Can a Bank Run Be Stopped?
Government Guarantees and the Run on Continental Illinois

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Abstract

This paper analyzes the run on Continental Illinois in 1984 and the effect of the government's response, which included an extraordinary guarantee of all liabilities of the bank and a commitment to provide ongoing liquidity support. We find that the support efforts by bank regulators were partly successful, as the funding outflows slowed after the initial dramatic run, but nevertheless the outflows did not end. Among domestic bank counterparties, liquidity preferences appear to have played a role in the early run on Continental, while in subsequent months the size of banks' exposures to Continental became more predictive of their making large withdrawals. Among other counterparties, the initial run was heaviest among money market institutions, and these institutions were also the least likely to return funding to Continental. Finally, we show that the concentration of holdings of Continental's liabilities was a key dynamic in the run and was importantly linked to Continental's systemic importance.

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1 Introduction

Continental Illinois (Continental) was a major US commercial bank that experienced a massive and widely publicized run by its short-term creditors in May 1984.[1] Out of fear that Continental's failure would have broad fallout in the financial system, federal regulators provided the bank with several forms of support, including funding from the Federal Reserve and the FDIC, and an exceptional guarantee of all of the bank's creditors by the FDIC (FDIC 1997, 1998). These actions calmed the situation temporarily, but troubles at the bank persisted and two months after the run started, the FDIC essentially took over the bank to rehabilitate it. Eventually, Continental was recapitalized and reprivatized; previous shareholders were wiped out and the FDIC absorbed serious losses. This episode is well known for elevating the neologism "Too Big to Fail" in public consciousness and prompting a national discussion about very large banks.[2]

In this paper, we study the run on Continental and the impact of the government response, particularly the FDIC's guarantee of all bank liabilities. To do so, we use a remarkable data set, comprising daily data on broad aggregates of Continental's liabilities and monthly data on the holdings of Continental's liabilities by a large number of individual institutions. The daily data quickly reveal that the run on Continental was immense and extremely swift. In just 9 days, 30 percent of the firm's previous funding had left and was replaced by new funds from the government and a support coalition of private banks. In addition, the government's announcement of support had only a modest impact in stemming the run among Continental's creditors. The pace of the run diminished, but private counterparties continued to withdraw their funds from Continental until a permanent support program was put in place. After that private investors slowly returned.

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[1] We generally use the phrase "Continental" to refer to the entire bank holding company, Continental Illinois Corporation (CIC). The main subsidiary of CIC was Continental Illinois National Bank, which held the great bulk of CIC's assets. Where specificity is needed we refer specifically to the holding company or the bank subsidiary.

[2] The connection between the bailout of Continental and the origins of the phrase "too big to fail" in the bank regulatory lexicon may have arisen during Comptroller of the Currency Conover's testimony on September 19, 1984 to the House subcommittee on Financial Institutions, Supervision, Regulation, and Insurance. In the session, Congressman St Germain asked Conover whether he could foresee letting one of the eleven international money center banks fail and Conover admitted that, in the absence of a way of handling a large bank subsequent to its failure, he could not. Congressman McKinney promptly labeled these large banks as "too big to fail" (Conover 1984, p. 300). The press had been using the phrase "too big to fail" since at least July 1984, but this is often considered the first time a government official indicated that large banks might not be allowed to fail.

With the monthly data we are able to characterize the types of counterparties that were more likely to participate in the run, and conditional on participating, those that tended to withdraw larger portions of their funds. The initial run was heaviest among money market institutions (including money market funds, brokers, and other institutional investors involved in money markets), which are generally quite risk averse, as well as domestic banks. Foreign institutions and municipal creditors withdrew a smaller portion of their funds during the initial run.

Many of Continental's creditors were US depository institutions. For those institutions, we gather additional information and estimate a simple model to predict which participated in the run, and by how much. Early on, in the run that occurred during May, liquidity preferences appear to have played a role in the likelihood of banks' withdrawing large amounts. After May, we find a different pattern in which banks that were most exposed to Continental, in proportion to their assets, were more likely to mitigate those exposures by withdrawing. Throughout both periods smaller banks and more physically distant banks tended to withdraw more funds from Continental.

The last part of this paper describes how the concentration of funding in a small number of large accounts had important implications in this episode. While many large financial institutions provided funds to Continental, the distribution of the size of liability holdings was heavily skewed: A few institutions were responsible for a significant amount of Continental's funding. Consequently, while a broad set of creditors withdrew funds from Continental, the outflows were quite concentrated among the largest creditors. For example, Continental's largest 25 creditors as of April 1984 withdrew about $2 billion from April to August, roughly 6 percent of the bank's total liabilities and about 30 percent of the total withdrawals. Each of these large creditors was owed tens or hundreds of millions of dollars, far above the insurance limit. Such large short-term creditors have long played key roles in deposit runs, and remain important features of the banking system today. They deserve special focus in planning for potential future crises.

Some of the largest providers of funding for Continental were money market mutual funds. It is highly likely that these institutions would have suffered losses and "broken the buck" in the event that Continental had been allowed to fail. As money market funds were important

providers of funds to many other large financial institutions, even at this time, problems at money market funds would likely have had systemic consequences.[3] The funding data also indicate that several large banking institutions had significant exposures to Continental and that these institutions may have faced significant losses. Thus, even if the government support did not stop the funding drain on Continental, it does appear to have been important in preventing serious spillovers to other institutions and thus in containing the crisis.

These findings have important lessons for policymakers. One lesson is that a guarantee of liabilities by the FDIC may not be effective in stabilizing the funding of troubled institutions. In the future, one method for dealing with an insolvent but systemically important depository institution could be for the FDIC to place it into a special type of receivership, using its new Orderly Liquidation Authority. This type of receivership is intended to provide for the resolution of a firm in the long run, but the preservation of the firm's systemically important operations in the short run. Under such circumstances, an important question is whether the FDIC would be able to convince short-term creditors to stay. Continental's experience suggests that obtaining sufficient financing from private sources to keep the firm operating while in receivership may be difficult.

This paper adds to our understanding of the impact of general guarantees for a financial institution's creditors. Scholars have noted that, during financial crises, a government guarantee of the liabilities of private financial institutions, like the one put in place for Continental, is one of the strongest responses that can be employed (Estrella 2001, Tanaka and Hoggarth 2006). For example, the U.S. Treasury issued a guarantee of money market mutual fund investments to stop a run on those funds during the financial crisis of 2008 (Bernanke 2009, McCabe 2010). The U.K. government similarly issued a guarantee, in addition to other support, in response to the run on Northern Rock in 2007 (Shin 2009). Likewise, the Swedish government implemented a bank support program to arrest the Swedish banking crisis in the early 1990s (Ingves and Lind, 1996). We find that the FDIC and Federal Reserve support appeared effective in calming some of the investors who may have been somewhat more susceptible to some spillovers from the

[3] While it is not clear that any difficulties would have approached the troubles that occurred in the wake of the Lehman Brothers bankruptcy and the "breaking of the buck" by Reserve Fund, it is likely that there would have been significant dislocations.

Continental episode, but investors who had substantial exposures directly to Continental still tended to reduce those exposures.

Finally, our paper also adds to a literature which looks at the behavior of depositors during a run. A small number of papers examine the behavior of individual actors, such as Brown, Guin, and Morkuetter (2013), Kelly and Ó'Gráda (2000), Ó'Gráda and White (2003) and Iyer and Puri (2012). These papers improve our understanding of the factors that motivate runs and can give insights into what actions by policymakers in response to a run are most effective. The current literature finds that information flows within social networks often played a role in bank funds. However, these papers focus on small depositors, in most instances at small savings banks. Our paper adds to the literature by using, for the first time, data on a large commercial bank with information on individual large institutional counterparties where developments were headline events at newswires and in major newspapers.

The paper proceeds as follows. Section 2 provides an overview of the crisis at Continental. Section 3 discusses the dynamics of various deposit aggregates during the crisis and section 4 discusses the responses to the FDIC guarantee along with how the responses compared to other instances of government support. In section 5 we examine the composition of liability holders and discuss which counterparties were more likely to run. Section 6 discusses the distribution of liabilities, and the role that concentration played in the run and in shaping Continental's systemic importance. Section 7 concludes.

Section 2. Overview of the 1984 Crisis at Continental Illinois

Continental was the eighth largest bank in the United States in 1984, following rapid growth over the previous several years. Continental's troubles began on the asset side, as the credit quality of Continental's loans to oil and gas companies deteriorated in the early 1980s. Some of these loans had been acquired from Penn Square Bank, which failed in 1982. Market participants also became concerned about Continental's loans to entities in developing countries in the Americas, particularly after Mexico's default in 1982. Because of these developments, Continental's earnings release in April 1982 was taken badly by market participants. The release contributed to downgrades of its credit and debt ratings by rating

agencies later that year, and also to downgrades by stock analysts of its earnings estimates.[4] This scrutiny created difficulties on the bank's liability side as well. Continental had always been limited in its retail deposit network, since Illinois law forbade any branching. To fund its expansion, the bank aggressively competed for wholesale deposits. After Penn Square's failure, Continental increasingly raised funds in the Eurodollar market rather than in the domestic commercial paper market, and its funding costs increased.[5]

Table 1 shows the degree to which the bank had funded its expansion by aggressively competing for wholesale deposits, rather than by the means of a retail banking business. The table reports a simple breakdown of Continental's liabilities at the end of the first quarter of 1984. The bank was particularly dependent on foreign deposits (typically eurodollar deposits) which accounted for more than 40 percent of the bank's liabilities, nearly twice the amount of domestic deposits. (Note that domestic banks as well as foreign banks supplied money to Continental through the eurodollar market.) Continental maintained correspondent relationships with a large number of domestic banks and held significant balances connected to these relationships. Continental also provided a variety of services to institutions involved with Chicago financial markets, and some of those institutions maintained balances with Continental in connection with those services. Additionally, Continental funded itself with a moderate amount of funds purchased on the federal funds and repo markets.

Continental's insurance coverage for its deposits was quite low, with only around 15 percent of deposits insured by the FDIC. The low coverage was due to Continental's reliance on foreign deposits, which are not eligible for FDIC insurance, and the fact that only about 40 percent of its domestic deposits were covered by the insurance.[6] Moreover, Continental had a substantial number of other domestic liabilities that were not covered by insurance.

Table 2 compares Continental with the other banks comprising the largest 20 in the country, by assets, as of March 1984. The table indicates clear credit quality problems at Continental, with elevated delinquency rates, charge-off rates, and provisioning for future losses, as well as lower profitability. Continental's reliance on foreign funds and on fed funds and repos

[4] Moody's rated the firm Aaa in 1981 but only A3 in 1983 (Moody's Investor Service 1981 and 1983).
[5] This paragraph draws on FDIC (1997, 1998) and US Congress (1984), pp. 54-57.
[6] The most up-to-date insurance coverage information prior to the May 1984 run is from the June 1983 call report.

were also elevated compared to its peers. The average interest rates it paid for its funds is about in line with this set of peers, though.

In late April 1984, Continental announced that an increase in nonperforming loans to $2.3 billion. This announcement may have increased investor concerns about the bank's prospects.

Starting about May 7, 1984, rumors circulated that the bank could fail or be forced to seek a merger. On Tuesday May 8, 1984, this rumor, along with a denial by Continental, appeared in Dow Jones Capital Markets Reports. These articles reportedly made financial market participants even more concerned about the financial health of Continental and precipitated a run on the bank.[7] Consequently, Continental's funding situation deteriorated as investors either refused to roll over eurodollar deposits or demanded significantly higher rates for renewal. Continental also had difficulty placing large CDs, and investors holding outstanding CDs reportedly tried to dump them in the secondary market (Bailey and Zaslow 1984). To address its funding problems, Continental turned increasingly to the discount window (FDIC 1997, Kilborn 1984, Rowe 1984).

The banking industry rallied to support Continental. On Monday, May 14, Continental announced that 16 of the nation's largest commercial banks had agreed to provide the firm with $4.5 billion in short-term credit (Bailey, Carrington, and Hertzberg 1984).[8] This action was reportedly taken in part to shore up the confidence of financial market participants, especially overseas investors, and prevent the crisis from spreading. There were some indications that the provision of this facility eased general conditions; interest rates retreated somewhat and the Wall Street Journal reported that markets for managed deposits were calmer (Bailey, Helyar, and Hertzberg 1984). However, other reports indicated that the run on Continental continued as foreign depositors refused to renew CDs and Continental's sources for eurodollar funding were being withdrawn (FDIC 1997; Sprague 1986, p.154).

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[7] Once the run started, rumors really started flying. The Wall Street Journal reported that "at one point word was spreading at the Chicago Board of Trade that Continental's traders had been abruptly called off the floor at the same time Continental's traders were in prominent view on the other side of the bond trading pit" (Bailey and Zaslow 1984).

[8] Reports from the time widely noted that the Federal Reserve had a tacit role in the formation of this coalition, by providing private assurances to the coalition members that Continental would be able to borrow up to $17 billion from the discount window based on collateral already on deposit with the Chicago FRB. See Rowe (1984b) and Bennett (1984). The Federal Reserve's first public statement regarding Continental came on May 17.

On Thursday May 17, continuing pressures on Continental led the FDIC, Federal Reserve, and the Office of the Comptroller of the Currency to create a temporary assistance plan announced in a joint news release. This program was a combined effort by these regulatory agencies and commercial banks. Most importantly, the FDIC announced that it would guarantee all deposits and general creditors of Continental.[9] The press release stated the FDIC's guarantee clearly, but briefly and with few details:

> In view of all the circumstances surrounding Continental Illinois Bank, the F.D.I.C. provides assurance that, in any arrangements that may be necessary to achieve a permanent solution, all depositors and other general creditors of the bank will be fully protected and service to the bank's customers will not be interrupted.

This guarantee was particularly important given Continental's low level of insurance coverage; the FDIC (1998) reported that at this point, Continental had about $3 billion of insured liabilities and $30 billion of uninsured liabilities. The guarantee covered all the creditors, including the uninsured liabilities. Liabilities of the bank holding company excluding the bank were not covered, although these were generally small (Moody's reports that at the end of 1983, liabilities of the consolidated company were $40.3 billion of which nonbank subsidiaries accounted for $1.2 billion).

In the same press release, the FDIC also announced an injection of $2 billion into the bank in the form of subordinated notes provided by itself and a group of commercial banks The Federal Reserve stated that it would meet extraordinary liquidity needs, without many further details. Finally, the $4.5 billion short-term credit facility from sixteen commercial banks, which had been initiated on May 14, was replaced by a $5.3 billion line of credit to Continental from a consortium of 24 banks.[10]

The regulators stated that the assistance package and guarantee were needed to maintain confidence and prevent the run on Continental from spreading to other large banks (Conover 1984, and Volker 1984). Of particular concern was that the run on Continental would cause

[9] Before Continental, we know of one instance in which the FDIC gave an explicit general guarantee of all creditors to a depository institution: Greenwich Savings Bank in 1982 (see p. 223 of the FDIC (1997), chapter 6). Nevertheless, Continental's guarantee was of much greater significance given Continental's size and systemic importance. In other instances prior to Continental and Greenwich the FDIC had provided open bank assistance to troubled institutions. This assistance involves capital injections, therefore providing protection to the general creditors of the institutions being assisted, but not explicit guarantees.

[10] Soon thereafter, four additional banks joined the group to provide loans.

problems at other large institutions. The chair of the FDIC argued that "the funding problem at Continental was beginning to affect financial markets generally. Something needed to be done quickly to stabilize the situation" (Isaac 1984, p. 459). FDIC Board Member Irvine Sprague reported that regulators believed the collapse of Continental would cause funding difficulties at other large banks which in turn would likely bring down two large (unnamed) institutions (Sprague 1986, p. 155). These concerns were reportedly reflected in market data; Bailey and Zaslow (1984) reported a widening of spreads between rates on Treasury Bills and bank CDs for banks other than Continental.[11] Further, Continental had numerous correspondent banks and the FDIC maintained that the deposits of these smaller banks needed to be guaranteed to keep these institutions from failing (Conover 1984, FDIC 1997). Isaac (1984, pp. 470-474) noted that even if some of the smaller banks might not have failed had Continental closed, they might have experienced liquidity problems and decreased profitability while Continental was being liquidated.

The initial response by regulators and other commercial banks was meant to assure investors that there would be sufficient capital, liquidity, and time to arrange an orderly resolution did appear to calm markets for a time. However, starting in late June, concern gradually re-emerged about the viability of Continental and the bank experienced renewed outflows of deposits. On July 26, federal regulators announced a permanent assistance plan (FDIC 1998). Under this plan, the FDIC acquired $1 billion in preferred stock in Continental's holding company (an 80 percent stake), with the ability to convert these shares into common stock at a later date. The FDIC also assumed Continental's liabilities to the discount window, which had been hovering between $2 billion and $4 billion, and in return received an equal amount of loans held by Continental in its asset portfolio, along with an option to buy stock in Continental at a rate that depended on the recovery rate on the loans. The Federal Reserve also agreed to continue to provide liquidity assistance (and the commercial banks continued to extend a line of credit). The permanent assistance plan was put into place in September, and was successful in preventing Continental from being closed. Discount window borrowings by the

[11] Similarly, Goldsmith-Pinkham and Yorulmazer (2010) find that when the British bank Northern Rock experienced a run that other banks paid more for their money market and interbank liabilities, especially those more depending on money market funding.

bank edged up briefly following the July announcement, but then declined steadily as the firm was able to use market sources to a greater extent. Financial markets remained orderly. However, the assistance plan was one of the most expensive ever arranged by financial regulators at the time: the FDIC estimated its cost for the bailout at $1.1 billion and Continental's shareholders were essentially wiped out.[12]

Section 3. The run by type of liability

Daily data on Continentals' liabilities from May 8 to August 29 (along with the level at the end of 1983), presented in Figure 1, show the timing of the outflows on an aggregate basis.[13] As shown in the figure, between the end of 1983 and May 8, there was only a slight decline in Continental's liabilities. Once the run started, there was a rapid decline in Continental's liabilities from the general private sector. Between May 8 and May 17, these private sector funds declined by about $10 billion, which represented about 30 percent of Continental's liabilities. These were largely replaced by funds from the government—either the FDIC or the Federal Reserve—and the private sector through the support collation of large banks. Altogether, this support quickly totaled almost $9 billion.

The announcement of the interim support package arrested the steep run-off in deposits, as non-support liabilities were roughly stable for a while. However in late June and early July there was a renewed decline in these liabilities. Between May 17 and July 26, when the permanent assistance program was announced, non-support liabilities declined by another $7 billion. Support by the government and bank coalition increased only $3.6 billion, so that total liabilities contracted. Even after announcement of permanent support, non-support liabilities continued to decline, but more modestly. At the end of August, the amount of such liabilities was nearly equal to the amount of liabilities provided by the government/coalition. Altogether, between May 17 and August 29, non-support liabilities declined $9 billion, almost as much as during the initial run. Thus, while the FDIC guarantee clearly slowed the withdrawal of funds, it also clearly did not completely convince creditors to remain.

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[12] If its losses exceeded $800 million, the FDIC's call option allowed it to purchase all 40.3 million of the holding company's outstanding stock shares at a price of $0.00001 per share, or about $400. The FDIC ended up exercising this option.

[13] This information was presumably provided to the Federal Reserve as part of the monitoring of the firm.

More detail regarding the composition of the decline in private, non-coalition liabilities is shown in Figure 2. All types of liabilities declined during the run on Continental. The steepest drop occurred in federal funds purchased and reverse repurchase (repo) transactions, which contracted 77 percent.[14] These liabilities rebounded following the interim support announcement and then were generally flat (though at about half their pre-run level). International deposits contracted by about 22 percent during the run. The rate at which these deposits contracted slowed only slightly following the announcement of the guarantee of the bank's liabilities. Domestic deposits fell quickly amid the run, though not as quickly as the other categories.[15] These liabilities continued to ebb over subsequent weeks and declined about 30 percent between May 17 and July 26. After the announcement of the permanent assistance package, these liabilities appear to have stabilized.

Thus, the interim support announcement appears to have been successful in stopping the run in some of the most volatile funding sources—federal funds and repos, which tend to be overnight. However, other sources of funding do not appear to have been as strongly influenced by the guarantees.

Section 4. Composition of liability holders and runners

To analyze the composition of liability holders, and which were most likely to run, we also have data on the individual liability holdings of nearly 600 institutions at a month-average frequency during 1984.[16] The list was compiled by Continental's Treasury Services Division. (For brevity, we refer to these as the CTS reports.) It is not a complete list of all counterparties, and the selection process is unknown to us, but the list evidently comprises a group that Continental's Treasury department deemed important enough to track with a monthly report. We estimate that liabilities to these counterparties accounted for at least one-third of Continental's

[14] Many Eurodollar deposits had 3-month maturities, which could affect the rate at which this type of funding dropped. However; a House of Representatives Staff Report (House of Representatives 1984) found that in some cases Continental was forced to prepay such deposits.

[15] Domestic deposits includes items such as demand deposits, retail savings, commercial certificates of deposit, and commercial time deposits.

[16] Our data on the liabilities of Continental are from a memorandum provided by the Continental's Treasury Services Division entitled "January, 1985 CICorp Funding Concentration Report." This memorandum was included in the bank examination reports at the Federal Reserve Bank of Chicago.

total liabilities.[17] Not every counterparty contributed to funding to Continental in every month. Rather, in any given month, Continental typically had nonzero liabilities to about 350 to 450 of those in the panel.

For each month in 1984, the documents give the average amount of funding provided by each of the counterparties, which include domestic banks, foreign banks, money funds, brokers and investment banks, the U.S. government and its agencies, foreign governments, international institutions, corporations, and state and municipal governments, and others. The data cover all types of funding provided to Continental from these counterparties, including domestic and foreign deposits, federal funds, commercial paper, discount window loans, and other forms.

Section 4.1 Types of liability holders

We report the distribution of funding provided by institutions in our sample by type of institution in the first columns of Table 3. Just prior to the run, in April 1984, the most numerous group was domestic banks which, when including both those in and outside the support coalition, accounted for a bit less than 25 percent of the liabilities. Foreign banks were the largest by amount, holding a bit more than 30 percent of the liabilities, and also had the highest average balance. Money market institutions and foreign governments were also important funding sources for Continental and provided 18 percent of the funding covered in the CTS reports. A fairly sizeable number of corporations maintained balances at Continental, though these balances were generally of more modest size. Rounding out the sample are savings and loan associations and other customers, which primarily consists of municipalities.

Table 3 also shows how the positions of Continental's major short-term creditors changed between April, May, and August 1984. Across the whole period, from April to August, Continental gained $10 billion from federal government entities and the 28-bank coalition, but lost $7 billion from the other private counterparties identified in the CTS reports. (Note that

[17] Comparing these data to aggregates for the holding company filed in the Y9-C report form, we estimate the CTS documents capture the bulk of federal funds borrowings and about 65 percent of offshore deposits. In other areas, the CTS documents capture less, such as the domestic deposit market where our data cover only about 20 percent of the roughly $7 billion in domestic deposits. We view our data as most representative of large depositors that are least likely to be insured and most likely to run, and which are the types of depositors of most interest to us in this investigation. Finally, as over 95 percent of the liabilities of the holding company were in the commercial bank, most of the liabilities covered in our data reflect liabilities of the bank (and thus were covered by the FDIC's guarantee).

these data capture all of the institutions in Continental's support coalitions, but cover only a portion of the institutions withdrawing funds.) Withdrawals from these other counterparties were substantial, as the rate of decline was 19 percent between April and May and 53 percent between April and August. During the initial run, money market institutions (money funds, brokers, and investment banks, etc.) reduced exposures to Continental by over 35 percent. Savings and Loans reduced their exposure by over 50 percent. On the opposite end of the spectrum, foreign banks, foreign official institutions, and other customers had relatively low withdrawals rates during the run. Possibly, municipalities, in the other customer category, may have been reassured by collateral that Continental had agreed to post against their deposits, a typical practice for government funds. In the months shortly after the FDIC guarantee, from May to August, the percent declines in exposure for most groups was about the same as it had been for the single month covering the run period (which implies a notable decline in the rate at which exposures were reduced). The most notable exception is the foreign bank category, the institutions which had reduced their exposures the least during the initial run, which then withdrew at a notably faster pace.[18]

Section 4.2 Outflows in a cross section of banks

In this section, we further investigate the funding outflows by assessing whether counterparties with certain characteristics were more likely to make large withdrawals. We focus on domestic banks, as we are able to obtain detailed financial information on those institutions from regulatory filings. One caveat to this analysis is that, given the concentrated nature of Continental's funding that we will discuss in section 5, the cross sectional results may or may not translate into major aggregate funding movements, depending on whether or not the institutions supplying the largest amounts of funding to Continental conform with the average trends we identify.

[18] Similar patterns are also apparent when we examine withdrawal behavior at individual institutions. For example, we ran a simple regression (not shown) of a dummy variable—indicating a withdrawal of more than 50 percent from April to May—on dummies for each institution type. The results suggest that foreign banks, foreign and other customers were about 20-30 percentage points less likely to withdraw than the omitted group, corporations, and the other types had average withdrawal rates not statistically significantly different than corporations.

As a first step, we match as many domestic banks from the CTS reports as possible to data from the Reports of Income and Condition (Call Reports) on those institutions. While we are not able to verify the identity of every bank listed in the CTS reports because of the ambiguities of some of their names. we are able to successfully match 128 of the 136 domestic banks not in the support coalition and that provided nonzero funding to Continental in April or May 1984.[19] When analyzing the run from April to May, we exclude 19 banks that provided $300,000 or less in funding to Continental in April (to ensure that we are capturing the behavior of institutions whose incentives might have been affected by the deposit insurance limit, which was $100,000 at the time) and also one bank that is an outlier in terms of its capital position. Overall we have a sample of 108 banks for the initial run period.[20]

Given the modest number of institutions in the sample, we also use a limited number of variables to predict the extent to which each institution participated in the run on Continental. Summary statistics of these variables are shown in Table 4. We measure the size of each bank's exposure to Continental with the total funding provided as of April 1984 divided by assets, and we take the log of this measure since a handful of banks have very large exposures. We include log assets to measure the size of the institutions, and distance from Chicago to measure physical proximity to Continental, which could be correlated with other unobservable relationships between the banks and Continental. Banks in Illinois and the surrounding states may hold deposits with Continental for different reasons or have different views on the institution and its prospects compared to those located farther away. We have several additional balance sheet measures that help describe these institutions and their business models. To measure liquidity, we include the ratio of cash and Treasury securities over assets. To measure capital adequacy, we use the ratio of equity to assets. To account for performance, we include the ratio of the earnings before interest, taxes, and amortization to equity, as well as the overall delinquency rate. We include a measure of loans, excluding loans to depository institutions, to assets as a measure of business model. Lending to the banking sector and to Continental in particular is likely to

[19] For example, a common bank name such as "Bank of Commerce" without any information on its location could refer to many different banks.

[20] The results are generally robust to including the 19 banks that provided positive funding equaling $300,000 or less to Continental. The exclusion of the bank with the outlying capital ratio affects no results except for those relating to the capital ratio.

affect the bank's actions and we measure these exposures using total due from other banks to assets and funding provided to Continental in April 1984 to assets. We also include several measures of the liability structure including the ratio of borrowing via fed fund and repos to liabilities; the ratio of domestic large time deposits to liabilities, and an indicator of whether the bank raises at least five percent of its funds from foreign deposits.[21]

We look at deposit withdrawals during the initial run period (April to May) and during subsequent months (May to August).[22] We take the reaction in the first period as capturing primarily the response during the initial run period before the government response. However, since our data are monthly-average data, some portion of the change from April to May will reflect movements after the initial run in the first half of May. The period from May to August more clearly captures behavior after the government guarantees were put in place.

We focus on three types of outcome variables, in each period. The first is the percent of funding withdrawn from Continental (i.e. the negative of the percent change in funding). This measure is mechanically bounded above at 100 percent, since institutions cannot withdraw more than 100 percent of their funds, but by its nature is not bounded below. Some institutions have very large negative numbers by this measure because they increased their funding from relatively small initial levels, and as a result we bound this measure below at -100 percent. When using this outcome variable, we estimate a tobit regression to account for the institutions at the upper and lower bounds. Second, we also construct a dummy variable that indicates whether an institution withdrew more than 50 percent of its funds.[23] As a third approach, we sort the sample into quintiles by the percent change in funding, ranking the quintiles from 1 to 5, and estimate an ordered logit.[24] Compared to the tobit estimation, the use of quintiles has the advantage of not

[21] We use an indicator for the latter variable as it tends to be either zero or fairly substantial.
[22] Some other studies have found that, in other episodes, some liability holders withdrew funds in advance of the general run. For instance, Iyer, Puri, and Ryan (2013) look at a run on a bank in India and find that insiders and receivers of loans from the bank, i.e. individuals likely to be more informed, run first. We looked at withdrawals from January 1984 to April 1984 but did not find any such behavior. Few institutions completely removed funding from Continental during that period, and we find little association between bank characteristics at the end of 1983 and withdrawals. More aggregated, at the institution type level, the fractions of different institution types that reduced funding were roughly proportional to their shares in the overall funding base.
[23] This measure is close to that used by Iyer and Puri (2012), who use a threshold of 75 percent. Since we have monthly average data rather than daily data for the cross section, we consider a smaller threshold to be more appropriate, but report the larger threshold below as a robustness check and for purposes of comparison.
[24] Using deciles instead of quintiles yielded identical results.

imposing artificial bounds on the percent change in funding for banks that increased their funding by more than 100 percent.

April to May

The results for the initial period, from April to May, are shown in Table 5a. Here and in the subsequent tables, we report marginal effects, evaluated at the means of the independent variables, with robust standard errors in parentheses. In the first column, a positive coefficient indicates that a larger value of the independent variable is associated with a greater degree of withdrawal in the funding provided to Continental. In the second column, a positive coefficient is associated with a higher propensity to withdraw 50 percent or more. In the third column, for the quintile estimation we display the marginal effects on the probability of the bank's withdrawal rate falling in the highest quintile of withdrawal rates, which corresponds to a withdrawal rate of 73 percent or greater.

A few results stand out from Table 5a. First, larger banks were less likely to withdraw large amounts. Combined with the fact that the 28-bank support coalition (not included in these regressions) comprised many of the country's largest banks, these results indicate that large banks inside and outside the coalition were more stable funding partners for Continental. In part, the large banks could have been acting in self interest, out of a desire to avoid possible contagion to themselves from Continental's failure. Even so, the banks outside of the support coalition never publicly committed themselves to support Continental and if they had an incentive to withdraw would have also have had an incentive to free ride on the support of others. The fact that they tended to not do so could reflect, as another explanation, more sophisticated managers who were in a better position to understand the FDIC's guarantee and satisfy themselves with the guarantee even though the FDIC left many details unexplained. That said, as a group in aggregate domestic banks withdrew money from Continental at a high rate, implying that the large number of withdrawals from smaller banks added up.

A second result from Table 5a is that banks that were located physically close to Continental were less likely to withdraw large amounts. In particular, this result is driven by a small number of banks in Chicago and in Illinois. One possible explanation is that these banks may have had different and more longstanding relationships with Continental, or perhaps were

more likely to suffer if Continental had failed. Third, banks that held relatively large amounts of liquid or safe assets (cash and Treasuries) withdrew more than other banks. If all the banks had identical business models, the fact that these banks held more liquidity than other banks might indicate that they would be less concerned about losing the liquidity of their funds in Continental. However, the elevated liquidity at these banks could be a sign that their managers had a preference for liquidity, perhaps due to the business model of those banks that might involve larger than average potential turnover of funds. Fourth, banks that raised relatively higher amounts of their funds from large time deposits were less likely to withdraw. This might indicate fear of contagion that was noted by the financial press at the time, leading these banks to support Continental lest their own ability to raise funds be constrained.

Interestingly, we do not find strong evidence that banks with larger exposures to Continental (measured relative to their assets) were more likely to make large withdrawals, at least in the initial period from April to May. As we will see below, there is strong evidence that the most exposed institutions did withdraw more during the second period from May to August. One interpretation of these results is that the managers of these institutions understood the support provided by the FDIC and the Fed in the short run and so did not rush to withdraw, but over the subsequent months nevertheless had an incentive to pull down their funding to more modest proportions.

Overall, these results suggest that in addition to larger banks and closer banks being less likely to withdraw, preferences for liquidity and possible fear of contagion from Continental's fallout motivated some banks to not withdraw as much from Continental as other banks. We generally find the same basic pattern of results in Table 5b, in which we report two alternate specifications, including different thresholds of 75 percent and 90 percent for the probit analysis.

May to August

Results for the latter period, from May to August, are shown in Table 6a. The sample is again limited to banks which had provided funding to Continental in May of at least $300,000, yielding 12 fewer banks than in April given the withdrawals from April to May. The independent variables are the same with two exceptions. First, we add a dummy for whether a bank withdrew more than 50 percent of its funds in the first period. Second, we include the

quadratic of log assets, as tests for nonlinearity (not shown) favor its inclusion here, but did not in the regressions for the earlier period. In this table, the quintile estimation displays the marginal effects on the probability of the bank's withdrawal rate falling in the highest quintile of withdrawal rates, which here actually corresponds to a withdrawal rate of 100 percent.

The results in the second period point to a stronger role for the relative exposure of different banks to Continental, in contrast to the run from April to May. Banks which supplied relatively large amounts of their assets to Continental were more likely to make large withdrawals. It appears that while such highly-exposed banks were not in a rush to run on Continental in May, they nevertheless preferred to substantially reduce their exposures to the troubled bank over the next few months during the summer. In addition, the sign on the coefficient of the liquidity measure turns negative in the second period, suggesting that liquidity concerns related to investing in Continental mitigated after May. In line with the earlier period, we continue to find that larger banks were less likely to withdraw large amounts. Altogether, the results point to less of a role for liquidity concerns, and more of a role for managing outsized exposures.

Again, we present alternate specifications in Table 6b, conducting probit analysis with different thresholds of 75 percent and 90 percent in the first and second columns. In the third column, we report the results of an ordered logit regression analysis using quintiles of the percent change in funding. The 75 percent threshold analysis again suggests that large exposures are associated with larger withdrawals, but the 90 percent threshold and the ordered logit results suggest that such exposures did not necessarily lead banks to withdraw 90 or 100 percent of their funds from Continental. This is consistent with a picture in which these banks sought to mitigate but not necessarily eliminated their outsized exposures.

After August

Following the approval of the permanent restructuring plan in late July, the counterparty data show that Continental was able to attract some funding from private sector counterparties and reduce its dependence on government support. Nevertheless, the overall size of its non-government liability base remained well below the level at the start of the year. In the same

spirit as the previous analysis, it is interesting to analyze what institutions were likely to increase or decrease the funding they provided to Continental.

First, we look at all of Continental's counterparties (not just domestic banks) between August 1984 and January 1985, outlined in Table 7. Of the 447 institutions outside of the support coalition, 147 (about one-third) increased the funding they provided to Continental over this period. Nevertheless, those who withdrew funding represented half of all counterparties, and two-thirds of those that still provided any funding at all as of August. Some of the institutions that increased their funding to Continental had previously had not provide much to the bank, and in some cases the amount of new funding was quite considerable. The institutions that increased their exposure to Continental appear to have had confidence in the rescue plan (and were likely attracted by the premiums that Continental was willing to pay).

Looking at the types of institutions that increased or decreased funding according to Table 7, it is apparent that foreign governments and international agencies, as well as money funds, brokers, and investment banks, were notably less likely to increase funding than other types of institutions (for both types, there were about three institutions that decreased funding to Continental for each institution that increased funding). Nonfinancial corporations appear to have been the most willing to increase funding (the same number increased funds provided to Continental as decreased funding). As speculation, we note that one difference between these types of institutions is the scrutiny they would face about where they placed their funds. Governments are subject to public scrutiny and unlikely to want to deal with negative publicity should they be found to be keeping funds with a troubled foreign bank. Similarly, investors in money funds are generally quite risk averse and such institutions might prefer to avoid being associated with Continental. By contrast, nonfinancial corporations are generally subject to relatively less scrutiny than the other types of institutions about where they invest their short-term cash.

Focusing again on our sample of domestic banks, we run a similar regression as before but use the change in funding provided to Continental from August 1984 to January 1985 as our dependent variable. We again look at a Tobit regression with the change in deposits truncated at positive and negative 100 percent, and a probit regression about whether the change in funding was positive or negative. In the first two columns of Table 8, the sample is restricted to

institution with at least $300,000 in deposits in August 1984. In the third column, we expand the sample for the probit analysis to the full sample of banks that provided funding to Continental as of April. The results suggest some reversal of the factors that were important in predicting institution's run behavior during the spring and summer. Larger institutions in this period were less likely to increase their funding to Continental, and in general those institutions that had withdrawn 50 percent or more from April to August were much more likely to increase their funding after August.

Section 5. Discussion of the response to the FDIC guarantee

Besides Continental, there have been a number of cases in which government guarantees and backstops have been introduced or expanded in response to runs on financial institutions. Sometimes these guarantees have been effective, such as the announcement on September 19, 2008 by the U.S. Treasury that they would offer a temporary guarantee program for prime money market funds which stopped a dramatic run on those firms (McCabe 2010). Liabilities of these institutions dropped by about 20 percent in the two weeks after Reserve Fund "broke the buck" but stabilized quickly after the guarantee was announced. By the end of the year, about half of the drop had been reversed. There have also been instances where government support has been less effective. In the case of Northern Rock, Shin (2009) reports that while the bank had been losing funding from money market providers from some time, the run by retail depositors on Northern Rock started only after the Bank of England announced that it was intervening to support the bank. The run stopped when the Chancellor of the Exchequer provided a taxpayer-backed guarantee, but funding conditions for the bank did not improve and several months later the institution was taken over by the state.

Scholars have also studied the effect of static guarantee policies on runs. In their examination of a run at a small cooperative bank in India, Iyer and Puro (2012) find that the deposit insurance system did help the bank retain insured depositors, but there were still withdrawals by some fully-insured depositors with balances closer to the insurance limit. Brown, Guin, and Morkoetter find that coverage by deposit insurance had little effect on the probability of a household to withdraw money from two large Swiss banks affected by the 2007-2009 financial crisis.

The most surprising result of this study is the degree to which creditors continued to withdraw funding from Continental following the FDIC's blanket guarantee. We suggest a few possible reasons for this finding.

One possible reason that institutions may have opted to withdraw funding is that the FDIC's guarantee may not necessarily have ensured timely payment in case of Continental's failure. The *Wall Street Journal* interviewed a bank manager who dealt with Continental, and described him as worrying that "if the FDIC was to take control of Continental, depositors would get all their money back but there might be some delay."[25] If so, resolution process might have converted demand obligations into longer-term obligations, and some counterparties may have been unwilling to take on the longer and uncertain duration (especially institutions with short-term liabilities of their own). As a potential sign of the illiquidity of Continental obligations, its negotiable certificates of deposit commanded a premium to T-bills despite the guarantee. The *Wall Street Journal* reported that "Without a deep secondary market, investors are wary about being trapped with a security they can't resell."[26] However, there are limits to this line of reasoning, as the Federal Reserve had committed to providing liquidity support to Continental that presumably could have been tapped to repay liabilities. Moreover, institutions awaiting payment from the FDIC would likely have been easily able to borrow on a short-term basis against that future receipt.

Another possible explanation is that Continental's short-term creditors may not have found the announcement by the FDIC and Federal Reserve to be credible. Support for this explanation comes from a *Wall Street Journal* article containing interviews with officials at several of Continental's peers and noted a few reasons for incredulity.

> From Continental's point of view, perhaps the FDIC hasn't done enough to reassure depositors. One banking official close to Continental's problems said, "All there is (to explain the FDIC's guarantee) is a press release. The FDIC won't provide more specificity. That quite obviously limits the effectiveness of the assurance. There is no precedent for this," the banker said, "so it's probably very difficult for investors to get their arms around (the FDIC guarantee)."

[25] *Wall Street Journal*, "Run Continues On Continental Illinois Deposits --- Bank Sells $5 Billion in Assets As U.S.-Led 'Safety Net' Proves to Be Insufficient" July 2, 1984.
[26] *Wall Street Journal*, "Is a Continental CD a U.S. Treasury Bill by Another Name?" May 25, 1984, p. 6.

It is possible that the press release, which was quite laconic (see it quoted above on page 5), did not give enough details, such as listing all types of counterparties that would be covered, or how and when the funds would be released. Along these lines, Guttentag and Herring (1987) assert that concerns about the lack of formal legal safeguards led to reluctance among Continentals' counterparties. Concerns about the ambiguity of the press release may have been most important for foreign banks whose officers would be least familiar with FDIC policies. However, the CTS reports show the large declines in funding provided by domestic depository institutions between June and August, which is somewhat surprising as these institutions were most likely to understand the guarantees provided by the FDIC and the Federal Reserve. Otherwise, counterparties may have been concerned that the courts or Congress could change the nature of their investments with unexpected interventions.

Finally, counterparties may have been unwilling to deal with Continental regardless of its creditworthiness because of the procedural difficulties in dealing with a troubled institution such as Continental. The *Wall Street Journal* interviewed one banker who stated that dealing with Continental would not be worth the trouble of explaining the decision to his superiors, given other investment options. Another banker noted that many potential counterparties would rather not have exposures to Continental on public accounting statements. These concerns may not explain the largest withdrawals but could have had at least a marginal impact if not more.

There were however some counterparties that increased their exposure to Continental. Among the individual institutions covered in our sample, about 16 percent of institutions (excluding the support coalition and the US government) increased their exposure to Continental between April and August 1984. Foreign banks were somewhat more likely than other types of institutions to increase their exposure (about 21 percent of these institutions in the sample did so), and some increased the amount of funding they were providing considerably. As discussed above, there were also further increases in funding in late 1984. Thus it appears that at least some institutions took the government guarantee fairly seriously.

Section 6 Liability concentration and Continental's systemic risk

The CTS reports reveal that, before the run, Continental's liabilities were heavily concentrated with a small number of large counterparties. Looking at all non-U.S. government

institutions, in April 1984, Continental's largest 10 counterparties provided funding of $3.4 billion, (roughly 9 percent of all liabilities). The largest 25 funded about $6 billion (16 percent of all liabilities).[27] Among those counterparties holding domestic deposits, the deposit insurance limit of $100 thousand would have been essentially irrelevant given that all of the largest 25 counterparties held liabilities exceeding $100 million each. About half of the largest 25 counterparties were foreign banks, and the rest were a mix of domestic banks, money market funds, and foreign governments or international institutions.

The concentration of funding played an important role during the run. To document this, in Table 9 we examine the concentration of funding among institutions that were not part of the support coalition. The counterparties are separated into groups such that their exposures are roughly equal in size. The top 10 accounted for nearly 22 percent of the funding from these institutions, while the next 15 accounted for another 17 percent. The run-off rates from April to May are shown to the right. The run-off rate for the top 10 is elevated compared to the other groups. In addition, because of the size of the top group's initial liability holdings, the sizable run-off rate in this group meant that the dollar drop in funding from just 10 institutions accounted for about one-third of the total decline that we observe. Thus, this small number of institutions had a very large impact on the funding situation. In contrast, the run-off rate for the next banks 15 largest bank counterparties is modest in size, giving Continental some amount of much-needed stability but also underscoring the idiosyncratic levels of support that Continental faced from its most important counterparties. Each of the remaining groups of counterparties also decreased their funding to Continental, by varying amounts.

Figure 3 displays the concentrated nature of the outflows among Continental's largest 25 private counterparties (including those within the support coalition but excluding government counterparties), displaying the movements of each between April and August. The green arrows indicate the changes for those that were not in the support coalition, and the black dashed arrows indicate the changes in funding for each that were in the coalition. The graph shows the extremely large amounts withdrawn by the largest counterparties, as several of those not in the coalition withdrew between $100 million or $200 million each. The counterparties responsible

[27] Total liabilities are measured as of the March 31, 1984 call report for the purposes of these comparisons.

for the very largest declines between April and July mainly included money market mutual funds and foreign banks.

This concentration is also related to the nature of Continental's systemic importance, and in fact we identify an additional channel through which Continental may have posed a systemic risk. Several of the largest liability holders were money market mutual funds. Four of these funds had exposures to Continental amounting to more than $100 million. For at least one institution, which has publicly available information on total assets, the holdings of Continental funds accounted for roughly 7 percent of its assets. Given the losses incurred by the FDIC, it is highly likely that this fund would have seen a significant loss in the event that Continental had been allowed to fail. Even apart from those losses, these mutual funds would have seen these assets become inconvertible to cash and the funds' liquidity would have dried up.

The exposures of money funds to Continental brings to mind one aspect of the 2007-2009 financial crisis, when there were considerable disruptions after a money market fund "broke the buck" (i.e. was no longer able to pay out $1 per share). As a result, there were rapid withdrawals from money funds and money funds significantly curtailed their purchases of privately issued money market securities (McCabe 2010; Duygan-Bump, Parkinson, Rosengren, Suarez, and Willen 2013). How events would have played out in 1984 had some money funds incurred significant losses cannot be known. The fallout might have touched many of the large banks, which had large amounts of non-performing loans stemming from their lending to developing countries (FDIC 1997, FDIC 1998). Had Continental failed and significantly affected some money funds, the money funds could certainly have seriously reduced their purchases of bank-issued money market instruments, either because they sought safer assets or because they experienced outflows from investors who perceived money funds as more risky than before.

Otherwise, whether the failure of Continental would have constituted a systemic event has been a matter of notable debate. The main regulators asserted that it was (Isaac 1984, Volcker 1984, Conover 1984, and Sprague 1986). Some of the academic work has been more skeptical. Several papers have analyzed the effect of Continental's failure on equity prices of various banks and firms, using event study methodologies. Wall and Peterson (1990) and Swary (1986) both examine the reactions of the equity price of other large US banks, and Jayanti and Whyte (1996) similarly analyze the reactions of foreign bank equity prices. In general, they do

not find much evidence that there were increased correlations of equity prices around this time which casts some doubt on the likelihood of contagion risks. Furlong (1984) and Bailey and Zaslow (1984) report that funding costs for other banks, as indicated by the spread between the rate on large negotiable CDs and the rate on comparable maturity Treasury bills, increased during Continental's travails. These findings imply that serious problems at Continental were having spillovers effects on other institutions. Looking at systemic importance from another perspective, Slovin, Sushka, and Poloncheck (1993) find that firms who borrowed from Continental had notable negative equity price reactions to the troubles at Continental and positive equity price reactions to the FDIC rescue efforts.

FDIC Chairman Isaac indicated that, at the time they intervened, about 66 domestic banks had exposures to Continental that exceeded their capital. (Among the institutions we can identify, we find that 14 institutions had exposures to Continental that represented at least 25 percent of the equity capital and 9 institutions had exposures that represented more than 100 percent of their equity capital.) These figures suggest that some institutions could have had significant difficulties in the event that Continental failed. However, Wall (1993) argues that few of these institutions would have actually failed.

Section 7. Conclusion and Implications for Resolution in the Future

Continental's experience has important implications for the receivership of systemically important institutions in the future. The FDIC no longer has the ability to issue the same sort of guarantee that it issued Continental, but an effectively similar guarantee could be issued if the FDIC placed a systemically important institution into receivership using the Orderly Liquidation Authority created by the Dodd-Frank Act. In doing so, the FDIC would be required to maintain the operations of the systemically important parts of the firm, and it seems quite likely that the FDIC would be required to issue a guarantee to short-term creditors, lest those creditors run on the firm and force the very unwinding that the FDIC would be seeking to prevent. Continental's experience suggests that the FDIC should nevertheless be prepared for short-term creditors to make enormous demands for withdrawals. This in turn would require large drawdowns from the FDIC's credit line with the Treasury that was created by Dodd-Frank to fund the FDIC's operation of an institution in receivership. The Continental experience also suggests that

uncertainty about the nature of the guarantee may be detrimental and, the FDIC would likely benefit from communicating clearly and in detail the guarantees it would offer to creditors of an institution in receivership.

Our findings also demonstrate that a relatively small number of large short-term creditors can destabilize a financial institution. Continental may have been unusual in its reliance on uninsured deposits, but today all of the systemically important depository institutions continue to have significant amounts of uninsured deposits. Indeed, during the 2008 crisis, Wachovia and Washington Mutual both lost large amounts of deposits during runs by short-term creditors. Though neither institution's run was as extreme as Continental's, neither survived their funding crises.

Finally, we find that the FDIC guarantee did dramatically slow the precipitous run experienced by Continental and appears to have reassured some institutions that would have had the greatest reason to run. Nevertheless, institutions did continue to reduce their exposure to Continental even after the guarantee was in place. While we do not find that the FDIC guarantee enabled Continental to retain funding and reduce its reliance on government funding, that guarantee may nevertheless have been vital in preserving the stability of the financial sector. Our data regarding the concentration of funding suggest that a few institutions had large exposures to Continental and would have suffered significantly in the event that Continental had been allowed to fail. Some of these institutions were large enough that their closure would also likely have had systemic implications. The FDIC guarantee was likely exceptionally important in preventing catastrophic losses at these institutions, allowing them to withdraw their funding, and preventing additional spillovers and thus preserving stability.

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Table 1: Liabilities at Continental Illinois National Bank during 1984

Liability	3/31/1984	6/30/1984	9/30/1984	12/31/1984
Domestic office deposits	10,046	6,889	6,377	7,673
Foreign office deposits	18,545	10,562	5,965	7,926
Fed funds purchased, repo	5,091	6,988	5,650	5,309
Demand notes to US Treas.	631	558	2,160	799
Other borrowed money (including discount window)	1,867	4,843	7,545	5,339
FDIC note, subordinated to deposits	0	2,000	0	0
Acceptances	870	458	418	487
Other	1,050	889	632	641
Total Liabilities (excluding capital)	38,100	33,187	28,747	28,174

Notes: Amounts are in millions of dollars. Source: Call reports.

Table 2: Comparison of Continental with other large banks

		Other 19 largest banks		
Financial measurement	Continental	Median	25th pctile	75th pctile
Net chargeoffs as percent of loans	0.29	0.06	0.02	0.10
Delinquencies as percent of loans	9.16	3.61	2.50	5.26
Loan loss provisions as percent of assets	0.46	0.12	0.09	0.19
Net income as percent of equity	1.46	2.83	2.19	3.36
Large time deposits as percent of liabilities	8.82	6.07	4.40	12.63
Foreign deposits as percent of liabilities	48.67	33.59	22.41	43.01
Fed funds and repo as percent of liabilities	13.36	8.51	6.16	12.00
Interest rate on large time deposits	2.46	2.43	2.40	2.55
Interest rate on domestic deposits	2.84	1.63	0.82	3.80
Interest rate on federal funds bought	2.40	2.41	2.39	2.43
Equity as percent of assets	4.65	4.38	4.12	4.65
Loans as percent of assets	73.12	63.81	56.96	67.19

Notes: Data from the March 31, 1984 call report. The peer group is the other banks comprising the largest 20 banks, by assets.

Table 3: Funding by Selected Large Counterparties in 1984

Type of Creditor	N	Funding Provided as of April 1984	May 1984	August 1984	Percent change from April to May	Percent change from May to August	Percent change from April to August
Creditors Providing Support							
US Government Entities	8	2,569.7	4,428.5	9,955.3	72.3	124.8	287.4
Domestic Bank Support Coalition	28	2,841.9	4,807.8	5,640.5	69.2	17.3	98.5
Total	36	5,411.6	9,236.3	15,595.8	70.7	70.7	188.2
Other Creditors							
Foreign Banks	103	5,987.2	5,720.1	3,021.7	-4.5	-47.2	-49.5
Money Market Funds	42	1,665.0	1,049.2	657.9	-37.0	-37.3	-60.5
Foreign Governments and Official Inst.	37	1,658.1	1,342.2	834.2	-19.1	-37.8	-49.7
Domestic Banks Not in Support Coalition	146	1,475.8	912.3	511.2	-38.2	-44.0	-65.4
Corporations	74	1,201.6	869.1	444.0	-27.7	-48.9	-63.0
Other Customers	19	632.1	510.0	539.5	-19.3	-11.6	-14.6
Savings and Loans	27	507.7	240.4	145.3	-52.6	-39.6	-71.4
Total	448	13,127.5	10,643.3	6,153.8	-18.9	-42.2	-53.1

Note: Figures are in millions of dollars. The table includes any counterparty listed in the CTS reports that gave positive funding to Continental in any month during 1984, thereby excluding those listed as providing zero or negative funding. Funding from US government entities was primarily supplied by the FDIC, FRB Chicago, the Treasury, and various government sponsored enterprises.

Table 4
Summary statistics of variables used in bank withdrawal regressions

	N	Mean	SD	Min	Max
Withdrawals from April to May					
Percent withdrawn (bounded -1 to 1, positive = withdraw, negative = increase funding)	108	0.385	0.419	-1	1
1(rate of withdrawal>50%)	108	0.398	0.492	0	1
1(rate of withdrawal>75%)	108	0.176	0.383	0	1
1(rate of withdrawal>90%)	108	0.120	0.327	0	1
Withdrawals from May to August					
Percent withdrawn (bounded -1 to 1, positive = withdraw, negative = increase funding)	96	0.537	0.628	-1	1
1(rate of withdrawal>50%)	96	0.667	0.474	0	1
1(rate of withdrawal>75%)	96	0.573	0.497	0	1
1(rate of withdrawal>90%)	96	0.503	0.503	0	1
Changes from August to January					
Percent increase in deposits (bounded -1 to 1)	57	-0.255	0.680	-1	1
1(change in funding>0)	57	0.228	0.423	0	1
Independent variables (measured as of April 1984)					
log(exposure to CI/assets)	108	0.949	1.662	-2.665	5.253
log(assets)	108	14.792	1.003	11.154	16.285
log(distance to Chicago)	108	6.560	1.168	1.187	7.999
(cash+treasuries)/assets	108	0.157	0.061	0.038	0.441
equity/assets	108	0.060	0.012	0.027	0.103
(net income)/equity	108	0.032	0.012	-0.010	0.064
loan delinquency rate	108	0.028	0.019	0.002	0.121
(core loans)/assets	108	0.544	0.102	0.195	0.799
(loans to depos. inst'ns)/assets	108	0.027	0.027	0.000	0.112
(fed funds and repos borrowed)/liabilities	108	0.132	0.086	0.011	0.6611
(large time deposits)/liabilities	108	0.113	0.069	0.015	0.334
1(5 percent of funding from foreign liabilities)	108	0.343	0.477	0.000	1.000

Note: We define core loans as excluding loans to depository institutions. Our data on large time deposits cover only domestic deposits.

Table 5a
Withdrawals from April to May and bank characteristics

Model	(1) Tobit	(2) Probit	(3) Ordered Logit
Dependent variable(s)	Percent withdrawn (bounded -1 to 1, positive = withdraw, negative = contribute)	1(rate of withdrawal>50%)	Quintiles of percent withdrawn
log(exposure to CI/assets)	0.00828	-0.0166	0.00499
	(0.0321)	(0.0423)	(0.0247)
log(assets)	-0.153**	-0.248***	-0.0892**
	(0.0626)	(0.0859)	(0.0388)
log(distance to Chicago)	0.0616**	0.146**	0.0386*
	(0.0293)	(0.0642)	(0.0227)
(cash+treasuries)/assets	1.599***	2.059**	0.916**
	(0.518)	(0.977)	(0.370)
equity/assets	0.118	7.881*	0.936
	(3.146)	(4.573)	(2.358)
(net income)/equity	9.282**	12.95**	6.771**
	(3.914)	(5.044)	(3.231)
loan delinquency rate	5.128	6.427*	4.752
	(3.374)	(3.890)	(2.907)
(core loans)/assets	0.327	0.730	0.0418
	(0.423)	(0.619)	(0.346)
(loans to depos. inst'ns)/assets	4.324***	4.807***	2.619***
	(1.340)	(1.832)	(0.983)
(fed funds and repos borrowed)	0.218	0.685	0.0465
/liabilities	(0.513)	(0.718)	(0.316)
(large time deposits)/liabilities	-1.602**	-1.955**	-1.012**
	(0.641)	(0.773)	(0.440)
1(5 percent of funding from	0.0937	0.243*	0.0126
foreign liabilities)	(0.0985)	(0.125)	(0.0651)
Observations	108	108	108
Pseudo R-squared	0.167	0.208	0.069
Obs at lower/upper bound	2/7		

Note: This table reports marginal effects with robust standard errors in parentheses. The symbols ***, **, and * denote statistical significance at the 1 percent, 5, percent, and 10 percent levels respectively. The marginal effects for the ordered logit relate to the probability of the highest quintile, i.e. with the highest withdrawal rates.

Table 5b
Withdrawals from April to May, alternate specifications

	(1)	(2)
Model	Probit	Probit
Dependent variable(s)	1(rate of withdrawal>75%)	1(rate of withdrawal>90%)
log(exposure to CI/assets)	0.0149	0.00290
	(0.0273)	(0.0184)
log(assets)	-0.0113	-0.0144
	(0.0494)	(0.0343)
log(distance to Chicago)	0.104**	0.0851***
	(0.0419)	(0.0308)
(cash+treasuries)/assets	1.016**	0.145
	(0.458)	(0.283)
equity/assets	3.626	1.868
	(2.379)	(1.409)
(net income)/equity	4.423	2.393
	(2.800)	(1.857)
loan delinquency rate	3.210*	2.343**
	(1.749)	(1.193)
(core loans)/assets	0.428	0.131
	(0.315)	(0.195)
(loans to depos. inst'ns)/assets	1.405	0.351
	(1.230)	(0.882)
(fed funds and repos borrowed)/liabilities	0.619	0.275
	(0.471)	(0.301)
(large time deposits)/liabilities	-0.849*	-1.002***
	(0.461)	(0.388)
1(5 percent of funding from foreign liabilities)	0.157*	0.0178
	(0.0897)	(0.0531)
Observations	108	108
Pseudo R-squared	0.181	0.178

Note: This table reports marginal effects with robust standard errors in parentheses. The symbols ***, **, and * denote statistical significance at the 1 percent, 5, percent, and 10 percent levels respectively.

Table 6a: Withdrawals from May to August and bank characteristics

	(1)	(2)	(3)
Model	Tobit	Probit	Ordered Logit
Dependent variable(s)	Percent withdrawn (bounded -1 to 1, positive = withdraw, negative = contribute)	1(rate of withdrawal>50%)	Quintiles of percent withdrawn
log(exposure to CI/assets)	0.156*	0.131***	0.0206
	(0.0896)	(0.0483)	(0.0396)
log(assets)	5.230***	4.627***	2.077***
	(1.616)	(1.337)	(0.697)
log(assets)^2	-0.178***	-0.155***	-0.0715***
	(0.0579)	(0.0464)	(0.0256)
log(distance to Chicago)	0.168***	0.0869*	0.0845**
	(0.0592)	(0.0489)	(0.0333)
(cash+treasuries)/assets	-2.043*	-1.743*	-0.885*
	(1.117)	(0.918)	(0.527)
equity/assets	-3.337	1.245	-0.139
	(8.286)	(5.032)	(3.182)
(net income)/equity	-13.18	-6.200	-4.633
	(10.17)	(5.840)	(3.950)
loan delinquency rate	-15.28*	-8.368**	-5.773
	(7.993)	(4.219)	(3.790)
(core loans)/assets	1.284	0.889	0.583
	(0.928)	(0.640)	(0.385)
(loans to depos. inst'ns)/assets	-3.871	-0.776	-0.684
	(4.055)	(2.361)	(1.625)
(fed funds and repos borrowed)	0.186	-0.170	0.392
/liabilities	(1.086)	(0.873)	(0.408)
(large time deposits)/liabilities	2.147	1.047	0.235
	(1.481)	(0.904)	(0.661)
1(5 percent of funding from	0.0521	-0.0358	-0.0645
foreign liabilities)	(0.206)	(0.144)	(0.0823)
1(withdrew 50% or more	0.152	0.0224	0.135
from April to May)	(0.195)	(0.124)	(0.0962)
Observations	96	96	96
Pseudo R-squared	0.112	0.232	0.097
Obs at lower/upper bound	8/27		

Note: This table reports marginal effects with robust standard errors in parentheses. The symbols ***, **, and * denote statistical significance at the 1 percent, 5, percent, and 10 percent levels respectively. The marginal effects for the ordered logit relate to the probability of the highest quintile, i.e. with the highest withdrawal rates.

Table 6b: Withdrawals from May to August, alternate specifications

	(1)	(2)
Model	Probit	Probit
Dependent variable(s)	1(rate of withdrawal>75%)	1(rate of withdrawal>90%)
log(exposure to CI/assets)	0.0882*	0.0393
	(0.0510)	(0.0534)
log(assets)	3.799***	3.475***
	(1.225)	(1.305)
log(assets)^2	-0.128***	-0.121***
	(0.0432)	(0.0462)
log(distance to Chicago)	0.124**	0.207***
	(0.0554)	(0.0701)
(cash+treasuries)/assets	-1.736*	-1.740
	(1.031)	(1.063)
equity/assets	1.311	-3.580
	(5.251)	(5.287)
(net income)/equity	-8.930	-9.913*
	(5.679)	(6.001)
loan delinquency rate	-9.311**	-7.399
	(4.622)	(4.700)
(core loans)/assets	0.636	0.608
	(0.663)	(0.643)
(loans to depos. inst'ns)/assets	1.048	1.116
	(2.474)	(2.481)
(fed funds and repos borrowed)/liabilities	0.140	-0.00241
	(0.789)	(0.785)
(large time deposits)/liabilities	0.551	0.453
	(1.041)	(1.065)
1(5 percent of funding from foreign liabilities)	-0.209	-0.161
	(0.142)	(0.138)
1(withdrew 50% or more from April to May)	0.0938	0.154
	(0.125)	(0.126)
Observations	96	96
Pseudo R-squared	0.196	0.215

Note: This table reports marginal effects with robust standard errors in parentheses. The symbols ***, **, and * denote statistical significance at the 1 percent, 5, percent, and 10 percent levels respectively.

Table 7
Change in funding from August 1984 to January 1985

Type of institution	Total	Number of observations…. Funding >0 as of August	Increased funding after August	Decreased funding after August	Ratio of increases to decreases
Foreign banks	103	93	41	56	0.73
Money funds/brokers/ investment banks	42	34	9	25	0.36
Foreign governments and official institutions	37	22	5	17	0.29
Domestic banks	145	126	46	93	0.49
Nonfinancial corporations	74	57	31	31	1.00
Other customers	19	13	6	8	0.75
Savings and Loans	27	14	9	7	1.29
Total	447	359	147	237	0.62

Table 8
Change in funding from August 1984 to January 1985 and bank characteristics

	(1)	(2)	(3)
Model	Tobit	Probit	Probit
Sample	Banks providing > $300,000 in August 1984	Banks providing > $300,000 in August 1984	Banks providing > $300,000 in April 1984
Dependent variable(s)	Percent increase in deposits (bounded -1 to 1)	1(positive change in funding)	1(positive change in funding)
log(exposure to CI/assets)	-0.103	-0.0909	-0.0913**
	(0.0858)	(0.0560)	(0.0410)
log(assets)	-6.456***	-1.585	-2.371***
	(1.818)	(1.013)	(0.918)
log(assets)^2	0.227***	0.0516	0.0786**
	(0.0672)	(0.0368)	(0.0319)
log(distance to Chicago)	-0.146*	-0.0365	0.0298
	(0.0862)	(0.0395)	(0.0545)
(cash+treasuries)/assets	0.291	-1.010	-0.637
	(1.218)	(0.960)	(0.671)
equity/assets	-6.447	-9.150**	-4.454
	(7.171)	(3.718)	(4.324)
(net income)/equity	12.79	0.236	2.485
	(12.15)	(5.174)	(3.921)
loan delinquency rate	1.749	-2.797	-0.915
	(6.826)	(4.524)	(3.150)
(core loans)/assets	-0.598	-0.126	-0.225
	(1.027)	(0.491)	(0.472)
(loans to depos. inst'ns)/assets	0.379	0.0656	-0.647
	(3.565)	(1.777)	(1.813)
(fed funds and repos borrowed) /liabilities	1.443	0.803	0.468
	(1.157)	(0.655)	(0.511)
(large time deposits)/liabilities	0.863	0.820	1.983***
	(1.700)	(0.582)	(0.662)
1(5 percent of funding from foreign liabilities)	-0.0648	0.0566	0.0322
	(0.279)	(0.0900)	(0.106)
1(withdrew 50% or more from April to August)	0.668***	0.311***	0.275***
	(0.218)	(0.101)	(0.0742)
Observations	57	57	108
Pseudo R-squared	0.136	0.355	0.211
Obs at lower/upper bound	6/8		

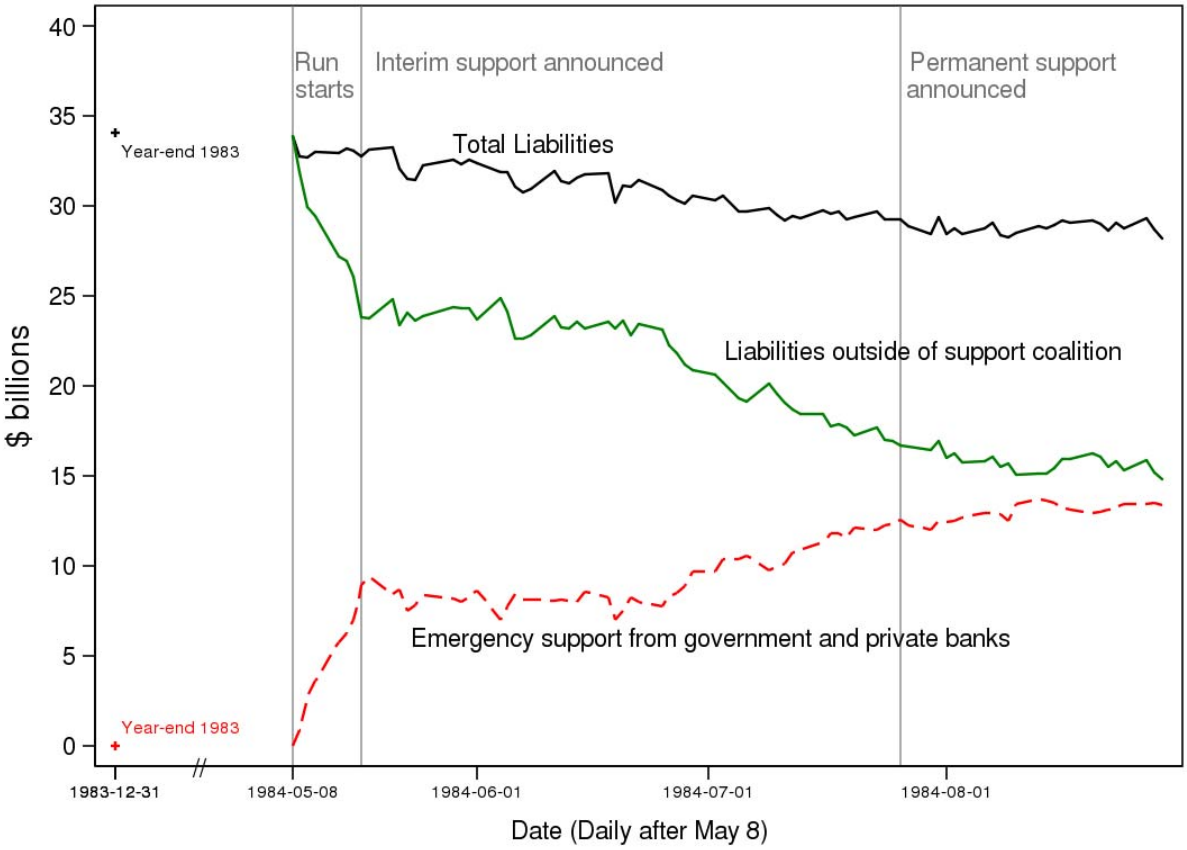
Note. Standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1 percent, 5, percent, and 10 percent levels respectively.

Table 9: Funding by Size of Exposure for Non-Support Institutions in 1984

Type of Creditor	Funding April 1984	Funding May 1984	Dollar Change April to May	Percent of total liabilities in April	Percent Change April to May	Percent of total dollar decline
Top 10	2,859.7	2,036.0	-823.7	21.7	-28.8	33.1
11 to 25	2,212.2	2,109.7	-102.5	16.8	-4.6	4.1
26 to 50	2,074.1	1,719.9	-354.2	15.8	-17.1	14.2
51 to 100	2,500.1	1,886.0	-614.1	19.0	-24.6	24.7
101 to 200	2,383.3	1,898.5	-484.8	18.1	-20.3	19.5
Remainder	1,120.1	1,009.1	-111.0	8.5	-9.9	4.5
Total	13,149.5	10,659.2	-2,490.3	100.0	-18.9	100.0

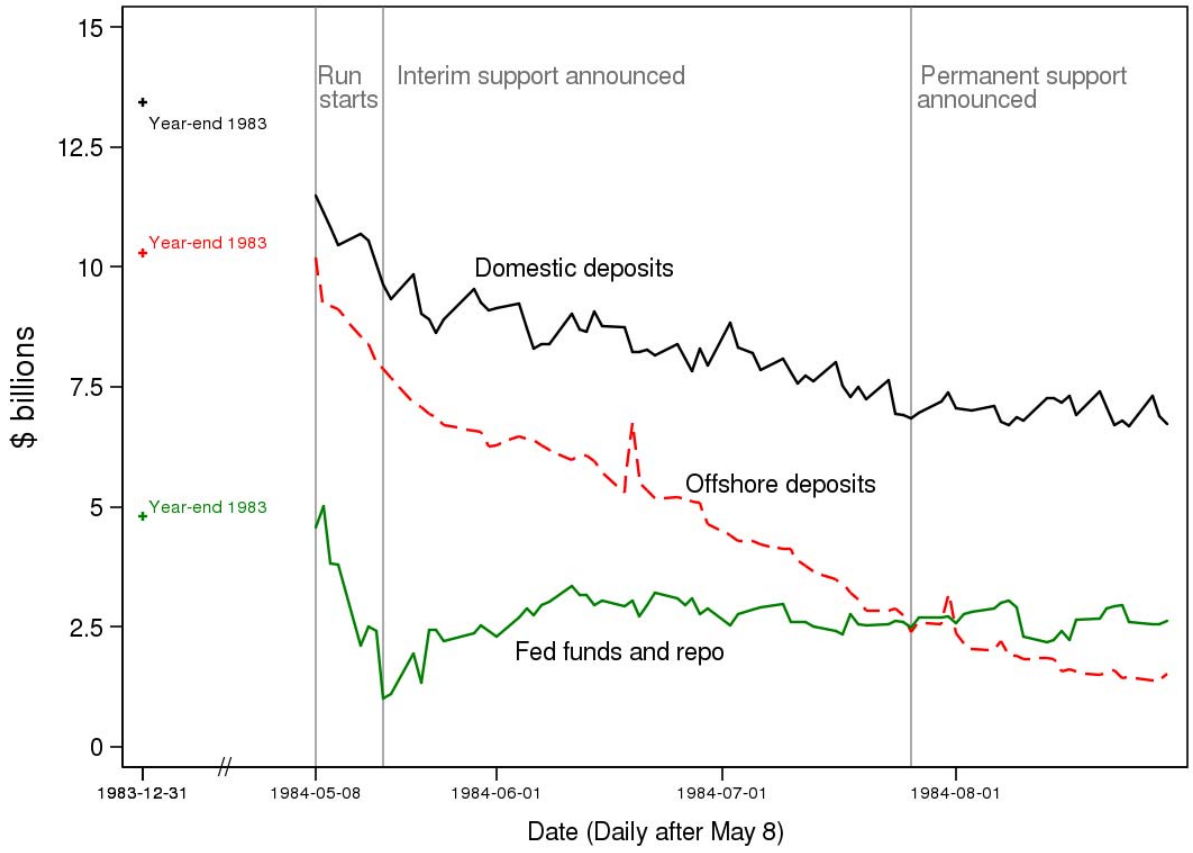
Notes: Figures are in millions of dollars. The source is the CTS reports. Counterparties included are those identified in the CTS reports, providing positive funding to CTS, excluding US government institutions and domestic banks that were part of the private support coalition.

Figure 1: Liabilities at Continental Illinois during 1984



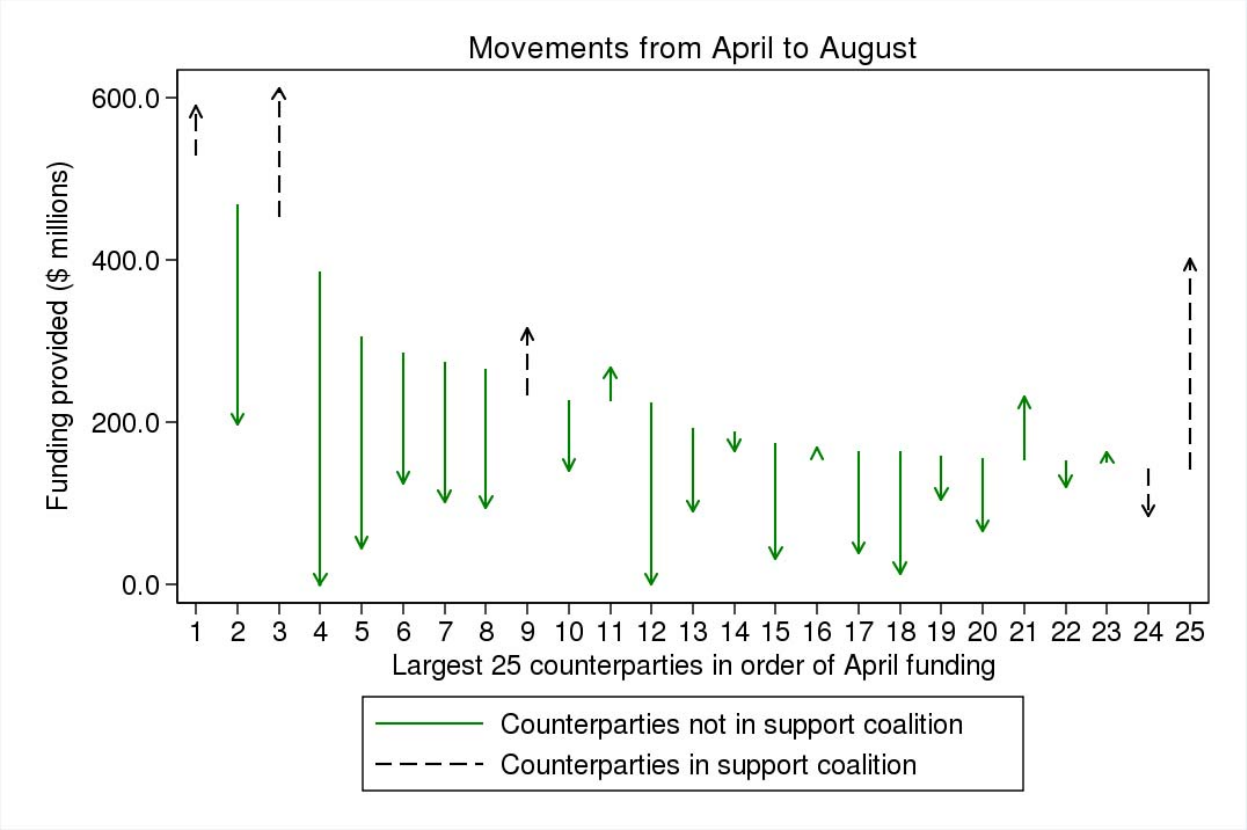
Notes: The emergency support includes discount window loans, funds from the FDIC, and funds from the private coalition of large banks. The data are taken from the CTS reports.

Figure 2: Decomposition of liabilities excluding government and coalition support



Notes: Offshore deposits include the net amount due to Continental's foreign branches, and international time deposits. Domestic deposits include demand, retail savings, commercial CDs and time deposits, public funds, and retail money market funds. Not all liabilities are included so components do not sum to the total non-support liabilities from the previous figure.

Figure 3: Funding provided by Continentals' Largest 25 Private Counterparties



Note: This excludes US government or government-affiliated institutions. Source: CTS documents.