The Federal Reserve as Global Lender of Last Resort, 2007-2010

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ABSTRACT: Passage of the Dodd-Frank financial reform bill, in conjunction with a Supreme Court ruling supporting a Freedom of Information Act request, required the Federal Reserve (Fed) to disclose bank-specific information about its emergency lending during the financial crisis. The disclosures revealed the extent to which the Fed served as a *global* lender of last resort, providing dollar liquidity to foreign banks that were having difficulty funding their dollar-denominated liabilities. I exploit the exogenous nature of these disclosures on two levels. First, I use the disclosed information to evaluate the Fed's global lending during the crisis. My findings indicate that the Fed supported foreign banks in countries in which U.S. money-center banks had high loan exposures, which suggests that the Fed served the interests of major U.S. banks. Second, I explore the congressional response to the revelation of the Fed's massive global lending. I analyze an "Audit the Fed" vote in the House of Representatives that would end the Fed's confidentiality about the banks and countries it supports and potentially reduce its monetary policy independence. I find the influence of U.S. money-center banks extends to Congress by way of campaign contributions: contributions from these banks significantly reduce the likelihood that a representative will vote in favor of the bill. In addition, I find that right-wing representatives are substantially more likely than their left-wing peers to support the bill, which suggests that new congressional coalitions are forming on the role of the Fed in the (global) economy.

1. Introduction

On December 1, 2010, the Federal Reserve (Fed) released previously confidential information about its special emergency programs during the financial crisis, as required by the Dodd-Frank Wall Street Reform and Consumer Protection Act. The Fed's disclosures included the names of the financial institutions and foreign central banks that received financial assistance from the Fed during the crisis, the amounts borrowed, the dates credits were extended, the interest rates charged, information about collateral, and a description and rationale of the credit terms under each Federal Reserve emergency facility.[1] While the Dodd-Frank law did not require the release of these details for crisis lending through the Fed's regular discount window, the Fed was forced to disclose this information by court order on March 31, 2011, after running out of legal appeals to block publication.[2]

These disclosures revealed the extent to which the Fed had served as a *global* lender of last resort during the crisis, providing dollar liquidity to foreign banks with significant dollar-denominated exposures. On the day the Fed published the first installment of this detailed information on its Web site, news organizations from around the world touted the unexpectedly

[1] The Fed's crisis transactions data are available at http://www.federalreserve.gov/newsevents/reform_transaction.htm Bloomberg News provided spreadsheets aggregating the Fed's seven broad-based facilities, including the discount window at http://bit.ly/Bloomberg-Fed-Data

[2] In 2008, Bloomberg News LP filed a request for the Fed's discount window data under the Freedom of Information Act. When the Fed denied the request, Bloomberg filed a lawsuit and then won a trial court ruling in 2009. The Fed appealed the decision but a federal appeals court handed Bloomberg another victory in March 2010. At that point the Fed conceded the issue. However, the verdict was appealed by the New York Clearing House Association, which represents 10 of the nation's largest banks (Appelbaum 2011). The U.S. Supreme Court rejected the appeal on March 21, 2011, breaking a policy of confidentiality that dates back to the Fed's founding. Going forward, the Dodd-Frank law stipulates that the Fed must release data on discount-window loans after a two-year lag.

large participation of foreign banks in the various Fed programs. The *Financial Times* headlined with "European Banks Took Big Slice of Fed Aid" and noted that "foreign banks were among the biggest beneficiaries of the $3,300bn in emergency credit provided by the Federal Reserve during the crisis…a revelation…that underlines the global nature of the turmoil and the crucial role of the Fed as the lender of last resort for the world's banking sector" (Hardin et al. 2010). *The New York Times* highlighted the global aspects of the Fed's crisis lending and quoted the response of Senator Bernie Sanders, author of the Dodd-Frank disclosure provision: "After years of stonewalling by the Fed, the American people are finally learning the incredible and jaw-dropping details of the Fed's multitrillion-dollar bailout of Wall Street and corporate America. Perhaps most surprising is the huge sum that went to bail out foreign private banks and corporations including two European megabanks--Deutsche Bank and Credit Suisse--which were the largest beneficiaries of the Fed's purchase of mortgage-backed securities" (Sewall and McGinty 2010).[3] Three months later, when the Fed released the details of its discount window lending under court order, *Bloomberg News* headlined with "Foreign Banks Tapped Fed's Secret Lifeline Most at Crisis Peak." Bloomberg reported that foreign banks accounted for "at least 70 percent of the $110.7 billion borrowed" at the discount window at the peak of the crisis in October 2008 (Keoun and Torres 2011).

The Fed's disclosures were exogenous in the sense that Federal Reserve officials could not have known they would be required to reveal the transaction-specific details of their lending at the time they were making their emergency lending decisions. The Fed's policy had always been to keep these data confidential, on the grounds there is a stigma attached to borrowing from

[3] The article quotes Sanders from his public statement, which is available at http://www.sanders.senate.gov/newsroom/news/?id=f75fee31-aeba-4a13-b6a7-05adf56ccfe8

the Fed during a crisis. But the disclosure requirements came after the credit crisis had passed and were very likely unexpected. Bernie Sanders' amendment to the Dodd-Frank bill requiring the disclosures was introduced in Congress in May 2010, over a year after the Fed's emergency program lending peaked at more than $1 trillion in late-2008.[4] Likewise, lending through the Fed's discount window peaked in late-2008, and since the Fed had never previously revealed the identities and transaction details of discount window borrowers, it could not have foreseen the March 2011 United States Supreme Court ruling that required it to release these data. It is therefore unlikely that either the Fed itself, or the banks that made use of its crisis programs, could have anticipated these disclosures at the time of the crisis.

I exploit this exogeneity for two purposes. First, I use the disclosed information to examine the Federal Reserve's global operations during the 2007-2010 financial crisis. The main aim here is to see if political economy factors played any part in the Federal Reserve's lending to foreign financial institutions. I create two measures of the "Fed's foreign lending" during the crisis. The first measure is an indicator variable equal to 1 if the Federal Reserve selected a foreign central bank for a dollar swap line arrangement. During the crisis, the Fed selected fourteen foreign central banks to receive dollar swap lines for the purpose of providing liquidity in U.S. dollars to banks in foreign jurisdictions.[5] The second measure is a country's share of the Fed's total foreign lending from its six emergency facilities plus the discount window. Unlike the swap arrangements, the Fed had little discretion over where the money from these other facilities went, as most of it was distributed through auctions. Nevertheless, I find that the best predictor of the Fed's foreign lending by either measure is the exposure of large U.S. money-center banks

[4] Sanders' disclosure amendment (S.AMDT.3738) was proposed on May 6, 2010 and approved by a vote of 98-0 on May 11, 2010.

[5] The Fed had discretion over swap arrangements and some requests by foreign central banks were denied by the Fed.

to a foreign market (where "exposure" is measured as the share of the individual foreign market in the total consolidated foreign claims of U.S. money-center banks). This relationship is robust to economic and financial controls, which suggests that the Federal Reserve served as lender of last resort for the world's banking sector at least in part because it served the interests of the major U.S. banks.

The second way I use the disclosures follows from this finding. Within the United States, the disclosures contributed to a congressional backlash against the Federal Reserve's policy of confidentiality. Prior to the disclosures, many politicians believed that the Fed was too cozy with Wall Street banks, and legislation had been introduced to require the Fed to be more transparent about the banks it supported in crises. For example, in February, 2009 Congressman Ron Paul (R-TX14) found 320 cosponsors for his *Federal Reserve Transparency Act of 2009* (H.R.1207), which was later incorporated into the Dodd-Frank law. With the revelations in December 2010 and March 2011 that the Fed had provided hundreds of billions of dollars of support to foreign financial institutions and central banks, pressure mounted in Congress to increase the Fed's transparency.

I analyze congressional voting on Ron Paul's 2012 "Audit the Fed" legislation, which would end the Fed's confidentiality about the banks and countries it supports and perhaps reduce the Fed's monetary policy independence as well. The bill was very popular and was approved in the House of Representatives on July 25, 2012 by a vote of 327-98. I find that the influence of money-center banks extends to Congress by way of campaign contributions to Representatives: contributions from "global banks" (defined as U.S. and foreign-owned money-center banks with branches or agencies in the U.S.) significantly reduce the likelihood that a legislator will vote in favor of the bill. In addition, I find that ideologically right-wing representatives are substantially

more likely than left-leaning representatives to support this legislation--an historic reversal of ideological positions on the Fed.

The plan of the paper is as follows. Section 2 provides background on the global crisis and a summary of the Fed's global lender-of-last-resort facilities. Section 3 introduces the data, models, and results of my analyses of the Fed's foreign operations. Section 4 moves to the congressional level and provides data, models, and results of my analysis of voting on the "Audit the Fed" bill. Section 5 concludes with implications for the future of the Fed's political independence.

2. The Federal Reserve's Global Lending during the Crisis

The Federal Reserve Act of 1913 gave the Federal Reserve responsibility for both setting monetary policy and for maintaining the stability of financial markets. In the latter capacity, the Fed supervises U.S. and non-U.S. banks and bank holding companies that are members of the Federal Reserve System and provides lender-of-last-resort services to these institutions during financial crises. During the recent financial crisis, the Fed provided more than a trillion dollars in emergency loans to the financial sector to address the breakdown of interbank and other money markets and to avert the failure of individual firms of systemic-importance, like AIG. According to the General Accounting Office (GAO), which conducted a one-time audit of the Fed's emergency operations under the authority of the Dodd-Frank law, "the scale and nature of this assistance amounted to an unprecedented expansion of the Federal Reserve System's traditional role as lender-of-last-resort" (United States GAO 2011, 1).

The programs were unprecedented partly because of their international scope. The largest program, measured in terms of the peak dollar amount of loans outstanding, was the

dollar swap lines program (see **Table 1**, reproduced from the GAO Report).[6] But other emergency programs, particularly the Term Auction Facility (TAF) and the Commercial Paper Funding Facility (CPFF) were also tapped by foreign financial institutions.[7] In fact, U.S. branches of foreign banks and U.S. subsidiaries of foreign institutions received more than half of the total dollar amount of TAF and CPFF loans made (see **Table 2, Table 3, and Figure 1**). Foreign banks were also heavy borrowers at the Fed's discount window during the crisis. **Table 4** indicates that 15 of the 30 largest borrowers (measured by peak loan amount) at the discount window where branches or agencies of foreign banking organizations.

The proximate reason the Fed provided last-resort loans to non-U.S. banks was that foreign financial institutions experienced severe funding shortages in U.S. dollars after short-term interbank markets froze up in October 2008. These dollar shortages were a direct outgrowth of the explosive growth of cross-border banking after 1999.[8] As depicted in **Figure 2**, foreign banks, particularly European banks, began accumulating large amounts of dollar-denominated assets, including Mortgage-Backed Securities (MBS), via the shadow banking system.[9] Dollar-denominated assets of banks outside the U.S. peaked at over $10 trillion before the crisis, an amount equal to the total assets of the U.S. commercial banking sector (Shin 2012).

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[6] **Table 1** excludes lending from the discount window because the GAO was not authorized to review this part of the Fed's activity during the crisis.

[7] Foreign banks operating in the U.S. are eligible for Federal Reserve services—including emergency services—under the principle of "national treatment," or parity of treatment between domestic and foreign banks.

[8] See Shin (2012) and the Committee on the Global Financial System (2010).

[9] The shadow banking system is the collection of non-bank financial intermediaries that provide services similar to traditional commercial banks outside the purview of regulators. It includes hedge funds, money market funds, structured investment vehicles, and the off-balance sheet activities of investment banks.

Foreign banks funded their dollar positions largely in short-term wholesale markets, either by borrowing dollars in the United States from money-market mutual funds or by acquiring domestic currencies and converting them into dollars via foreign-exchange swaps. This led to the build-up of maturity and currency mismatches: given their reliance on short-term wholesale and swap markets for dollar funding, foreign banks were vulnerable to losses on their long-dated and illiquid dollar-denominated subprime assets. When wholesale dollar funding markets tightened during the credit crisis--and then froze completely after the Lehman Brothers bankruptcy--foreign banks could not rollover their dollar liabilities. Although the resulting dollar liquidity crisis affected both U.S. and foreign banks, it was particularly acute for foreign banks since they did not hold significant U.S. dollar deposits and relied more heavily on the wholesale and swap markets to fund their dollar-denominated assets.[10] In short, the rapid expansion of cross-border lending and borrowing in U.S. dollars placed the Federal Reserve in the unprecedented position of having to provide dollar liquidity to banks throughout the globally-integrated financial system.

In response to the global dollar liquidity crisis, the Federal Reserve simultaneously established two programs: the Term Auction Facility (TAF) and the dollar swap line program with foreign central banks. While the TAF addressed domestic dollar funding pressures, the Fed recognized that the new facility was unlikely to alleviate dollar funding pressures overseas since interbank lending was effectively frozen and foreign central banks' could not create dollars (typically, central banks lend to domestic banks in domestic currency). Although U.S. branches of foreign banks could borrow dollars from the Fed, many foreign banks could not. The Fed stepped in by offering dollar swap lines to foreign central banks, which enabled these central

[10] See McGuire and von Peter (2009), Allen and Moessner (2010), and Fleming and Klagge (2010) and Goldberg, et al. (2010).

banks to provide dollar liquidity to banks within their jurisdictions. According to Bordo et al. (2012, 8), "These swap lines essentially extended the Term Auction Facility's reach beyond U.S. borders by financing term dollar funding facilities for foreign banks."

The Fed's Federal Open Market Committee (FOMC) approved temporary swap lines with 14 foreign central banks between December 12, 2007, and October 29, 2008 (**Table 5**). These foreign central banks used the U.S. dollars obtained through the swap lines to make dollar loans to financial institutions in their jurisdictions. The foreign central banks assumed the risk of losses on these dollar loans and paid Fed the interest collected on these loans, and the Fed did not pay interest on the foreign currency it received under the swap lines (Fleming and Klagge 2010).

Dollars outstanding to foreign central banks peaked at $586 billion in December 2008, with the European Central Bank accounting for about 80 percent of total dollars drawn (**Table 5**). At the peak, the temporary swap lines accounted for over 25 percent of the Fed's total assets (Fleming and Klagge 2010, 5). By most accounts, the swaps were successful in channeling dollar liquidity abroad, signaling central bank cooperation, and calming markets (Goldberg, et al. 2010, Baba et al. 2009, Obstfeld et al. 2009). The swap lines expired on February 1, 2010. However, the Fed reauthorized the swap lines with five foreign central banks in May 2010 in response to strains in dollar funding markets associated with the Euro zone debt crisis. As the Euro zone crisis continues, the swap lines have been reauthorized, with the latest extension running to February 1, 2013.

The Fed explained the large participation of non-US banks in its various crisis programs as a function of the large pools of dollar assets owned by foreign banks, which could not funded by short-term borrowings in the frozen interbank and swap markets. With respect to the TAF, the GAO reported that "FRBNY staff identified a few possible reasons for high use by U.S.

branches and agencies of foreign banks. First, many of them faced liquidity strains arising from the need to bring certain illiquid U.S. dollar assets back on to their balance sheets and could not finance these assets elsewhere. In addition, many of these institutions held U.S.-dollar denominated collateral that could be pledged to TAF but not in their home country" (United States GAO 2011, 235.)

While the crisis certainly caused a spike in demand for dollar liquidity worldwide, there is substantial cross-national variation in the extent to which non-U.S. banks participated in the various Fed programs. **Table 6** aggregates foreign bank borrowing from the Fed by country, using the peak daily outstanding balance owed to the Fed from all programs (except the dollar swap lines) to indicate the extent to which foreign banks tapped the Fed for dollar liquidity. The aggregation includes direct foreign bank borrowing from six broad-based Fed facilities—the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF), the Commercial Paper Funding Facility (CPFF), the Primary Dealer Credit Facility (PDCF), the Term Auction Facility (TAF), the Term Securities Lending Facility (TSLF), Single-Tranche Open Market Operations (ST OMO—plus borrowing through the discount window.[11] Overall, banks from 26 foreign countries made use of these Fed facilities. Banks from the United Kingdom and Germany were the heaviest borrowers, drawing 27% and 24% respectively of the Fed's total foreign lending.

What explains the Fed's selection of 14 foreign central banks for dollar swap lines during the crisis? More generally, what explains cross-national variation in borrowing from the Federal Reserve during the dollar liquidity crisis? The next section explores these questions.

[11] The table does not include foreign borrowing via the dollar swap because swaps for Eurozone banks were administered by the European Central Bank (ECB), and the ECB did not disclose the names and nationalities of the borrowers that tapped the swapped dollar credits.

3. Correlates of Foreign Borrowing from the Federal Reserve

I create two measures of cross-country variation in the Fed's foreign lending during the crises. The first measure is SWAP LINE, an indicator variable equal to 1 if the Federal Reserve selected a country or central bank jurisdiction for a dollar swap line during the crisis. Fourteen central banks received swap lines from the Fed between December 2007 and October 2008 (**Table 5**). The second measure is SHARE FED LOANS, which is a country's share of the Fed's total peak foreign lending from August 1, 2007 to April 30, 2010. Country shares are calculated by taking the largest daily outstanding amount owed to the Fed by all banks in a foreign country and dividing by the largest daily outstanding amount owed to the Fed by all non-U.S. banks from all foreign countries. The data for this measure incorporates lending from the Fed's six temporary broad-based emergency facilities (AMLF, CPFF, PDCF, TAF, TSLF, ST-OMO) and the discount window. It does not include loans from swap lines. For non-zero values, the variable has a mean of 0.039 and ranges from 0.00002 (Venezuela) to 0.2678 (United Kingdom).

The swap line indicator is my preferred measure of the Fed's foreign lending because obtaining a dollar swap line required the explicit approval of the FOMC. As disclosed by the GAO audit, "The FOMC's consideration of a new swap line arrangement generally followed a request from an interested foreign central bank, but not all requests were granted" (United States GAO 2011, 118).[12] Hence, establishing a swap arrangement with a foreign central bank was a choice variable for the Federal Reserve. Another advantage of this measure is that the GAO audit revealed the criteria the FOMC used to evaluate these requests. Based on internal memorandums and communication with Federal Reserve Board staff, the GAO found that the

[12] The names of the central banks that were denied swap lines by the FOMC are not public knowledge.

FOMC's approval of swap line requests "were generally based on the economic and financial mass of the country's economy, a record of sound economic management, and the probability that the swap line would make an economic difference." The GAO also noted that "the swap line arrangements were generally made with foreign central banks of important U.S. trading partners or global financial centers, such as Switzerland, Japan, and England, based on global funding needs" (United States GAO 2011, 118). Further insight into the selection of foreign central banks comes from FOMC member William Poole, President of the Federal Reserve Bank of St. Louis. Poole voted against establishing swap lines with the ECB and the Swiss National Bank on that the grounds that these central banks held large reserves, presumably in dollars, that could be used to backstop dollar liquidity in Europe (*Minutes* 11 December 2007). The broader point is that the Fed *selected* certain central banks for swap lines on basis of objective economic and financial considerations. In my analysis, I control for these considerations in an effort to isolate the influence of political factors, such as the interests of U.S. money-center banks.

The primary advantage of the second measure, SHARE FED LOANS, is that it allows observations of Fed lending to vary by *country* rather than by central bank jurisdiction. With the swap lines, by contrast, there is a single observation for all Euro zone member countries. The Fed established a dollar-euro swap arrangement with the ECB, but the ECB did not release the names or the nationalities of the banks that drew dollar credits under the swaps.[13] The weakness of this measure is that the Fed's policy was to auction emergency loans to any domestic or foreign bank that met the eligibility requirements, so the Fed had little control over where the

[13] The ECB's lack of disclosure irked U.S. Representative Randy Neugebauer (R-TX19), Chairman of the House Financial Services Subcommittee on Oversight and Investigations, who is trying to make disclosure of recipients a condition of Fed swap lines (Lanman and Keoun 2011).

loans went (United States GAO 2011). The same held for the discount window where foreign banks with branches in the U.S. could draw loans under the authority of U.S. law.[14] For all these programs, the impetus to draw credit from the Fed rested with the borrower.

I draw on the FOMC's swap line selection criteria to estimate the economic and financial covariates of the Fed's foreign lending during the crisis. I also consider a *political economy* covariate: the interests of large money-center banks. Previous research has shown that U.S. money-center banks comprise a key constituency for international last-resort lenders such as the International Monetary Fund (IMF) and the U.S. Treasury Department's Exchange Stabilization Fund (Broz 2005, Broz and Hawes 2006a, Broz and Hawes 2006b). This is because such last-resort lending ensures that the countries in which these banks are highly exposed are protected under the lender's insurance umbrella.[15]

The connection between money-center banks and the Federal Reserve is more direct and more formal than it with the IMF and ESF, I expect money-center banks to have substantial influence over the Fed's policies. Money-center banks elect the majority of the Federal Reserve Bank of New York's (FRBNY) Board of Directors, which is important because (1) during normal times the FRBNY conducts the international operations for the entire Federal Reserve system, and (2) because during the recent global financial crisis the Federal Reserve Board directed the FRBNY to implement the Fed's emergency facilities (United States GAO 2011). As the Fed's dominant constituency with a direct and formal role in FRBNY policy-making, money-center banks can therefore be expected to have influence on the Fed's foreign lending.

[14] The Monetary Control Act of 1980 stipulates that a U.S. branch or agency of a foreign bank that maintains reserves at a Fed bank may receive discount-window credit.

[15] The U.S. Treasury Department's ESF was tapped to provide financial rescues to emerging market economies during the 1990s. Broz (2005) shows that campaign contributions from money-center banks influenced members of Congress to vote against legislation to constrain the ESF's global bailout activities.

My measure of the interests of U.S. money-center banks is U.S. BANK EXPOSURE, the consolidated claims of U.S. banks on individual countries divided by the consolidated claims of U.S. banks on all countries in December 2007.[16] These data highlight the role of large financial institutions located in the nation's money centers (i.e., "money-center banks") because these large banks conduct almost all the nation's international lending. According to data from the Federal Financial Institutions Examination Council, the following 11 money-center banks accounted for 93% of all the consolidated foreign claims of U.S. banks: Bank of America Corp., Bank of New York Co., Citigroup, Deutsche Bank (Taunus Corp.), HSBC Holdings PLC., JPMorgan Chase, State Street Corp., Wachovia Corp., and Wells Fargo.[17] My argument is that U.S. money-center banks benefit when the Fed provides dollar liquidity to foreign countries in which they are highly exposed.

While it is not possible to observe money-center bank influence directly, we can assess the degree which the Fed's selection of swap lines correlates with their interests. **Table 7** reports the results of probit regressions of SWAP LINE on U.S. BANK EXPOSURE and controls. The dependant variable takes the value of 1 for countries that the FOMC selected for dollar swap lines between December 2007 and October 2008, zero otherwise (see Table 5). As the ECB received a swap line for its nine member countries, there is a single observation for the Euro zone, with covariate values representing the sum (or average where appropriate) of Euro zone member country values. The results show a positive and significant U.S.BANK EXPOSURE estimate across all five models. In Model 1, this covariate alone accounts for 59% of the

[16] The data are from the Bank of International Settlements (BIS), Consolidated Banking Statistics, Table 9B, Foreign claims by nationality of reporting banks, immediate borrower basis. http://www.bis.org/statistics/consstats.htm

[17] Federal Financial Institutions Examination Council Statistical Release E.16, dated December 31, 2007. See http://www.ffiec.gov/E16.htm

variation in the data. Yet Models 2-5 provide some evidence in support of the Fed's selection economic and financial criteria. The set of controls is derived from the GAO's audit, during which FOMC members and Federal Reserve staff described the factors that shaped the their selection of countries for swap lines. The following criteria were highlighted by Fed officials as increasing the chances a foreign central bank would be selected for a swap line:

- The economic and financial mass of the country or central bank jurisdiction
- Whether the country/jurisdiction contained a global financial center
- The country's or jurisdiction's importance to the U.S. as a trading partner
- The central bank's record of sound economic management
- The dollar funding needs of the country's or jurisdiction's financial institutions

Controlling for these economic factors is important because many of these variables are correlated with my political economy variable, U.S. BANK EXPOSURE (see **Appendix 1** for the correlation matrix). In Model 2, I control for "economic and financial mass" with SHARE WORLD GDP (a country's gross domestic product in billions of U.S. dollars divided by total world GDP, 2007) and SHARE WORLD LIQUID LIABILITIES (in millions of U.S. dollars in 2007).[18] Liquid liabilities (aka M3) equal currency plus demand and interest-bearing liabilities of banks and other financial intermediaries. It is the broadest available indicator of financial intermediation. The variable is defined as a country's liquid liabilities divided by total world liquid liabilities. In Model 2, the estimates for "economic and financial mass" are wrongly

[18] GDP data are from the World Economic Outlook (WEO) Database. Liquid liabilities data are from Beck et al (2000) Financial Structure Database.

signed but insignificant.

Model 3 introduces U.S. TRADE SHARE, which is U.S. bilateral trade with a country (imports plus exports) as a share of total U.S. trade (imports plus exports) in 2007, and INFLATION, the annual percentage change in CPI inflation averaged over the previous decade (1997-2007).[19] The trade share variable is meant to capture the Fed's concern with supporting countries that are major U.S. trading partners. The inflation rate proxies for the Fed's concern with a central bank's "record of sound economic management."[20] Against expectations, the sign on this estimated effect of U.S. TRADE SHARE in Model 3 is negative, but it is not significant. However, the estimated INFLATION coefficient is negative and significant, suggesting that the FOMC did considered "sound economic management" a criterion for selection.

Model 4 controls for the "dollar funding needs" of banks in foreign countries with DOLLAR SHORTAGES, which I constructed from the Bank of International Settlement's (BIS) Locational Banking Statistics following Allen and Moessner (2010). The BIS collects data on the currency-specific claims and liabilities of banks in BIS reporting countries.[21] DOLLAR SHORTAGES is measured as the net outstanding U.S. dollar cross-border claims on BIS reporting banks and non-banks in a country/jurisdiction in December 2008, where "net" is defined as total dollar cross-border liabilities minus claims in all foreign and domestic currencies at the end of 2008. By this measure, the largest dollar liquidity shortage was in the United

[19] Bilateral trade data are from the Correlate's of War dataset and the inflation data are from the IMF's International Financial Statistics.

[20] FOMC officials were apparently concerned about the ability of foreign central bankers to carry out dollar liquidity operations on behalf of the Federal Reserve, which is consistent with Obstfled's (2009) characterization of foreign central banks as "subcontractors" for the Fed, providing dollar lender-of-last-resort (money creation) services in foreign jurisdictions.

[21] Currency-specific banking data are not available *by country* from the BIS's online database at http://www.bis.org/statistics/bankstats.htm. The BIS provided these data to me upon request.

Kingdom (-$153.6 billion), which was the largest borrowers from the Federal Reserve during the crisis (**Table 6**). Since negative values indicate dollar shortages, I expect the estimated effect of DOLLAR SHORTAGES to be negative.

The sample in Model 4 drops to 32 observations because the BIS does not collect currency-specific banking data on all countries. While the estimate of dollar shortages is negative as expected, it is not significant. Despite the change in sample, the U.S BANK EXPOSURE coefficient in Model 4 remains similar in magnitude and significance to Models 1-3.

Model 5 includes GLOBAL FINANCIAL CENTER, an indicator variable equal to 1 if a country is home to a global financial center city.[22] I drop SHARE WORLD GDP, SHARE WOLRD LIQUID LIABILITIES, and U.S TRADE SHARE because GLOBAL FINANCIAL CENTERS correlates very highly with these variables and the model cannot be fitted when any of these variables is included with it (**Appendix 1**). The DOLLAR SHORTAGE estimate is negative and significant, which accords with the Fed's criteria: countries with "greater need" of dollar liquidity were more likely to get a swap line from the Fed. GLOBAL FINANCIAL CENTERS enters positively and significantly, which supports the Fed's statements on this criterion. Nevertheless, the exposure of U.S. banks remains positively and significantly correlated with obtaining a swap line from the Fed.

Figure 3 displays the predictive margins with confidence intervals of receiving a swap line from the Fed based on simulations of Model 5 from Table 7, holding covariates to their means (or mode = 0 for Global Financial Center) while increasing U.S. BANK EXPOSURE from its minimum to its maximum value. The figure illustrates the substantively large effect of

[22] The Global Financial Centres Index at http://www.zyen.com designates cities in these 7 countries as "global financial centers": Canada (Toronto), Germany (Frankfurt), Hong Kong, Japan (Tokyo), Singapore, Switzerland (Zurich), and the United Kingdom (London).

U.S. bank exposure on the probability of receiving a Fed swap line. For example, increasing a country's share of total money-center bank claims on other countries from 2% to 4% increases the likelihood the country will be offered a swap line by the Fed by 28 percentage points (from 45% to 73%). Furthermore, any country holding more that 10% of total U.S. foreign banking claims is virtually assured to receive a swap line, as predictive margins rise above 90%. The loan exposure of U.S. banks appears to be a powerful predictor of Fed swap lines.

My alternative measure of the Fed's foreign lending is SHARE FED LOANS, which is a country's share of the Fed's foreign lending from all sources except swap lines. Even though Fed officials had little discretion over the allocation of these loans, **Table 8** reports surprisingly similar results to the swap line analyses, especially in regard to the exposure of U.S. money-center banks. Here, a linear OLS regression of SHARE FED LOANS on U.S. BANK EXPOSURE indicates a large, statistically significant positive relationship between these variables. In Model 1, U.S. BANK EXPOSURE fits the data very well ($R^2 = 0.61$). As these variables are measured as shares, the coefficient estimate suggests that a one percent increase in the exposure of U.S. banks to a country is associated with a 1.3 percent increase in the share of Fed lending to a country.

Model 2 adds controls for the "economic and financial mass" of countries (SHARE WORLD GDP, and SHARE WORLD LIQUID LIABILITIES). Model 3 introduces GLOBAL FINANCIAL CENTER, U.S. TRADE SHARE, and INFLATION. The results of Model 3 suggest that financial importance, as measured by whether a country serves as a global financial center, is positively related to crisis lending by the Fed. This is important because two global financial centers—the United Kingdom and Germany—are outliers in terms of borrowings from the Fed. Nevertheless, the BANK EXPOSURE estimate is nine times the magnitude of the

GLOBAL FINACIAL CENTER control and highly significant. The importance of a country as a trading partner of the United States is *negatively* associated with lending from the Fed, according to Model 3 estimates, and a country's record of macroeconomic management, as measured by inflation performance, is uncorrelated with Fed lending. One possible explanation for the trade links finding is that major trading partners like Canada, China, and Mexico did not experience severe dollar shortages as their banks raised most of their funding domestically. In any case, this criterion is not supported by the data

Model 4 controls DOLLAR SHORTAGES and, as before, this reduces the number of observations by 75 percent. Despite the change in the sample, the U.S BANK EXPOSURE coefficient in Model 4 is of similar magnitude to the other models and R^2 increases to 0.87. The fit is driven almost entirely by the bank exposure variable: in a regression of SHARE FED LOANS on DOLLAR SHORTAGE, the estimate for dollar shortages is tiny (-0.00015), and not significant (t = -0.39).

Overall, the results in **Table 8** reveal a remarkably consistent pattern: foreign countries that received larger shares of the Fed's total peak emergency lending were countries in which U.S. money-center banks held larger claims on banks and corporations. In other words, the exposure of U.S. banks to a foreign country correlates strongly and positively with crisis lending by the Federal Reserve. Since this lending was allocated mostly by auctions, the Fed did not explicitly choose which banks and which countries to support. This suggests that foreign banks that tapped the Fed for dollar liquidity have connections via branches and counterparty relationships that overlap closely with the foreign lending exposures and interests of U.S. money-center banks.

4. Correlates of Congressional Voting to Increase the Fed's Transparency

Immediately following the Federal Reserve's court-ordered disclosure of the names and nationalities of the banks that had borrowed from the Fed, Ron Paul began plans for congressional hearings: "I am surprised and deeply disturbed to learn the staggering amount of money that went to foreign banks. These lending activities provided no benefit to American taxpayers, the American economy, or even directly to American banks" (Felsenthal and Zargham 2011). Paul's efforts culminated in legislation to make the Federal Reserve more transparent on a permanent basis, culminating in *The Federal Reserve Transparency Act of 2012* (H.R.459), which was approved by the House of Representatives on July 25, 2012. I analyze congressional voting on this bill to see if the influence of money-center banks extends beyond the Fed to the political body that has power over the Fed: the U.S. Congress.[23]

The intent of this legislation is to make the one-time Dodd-Frank Act disclosures a permanent feature of congressional oversight and to extent the GAO's audit authority to the Fed's open market operations. According to the congressional report that accompanied the bill to the floor, the Dodd-Frank Act provided a one-time exception to legal restrictions that prevented the GAO from auditing the Fed in four key areas: "(1) Transactions for or with a foreign central bank, foreign government or international financing agency; (2) Deliberations, decisions, or actions on monetary policy matters, including discount window operations, reserves of member banks, securities credit, interest on deposits, and open market operations; (3) Transactions made under the direction of the Federal Open Market Committee; and (4) Any discussions or communications among or between members of the Federal Reserve Board of

[23] The Fed is a creation of Congress and Congress conducts oversight of the central bank's exercise of its constitutionally-delegated authority.

Governors and officers and employees of the Federal Reserve System related to the above."[24] H.R.459 would remove these restrictions. Elijah Cummings (D-MD7) wrote the minority views section of the report, arguing that the bill would critically undermine the political independence of the Federal Reserve.[25]

The bill was very popular in the House where the vote was taken under a procedure called "suspension of the rules." Suspension is typically used to pass non-controversial bills since votes under suspension require two-thirds majority. The tally of 327-98 easily met this hurdle. All Republicans except Robert Turner (R-NY9) voted in favor of the bill. But Democrats were divided, with 89 Democrats joining Republicans to approve the bill and 97 voting against.

While election-year politics probably had some impact on the partisan alignment, it is noteworthy that Republicans, the traditional supporters of the Fed's independence, voted *en masse* for the bill while Democrats, the party that usually attacks the Fed as an unaccountable power with incestuous relations with banks, lined up as the Fed's protector. In a striking indicator of this reversal, Democratic Whip Steny Hoyer (D-MD5) implored Democrats to vote "no" on the grounds that the bill "impedes the independence of this critical institution…House Republicans cannot be allowed to hold our economy or our critical economic institutions hostage in order to further their extreme agenda."[26]

The whip was not effective as almost half of the Democrats broke ranks and voted with Republicans. I analyze Democrats' vote choice on this bill with an eye toward gauging the influence of money-center banks and identifying the personal and constituency factors that

[24] Committee on Oversight and Government Reform report, CRPT-112hrpt607-pt1. http://www.gpo.gov/fdsys/pkg/CRPT-112hrpt607/pdf/CRPT-112hrpt607-pt1.pdf

[25] Ibid

[26] Office of the Democratic Whip Steny Holler http://www.democraticwhip.gov/content/daily-whip-tuesday-july-24-2012

contribute to legislators' decisions. While previous research has shown that campaign contributions from money-center banks shapes congressional voting in other areas, such as funding for the IMF, the ESF, and foreign aid, I extend this analysis to voting on the "Audit the Fed" bill (Broz 2005, Broz 2011, Milner and Tingley 2011). My measure of bank influence is BANK CONTRIBUTIONS, operationalized as campaign contributions from money-center banks' Political Action Committees (PACs) to representatives during the two election cycles prior to the vote divided by total contributions a representative received from all sources during these two cycles. My expectation is that representatives that are more dependent on money-center banks for campaign contributions are more likely to the vote against H.R.459.

I identify "money-center banks" from the FFIEC's list of "Large Financial Institutions" that account for over 90% of all foreign banking claims held by U.S. banks (see footnote 16). The banks comprising this group are: Bank of America, Bank of New York, Citigroup, Deutsche Bank (Taunus Corp.), HSBC, JPMorgan Chase, State Street Corp., Wachovia Corp., and Wells Fargo. Deutsche Bank and HSBC are foreign-owned banks with branches in the United States and each has a PAC that contributes to congressional campaigns. This measure thus captures the role that money-center banks play in Congress via contributions to campaigns.

Model 1 in **Table 9** reports results of a probit model regression of Democrats' voting on H.R.459. The BANK CONTRIBUTIONS estimate is negative and statistically significant, albeit of limited explanatory power (Pseudo $R^2 = 0.03$). Model 2 controls for the political "ideology" of representatives using the first dimension DW-NOMINATE score, which is derived from a spatial model of representatives' individual roll-call voting histories. As Poole and Rosenthal (2000) explain, the first dimension can be interpreted as a representative's position on government intervention in the economy. Values range from -1 to 1, with higher values

indicating a more right-wing, anti-government ideology. The estimate in Model 2 suggests that right-leaning Democrats are more likely than left-leaning Democrats to support auditing the Fed.

This ideological finding is interesting for a number of reasons. First, it suggests that not all Republicans that supported the bill did so to harm President Obama's chances in the upcoming election—right-wing ideology probably mattered too. Second, it suggests that the revelations of the Fed's massive global operations during the crisis may have reversed partisan positions on the Federal Reserve, so that the Right now opposes the Fed for its internationalist, interventionist activities while the Left supports it for these very same reasons.[27]

However, there are material reasons that the Right might have shifted positions on the Fed. Research on older, right-wing constituents suggests that these citizens were especially hard hit by the Fed's monetary policies before and after the crisis. For example, research on the social characteristics and attitudes of Tea Party adherents indicates that these constituents tend to be older (62 years of age on average), wealthier, and more strongly supportive of the Social Security and Medicare programs than moderate conservatives (Skocpol and Williamson 2011).[28] As retirees living on their savings, these constituents have a material basis for their criticism of the Federal Reserve. On the one hand, they tend to hold the Fed responsible for propagating the housing crisis as easy credit conditions early in the cycle facilitated the boom. The subsequent bust devastated older homeowners who saw their primary nest eggs – their homes – plummet in value. On the other hand, the Fed's stimulus that followed the bust dramatically reduced the return on retirees' savings, as interest rates have been stuck close to zero for several years. These material losses have left the Fed open to attack from older, more conservative constituents.

[27] See Milner and Tingley (2011) for a similar argument about the anti-globalization effect of right-wing ideology on foreign aid policy, and Broz (2011, 2008) for the Right's opposition to funding the international financial institutions.

[28] I thank Jeff Frieden for suggesting this interpretation.

To control for the possibility that opposition to the Fed among congressional Democrats is based on these constituency considerations, Model 3 includes SHARE SOCIAL SECURITY, which is the share of a district's population receiving OASDI benefits, and FORECLOSURE RATE, which is the share of a district's private housing stock in foreclosure.[29] The estimates are both positively signed but not significant.[30] Given that estimated effect of DW-NOMINATE remains virtually unchanged, it is fair to conclude that ideology is driving representatives' voting, not the hardships endured by older constituents during the crisis. I consider the implications of this finding in the conclusion

In Model 4, I control for additional factors to be sure that the estimates on campaign contributions from large banks and member ideology are not spurious. BANK HQ is an indicator variable equal to 1 if a representative's district is home to the headquarters to one of the nation's eleven money-center banks. I expected a negative sign since these banks opposed H.R.459. The estimate, however, is positive and but not significant. Note that contributions from banks remain negatively and significantly related to voting. CHAMBER SENIORITY counts the number of terms representatives have served in the House. The estimate is negative and significant, indicating that more senior Democrats were less likely to support the bill, in line with their party's whip. Nevertheless, the ideology estimate is hardly affected. FINANCE COMMITTEE is an indicator variable equal to 1 if a representative sits on the House Financial

[29] The source for the social security data is the U.S. Social Security Administration, Office of Retirement and Disability Policy, Office of Research, Evaluation, and Statistics, December 2010. http://www.ssa.gov/policy/docs/factsheets/cong_stats/2010/index.html. The foreclosure rate is from the real estate listing service Hotpads.com http://hotpads.com/sites/Election/congressional-districts-all

[30] The results (not reported) are nearly identical when the share of a district's population aged 65 and over is used in place of the share of social security beneficiaries. The two measures are highly correlated ($r = 0.85$).

Services Committee.[31] Membership on this committee may be correlated with bank contributions since interest groups are known to bestow larger contributions on legislators with greater influence over their industries. The estimate is positive but not significant.

Figure 4 provides a sense of the substantive effects of Model 4's estimates. The figure displays the estimated change in the predicted probability that a House Democrat would vote in favor of Ron Paul's "Audit the Fed" bill (H.R. 459) caused by increasing each covariate in Model 4 by one standard deviation above its mean while holding all other covariates at their means (or modes for indicator variables). For example, increasing the share of campaign contributions from money-center banks from its average value to one standard deviation above its average reduces the likelihood a Democrat will vote in favor of Ron Paul's bill by 15 percentage points. A change in member ideology has an effect of similar magnitude. Since larger values of DW-NOMINATE indicate a more conservative ideology, a Democrat that is one standard deviation more right-leaning than average is about 15 percentage points more likely to vote "yes" on the bill.

I also computed marginal effects from Model 4 in Table 9. **Figure 5** presents the predictive margins of bank contributions on the probability of voting for the bill. These estimates suggest large effects. According to the figure, there is a 58% chance that a Democrat will vote "yes" on the bill when getting a zero share of contributions from money-center banks. However, a Democrat that gets 1 percent of his total contributions from banks is 38 percentage points less likely to favor the bill, with a predicted probability of voting "yes" of just 20%. Contributions from big banks seem to have large effects even when they comprise relatively small shares of representatives' total receipts.

[31] The data on seniority and committee membership are from Stewart and Woon (2011).

The same holds for member ideology. According to **Figure 6**, moving DW-NOMINATE from the value of the most left-wing Democrat (Jim McDermott, WA-7) to the value of the most right-wing Democrat (Heath Shuler NC-11) increases the odds of voting "yes" on the bill by 67 percentage points. Ideology thus appears to have a large effect on voting to make the Fed more transparent. Note, however, that the direction of this effect is the reserve of traditional coalition patterns. The Right is now challenging the Fed to be more transparent, more accountable, and less beholden to banks while the Left is positioning itself as the defender of the Fed. I consider this historic reversal in the conclusion.

5. Conclusion

The Dodd-Frank law combined with a Supreme Court ruling to force the Federal Reserve to disclose nearly all borrower-specific information about its last-resort lending during the crisis. The disclosures revealed that the Fed had provided vast amounts of dollar liquidity to foreign banks and central banks—a consequence of the rapid globalization of banking after 1999 that left many foreign banks highly exposed to disruptions in short-term dollar funding markets. Had the Fed not supported foreign banks, the credit crisis in the U.S. would almost certainly have been worse. In a broader sense, the disclosures revealed that the Federal Reserve had become—by default—the lender of last resort to the *world's* global banks.

At the time they were making crisis decisions, Federal Reserve officials did not know they would have to reveal this borrower-specific information. In this paper, I utilized this exogeneity for two purposes. First, I used data from the disclosures to evaluate cross-country variation in the Fed's foreign lending. I created two measures of this outcome: (1) an indicator variable for the 14 central bank jurisdictions the Fed selected for dollar swap lines, and (2) country shares of the Fed's total peak foreign lending from all other facilities. I regressed each variable on set of economic and financial variables that proxy for the Fed's selection criteria (as

revealed by the disclosures), plus a political-economy variable that captures the interests of U.S. money-center banks: their exposure in a foreign market as a share of their total foreign exposure. While I found some support for the Fed's selection criteria, the factor that most strongly and consistently "predicts" the Fed's foreign lending is the extent to which large U.S. banks have financial claims on a country.

It is perhaps impolitic for the Fed to acknowledge the role that money-center banks played in shaping its crisis decisions. Yet serving the interests of these banks is a formal component of the Fed's political organization. Banks elect the majority of the regional reserve banks' directors and the directors of the FRBNY, in conjunction with the FOMC, manage the Fed's international operations as well as its crisis programs. But the Federal Reserve has a greater principal to whom it owes its existence: the U.S. Congress. Hence, the second way I exploited the disclosures was to examine the congressional response to them.

The revelations of the Fed's support for foreign banks and central banks prompted legislation in the House to make the one-time Dodd-Frank disclosures permanent, and to go beyond them in certain areas. Ron Paul's 2012 "Audit the Fed" bill would remove remaining limits on GAO audits of the Fed's operations, including its transactions with foreign central banks and its open-market operations, which might compromise the Fed's political independence. I analyzed voting on this bill with the aim of seeing whether global banks have influence over the Fed's ultimate principal by way of contributions to congressional campaigns. I found that voting against this bill is strongly correlated with campaign contributions from the 11 money-center banks that account for nearly all foreign lending by U.S. banks. I also found something surprising and worthy of further analysis: Right-leaning Democrats strongly support

auditing the Fed--apparently even at the risk of a politicizing monetary policy--while left-leaning Democrats opposed such transparency.

With all but one Republican voting "yes", and 97 mostly right-wing Democrats joining them, the Fed seems to have fallen out of favor with the Right. Put another way, Ron Paul's anti-Fed ideas, which have long been considered to be on the fringe, appear to be moving into the mainstream. This is a break from the past since the Right has historically supported the Federal Reserve for its conservative commitment to monetary stability.

What is causing this historic reversal? While it is too soon to say with certainly, my analyses suggests that it is *not* driven by the hardships of older, home-owning Americans experienced during the crisis. My regressions show no correlation between voting to audit the Fed and district foreclosure rates, district social security beneficiaries, or the share of residents aged 65 and older in a district. This leaves open the possibility that the Dodd-Frank disclosures fueled the Right's antipathy of the Fed.

The financial crisis downgraded monetary policy to a second-order concern for the Fed, which concentrated on restoring stability to the increasingly globalized financial sector. This shift in focus left the Fed vulnerable to attacks from the right of the political spectrum, where people tend to see financial instability as *caused* by excessive government intervention in the economy. From this perspective, the Fed's emergency loans were "bailouts" that created the moral hazard that caused banks to take on too much risk in the first place.

In addition, the disclosures revealed the Fed to be an agency committed to *global* financial stability, which touched another nerve on the Right. Details of the Fed's support for foreign banks and central banks antagonized right-wing legislators, who are known to oppose organizations like the IMF that backstop the international financial system (Broz 2011, Broz

2008). In short, the disclosures may have led the Federal Reserve to be associated with "globalization," "bailouts," and "excessive government intervention," thereby reversing the Right's traditional support for the central bank, which is grounded in the Fed's commitment to low inflation.

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Table 1: Federal Reserve Emergency Programs Covered by the GAO Audit

Dollars in billions			
Programs and Assistance	**Peak dollar amount outstanding**	**Balance as of 6/29/11**	**Description**
Broad-based programs			
TAF - Term Auction Facility (Dec. 12, 2007–Mar. 8, 2010)	$493	$0	Auctioned one-month and three-month discount window loans to eligible depository institutions
Dollar Swap Lines (Dec. 12, 2007–Feb. 1, 2010*)	586	0	Exchanged dollars with foreign central banks for foreign currency to help address disruptions in dollar funding markets abroad
TSLF - Term Securities Lending Facility (Mar. 11, 2008–Feb. 1, 2010)	236	0	Auctioned loans of U.S. Treasury securities to primary dealers against eligible collateral
PDCF - Primary Dealer Credit Facility (Mar. 16, 2008–Feb. 1, 2010)	130	0	Provided overnight cash loans to primary dealers against eligible collateral
AMLF - Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (Sept. 19, 2008–Feb. 1, 2010)	152	0	Provided loans to depository institutions and their affiliates to finance purchases of eligible asset-backed commercial paper from money market mutual funds
CPFF - Commercial Paper Funding Facility (Oct. 7, 2008–Feb. 1, 2010)	348	0	Provided loans to a special purpose vehicle to finance purchases of new issues of asset-backed commercial paper and unsecured commercial paper from eligible issuers
MMIFF - Money Market Investor Funding Facility (Oct. 21, 2008 but never used)	No loans provided	0	Created to finance the purchase of eligible short-term debt obligations held by money market mutual funds
TALF - Term Asset-Backed Securities Loan Facility (Nov. 25, 2008–June 30, 2010)	48	13	Provided loans to eligible investors to finance purchases of eligible asset-backed securities
Assistance to Individual Institutions			
Bear Stearns Companies, Inc. acquisition by JP Morgan Chase & Co. (JPMC)			
Bridge Loan (Mar. 14, 2008–Mar. 17, 2008)	13	0	Overnight loan provided to JPMC subsidiary, with which this subsidiary made a direct loan to Bear Stearns Companies, Inc.
Maiden Lane (Mar. 16, 2008)	29	22	Special purpose vehicle created to purchase approximately $30 billion of Bear Stearns's mortgage-related assets
AIG Assistance			
Revolving Credit Facility (Sept. 16, 2008–Jan. 14, 2011)	72	0	Revolving loan for the general corporate purposes of AIG and its subsidiaries, and to pay obligations as they came due
Securities Borrowing Facility (Oct. 8, 2008–Dec. 12, 2008)	21	0	Provided collateralized cash loans to reduce pressure on AIG to liquidate residential mortgage-backed securities (RMBS) in its securities lending portfolio
Maiden Lane II (Nov. 10, 2008)	20	9	Special purpose vehicle created to purchase RMBS from securities lending portfolio of AIG subsidiaries
Maiden Lane III (Nov. 10, 2008)	24	12	Special purpose vehicle created to purchase collateralized debt obligations on which AIG Financial Products had written credit default swaps
Life Insurance Securitization (March 2, 2009 but never implemented)	Not used	0	Authorized to provide credit to AIG that would be repaid with cash flows from its life insurance businesses
Loans to affiliates of some primary dealers (Sept. 21, 2008–Feb. 1, 2010)	41	0	Loans provided to broker-dealer affiliates of four primary dealers on terms similar to those for PDCF
Citigroup Inc. lending commitment (Nov. 23, 2008–Dec. 2009)	No loans provided	0	Commitment to provide non-recourse loan to Citigroup against ring-fence assets if losses on asset pool reached $56.2 billion
Bank of America Corporation lending commitment (Jan. 16, 2009–Sept. 2009)	No loans provided	0	Commitment to provide non-recourse loan facility to Bank of America if losses on ring fence assets exceeded $18 billion (agreement never finalized)
Open Market Operations			
Agency Mortgage-Backed Securities Purchase Program (Nov. 25, 2008–Mar. 31, 2010)	$1,250 total purchases	$909 (remaining principal balance)	Purchased agency mortgage-backed securities to provide support to mortgage and housing markets and to foster improved conditions in the financial markets more generally

Source: Federal Reserve Board Statistical Release H.4.1 and Federal Reserve Board documents

Source: United States General Accounting Office (2011). The GAO was not authorized by the Dodd-Frank law to audit the Fed's discount window lending, which is why it is not included in the table.

Table 2: Top 25 Largest CPFF Borrowers (U.S. dollars in billions)

Rank	Issuer of unsecured commercial paper or sponsor of ABCP issuer	ABCP	Unsecured commercial paper	Issuer total	Percent of total CPFF issuance
1	UBS AG (Switzerland)	0.00	74.50	74.50	10.10
2	American International Group	36.3	24	60.2	8.2
3	Dexia SA (Belgium)	0	53.5	53.5	7.2
4	Hudson Castle	53.3	0	53.3	7.2
5	BSN Holdings (United Kingdom)	42.8	0	42.8	5.8
6	The Liberty Hampshire Company	41.4	0	41.4	5.6
7	Barclays PLC (United Kingdom)	0	38.8	38.8	5.3
8	Royal Bank of Scotland Group PLC (United Kingdom)	24.8	13.7	38.5	5.2
9	Fortis Bank SA/NV (Belgium)	26.9	11.6	38.5	5.2
10	Citigroup Inc.	12.8	19.9	32.7	4.4
11	Natixis (France)	4.7	22.3	27	3.7
12	General Electric Co	0	16.1	16.1	2.2
13	Ford Credit	15.9	0	15.9	2.1
14	Bank of America Corporation	0	14.9	14.9	2
15	State Street Corporation	14.1	0	14.1	1.9
16	GMAC LLC	13.5	0	13.5	1.8
17	KBC BANK NV (Belgium)	9	2.3	11.3	1.5
18	ING Group NV (Netherlands)	0	10.9	10.9	1.5
19	Dresdner Bank AG (Germany)	5.1	4.9	10	1.4
20	Northcross (United Kingdom)	8.6	0	8.6	1.2
21	WestLB (Germany)	8.2	0	8.2	1.1
22	Merrill Lynch & Co	0	8	8	1.1
23	Allied Irish Bank (Ireland)	0	6.6	6.6	0.9
24	Bayerische Motoren Werke AG (Germany)	0	6.2	6.2	0.8
25	Handelsbanken (Sweden)	0	6	6	0.8
	All Others	24.9	61.8	86.7	11.80
	Total	**342.3**	**395.9**	**738.3**	**100.00**

Notes: Shaded rows indicate foreign financial institutions. Reproduced from United States General Accounting Office (2011), Table 20, p. 196. Borrowing is aggregated at the parent company level and includes borrowing by branches, agencies, subsidiaries, and sponsored ABCP conduits.

Table 3: Top 25 Largest TAF Borrowers at the Parent Company Level

Rank	Parent company of TAF borrowing institution	Total TAF loans (Billions USD)	Percent of total
1	Bank of America Corporation	280	7.3
2	Barclays PLC (United Kingdom)	232	6.1
3	Royal Bank of Scotland Group PLC (United Kingdom)	212	5.5
4	Bank of Scotland PLC (United Kingdom)	181	4.7
5	Wells Fargo & Co.	159	4.2
6	Wachovia Corporation	142	3.7
7	Societe Generale SA (France)	124	3.3
8	Dresdner Bank AG (Germany)	123	3.2
9	Citigroup Inc.	110	2.9
10	Bayerische Landesbank (Germany)	108	2.8
11	Dexia AG (Belgium)	105	2.8
12	Norinchukin Bank (Japan)	105	2.8
13	JP Morgan Chase & Co.	99	2.6
14	UniCredit SpA (Italy)	97	2.5
15	Mitsubishi UFJ Financial Group, Inc. (Japan)	84	2.2
16	WestLB AG (Germany)	78	2.1
17	Deutsche Bank AG (Germany)	77	2
18	Regions Financial Corporation	72	1.9
19	BNP Paribas SA (France)	64	1.7
20	Sumitomo Mitsui Banking Corporation (Japan)	56	1.5
21	UBS AG (Switzerland)	56	1.5
22	HSH Nordbank AG (Germany)	53	1.4
23	Mizhuo Financial Group, Inc. (Japan)	51	1.3
24	Commerzbank AG (Germany)	51	1.3
25	Hypo Real Estate Holding AG (Germany)	47	1.2
	All others	1,051	27.5
	Total	**3,818**	**100.0**

Notes: Shaded rows indicate foreign financial institutions. Reproduced from United States General Accounting Office (2011), Table 30, pp. 231-32. Total borrowing is aggregated at the parent company level and includes borrowing by branches, agencies, and subsidiaries for foreign financial organizations.

Table 4: 30 Largest Borrowers at the Fed's Discount Window from March 3, 2008 through March 16, 2009

Rank	Origination Date	Borrower	Maturity Date	Peak Borrowing (Billions USD)
1	10/1/2008	AIG	9/22/2010	61.00
2	10/29/2008	CPFF	1/27/2009	56.56
3	9/26/2008	BANK OF NY MELLON	9/29/2008	44.11
4	12/31/2008	DEXIA CREDIT LOCAL NY BR (Belgium)	1/5/2009	37.00
5	11/6/2008	DEPFA BK PLC NY BR (Ireland)	11/7/2008	28.50
6	3/28/2008	JPMORGAN CHASE BK NA	3/31/2008	28.50
7	10/6/2008	WACHOVIA BK NA	1/2/2009	23.00
8	10/6/2008	ROYAL BK OF SCOTLAND PLC NY B (United Kingdom)	10/7/2008	8.40
9	3/27/2008	BANK OF NY	3/28/2008	7.50
10	10/14/2008	SOVEREIGN BK	10/15/2008	7.26
11	9/29/2008	FORTIS BK SA/NV NY BR (Belgium)	9/30/2008	6.96
12	11/24/2008	US CENTRAL FCU	11/25/2008	6.00
13	9/17/2008	BANK OF SCOTLAND PLC NY BR (United Kingdom)	10/17/2008	5.00
14	9/19/2008	SOCIETE GENERALE NY BR (France)	12/18/2008	4.00
15	10/8/2008	MS CO	10/9/2008	3.63
16	5/28/2008	ERSTE BK OESTERREICHISCH NY BR (Austria)	6/6/2008	3.50
17	10/9/2008	MORGAN STANLEY BK NA	10/14/2008	3.25
18	6/30/2008	DEUTSCHE BK AG NY BR (Germany)	7/1/2008	3.04
19	3/28/2008	CALYON NY BR (France)	4/4/2008	3.00
20	9/16/2008	NORINCHUKIN BK NY BR (Japan)	12/15/2008	3.00
21	12/22/2008	WESTERN CORP FCU	12/23/2008	2.75
22	5/19/2008	HSH NORDBK AG NY BR (Germany)	8/15/2008	2.50
23	9/18/2008	LANDESBK BADEN WUERTTEMB NY (Germany)	10/16/2008	2.50
24	3/31/2008	RBS CITIZENS NA	4/1/2008	2.24
25	10/7/2008	COMMERZBANK AG NY BR (Germany)	1/5/2009	2.00
26	9/18/2008	WASHINGTON MUT BK	9/22/2008	2.00
27	6/20/2008	BANK OF AMER NA	6/23/2008	1.70
28	4/10/2008	BNP PARIBAS EQUITABLE TOWER B (France)	4/11/2008	1.64
29	9/22/2008	ABCP - JPMORGAN CHASE BK	9/29/2008	1.15
30	9/29/2008	BANK TOK-MIT UFJ NY BR (Japan)	10/8/2008	1.00

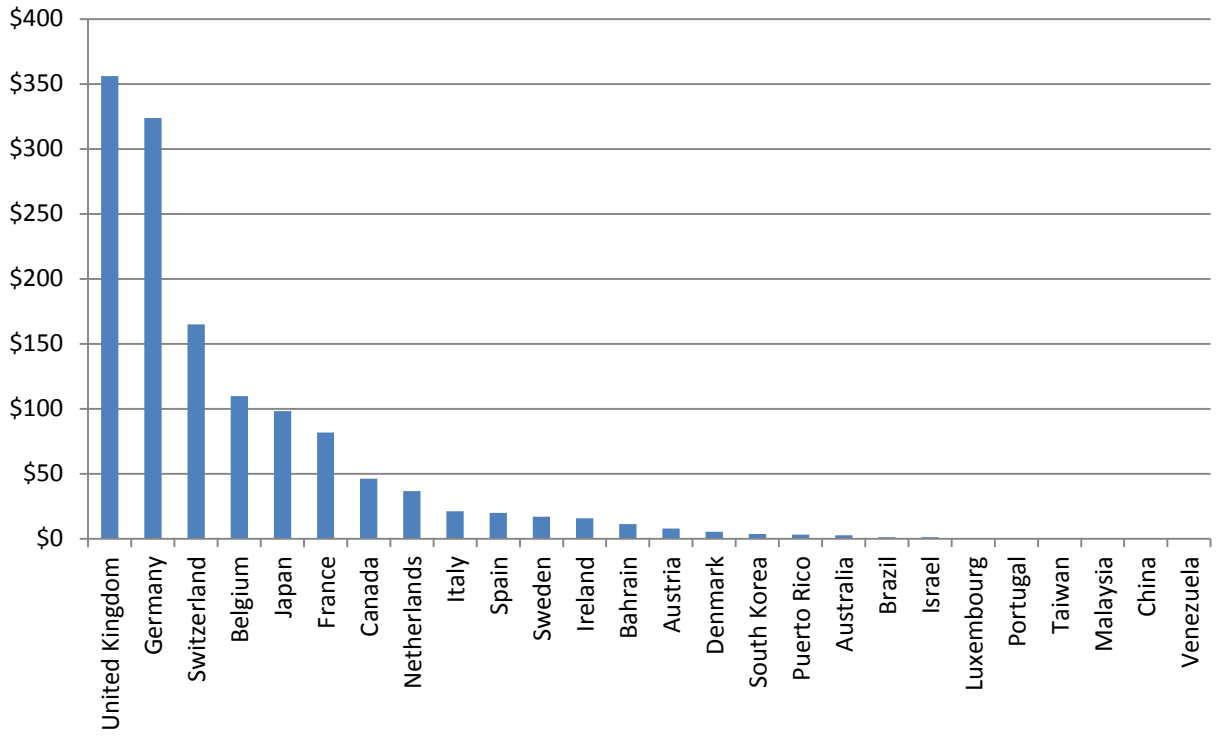
Source: *Bloomberg News* released the Fed's court-ordered data files in raw form at http://cdn.gotraffic.net/downloads/30110331_fed_release_documents.zip. The discount window data are included in Bloomberg's spreadsheets at http://bit.ly/Bloomberg-Fed-Data

Table 5: Dollar Liquidity Swap Lines with Foreign Central Banks

Foreign Central Bank (date announced)	Number of Transactions	Peak Amount (Billions USD)	Peak Trade Date
European Central Bank (12/12/2007)	271	170.93	Oct 15 2008
Bank of England (09/18/2008)	114	76.31	Oct 15 2008
Bank of Japan (09/18/2008)	35	50.17	Oct 21 2008
Swiss National Bank (12/12/2007)	81	13.11	Jan 13 2009
Danmarks Nationalbank (09/24/2008)	19	10.00	Oct 24 2008
Sveriges Riksbank (09/24/2008)	18	10.00	Oct 15 2008
Reserve Bank of Australia (09/24/2008)	10	10.00	Sep 26 2008
Norges Bank (09/24/2008)	8	7.05	Jan 27 2009
Bank of Korea (10/29/2008)	10	4.00	Dec 2 2008
Banco de Mexico (10/29/2008)	3	3.22	Apr 21 2009
Bank of Canada (09/18/2008)	0	0	-
Reserve Bank of New Zealand (10/28/2008)	0	0	-
Banco Central do Brasil (10/29/2008)	0	0	-
Monetary Authority of Singapore (10/29/2008)	0	0	-

Notes: These data cover the swap agreements that ran between December 1, 2007 and February 1, 2010. Peak amount represents the largest dollar swap transaction under the arrangement. Peak trade date indicates the date the largest swap took place. The central banks of Canada, New Zealand, Brazil, and Singapore did not draw on their swap lines. These data are derived from the Fed's disclosures at http://www.federalreserve.gov/newsevents/reform_swaplines.htm

Table 6: Peak Amount of Debt Owed to the Federal Reserve by Foreign Banks, by Country (Billions, USD)



Notes: Peak debt to the Fed is the largest daily outstanding amount owed to the Fed by all banks in a country (in billions of U.S. dollars) during the August 1, 2007 to April 30, 2010 period. The aggregation includes direct foreign bank borrowing from six broad-based Fed facilities—AMLF, CPFF, PDCF, TAF, TSLF, ST OMO—plus borrowing at the discount window. The table does not include indirect borrowing from the dollar swap line program. Data are from the Bloomberg spreadsheets at http://bit.ly/Bloomberg-Fed-Data.

Table 7: U.S. Bank Exposure and the Fed's Selection of Central Banks for Dollar Swap Lines

	(1) Swap Line	(2) Swap Line	(3) Swap Line	(4) Swap Line	(5) Swap Line
US Bank Exposure	118.967***	137.029***	154.809***	148.454***	76.115***
	(33.817)	(46.285)	(37.379)	(46.113)	(22.841)
Share World GDP		-20.032	70.759	40.099	
		(37.783)	(54.883)	(64.406)	
Share World Liquid Liabilities		-12.812	-50.736**	-46.584**	
		(15.668)	(20.037)	(23.189)	
US Trade Share			-14.603	-8.436	
			(14.273)	(16.411)	
Inflation			-0.609***	-0.800***	-0.351**
			(0.182)	(0.277)	(0.139)
Dollar Shortage				-0.004	-0.031***
				(0.005)	(0.012)
Global Financial Center					4.552**
					(2.178)
Constant	-2.202***	-2.129***	-0.592	0.866	-0.310
	(0.231)	(0.245)	(0.444)	(0.824)	(0.586)
Observations	149	122	117	32	38
Model	probit	probit	probit	probit	probit
Pseudo R-Squared	0.594	0.622	0.728	0.679	0.600
P-Value	0.000435	0.00195	0.00000591	0.0201	0.00244
Log Pseudolikelihood	-18.85	-15.66	-9.906	-6.619	-9.761
Wald Chi-Squared	12.38	14.85	32.01	15.02	16.48

Robust standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Probit models of the binary dependent variable SWAP LINE which equals one when the FOMC selected a foriegn central bank for a dollar swap line, zero otherwise. Since the ECB received a swap line for all its members countries, I code a single observation for the Euro zone and sum (or average, where appropriate) values of covariates for its members.

Table 8: U.S. Bank Exposure and the Fed's Foreign Lending from its Emergency Facilities

	(1) Share Fed Lending	(2) Share Fed Lending	(3) Share Fed Lending	(4) Share Fed Lending
US Bank Exposure	1.320***	1.171***	0.731***	1.227***
	(0.178)	(0.194)	(0.228)	(0.260)
Share World GDP		0.601	1.482**	0.607
		(0.935)	(0.742)	(0.726)
Share World Liquid Liabilities		-0.165	-0.486**	-0.299
		(0.245)	(0.240)	(0.281)
Global Financial Center			0.086**	0.042
			(0.037)	(0.034)
US Trade Share			-0.516***	-0.323*
			(0.138)	(0.162)
Inflation			-0.000	0.000
			(0.000)	(0.000)
Dollar Shortage				0.000
				(0.000)
Constant	-0.002*	-0.003	-0.002*	-0.009**
	(0.001)	(0.002)	(0.001)	(0.003)
Observations	160	133	129	32
Model	OLS	OLS	OLS	OLS
R-Squared	0.614	0.626	0.806	0.869
P-Value	0.000000	0.000000	0.000000	0.000000

Robust tandard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: OLS regressions where the dependent variable is peak lending by the Federal Reserve to the banks and non-banks of a foreign country as a share of the Fed's total peak lending to all foreign banks and non-banks during the financial crisis (see the text for details).

Table 9: Democrats Voting on Ron Paul's 2012 "Audit the Fed" Bill (H.R.459)

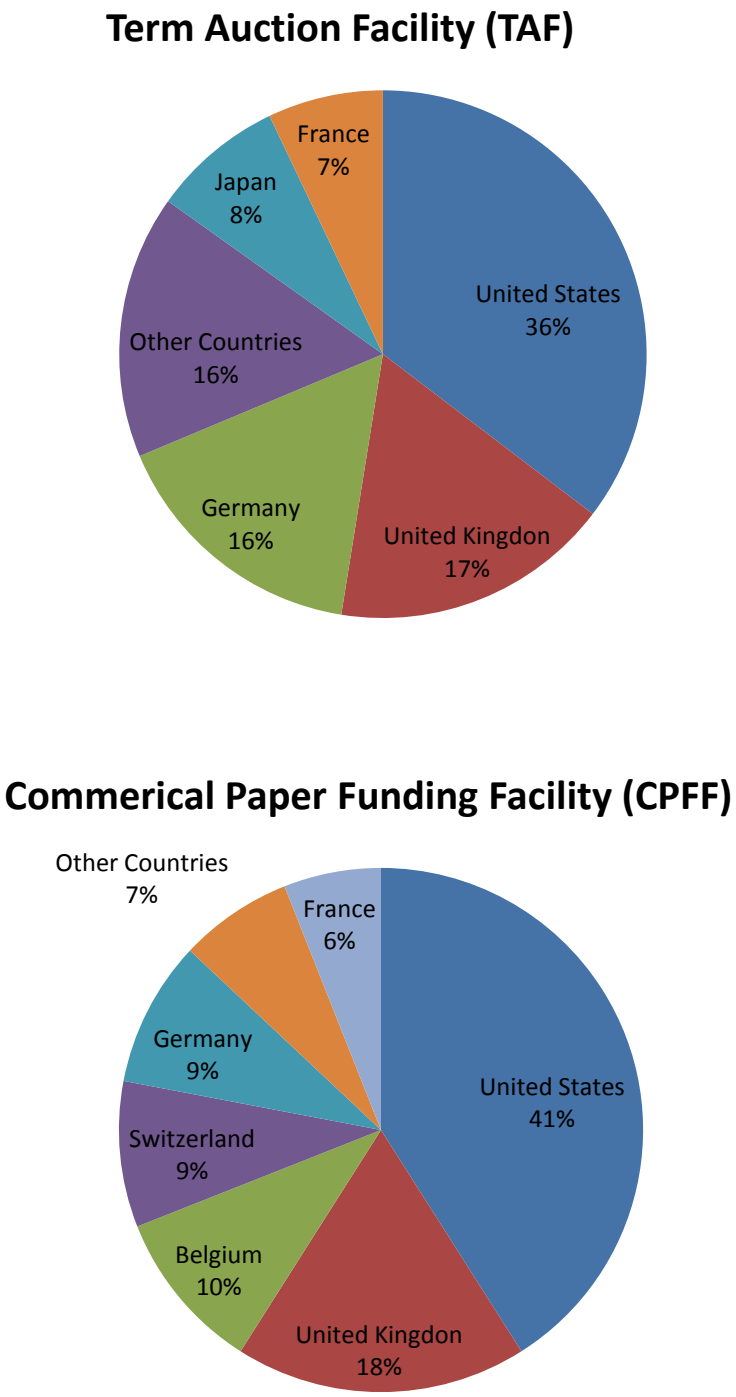
	(1) Vote=1	(2) Vote=1	(3) Vote=1	(4) Vote=1
Bank Contributions	-71.374***	-98.931***	-94.910***	-100.845***
	(26.214)	(27.838)	(28.010)	(33.400)
DW-Nominate		3.650***	3.571***	2.876***
		(0.850)	(0.870)	(0.934)
Share Social Security			1.771	2.268
			(2.920)	(3.137)
Foreclosure Rate			10.656	9.732
			(15.617)	(16.419)
Bank HQ				-0.055
				(0.666)
Chamber Senority				-0.065***
				(0.022)
Finance Committee				0.143
				(0.334)
Constant	0.085	1.666***	1.283*	1.403**
	(0.107)	(0.375)	(0.670)	(0.701)
Observations	186	174	174	174
Model	probit	probit	probit	probit
Pseudo R2	0.0248	0.122	0.125	0.160
P-Value	0.00647	0.00000130	0.0000224	0.00000220
Log Pseudo-likelihood	-125.6	-105.8	-105.5	-101.3
Wald Chi2	7.413	27.10	26.74	38.73

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Robust standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

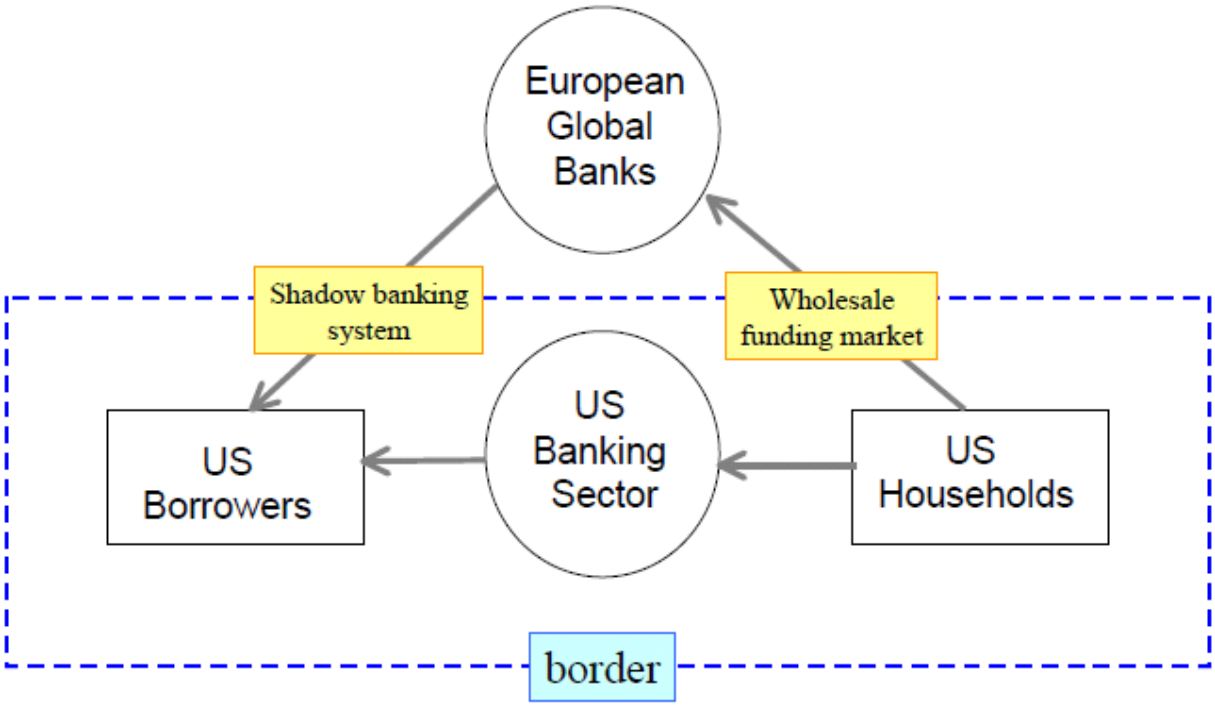
Notes: The analysis is of Democrats only since all but one Republican voted for H.R.459. DW-NOMINATE measures the "left-right" ideology of representatives and ranges from -1 to 1, with higher values indicating a more right-wing ideology. See the text for the definitions of other variables. Sample size drops in Model 2 because DW-NOMINATE scores for freshman elected in 2010 are not yet available.

Figure 1: Total TAF and CPFF Borrowing by Country of the Parent Company



Notes: Reproduced from United States General Accounting Office (2011), Figure 10, p.134.

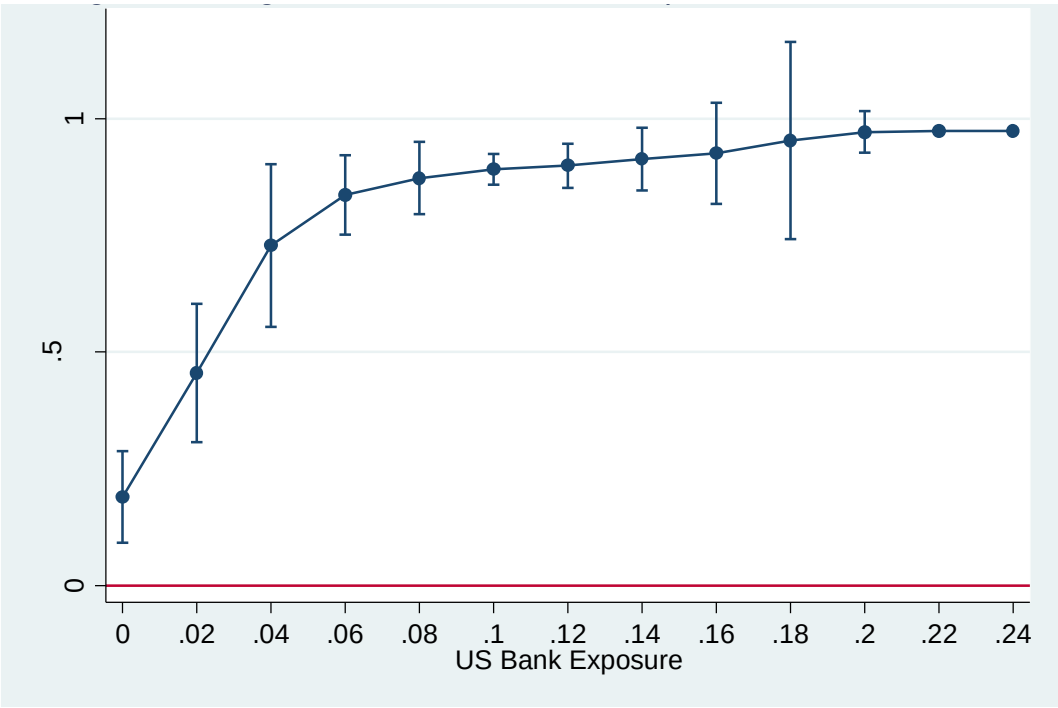
Figure 2: Cross-Border Banking and the Onset of the Dollar Liquidity Crisis



Source: Shin, Hyun Song. 2012. "Global Banking Glut and Loan Risk Premium." *IMF Economic Review* 60, 2 (July): 155-192.

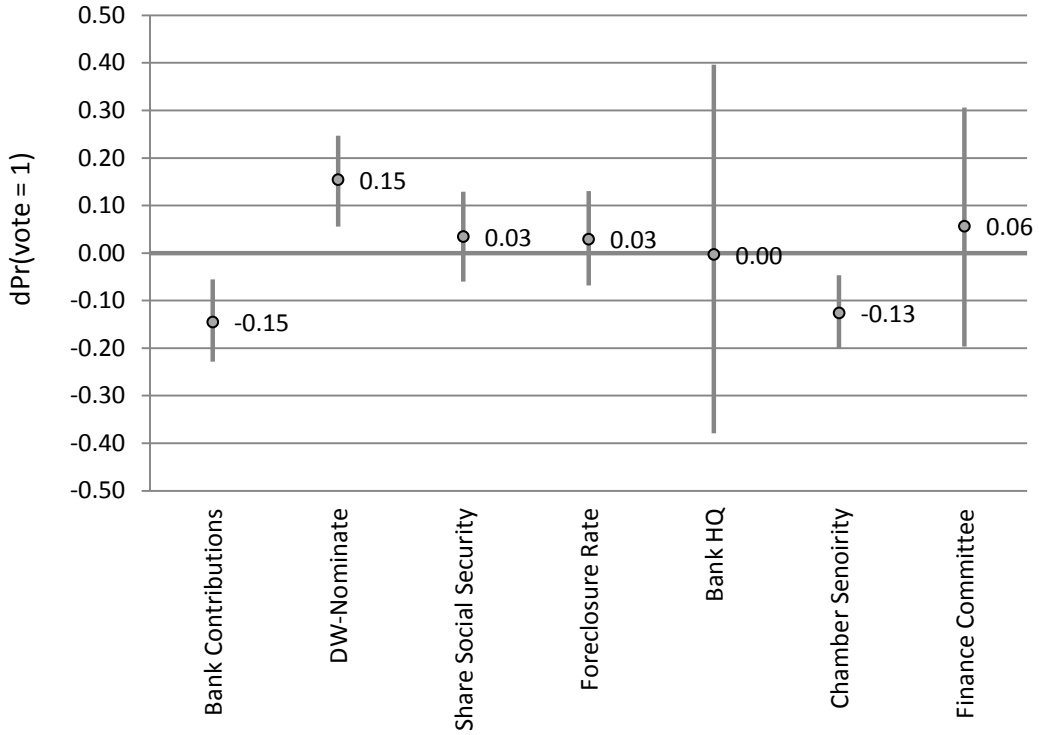
Notes: After 1999, foreign banks, particularly in Europe, began investing heavily in U.S. subprime assets via the shadow banking system. They funded these asset purchases by borrowing dollars in U.S. wholesale markets, particularly from U.S. money market funds. When these wholesale funding markets froze up in October 2008 after the Lehmann failure, foreign banks could not roll-over their short-term dollar liabilities. In response to this dollar liquidity crisis, the Federal Reserve served as global lender-of-last-resort, creating liquidity to meet the (largely foreign) demand for U.S. dollars.

Figure 3: Marginal Effects of U.S. Bank Exposure on SWAP LINE



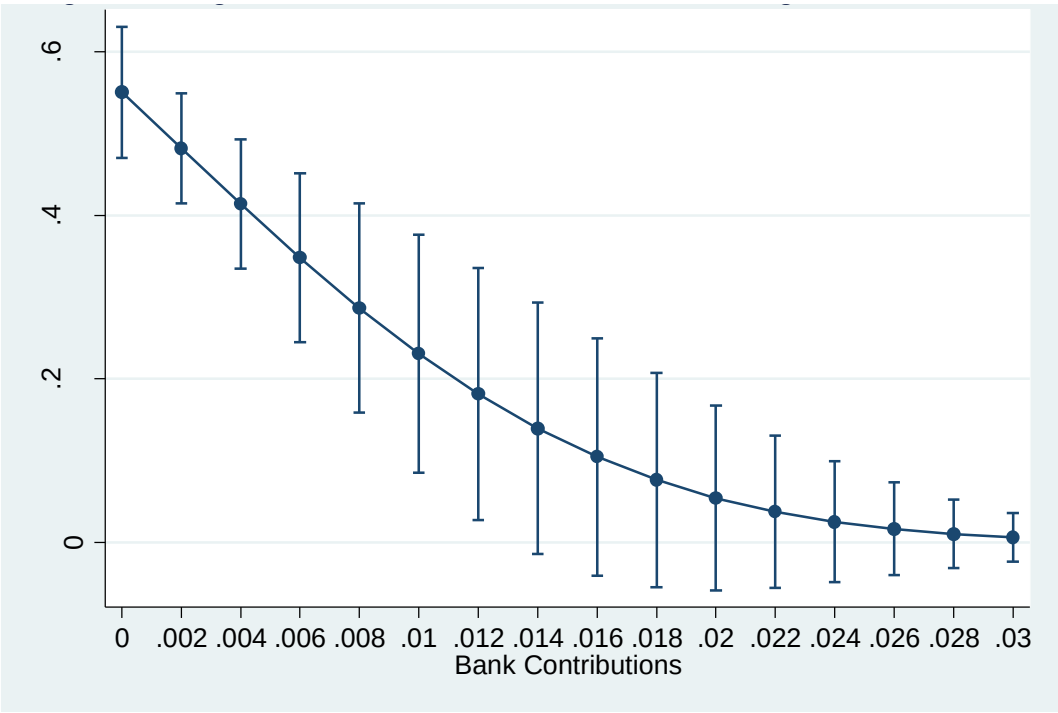
Notes: Predictive margins with 95 % confidence intervals of receiving a swap line from the Fed using Model 5 from Table 7, holding covariates to their means (or mode = 0 for Global Financial Center), while increasing U.S. BANK EXPOSURE from its minimum to its maximum value.

Figure 4: Substantive Effects on Voting to "Audit the Fed" by House Democrats



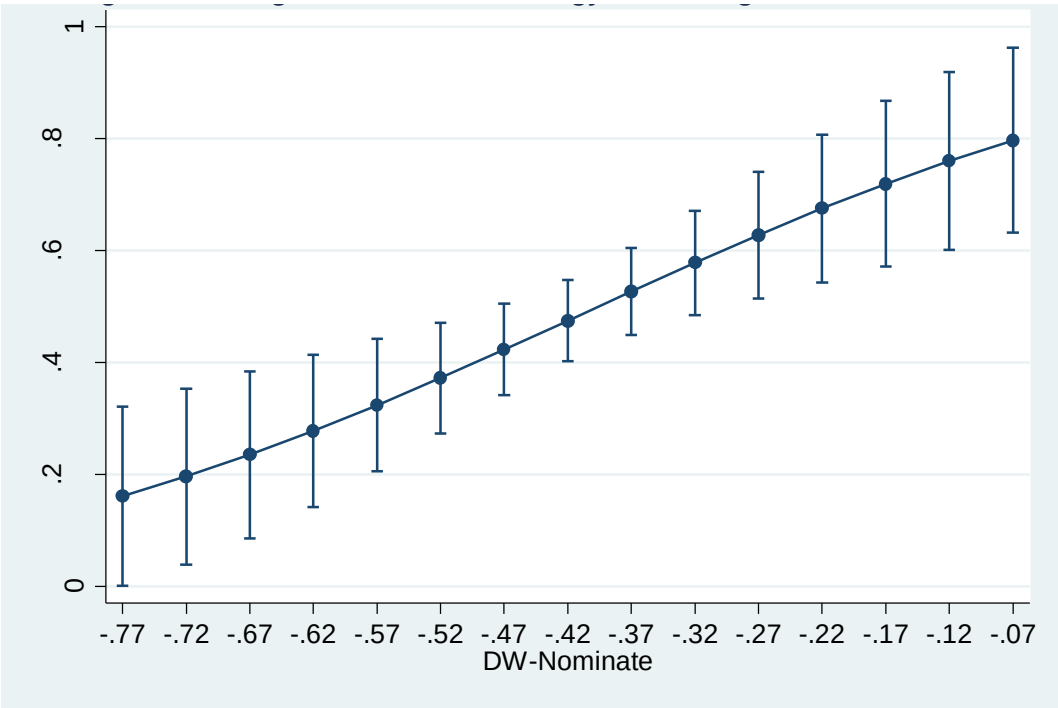
Notes: The figure displays first difference in the predicted probability that a House Democrat would vote in favor of Ron Paul's "Audit the Fed" bill (H.R. 459) caused by increasing each covariate by one standard deviation above its mean while holding all other covariates at their means (or modes for indicator variables). Error bars indicate the 95% confidence intervals. DW-Nominate measures members' ideological position on a left-right scale, with larger values indicating a more right-wing ideology.

Figure 5: Marginal Effects of Bank Contributions on Voting to Audit the Fed



Notes: The figure displays the predicted marginal effects and 95% confidence intervals of BANK CONTRIBUTIONS on voting "yes" to audit the Fed. The estimates are based on partial derivatives from Model 4 in Table 9.

Figure 6: Marginal Effects of Ideology on Voting to Audit the Fed



Notes The figure displays the predicted marginal effects and 95% confidence intervals of BANK CONTRIBUTIONS on voting "yes" to audit the Fed. The estimates are based on partial derivatives from Model 4 in Table 9.

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Appendix 1: Correlation Matrix for the SWAP LINE Regressions

	BankExposure	ShareWorldGDP	ShareLiquidLia~	USTradeShare	Inflation	DollarShortage	GlobalFinCen~
BankExposure	1						
ShareWorldGDP	0.6479	1					
ShareLiquidLia~	0.4734	0.8801	1				
USTradeShare	0.3409	0.6256	0.44	1			
Inflation	-0.157	-0.1636	-0.1506	-0.1532	1		
DollarShortage	-0.4219	-0.0665	0.1893	-0.0473	-0.0774	1	
GlobalFinCen~	0.6004	0.4732	0.5008	0.3925	-0.1977	0.1942	1