

Financial Protectionism: the First Tests¹

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Abstract

During the crisis of 2008-09, many countries engaged in bank nationalizations and other large public interventions in the financial sector. Did such actions lead to nationalistic changes in financial activities? In this paper we provide the first empirical tests for “financial protectionism.”

Manifestations of financial protectionism include a decrease in the quantity and/or an increase in the price of loans that foreign banks make to domestic borrowers. We provide evidence of financial protectionism from a bank-level panel data set spanning all British and non-British (foreign) banks providing loans within the United Kingdom between 1997Q3 and 2010Q1. During this time, a number of banks were nationalized, privatized, given unusual access to loan or credit guarantees, or received capital injections. We use standard empirical panel-data techniques to study the “loan mix,” British loans of a bank expressed as a fraction of its total loan activity. We also examine effective short-term interest rates, though our data set here is smaller. We examine the loan mix for British and foreign banks, both before and after unusual public interventions such as nationalizations and public capital injections. We find strong evidence of financial protectionism. After nationalization, non-British banks reduced the fraction of British loans by about eleven percentage points and increased their effective interest rates by about 70 basis points. By way of contrast, nationalized British banks did not significantly change either their loan mix or effective interest rates. Succinctly, foreign nationalized banks seem to have engaged in financial protectionism, while British nationalized banks did not.

Keywords: bank; nationalization; privatization; crisis; loan; domestic; foreign; empirical; panel.

JEL classification: F36; G21

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“We will not retreat into financial protectionism”

- G20 Leaders' Statement from London Summit, April 2009
- G20 Leaders' Statement from Pittsburgh Summit, September 2009

1. Introduction

The “Great Recession” which engulfed the world in 2008-09 is frequently compared to the Great Depression of the early 1930s. Many economists blame trade protectionism for deepening, spreading, and/or lengthening the Great Depression. This time around, there is only muted evidence of traditional trade protectionism, at least thus far. But the public sector has made substantial interventions in financial markets around the world, particularly in the banking sector, while cross-border bank lending has fallen. In this study we ask if government support for banks has reduced foreign lending and resulted in a new type of protectionism: financial protectionism.

We think of financial protectionism as a nationalistic change in banks’ lending behavior, as the result of public intervention, which leads foreign banks either to lend less or at higher interest rates to domestic borrowers. While the idea of financial protectionism has been discussed informally for some time, to the best of our knowledge no other work has ever formally tested for the presence of financial protectionism in bank lending behavior. The lack of previous empirical work is not surprising to us, as publicly available data are typically aggregated and do not provide sufficient information to test this hypothesis rigorously. In this study, we take advantage of a panel data set on bank activity collected by the Bank of England. This data set covers all banks, both foreign and domestic, which operated in the UK, a rich country with a large international financial sector. Our data spans 1997Q3 through 2010Q1, a period characterized by the most significant international financial crisis in decades, during which a number of British and foreign banks were nationalized or supported with capital injections and/or loan guarantees. Concurrently, many British and foreign banks did not need to rely on explicit state support for their survival. As such, this heterogeneity means that our data set is well suited to testing for financial protectionism.

We use a standard panel data model with period- and bank-specific fixed effects to search for financial protectionism. Our main focus is the fraction of domestic (British) loans that a bank (British or non-British) makes as a fraction of its total loan activity, a ratio we refer to as the “loan mix” (we also investigate interest rates). Our key finding is that after nationalization, non-British banks reduced British lending as a share of their total lending by about eleven percentage points, and increased interest rates on new loans to UK residents by 70 basis points. By way of comparison, nationalization does not seem to affect either the lending or interest rates of British banks. These results are robust to a variety of perturbations to the underlying empirical model. Succinctly, foreign nationalized banks seem to have engaged in financial protectionism, which British nationalized banks have not.

2. Data and Methodology

2.1 The Data Set

Strategy. The aggregate data lends at least *prima facie* plausibility to the idea that lenders cut back more dramatically on cross-border activity than on domestic activity. Figure 1 plots the growth of lending to British business over the past few years. The superficial impression one gets is that during the Great Recession, foreign lenders (i.e., banks with headquarters outside the UK) contracted their activity more dramatically than British lenders (banks with headquarters in the UK). But such aggregate evidence provides at most indirect support for the presence of financial protectionism. Only if foreign *public* institutions contracted their British loans more than foreign *private* institutions, would we have strong *prima facie* evidence of financial protectionism.

We are interested in examining if public interventions, such as bank privatization or nationalization, skew either the prices that banks charge for foreign (as opposed to domestic) loans, or the quantity supplied. Most publicly available data sets provide insufficient information to answer this question rigorously. For instance, the BIS provides two data sets on cross-border bank lending, “locational” and “consolidated.” However, neither allows one to differentiate domestic from foreign lending, let alone lending for e.g.,

private banks as opposed to those that have received public support. Laeven and Valencia (2010) study systemic banking crises and provide data on bank nationalizations during these crises. However, these authors use aggregated data and are also unable to differentiate the effects of public intervention on domestic as opposed to foreign financial activity. Since aggregation may thus mask the effects of financial protectionism, it is best to test for this phenomenon using data at the institution specific level. For such reasons, it seems natural to test for financial protectionism at the level of individual institutions. However, publicly available disaggregated databases such as *BankScope* do not provide information on individual institutions' external claims. A good test for financial protectionism requires data on both external and domestic lending at the level of individual institutions, some of which were affected by public interventions during the sample period.¹

Source of Financial Data. Fortunately, for the purposes of this investigation, the Monetary and Financial Statistics Division at the Bank of England have kindly provided us with an appropriate data set. It includes quarterly data with a host of information for all banks doing business in the UK. London's status as a major international financial center means that the banking system of the UK has considerable diversity, enabling us to search credibly for indications of financial protectionism in the behavior of both British and foreign banks. This rich dataset is substantially better suited to test for financial protectionism than publicly available datasets. Unfortunately, it has three substantive disadvantages. First, the data set is aggregated to the individual bank level; the bilateral relationship between individual banks and lenders cannot be modeled, nor can one control for borrower characteristics. Second, the data set only includes activities of banks operating within the UK. Third, the data set is confidential, for obvious reasons.

The data set provides us with a complete set of balance sheet data for every institution in the UK banking sector, as all banks operating in the UK must provide this information to the Bank of England under the present regulatory regime. Internally, the Bank of England uses this confidential data set to help carry out its financial and monetary stability objectives. Externally, these data are passed on the FSA for the purposes of bank regulation and to the Office of National Statistics, where it features as one of the building

blocks of the UK's national accounts. The accuracy of this data set is an important priority of the Bank of England: it is compiled in accordance with the Bank's *Statistical Code of Practice*.²

Reporting institutions must provide the data to the Bank of England in several "forms." The "AL" form of the dataset provides disaggregated loans and advances granted to UK residents (including monetary and financial institutions). The "CC" form provides disaggregated series on a reporting institution's total claims on non-residents. We combine AL and CC series to derive our key regressand, the "loan mix" ratio. The loan mix measures the ratio of British to total bank lending, and is our dependent variable of choice. The data set on loan mix is available quarterly from 1997Q3 until 2010Q1 for a total of 361 banks (not all of which have complete series). As of May 2010, 38 of these banks are British according to the Bank of England, while the rest are foreign. Further details on the construction of our variables are available in the data appendix.³

British banks seem naturally to lend more inside the UK, at least compared with foreign banks. This is clear from Figure 2, which provides histograms of the loan mix for British and foreign banks. The behavior of the loan mix ratio suggests that British banks tend naturally to lend relatively more at home (the distribution is skewed towards one), and the average is .67, while foreign banks lend more abroad (the distribution is skewed towards zero, with a much lower average of .27). This does not necessarily indicate financial protectionism, since Figure 2 combines data from publicly-owned, privately-owned banks, and a number of banks whose ownership switched. The question we ask is whether a bank's behavior – that is, its loan mix – changes following a large public intervention. Regression analysis of the loan mix permits us to explore whether or not a bank changes its preferences for domestic, as opposed to foreign, lending, following events like nationalization.

Data on loan rates provides us with an alternative, inferior, way to test for financial protectionism. In particular, the "ER" form provides information on disaggregated effective interest rates on new loans, weighted by loan size. Unfortunately, these data are available over a shorter span of time (only from 2004Q1), and only for the largest institutions (though these collectively make up three-quarters of total lending to any particular sector).

We also take advantage of data provided by the “BT” and “PL” forms, which contain in-depth information of the reporting institution’s balance sheet and income/expenditure statement, respectively. The additional data from these forms are used to construct several control variables such as the non-performing loan ratio and measures of capital adequacy, liquidity, and profitability.

Source of Public Intervention Data. Which of the banks in our sample have been affected by public interventions during the sample period? In early August 2010, we conducted bank-by-bank Google searches for ‘“bank name” nationalization nationalize privatize’ where “bank name” was the precise name of the individual bank in question (according to the Bank of England data set). The clues we discovered from these searches lead us to investigate approximately 150 banks in detail. As we found convincing evidence of public interventions, we constructed suitable binary dummy variables (which take on the value of one at the time of and after public intervention, and are otherwise zero). Subsequently we discovered a number of disaggregated data sets on public interventions in banks such as Ait-Sahalia, et al (2009); we have used these to check and corroborate our classifications.

We gathered data on four types of public interventions: 1) nationalizations, 2) privatizations, 3) injections of public capital, and 4) unusual access to loans, guarantees or liquidity. We focus on bank nationalizations in our empirical work. When a bank receives a public capital injection, it is difficult to measure the government’s effective influence on the bank, since private bank capital is difficult to measure during the very times of crisis when capital is injected. Some banks received capital injections that were minor compared with their existing capital; they remained, for the most part, private institutions. Other banks were essentially nationalized when they received capital injections. For this reason, it seems unwise to assume that all banks treat capital injections similarly. It is also problematic to treat uniformly all banks’ access to unusual liquidity facilities or loan guarantees (where banks received larger amounts of liquidity against assets of lower quality than in normal times); such assistance has heterogeneous impacts, and not all banks chose to access such facilities during the crisis. Further, capital injections and other forms of public

assistance can occur repeatedly; the effect of such assistance is also likely to be heterogeneous, especially since repeated rescues are sometimes implicitly guaranteed in advance. Nationalization, by way of contrast, is a more clear-cut and discrete event. Nationalization is also more discrete than bank privatization (which is often spread over a period of time). Since bank privatization tends to occur during periods of tranquility, the associated effects on lending decisions are not likely to be “the opposite” of bank nationalization, which occurs in times of crisis. For all these reasons, bank nationalization seems like the most obvious measure of public intervention likely to result in detectable financial protectionism.

In our sample, there are a number of notable nationalizations of British banks, including: Northern Rock, National Westminster, and the Royal Bank of Scotland. Nationalizations from Ireland (AIB), the low countries (Fortis), and Iceland (Glitnir, Kaupthing, and Landsbanki) are also in our sample. A number of banks received capital injections (British examples include HBOS, Lloyds, NatWest and RBS; non-British examples include AIB, BNP Paribas, Citibank, Commerzbank, Dexia, ING, and UBS), and many banks also had unusual access to liquidity or loan guarantees. Figure 3 provides a set of four histograms for British banks; three present public interventions and the last presents “tranquil” observations (i.e., those without any intervention). Each histogram graphs the number of relevant observations, organized into bins corresponding to the loan mix.

2.2 Methodology

We begin to explore our data set with a simple panel data model. We start by estimating the following regression equation:

$$\begin{aligned} \text{Dom}_{i,t}/(\text{Dom}_{i,t}+\text{For}_{i,t}) = & \alpha_i + \beta_t + \gamma\text{Nat}_{i,t} + \gamma_{\text{UK}}\text{Nat}_{\text{UK},i,t} + \delta\text{Priv}_{i,t} + \delta_{\text{UK}}\text{Priv}_{\text{UK},i,t} \\ & + \zeta\text{Cap}_{i,t} + \zeta_{\text{UK}}\text{Cap}_{\text{UK},i,t} + \theta\text{LL}_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where:

- $Dom_{i,t}$ is lending to domestic (British) residents by bank i at time t ;
- For is lending to foreign residents;
- $\{\alpha_i\}$ is a comprehensive set of bank-specific fixed effects;
- $\{\beta_t\}$ is an analogous set of time fixed effects;
- $Nat_{i,t}$ is a dummy variable which takes a value of one when a British bank i is nationalized at or before time t , minus one if a foreign bank is nationalized at or before time t , and is otherwise zero;
- $Nat_{UK,i,t}$ is a dummy variable which takes a value of one when British bank i is nationalized at or before time t , and is otherwise zero;
- $Priv$, Cap , and LL are analogues for banks that are privatized, the recipients of public capital injections, and receive unusual access to liquidity, or loan guarantees;
- ε is a well-behaved disturbance term;
- $\{\gamma\}$, $\{\delta\}$, $\{\zeta\}$, and $\{\theta\}$ are coefficients.

The coefficients of greatest interest to us are γ and γ_{UK} . They measure the *permanent* effect of bank nationalization on the loan mix. We note in passing that our loan mix regressand is unaffected by changes in total lending.

Financial protectionism might be expected to result in British banks *increasing* the share of British loans in their loan portfolios following a public intervention like nationalization; symmetrically, foreign banks might be expected to *reduce* the British share of their loan mix. That is, we have constructed our dummy variable such that financial protectionism, if it exists, would be manifest in a positive and significant γ coefficient. Of course, British and foreign responses to nationalization may not be similar quantitatively. Accordingly, we check whether the behavior of public interventions is the same for British and foreign owned banks. We also do not assume but instead check for the equality of responses to different public interventions (like nationalization, capital injections, and so forth).

We estimate our equation with least squares, though we provide a variety of alternative estimators (and other sensitivity analysis) below to ensure the robustness of our

results. Ours is an unbalanced panel with gaps and incomplete coverage (primarily because of mergers and acquisitions). We present robust standard errors that are clustered by time, though again we also check that our results are not sensitive to this assumption. We cluster by time since public interventions in our sample are in practice temporally concentrated. Table 1 provides some relevant evidence; it tabulates the proportion of different interventions in particular periods of time. Half of all bank nationalizations in the sample took place during the second half of 2008 when the financial crisis was at its peak. Other interventions (such as public capital injections) are even more concentrated. Throughout, we include time fixed effects to take account of common shocks (such as general deleveraging), and bank fixed effects to control for bank-specific heterogeneity.

3. Results

3.1 Lending

Estimates of equation (1) are presented in Table 2. Our interest in this table is mostly in checking for two types of symmetry: a) between different types of public interventions (nationalizations, capital injections and so forth); and b) between British and foreign bank responses to public interventions. Since there were no British bank privatizations during our data sample, we can only test the symmetry between British and foreign responses to nationalizations, public capital injections, and unusual access to loan or liquidity facilities. We begin with that task.

The results in Table 2 indicate that there is a statistically negligible difference between British and foreign access to both capital injections and unusual loan or liquidity facilities. Both δ_{UK} and ζ_{UK} are not only statistically insignificant at conventional levels but have the same signs as δ and ζ . When we test the restriction $\delta_{UK}=\zeta_{UK}=0$, the restriction is consistent with the null hypothesis at better than the .2 confidence level. The same cannot be said of the British and foreign responses to bank nationalization; the loan mix of British banks responds much less to a degree that is both economically and statistically significant. Accordingly, we impose the reasonable restrictions (of symmetric responses to British and

foreign capital injections and unusual access to loan/liquidity facilities) and re-estimate our equation; these results are tabulated in the middle column.

Our chief interest is the effect of bank nationalization on the loan mix. Nationalization seems to have a significant effect on the loan mix; foreign banks reduce their proportion of British to total lending by over ten percentage points. This is a large economic effect, which is also highly statistically significant; the t-statistic for the hypothesis of no effect is 5.2. It is also interesting to note that the coefficient on the British nationalization dummy variable is of almost identical magnitude but opposite sign; that is, British bank nationalization appears to have no economically (or statistically) significant effect on the loan mix. By 2010Q1, the banks that had been nationalized account for just over 12% of the total loans made in our sample, so this is an economically large result. No single foreign nationalization seems to be driving our results, nor do the nationalizations come from one particular foreign country. The substantive evidence of financial protectionism after foreign bank nationalization is our most striking finding, especially when combined with the absence of any indication of a comparable reaction by British banks.

The results of Table 2 indicate that other public interventions also have effects on the loan mix. These effects differ by the type of intervention. Banks that are granted unusual access to loan or liquidity facilities seem to engage in financial protectionism; British banks raise the proportion of British loans in their portfolios by almost three percentage points (foreign banks lower their British loan mix by the same amount). Capital injections have a smaller effect which is curiously negatively signed, indicating that foreign banks which receive public capital actually *increase* the proportion of British loans in their portfolios, though only by a small amount (just over one percentage point). Privatized foreign banks reduce the proportion of British loans by over ten percentage points, a statistically and economically significant amount. The strong and different effects of these public interventions on the loan mix make it *prima facie* implausible that shocks to the demand for loans can explain our results (as opposed to the supply of bank loans).

In the column at the right of Table 2, we restrict the sample to observations that are in the middle 90% of the loan-size distribution for both British and non-British banks, so

that banks are comparably sized. Using this smaller sample makes little difference to our key results. Unfortunately, some of our smaller results are sensitive to other minor econometric assumptions, as we now show.

3.2 Sensitivity Analysis

Table 3 checks the robustness of our key results in sixteen different ways; each row in the table represents a separate least squares regression. Since a) there are no British bank privatizations during the sample and b) foreign British and foreign bank nationalizations have separate effects, we replace the “symmetric” (+1 British/0/-1 Foreign) dummy variables with conventional (+1/0) dummy variables.

We begin by using two alternative definitions of our dependent variable. First we replace CC15 (Total external claims on non-resident customers) in the denominator with CC1 (Loans and advances to non-residents). Second, we exclude financial sector lending from the numerator. Our key nationalization results using the two ratios are very similar in both cases, though coefficient estimates for other interventions vary somewhat in significance. Next we check that our standard error assumptions are not critical by providing two alternatives; robust standard errors that are not clustered, and traditional standard errors. The statistical significance of our nationalization results is unaffected, though different standard errors do affect the significance of other public interventions.

Next, we weight our least squares regressions in two different ways: by the natural logarithm of total bank loans (the denominator of our loan mix dependent variable), and by the log of total assets. Neither of these checks appears to affect the results much. Adding these variables as controls (instead of weighting by them) also seems to affect the results little. Since the loan mix is a limited dependent variable, we also estimate our equation with an appropriate censored technique (Tobit), but again this does not affect our results much.

We also cut our sample of data in a number of different ways. First, we divide the sample into big and small banks, using the median bank loan portfolio (the denominator of our dependent variable) as the dividing point. The results differ by bank size; bigger banks that are nationalized seem to engage in more financial protectionism, as seems intuitive.

The responses of smaller banks to public interventions are not statistically significant from zero. Next, we check whether our results are sensitive to the inclusion of particular observations. Our results are little affected by dropping the earlier part of our sample, though the privatization effect drops by an order of magnitude. Similarly, we can successively drop: a) foreign branches; b) foreign subsidiaries; and c) all our British banks without any serious effect on our results. Our last test in this vein is to drop all observations with a residual which lies more than two standard errors from the mean. However, this does not have a major effect on our key coefficient, indicating that outliers are not responsible for our results.

We note in passing that our results do not stem from bizarre behavior in either the numerator or denominator of our loan mix regressand, since both behave in a broadly similar fashion. For instance, the average quarterly growth rate of total lending (the denominator) for British banks is 4.3%, similar in both economic and statistical terms to the 5% growth rate of British lending. This similarity is also true of foreign banks, private and nationalized banks, and combinations thereof.

To summarize: the effects of unusual access to loans or liquidity, and public capital injections are not always robust when we investigate minor perturbations to the basic econometric methodology. However, both foreign bank nationalizations and privatizations seem consistently to lower the proportion of British loans in the portfolios of foreign banks. These effects are usually economically large (around ten percentage points), and statistically significant. While there have been no British bank privatizations during our sample period, the British bank nationalizations have had no consistently large effect on the loan mix, from either an economic or statistical perspective.

3.3 Adding Extra Controls

So far we have shown that our default results seem fairly robust to various model specifications. However, omitted variable bias remains a serious concern even though we have included both time- and bank-specific fixed effects. Accordingly, we construct a set of nine other control variables which have been used in microeconomic studies of bank

lending (e.g., Ehrman, et al, 2001, and Kashyap and Stein, 2000). The variables we consider are: a) loan growth; b) asset growth; c) two variants of the capital adequacy ratio; d) two measures of leverage; and e) a measure of a banks dependency on the wholesale market (the precise definitions of these variables are in the data appendix).

We add the nine extra control variables one by one to our default model, and present the results in Table 4a. It turns out that our key estimates seem to be robust to the inclusion of the controls we consider. Regardless of which extra control variable we include, the coefficients suggest that foreign nationalizations have a statistically significant effect on the domestic share of lending of around ten percentage points, while the effect of British nationalizations is not statistically significantly different from zero. Including the control variables also does not substantially change the effects of the other public interventions we consider.

At the bottom of Table 4a we successively add four sets of dummy variables to the default specification. The first set isolates the periods after a bank switches its regulatory status. There are three types of banks in our sample. UK-owned banks have their headquarters in the UK and are regulated by the FSA. There are also subsidiaries of foreign banks which operate in the UK and participate in the UK's deposit insurance scheme; they are therefore subject to FSA capital requirements. Finally, there are branches of foreign banks which operate in the UK and are covered by deposit insurance from their home country these are not subject to FSA regulation. Banks sometimes switch from one category to another, as for instance when Santander Bank purchased Abbey National in 2004. For each of the (seventeen) banks that switched regulatory status in the sample, we add a dummy which is one for the bank during the period after the switch in regulatory regime, and zero otherwise. As can be seen, adding these controls has little impact on our results.

The next set of controls is determined by European Commission policy. The EC is in charge of maintaining a competitive single market, among other things. As such, it can choose to pursue competition policies when state aid is given to a private entity like a bank. It can also choose to raise objections, and indeed sometimes publicly declares that it will or will not object to state support for a bank (sometimes conditional on restructuring). The EC

can also investigate a bank instead, and also publicly declares this as well. We created separate dummy variables that were unity on and after the EC's public declarations of either "no objections" or of "initiating investigations" for individual banks (we created separate British and foreign dummies, depending on bank nationality), and zero otherwise. However, when we added these to our default specification they had essentially no effect; the results are tabulated in the penultimate row of Table 4a.

The final set of controls we add are interactions between a bank's nationality and time-specific fixed effects (we note in passing that 51 banks in the sample switched their nationality). We do this in two ways. First, we interact time effects with a simple dummy which is one for all foreign banks (and zero for British banks). Second, we interact time effects with bank nationality dummy variables (banks from some fifty countries operate in the UK). These fixed effects allow us to ignore any shocks that are common to the banks from a particular country at any point in time (e.g., national business cycle or foreign exchange rate shocks). This is particularly important given the evidence of "flight home" in the syndicated loans market uncovered by Giannetti and Laeven (2011) and the general "great retrenchment" analyzed at a more aggregate level by Milesi-Ferretti and Tille (2011). Adding this (large number of) fixed effects also has little impact on our key results. A more parameterized approach, where we add country-specific measures of either the size of the Great Recession or the country's policy response to the financial crisis, delivers similarly robust results.

We can add a number of other control variables of interest if we limit our data sample. In particular, the "PL" form allows us to construct a number of potentially relevant ratios: a) the ratio of non-performing loans to total assets; b) three variants of the profit rate (profits as a proportion of assets); and c) the dividend to asset ratio. We add these ratios one by one, and report the results in Table 4b. Since the PL form has only been available since 2004, the number of observations used for each of the regressions (reported in individual rows of Table 4b) is 3,742, less than 40% of the sample used to generate the estimates of Table 4a. However, despite the smaller sample size, our results still seem robust. There is one exception; when we add the non-performing loan ratio, the size of the foreign

nationalization effect approximately halves and is only significantly different from zero at the 7.3% confidence level.

Our results do not change much when we include a number of the extra control variables simultaneously (instead of one at a time). We divide the extra controls into two groups, and present the results in Table 5. The first set contains the controls of Table 4a: loan growth; asset growth; log total assets; capital adequacy; assets/capital (leverage); and wholesale market dependence. The second set includes the controls included in Table 4b: the non-performing loan ratio; the dividend ratio; and the profit ratio. Our base-line results are confirmed when we include all of the controls in the first group. As expected, when include the second set of controls and the number of observations is reduced accordingly, our results are weaker. In the bottom row of the table, we include all the controls simultaneously; at this point, the difference between British and non-British nationalization effects becomes insignificant.

3.4 Interest Rates

If the banking sector is perfectly competitive, banks are price-takers and the effects of financial protectionism on a bank's behavior might only be observable in the quantity of lending, but not in interest rates charged on new loans. With imperfect competition on the other hand, standard bank lending models predict that banks can charge interest rates which are above their cost of capital (Freixas and Rochet, 2008). Since previous work has rejected the hypothesis of perfect competition in the UK banking system (Claessens and Laeven, 2004), it seems worthwhile to explore whether we find evidence of financial protectionism in individual banks' interest rate decisions. If banks engage in financial protectionism following nationalization, we would expect foreign banks to raise interest rates on British loans following nationalization and *mutatis mutandis*. Accordingly, we repeat our analysis, but substitute interest rates for the loan mix as our dependent variable.

Table 6 is an analogue to Table 3, but uses the effective interest rate on new private non-financial corporation loans of less than one year maturity as the dependent variable (instead of the loan mix). We measure interest rates this way since a larger group of banks

lends to the private non-financial corporation sector than to any other sector. Unfortunately, interest rate data are only available since 2004Q1, and only for a relatively small number (less than forty) of the largest banks active in the UK. Still, while the estimates of Table 6 are based on a small sample of data, they corroborate the results we obtained above with the ‘loan mix’. In particular, after foreign banks are nationalized they seem to demand interest rates on loans to British companies that are about seventy basis points higher. This effect is statistically significant and reasonable in economic magnitude. By way of contrast, nationalized British banks do not seem to lend at lower rates to UK resident non-financial private companies, as the financial protectionism hypothesis would suggest. While this is not direct evidence, our interest rate results are consistent with the hypothesis of financial protectionism.

Of course, it could still be the case that British banks charge higher interest rates abroad following nationalization. Unfortunately we do not have the data to test this proposition. The same is true for nationalized foreign banks’ interest rate behavior abroad. It is, on the other hand, reassuring that the difference in the behavior of foreign and British nationalized banks is robust to whether we use the ‘loan mix’ or interest rates as the dependent variable.

3.5 A Note on Endogeneity

Are there reasons to believe that our key regressors – massive public interventions like nationalizations – are simultaneously determined with the bank’s choice of loan mix? Alternatively, is there any reason to believe that reverse causality is a problem, with a bank’s loan mix driving public interventions? We think it unlikely; it unclear to us that bank nationalizations and the like are much affected by the domestic/foreign loan ratio, at least in our data context. While many British loans did sour during the “Great Recession” of 2008-09, so did many loans abroad; the crisis was a global phenomenon.

Furthermore, bank nationalizations are rare events, and often occur because of inadequate risk management. In rich countries like the UK, it seems unlikely that the loan mix is a significant source of such risk. We nevertheless tried a series of instrumental

variables, consisting of the controls used in Tables 4 and 5, but none of them produced statistically significant results for the coefficients of interest to us. This is probably because the variables we considered are weak instrumental variables, as they are not significantly correlated with our dummy variables for public interventions (nationalization, and the like).

4. Conclusion

In this paper, we have provided the first evidence of financial protectionism. We take advantage of a uniquely suitable confidential bank-level panel data set collected by the Bank of England which includes the activities of all banks operating in the UK from 1997Q3 through 2010Q1. Our methodology consists in a plain-vanilla “difference in difference” panel data regression model, which controls for time- and bank-specific fixed effects. We find that foreign banks which have been nationalized reduce their proportion of British to total lending by about eleven percentage points; they also raise loans rates for British companies by about 70 basis points. But financial protectionism is not universal. In contrast to their foreign counterparts, there is no evidence that nationalized British banks changed their lending behavior in any substantive way.

Our main message from this study is that the behavior of foreign banks operating in the UK seems to be consistent with financial protectionism. We have not investigated why these banks chose to act in this way, or whether these actions had any substantive consequences for welfare. We leave those important issues for future research.

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Table 1: Temporal Clustering of Public Interventions

	Nationalization (5 British/15 Foreign)	Capital Injection (17 British/ 59 Foreign)	Unusual Access to Loan Guarantee (30 British/10 Foreign)
2008Q3	20	0	5
2008Q4	30	70	83
2008H2	50	70	88
2008	55	71	88
2009H1	10	15	10
2008H2-2009H1	60	85	98

All figures are percentages.

Table 2: The Effect of Public Interventions on Loan Mix

After:			Similar Size
Nationalization (γ)	10.9** (2.1)	10.9** (2.1)	11.2** (2.1)
British Nationalization (γ_{UK})	-10.5** (2.2)	-10.4** (2.2)	-9.2** (2.4)
Access to Unusual Loans/Liquidity (δ)	1.9 (1.1)	2.8** (.6)	4.5** (.7)
British Access to Unusual Loans/Liquidity (δ_{UK})	1.8 (1.2)		
Capital Injection (ζ)	-1.2* (.5)	-1.3** (.5)	-.6 (.6)
British Capital Injection (ζ_{UK})	-1.0 (.9)		
Privatization (θ)	10.8** (3.1)	10.8** (3.1)	11.0** (3.2)
British Privatization	n/a		
Foreign=British effects (p-value)	.00**		
Foreign=British effects except Nationalization (p-value)	.23		
Observations	9,615	9,615	8,243
R²	.92	.92	.92
RMSE	9.21	9.21	8.82

Dependent variable: $100(\text{domestic loans}/(\text{domestic} + \text{foreign loans}))$. Coefficients for row dummy variables; robust standard errors recorded in parentheses (clustered by time) unless recorded otherwise. One (two) asterisk(s) mark coefficients significantly different from zero at .05 (.01) significance level. Each column represents a separate LS regression. Observations from quarterly panel, spanning 1997Q3-2010Q1 for 361 banks. Dummies are +1 for time during/after British banks/event, -1 for foreign banks/events. Time- and bank-specific fixed effects included but not recorded. Column with similar size is restricted to sample where British and non-British banks have comparably-sized total loan portfolios.

Table 3: Sensitivity Analysis

After:	Foreign Nationalization	British Nationalization	Unusual Access to Loans or Liquidity	Public Capital Injection	Foreign Privatization
Default (Table 2)	-10.9** (2.1)	.5 (.5)	2.8** (.6)	-1.3** (.5)	-10.8** (3.1)
Denominator Variant	-10.6** (2.1)	1.5* (.6)	1.5* (.6)	-.9 (.5)	-12.3** (3.4)
No Financial Lending	-12.3** (2.2)	-.2 (2.0)	.1 (.8)	.7* (.3)	-12.9** (3.4)
Robust SEs, not clustered	-10.9** (2.7)	.5 (1.9)	2.8 (1.5)	-1.3 (1.0)	-10.8** (2.8)
Traditional SEs	-10.9** (2.0)	.5 (2.0)	2.8* (1.2)	-1.3 (.8)	-10.8** (3.4)
Weight by Log Loans	-10.6** (2.0)	.1 (.4)	2.6** (.6)	-1.4** (.4)	-11.5** (3.1)
Weight by Log Assets	-10.8** (2.0)	.2 (.5)	2.7** (.6)	-1.4** (.4)	-11.2** (3.1)
Control for Total Loans	-9.9** (2.0)	-.5 (.5)	3.5** (.6)	-1.1* (.5)	-10.9** (3.1)
Control for Total Assets	-9.8** (2.0)	-.5 (.5)	3.8** (.5)	-.9 (.5)	-10.9** (3.1)
Tobit	-11.7** (.6)	-3.2 (2.3e+7)	-.1 (.4)	-.6** (.1)	-10.0** (88.)
Big Banks	-8.6** (2.41)	-1.6** (.41)	1.1* (.5)	.1 (.4)	-19.7** (2.9)
Small Banks	3.4 (12.6)	5.8 (3.1)	6.3 (3.4)	-.5 (3.0)	-2.5** (.6)
Drop pre-2000	-11.9** (2.2)	-.6 (.5)	2.7** (.6)	-1.3** (.5)	-1.0** (.3)
No Foreign Branches	-11.5* (5.1)	.4 (.6)	3.9** (.7)	-3.0** (1.0)	n/a
No Foreign Subsidiaries	-8.0** (2.1)	.3 (.5)	2.3** (.5)	.3 (.4)	11.4** (3.1)
No British Banks	-10.9** (2.1)	n/a	1.9 (1.1)	-1.2* (.5)	-10.5** (3.1)
Drop > 2σ outliers	-9.9** (1.2)	2.8** (.8)	-.1 (.5)	-.0 (.3)	-8.5** (2.6)

Dependent variable: domestic loans/(domestic + foreign loans), expressed as a percentage. Coefficients for column dummy variables; robust standard errors recorded in parentheses (clustered by time) unless recorded otherwise. One (two) asterisk(s) mark coefficients significantly different from zero at .05 (.01) significance level. Each row represents a separate LS regression. Dummies are +1 for British banks/event, -1 for foreign banks/events except for nationalizations and privatizations. Default regression has 9,615 observations from quarterly panel spanning 1997Q3-2010Q1 for 361 banks. Time- and bank-specific fixed effects included but not recorded (Tobit has fixed time effects, random bank effects).

Table 4a: Adding Extra Controls, One by One

Extra Control(s):	Foreign Nat'n	British Nat'n	Unusual Loan/Liq'y Access	Public Capital Injection	Foreign Privatization	Extra Control(s)
Default (Table 2)	-10.9** (2.1)	.5 (.5)	2.8** (.6)	-1.3** (.5)	-10.8** (3.1)	
Loan Growth	-10.8** (1.9)	.6 (.5)	3.0** (.6)	-1.4** (.5)	-10.8** (3.2)	-.9** (.3)
Asset Growth	-11.1* (2.1)	.4 (.5)	2.9** (.6)	-1.4** (.5)	-10.8** (3.2)	.030** (.004)
Capital Adequacy	-11.1** (2.1)	.0 (.5)	3.1** (.6)	-1.3** (.5)	-10.9** (3.1)	4.4** (.8)
Capital Adequacy, variant	-11.1** (2.1)	-.0 (.5)	3.1** (.6)	-1.3** (.5)	-10.8** (3.1)	4.3** (.8)
Assets/Capital (Leverage)	-10.8** (2.1)	-1.5** (.4)	2.8** (.6)	-1.5** (.5)	-10.6** (3.1)	-3e-7 (4e-7)
Assets/Capital (Leverage), variant	-10.9** (2.1)	.5 (.5)	2.9** (.6)	-1.3** (.5)	-10.8** (3.1)	-3e-7 (4e-7)
Wholesale Market Dependence	-10.9** (2.1)	.5 (.6)	2.8** (.6)	-1.3** (.5)	-10.8** (3.1)	1.2 (3.0)
Status-Switching Banks	-9.5** (2.2)	1.2 (.6)	1.6** (.5)	-1.0* (.4)	-10.8** (3.1)	F(•)= 36**
EC Objection or Investigation	-10.7* (4.2)	.3 (.6)	2.8** (.6)	-1.3** (.5)	10.8** (3.1)	F(•)= 1.0
Foreign x Time FE	-10.9** (2.1)	.5 (.6)	3.0** (.8)	-1.2** (.5)	-10.5** (3.1)	F(•)= 1.3**
Nationality x Time FE	-16.1** (3.2)	1.8 (2.1)	4.0** (1.4)	-.9 (1.0)	-4.7 (3.7)	F(•)= 1.2**

Dependent variable: 100(domestic loans/(domestic + foreign loans)). Coefficients for column dummy variables; robust standard errors recorded in parentheses (clustered by time), conventional for bottom row. One (two) asterisk(s) mark coefficients significantly different from zero at .05 (.01) significance level. Default regression has 9,615 observations from quarterly panel spanning 1997Q3-2010Q1 for 361 banks. Time- and bank-specific fixed effects included but not recorded.

Table 4b: Adding Extra Controls, One by One; (Data only available from 2004 onwards)

	Foreign Nat'n	British Nat'n	Unusual Loan/Liq'y Access	Public Capital Injection	Foreign Privatization	Extra Control(s)
Non-Perf. Loan Ratio	-5.3 (2.8)	.8 (.5)	1.9** (.5)	-.8 (.5)	n/a	-143.** (41.)
Profits/ Assets	-8.2** (2.7)	.5 (.5)	1.8** (.5)	-.7 (.4)	n/a	34. (20.)
Profits/ Assets, variant #1	-8.4** (2.7)	.5 (.5)	1.8** (.5)	-.6 (.4)	n/a	31. (25.)
Profits/ Assets, variant #2	-8.4 (2.7)	.5 (.5)	1.8** (.5)	-.6 (.4)	n/a	30. (25.)
Dividends/ Assets	-8.5** (2.7)	.5 (.5)	1.7** (.5)	-.6 (.5)	n/a	-16. (207.)

Dependent variable: 100(domestic loans/(domestic + foreign loans)). Coefficients for column dummy variables; robust standard errors recorded in parentheses (clustered by time) unless recorded otherwise. One (two) asterisk(s) mark coefficients significantly different from zero at .05 (.01) significance level. Default regression has 3,742 observations spanning 2004Q1-2010Q1. Time- and bank-specific fixed effects included but not recorded.

Table 5: Adding Extra Controls Simultaneously

Extra Controls:	Foreign Nat'n	British Nat'n	Unusual Loan/Liq'y Access	Public Capital Injection	Foreign Privatization	No. Obs.
Default (Table 2)	-10.9** (2.1)	.5 (.5)	2.8** (.6)	-1.3** (.5)	-10.8** (3.1)	9,615
Set #1	-9.7** (1.8)	-2.9** (.4)	4.0** (.6)	-1.2* (.6)	-10.9** (3.2)	9,141
Set #2	-5.4 (2.8)	.8 (.5)	1.9** (.5)	-.8 (.05)	n/a	3,742
Both Sets #1 and #2	-5.5* (2.3)	-3.0* (1.3)	3.6** (.7)	-.2 (.5)	n/a	3,641

Dependent variable: domestic loans/(domestic + foreign loans), expressed as a percentage. Coefficients for column dummy variables; robust standard errors recorded in parentheses (clustered by time) unless recorded otherwise. One (two) asterisk(s) mark coefficients significantly different from zero at .05 (.01) significance level. Each row represents a separate LS regression. Dummies are +1 for British banks/event, -1 for foreign banks/events except for nationalizations. Default regression has 9,615 observations from quarterly panel spanning 1997Q3-2010Q1 for 361 banks. Time- and bank-specific fixed effects included but not recorded. Set #1 of controls includes: loan growth; asset growth; log total assets; capital adequacy; assets/capital (leverage); and wholesale market dependence. Set #2 of controls includes: non-performing loan ratio; dividend ratio; profit ratio.

Table 6: Interest Rates

After:	Foreign Nationalization	British Nationalization	Unusual Access to Loans or Liquidity	Public Capital Injection
Default	.71** (.07)	.19 (.17)	.15* (.06)	.04 (.05)
Interest Rate Variant	.86** (.25)	-.83** (.16)	.08 (.14)	.29 (.16)
Robust SEs, not clustered	.71** (.08)	.19 (.14)	.15 (.10)	.04 (.07)
Traditional SEs	.71** (.17)	.19 (.10)	.15 (.08)	.04 (.07)
Weight by Log Loans	.71** (.07)	.16 (.17)	.20** (.07)	.03 (.06)
Weight by Log Assets	.71** (.07)	.18 (.16)	.17** (.06)	.04 (.05)
Control for Total Loans	.71** (.07)	.18 (.16)	.17* (.07)	.04 (.06)
Control for Total Assets	.71** (.07)	.21 (.16)	.14* (.05)	.03 (.06)
Drop $> 2\sigma$ outliers	.70** (.07)	.08 (.06)	.10* (.04)	.05 (.04)

Dependent variable: Interest rate for private non-financial corporation loans of less than one year maturity. Variant is interest rate for households and individual trust loans of less than one year maturity. Coefficients for column dummy variables; robust standard errors recorded in parentheses (clustered by time) unless recorded otherwise. One (two) asterisk(s) mark coefficients significantly different from zero at .05 (.01) significance level. Each row represents a separate LS regression. Dummies are +1 for British banks/event, -1 for foreign banks/events except for nationalizations. Default regression has 679 observations from quarterly panel spanning 2004Q1-2010Q1 for 35 large banks active in the UK. Time- and bank-specific fixed effects included but not recorded. No privatizations occurred in the sample.

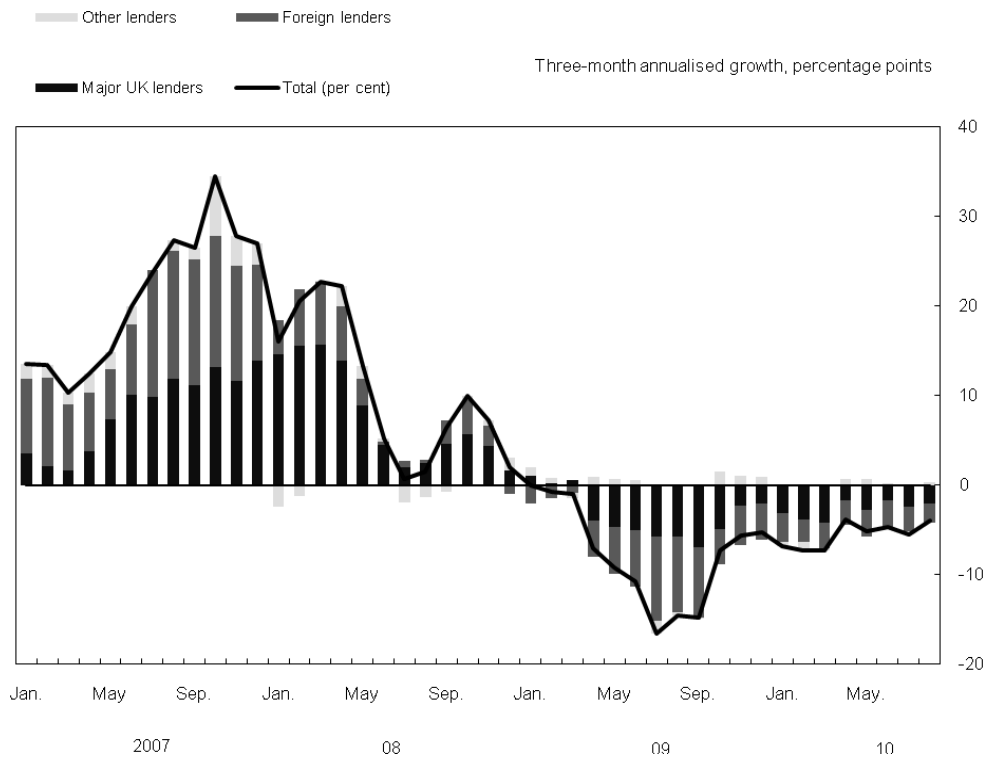


Figure 1: Contributions to Growth in Lending to UK Businesses
 (Lending to private non-financial corporations; three-month annualized growth rates in the stock of lending.)

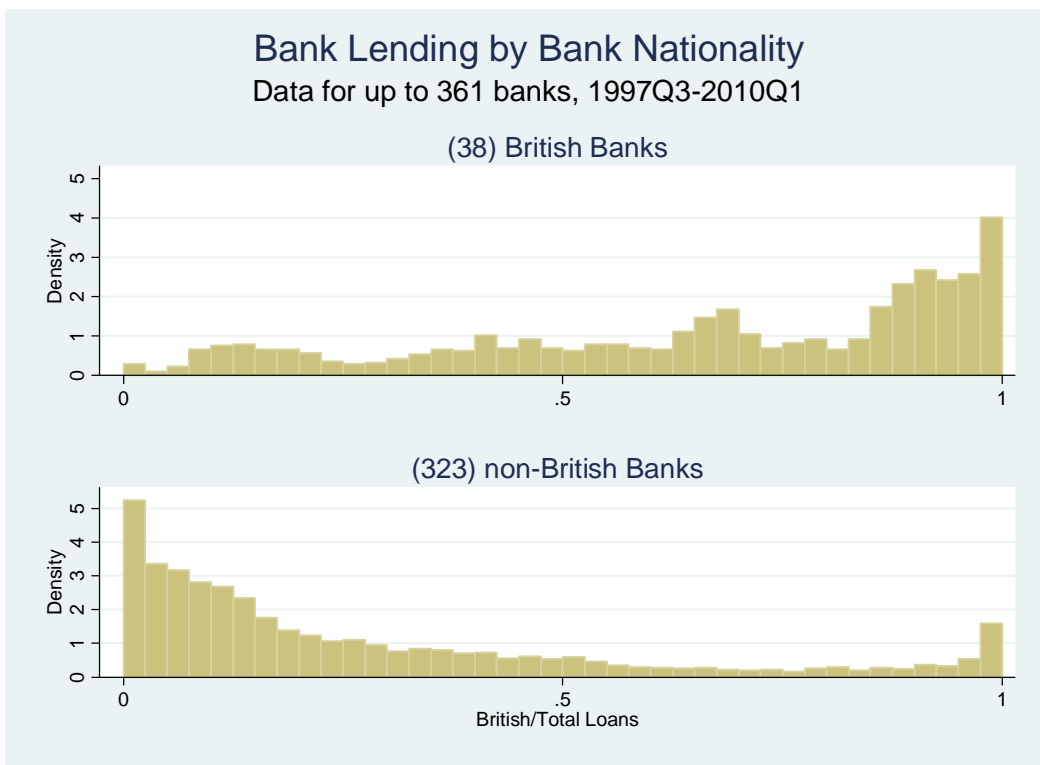


Figure 2: Loan Mixture varies by Nationality

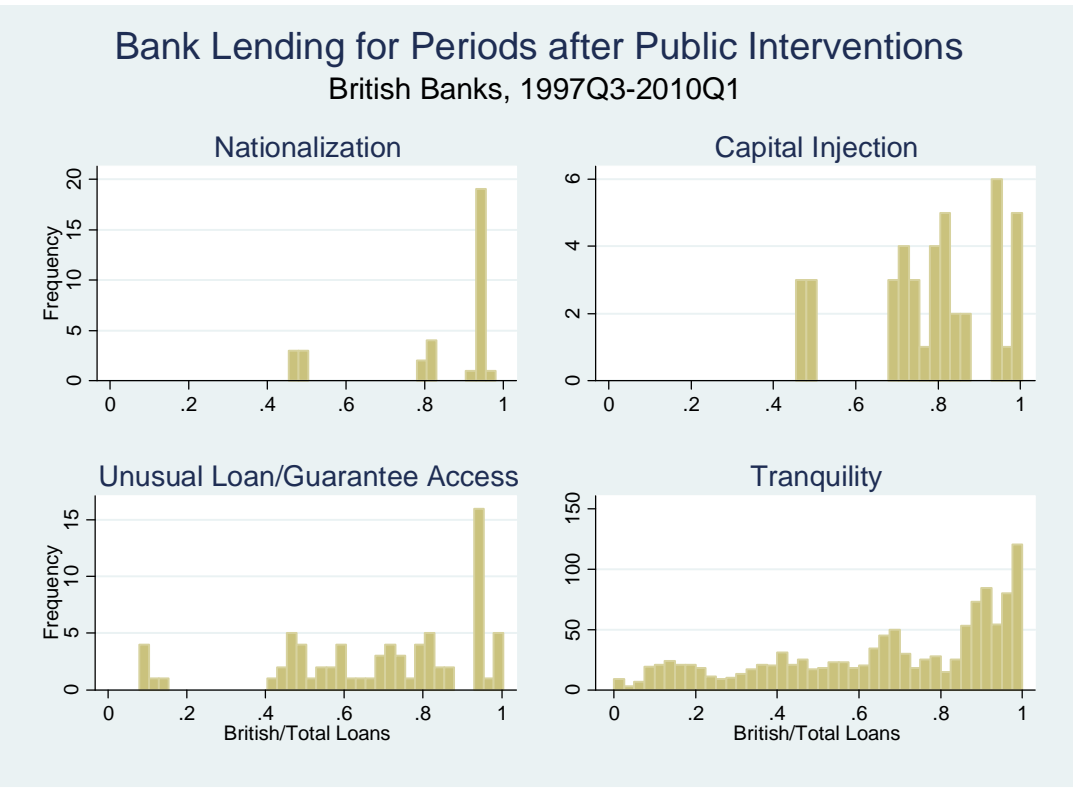


Figure 3: Histograms of the Loan Mix for British Banks

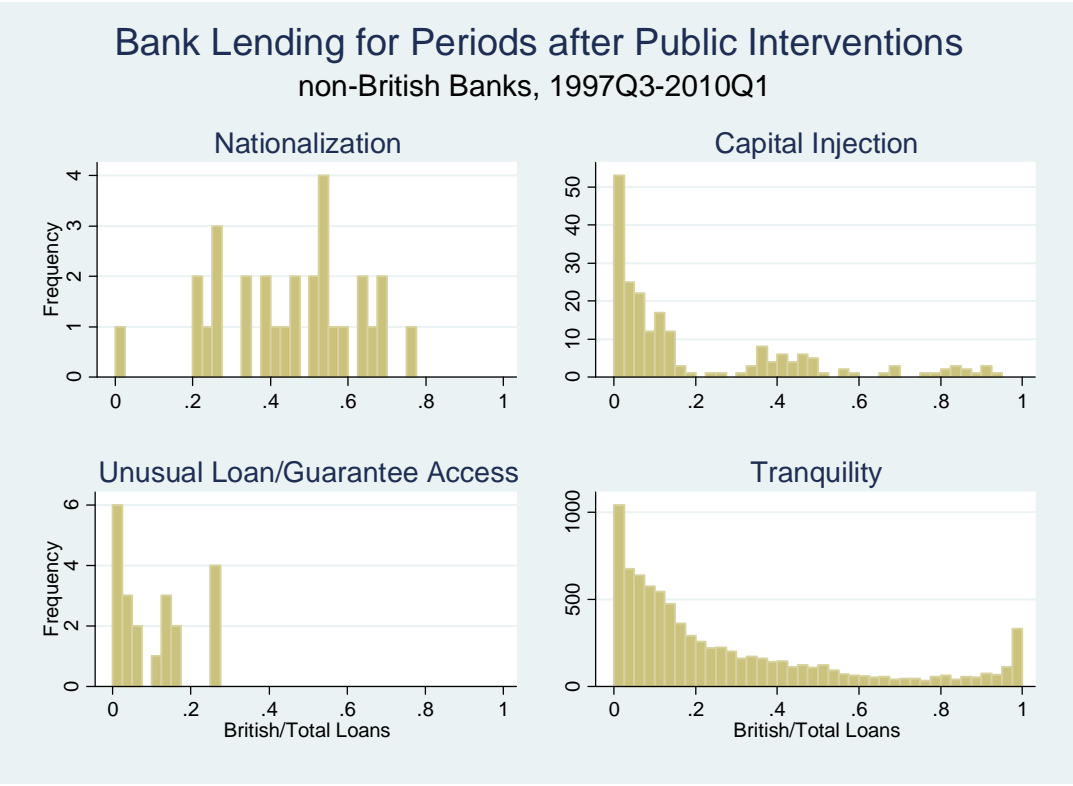


Figure 4: Histograms of the Loan Mix for non-British Banks

Data Appendix

We collect the raw data from the AL, BT, CC, CE, ER, IS, PL and QD forms. A detailed description of these forms (along with the forms themselves) is available at <http://www.bankofengland.co.uk/statistics/reporters/defs/defs.htm>. The variables actually used in our regressions are transformed from the raw data as described below.

Variable	Item in form
Share of Domestic in Total Lending, "Loan Mix"	$AL\ 19\ [\text{Total Lending to UK residents}] / (AL\ 19\ [\text{Total Lending to UK residents}] + CC15\ [\text{Total external claims on non-resident customers}])$
Share of Domestic in Total Lending (Denominator Variant)	$AL\ 19\ [\text{Total Lending to UK residents}] / (AL\ 19\ [\text{Total Lending to UK residents}] + CC1\ [\text{Total loans and advances to non-residents}])$
British Bank	Institutional Nationality is identified by the Bank of England (over time) in http://www.bankofengland.co.uk/statistics/reporters/institutions/index.htm#UK
Size	BT 40 [Total Assets]
Asset Growth	Growth rate of BT 40 [Total Assets]
Loan Growth	Growth rate of AL 19 [Total Lending to UK residents]
Capital adequacy ((Capital + Reserves)/Total Assets)	$BT\ 19\ [\text{Capital and Other funds}] / BT\ 40\ [\text{Total Assets}]$
Capital adequacy ((Capital + Reserves)/Total Assets), Variant	$BT\ 19CD\ [\text{Capital and Other accounts}] / BT\ 40\ [\text{Total Assets}]$
Leverage (Assets/Owners Equity)	$BT\ 40\ [\text{Total Assets}] / BT\ 19CD\ [\text{Capital and other internal accounts}]$
Leverage (Assets/Owners Equity), Variant	$BT\ 40\ [\text{Total Assets}] / BT\ 19\ [\text{Capital and Other funds}]$
Wholesale Market Dependence	$BT\ 6\ [\text{Liabilities under Sale and Repurchase Agreements}] / BT\ 20\ [\text{Total Liabilities}]$
Non Performing Loan Ratio	$PL\ 20B\ [\text{Financial Level of Provisions for Bad and Doubtful Debts}] / BT\ 40\ [\text{Total Assets}]$
Profitability	$PL\ 21\ [\text{Retained Profit after Provisions for Bad and Doubtful Debts}] / BT\ 40\ [\text{Total Assets}]$
Profitability, Variant 1	$PL\ 19\ [\text{Retained Profit before Provisions for Bad and Doubtful Debts}] / BT\ 40\ [\text{Total Assets}]$
Profitability, Variant 2	$PL\ 15\ [\text{Pre-tax profits on ordinary activities before provisions for bad and doubtful debts}] / BT\ 40\ [\text{Total Assets}]$
Dividends/ Assets	$PL\ 17\ [\text{Dividends paid}] / BT\ 40\ [\text{Total Assets}]$
Effective interest Rates on loans to Private non-financial corporations	ERC102 [Private non-financial corporations Time – fixed original maturity <= 1 year (maturity)]

Endnotes

¹ Shortly after this paper began to circulate, we became aware of Giannetti and Laeven (2011) who use a similar methodology focusing on syndicated bank loans. They do not distinguish between different types of public interventions but for banks that received some sort of intervention, Giannetti and Laeven find (p26) “no evidence that these banks rebalance their portfolio towards domestic borrowers to a larger extent than other banks.” Buch et al (2011) use a confidential data set on German banks but adopt a somewhat different methodology, analyzing the effect of German policy measures on foreign affiliates through their German “parent” banks. They find (p13) “... the support measures of the German government have induced the banks to increase their foreign assets and liabilities but compared to affiliates of other banks worldwide, the banks have down-sized their foreign activities.”

² Available at <http://www.bankofengland.co.uk/statistics/about/code.htm>

³ We caution that our loan mix variable is not a perfect measure of “home bias.” For instance, a loan shifted from a British company in the UK to the same company abroad would lead to a decline in the loan mix. Also, if (say) a French bank contracts lending in the UK and France but expands its activities in Germany, our loan mix measure might again decline even though there may have been no shift in its lending activities towards France. To measure financial protectionism more effectively, one would need data on the entire portfolio of a banking group’s activities, not just those in one country.