

Foreign Banks in the Great Recession: Diversity in Internal and External Lending

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December 26, 2011

Abstract

Foreign banks with branches and agencies in the United States had a range of possible options for responding to parent bank funding shocks in the Great Recession. The responses of these branches and agencies reflect both the specific shocks to their parent banks, and their respective business models in the United States including their roles as dollar funding sources and investment gateways. We show that the responses of external and internal lending of these foreign bank branches in the United States were quite diverse and related to the diversity in ex ante models.

Keywords: Bank, global, liquidity, transmission, capital markets, crisis, branch

JEL Classification: E44, F36, G32

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I. Introduction

The financial crises have focused considerable academic and policy attention on the roles of foreign banks in transmitting shocks and creating vulnerability for host or parent countries. Adverse consequences are presumed and a premise of their destabilizing behavior, in particular surrounding the branches of foreign banks, has taken hold. In this paper, we focus attention on the branches of foreign banks in the United States, and look carefully at their relationships with external markets and with their parent organizations. These foreign banking organizations are important for U.S. economic activity and presumably for their parent banks, so a deeper understanding of their behaviors during stress periods is essential.

A body of literature is emerging on global bank activity during the crisis, some of which argues that foreign banks scaled back international lending disproportionately. We argue that this broad statement provides too simplistic a characterization of what global banks do internationally. Global banks pursue a range of business models in foreign markets. During the Great Recession, U.S. banks moved funds across their affiliate locations in response to both positive and negative liquidity shocks, and in relation to bank business models as well as country and institutional “distance” features (Cetorelli and Goldberg 2011b). The U.S. banks had some foreign locations as “core investment markets” that continued as destinations for funding. Other foreign locations served as “core funding markets” that would send even larger net flows to their parent banks in times of parent balance sheet disturbances.

In the present paper, we provide a complementary analysis that examines the U.S. affiliates of foreign banks, with a specific focus on foreign bank branches. Branches, as opposed to subsidiaries, have more legal room to lend and borrow with the rest of their banking

organization.¹ These branches actively engage in borrowing from or serving as dollar funding sources to their parent organizations outside the United States. In response to funding shocks to their parents, we show that these branches exhibit significant differential responses on both sides of their balance sheet. The responses also differ according to the asset size of the branch and are heterogeneous depending on ex ante modes of business operation.

Our findings contribute to a growing body of insights on how global banks manage their international activity conditional on balance sheet disturbances. This management occurs in normal times, as well as in periods of extreme stress. U.S. banks adjust internal capital market flows, domestic lending, and international lending in response to liquidity shocks in normal economic conditions (Cetorelli and Goldberg, Forthcoming). The net borrowing of foreign branches in the United States is procyclical with the U.S. economy and lending is more volatile than that of U.S. banks (Correa, Sapriza, and Zlate, 2011). Interoffice flows between foreign banks and their affiliates are influenced by market volatility and rates of return across domestic and foreign markets (Bruno and Shin, 2011).

Focusing specifically on the Great Recession period, balance sheet stresses showed up in a number of modes of adjustment by banks internationally.² The use of asset-backed commercial paper (ABCP) conduits by banks led the crisis transmission around the globe (Acharya and Schnabl, 2010). As funding markets were disrupted, banks with dollar funding mismatches on their balance sheets transmitted this distress through reductions in cross-border lending and local claims; loan supply by unaffiliated banks declined if their interbank funding was provided by distressed counterparties (Cetorelli and Goldberg, 2011a). Foreign banks in the United States loaned relatively less in overnight interbank markets, borrowed more from the Federal Reserve's

¹ Limitations on transactions among subsidiaries are presented in [Federal Reserve Act 23A](#).

² Patterns of cross country lending changes by banks, measured using the BIS data on international bank lending, are described in Hoggarth, G, L. Mahadeva and J. Martin (2010).

Term Auction Facility, and charged higher rates on syndicated loan packages to corporations in the United States, especially on revolving credit lines (Acharya, Afonso, and Kovner, 2011).³

Stressed banks cut their syndicated lending to a lesser degree if they had better access to deposit financing and were less reliant on short-term debt. Banks that were more vulnerable to credit-line draw downs because they co-syndicated more of their credit lines with Lehman Brothers reduced their lending to a greater extent (Ivashina and Scharfstein, 2010). Analysis of the locational placement of syndicated loan issuance shows disproportionately higher retrenchment of lending to external markets (Giannetti and Laeven, 2011). Yet, there was not a rush for the exit by syndicated lenders: banks continued to lend more to countries that are geographically close, integrated into a network of domestic co-lenders, and with more historic ties (De Haas and van Horen, 2011).

The findings of this present paper make clear that the branches of foreign banks adjust also. Yet, there is no single and uniform business model that predicts the pattern of internal and external lending adjustment after the parent bank is disrupted.

II. Foreign bank branches in the United States

United States banking activity has increasingly been conducted by large global banks.⁴ While the outward adjustment of U.S. chartered banks has been explored elsewhere (Cetorelli and Goldberg

³ Popov and Udell (2011) study the effects of financial distress in foreign parent banks on local small financing in 16 central and eastern European countries. Buch, Koch and Kotter (2011) examine the consequences of a range of capital injections, credit lines, and guarantees by the German government between August 2007 and August 2008, concluding that these measures helped stabilize the foreign activities of the German banks. They also find that German banks claiming liquidity support under the Term Auction Facility (TAF) program withdrew from foreign markets outside the United States, yet this withdrawal was more limited than that of affiliates of other German banks. Aiyar (2011) examined lending by U.K. resident banks and found that funding shocks in the crisis contributed to a substantial decline in domestic lending, with the foreign subsidiaries and branches pulling back disproportionately more and differentially across sub-components of the domestic loan market. Those results accord with Rose and Wieladek (2011) who explored external versus domestic lending by banks in the United Kingdom.

⁴ Goldberg (2006) and Cetorelli and Goldberg (2006, 2011a) describe this evolution over the last 20 years.

2011b), here we focus exclusively on foreign banking organizations *within* the United States. We concentrate on the U.S. branches and agencies of foreign banks and specifically the full sample of such institutions that file the Federal Financial Institutions Examinations Council (FFIEC) Report of Assets and Liabilities of U.S. Branches and Agencies of Foreign Banks (FFIEC 002). We focus on the interval from 2006q2 through 2009Q4.⁵

The sample of foreign banks with branches in the United States contains 162 independent bank families, with a total of 241 branches filing regulatory reports (Table 1). The asset size distribution is wide, with the median size under \$1 billion and the mean over \$7 billion. These branches generally devote about 40 percent of their balance sheets to lending activity, although they differ substantially in how much of this lending is to U.S. domestic customers and in the share of lending directed at commercial and industrial (C&I) activity. They also differ in balance sheet liquidity, with smaller banks less liquid, and in their internal borrowing and lending with affiliates in the United States and with the foreign parent banking organization. These internal capital market transactions are captured by branch reports of Net Due From related depository institutions (a branch asset) or Net Due To (a branch liability).

Also noteworthy are the *ex ante* differences across foreign bank families in the scope of bank balance sheet shocks from the collapse of the subprime asset market. While the details of this asset backed commercial paper exposure are discussed at length elsewhere,⁶ the smaller branches tended to be from foreign bank families without ABCP exposure while the larger banks had quite diverse exposure often amounting to more than 20 percent of parent bank equity.

⁵ Foreign bank branches and agencies are legal extensions of their parent companies, and they do not have any regulatory capital of their own. Foreign banks' U.S. subsidiaries instead are freestanding legal entities with U.S. or state charters and their own capital (<http://www.newyorkfed.org/aboutthefed/fedpoint/fed26.html>).

⁶ For example, see Acharya and Schnabl (2010). We thank these authors for providing this data.

Given an exogenous shock to the foreign parent bank balance sheet, to what extent did this spillover onto the actions of the branches in the United States? We conjecture that not all of these branches and agencies of foreign banks in the United States are operated with comparable business models, as the data summarized in Table 1 suggest. In our prior work, Cetorelli and Goldberg (2011b), we argued that affiliates can be “core” or “periphery” locations from the vantage point of the parent organization. In the case of the U.S. branches of foreign banks, the unit of observation is the balance sheet of the branch or agency in the United States, without broad information on the balance sheet of the foreign parent bank.⁷ We thus conjecture that “core” and “periphery” concepts can relate to four ex ante indicators of branch business models: share of domestic investments in the balance sheet, liquidity ratio, ex ante activity of internal borrowing and lending, and existence of related bank subsidiaries within the United States.

III. Diversity in Branch Responses to the Foreign Parent Balance Sheet Disturbances

Given a parent bank balance sheet disturbance, we want to capture simultaneously both the possible of their U.S. branch(es) balance sheet adjustment on the liability side, as reflected in a potential internal transfer of funds with their parents, and on the asset side, through a corresponding impact in investments such as loans. Our dependent variables therefore are expressed as changes (pre- versus post-crisis) in branches’ net internal borrowing from the parent organization, and changes in their external lending in the United States. The analysis takes the form of a difference-in-difference identification strategy: we compare the pre-post crisis balance sheet adjustments but look for a differential response across branches, depending on their

⁷ This type of information limitation is a theme under discussion in international efforts to achieve a safer and more robust international financial system, but still is not resolved. See William Dudley [Financial Stability and Economic Growth](#), Remarks at the 2011 Bretton Woods Committee International Council Meeting, Washington, D.C. September 23 2011.

parent's pre-crisis exposure to ABCP conduits and other branch characteristics. Hence the basic testing specification is

$$\Delta Y_{it} = \beta_0 + \beta_1 \cdot ABCP\ Exposure_{it} + \beta_2 \cdot X_{it} + \varepsilon_{it}$$

where Y_{it} is one of the balance sheet items that should adjust in response to the shock, *ABCP Exposure* is the ratio of total exposure from ABCP conduits to total equity capital of the branch's parent bank as of December 31, 2006, and X_{it} is a vector of branch balance sheet characteristics. Because of the significant heterogeneity in asset size, we allow the exposure variable to interact with both asset size and its squared term. The dependent variables are measured as the change from pre-crisis quarters – where we smooth out quarterly variability by taking an average, calculated over 2006Q2 through 2007Q2 – and post-crisis quarters – as the average over the period 2008Q3 through 2009Q4.⁸ All the variables in the X vector are calculated as pre-crisis quarterly averages. Because we want to test specifically for heterogeneous responses across branches, we let the specification be flexible enough to accommodate terms of interactions among the right hand side variables. The level of ABCP exposure accumulated in the pre-crisis quarters, and especially its level compared to total equity, can be reasonably considered as determined by the parent orthogonally to the balance sheet characteristics of the U.S.-based branches. This implies that whatever balance sheet effect we may find it is unlikely to be driven by confounding simultaneous changes in local (U.S.) market conditions. We begin investigating the response to the shock on both sides of the balance sheet by the branches, irrespective of specific differences in business models. As a second step we introduce the business model considerations.

⁸ This is similar to Cetorelli and Goldberg (2011b). We exclude the quarters from 2007Q3 and 2008Q2 to obtain a clean cut definition of the post period, to start right after the Lehman Brother's collapse, while still maintaining a likewise clean definition of the pre-crisis period, ending before August 2007.

3.1 Net Due and Loan Response to Parent Funding Shocks.

First, we test the basic hypothesis that the shock to the parent organization activates an internal capital market between the branch and the parent organization. If this is the case, the Net Due To balance sheet item should decrease disproportionately more for those branches whose parents were highly exposed to ABCP conduits. Column 1 of Table 2 reports the results of the basic model specification, including the ABCP exposure variables, the controls for branches' asset size, and the related terms of interaction with exposure. The results indicate that there is a stronger response for the branches of parents with higher *ex ante* exposure, but also that the larger effects are found among the largest branches. This result suggests that size matters when determining the importance of foreign branches as a “source of strength” for the parent banks. To give a sense of the economic magnitude, consider a branch at the mean of the asset size distribution (about \$7 billion), one that is one standard deviation larger (\$24 billion), and one that is two standard deviations larger (\$41 billion). For each asset class, the difference in the change in Net Due To for a branch with a parent with ABCP exposure at the 75th percentile of the exposure distribution (0.14) and one at the 25th percentile (0) would be, respectively, \$48 million, \$566 million and \$1.62 billion. This effect is progressively large, given that in pre-crisis quarters the median of the Net Due To distribution – irrespective of sign - is about \$134 million and the mean is \$2.8 billion.

Next, consider the response on the asset side of the branch balance sheet. Column 2 reports the result of the regression where the dependent variable is the change in total lending. The results indicate a negative asset side adjustment to the parent bank shock, with lending decreasing more by branches of parents with higher ABCP exposure. This effect also is quite heterogeneous along the asset size dimension. In fact, the estimated coefficients suggest a U-

shaped relationship, where the negative effect on lending diminishes for the largest branches. This result is consistent with an argument that larger branches may have better, less encumbered access to alternative funding sources. Consequently, the largest branches can support their parent bank without impairing their own balance sheets by the activation of the internal capital market. Indeed the magnitude of the effect on the lending side is relatively contained. Running a similar quantitative exercise to that done for the Net Due To response, the results indicate a differential negative effect for branches at the mean, one standard deviation and two standard deviations above of \$17 million, \$423 million and \$513 million, respectively. Total lending in pre-crisis quarters was about \$233 million at the median and \$1.84 billion at the mean.

A possible objection to using total loans as a reference asset side variable is that there may be significant heterogeneity across branches within loan categories. In fact, Table 1 showed that a large portion of lending by the U.S. branches of foreign banks is to non-U.S. addressees. As tests of robustness, we also examine total C&I lending and total “domestic” lending with the latter comprising loans to U.S. addressees only. The results, provided in columns 3 and 4, confirm the same basic dynamic of adjustment on the asset side that was reflected in total loans. Quantitatively, however, the effects on the sub-categories of loans are larger. Take for instance domestic loans. According to the regression results, the negative adjustment would be about \$6 million, \$207 million and \$250 million for branches at the mean, one and two standard deviations above the mean, respectively. These responses are relatively larger given that the pre-crisis median and mean in the domestic loan distributions were about \$67 million and \$765 million, respectively.

Next, we examine the direct link between the balance sheet adjustment on the liability side and that on the asset side. In other words, we consider the quantity of dollar lending

investment lost for each dollar of funding that the U.S. branch of foreign parent may transfer back to the parent organization. In order to calculate this “elasticity”, we regress the change in total loans directly on the change in Net Due To. However, in such a specification we cannot assume that the right hand side variable is necessarily exogenously determined. Hence, we use an instrumental variable regression. In the first stage we obtain the component of change in Net Due To determined by the corresponding parent shock, and then we use this component in the second stage regression. The results, reported in column 5, indicate a positive and significant link between a change in net internal borrowing and a change in external lending. More specifically, for each dollar of decrease in internal borrowing from the parent (or each dollar of increased lending to the parent), each branch displays a 40 cent decrease in total lending to unrelated parties. For U.S. domestic lending, the comparable elasticity is 18 percent (not reported).

3.2 The Role of the Branch Business Model.

The analysis based on the basic specification already suggests significant heterogeneity in balance sheet response along the size dimension. However, we conjecture that the funding dynamics in foreign banks should also depend on the mode of business operation in the local U.S. market. More specifically, the extent to which a local branch in a foreign country is used for active global liquidity management by the parent is likely to depend on the degree to which the parent is committed – from an investment perspective – to that local market.

In order to test this conjecture, we identified four proxies of business model. The first three proxies are derived directly from the balance sheet of the branches. From the liability side, for instance, the sensitivity to parent needs may depend on the relative reliance – in normal times – on internal borrowing from the rest of the organization in order to fund the branch operations. If a branch has a high proportion of its total liabilities represented by internal borrowing, then

one could argue that such branch operates without a close tie to the local market in which it is established (relative small raising of local, external, funds), with the parent “parking” local currency liquidity with its branch mainly for liquidity management purposes. In that sense, it may be a branch better apt to provide support to the global liquidity needs of the organization. On the other hand, not having access to local funding pools may also be an indication of an opposite strategy, where the branch is considered a funding *destination* within the organization rather than a funding *source*.

The other two balance sheet based proxies of business model are based instead on composition ratios on the asset side. One is the ratio of liquid assets to total assets. Irrespective of the source of borrowing, the choice of a branch to keep funds “idle” rather than immobilized long term may indicate a strategy to remain available to accommodate the liquidity needs of the rest of the organization. The other is the ratio of domestic lending to total assets. A high ratio may be an indication of branch that is committed to local investments and therefore less available to fund the rest of the organization.

Columns 1-3 in both top and bottom panels of Table 3 present the results of regressions to test for differential effects captured by these three proxies of branches’ business model. Focusing first on the change in Net Due To regressions (top panel) and starting with the ratio of internal borrowing to total liabilities, only one of the bottom three coefficients is significant (ratio of internal borrowing * Exposure). Calculating the marginal effect, as before, conditional on the level of exposure, the regression indicates that conditional on the parent having a high ex ante ABCP exposure, branches with higher reliance on internal borrowing have a larger change in Net Due To, so that either they are receiving less support from parents or sending more funds

abroad. The same overall negative relationship is also found on the asset side of such branches, as they are the ones that seem to reduce lending differentially more.

The regressions run using the liquid investment ratio display no significant coefficients among the terms of interaction with exposure and asset size (aside from one coefficient in the change in loans regression). The regressions run using the domestic loans ratio display some evidence of differential response, albeit only on the liability side. The marginal effects calculated for the regressions on changes in Net Due To indicate, contrary to expectation, that branches with domestic loans having a higher weight on the balance sheet are in fact the ones contributing more to the liquidity needs of the parent.

A possible explanation for the apparent lack of consistent results across these three measures is that while we want to refer to differences in business model as reflected on branches' balance sheet, having computed such measures as averages over the four quarters leading to the crisis may not have been sufficient to capture true "normal times" business model features. Our fourth metric, however, has more of this needed pre-determined flavor, since we look one level up in the banking organization, comparing foreign families and differentiating cases where foreign bank families are in the United States with just branches as opposed to having both branches and bank subsidiaries. The decision to operate with a subsidiary as well as a branch may be an indication of an overall commitment to the local market. As such, the balance sheet of local branches may be less sensitive to the needs of the parents. On the other hand, the foreign parent may have chosen to enter with a local subsidiary, which requires its own capital and granting of a local charter, as its committed charter for local investment, while keeping the activity of the branches more at arm's length. It may therefore use the branches' balance sheets more actively for purposes of global liquidity management. The advantage of this proxy of

business model is that it is more likely to better reflect strategic choices made during normal times and therefore more orthogonal with the crisis event.

Column 4 in the two panels of Table 3 reports the results of the corresponding regressions on both changes in Net Due To and Total Loans. The estimates indicate substantial distinction in balance sheet response between branches of parents with and without subsidiaries. The effects are definitely non linear. From the calculation of the marginal effects it appears that branches whose parents also own a separate U.S. subsidiary display a stronger balance sheet adjustment than those whose parents do not have a subsidiary. In particular, the branches with related subsidiaries experience larger decreases in their internal net borrowing positions, even more so for larger branches, and likewise they have larger differential negative effects on lending. These results support the conjecture that the existence of a common subsidiary renders the branches more sensitive to the liquidity needs of the parent.

4. Conclusions

Global banking is a well-recognized vehicle of international shock transmission. The management of liquidity on a global scale, with funds flowing internally among bank affiliates located across borders, is one important factor determining such global propagation of local balance sheet adjustments. Using data on the operations of U.S.-based foreign bank branches we confirm the existence of a cross-border, internal capital market, but argue that the balance sheet adjustments of such branches - and therefore the potential consequences for the local markets in which they operate - are very heterogeneous. Branch size matters significantly for both the intensity of the internal capital market response to a parent shock and for the intensity of the subsequent external capital market adjustment through branch lending. Moreover, the choice of the mode of operation in the host country, as reflected by the level of "commitment" to the local

market, matters substantially in assessing if and how much a foreign shock gets transmitted internally. Besides the positive contribution to a deeper understanding of global banking, this type of research has paramount normative implications. Knowledge of the different characteristics of foreign banks, more than the common trait represented by the adjective "foreign", is likely to produce more effective regulation and monitoring of their activities.

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Table 1: Statistics on US Branches or Agencies of Foreign Parents

	2006Q2-2007Q2		2008Q3-2009Q4	
	median	mean	median	mean
Branch asset size (in billions USD)	0.6	7.2	0.7	8.9
Total Loans / Assets (percent)	37	41.6	39.3	44.8
Commercial & Industrial Loans / Total Assets (percent)	15.2	23	21.1	26.3
Domestic Loans / Total Assets (percent)	9.2	18.4	10	21.4
Liquid Assets / Total Assets (percent)	13.6	24.8	16.4	27.8
Liabilities to Related Parties / Total Assets (percent)	14.6	31.3	26.2	36.8
Liabilities to Related parties / Total Assets (percent, by head)	30.9	39.6	46	48.4
ABCP Exposure / Equity (percent, by foreign family)	0	18.2	0	19.9
Number of branches	241		232	
Number of foreign bank families	162		152	
Number of foreign families with banking subsidiaries in US	32		31	

Notes: Liquid assets are defined as the sum of cash and balances due from depository institutions, US government and non-US government securities, fed funds sold and securities repurchased under agreements to resell. Domestic loans are constructed as the sum of total real estate loans, and all loans to depository institutions and C & I loans specifically made to US addresses. Liabilities to related parties are calculated as absolute values.

Table 2: Net Due and Loan Response to Funding Shock

	Δ Net Due	Δ Total Loans	Δ C & I Loans	Δ Domestic Loans	Δ Total Loans
	(1)	(2)	(3)	(4)	(5)
ABCP Exposure	-0.785 (1.95)	1.779* (0.81)	0.989* (0.45)	0.897* (0.42)	
Assets	-0.337** (0.13)	0.280** (0.05)	0.176** (0.03)	0.167** (0.03)	0.14** (0.37)
Assets ²	0.009** (0.00)	-0.003** (0.00)	-0.002** (0.00)	-0.002** (0.00)	-0.002** (0.00)
Exposure \cdot Assets	0.213 (0.17)	-0.286** (0.07)	-0.147** (0.04)	-0.148** (0.04)	
Exposure \cdot Assets ²	-0.007** (0.00)	0.004** (0.00)	0.002** (0.00)	0.002** (0.00)	
Δ Net Due To					0.399* (0.17)
Constant	0.122 (0.59)	-0.187 (0.24)	-0.117 (0.14)	-0.129 (0.13)	
# Observations	223	223	223	223	223
Adjusted R ²	0.13	0.15	0.23	0.23	.

Notes: Coefficient and standard errors reported, $p < 0.01$ $p < 0.05$. Domestic loans are constructed as the sum of total real estate loans, and all loans to depository institutions and C & I loans specifically made to US addresses. Net Due To is constructed as the difference between net due to and net due from related depository institutions and of the reporting branch or agency. All dependent variables and assets are in billions USD. Assets are averaged over the period 2006Q2 -2007Q2.

Table 3: Business Model Drivers of Adjustment

	x = Borrowing from Related	x = Liquid Investment	x = Domestic Investment	x = Subsidiary
	Net Due To			
	(1)	(2)	(3)	(4)
ABCP Exposure	0.931 (2.23)	-1.934 (2.92)	0.223 (2.15)	-11.165*** (3.08)
Average Assets	-0.255 (0.14)	-0.582*** (0.17)	-0.459*** (0.15)	-0.330* (0.15)
Assets ²	0.007*** (0.00)	0.014*** (0.00)	0.011*** (0.00)	0.010*** (0.00)
Exposure · Assets	0.149 (0.19)	0.390* (0.20)	0.148 (0.20)	1.300*** (0.31)
Exposure · Assets ²	-0.006* (0.00)	-0.012*** (0.00)	-0.005 (0.00)	-0.023*** (0.00)
x · Assets	0.899 (0.67)	2.012*** (0.64)	1.171 (0.82)	0.092 (0.24)
x · Assets ²	-0.032 (0.02)	-0.047*** (0.02)	-0.012 (0.02)	-0.005 (0.00)
x · Exposure	-10.262* (4.95)	-2.75 (7.29)	-36.091*** (9.45)	13.122*** (4.37)
x · Exposure · Assets	-1.462 (1.54)	-0.117 (0.99)	4.239*** (1.50)	-1.354*** (0.37)
x · Exposure · Assets ²	0.032 (0.03)	0.023 (0.03)	-0.106*** (0.04)	0.022*** (0.01)
Constant	0.00 (0.59)	0.02 (0.58)	0.22 (0.57)	0.07 (0.57)
# Observations	223	223	223	223
Adjusted R ²	0.16	0.17	0.20	0.20
	Total Loans			
ABCP Exposure	1.928* (0.85)	1.221 (1.17)	0.923 (0.62)	1.081 (1.16)
Average Assets	0.132* (0.05)	0.357*** (0.07)	-0.012 (0.04)	0.067 (0.06)
Assets ²	-0.001 (0.00)	-0.006*** (0.00)	0 (0.00)	-0.001 (0.00)
Exposure · Assets	-0.218*** (0.07)	-0.418*** (0.08)	-0.01 (0.06)	-0.044 (0.12)
Exposure · Assets ²	0.002 (0.00)	0.006*** (0.00)	0.001 (0.00)	0.001 (0.00)
x · Assets	0.328 (0.25)	-0.870*** (0.26)	1.723*** (0.24)	0.540*** (0.09)
x · Assets ²	0.031*** (0.01)	0.028*** (0.01)	-0.004 (0.01)	-0.007*** (0.00)
x · Exposure	-3.909* (1.88)	-0.510 (2.91)	-4.467 (2.72)	-1.795 (1.64)
x · Exposure · Assets	1.101 (0.59)	0.911* (0.40)	-0.594 (0.43)	-0.495*** (0.14)
x · Exposure · Assets ²	-0.040*** (0.01)	-0.016 (0.01)	-0.02 (0.01)	0.006*** (0.00)
Constant	-0.12 (0.22)	-0.02 (0.23)	-0.15 (0.16)	-0.02 (0.21)
# Observations	223	223	223	223
Adjusted R ²	0.32	0.25	0.62	0.36

Notes: Coefficient and standard errors reported, $p < 0.01$ $p < 0.05$. Liquid investment is defined as the sum of cash and balances due from depository institutions, US government and non-US government securities, fed funds sold and securities repurchased under agreements to resell. Domestic investment is constructed as the sum of total real estate loans, and all loans to depository institutions and C & I loans specifically made to US addresses. Net Due To is constructed as the difference between net due to and net due from related depository institutions and of the reporting branch or agency. All dependent variables and assets are in billions USD. Assets and "x" variables are averaged over the period 2006Q2 -2007Q2.