock, a bank with a commitment ratio of 1pp above average adjusted their domestic lending by around 80% less than average. This could simply mean that borrowers were more likely to draw down on their commitments during a period of economic stress. Interestingly, banks with higher existing commitments actually cut their provision of new commitments by around 250% more than the average – perhaps reflecting a desire to protect existing relationships by focusing on them.

More generally, the coefficient α^1 on the triple interaction between funding costs and official interventions is insignificant for most balance sheet variables, suggesting that the interaction

⁸ Recall that, due to the inclusion of bank and time fixed effects in our baseline regression, this has a specific meaning: the deviation of a bank's total assets in levels from its own time series average, relative to other banks. So the 'largest' banks are not necessarily those with the highest level of assets, but those whose assets grew the most rapidly pre-crisis.

⁹ This figure is obtained as follows. In Table 2, column 2, the coefficient for the interaction term of the LIBOR-OIS spread and log real assets is -0.367, significantly different from zero at 10% confidence. The liquidity shock in this case is assumed to be 1pp. This gives us $1 \times 1 \times (-0.367) = -0.367$ (i.e. 36.7%). This is the figure by which total lending as a share of a bank's balance sheet contracts relative to the average bank.

between LIB_OIS and balance sheet characteristics was not a biased measure of funding risk during our sample period. The only case where this is different is for commitments. Here we find that now $\beta^1 + \alpha^1$ in both the domestic lending and commitment equation is approximately zero. This suggests that only banks with higher existing commitments which were *unaffected* by official interventions cut back on new commitments. Those that received official help, on the other hand, did not discriminate in this fashion, which may indicate that they extended the support they received to new borrowers.

(ii) Splitting the main sample

We next probe these aggregate results in more detail. We re-estimate equation (1) but split the sample between UK-owned banks and foreign-owned banks (Table 2, Panel B).¹⁰ For UK-owned banks, the results are qualitatively similar to the full sample: banks with higher pre-shock assets growth cut their external lending by more than average (17%, though the coefficient is not significant), offset by expanding their domestic lending by 42%. This is tentatively suggestive of a form of home bias in lending by UK-owned banks – a widely documented feature of bank behaviour in many countries since the onset of the crisis. For foreign-owned banks, we find the same effect for external lending (cut by 51% more than average), but the result for domestic lending is not significant. This may be indicative of loan substitution. In particular, to the extent that foreign-owned banks are less affected by shocks originating in the United Kingdom, the rise in the sterling LIBOR-OIS spread may allow them to gain market share at the expense of UK-owned banks, which might be relatively more affected.

We then split the sample further by types of lending - to the real and financial sector – for both domestic and external lending. Table 3 suggests that splitting the sample in this way does not make a significant difference to most of our key findings, apart from the commitments result, which is only statistically significant for domestic real sector lending.

(iii) Exploring non-linearities

Our investigation thus far has revealed that balance sheet size, relative to the bank's own historical average and other banks, seems to be the most important determinant of exposure to the funding shock in UK resident banks. In Table 4, we explore whether there are time-invariant

¹⁰ As foreign branches are not required to hold capital in their UK-resident entity, and they are a significant fraction of the foreign bank group, the capital ratio has been excluded from all foreign bank regressions.

balance sheet characteristics, which make this effect smaller or larger, by testing for threshold effects. We split the full sample of banks by quartiles using our four main balance sheet variables of interest. We then construct dummy variables which take the value of one if average value of that balance sheet variable is in either the top or bottom quartile and zero if in the middle quartiles. These dummy variables are referred to as ‘TOP’, ‘MEDIUM’ and ‘BOTTOM Quartile’. We then add the interactions between these dummy variables and the lag of log real assets, and the $\text{LogRealAssets}_{i,t-1} * \text{LIB_OIS}_t$ coefficient, as additional explanatory variables in the model (1). This regression is estimated separately for different dependent variables and different balance sheet variable quartiles.

Table 4 shows that the middle 50% of the sample in terms of liquid assets or level of capital, when facing a liquidity shock, react similarly to our headline results, i.e. they cut back external lending which is partially offset by increased lending to domestic economy. The estimated coefficients are quantitatively similar to those reported above in Table 2. And in both cases the results for the top and bottom quartiles are not significant (with the exception of one observation).

But there is an interesting difference for the ratio of core funding (retail deposits) to total assets: for banks in the top quartile of the sample, the results actually go the opposite way to the aggregate or middle 50% (and are significant): for these banks, the more a bank increased the size of its balance sheet relative to other banks and its historical average, the more it *increased* external lending relative to other banks in the face of a liquidity shock. This is robust across almost all types of lending. Since banks whose business model is more reliant on retail deposits are likely to be more insulated from wholesale liquidity shocks, these positive coefficients suggests that they perhaps used this opportunity to gain more market share from those banks which were more wholesale market funding reliant.

3.3 Bank-country-level regression results

The second type of analysis considers in greater detail the incidence of transmission of liquidity risk to foreign countries through different types of claims extended. For this purpose we exploit detailed information on the claims of parent banks on related and unrelated counterparties in foreign countries. We follow the approach in Aiyar et al (2014b), as outlined above in model

(2). This bank-country-time set up provides a more convincing framework for controlling for demand shocks than it is possible to do in the bank-time specification in model (1).

The results for model (2) are shown in Table 5, and confirm most of the main findings from the previous section are robust to a more sophisticated treatment of demand shocks. The cut-back in cross-border lending response to a liquidity shock is again found to be greater, the larger the relative increase in size of the bank and mainly via foreign banks. The cross-border transmission of domestic liquidity shocks is also found to be stronger via interbank lending than to real-economy lending, consistent with the findings of a previous study on the international transmission of capital requirements (Aiyar et al, 2014a).

4. Concluding Remarks

Our headline conclusion is that, following a rise in our liquidity shock measure, UK-resident banks that grew their balance sheets quicker relative to their peers pre-crisis, decreased (increased) their external (domestic) lending by more relative to other banks. This suggests a form of home bias – a widely documented feature of bank behaviour in many countries since the onset of the crisis. Interestingly, our results suggest that UK-owned banks increased domestic lending, while foreign banks cut back external lending. We also investigate to what extent these effects could be non-linear and find that banks with high core funding ratios cut back (raised) external (domestic) lending by more. This is consistent with the idea that banks with a funding model more reliant on stable retail deposits, used the disruption in wholesale funding as an opportunity to gain market share.

There is also some evidence that the commitment ratio is also an important determinant of the liquidity shock transmission: banks with a high commitment ratio tend to cut back on commitments, while raising domestic lending. This is particularly pronounced for foreign banks and non-bank lending and may reflect their desire to protect existing domestic lending relationships at the expense of new commitments. Interestingly, our results suggest that banks affected by official interventions do not discriminate in that way, perhaps as a means of passing on the support to real economy borrowers.

Finally, we examine the robustness of our results to our treatment of demand shocks with bilateral cross-border lending by country. In contrast to our baseline model, where loan demand

is proxied by a time effect, in common to all banks at each point in time, the bilateral nature of the data allows us to model demand as a country-specific time fixed effect, as in Aiyar et al (2014). Most of the main findings are robust to this more sophisticated treatment of demand shocks.

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Table 1: Summary Statistics on Bank Lending and Characteristics

This Table provides summary statistics for bank balance sheet and lending data. Beginning-of-quarter assets are used to standardize most of the growth variables. Assets and commitments, together, are used to standardize growth in private credit. Growth variables are winsorised at the 1st and 99th percentiles. Data are observed quarterly from 2006Q1 to 2012Q4. Banks are split into subgroups - UK-owned, and foreign banks - on the basis of the ownership of a parent firm. Banking data come from the Bank of England (BoE) BT, BE, and CC forms. Information on banks' ownership comes from the BoE.

Panel B (relevant for only a subsample of banks): This panel reports summary statistics for locational data, broken down by destination. It includes lending to other banks within the same banking group (intragroup) but excludes any lending in local currencies done by bank i 's foreign affiliate in country j . Lending is in all currencies and comprises loans and advances, and claims under sale and repurchase agreements.¹¹ A full description of these forms can be found at: <http://www.bankofengland.co.uk/statistics/Pages/reporters/default.aspx>. The whole population of UK-regulated banks (i.e. UK-owned banks and foreign subsidiaries) are included that have external claims above the reporting threshold of £300mn.¹²

Variables	All banks (n=386)			UK-owned banks (n=74)			Foreign banks (n=312)		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Panel A: Balance sheet data (for each bank i and quarter q)									
Observations	8586			1648			6938		
<i>Dependent Variables (a)</i>									
Δ Private Credit/(Assets + Commitments) (%)	2.44	0.065	24.7	1.66	0.29	12.7	2.63	0.005	26.76
Δ Loans/Assets (%)	1.1	0	19.02	0.67	0	8.27	1.21	0	20.77
Δ Domestic Loans/Assets (%)	0.3	0	4.61	0.52	0	6.76	0.25	0	3.93
Δ Foreign Loans/Assets (%)	0.77	0	18.15	0.12	0	3.53	0.93	0	20.11
Δ Liquid Assets/Assets (%)	0.18	0	2.13	0.38	0	2.83	0.14	0	1.93
Δ Commitments/Assets (%)	1.26	0.03	10.89	0.98	0.28	7.12	1.33	0.001	11.61
<i>Independent Variables</i>									
Liquid Assets Ratio (%) (b)	1.82	0.003	5.46	4.41	0.39	8.04	1.21	0.001	4.43
Commitments Ratio (%)	0.52	0.39	4.04	0.55	0.51	0.57	0.51	0.37	4.49
Core Deposits Ratio (%)	21.36	7.57	273.94	58.14	67.55	28.03	12.62	4.53	303.79
Capital Ratio (%)	14.87	7.66	23.29	18.56	12.78	18.51	13.99	5.52	24.21
Log Real Assets	14.13	14.03	2.5	13.98	13.43	2.9	14.17	14.13	2.39
Panel B: Cross-border data (for each bank i, quarter q, and country j)									
	Mean	Median	SD	Obs	Banks	Countries			
Δ Cross-border Claims/ Assets (a) (c)	-3.87	0	30.51	146538	218	175			

¹¹ A full description of these forms can be found at: <http://www.bankofengland.co.uk/statistics/Pages/reporters/default.aspx>

¹² Banks omitted from the sample tended to be small or domestically focused (e.g. building societies).



Table 2: Liquidity risk and bank lending, including information on public interventions
Panel A: Aggregate results

This Table reports the results of the overall sensitivity of loans (private credit, liquidity, and commitments) to liquidity risk operating through balance sheet characteristics in periods of stress and official interventions. The sample consists of all banks resident in the United Kingdom. The underlying specification is equation (1) with time and bank fixed effects. We include information on official sector interventions in form of a dummy variable in the specification. We also include a full set of interactions with the LIBOR-OIS spread and each balance sheet characteristic. For more details on the variables see Appendix Table 1. Growth variables are winsorised at the 1st and 99th percentiles. Bank explanatory variables are lagged by one quarter. Standard errors are clustered by bank-time. ***, **, and * respectively indicate significance at the 1%, 5%, and 10% level.

<i>UK- and foreign-owned banks</i>						
Variables	Δ Credit/ (Assets + Commitments)	Δ Loans/Assets	Δ Liquid Assets/Assets	Δ Foreign Loans/Assets	Δ Domestic Loans/Assets	Δ Commitments/Assets
Liquid Assets Ratio	0.133*	0.0532	-0.0027	0.0401	-0.00568	0.0663
Liquid Assets Ratio*Libor-OIS	0.0766	0.111	-0.0776	0.140*	-0.003	-0.00422
Liquid Assets Ratio*Libor-OIS*Facility	-0.252	-0.376	0.0261	-0.253	-0.112	0.104
Commitments Ratio	0.818*	0.00896	-0.00541	0.132	-0.119	0.828***
Commitments Ratio*Libor-OIS	-1.512	1.616**	0.0373	0.794	0.761***	-2.572***
Commitments Ratio*Libor-OIS*Facility	1.744	-1.422*	-0.0419	-0.604	-0.745***	2.634***
Log Real Assets	-4.415***	-2.502***	-0.00977	-2.307***	-0.137**	-1.732***
Log Real Assets*Libor-OIS	-0.283	-0.367*	0.0069	-0.473**	0.111***	0.0391
Log Real Assets*Libor-OIS*Facility	1.143	0.698	0.0398	0.595	0.0293	0.211
Core Deposits Ratio	-0.00598**	-0.00137	5.38E-05	-0.00185	0.000564	-0.00360***
Core Deposits Ratio*Libor-OIS	0.0177*	-0.00686	-0.000193	-0.00168	-0.00471**	0.0166***
Core Deposits Ratio*Libor-OIS*Facility	0.046	0.0483	0.00191	0.0386	0.00875	0.00686
Capital Ratio	0.0222	0.0058	0.000196	0.0104	-0.00561	0.0245
Capital Ratio*Libor-OIS	-0.048	-0.0283	-0.00107	-0.0253	-0.00311	-0.0213
Capital Ratio*Libor-OIS*Facility	0.159	0.0446	0.00475	0.0366	-0.00627	0.0347
Libor-OIS*Facility	-22.7	-11.7	-0.498	-10.06	-0.571	-6.22
Facility	-9.237	3.309	-1.247**	2.572	0.835	-13.78
Observations	8,585	8,585	8,585	8,585	8,585	8,585
R-squared	0.113	0.077	0.071	0.064	0.197	0.138
Number of banks	386	386	386	386	386	386
Adjusted R-squared	0.066	0.029	0.0219	0.0143	0.15	0.09
Time Period	2006Q1- 2012Q4	2006Q1- 2012Q4	2006Q1- 2012Q4	2006Q1- 2012Q4	2006Q1- 2012Q4	2006Q1-2012Q4
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Official support						
Liquid Assets Ratio*Facility	0.167	0.569**	-0.126**	0.506**	0.0313	-0.23
Commitments Ratio*Facility	-1.398**	-0.263	0.0101	-0.353	0.0841	-1.071***
Log Real Assets*Facility	0.254	-0.41	0.0740**	-0.213	-0.176	0.732
Core Deposits Ratio*Facility	-0.00598**	-0.00137	5.38E-05	-0.00185	0.000564	-0.00360***
Capital Ratio*Facility	0.00563	0.0331	-0.00268	0.0263	0.00835	0.00205

Panel B: Foreign/domestic bank split

This Table reports the results of the overall sensitivity of loans (split according to whether the borrower is a domestic or foreign resident) to liquidity risk operating through balance sheet characteristics in periods of stress and official interventions. The sample consists of all banks resident in the United Kingdom, but is split into UK-owned banks (i.e. if the bank's parent is incorporated in the United Kingdom) and foreign-owned banks. The underlying specification is equation (1) with time and bank fixed effects. We include information on official sector interventions in form of a dummy variable in the specification. We also include a full set of interactions with the LIBOR-OIS spread and each balance sheet characteristic. For details on the variables see Appendix Table 1. Growth variables are winsorised at the 1st and 99th percentiles. Bank explanatory variables are lagged by one quarter. Standard errors are clustered by bank-time. ***, **, and * respectively indicate significance at the 1%, 5%, and 10% level.

Variables	UK-owned Banks		Foreign-owned Banks	
	Δ Domestic Loans/Assets	Δ Foreign Loans/Assets	Δ Domestic Loans/Assets	Δ Foreign Loans/Assets
Liquid Assets Ratio	0.0247	0.0269	-0.00843	-0.0204
Liquid Assets Ratio*Libor-OIS	0.0222	-0.0569*	-0.0262	0.247*
Liquid Assets Ratio*Libor-OIS*Facility	-0.284*	0.376***	0.101	-0.698
Commitments Ratio	3.733***	0.208	-0.199***	0.166
Commitments Ratio*Libor-OIS	0.161	0.0301	0.845***	1.085
Commitments Ratio*Libor-OIS*Facility	-1.856	6.960***	-0.831***	-0.891
Log Real Assets	-0.918**	0.171	-0.0618	-2.552***
Log Real Assets*Libor-OIS	0.420**	-0.174	0.0413	-0.517**
Log Real Assets*Libor-OIS*Facility	-0.256	-0.379	0.0966	1.024
Core Deposits Ratio	0.00357	0.0105	0.000809*	-0.000954
Core Deposits Ratio*Libor-OIS	-0.0324	0.00797	-0.00493**	-0.00699
Core Deposits Ratio*Libor-OIS*Facility	0.0184	0.0929***	0.00448	0.0596
Capital Ratio	-0.0170	0.0341	-0.00350	0.0146
Capital Ratio*Libor-OIS	-0.0409	-0.00424	-0.00351	-0.0349
Capital Ratio*Libor-OIS*Facility	-0.0124	0.109*	-0.00207	0.0698
Libor-OIS*Facility	3.003	-4.763	-1.530	-16.89
Facility	-3.027	15.13	-2.801	4.844
Observations	1,648	1,648	6,937	6,937
R-squared	0.297	0.161	0.181	0.067
Number of banks	74	74	312	312
Adjusted R-squared	0.2408	0.0943	0.1367	0.0164
Time Period	2006Q1- 2012Q4	2006Q1- 2012Q4	2006Q1- 2012Q4	2006Q1- 2012Q4
Time fixed effects	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes
Official support				
Liquid Assets Ratio*Facility	0.176	-0.182*	-0.0541	0.802**
Commitments Ratio*Facility	-4.513	2.418	0.174**	-0.393
Log Real Assets*Facility	0.106	-0.769	0.0605	-0.328
Core Deposits Ratio*Facility	-0.000959	-0.0362	-0.00512	-0.0884
Capital Ratio*Facility	-0.00268	0.0263	0.00835	0.00205



Table 3: Bank/nonbank split

This Table reports the results of the overall sensitivity of loans (split according to whether the borrower is in the financial or non-financial sector and a domestic or foreign resident) to liquidity risk operating through balance sheet characteristics in periods of stress and government interventions. The sample consists of all banks resident in the United Kingdom. The underlying specification is equation (1) with time and bank fixed effects. The data are quarterly from 2006Q1 to 2012Q4. We include information on official sector interventions in form of a dummy variable in the specification. We also include a full set of interactions with the LIBOR-OIS spread and each balance sheet characteristic. For more details on the variables see Appendix Table 1. Growth variables are winsorised at the 1st and 99th percentiles. Bank explanatory variables are lagged by one quarter. Standard errors are clustered by bank-time. ***, **, and * respectively indicate significance at the 1%, 5%, and 10% level.

<i>All banks</i>				
Variables	Δ Domestic Nonbank Loans/Assets	Δ Foreign Nonbank Loans/Assets	Δ Domestic Bank Loans/Assets	Δ Foreign Bank Loans/Assets
Liquid Assets Ratio	-0.00531	0.0137	-0.000257	0.0352
Liquid Assets Ratio*Libor-OIS	-0.00992	0.00528	0.00693	0.119*
Liquid Assets Ratio*Libor-OIS*Facility	-0.0615	0.0869	-0.0676*	-0.342
Commitments Ratio	-0.104	0.0625	-0.00483	0.0537
Commitments Ratio*Libor-OIS	0.648***	-0.281	0.0620	1.114
Commitments Ratio*Libor-OIS*Facility	-0.644***	0.262	-0.0540	-0.917
Log Real Assets	-0.107*	-0.130	-0.0121	-2.160***
Log Real Assets*Libor-OIS	0.0661**	-0.130*	0.0411**	-0.333*
Log Real Assets*Libor-OIS*Facility	-0.0229	-0.0347	0.0287	0.641
Core Deposits Ratio	0.000514	-0.000420	4.62e-05	-0.00145
Core Deposits Ratio*Libor-OIS	-0.00403**	0.00233	-0.000370	-0.00376
Core Deposits Ratio*Libor-OIS*Facility	-0.0615	0.0869	-0.0676*	-0.342
Capital Ratio	-0.00566	-0.00295	0.000339	0.0167
Capital Ratio*Libor-OIS	-0.00438*	-0.00792	0.00126*	-0.0159
Capital Ratio*Libor-OIS*Facility	0.00933	0.0376**	-0.00492	0.000970
Libor-OIS*Official	0.310	-1.309	-0.407	-9.028
Official	-1.907	1.607	2.356***	1.038
Observations	8,585	8,585	8,585	8,585
R-squared	0.171	0.074	0.120	0.048
Number of banks	386	386	386	386
Adjusted R-squared	0.0219	0.0143	0.15	0.09
Time Period	2006Q1- 2012Q4	2006Q1- 2012Q4	2006Q1- 2012Q4	2006Q1- 2012Q4
Time fixed effects	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes
Official support				
Liquid Assets Ratio*Facility	-0.000182	-0.00197	0.0286	0.504**
Commitments Ratio*Facility	0.0771	-0.0799	-0.00392	-0.251
Log Real Assets*Facility	0.0255	-0.0823	-0.170***	-0.144
Core Deposits Ratio*Facility	-0.0148	-0.00202	4.34e-05	-0.0175
Capital Ratio*Facility	0.00863	-0.0132	-0.000917	0.0358



Table 4: Threshold effects

This Table reports the effects of liquidity risk conditions and firm characteristics on growth in domestic and foreign lending, private credit, liquidity, and commitments. The underlying specification is equation (1) with time and banks fixed effects. The data are quarterly from 2006Q1 to 2012Q4. The LIBOR-OIS spread is the quarterly average of the daily difference between the 3-month unsecured interbank lending rate at London Stock Exchange, and the OIS, an interest rate swap rate derived from the overnight rate in sterling. For more details on the variables see Appendix Table 1. Growth variables are winsorised at the 1st and 99th percentiles. We split the full sample of banks by quartiles using four main balance sheet variables of interest – log real assets, capital ratio, liquidity and core-funding. We then construct dummy variables which take the value of one if average value of that balance sheet variable is in either the top or bottom quartile and zero otherwise. These dummy variables are referred to as ‘TOP QUARTILE’ and ‘BOTTOM QUARTILE’. Standard errors are clustered by bank-time. ***, **, and * respectively indicate significance at the 1%, 5%, and 10% level.

<i>All banks</i>		Δ Credit/ (Assets + Commitments)	Δ Commitments / Assets	Δ Foreign Loans / Assets	Δ Domestic Loans / Assets	Δ Foreign Nonbank Loans / Assets	Δ Domestic Nonbank Loans / Assets	Δ Foreign Bank Loans / Assets	Δ Domestic Bank Loans / Assets
Sorting variable:									
Unrestricted	Log Real Assets*Libor-OIS	-0.262	-0.052	-0.375**	0.0903***	-0.176***	0.0597***	-0.192	0.0362***
LOG REAL ASSETS	Log Real Assets*Libor-OIS -(MIDDLE QUARTILES)	-0.507	0.092	-	-0.001	-0.092	0.045	-	0.021
	Log Real Assets*Libor-OIS - (TOP QUARTILE)	0.106	-0.045	0.00626**	0.001	-0.035	0.005	0.543**	0.010
	Log Real Assets*Libor-OIS - (BOTTOM QUARTILE)	-0.036	0.041	0.000	-0.002	0.004	-0.010	0.000	0.005
CAPITAL RATIO	Log Real Assets*Libor-OIS -(MIDDLE QUARTILES)	-0.300	28.09*	-0.381***	0.0908***	-0.186***	0.0601***	-0.188	0.0368***
	Log Real Assets*Libor-OIS - (TOP QUARTILE)	-0.029	-4.040	0.090	-0.013	0.008	-0.008	0.083	-0.001
	Log Real Assets*Libor-OIS - (BOTTOM QUARTILE)	0.078	-9.156	0.081	-0.0246**	0.0712**	-0.0182**	0.009	-0.006
LIQUID ASSETS RATIO	Log Real Assets*Libor-OIS -(MIDDLE QUARTILES)	-0.291	-0.097	-0.359**	0.0735**	-0.194***	0.0595***	-0.155	0.024
	Log Real Assets*Libor-OIS - (TOP QUARTILE)	-0.053	0.104	-0.148	0.004	0.015	-0.014	-0.215	0.015
	Log Real Assets*Libor-OIS - (BOTTOM QUARTILE)	0.048	0.028	0.020	0.0197*	0.016	0.006	0.014	0.00948*
CORE DEPOSITS RATIO	Log Real Assets*Libor-OIS -(MIDDLE QUARTILES)	-0.206	-0.050	-0.334**	0.0907***	-0.176***	0.0612***	-0.150	0.0365***
	Log Real Assets*Libor-OIS - (TOP QUARTILE)	0.256**	0.056	0.207***	0.024	0.0825***	0.0301**	0.127**	-0.003
	Log Real Assets*Libor-OIS - (BOTTOM QUARTILE)	0.153	-0.004	0.115	0.015	0.032	0.0218*	0.091	-0.001

Table 5: Bank-country-time regressions

This Table reports the results of specification (2) - effects of liquidity risk conditions and firm characteristics on growth in foreign lending split into interbank and non-bank lending, controlling for demand. The dependent variable is the change in foreign loans (FX adjusted) split into interbank and non-bank lending during quarter t , scaled by $(t-1)$ bank assets. The data are quarterly from 2006Q1 to 2012Q4. The LIBOR-OIS spread is the quarterly average of the daily difference between the 3-month unsecured interbank lending rate at London Stock Exchange, and the OIS, an interest rate swap rate derived from the overnight rate in sterling. For more details on the variables see Appendix Table 1. Growth variables are winsorised at the 1st and 99th percentiles. All specifications include bank-specific and country-time fixed effects. Standard errors are clustered by bank-time. ***, **, and * respectively indicate significance at the 1%, 5%, and 10% level.

	Dependent variable: cross-border lending by bank i to country j								
	All banks			UK Banks			Foreign Banks		
	All loans	Bank	Non-bank	All loans	Bank	Non-bank	All loans	Bank	Non-bank
Liquid Assets Ratio	0.119**	0.065*	0.055	0.133	0.138	-0.020	0.125*	0.061	0.067
Liquid Assets Ratio*Libor-OIS	-0.076	-0.024	-0.050	-0.291	-0.187	-0.063	-0.087	-0.050	-0.041
Liquid Assets Ratio*Libor-OIS*Facility	0.190	0.061	0.129	0.348	0.089	0.228	0.254	0.183	0.069
Commitments Ratio	0.228	0.793	-0.479	5.083	4.123**	0.950	-0.561	0.530	-1.012
Commitments Ratio*Libor-OIS	2.055**	1.075	0.992	-1.911	-5.677**	3.698	2.701**	1.570*	1.141
Commitments Ratio*Libor-OIS*Facility	5.085	1.241	3.521	8.322	13.760**	-6.390	1.334	-2.119	3.341
Log Real Assets	0.337	-0.157	0.500	1.766	0.752	1.055	0.085	0.337	-0.157
Log Real Assets*Libor-OIS	-0.489***	-0.343**	-0.156	-0.742	-0.447	-0.318	-0.456**	-0.49***	-0.34**
Log Real Assets*Libor-OIS*Facility	-0.083	-0.026	-0.048	0.031	-0.520*	0.576*	0.059	-0.083	-0.026
Core Deposits Ratio	0.016	-0.018	0.033*	-0.022	0.039	-0.055	0.028	-0.031	0.055**
Core Deposits Ratio*Libor-OIS	-0.004	0.006	-0.009	0.019	-0.029	0.047*	-0.013	0.013	-0.025
Core Deposits Ratio*Libor-OIS*Facility	0.008	0.011	-0.001	-0.007	0.031	-0.034	-0.013	-0.002	-0.008
Capital Ratio	-0.016	-0.043	0.024	-0.049	0.030	-0.078	0.010	-0.048	0.054
Capital Ratio*Libor-OIS	-0.022	0.056*	-0.07**	0.179	0.005	0.169**	-0.044	0.059	-0.09**
Capital Ratio*Libor-OIS*Facility	-0.012	-0.066	0.054	-0.275	-0.046	-0.23**	0.064	-0.033	0.098
Observations	146538	146534	146534	34904	34904	34904	111634	111630	111630
R-Squared	0.042	0.034	0.045	0.138	0.116	0.146	0.049	0.040	0.054
Number of banks	386	386	386	74	74	74	312	312	312
Adjusted R-squared	0.0097	0.0026	0.0151	0.0079	0.0162	0.0177	0.0092	0.0012	0.0177
Time Period	2006Q1-2012Q4	2006Q1-2012Q4	2006Q1-2012Q4	2006Q1-2012Q4	2006Q1-2012Q4	2006Q1-2012Q4	2006Q1-2012Q4	2006Q1-2012Q4	2006Q1-2012Q4
Bank Fixed Effects	X	X	X	X	X	X	X	X	X
Country Time fixed effects	X	X	X	X	X	X	X	X	X
Official support									
Liquid Assets Ratio*Official	-8.968*	-1.838	-6.941*	-7.309	-7.955	1.554	-3.647	3.375	-7.281
Commitments Ratio*Official	0.127	-0.003	0.125	-0.181	0.176	-0.384	-0.056	-0.190	0.151
Log Real Assets*Official	0.027	0.058	-0.026	0.186**	0.074	0.116*	-0.071	0.011	-0.077
Core Deposits Ratio*Official	0.004	-0.004	0.008	0.031	-0.010	0.040	-0.058	-0.006	-0.054
Capital Ratio*Official	0.066	-0.012	0.082	0.075	0.018	0.077	0.273	-0.056	0.322

Appendix 1: Construction of variables

Variable Name	Report Form Description	Source	Notes
<i>Dependent Variables</i>			
Δ Loans/Assets _(t-1)	Δ (Total loans to residents and nonresidents)/Assets	Form BT	Includes securities as well as loans, and domestic intragroup lending.
Δ Credit/Assets _(t-1)	Δ (All commitments +domestic and external lending) / (Assets + commitments)	Form BT, CC	Excludes lending to the UK public sector.
Δ DomesticLoans/Assets _(t-1)	Δ (Loans to residents)/Assets	Form BT(BE)	
Δ ForeignLoans/Assets _(t-1)	Δ (Cross-border claims on banks, public, and other) /Assets	Form CC	
Δ LiquidAssets/Assets _(t-1)	Δ (Cash +UK government bonds) /Assets	Form BT	
Δ DomesticLoansInterbank/Assets _(t-1)	Δ (Loans to resident banks)/Assets	Form BT	
Δ ForeignLoansInterbank/Assets _(t-1)	Δ (Cross-border claims on banks)/Assets	Form CC	
Δ DomesticLoansNonbank/Assets _(t-1)	Δ (Loans to resident non-bank institutions)/Assets	Form BT	
Δ ForeignLoansNonbank/Assets _(t-1)	Δ (Cross-border claims on non-banks)/Assets	Form CC	
<i>Independent Variables</i>			
LiquidAssetsRatio _(t-1)	(Cash +UK government bonds)/ Assets	Form BT	
CommitmentsRatio _(t-1)	(All commitments) / (Assets)	Form BT	Includes overdraft, loan, acceptance and other facilities outstanding.
LogRealAssets _(t-1)	log(Total real assets)	Form BT	Assets deflated by CPI.
CoreDepositsRatio _(t-1)	[Total time and sight deposit from domestic residents]/(Liabilities – balance sheet capital)	Form BT	
CapitalRatio _(t-1)	(Total balance sheet capital)/Assets	Form BT	
Facility	A dummy that takes the value of 1 when a British bank has been subject to at least one of the following i) nationalisation; ii) a public capital injection; and iii) participated in a liquidity insurance scheme in its home country, and zero otherwise.	Rose and Wieladek (2014)	
LIBOR-OIS	The LIBOR-OIS spread is the quarterly average of the daily difference between the 3-month unsecured interbank lending rate at London Stock Exchange, and the OIS, an interest rate swap rate derived from the overnight rate in sterling.	Bank of England	

Note: “Form (BT/CC/CE)” refers to the relevant Bank of England reporting form. See <http://www.bankofengland.co.uk/statistics/Pages/reporters/defs/default.aspx> for full definitions.

