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The Bank Panic of 1907: The Role of Trust Companies

JON MOEN AND ELLIS W. TALLMAN

The Bank Panic of 1907 was one of the most severe financial crises in the United States before the Great Depression. Although contemporaries realized that the panic in New York City was centered at trust companies, subsequent research has relied heavily on national bank data. Balance sheet data for trust companies and state banks as well as call reports of national banks indicate that the contraction of loans and deposits in New York City during the panic was confined to the trust companies.

The runs on deposits that sparked the Bank Panic of 1907 were at two of the largest New York City trust companies: Knickerbocker Trust and Trust Company of America. Contemporary studies of the panic dating back to that of O. M. W. Sprague assigned a pivotal role to the trust companies in New York City, but his quantitative analysis was confined mainly to New York City national banks.[1] Even today, economists have not examined quantitatively the role of trust companies during the panic and, like earlier studies, have looked primarily at national banks.[2] For example, Calomiris and Gorton offered the lack of national bank failures in 1907 as a puzzle in their comprehensive study of the origins of banking panics.[3] Our research indicates that in 1907 national banks were not stricken with widespread runs as in previous panics. Rather, the trust companies were the institution subject to severe depositor withdrawals.

Most studies of bank panics and financial markets during the National Banking Era have employed data from the comprehensive and widely

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The contents of this paper do not reflect the opinions or views of the Federal Reserve System or of the Federal Reserve Bank of Atlanta. The authors are fully responsible for any errors or omissions contained in this paper.

[1] Sprague, *History of Crises*.

[2] Larry Neal provides an exception and has described the innovative role of trusts as financial intermediaries to promote capital growth in the United States, and he documents their phenomenal growth in the early 1900s. His evidence also shows how trusts suffered a tremendous contraction relative to state banks and national banks in New York State following the Panic of 1907, as a result of depositor withdrawals. Neal, "Trust Companies," p. 43.

[3] Calomiris and Gorton, "The Origins of Banking Panics," p. 55.

available reports of the National Monetary Commission.[4] The commission used two important sources of information on national banks: balance sheet data from all national banks, which had been compiled on call dates by the Comptroller of the Currency of the United States (about five times a year), and weekly statements of clearinghouse member banks in several major cities, which the commission compiled.

Our evidence on balance sheet data for trust companies and state-chartered banks in New York City complements the New York City national bank information. The balance sheets are available on a nearly quarterly basis, beginning (for trusts) in September 1905 and covering a period including the Panic of 1907.[5] In panics before 1907—for example in 1873, 1884, and 1893—trusts had not yet become important intermediaries in New York City, so most of the financial distress was centered at banks. The Panic of 1907 was different in that it was concentrated in another large intermediary apart from banks. We expand the description of the panic by providing balance sheet information on a relatively unregulated intermediary, the New York City trust company.[6]

The balance sheet data shows that in New York City the aggregate value of trust company assets just before the panic was nearly the same as that of national banks and much larger than that of state banks. The percentage of contraction of loans and deposits of trust companies during the panic, however, dwarfed the contraction at state banks and overwhelmed the increases at national banks. Measuring only changes in national banks' assets results in an underestimate of the contraction in borrowing and lending in New York City during the panic. Our analysis focuses on trust data and offers an altered perspective on the panic that has implications for empirical and theoretical research.

TRUST COMPANIES IN THE NEW YORK MONEY MARKET

Trust companies rapidly emerged as important intermediaries in the New York financial market in the late nineteenth century. In the ten years ending in 1907, trust company assets in New York State had grown 244 percent (from $396.7 million to $1.364 billion) in comparison to 97 percent (from $915.2 million to $1.8 billion) for those of national banks, and 82 percent (from $297 million to $541 million) for state banks in New York.[7] The disposition of trust assets was therefore significant in the New York money market.

[4] Andrew, "Statistics for the United States."

[5] The compiled balance sheets are located at the New York Clearinghouse Association in New York City. They were also published in various reports of the Superintendent of Banks of the State of New York: the *Annual Report on Banks of Deposit or Discount* (for state-chartered banks) published by the New York State Superintendent of Banks and the *Annual Report of the Superintendent of Banks in the State of New York Relative to Savings Banks, Trust Companies, Safe Deposit Companies and Miscellaneous Corporations* (for trust companies).

[6] The largest and most significant trust companies in the country operated in New York City.

[7] Barnett, *State Banks*, pp. 234–35.

The following excerpt from Vincent Carosso provides a useful overview of the role of trusts in financial markets at the turn of the century:

> The trust company was the other principal institution that engaged in the investment banking business. Incorporated under liberal state laws, trust companies quickly extended their activities far beyond those usually associated with the services of a fiduciary institution. Beginning in the 1890s, trust companies took on most of the functions of both commercial and private banks. They accepted deposits; made loans; participated extensively in reorganizing railroads and consolidating industrial corporations; acted as trustees, underwriters, and distributors of new securities; and served as depositories of stocks, bonds, and titles. Frequently, they acted as attorneys for individuals and companies. Corporations regularly appointed them as registrars or fiscal and transfer agents. Very often they also owned and managed real estate.[8]

Although trusts could perform many of the particular functions of banks, the general role of trusts in the New York financial market was different from that of national banks. While the volume of deposits at trust companies in New York City was comparable to that at national banks, trusts did much less clearing activity than national banks. The trusts had only 7 percent of the clearings of national banks, so were not like commercial banks that provided transactions services to the average depositor.[9] According to George Barnett, trust deposit accounts served as "surplus funds of individuals and corporations deposited for income and pending investment," and thus were not widely used as transactions or checking accounts, despite the fact that the deposits were demand deposits subject to check.[10]

Trusts were also less involved in correspondent banking than were the national banks.[11] Trusts served as correspondents for a number of intermediaries because they generally offered higher interest rates on deposits than did national banks, but correspondent deposits accounted for less than one-sixth of their total deposits. Trust deposits were more local and less subject to the recurring seasonal strains on funds than were deposits at national banks. Instead of financing trade across regions, trusts in many ways were similar to investment banks. As Carosso noted, trusts were an important source of short-term business financing, actively underwriting and distributing securities.[12] Most observers of trust companies at the turn of the century noted the active role played by trusts in the underwriting of railroad securities and the

[8] Carosso, *Investment Banking*, p. 99.

[9] Barnett, *State Banks*, p. 133.

[10] Ibid.

[11] Unlike those at New York City's national banks, bankers' balances at trust companies did not count toward legal reserve requirements.

[12] The entry of trusts into the securities market was aided by the restrictions placed upon national banks by the Comptroller of the Currency in 1902. National banks maintained a presence in the securities market by forming securities affiliates and/or by buying trust companies or establishing subsidiary trust companies. Carosso, *Investment Banking*, p. 97.

making of loans for large industrial mergers or consolidations. For example, Fritz Redlich presented the case of United States Trust Company working with National City Bank and Kuhn, Loeb, and Company in a $35 million flotation of the Chicago, Milwaukee, and St. Paul Railroad securities. More generally, C. M. Keys has noted that the failure of various trust companies usually involved large holdings of unmarketed securities.[13]

Contemporary legal decisions reflected the view that trusts performed a different intermediary role from banks. Clay Herrick presented a judicial decision that emphasizes the differences:

> Banks and trust companies are not identified with each other in the popular mind. Banks are ancient, trust companies are modern. Banks deal primarily with merchants, trust companies with all classes, without distinction. Banks lend on personal credit, trust companies on the security of pledged collaterals. Banks take on the risk of the business success of mercantile enterprises, while trust companies incur only the risk of a decline in investment values. Banks actively promote commerce, while trust companies manage investments. What they have in common is that they both receive deposits. . . .[14]

Trust companies were state-chartered institutions. In New York they were regulated less than national or state banks and had fewer restrictions on their choice of assets. For example, in contrast to national banks, trusts could own stock equity directly.[15] They could also own real estate, although no more than 15 percent of their total assets could be in this form. Trust companies could also make commercial loans like national banks. In short, while trust companies could compete with national banks in most banking activities, they also had investment opportunities that were prohibited to national banks. Until 1906 in New York City, trusts were not required to hold a minimum of reserves against deposits, while national banks had to hold a reserve of 25 percent in specie or legal tender. In response to protests by national and state banks about the unfair advantage these different reserve requirements gave trusts, in 1906 New York State instituted a reserve requirement of 15 percent for trust companies. Only one-third of the reserve, however, needed to be in the form of currency held on the premises. The other two-thirds could be composed of bank balances and specified bonds.[16]

Figure 1 displays the ratio of specie, legal tender, and national bank notes to deposits subject to check at New York City trust companies.

[13] Redlich, *The Molding*, pp. 394–95; and Keys, "The Money Kings," p. 9909.

[14] Herrick, "Trust Companies," p. 378.

[15] Trust companies in New York City held on average 22 percent of total assets in the form of stocks and bonds. Knickerbocker Trust and Trust Company of America on average held 12 and 18 percent of their assets in the form of stocks and bonds, respectively.

[16] The bonds could not amount to more than one-third of required reserves. National bank notes were adequate as cash reserves for trusts, in contrast to national banks, which were required to hold legal tender or specie as reserve. Barnett, *State Banks*, p. 129.

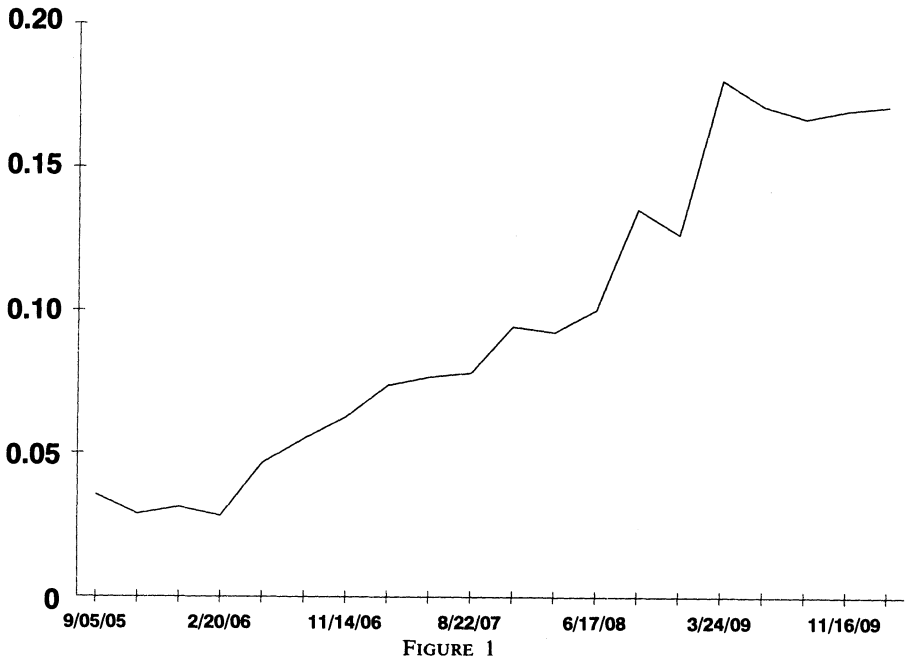

FIGURE 1

RATIO OF SPECIE AND CURRENCY TO DEPOSITS (DEPOSITS SUBJECT TO CHECKS)

Source: Compiled balance sheets of the New York City trust companies.

The measure indicates the evolution of the cash reserve ratio at trusts over time. Before 1906, the reserve ratio appeared to hover between 3 and 4 percent of deposits. The institution of the reserve requirement in 1906 appears to have been a binding constraint on trust reserve behavior, as reserves increased to over 6 percent of checkable deposits. Still, the reserves were far less than the 25 percent required reserves held by central reserve-city national banks in New York City. The federal requirement that these national banks hold such a high proportion of noninterest-bearing assets hurt their competitiveness with the less regulated intermediaries.

Several writers have pointed out that the more liberal reserve requirements granted trust companies by individual states were primarily responsible for their rapid growth.[17] The lower reserve requirements allowed a larger share of trust company assets to earn interest. In New York City, approximately 70 percent of the assets of national and state banks earned interest, while 92.2 percent of trust company assets did so.[18] Not only did the lower reserve requirements on deposits contrib-

[17] Barnett, *State Banks*, p. 235.

[18] Barnett, *State Banks*, p. 236. National banks often used trust companies to get around their 25 percent reserve requirement. When interest rates were high, banks would shift loans to trust companies to preserve their 25 percent reserve ratio. In the case of larger banks, they would

ute to the rapid growth of trust companies, the wider range of investments open to trusts probably did so as well.

The looser regulation of trusts allowed them to issue credit in a less restricted manner than banks, especially national banks. Because trust companies were less constrained in their investment opportunities, it is possible their asset portfolios were relatively more risky than those held by national banks. Unfortunately, the compiled balance sheets do not contain enough detailed information about the composition of trust assets—in particular, the composition of their loan portfolios—to permit an assessment of their riskiness relative to bank assets. Trusts, however, were reported to be paying higher rates of interest on deposits than banks and were likely attracting deposits away from state and national banks.[19]

Before widespread deposit insurance schemes, banks and trusts publicly advertised their capital levels (or capital-asset ratios) to signal their willingness to risk their own assets in their business endeavors. From the call reports, we estimate that the capital-asset ratio at New York City intermediaries was approximately 4.8 percent at the trusts, 5.8 percent at the state banks, and 7.5 percent at the national banks. The higher rates of interest paid on trust deposits suggest that there was more risk associated with them than with those at national banks. The source of the higher risk at trust companies may have been due to some combination of lower reserves, lack of access to a "lender of last resort," lower capital relative to assets, and possibly riskier asset portfolios. We are unable with our current information to distinguish the relative importance of these sources of risk at trust companies.

TRUSTS AND BANKS IN THE PANIC OF 1907

The Bank Panic of 1907 came on top of a slowing economy and displayed a number of features commonly seen in earlier financial crises. For example, interest rates spiked, stock prices fell, output in the real economy contracted sharply, and banks and other financial institutions suffered extreme deposit withdrawals.[20] Measures of stock market prices and monthly measures of real output were declining well before the onset of the panic.

International credit markets were also tight before the panic. In 1906 the Bank of England raised its discount rate from 4 to 6 percent in response to abnormally large gold outflows to the United States. It also constrained the market for bills of finance, a market in which American

increase loans at trusts with which they had close affiliations or that they owned outright. Sprague, *History of Crises*, pp. 227–28.

[19] Sprague, *History of Crises*, p. 255; and Anonymous, "Supervision," p. 5458.

[20] For measures of real and financial activity, see Moen and Tallman, "The Bank Panic of 1907;" Frickey, *Production in the United States*; Macaulay, *The Movement*; and Miron and Romer, "A New Monthly Index."

trust companies were apparently important borrowers.[21] During the summer, banks and trust companies would normally sell short-term finance bills in London, payable in pounds sterling, and ship the proceeds in gold to the United States. The bills would mature at the time the U.S. crop shipments arrived in London and the U.S. banks received payment, which was used to pay off the maturing finance bills. In the summer of 1907, there was a large gold outflow from the United States, instead of the usual inflow generated by the trade and financial arrangements.

New York City, the centerpiece of the U.S. money market, entered the fall of 1907 in a relatively tight cash position. The panic began in full on Tuesday, October 22, with the run on and resulting failure of the Knickerbocker Trust Company, one of the largest trust companies in New York City, having total assets of $69 million.[22] Several other trust companies were also subjected to extreme depositor withdrawals of cash. Unlike in earlier panics, the trust companies were the intermediaries that suffered the most severe contractions in loans and deposits. Given that the trust companies held a relatively low proportion of cash reserves to demandable deposits, the onset of the panic in which cash demands may have exceeded available cash reserves forced trusts to sell assets and/or call in loans.

The aggregate volume of trust loans before the panic was comparable to that of national banks. Total loans by New York City state banks were between one-fourth and one-third of the volume of either trust company or national bank loans. Figures 2 and 4 present measures of the volume of loans and deposits at trust companies and state and national banks in New York City between 1905 and 1909. Figures 3 and 5 present the percentage of changes in those loans and deposits between call dates.[23]

Virtually all the contraction in New York City loans during the panic happened at the trust companies (see Figure 4). Total loans at trust companies contracted by $247.6 million, or 37 percent, between the call dates of August 22 and December 19, 1907. Loans at state banks contracted by $31.3 million, or 11 percent. In contrast, loans at national banks actually increased by $59.4 million, or 8 percent, between the call dates of August 22 and December 3. Loans at all national banks in the United States contracted by $85 million, or about 2 percent.[24] Even

[21] Myers, *The New York Money Market*, p. 348.

[22] The exact date of the run on Knickerbocker varies; Carosso suggests that the run began on October 18, citing J. P. Morgan's personal papers (Carosso, *The Morgans*). Conventional treatments offer October 21, 1907 as the beginning of the run on the trust, following the refusal of National Bank of Commerce to act as clearing agent for Knickerbocker. For additional discussion, see Moen and Tallman, "Lessons."

[23] The pattern of deposit and loan measures for trusts was similar over the relevant time period, so we discuss only the behavior of the loan aggregate measures.

[24] Andrew, *Statistics*, p. 67.

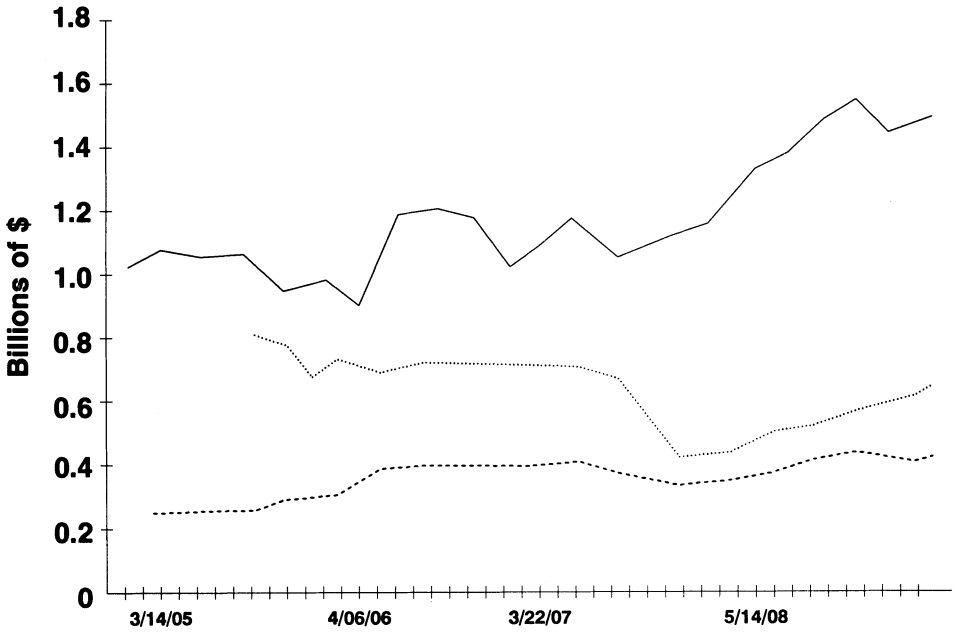

FIGURE 2

DEPOSITS AT CALL DATES IN NEW YORK CITY

Note: Trusts (dotted line); state banks (dashed line); national banks (solid line).
Source: New York Clearinghouse balance sheets.

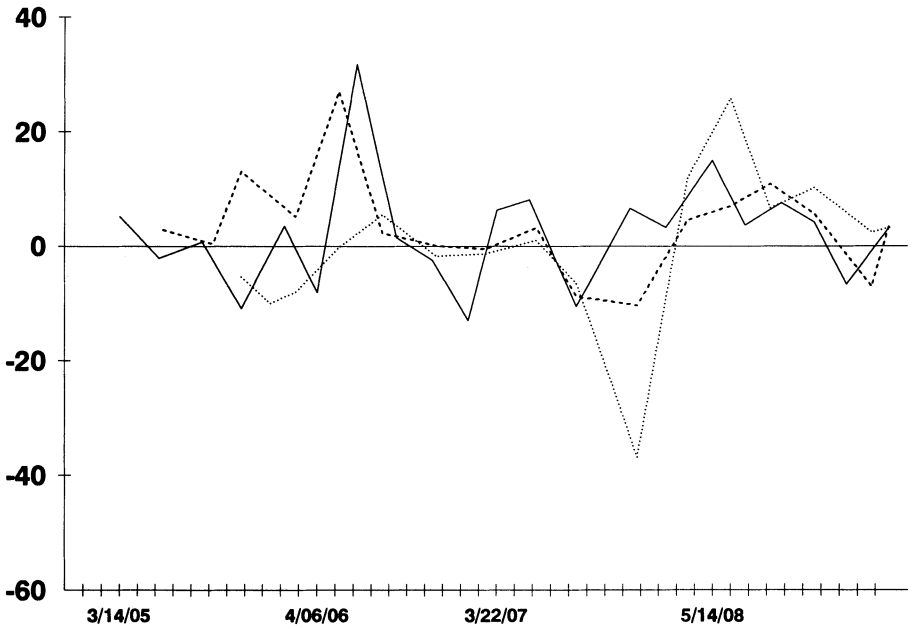

FIGURE 3

PERCENTAGE CHANGE IN NEW YORK CITY DEPOSITS

Note: Trusts (dotted line); state banks (dashed line); national banks (solid line).
Source: New York Clearinghouse balance sheets.

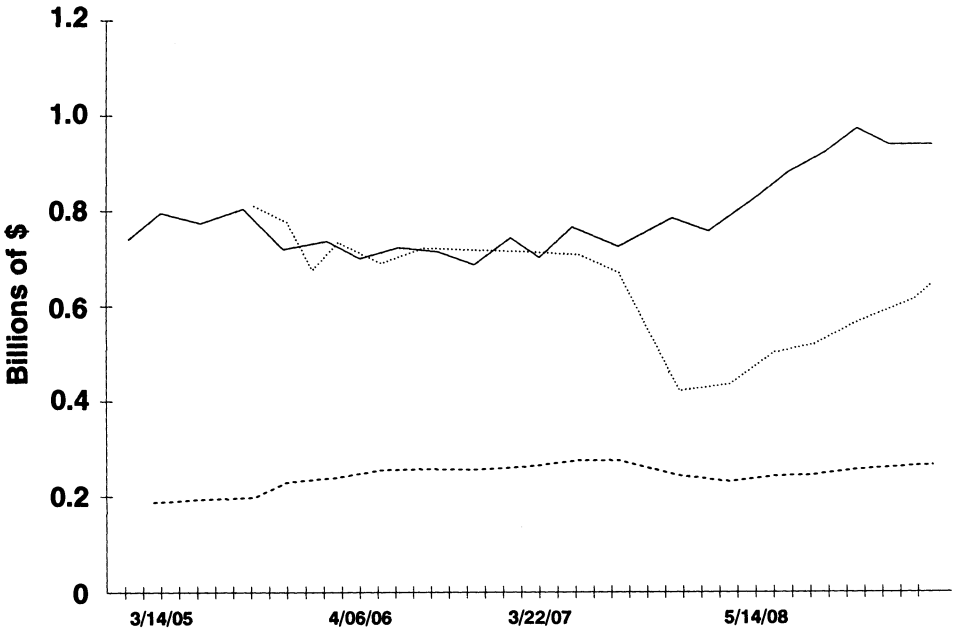

FIGURE 4

LOANS AT CALL DATES IN NEW YORK CITY

Note: Trusts (dotted line); state banks (dashed line); national banks (solid line).
Source: New York Clearinghouse balance sheets.

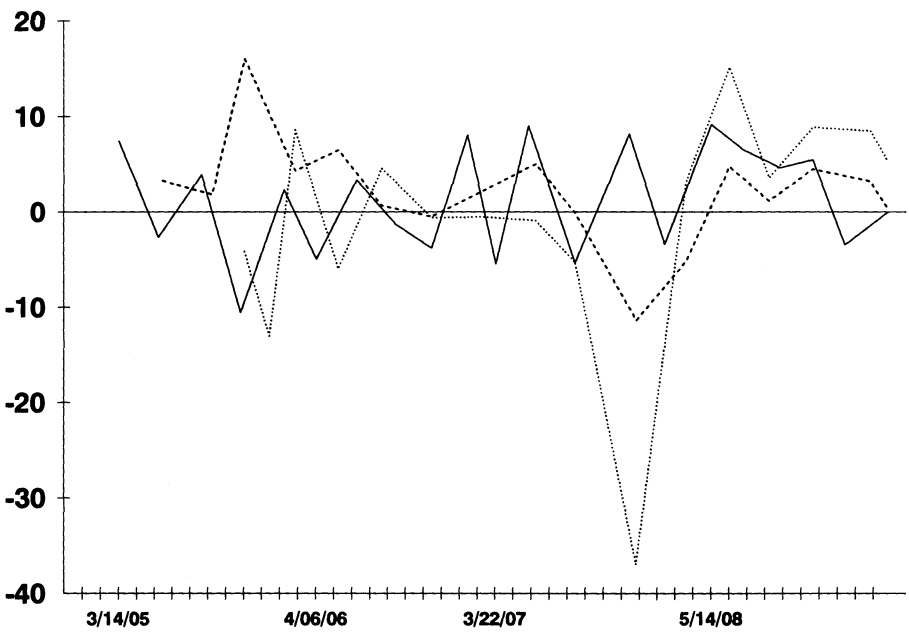

FIGURE 5

PERCENTAGE CHANGE IN NEW YORK CITY LOANS

Note: Trusts (dotted line); state banks (dashed line); national banks (solid line).
Source: New York Clearinghouse balance sheets.

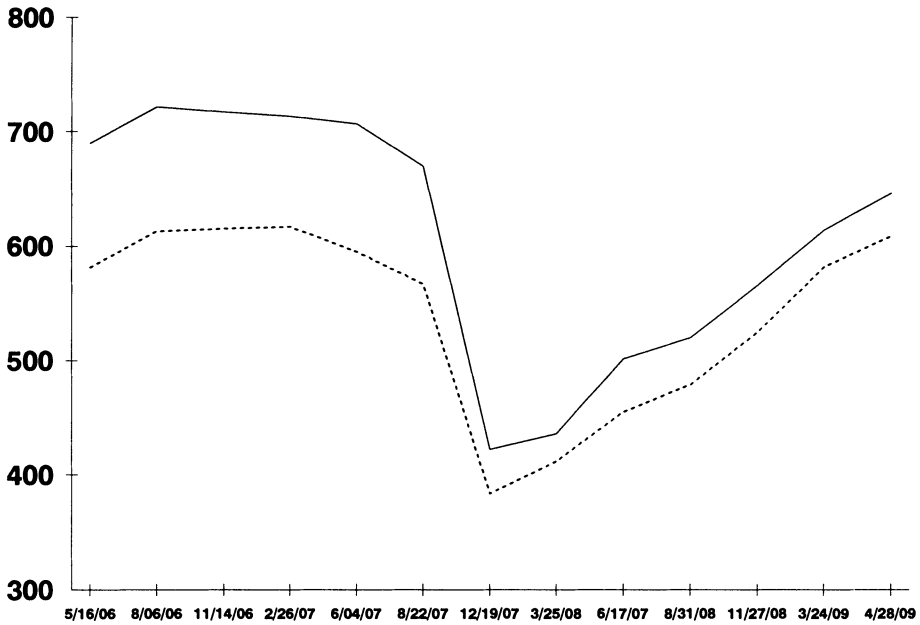

FIGURE 6

TRUST COMPANY TOTAL LOANS VERSUS LOANS WITHOUT KNICKERBOCKER, TRUST COMPANY OF AMERICA, AND LINCOLN

Note: Total loans (solid line); loans less three trusts (dashed line).
Source: Compiled balance sheets of the New York City trust companies.

excluding Knickerbocker's loans the contraction at the remaining trusts in New York City totaled $204.6 million, over twice the contraction at all national banks in the United States.

The contraction in assets was most severe at the three trusts—Knickerbocker, Trust Company of America, and Lincoln—that suffered the most publicized runs by depositors. The assets of other trusts, however, also contracted substantially—by $237.8 million, or 23 percent, from August to December. The loan portion of their assets alone contracted by $183.4 million (32.4 percent) and accounted for 75 percent of the decline in loans at all trusts. Figure 6 compares the contraction in loans of all trusts with that of trusts excluding the three that suffered publicized runs, while also illustrating that the entire industry contracted during the Panic of 1907. New York City trusts did not fully return to their pre-panic volume of loans until April 1909. As seen in Figures 2 and 4, trusts permanently lost a substantial percentage of their business to national banks following the panic.

In previous financial crises, the New York Clearinghouse acted as a lender of last resort for its members.[25] Trust companies were not an

[25] Timberlake, "The Central Banking Role"; and Gorton, "Clearinghouses."

integral part of the payments system and were for the most part outside the clearinghouse system, although they had indirect access through a clearinghouse member bank. As of June 1903, the clearinghouse required that trust companies keep a cash reserve of 7.5 percent of deposits if they were to continue to clear through a clearinghouse bank, but this was increased to between 10 and 15 percent after June 1, 1904. Rather than hold such reserves, most New York trust companies withdrew from the clearinghouse.[26] Plans for a trust company clearinghouse never went much beyond formal discussion because the demand for check clearing at trusts was limited in comparison to national banks.

The isolation of trusts from the existing lender of last resort mechanism meant that trusts were not able to stave off depositor withdrawals by borrowing from the clearinghouse.[27] Thus, the contraction in trust company loans in New York City was probably more severe than if they had had reliable access to a lender of last resort.[28] The Panic of 1907 suggests that runs at intermediaries that are outside the payments system can threaten the entire payments system.

R. Glen Donaldson argued that National Banking Era panics, using 1907 as a key example, resulted from a concentration of cash reserves at a few banking organizations.[29] He hypothesized that in 1907 cash demands at trusts exceeded available liquidity in the market, giving the few financial organizations with substantial cash reserves "monopoly power" over the marginal supply of cash. The possessor of monopoly power could have earned a higher-than-competitive rate of return on cash holdings by charging a premium on cash during the panic. Because trusts held lower cash reserves to demand deposits than other important New York City intermediaries, they were forced, in the extreme circumstance of the panic, to borrow cash and pay the premium.

Figure 1 shows how trusts, in the aftermath of the panic, held far more cash reserves in the form of specie and currency relative to deposits than before the panic. Trusts appear to have altered their liquidity preferences toward holding more cash. Following the experience of the panic and de facto reliance on New York City national banks for cash, the trusts became more wary of the potential for depositors to withdraw deposits on demand. Also, the trusts may have recognized the risks of relying on banks as the emergency source of cash.[30]

[26] J. Smith, *The Development of Trust Companies*, pp. 347–50.

[27] The refusal of the National Bank of Commerce to continue to provide clearing services to the Knickerbocker Trust was a signal to depositors that the trust was in trouble.

[28] The issue is related to the dual banking system in which federally chartered national banks were clearly differentiated from state-chartered banks by having membership in local clearinghouses and by having note-issuing privileges. The distinction between state and national banks seems to apply to trusts and national banks as well. See White, *The Regulation and Reform*.

[29] Donaldson, "Panic, Liquidity."

[30] Another interpretation is that trusts may have viewed their alternative investment opportuni-

It appears that trust companies behaved quite differently from state banks as well as from national banks in New York City. In New York City, the volume of national bank loans was relatively stable throughout the panic. Even for all national banks in the United States, aggregate loans declined only slightly ($85 million) from August 22 to December 3, 1907. Studies that use only national bank data fail to pick up the extent of loan and deposit contractions at non-national banks. They overlook the degree of distress in the New York City financial market during the panic.[31]

THE TRANSMISSION OF PANICS AND THE TYPE OF LOAN

The main mechanism for the transmission of financial distress throughout the financial system was the contraction of loans, primarily collateralized loans, held by trusts. Nearly 90 percent of trust company loans were backed with collateral, compared to 57 percent for New York City national banks. In Table 1, we present measures of collateralized loans at New York City trust companies, national banks, and for all U.S. intermediaries. As can be seen, the collateralized share of all loans at New York City intermediaries was much larger than that held by all intermediaries in the United States. The collateralized loans at all trust companies in New York City, excluding those at Knickerbocker, contracted by $175 million between August 22 and December 19, 1907. Excluding those at Knickerbocker, Trust Company of America, and Lincoln Trust, collateralized loans in New York City contracted by $156.4 million, approximately 32 percent.[32]

The compiled balance sheets of trust companies present "Loans on Collateral" and "Other Loans" separately until June 1908, but after that list only "Loans." Furthermore, the compiled balance sheets do not distinguish between demand loans on collateral, that is, call loans, and collateralized loans on time. It would be useful to distinguish between call loans and other loans, because trust companies and national banks appear to have had different portfolios of loans.

New York City national banks had a greater incentive to keep large amounts of call loans in their asset portfolios than did trust companies. Because bankers' balances—interior bank deposits at New York City

ties in loans for real investment projects as unattractive relative to the less risky option of holding cash.

[31] Friedman and Schwartz have produced the only study of which we are aware that uses trust company balance sheet information. They compiled an exhaustive series of deposits from all intermediaries in the United States and estimated a monthly money supply series. The money supply series contracted substantially during the panic, indicating the serious contraction in financial intermediation as a result of the panic. Our study of New York City intermediaries shows that trusts were the source of the contraction. Better identification of the type of loans that contracted during the panic will help isolate the mechanism that transmitted the financial shocks throughout the economy. Friedman and Schwartz, *A Monetary History* and *Monetary Statistics*.

[32] Calculated from the compiled balance sheets of trust companies.

TABLE 1
DISPOSITION OF LOANS, 1907 (IN BILLIONS OF DOLLARS)

	All Loans	Collateralized Loans	
		Amount	Share of Total (%)
All U.S. Commercial Banks	11.319	3.911	34.6
All NYC National Banks	0.712	0.404[a]	56.8
All NYC Trust Companies	0.670	0.583	87.0

[a] Of this amount, 62 percent ($252 million) of collateralized loans at New York City national banks were demandable or call loans. The remaining 38 percent were collateralized loans on time.
Note: "All Commercial Banks" are as of June 30, 1907. National banks and trusts are as of August 22, 1907.
Source: Board of Governors, all Bank Statistics; Sprague, *History of Crises*, p. 301, compiled balance sheets from the New York Clearinghouse.

national banks in excess of required reserves—were used to finance interregional trade, interior banks could draw on these balances with short notice, and did so especially during the fall crop-moving season. As a result, New York national banks lent their excess funds in the short-term call loan market rather than in time loans (that is, commercial loans).

Even though we cannot separate time and demandable collateralized loans at trust companies, we can make the distinction for national banks using data from Sprague.[33] The national banks in New York City held 62 percent of their collateralized loans as call loans on stock collateral.[34] Because trust companies had a smaller share of their deposits from correspondents than did national banks, we suspect that trust companies had a lower proportion of call loans than did national banks. Even though lending on call was profitable, the interest rate on time loans tended to be higher than the call rate because of the greater perceived liquidity of call loans. Trusts probably invested in time loans because their liquidity needs were less than those of national banks.

We use the relationships among bankers' balances, the reserve requirement, and call loans at national banks to estimate the amount of call loans at trust companies in New York City.[35] Bankers' balances at

[33] Sprague, *History of Crises*, p. 301.

[34] Call loans were about 30 to 40 percent of total loans made by New York national banks. The exposure of New York City national banks to call loans was from $250 to $300 million. Myers, *The New York Money Market*, p. 270; and James, *Money and Capital*, p. 103.

[35] Data on call loan volume and direct call loan participation of intermediaries are scarce. Myers shows data furnished for the Pujo Committee hearings on the volume of loans on call at the stock market from about 30 New York City banks and trust companies. Myers, *The New York Money Market*, p. 269. As of January 1, 1908, the first observation, these intermediaries reported that $360.5 million were on call for their own account. Sprague shows data on the volume of call loans at all New York City national banks on December 3, 1907; these banks reported $306.1 million of call loans. Unfortunately, both data points measure call loans after the panic, so that trust participation in the call loan market was likely lower than normal. Inferences on the size of the trust role in the call market from these measures would likely be biased. Sprague, *History of Crises*, p. 300.

trusts averaged approximately $85 million between 1905 and 1909; at national banks in New York City they were only around $500 million over the same period. Call loan volume at national banks generally followed the volume of bankers' balances. Margaret Myers noted that call loans represented about 75 percent of the bankers' balances at national banks, which is consistent with the 25 percent reserve required of New York City national banks.[36]

The incentives that motivated national banks to lend their bankers' balances in the call loan market should apply to trust companies as well. Trust companies likely invested their bankers' balances in liquid assets like call loans so that they could have access to funds at short notice in response to fluctuating demands by correspondents. We assume that the relationship between call loans and bankers' balances for trust companies was equal to that for national banks—even though the reserve requirement of trust companies was lower—and estimate the trust company call loans to have averaged approximately $81 million.[37] Trust companies may have held more call loans than our calculation suggests if they used call loans as pseudoreserves to back their deposits. Call loans held as reserves during normal business conditions were liquid and earned interest, unlike the banknote portion of their required reserve.

Call loans required less monitoring by the intermediary and less lender-specific information about the borrower, because the value of the collateral on call was publicly observable through the stock market. As a result, banks were more willing on short notice to take over call loans than other loans. The perceived liquidity of call loans, in normal economic conditions, may be consistent with Myers's assertion, but widespread attempts to liquidate call loans, as in a panic, could seriously depress the value of stocks, reduce the value of collateral on existing call loans, and encourage margin calls and further liquidation. National banks were particularly interested in taking over call loans during a panic because they were more exposed in the call market than were trust companies and had an incentive to protect the call loan market by providing liquidity to support stock prices. In addition to taking over individual trusts' call loans, the large national banks in New York City also created large money pools to protect the call loan market and support prices on the stock exchange.[38]

In response to panic withdrawals by depositors, trusts likely liquidated call loans before liquidating assets with longer maturity, such as collateralized time loans. In the extreme case, trust companies would have liquidated at least $80 million of call loans. Several writers

[36] Myers, *The New York Money Market*, pp. 266–71.

[37] Our rough estimate is based on multiplying $85 million in bankers' balances by 1 minus the cash portion of reserves held by trusts (1 − 0.05), which equals $81 million in call loans.

[38] Moen and Tallman, "Lessons."

document that call loans at national banks increased by $54 million from August 22 to December 3, 1907, allegedly in response to the contraction of call loans by trust companies.[39] Thus, the increase in national banks' call loans may not have been enough to offset the contraction in trust companies' call loans.

We are not aware of any published data on the total volume of the call loan market in New York City. Our preliminary estimate, based on Myers's and Sprague's national bank data, suggests a range of from $400 million to $600 million average volume in 1907.[40] We believe demand for call loans was stable because the stock market continually relied on the funds from the call loan market for liquidity, with few substitute sources readily available. Given that trust companies' collateralized loans contracted by $175 million between August 22 and December 19, 1907, we conjecture that, even if the trusts had liquidated all their call loans (our rough estimate was $81 million), then an additional $90 million in collateralized loans would still have had to be called in. The extreme observations of the call loan rate during the panic, once reaching 125 percent, indicate the contraction of the supply of lendable funds rather than an increased demand for funds.[41] Because demand for call loans was likely stable and the call loan rate spiked upward by over 2,000 percent, we believe that either the market faced a brief but extreme shortage of lendable funds or the demand for call loans was highly inelastic. High call loan rates persisted throughout the remainder of 1907.

THE PANIC OF 1907: IMPLICATIONS FOR PREVIOUS STUDIES

Recent theoretical treatments of bank panics have summarized the Panic of 1907 as an example of a financial crisis. These studies, however, have examined national bank data only; without trust company and state bank data, the analysis of the panic results in seemingly contradictory relationships between the financial crisis and the condition of intermediaries. One reason that trusts may have not been included in earlier studies of panics is that before 1907 they had not been as important intermediaries as national banks.

Bruce Smith referred to the Panic of 1907 as a bank panic that most theoretical models have difficulty explaining.[42] He noted that New York national banks increased their loans during the panic, bank reserves were relatively high, and loan quality was perceived as high. If this were a complete description, it does not seem that a panic should have occurred. The inclusion of trust company data makes the Panic of 1907

[39] Sprague, *History of Crises*, pp. 300–301; Watkins, *Banker's Balances*, p. 30; and Myers, *The New York Money Market*, pp. 269–70.

[40] Myers, *The New York Money Market*, p. 269; and Sprague, *History of Crises*, p. 301.

[41] Andrew, *Statistics*, p. 136.

[42] B. Smith, "Private Information."

more consistent with existing models. As we have shown, the runs on trust companies forced them to liquidate call loans. The loan increases that Smith cited refer to national banks only, but among all New York City intermediaries, net loans contracted. The bank reserve measures were less relevant for national banks because they historically avoided going below the 25 percent legal requirement. Also, asset quality at intermediaries may have deteriorated, as signaled by the bearish stock market movements. Smith, while not using data on trusts, did acknowledge their growing importance in the New York money market during the ten years before 1907.

V. V. Chari presented a theoretical model relying on the pyramidal structure of reserves as creating a system more prone to panics.[43] In essence, he argued that national banks in reserve cities held illiquid portfolios of assets. Our evidence suggests that New York City national banks held a large proportion of their assets in call loans, which were highly liquid. The illiquid portfolios were at the trust companies, which were outside the reserve structure and were the intermediaries most severely affected by panic runs in 1907. While the pyramiding of reserves may have promoted the transmission of the panic to the rest of the nation, it does not seem likely that it was a major cause of the Panic in 1907.

The Panic of 1907 was ignited by widespread depositor withdrawals from the trust companies, a restricted class of intermediaries in New York City. Depositors likely were aware of the differences between assets held by trusts and those held by the more regulated state and national banks. The concentration of runs at the trust companies lends support to a theory of banking panics referred to as the asymmetric information model. In this model depositors infer the risk of an intermediary's assets from publicly available information when they lack direct information about the value of that intermediary's assets. From this perspective, trust depositors in 1907 inferred a substantial increase in the riskiness of the trust companies' assets relative to those of state and national banks. Charles Calomiris and Gary Gorton provide extensive discussion of the asymmetric information and other competing models of banking panics in their empirical study of the origins of banking panics during the National Banking Era (1863–1914).[44]

The existence of frequent and detailed data on trust companies in New York City adds evidence to the growing number of studies focused on business cycles and banking panics during the National Banking Era. Although the data in this article are specific to the Panic of 1907, they may also alter the interpretation of evidence in more general works regarding financial and real markets.

[43] Chari, "Banking without Deposit Insurance."
[44] Calomiris and Gorton, "The Origins of Banking Panics."

Gary Gorton examined business cycles and banking panics during the National Banking Era to determine whether the occurrence of panics is consistent with the model of the rational consumer.[45] In his analysis, the currency-to-deposit ratio increased significantly, indicating a panic had occurred. His deposit data, however, are for national banks only, and with the inclusion of the trust data the deposit contraction would have been more severe and would strengthen the argument in his paper.

Richard Grossman investigated the channels of real and financial market interactions during the National Banking Era business cycles.[46] Rather than concentrate on panics, Grossman focused on bank failures as an explanatory variable for real output. The bank failure measures reflect a curtailment of intermediary services and a higher cost of intermediation. His results support bank failures as an important explanatory variable for contractions in real output, separate from real deposits. The addition of trust company data to national bank data enhances the study of the real and financial market linkages found by Grossman. The trust data show the proportion of financial and intermediary services provided by an unregulated market innovation. The contraction in trust loan activity may provide a clearer picture of the degree to which overall intermediary services contracted and became more costly during and after the panic.

Analysis of their asset portfolios may help explain why trusts were more subject to runs than were national banks in 1907. Unfortunately, we cannot evaluate the validity of this argument without detailed information on the composition of trust company and national bank loan portfolios. Trusts were considered outside of the payments system and had only indirect and uncertain access to clearinghouse support during tight credit markets. Furthermore, trusts held a lower proportion of reserves against deposits than did national banks and would require additional liquidity in the face of panic withdrawals. Thus, the liquidation of collateralized loans appears to have been their primary means of raising cash during a panic. The Clearinghouse Association came to the aid of the national banks that experienced runs during the week before the Knickerbocker failure, and such runs stopped. The lack of direct access to a lender of last resort may provide an important reason why trusts were stricken with panic withdrawals.

The volume of new capital formation through the equity, bond, and bank loan markets was roughly equal each year from 1906 to 1909. Net new issues of equity averaged $514.5 million, net new issues of corporate bonds averaged $773.4 million, and the average increase in total bank loans in the United States was $448.8 million.[47] The contrac-

[45] Gorton, "Bank Panics."

[46] Grossman, "The Macroeconomic Consequences of Bank Failures."

[47] Data are from Goldsmith, *A Study of Saving*, p. 316; Hickman, *The Volume of Corporate*

tion in collateralized loans in New York City trust companies, nearly $220 million, was clearly enough to disrupt credit markets substantially. National banks were prohibited from investing in certain assets that were available to trusts; therefore, trusts and national banks were not perfect substitutes with regard to particular borrowers. This raises the question about who were the main borrowers of collateralized loans at the different institutions. Clearer identification of the borrowers will help assess the relative riskiness of the assets held by trusts compared to those of national banks.

CONCLUSIONS

Trust companies in New York City suffered a tremendous contraction in deposits and loans as a result of depositor withdrawals during the Panic of 1907, while state and national banks experienced no comparable contraction. The net asset contractions at New York City trusts were significant even after we exclude the three trust companies that suffered highly publicized runs. Thus, the trust industry in New York City contracted on a wide front relative to the other predominant financial intermediaries.

The contraction in financial intermediation that spread to the rest of the nation started in a specific intermediary that was less regulated than others operating in the same financial markets. The risk of trust portfolios, the lack of direct access to the clearinghouse, and lower reserves against deposits must be the main reasons why the Panic of 1907 was concentrated in the trust companies. Since we have no direct evidence on the detailed composition of trust company loan portfolios, however, we can only cite anecdotal evidence and hypothesize about their riskiness. We know that trust companies held a higher share of collateralized loans than did national banks (Table 1), and we suspect that trusts also had more loans on time than did national banks. Pursuit of direct evidence on trust company loan portfolios remains a subject for further research. In spite of this shortcoming, the evidence on the trusts' behavior advances our understanding substantially over that presented in previous studies. None of those studies relied on asset or loan composition as a key variable; instead, they looked primarily at aggregated measures of deposits or loans. Our analysis makes clear that these aggregated measures are incomplete or confusing without the inclusion of the trust companies' loans or deposits.

Bond Financing, p. 300; and Board of Governors of the Federal Reserve System, *All Bank Statistics*, p. 34.

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