

# **Liquidity, Contagion, and the Founding of the Federal Reserve System: The Panic of 1907**

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## **I. Introduction**

The establishment of the Federal Reserve System in 1913 is conventionally viewed as the inevitable outcome of the turmoil surrounding the Panic of 1907. Before 1907, there had been support from bankers and politicians for a central bank (or system of centralized reserves -- terms we shall use interchangeably), and there had been severe financial crises and bank panics before 1907. Yet these earlier panics had not led to the establishment of a central bank. So what made the Panic of 1907 different from earlier National Banking Era panics?

One reason is that the Panic of 1907 was focused uniquely on the New York City trust companies. Moen and Tallman (1992) show that New York City trust companies were singled out by depositors for withdrawals in 1907, unlike the New York City national banks. During the Panic of 1907, deposits at New York City trust companies fell precipitously by nearly 37 percent. In contrast, deposits at New York City national banks increased by over 8 percent.<sup>1</sup> A key difference between the panic of 1907 and the earlier crises was that trusts did not play a major role in intermediation during the earlier instances of financial panics.

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<sup>1</sup> Loan behavior was analogous for the respective intermediary type (Moen and Tallman, 1992).

We argue that this unusual deposit behavior was a result of the fact that New York City trust companies were not members of the New York Clearinghouse. Timberlake (1984) and Gorton (1985) describe how the private clearinghouses employed specific mechanisms to stem panics during National Banking Era panics. In panics before 1907, the New York Clearinghouse addressed runs on member institutions by providing adequate reserves to solvent member banks, and closing down insolvent ones. During the 1907 panic, the Clearinghouse lacked sufficient timely information about the trust companies' balance sheets to make reliable inferences about the solvency of these institutions. Eventually a coalition of New York bankers led by J.P. Morgan provided aid to the trusts, presumably because letting the trusts go it alone posed a risk to the entire financial system. We therefore provide a hypothesis for why New York bankers perceived a risk to their own balance sheets arising from the potential actions of trusts faced with depositor's panic withdrawal demands: the national banks were linked to the trusts companies through the call loan market, the overnight loan market at the New York Stock Exchange.

## **II. Background and Previous Research**

There are many extensive studies on the evolution of the US financial system and the establishment of a central bank (White 1983, Livingston 1986, McCulley 1991, Broz 1997 are a few examples). Each takes a different view of the key factors that eventually led to the general acceptance by the US legislature and electorate of the creation of a central bank . The political economy surrounding specific pieces of legislation are dealt with in detail within those studies. Our goal is different; we emphasize how the Panic of 1907 was different from earlier panics, and then we indicate how such differences posed much greater risks for the financial system than the risks observed in earlier panics.

E.N. White's study of American banking regulation is of particular relevance to our argument; he views the Panic of 1907 as the galvanizing force in forming a US central bank (White 1983). His research focuses on the dual banking system, and his analysis at the national level shows that national banks were the dominant intermediary in the early part of the National Banking Era. The rapid growth of the state-chartered trusts and banks weakened the dominance of national banks and the influence of the

clearinghouses over aggregate financial assets.<sup>2</sup> White notes that the effectiveness of the clearinghouses in combating panics declined as the proportion of assets outside the clearinghouse banks increased.<sup>3</sup> He notes also how the circumscribed coverage of the clearinghouse was an observable flaw when, during the 1907 banking panic, the trusts were not able to get quick liquidity assistance from the New York Clearinghouse.<sup>4</sup> Because some state banks in New York were clearinghouse members and no New York trusts were members in 1907, the distinction between state banks and trusts appears warranted.<sup>5</sup> White's conclusions remain relevant to our narrower focus on the trusts and their "outsider" status in New York City, as a refinement of his argument. We propose that the trusts in New York City imposed risks on the financial system and more specifically the payments system coming from outside the national banking structure.

Until 1907, New York national banks handled financial crises adequately on their own, at least in terms of protecting the clearinghouse member banks. It is possible that they may have even profited from crises (Donaldson 1992, 1993). Under such circumstances, one would expect little enthusiasm for the institution of a central bank in the US coming from New York banking forces.

### **III. Theoretical Models of Banking Panics – Motivations for a Central Bank**

The theoretical research on individual bank runs has recently been extended to the analysis of the propagation of runs into widespread banking panics. The papers on banking panics have implications regarding whether key financial market participants would support the establishment of a central bank. We focus on three particular models, showing that our hypothesis about the establishment of a central bank can resolve some inconsistencies in the implications of each model, implications concerning the motives for establishing a central bank.

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<sup>2</sup> Note that White analyzes an aggregation of state banks and trusts as intermediaries outside the National Banking system and the clearinghouses. Our analysis focuses on trusts separately, noting that in earlier research, Moen and Tallman (1992,1999) show that trusts suffered more extreme deposit losses than state banks in New York during the 1907 Panic. We infer that state banks did not present the same "risks" to the safety and soundness of the banking system, i.e., systemic risk, as trusts represented.

<sup>3</sup> White (1983), p 80.

<sup>4</sup> White (1983) pp. 81-82.

<sup>5</sup> Moen and Tallman (1999).

Timberlake (1984) and Gorton (1985) discuss the role of private clearinghouse behavior during the National Banking Era (1863-1913). These papers provide a sense in which the existing clearinghouse system may have been sufficient to quell panics, and that the establishment of the Federal Reserve System may have been unnecessary.

Donaldson (1992, 1993) presents a model of banking panics that implies a more controversial view of clearinghouse behavior. Donaldson suggests that the large New York banks, especially the members of the New York Clearinghouse, were able to earn risk-adjusted excess rates of return from loans of cash during the banking panics. If Donaldson is correct, why would the large New York banks that earned excess profits have been in favor of establishing a central bank, when this new institution would remove the monopoly on cash reserves from the New York Clearinghouse?

McAndrew and Roberds (1995) present a model of banking in which optimal private clearinghouse behavior allows for the possibility of bank panics. Nonmember institutions free ride on the reserve holdings of the clearinghouse in this model, but the clearinghouse lacks the power to enforce any direct penalty on nonmember institutions for holding lower reserves. In the model, the existence of banking panics is a mechanism to punish nonmember financial institutions for holding lower than optimal.

Why then, given these theoretical results, would any coalition of bankers support an outside central bank? A key reason is that the assets of trust companies had grown tremendously since 1896; by 1907 total assets of trust companies and of national banks in New York City were about the same (Moen and Tallman 1992, p.612). By 1907, the increased size of the trusts left a significant proportion of financial assets held by intermediaries beyond the examining authority of the Clearinghouse. Thus, unlike in earlier panics the Clearinghouse was an unreliable candidate to provide liquidity in 1907 to the troubled nonmember institutions, the trusts.

#### **IV. Systematic Aspects of National Banking Era Panics**

Many financial structures present during the 1907 panic had also been present in earlier panics and can be ruled out as the immediate causes of the panic and for establishing a central bank. The pyramid structure of reserves across central reserve city, reserve city, and country national banks existed in 1907 and earlier, and branch banking

was still pretty much nonexistent. Clearinghouse loan certificates, IOUs used between clearinghouse member banks in lieu of cash to settle clearing balances and therefore to free up cash to pay depositors during panics, had also been used in earlier panics. The problem with the inelastic currency also remained (Friedman and Schwartz 1963, pp. 168-73).

While the general financial structure remained similar across the panics of the National Banking Era, the behavior of balance sheet items (loans and deposits) was quite different in 1907. For example, Sprague notes that loans and deposits at New York national banks contracted somewhat in August during the Panic of 1893 (Sprague 1910, p. 190). Loans and deposits increased at the New York national banks as depositors fled the trusts during the Panic of 1907 (Moen and Tallman 1992). We therefore examine the loans, net deposits and reserves of national banks from the weekly statements of clearinghouse banks in New York City during the most severe National Banking Panics of 1873, 1893 and 1907. Loans are defined as total loans, deposits are defined as net deposits, and reserves are defined as specie and legal tender, and each series is the aggregate of clearinghouse member banks in New York City (in A.P. Andrew, *Statistics for the United States 1867-1909*). What we find in those figures is that the deposits, loans and reserves all contract during 1873 and 1893 when the panic strikes. The pattern observed in the series are consistent with the idea that depositors “panic” by withdrawing their funds from the intermediation system in general, lowering bank cash reserves, and occasionally forcing liquidation of demandable loans when reserve levels are perceived as low

In Graph 1, the series for deposits, reserves, and loans for New York national banks in 1907 displays behavior that is not consistent with the same panic story. In contrast, national bank loans and deposits increase while reserves decline. It is possible that this result is due to an idiosyncrasy of the 1907 panic. However, we then look at deposits and reserves in other reserve city national banks in 1907. Looking at the ratio of deposits to reserves among New York City national banks over the three major panics (Graph 2), we see that the deposits to reserves ratio did not fall in 1907, whereas it was typical for the ratio to fall in prior panics. Graphs 3, 4, and 5 present the behavior of loans, deposits, and reserves, respectively, in New York versus other reserve city national

banks in 1907. We aggregate these series into a measure of reserves and deposits at reserve city banks outside New York, and compare those aggregates to those of New York national banks in 1907. In the aggregate, deposits and reserves contract during the panic in ways consistent with the standard panic characterization described above, in clear contrast to the behavior of those series in New York national banks. The correlation coefficients between deposits and reserves at New York national banks in 1873, 1893, and 1907 are 0.89, 0.97, and  $-0.72$ ; the distinct difference noted for 1907 supports the patterns observed in Graph 1.

We interpret the unique decline in the reserves at New York national banks as an indication that there was some form of disintermediation taking place there. Notably, it was not depleting the assets of the national banks. Rather, it was depleting their reserve holdings. The increase in deposits, however, suggests that the panic-related withdrawals from trusts were re-deposited in banks so that the increase in national bank deposits may reflect partly a transfer of trust deposits into national bank deposits. The increase in loans among New York national banks likely reflected the purchase of trust loans by banks, perhaps call loans as discussed below. Hence, the dis-intermediation was affecting the trusts but not the payments system. The runs on trusts forced them to find additional sources of reserves because the trusts held a low proportion of reserves to deposits. Trusts likely borrowed reserves from the Clearinghouse member banks or acquired them by selling assets. In either case, the drain on trust deposits reduced the level of reserves among New York City national banks and contributed to the increased level of loans held by national banks.

## **V. Fear and Contagion in the Call Loan Market**

Even though the trusts were tangential to the payments system and, from a systemic perspective, should not have threatened a major disruption in the payments system, the New York bankers wanted to prevent large-scale withdrawals from trust companies to protect the assets and solvency of national banks. The link between the New York national banks and the trusts was the call loan market at the New York Stock Exchange. New York City national banks participated heavily in the call money market, providing demandable loans (collateralized by stock equity) to the stock market to

support the trading on the floor of the market. These short-term demandable loans were a convenient mechanism for earning interest on reserve city holdings of banker's balances and could be settled quickly on demand during normal times. Nearly 30 percent of the assets of New York banks were tied up in these demandable loans (see Moen and Tallman 1992).

Trust companies also participated in the call loan market, although it is likely that they held fewer call loans. The liquidity provided by these loans was less important to the trust companies because their volume of clearings was so much lower than the national banks. Still, the influence of trust companies in the stock market was not insignificant. Trust companies still held sizable proportions (estimates of from 10 to 25 percent) of their assets as call loans, as well as owning some stock shares outright (on average, 20 percent of trust assets were in stocks and bonds – we have no direct data on stock proportion).

During the panic of 1907, the call money rate peaked at an unprecedented 125 percent, indicating a significant lack of liquidity provision and/or perceptions of risk to stock market investments. The stock market index (Macaulay 1938) declined about 25 percent over the three months of the panic. But this measure does not capture fully the degree of turmoil that struck the stock market.<sup>6</sup> Even given standard discounts for the collateral asset values, some of these loans already would likely be contributing to bank losses if they were liquidated at depressed market prices. Banks were at risk of further losses if trust company assets related to the stock market were liquidated under financial duress, which would place additional downward pressure on stock prices. Given the degree of the panic, there was a possibility of a downward spiral of prices and further liquidation of call loans that would leave the financial system in a shambles. Instead, banks likely (we have no direct documentation) bought over the loans from trust companies rather than allow the collateral from those loans to be liquidated at fire sale

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<sup>6</sup> Moen and Tallman 1990 page 8, describes how the stock market nearly closed on October 24<sup>th</sup>, due to the lack of call money for loans even at a 60 percent rate. Descriptions of precipitous declines in stock values suggest that if there were standard indices on a daily basis, the fall in the stock market may look even more serious.

prices.<sup>7</sup> Lower stock prices would exacerbate the liquidity problems, sending call money rates again into triple digits

With the stock market and the call loan market linking the banks and trusts in a way that the payments system did not, we suggest that the rational national bank or clearinghouse member would want to aid the trusts. The increase in deposits and loans at the national banks that took place during the Panic of 1907, while puzzling at first, can therefore be seen as scramble by the banks to protect assets and intermediation rather than to profit off of the misfortune of the trusts.

## **VI. Conclusion**

In the aftermath of the Panic of 1907 the New York bankers recognized the growth of relatively unregulated intermediaries as a new and growing risk to the financial system. The fact that these intermediaries were beyond the influence of Clearinghouse monitoring contributed to the change in New York banker opinion that moved them toward finally supporting the creation of a central bank. While the Panic of 1907 convinced important New York bankers that the time for a system of centralized reserves had come, they nevertheless were unable to control the ultimate form that such a system took.

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<sup>7</sup> Moen and Tallman 1992 page 623-24 suggest that the liquidation of the approximate amount of existing trust call loans was likely offset by the amount of the increase in national bank call loans over the same period.

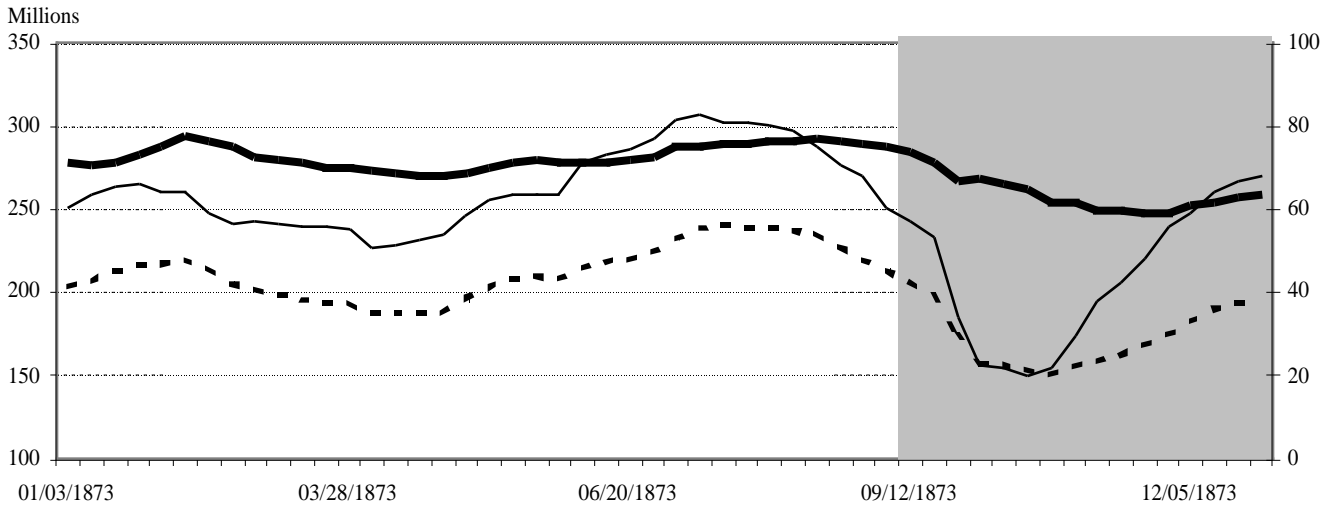
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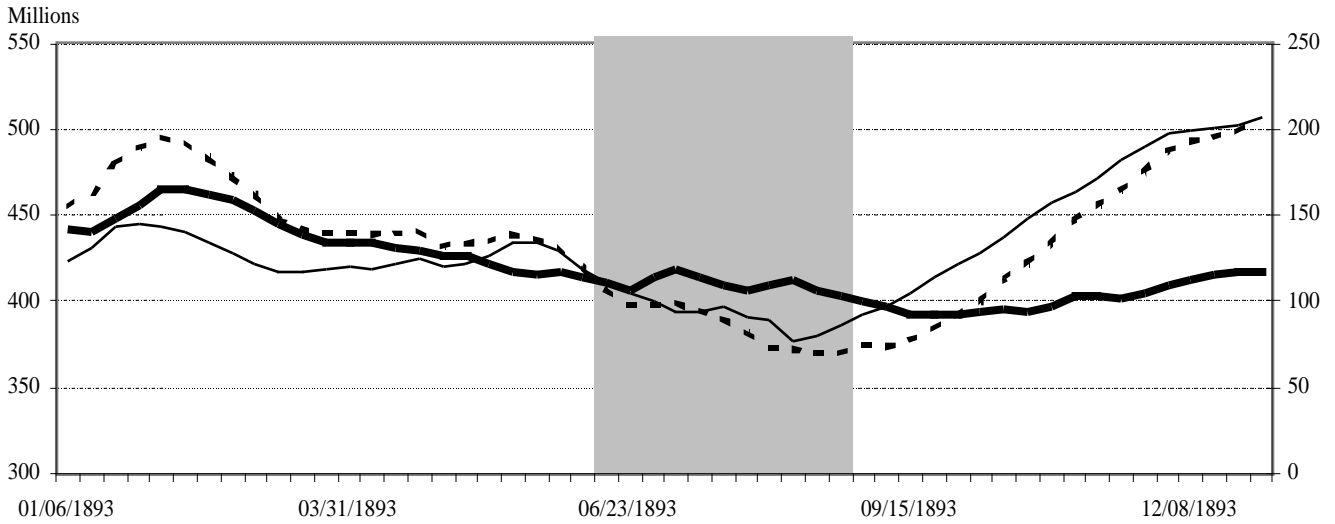
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Graph 1: Deposits, Reserves, and Loans in New York

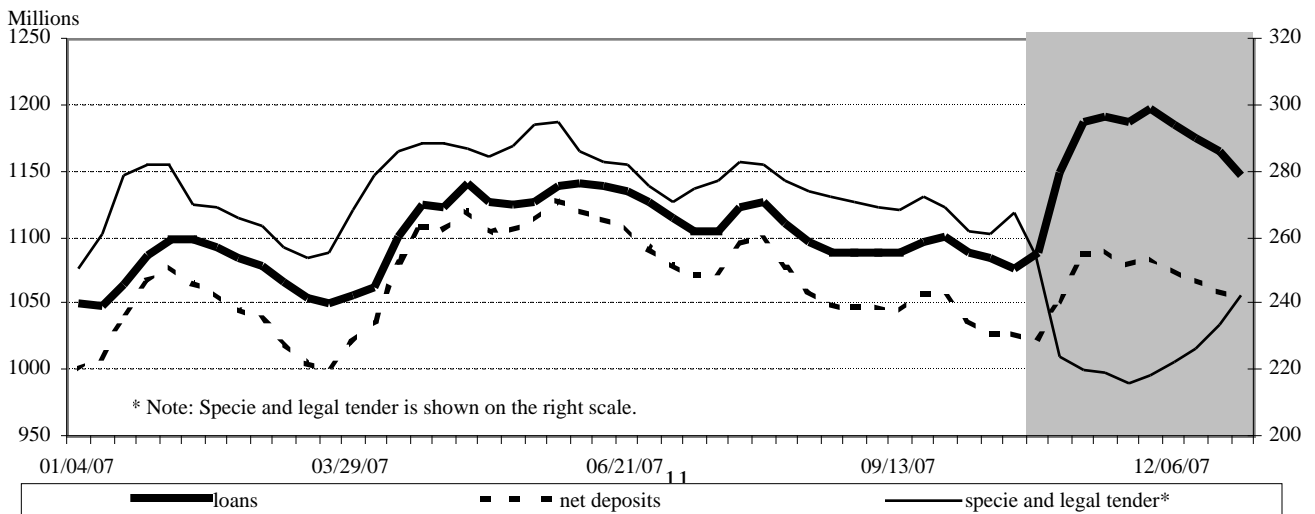
1873



1893



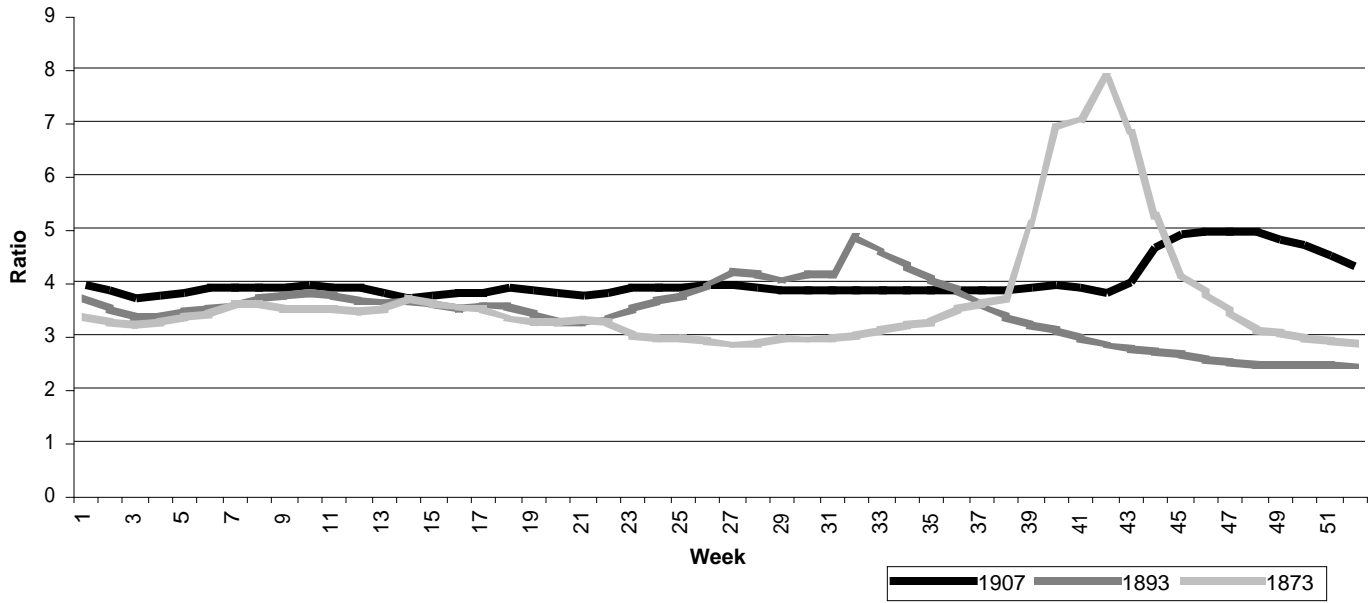
1907



— loans      - - - net deposits      — specie and legal tender\*

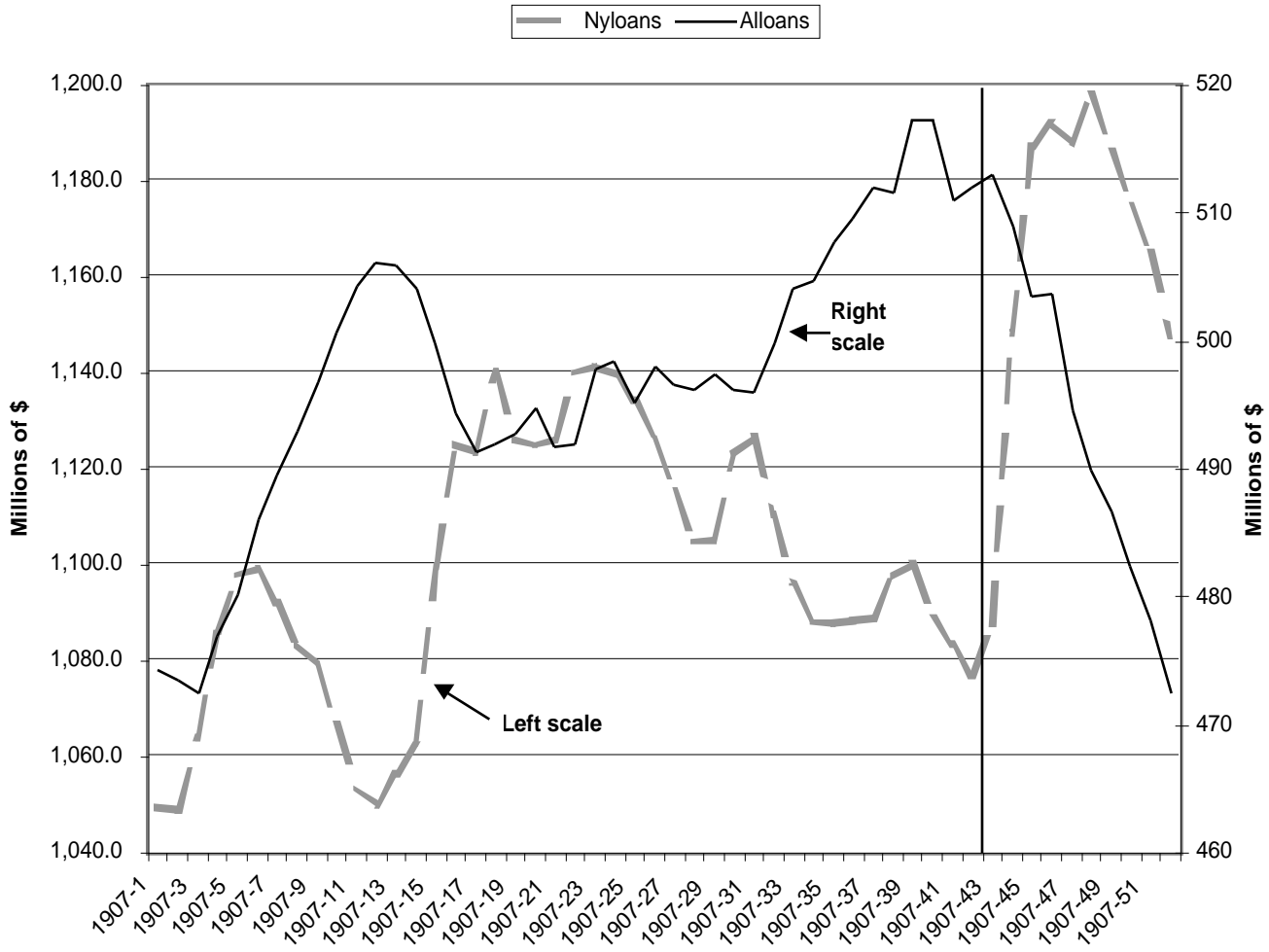
Graph 2

### Ratio of Deposits to Reserves



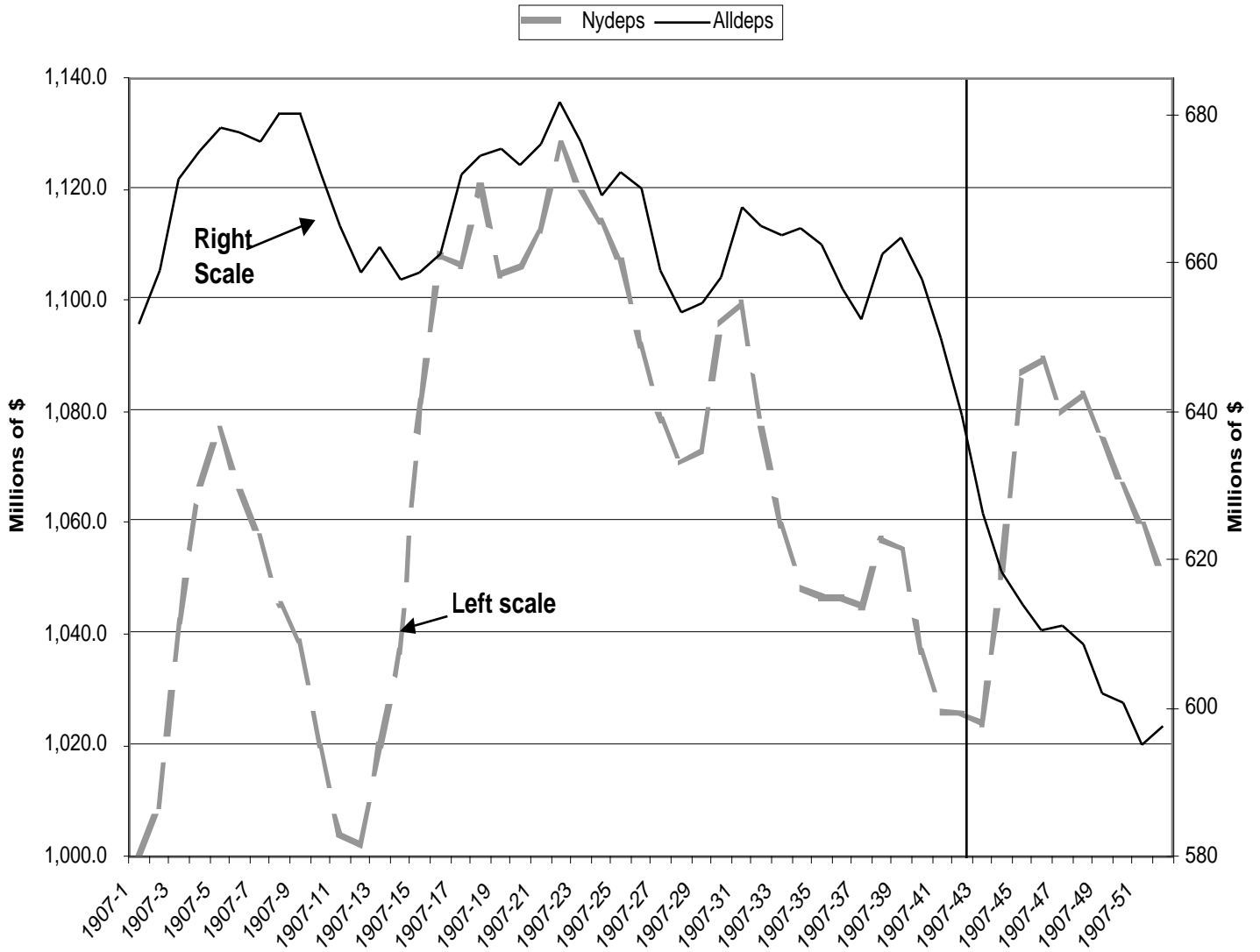
Graph 3

Loans: NY vs All other Central Reserve Cities



Graph 4

Deposits: NY vs All Other Central Reserve Cities



Graph 5

New York Reserves vs All other Central Reserve City Reserves (1907)

