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Close but not a Central Bank: The New York Clearing House and Issues of Clearing House Loan Certificates

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The paper examines the New York Clearing House (NYCH) as a lender of last resort by looking at clearing-house-loan-certificate borrowing during five banking panics of the National Banking Era (1863–1913). In that system, adequate aggregate liquidity provision was passive and dependent upon member bank borrowing. We document bank borrowing behavior using bank-level data for clearing-house loan certificates issued to NYCH member banks. The historical record reveals that the large New York City banks behaved in ways that resembled those of a central bank in 1884 and in 1890, but less so in the more severe crises.

Keywords: Banking crises, lender of last resort, National Banking Era, New York Clearinghouse, clearing house loan certificates, interbank borrowing.

JEL codes: G01, G21, G23, N20.

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The clearing-house system is becoming a definitely recognized power in the financial methods of the United States. It is as yet in its infancy, and the powers that the various clearing-houses possess are capable of development and expansion to an indefinite degree. The clearing-house, which was begun simply as a labor saving device, has united the banking interests of various communities in closer bonds of sympathy and union, and has developed into a marvelous instrumentality for the protection of the community from the evil effects of panics and of bad banking. Clearing-houses are gradually becoming a welding force that ultimately will bring to the banking business of this country the centralization which it so greatly needs. (Cannon 1910b, p. 24).

I INTRODUCTION

The New York Clearing House developed several tools that aided member banks in dealing with panics and runs on deposits.[1] One particularly central bank-like tool was the provision of clearing house loan certificates, which were IOUs backed by collateral and used by banks in place of specie and legal tender to settle accounts between banks during the check clearing process at the New York Clearing House.[2] As a result, clearing house loan certificates effectively freed up cash to pay depositors, buy up loans, facilitate gold imports, and preserve liquidity in the payments system.

Most previous research on the issuance of clearing house loan certificates during the National Banking Era (1863-1913) relies on aggregate measures of their use in New York and on the informative analysis of Cannon (1910). Relying on Cannon's description and on aggregated measures of clearing house loan certificates alone suggests that the Clearing House banks engaged in a united approach to fight panics during the National Banking Era. Our analysis based on bank-level data indicates that was likely not the case.

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[1] Contemporaries like Sprague cited the sudden desire of out of town correspondent banks to liquidate their deposits in New York as a main source of disruption during panics, at least in New York.

[2] See Timberlake (1993), Gorton (1985), Tallman and Moen (2012). Clearing house loan certificates were used by other clearing houses as well.

The big New York City national banks held the largest volume of cash reserves in the banking system and were the lynchpin of the reserves system during the National Banking Era. The pyramid of reserves and correspondent banking funneled reserves to the big New York City banks, which were also able to add liquidity to the financial market in the United States, as James Cannon optimistically anticipated in the quote above. The New York Clearing House would allow illiquid member banks to borrow clearing house loan certificates thereby providing liquidity to the banks that needed it. The entire clearing house membership would honor the clearing house loan certificates as (a temporary) final payment. But the larger New York City national banks, during the National Banking Era, could also affect liquidity indirectly and thereby aid illiquid banks by borrowing clearing house loan certificates, substituting them temporarily as clearing balances, thereby releasing cash from its clearing balances to the banking system in New York. In this way, the large, New York City national bank would be providing liquidity with a conscious appreciation for improving market liquidity, a positive externality. Although this conventional story is implicit in Cannon (1910), it is unclear whether incentives were sufficient to encourage the large, NYC banks to borrow in this way.

The central banking powers of the private clearing house system in the United States were limited. For example, the issues of clearing house loan certificates were imperfect substitutes for cash (they could not pass as hand to hand currency). One frequent criticism of clearing house loan certificate issues in New York City is that volume of issuance was perceived as too small to make a big difference in financial market liquidity during a panic and we agree. That observation likely arose from the passive method of issuance -- banks had to borrow them and post adequate collateral against them. Further, the New York Clearing House was not a separate financial entity – it was unable to issue its own liabilities as central banks could. Hence, the New

York Clearing House was unable to conduct “open market operations” and offer the financial market cash. Given such limitations to its power, it should not be surprising that the New York Clearing House was incapable of effectively alleviating panics during this period. Yet the perspective of Cannon still permeates the analysis of the period and conveys a sense of a united clearing house membership engaged in a coordinated effort to forestall the panic. While we find some evidence consistent with this conventional view, we also find much that is not.

We have created a new data set of bank-level observations from the daily minutes of the New York Clearing House Loan Committee for the panics 1873, 1884, 1890, 1893, and 1907. These data indicate the volume of the clearing house loan certificates requested, the bank identity, the exact date of the issues, and the date of cancellation of the certificates. The bank-level data on clearing house loan certificates contributes to our understanding of the behavior of individual banks during the panic. This in turn helps clarify the overall performance of the New York Clearing House as a private lender of last resort.

This paper focuses on the borrowing behavior of the big New York City national banks as well as that of the biggest borrowers of clearing house loan certificates in each panic. The bank level data indicate great variation in the responses of individual New York banks to each panic. We find no explicit evidence of pre-conceived effort from the New York Clearing House in providing liquidity to the banking system. Depending on the panic instance, some large banks borrowed substantially, other large banks not at all. While we do not yet know the reasons why particular banks issued loan certificates and others did not, we suspect that bank specific liquidity needs rather than concerns about the general stability of the banking system explains the changing participation in loan certificate issues. In summary, we find little evidence to indicate coordination of loan certificate issues by the New York Clearing House and its members.

II CENTRAL BANK-LIKE TOOLS AND SOME HISTORY

Interior banks deposited cash in New York City national banks and those deposits qualified as reserves meeting reserve requirements established by the National Bank Acts. Chicago and St. Louis had become central reserve cities in 1887, reducing the proportion of bankers' balances in New York. Nevertheless, New York was still the key central reserve city (Sprague 1910, p. 125) and the reserves held in New York City also had become increasingly concentrated at the big banks. Because the big New York national banks sat at the top of the pyramid of reserves, their ability to rearrange reserves combined with the supervisory capabilities of the New York Clearing House over its members presented them with nascent central bank powers.

A. Clearing House Loan Certificates.

The borrowing of clearing house loan certificates was a mechanism to allocate temporary liquidity to member banks, and active participation in honoring loan certificates as final payment was an obligation New York Clearing House members. Therefore, by honoring the payment by clearing house loan certificate, the accepting bank was effectively lending to the borrowing bank. Further the membership agreed in advance to abide by their loss-sharing rules, which specifically described how the membership would share losses from clearing house certificates of banks that failed to repay them. New York Clearing House member banks were exposed to losses arising from unpaid clearing house loan certificates, so their private equity capital was placed at risk by any issuance of clearing house loan certificates.[3]

The New York Clearing House was the issuer of clearing house loan certificates for the borrowing member banks. Member banks would borrow them after having put up collateral suitable to the Clearing House Loan Committee. Usually the clearing house loan certificates

[3] Losses on clearing house loan certificate issues to New York Clearing House members were shared among the membership and assessments to cover loss amounts would be made relative to member bank capital.

would be issued at 75 percent of the value of the pledged collateral, although it could be higher or lower. Member banks were obliged to accept clearing house loan certificates in lieu of cash during settlement, although the accepting bank would earn six percent interest paid by the bank that borrowed them. The New York Clearing House kept track of interest payments. While the certificates bore the name of the borrower, the membership of the New York Clearing House nevertheless guaranteed them and the guarantee was an important support to the required acceptance for payment.[4]

Clearing house loan certificates were not a net increase in cash reserves. Rather, the loan certificates were a temporary substitute for specie or legal tender used to settle final payment balances at the New York Clearing House among the member banks.[5] On the balance sheet, the clearing house loan certificate represents an asset for the receiving bank available for payment and as a liability in the form of a loan from the New York Clearing House membership, or more accurately, from each member bank that accepted them as final payment. The liability in the form of clearing house loan certificates could also be transferred from one bank to another at par during settlement. We emphasize that clearing house loan certificates were a transferable liability and not a single loan between two specific banks. Rather, as transferable liability, the clearing house loan certificate implicitly involved a loan from the holding bank to the borrowing bank. Because they could not circulate outside of the Clearing House and be issued to the public, clearing house loan certificates were an imperfect (and inferior) substitute for legal tender.[6]

[4] The arrangement for clearing house loan certificates resembles the modern tri-party repurchase agreement with the Clearing House Loan Committee managing the asset used as collateral.

[5] In some ways clearing house loan certificates resembled discount window loans at the Federal Reserve, although a Clearing House Loan Committee had to be assembled to authorize formally and over see their issue, while the discount window facility is a standing facility.

[6] National bank notes were never accepted at the New York Clearing House for final payment, whereas clearing house loan certificates were designed to serve that purpose during a panic. A stock of national bank notes would have allowed banks to offer currency to depositors withdrawing cash, and they contributed to the eventual recovery in 1907. But national banks note issues took nearly three weeks from request to delivery. Clearing house loan certif-

B. Other Tools.

Suspension of the convertibility of deposits into cash was a drastic tool used in panics to stem deposit withdrawals. Payment suspensions were imposed only in the most severe panics (not in 1884 or 1890). When implemented, they took hold usually near the time clearing house loan certificates were authorized, as in 1873 and 1907, but they were imposed more than a month later during the Panic of 1893. Contemporary observers like O.M.W. Sprague criticized payment restrictions/ suspension as an unnecessary response, one that usually added to panic; Wicker (2000) concurs. On the other hand, Friedman and Schwartz regarded restrictions of convertibility as a reasonable response to a panic thereby limiting the drain of reserves. Individual depositors were most affected by payment suspensions, because the big banks continued to send reserves to interior correspondent banks during a panic. One side effect of payment suspensions was a premium on currency over deposits. The currency premium would induce gold inflows if the country was maintaining the gold standard (1893 and 1907), and the additional supply of gold eventually would add to bank reserves more durably than clearing house loan certificates.

Another tool, reserve pooling, had been abandoned after successful applications in the Panic of 1873 (and the earlier panics associated with the Civil War) according to Elmus Wicker (2000). With a pooling arrangement, the Clearing House Committee was also authorized to equalize legal tender reserves when clearing house loan certificates were authorized.[7] In effect, the reserves of the member banks were united into one pool. In cases where a bank was falling dangerously low in actual reserves, the other members could be assessed and reserves would be directly provided to the troubled bank from the pool. It is not surprising, though, that the appar-

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icates could be issued more quickly.

[7] *Commercial and Financial Chronicle*, Sept. 27, 1873, pp. 410-11.

ently successful practice was abandoned; the reserve providers were likely uninterested in offering an uncompensated subsidy to the banks short liquidity.

Selective information provision was also a tool used by the New York Clearing House to subdue panic conditions. The *Commercial and Financial Chronicle* published weekly a subset of key balance sheet items of the New York Clearing House member banks; during panics, the New York Clearing House suppressed publication of individual bank data and instead reported only aggregate data to the public. The aggregate balance sheet typically reflected some stress in the banking sector, but avoided the isolation of a bank with a weak or weakening balance sheet.

III CLEARING HOUSE LOAN CERTIFICATES AND BIG NEW YORK BANKS

Of the tools available to the New York Clearing House to alleviate panics, the issuance of clearing house loan certificates most closely resembles central bank action to expand liquidity during a crisis. The New York Clearing House banks used clearinghouse loan certificates in all of the major banking panics during the national banking era. Previous studies have had to rely on the aggregate volume of certificates issued during a panic. Our analysis of clearing house loan certificates uses a new data set drawn from the minutes of the New York Clearing House Loan Committees from the 1873, 1884, 1890, 1893, and 1907 panics. We focus on the use of clearing house loan certificates by the big New York banks during panics because those banks controlled a large proportion of assets among New York Clearing House members and thereby had the greatest capacity to increase liquidity in an orderly and central-bank like manner.

During the major panics, the New York Clearing House would appoint a subcommittee of member bank officers to oversee the issuance of loan certificates to forestall or in anticipation of widespread depositor withdrawals. The minutes of the committee compiled by the Clearing

House contains, among other valuable records, the volume of loan certificates issued and cancelled (withdrawn) by each New York Clearing House member bank in 1873, 1884, 1890, 1893 and 1907.[8] Thus, we are able to identify the specific banks that were most actively borrowing clearing house loan certificates and how quickly they reacted to the onset of a panic.

We supplement the clearing house loan certificate data with balance sheet information by bank taken from the Annual Reports of the Comptroller of the Currency of the United States for the national banks and from the New York Superintendent of Banks for the state banks that were clearing house members.[9] The information from the Comptroller help us to identify characteristics of banks that would make them more likely to request clearing house loan certificates from the New York Clearing House. A bank's connection to the correspondent banking system, for example, as measured by the volume of deposits due to other banks, might be an important correlate with the volume of loan certificates issued by a bank. We also use weekly statements of the New York Clearing House banks published in the Commercial and Financial Chronicle; these statements include a subset of balance sheet items like net deposits, specie and legal tender.[10]

A. Evidence of Central Bank Behavior in a Counterfactual World.

We seek evidence of coordinated effort on the part of the clearing house member banks to fight a panic. We expect unified or coordinated behavior by the clearing house banks to provide liquidity during a panic, generously if at a high rate of interest if it were following Bagehot's advice. We also expect to see the New York Clearing House members intentionally taking on central bank functions. Note that these are ideal behaviors of a central bank.

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[8] We include the certificates issued by state chartered banks that were members of the Clearing House. While the membership was dominated by national banks, it was not restricted to national banks nor were national banks required to be members of the New York Clearing House, as they were of the Federal Reserve System.

[9] We use the call report date that is closest to the start of each panic because panics are transient and yet severe events, so we want to get measures that are temporally close to the event.

[10] These weekly reports display fewer aggregates and do not allow a rigorous examination of bank conditions. That said, they can offer useful information as interim reports of bank balance sheets items between call dates.

Reserve pooling, as in the Panic of 1873, might be such an action from a system-focused entity like New York Clearing House. One can think of reserve pooling as maximizing the value of liquidity provision at the margin and thereby avoiding inefficiencies like reserve hoarding by individual banks. That said, the absence of reserve pooling in the responses to panic conditions in 1884 through 1907 suggests that the New York Clearing House banks with sufficient reserves were unwilling to share them without compensation. In contrast, clearing house loan certificates has an implicit compensation scheme distinguishing it from reserve pooling.

Banks requesting clearing house loan certificates were trying to increase their liquidity, and the creditor banks accepting them were agreeing to share the risk of default if a member could not redeem their loan certificates. Borrowing loan certificates was at the discretion of the individual bank, and although member banks had to accept loan certificates as payment, there was no provision to compel member banks to borrow them in the first place. In a counterfactual world of an active lender of last resort, we would expect some obligation on the part of all member banks to issue them, and that is the sense one gets from reading Cannon (1910, page 79).

> Others regard it (requesting clearing house loan certificates) as in no way prejudicial to their interests, but rather ***as a patriotic movement in which all the banks should engage, both for the purpose of assisting their fellow-members and for the welfare of the community as a whole***. The members of the New York Clearing House Association especially have distinguished themselves in this regard. Up to 1907, when only about 60 per cent of the members found it necessary to take out certificates, ***it has been the almost universal rule for all the members to take loan certificates whenever the occasion demanded such action on the part of any of the banks, and this, too, without regard to how strong they may have been or how easily they might have gotten on without using them***.

Our evidence does not support this characterization.

Coordinated issues of clearing house loan certificates would display volumes in proportion to each bank's assets, reserves, bank clearings or net banker balances, which would require orchestration and/or coercion by the clearing house. Banks refusing to issue loan certificates might find themselves fined or expelled from the clearing house. This counterfactual assumes only the tools and supervisory authority that the New York Clearing House actually had at the time to establish a baseline for evaluating its observed behavior relative to that of a central bank. In short, could the New York Clearing House have reasonably altered its behavior to be more like a lender of last resort if the evidence indicates that its actual behavior had fallen short?[11]

B. Aggregate Measures

Before looking at bank level information, we present aggregate information for all New York Clearing House member banks in New York. Table 1 presents the total volume of clearing house loan certificates issued, a selection of standard balance sheet items, and several ratios for all New York Clearing House member banks in the five major panics. The first contradiction of Cannon's conventional view is the percentage of clearing house member banks that borrowed clearing house loan certificates. We find that the percentages for 1873, 1893, and 1907 are approximately the same at between 53-55%. Notably, the percentage of participation was highest in 1907, the crisis that Cannon noted as having only about 60 percent of the banks borrowing.

The volume of "due tos" or deposits from other banks held by the New York national banks reflect the exposure of national banks to withdrawal risk from correspondent banks located predominantly in the interior of the country. The aggregates reveal growth in deposits from individuals and other banks (due tos) with the most noticeable increase coming between the Panics of 1893 and 1907. Deposits held by the New York City banks at other banks (due froms) also expand noticeably between 1893 and 1907. These movements are consistent with New York's importance in the correspondent banking system, and the increase in the interconnections throughout the country through correspondent relationships. The correspondent relationships

[11] James Cannon (1908) proposes an emergency currency issue from the Treasury for which clearing house loan certificates could be deposited with the Treasury as collateral during a panic. Aldrich-Vreeland Emergency Currency embodied his central ideas, but the approval process eschewed clearing house loan certificates as collateral.

between banks in New York City and the banks in the other two central reserve cities (after 1887) -- St. Louis and Chicago -- became particularly important.

We examine the issuance of clearing house loan certificates relative to key balance sheet items across the five panics in Charts 1 and 2. Chart 1 presents the ratios of loan certificates to cash reserves and to net due tos. Chart 2 presents the ratios of clearing house loan certificates to net deposits and to total assets. The ratios indicate some important differences in the balance sheet conditions of the New York City banks in certain crisis periods. However, the differences do not indicate substantial changes in the behavior of the New York banks across the panics. For example, the ratio of total loan certificates issued to cash reserves is highest in 1873 around 65 percent with the next highest (40 percent) observed in both 1907 and 1893. The panics of 1873 and 1907 posed the greatest direct threat to the New York banks. The Panic of 1893 was severe in the interior of the country, but Wicker (2000) notes that the panic in New York City was less severe. The ratios for all four measures are lower in 1884 and 1890, the less severe crises.

Looking at the clearing house loan certificates to net due tos ratio, we note that the ratio is nearly 30 percent higher in both 1873 and 1907 relative to the other panics. The subsequent drains on deposits -- perhaps related to the level of net due tos -- likely determined the degree of clearing house loan certificate issuance. The aggregate figures indicate that the New York Clearing House banks were responding to the severity of panics, at least as viewed from New York.

Chart 1 illustrates how clearing house loan certificates were used most intensely to increase liquidity during panics that most directly affected the New York Clearing House banks (1873, 1907, and 1893 to a lesser extent). Aggregate level data presents a benign view of the New York Clearing House's response to panics, providing liquidity in proportion to the severity of each panic, at least from the perspective of New York City.

C. Who Issued Loan Certificates -- the Larger Panics: 1873, 1893 and 1907

Making comparisons across 1873 to 1907 is complicated by the fact that the ranks of the biggest banks changed. For example, the First National was rather small in 1873 as measured by volume of assets; by 1907 it was the fourth largest. National City Bank, James Stillman's bank in 1907, was only the seventeenth largest in 1873; it was largest in 1907. We examine the behavior of the six largest banks in each panic based on the volume of assets and then on the volume of loan certificates issued; these were the banks that had the most to lose if the financial markets shut down. We rank banks based on assets and total loan certificates issued because we presume that if Clearing House members behave like a lender of last resort, it will be most pronounced among the largest banks taking the lead during panics. We examine the big six banks in each panic, although there is no theoretical or structural reason for choosing the six largest banks.[12] Note also that the proportion of New York Clearing House member bank assets accounted for by the biggest six banks varies over time.[13]

We focus first on the largest panics --1873, 1893, and 1907—as each was unique in how New York was affected and how the Clearing House Banks reacted. Following Sprague (1910) and Wicker (2000), we return to 1884 and 1890 as two examples of how the New York Clearing House banks handled panics when their private interests were immediately threatened, but not as seriously as in the larger panics. Furthermore, we look only at the mix of banks, ranked by volu me of assets and loan certificates issued, participating in issuing loan certificates.

1. The Panic of 1873

[12] In 1907 the Big Six were National City Bank, National Bank of Commerce, Hanover National Bank, National Park Bank, First National Bank, and Chase National Bank (Sprague 1910, p. 267). This is the traditional definition of the Big Six. Myers (1931) also follows the convention of examining the six largest banks. In 1873 the six largest banks were the Fourth National Bank, the National Bank of Commerce, National Park Bank, the Bank of New York [never a big correspondent – more of a wholesale bank], the Metropolitan National Bank, and the Importers and Traders National Bank.

[13] We could choose a threshold proportion of New York Clearing House bank member assets or deposits as the condition for the large players in New York City banking and we may pursue that route in future work.

The Panic of 1873, like the Panic of 1907 and unlike 1893, was centered in New York. It began with the failure of Jay Cooke and Company, a well-regarded merchant bank in New York. Cooke was over-exposed to several investments in railroad bonds, most notably the Northern Pacific. A stock market panic soon followed and the New York Stock Exchange was shut down for two weeks. The New York Clearing House Committee authorized the issue of clearing house loan certificates and imposed the equalization of reserves of the clearing house member banks on September 20 and partially suspended payments on September 24.[14] Wicker points out that the New York City banks continued to pay legal tender currency to their correspondents even in the presence of suspension.[15]

The New York City banks varied their responses to the authorization of clearing house loan certificate issues. While the larger banks tended to request loan certificates, there were notable exceptions. The state chartered banks requested over 15 percent of all loan certificates in New York. The big national banks along with other intermediaries were borrowing clearing house loan certificates and thereby adding temporarily to the liquidity of the New York City financial market. There was no sense, however, that all the biggest banks were in dire need of liquidity.

Tables 2 and 3 present the volume and percentages of clearing house loan certificates borrowed by banks in 1873. Table 2 presents only the largest member banks ranked by volume of assets, and the biggest six banks represented about 40 percent of New York Clearing House member assets. Note that even though National Bank of Commerce did not issue loan certificates and Importers and Traders issued only $500,000, the big six banks contribute clearing house loan

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14 September 20, 1873 was the last date the Commercial and Financial Chronicle published bank specific balance sheet information of the New York Clearing House banks until the official release of the bank specific balance sheet information for publication resumed on December 13, 1873.

15 Gold coin did not circulate and currency did not become convertible to gold until 1879, although specie could be used as reserves by banks.

certificates in about the proportion to their share of New York Clearing House member assets (45 percent of clearing house loan certificates issued). Further, as emphasized above, the contribution of liquidity through clearing house loan certificates is a combination of borrowing loan certificates and having member banks accepting them as payment thereby playing the role of creditor. Any member bank holding the clearing house loan certificate of another member bank was therefore effectively a lender. Those banks with balance sheets unencumbered with borrowing clearing house loan certificates were effectively the underwriters of the implicit guarantee for issued clearing house loan certificates, precisely because they did not issue any.

Table 3 ranks all New York Clearing House member banks by volume of loan certificates issued. Both state and national banks were New York Clearing House members and issued loan certificates. The banks listed in Table 3 reveal that the banks other than the largest national banks were willing to borrow large volumes of loan certificates. Of all banks borrowing loan certificates in 1873, the Bank of North America is ranked fourth, and it was a state-chartered bank.[16] In addition, the Bank of North America borrowed clearing house loan certificates in an amount that was nearly 60 percent of its loans and discounts as of September 20, 1873.[17] This is notable because the Clearing House Loan Committee typically limited the clearing house loan certificate issues to 75 percent of the fair market value of collateral. State bank members borrowed about 16 percent of the total clearing house loan certificates borrowed in 1873.

The big New York Clearing House member banks requested clearing house loan certificates in a proportion comparable to their share of member assets -- approximately 40 percent. The large banks that did not borrow – National Bank of Commerce, American Exchange, and

[16] It had switched its charter and was a national bank by 1893. We note also that we lack explicit balance sheet data for the state banks in all panics except 1907. We will address this shortcoming in a future revision. Until then, we use the limited numbers from the weekly listing of New York Clearing House members from the Commercial and Financial Chronicle.
[17] Commercial and Financial Chronicle, September 27, 1873, Volume 17, page 412.

Merchant's National -- could be considered creditors for the borrowing banks. These large banks and the other banks not borrowing clearing house loan certificates in 1873 -- comprising about 35 percent of New York Clearing House assets – were the effective creditors (and guarantors) for banks like Central National, Fourth National, and the Bank of North America. The larger New York national banks shared the creditor role with a number of smaller banks that did not borrow clearing house loan certificates.

2. The Panic of 1893

The panic of 1893 started in the interior of the country and did not threaten the New York banks directly. The lack of an imminent threat to the liquidity of New York Clearing House banks is revealed in both Table 4 and Table 5. Table 4 shows that the six largest banks borrowed only 27 percent of the loan certificates, which was about the same as their share of New York Clearing House member capital and surplus (27 percent); the same banks combined accounted for about 30 percent of New York Clearing House bank loans.

As noted above, the borrowing reveals a potential for the larger banks to play the creditor role to borrowing banks. The biggest borrowers of loan certificates took out 42 percent and the bank that borrowed were relatively large, ranking from 3rd to 18th on the basis of total assets. The New York banks issued a larger total volume of loan certificates than in 1873 (and in 1884 and 1890). Mercantile National borrowed clearing house loan certificates in an amount over 20 percent of its total assets and in an amount that was over 125 percent of its capital and surplus, signaling that it faced a serious liquidity crunch. But the total amount of borrowing by Mercantile was not sufficient to threaten the solvency of the membership; the clearing house loan certificates of Mercantile were almost 40 percent of its loans, far below the nearly 60 percent of loans taken by Bank of North America in 1873. State bank members borrowed 15 percent of the total of clearing house loan certificates in 1893; that is a comparable ratio to what was observed in 1873 (16 percent) even though no state bank was listed among the largest borrowers in 1893. It is notable that Chase, Park, and First National took out clearing house loan certificates in amounts over 50 percent of their capital and surplus, with Chase taking out more in clearing house loan certificates than it had as capital and surplus.

3. The Panic of 1907

The Panic of 1907, while centered on the trust companies, still presented a grave threat to the New York Clearing House member banks. If the call loan market had frozen up and the stock market collapsed, the New York Clearing House member banks could have been dragged down with the trust companies. Five of the “Big Six” banks borrowed more loan certificates, collectively and individually, than they had in earlier panics (Tables 6 and 7). The exception is Hanover National, which therefore played a creditor (and guarantor) role. The 'borrowing five' of the largest banks were also the top five in terms of volume of loan certificates borrowed. Mechanics and Traders Bank, a state bank, came into the panic with a large volume of certificates outstanding. It had been subject to bank runs focused on the banks associated with Heinze-Morse-Thomas chain of banks in the week before the run on the trust companies started. The New York Clearing House had successfully stamped out the run on these banks in the week prior to the panic.

The big six banks borrowed 53 percent of the clearing house loan certificates issued, and comprised just over 50 percent of the total assets of the New York Clearing House membership.[18] Chase National borrowed an amount of clearing house loan certificates in excess of its capital and surplus, over 20 percent of its loans, and close to 15 percent of its total assets. Me-

[18] They also comprised 52 percent of capital and surplus and 52 percent of the loans of the New York Clearing House banks.

chanics and Traders State Bank borrowed an amount over 150 percent of its capital and surplus, nearly 30 percent of its loans, and 20 percent of its total assets. The highest proportion of borrowing relative to total assets was over 23 percent by New Amsterdam National Bank, another Heinze-Morse-Thomas bank. Of the Heinze-Morse-Thomas associated banks, those that were clearing house members borrowed loan certificates at a high ratio.[19]

Preliminary investigation of the ledger book of the New York Clearing House has suggested a mundane explanation for the pattern of borrowing clearing house loan certificates during the Panic of 1907. The ledger books are a daily record of payments to and payments from the major banks as cleared through the New York Clearing House. We accumulated the net debit/net credit balances for the membership starting in October 1907 (one starting on October 14 and another starting on October 21). The accumulated balances as of November 9 when correlated with the outstanding clearing house loan certificates borrowing at that date generates a correlation coefficient of -0.55 and -0.7 (relative to October 14 and October 21 accumulations, respectively), signaling that the banks with the largest accumulated debit balances at the New York Clearing House borrowed the most clearing house loan certificates. We only have these data available for 1907 at this time, but the finding is consistent with the idea that the banks facing their own liquidity shortage took out the most clearing house loan certificates.

4. Comparing 1893 and 1907

In the panics of 1893 and 1907 most of the same New York banks took out clearing house loan certificates. Although it is well known that the sources of the panics were quite different, the aggregate statistics display fairly similar proportionate borrowing among New York

[19] We display the maximum volume of clearing house loan certificates outstanding for each of these three panics in order to assess the largest potential exposure and the largest borrowings. These observations likely did not happen simultaneously, and are meant only to highlight the extent of borrowing during each panic.

Clearing House banks across the two panics. The big six banks in 1893 issued 27 percent of the clearing house loan certificates commensurate with their share of capital and surplus among the clearing house membership; in 1907, the big six banks issue 52 percent of CHLCs, comparable to their 52 percent share of capital and surplus at the New York Clearing House. Essentially, the big six just got bigger between 1893 and 1907 and the big six banks borrowed clearing house loan certificates commensurate with their share of the New York Clearing House.

O.M.W. Sprague, perhaps the most famous observer of the panic, criticized the New York banks for delaying in issuing Clearing House loan certificates until Saturday, October 26, four days after the run on the Knickerbocker Trust and then the Trust Company of America had started. Had they been issued immediately, Sprague claims that the banks could have avoided the unfortunate step of suspending cash payments, which occurred almost immediately after loan certificates were issued. Wicker (2000) also suggests that an earlier issuance of CHLCs may have avoided the haphazard arrangements necessary to provide for cash at the New York Stock Exchange on October 24, 1907. Indeed, J.P. Morgan was reluctant to authorize the issuance of loan certificates early in the panic, fearing that depositors would interpret the issuance as a sign of weakness among the banks (Wicker 2000, p. 94).

D. Who Issued Loan Certificates – the Lesser Panics: 1884 and 1890.

Wicker (2000) views the Panics of 1884 and 1890 as true success stories on the part of the New York Clearing House. Its prompt actions prevented full-scale panics from erupting out of financial disturbances in New York. In 1884 the largest banks issued 26 percent of loan certificates, slightly less than their share of loans (31 percent) in the New York Clearing House (Table 8). The panic-based withdrawals were focused on Metropolitan National Bank, which was rumored to have been caught in a large amount of fraudulent speculation in railroad stocks, rumors that were not confirmed by the Comptroller (Wicker 2000, p. 36-7). One third of all loan certificates issued in 1884 were borrowed by Metropolitan National Bank (Table 9). Bank of New York borrowed clearing house loan certificates in an amount over 40 percent of the loans on its balance sheet. Six banks accounted for 89 percent of all loan certificates issued.

Metropolitan borrowed clearing house loan certificates to an amount that was nearly 70 percent of the loans on its balance sheet as of May 10, 1884. The amount verged on its limit for collateral at the New York Clearing House because clearing house loan certificates were issued at 75 percent of the market value of the assets offered as collateral. By allowing Metropolitan National Bank request an enormous volume of clearing house loan certificates, the member banks of the New York Clearing House were effectively lending to a bank that was suffering a run. Given that six banks borrowed the majority of the clearing house loan certificates, there was a lot of capacity for offering credit to these banks from the remainder of the New York Clearing House member banks. There was no widespread restriction of convertibility of deposits into cash suggesting that only one specific bank was struck with panic withdrawals. Metropolitan was voluntarily liquidated in November 1884 following extensive withdrawals through the summer. The New York Clearing House required nearly two years to resolve the outstanding clearing house loan certificates with Metropolitan, indicating the unusual amount of the borrowing.

The success of the response to the financial distress of 1890 relies heavily upon the active Treasury intervention in the financial market earlier in August and September in amounts that dwarf the issues of clearing house loan certificates (see pages 387-399, Sprague 1910 and pages 44-45 in Wicker 2000). That said, the issues of clearing house loan certificates in November 1890 were still pertinent for the NYC banks to avoid a more disruptive financial crisis.

The pattern of loan certificates issued in 1890 indicates that the largest national banks did not participate heavily in issuing loan certificates; only two of the six issued any clearing house loan certificates at all (Table 10). In addition, in 1890, several state banks participated by requesting clearing house loan certificates, unlike in 1884 (Table 11). The most notable aspect for 1890 is that the largest borrowers of clearing house loan certificates practically borrowed an amount of temporary liquidity that was about the volume of their cash reserves. The figures provide strong indication of a severe liquidity crisis for these banks. Only in 1873 was a similar set of characteristics displayed.

E. Clearing House Loan Certificates and Liquidity Needs.

The ratio of loan certificates to reserves (or legal tender and specie) helps reveal the extent to which loan certificates were used to increase liquidity at banks facing large clearing debits and depositor withdrawals. In 1873 the ratio is in general much higher for the big banks than in subsequent panics, reflecting mainly the weak reserve position of New York City at the beginning of the panic as well as lower reserves present in the early National Banking period. There was also a lesser degree of concentration in banking in New York in 1873 when compared to 1907. Further, as emphasized in Wicker (2000, page 32), legal tender reserve in New York Clearing House banks became extraordinarily low even after the imposition of suspension of convertibility. For the New York City banks, it was closer to reserve depletion than they would ever again experience during the National Banking Era. In 1884, 1890, and 1893 the ratio was lower, and fewer of the large national banks even participated in issuing loan certificates.

Specific banks also issued exceptionally large volumes of loan certificates. Metropolitan Bank in 1884 is a prime example. Metropolitan had been linked to alleged speculation in railroad stocks and experienced a severe depositor run. The New York Clearing House authorized an issue $7 million of clearing house loan certificates to Metropolitan National Bank likely because it had significant correspondent deposits. This was by far the largest amount issued to any bank in 1884, amounting to over three times its reserves of legal tender and specie. The Bank of New York also borrowed a large volume of loan certificates, twice its reserves. While the Bank of New York was not in danger of failure, it apparently borrowed heavily owing to its prominent position in the correspondent banking system. State banks were also important borrowers of loan certificates in 1890, particularly Mechanics and Traders and the Bank of North America. These two banks were aided directly by nine large New York banks under the supervision of J.P. Morgan, but they also took out large volumes of loan certificates.

The ratio of loan certificates to reserves reveals clearly several things we already suspected. First, the big banks were more likely to take out loan certificates in general if the New York market was under threat, as in 1873 and 1907. It also identifies more closely banks that were in immediate need of reserves, like Bank of North America in 1873 and Metropolitan in 1884.

IV DISCUSSION

We suggest that issuing clearing house loan certificates could not be counted on to deliver reliable liquidity during many of the panics. The main weaknesses were structural. The flaws of clearing house loan certificates were: a) the liquidity provision mechanism was passive, relying on the demand from the borrowing banks and on the volume and quality of borrowing bank collateral, b) clearing house loan certificates were not a good substitute for base money liquidity because they were not allowed to pass as currency between non-clearing house banks (much less the public), and c) there was apparently no way for the New York Clearing House to offer liquidity to the market directly by compelling member banks to borrow loan certificates. They were designed to free up clearing balances and cover clearing debits and led to an increase net liquidity indirectly. That said they were better than nothing.

The operation of a private association of banks as the lender of last resort institution was also part of the complication. By using clearing house loan certificates as substitutes for cash reserves, the New York Clearing House member banks expose their equity capital to risk of losses during a panic. The risk of loss arises especially if the bank borrowing clearing house loan certificates could not pay them back. A frequent criticism of clearing house loan certificate issues as a solution to panics during the National Banking Era is that the aggregate issues were insufficient. It is possible that the fear of capital losses to the New York Clearing House membership limited the aggregate size of the clearing house loan certificate issues during the largest crises. A more mundane explanation may surround the simple fact that the New York Clearing House could not issue clearing house loan certificates unless banks borrowed them.

James Cannon (1910) hints that banks recognized the positive externality of providing for more liquidity to “other” banks when a given bank takes out CHLCs. Recall the quote above citing that banks would request CHLCs "for the purpose of assisting their fellow-members and for the welfare of the community as a whole." Still, it is possible that there was an imperfect understanding of CHLCs across banking institutions. If so, the perception that clearing house loan certificates were issued in insufficient amounts may arise because an insufficient amount of bankers thought it was valuable, hence missing the externality value of liquidity. Also, banks could request and borrow CHLCs and not circulate them, thereby not paying interest on them. The only way CHLCs get circulated is if a bank uses them to settle accounts at the clearing house in lieu of legal tender or specie. Some estimates of the percentage that circulated hover between 60 to 75 percent.

V CONCLUSIONS

The New York Clearing House had nascent central bank powers, but we have not uncovered evidence of a consistent application of a lender of last resort policy. There is scant evidence of coordination of loan certificate issues by the Clearing House as described in section **III.A** on what a counterfactual Clearing House might have done. While we do not yet know the reasons for why particular banks issued loan certificates and others did not, bank specific interests rather than concerns about the general stability of the banking system seem to be reflected in the changing participation in loan certificate issues.

Relying on Cannon's description and on aggregated measures of clearing house loan certificates alone suggests a united approach among New York Clearing House banks to fight panics during the National Banking Era. We show that there was notable variation in the responses of individual New York banks to each panic, and there appears to have been little pre-conceived effort from the Clearing House in providing liquidity to the banking system. Some large banks participated substantially, other large banks not at all. Even if there was a generally consistent proportional participation of the big banks in most panics, the severity of the panics suggested that the aggregate liquidity provision through clearing house loan certificates was insufficient. The system had to rely on gold imports and suspension of convertibility rather than a deeper use of loan certificates. Whether the shortfall was a result of insufficient quantity borrowed/issued or that the temporary liquidity medium itself was too limited is a question left for future study. Cannon's optimism was cut short by the Panic of 1907. The centralization of the banking business in the United States was accomplished by the Federal Reserve System, not the clearing houses.

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Table 1: Selected Balance Sheet Items and Ratios: New York National Banks (Millions $)

	1873	**1884**	**1890**	**1893**	**1907**
Total Loan Certificates	25.82	24.92	16.56	41.48	100.91
Maximum CHLC Outstanding	23.20	21.89	15.47	38.28	88.42
(date of maximum)	Oct. 10, 1873	May 24, 1884	Dec. 22, 1890	Aug. 29, 1893	Dec. 16, 1907
Deposits					
Individual	167.40	191.63	283.65	254.34	532.69
Due to banks	90.40	133.73	178.51	211.29	498.03
Due from banks	17.78	22.83	30.94	34.73	188.73
Net Due to banks	72.63	110.89	147.57	176.55	309.30
Net Deposits	240.03	302.52	431.22	430.89	841.99
Assets	389.49	457.22	569.73	601.26	1364.72
Reserves	36.05	67.39	77.30	95.21	218.79
Reserve ratio	0.15	0.22	0.18	0.22	0.26
NYCH member banks	60	65	66	70	56
Banks taking CHLCs	32	20	24	38	31
Participation (%)	53.33%	30.77%	36.36%	54.29%	55.36%
Various Ratios:					
Net Due Tos/Assets	0.19	0.24	0.26	0.29	0.23
CHLC/Net due tos	0.32	0.20	0.10	0.22	0.29
CHLC/Assets	0.07	0.05	0.03	0.07	0.07
Reserves/All Deposits	0.14	0.21	0.17	0.20	0.21
Reserves/Net Due Tos	0.50	0.61	0.52	0.54	0.71
CHLC to reserves	0.64	0.32	0.20	0.40	0.40
CHLC to net deposits	0.10	0.07	0.04	0.09	0.11

Source: Calculated from the Clearing House Loan Committee Minutes for each panic. Balance sheet data for aggregate New York Clearing House member banks from available Annual Reports of the Comptroller of the Currency for national banks and from Annual Reports of the Superintendent of Banking of the State of New York for state chartered member banks. Reserves are specie plus legal tenders.

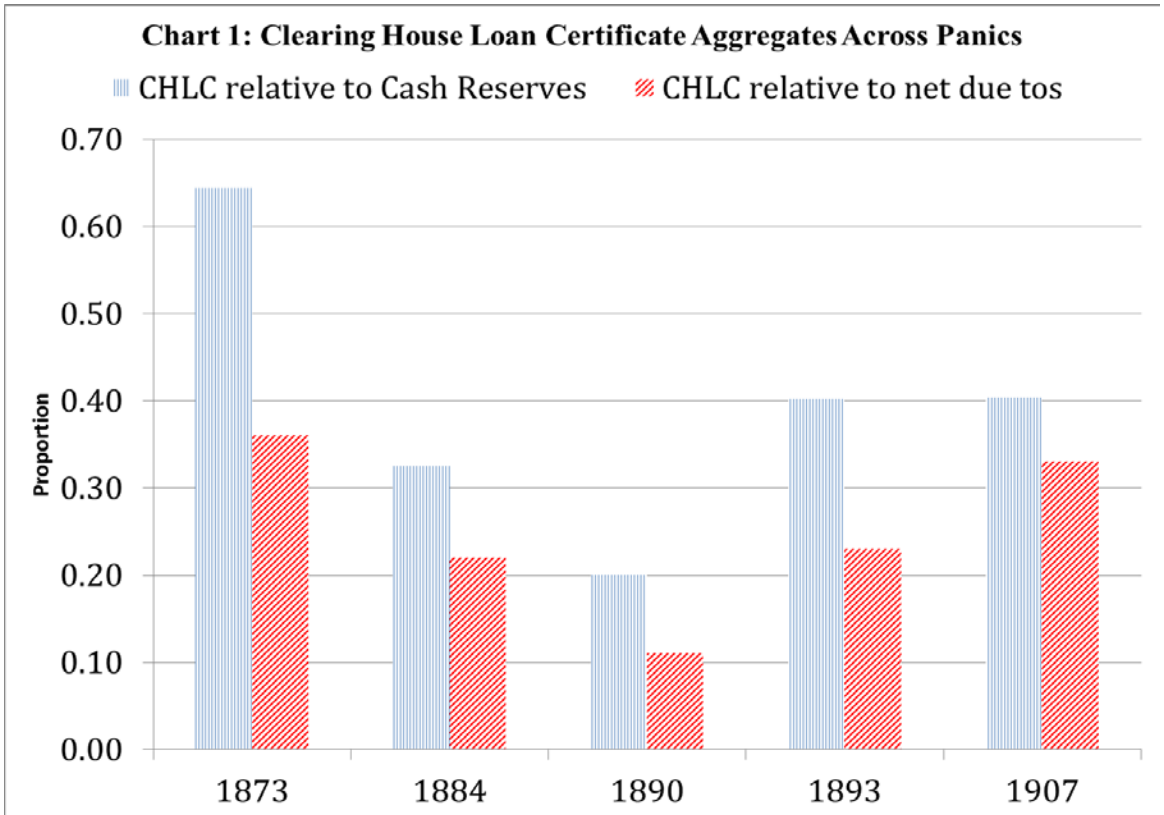
Chart 1: Clearing House Loan Certificate Aggregates Across Panics
CHLC relative to Cash Reserves
CHLC relative to net due tos
Proportion
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1873
1884
1890
1893
1907

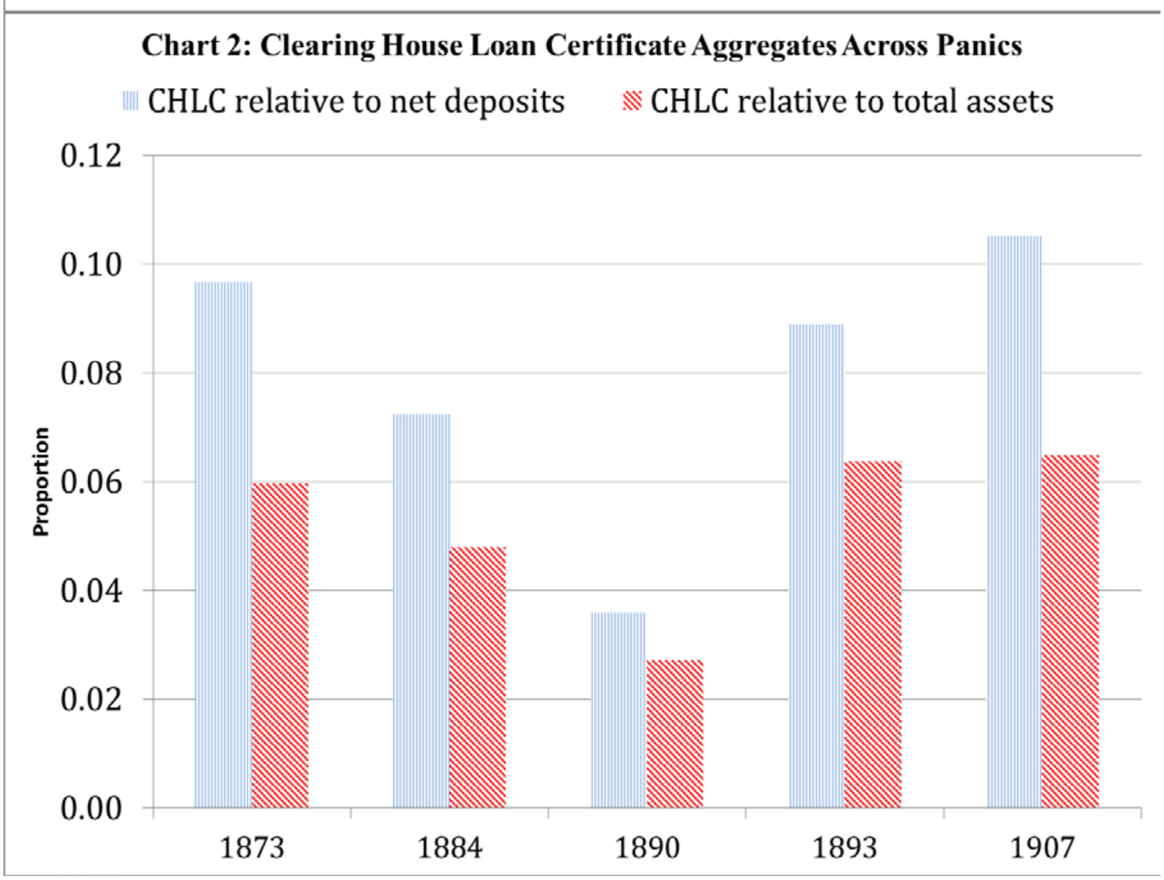
Chart 2: Clearing House Loan Certificate Aggregates Across Panics
CHLC relative to net deposits
CHLC relative to total assets
Proportion
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1873
1884
1890
1893
1907

Table 2: Volume of Loan Certificates, New York City banks ranked by asset volume.

Bank	**1873**	**Percent**	**CHLC to Reserves (%)**
Fourth National	4.88	19	164
National Bank of Commerce	0	0	0
National Park Bank	3.37	13	116
Bank of New York	1.30	5	67
Metropolitan National	1.50	6	195
Importers and Traders National Bank	0.50	2	25
Total, Other NY National Banks	*13.74*	*55*	-
Total, All NY Banks	**25.29**		**64**

Source: Minutes of the Clearing House Loan Committee of the New York Clearinghouse, September 20 through November 2, 1873. Commercial and Financial Chronicle (CFC), Banker's Gazette, page 412, Volume 17, September 20, 1873. CFC, Sept. 28, 1873.

Table 3: Volume of Loan Certificates, all member banks ranked by request volume.

Bank	**1873**	**Percent**	**CHLC to reserves (%)**
Fourth National	4.88	19	164
National Park Bank	3.37	13	116
Central National Bank	2.38	9	175
Bank of North America (state bank)	2.08	8	465*
Metropolitan National	1.50	6	195
Bank of New York	1.30	5	67
SUM	15.51	60	-
Total, Other NY Banks	*9.78*	*40*	-
Total, All NY Banks	**25.29**		**64**

Source: Same as Table 2.

Table 4: Volume of Loan Certificates, New York Banks ranked by volume of assets, 1893.

Bank	**1893**	**Percent**	**CHLC to Capital and Surplus (%)**	**CHLC to Loans (%)**	**CHLC to Reserves (%)**
National Park Bank	3.48	9	**68.31**	16.53	39
Chemical National Bank	0	0	0	0	0
First National Bank	4.00	10	**51.75**	19.51	76
Fourth National Bank	1.59	4	30.35	9.67	31
Importers and Traders	0	0	0	0	0
National Bank of Commerce	2.00	5	23.08	10.92	52
Total, Other NY Banks	*30.41*	*73*			-
Total, All NY Banks	**41.48**				**40**

Table 5: Volume of Loan Certificates, all New York banks ranked by borrowings, 1893.

Bank	**1893**	**Percent**	**CHLC to Capital and Surplus (%)**	**CHLC to Loans (%)**	**CHLC to Reserves (%)**
First National Bank	4.00	10	**51.75**	19.51	76
National Park	3.48	9	**68.31**	16.53	39
American Exchange	3.00	8	41.12	17.91	81
Mercantile National	2.81	7	**125.26**	**39.05**	123
Chase National	2.00	5	**117.74**	18.2	44
National Bank of Commerce	2.00	5	23.08	10.92	51
Total, Other NY Banks	*24.19*	*58*			
Total, All NY Banks	**41.48**		**26.21**	**10.01**	**40**

Source: For Tables 5 and 6. Minutes of the New York Clearinghouse, June 15 through August, 1893. Annual Report of the Comptroller of the Currency, 1894. Commercial and Financial Chronicle, June 17, 1893. * Missing state bank total assets at this time.

Table 6: Volume of Loan Certificates, New York banks ranked by volume of assets, 1907.

Bank	CHLCs	Percent	**CHLC to Capital and Surplus (%)**	**CHLC to Loans (%)**	**CHLC to Reserves (%)**
National City Bank	17.00	17	35	10.7	42
National Bank of Commerce	5.75	6	14.4	4.20	21
First National Bank	10.00	10	33.69	10.83	52
National Park Bank	9.70	10	**81.27**	13.4	46
Hanover National	0	0	0	0	0
Chase National Bank	10.50	10	**108.91**	20.55	72
Total, Other NY Banks	*47.96*	*47*	*34.4*	*9.19*	
Total, All NY Banks	**100.91**				**40**

Table 7: Volume of Loan Certificates, all New York banks ranked by volume borrowed, 1907.

Bank	CHLCs	**Percent**	**CHLC to Capital and Surplus (%)**	**CHLC to Loans (%)**	**CHLC to Reserves (%)**
National City Bank	17.00	17	35	10.7	42
Chase National Bank	10.50	10	**108.91**	20.55	72
First National Bank	10.00	10	33.69	10.83	52
National Park Bank	9.70	10	**81.27**	13.4	46
National Bank of Commerce	5.75	6	14.4	4.20	21
Mechanics and Traders (State Bank)	4.49	4	152.4	28.31	105
Total, Other NY Banks	43.48	43	34.4	9.19	
Total, All NY Banks	**100.91**				**40**

Source: Minutes of the New York Clearinghouse, October 26 and on, 1907. Commercial and Financial Chronicle, September 28, 1907.

Table 8: Volume of Loan Certificates, New York banks ranked by volume of assets, 1884.

Bank	**CHLCs**	**Percent**	**CHLCs/Loans**	**CHLC to Reserves (%)**
Fourth National	3.00	13	19	71
Importers and Traders	0	0	0	0
National Park	3.00	13	15	56
National Bank of Commerce	0	0	0	0
American Exchange	0	0	0	0
Chemical Bank	0	0	0	0
Total, Other NY Banks	*16.59*	*74*		
Total, All NY	**22.59**		**7.5**	**32**

Source: Minutes of the New York Clearinghouse, May 14 and on, 1884. Commercial and Financial Chronicle, May 17, 1884.

Table 9: Volume of Loan Certificates, all New York banks ranked by volume borrowing, 1884.

Bank	**1884**	**Percent**	**CHLC/Loans**	**CHLC to Reserves (%)**
Metropolitan	7.54	33	68	320
Bank of New York	4.00	18	41	207
Fourth National	3.00	13	19	71
National Park	3.00	13	15	56
Hanover	1.65	7	17.2	61
Mercantile National	1.03	5	14.4	56
Total, Other NY Banks	*2.46*	*11*		
Total, All NY Banks	**22.59**		**7.5**	**32**

Source: Minutes of the New York Clearinghouse, May 14 and on, 1884. Commercial and Financial Chronicle, May 17, 1884.

Table 10: Volume of Loan Certificates, New York banks ranked by volume of assets, 1890.

Bank	**1890**	**Percent**	**CHLC to Reserves (%)**
Fourth National	0	0	0
Chemical	0	0	0
National Bank of Commerce	1.00	6	32
Importers and Traders	0	0	0
American Exchange	2.40	15	104
National Park	0	0	0
Total, Other NY Banks	12.72	79	
Total, All NY Banks	16.12		20

Source: Minutes of the New York Clearinghouse, November 11 and on, 1890.

Table 11: Volume of Loan Certificates, all New York banks ranked by borrowings 1890.

Bank	**1890**	**Percent**	**CHLC to Reserves (%)**
Bank of New York	2.88	18	92
American Exchange	2.40	15	104
Bank of North America (state bank)	1.45	9	138*
Mechanics and Traders (state bank)	1.09	7	177*
Chatham National	1.00	6	76
National Bank of Commerce	1.00	6	32
Total, Other NY Banks	6.30	39	
Total, All NY Banks	16.12		20

Source: Minutes of the New York Clearinghouse, November 11 and on, 1890. *Commercial and Financial Chronicle, June 28, 1890.