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Correspondent Banking, Systematic Risk, and the Panic of 1893

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Abstract

During the U.S. National Banking Period (1863-1913), a network of correspondent banking relationships left the nation vulnerable to systemic risks, bank failures, and financial panics. We use comprehensive data on primary correspondent relationships for all national, state, savings, and private banks in the lead up to the Panic of 1893 to show that failures of both upstream and downstream correspondents increased the likelihood that a given bank would itself fail, and that these effects varied over the course of the Panic. Members of the New York Clearinghouse, despite a very low incidence of actual failure, also saw significant weakening of their balance sheets early in the Panic when their downstream respondents failed, and falling stock prices throughout the disruption. The results demonstrate a two-way system-wide weakness of the correspondent system that the Federal Reserve Act of 1914 presumably sought to remedy.

Keywords: Interbank networks, correspondent banking, the Panic of 1893, bank contagion
JEL Codes: G01, G21, L14, N21

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1 Introduction

For much of its history, the U.S. banking system consisted of fragmented unit banks operating in single locations. This structure required banks to form complex correspondent networks to facilitate the movement of capital and the clearing of payments across space and time. Although these relationships enabled the growth of a nationwide financial system during the National Banking period (1864-1913), at times they also served as conduits for transmitting financial shocks, contributing to the system's instability (Bordo, Redish, and Rockoff, 1996). The Panic of 1893 offers an opportunity to examine the role of correspondent networks during a major systemic event. As in the Great Depression, the Panic of 1893 emanated from the interior rather than New York City, which stood at the apex of the system's pyramid of reserves, and the vast majority of bank suspensions, numbering more than 550 in total, occurred outside of New York. The early phase, starting in April 1893, saw flights to liquidity in interior cities and a draining of reserves from the central reserve cities of New York and Chicago, while the suspension of payments by member banks of the New York clearinghouse (NYCH) in August 1893 put a later phase into motion, with downstream banks unable to recover reserves from upstream correspondents. The Panic thus facilitates study of transmission both up and down the network.

We examine the role of correspondent failures in the Panic's transmission using data on the entire network in early 1893, just prior to the start of the disruption. The data include more than 12,000 banks along with the identities of their primary upstream correspondents collected from Rand, McNally, and Company's *Bankers' Directory and List of Bank Attorneys*, which lists all national, state, savings, and private banks. This unique dataset extends earlier studies of 1893 by tracing the impact of a bank suspension on both upstream correspondent banks as well as downstream respondents, differentiating by type of bank. We find that correspondent suspensions substantially increased the probability of suspension for respondent banks and

that respondent suspensions similarly increased the probability their correspondents would suspend. Further, we find that upstream correspondent suspensions are no longer a significant determinant of respondent failures following the suspension of the NYCH, but that the effects of respondent suspensions on system-wide activity continue to be large throughout the Panic.

We also collect weekly balance sheet and stock price data to study the impact of respondent failures on New York City banks. Moving beyond suspensions as a measure of financial stress allows us to understand better what was happening at the center of the system, given that New York experienced only four bank suspensions. The balance sheets for NYCH banks come from weekly issues of the *Commercial and Financial Chronicle*, and our empirics demonstrate that respondent failures led to significant declines in loans, deposits, and specie reserves of New York banks. Since the NYCH ceased publication of balance sheet items after June 10th to forestall runs on vulnerable New York banks, we also use the published stock prices of its members from the *Chronicle* to show that New York banks more exposed to respondent failures saw larger declines in their stock prices throughout the disruption.

One example of upstream weakness and an accompanying stock price response during the "blackout" period, involves the St. Nicholas Bank in New York, which ultimately failed in December 1893. Its path to demise began with the August 1893 failure of the Madison Square Bank – another New York bank – for which St. Nicholas was the clearing agent. The stock price of St. Nicholas on 8 August 1893, the day before the bank announced that it would no longer act as clearing agent for Madison Square, was $125. The stock price fell to $113.50 and deposits fell 19 percent over the next two months as details about mismanagement at Madison Square and the role of St. Nicholas as a $267,000 creditor became public. Soon after the price of St. Nicholas fell dramatically as depositors withdrew funds, leading to its closing on 21 December with heavy losses (*New York Times*, various issues).

Previous work by Calomiris and Carlson (2017) provides an analysis of the 1893 panic that is particularly relevant to this paper. They study the role of the interbank network on suspensions among 208 national banks in 38 major cities using reports of bank examiners. These reports provide the amount of deposits a given bank had with each of its upstream reserve agents, which in turn reveal that greater exposure to upstream correspondents through interbank deposits related to higher rates of bank suspension. We complement their contribution by broadening the scope of analysis to the full correspondent network, albeit not to the same degree of detail, examining both upstream and downstream transmission of financial shocks, and studying the outcomes of New York banks specifically through weekly balance sheet and stock price data.

More broadly, our study contributes to a growing literature on the role of banking networks in transmitting financial shocks. A number of papers offer theoretical frameworks for how the structure of interbank relationships can affect financial fragility, including Allen and Gale (2007), Gai, Haldane and Kapadia (2011), and Acemoglu, Ozdaglar, and Tahbaz-Salehi (2015). Much of the empirical work on the role of correspondent networks has focused on the Great Depression. Das, Mitchener, and Vossmeyer (2021) demonstrate that the three-tiered pyramid structure of correspondent relationships made the banking system less stable than it could have been in 1929. Calomiris, Jaremski, and Wheelock (2020) collect correspondent data from the Rand McNally directory for all national banks from 1929 to 1934 and find that the failures of both correspondents and respondents increased a given bank's likelihood of failure. They conclude that what they call "contractual contagion" was a key factor in the bank failures of the Great Depression. Using quarterly data at the Federal Reserve district level, Mitchener and Richardson (2019) show that respondent suspensions during banking panics led to withdrawals of interbank deposits from reserve and central reserve cities, leading these banks to curtail lending significantly. Like

us, they measure the impact of respondent suspensions on outcomes beyond bank suspensions, and our work extends this aspect to the period prior to the founding of the Federal Reserve.

Section 2 below provides background on the formation of the correspondent banking system and the Panic of 1893. Section 3 presents results on the role of correspondent and respondent failures in determining the likelihood of bank failure during the Panic. Section 4 turns to New York banks specifically and investigates the impact of respondent failures on the balance sheets and stock valuations of New York banks. Section 5 concludes.

2 The Correspondent Banking System and the Panic of 1893

The network of correspondent relationships in the U.S. banking system derived from its fragmented nature and lack of branching. Unit banks located outside of financial centers sought out correspondents in larger cities to serve the needs of their customers more effectively. The National Bank Acts of 1863 and 1864 cemented these relationships by designating certain cities as reserve or central reserve cities, and by allowing deposits with reserve city correspondents to count toward a bank's reserve requirements. Anderson, Paddrik, and Wang (2019) demonstrate that these Acts concentrated interbank deposits at the city level and in particular banks, leading to systematically important banks and a greater likelihood of financial contagion. For this paper, we collect data on the full set of recorded correspondent relationships from the 1893 edition of the Rand McNally *Bankers' Directory*, which includes the primary correspondents of every bank operating in the United States as of January 1893. This includes a total of more than 12,000 national, state, and private banks. For a typical bank, the listed correspondents consist of a bank in New York City and another in a geographically proximate reserve or central reserve city, although a few banks listed as many as six primary correspondents. The pyramidal structure of correspondent relationships resulted in a concentration of interbank deposits in New York, making

its clearinghouse the de facto central actor during financial crises (see Gorton and Tallman 2018). This structure meant that during a crisis, respondent banks might be unable to access their interbank deposits as upstream reserve agents shored up their own balances.

The Panic of 1893 posed a unique challenge to the correspondent system in that, unlike other panics of the National Banking era, it originated outside of New York City and resulted in far more bank failures (more than 550 in total; the Panic of 1873 takes second place with 101 total bank failures). Two major economic developments in the early 1890s contributed to the onset of the Panic: first, an increase in business and commercial failures and an accompanying decline in economic activity; and second, concerns about the ability of the U.S. Treasury to maintain its commitment to the gold standard in the face of declining gold reserves. Contemporary observers noted the importance of both factors, with Sprague (1910), for example, emphasizing the former and Noyes (1909) stressing the latter. More recent scholarship supports both factors as contributing to the start of Panic (see Carlson, 2013). In the wake of these developments, a stock market crash in early May precipitated a series of bank failures, including several large banks in Chicago and one in New York. In June, banking panics began in the cities of Chicago, Omaha, Milwaukee, Los Angeles, San Diego, and Spokane. The NYCH stopped publishing bank-specific balance sheet information for its members on June 17, and began issuing clearinghouse loan certificates for settling interbank balances on June 21. In July, the Panic spread to Kansas City, Denver, Louisville, and Portland, and the NYCH partially suspended payments to the interior on August 3, generating a currency premium and currency hoarding. Bank suspensions continued, with over 100 banks suspending in the month of August. The Panic ended when the currency premium disappeared and the suspension of payments was lifted in early September.

The Panic thus falls into two phases: a first consisting of bank runs in interior

cities resulting in a drain of interbank deposits from New York reserve agents, and a second characterized by the suspension of convertibility in New York and a currency premium for banks in the interior. We examine both phases separately and find that the dynamics of correspondent suspensions change after the suspension of the NYCH. Further, although the majority of bank suspensions represented permanent liquidations, almost 30 percent of suspending banks would go on to reopen by the end of October. We examine permanent liquidations and temporary suspensions separately to test the importance of the correspondent network for each.

3 Correspondent Relationships and Bank Failures

We estimate probit models to predict the likelihood of a given bank failing based on suspensions of its correspondents and respondents, along with other potentially important bank-level factors. In section 3.1 we predict bank suspensions using indicator variables for correspondent and respondent suspensions and with a measure of the share of a bank's total respondent network that is in suspension. We are able to characterize completely the incidence of suspension in a given bank's downstream network because of our comprehensive data on all primary correspondent relationships throughout the country. This allows us to identify all of a correspondent bank's respondents and thus analyze both upward and downward channels of transmission along the network. In section 3.2 we investigate whether the importance of either channel was affected by the suspension of payments of the NYCH. Finally in section 3.3 we separate temporary suspensions from permanent closures to determine whether correspondent and respondent failures were important for both. The results speak to whether correspondent and respondent failures primarily represented solvency or liquidity threats to banks during the Panic.

3.1 Correspondent and Respondent Suspensions

Our first probit specification examines how the suspension of a given bank's upstream correspondent or downstream respondent relates to its own likelihood of suspension. The general setup is

$$\begin{aligned} Closure_i = \beta_1 Correspondent/RespondentClosure_i + \beta_2 FractionCityBankFailures_i + \\ \beta_3 ClearinghouseMember_i + \beta_4 ClearinghouseCity + \beta_5 BankType + \\ \beta_6 ln(Capital)_i + \beta_7 ln(CityPop)_i + \beta_8 ln(CountyPop)_i + \\ \beta_9 Urbanization_i + \beta_{10} OutputComposition_i + \varepsilon_i, \end{aligned}$$

where the dependent variable is an indicator of whether or not a given bank suspended during the Panic. The variable of interest is a measure of the suspension of correspondent or respondent banks. We include controls for the fraction of other banks in the city that failed to account for the possibility that an observed effect of correspondent/respondent closures is due to the banks likely being located in the same city, whether or not the bank was a member of a clearinghouse, and whether or not it was a national bank. Selected columns also include the bank's capital from the *Bankers' Directory* and the population of the bank's city or town (these two variables reduce the sample size when used). Membership in the clearinghouse is from the *Bankers' Directory*. We also include county-level controls for population, the urbanization rate, and the industrial composition of the county, defined as the share of farm output in total output (i.e., the sum of farm and manufacturing). Table 1 displays the results, with columns 1 and 2 looking at upstream suspensions in the full sample and columns 3-6 examining downstream suspensions with the sample restricted to only banks which themselves had downstream correspondents. All results display the marginal effects from probit regressions with standard errors clustered at the city level.

Table 1. Bank Suspensions and the Role of Correspondents and Respondents (Marginal Effects)

	All Banks		Banks with Respondents					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Upstream Correspondent Suspended	0.042***	0.039***					0.033**	0.039**
	(0.005)	(0.006)					(0.014)	(0.015)
Downstream Respondent Suspended			0.034**	0.039**			0.031**	0.037**
			(0.013)	(0.016)			(0.013)	(0.015)
Fraction of Respondent Network Suspended					0.062**	0.076***		
					(0.025)	(0.029)		
Fraction of Other Banks in City Suspended	0.185***	0.171***	0.195***	0.202***	0.201***	0.205***	0.185***	0.189***
	(0.015)	(0.016)	(0.058)	(0.054)	(0.057)	(0.052)	(0.057)	(0.053)
Non-National	0.010***	0.015***	0.008	0.017	0.004	0.013	0.009	0.018*
	(0.004)	(0.005)	(0.009)	(0.011)	(0.008)	(0.011)	(0.008)	(0.010)
Clearinghouse Member	0.007	0.000	-0.016**	-0.018***	-0.014*	-0.016**	-0.014*	-0.016**
	(0.010)	(0.008)	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)
Clearinghouse City	0.013	0.008	0.062	0.063*	0.055	0.059*	0.057	0.057*
	(0.010)	(0.010)	(0.041)	(0.035)	(0.038)	(0.035)	(0.039)	(0.033)
ln(City Population)		0.013***		0.021*		0.021*		0.018*
		(0.003)		(0.011)		(0.011)		(0.011)
ln(Capital)		-0.000		0.007		0.011*		0.007
		(0.003)		(0.006)		(0.006)		(0.005)
ln(County Population)	-0.014***	-0.026***	-0.016***	-0.042***	-0.013**	-0.040***	-0.015**	-0.037***
	(0.002)	(0.003)	(0.006)	(0.015)	(0.006)	(0.014)	(0.006)	(0.014)
Urbanization Rate	0.008	0.012	-0.003	-0.014	0.007	-0.004	-0.004	-0.014
	(0.009)	(0.012)	(0.018)	(0.019)	(0.019)	(0.019)	(0.017)	(0.018)
Ratio Farm Output to Total Output	-0.031***	-0.006	-0.030	-0.005	-0.018	0.015	-0.032	-0.009
	(0.006)	(0.009)	(0.023)	(0.030)	(0.022)	(0.030)	(0.023)	(0.029)
Pseudo R-squared	0.10	0.12	0.20	0.21	0.19	0.21	0.21	0.23
N	12,627	8,232	1,371	1,162	1,371	1,162	1,371	1,162

The table presents estimates of marginal effects from probit regressions of the incidence of bank suspension on selected covariates.
Standard errors appear in parentheses beneath the marginal effects and are clustered at the city level.
* $p < .1$, ** $p < .05$, *** $p < .01$

Columns 1 and 2 indicate that the suspension of an upstream correspondent is associated with a four percentage point increase in the likelihood of suspension. Given that the baseline rate of suspension in the full sample is slightly over four percent, the suspension of a correspondent bank roughly doubles the likelihood that a given bank will suspend. Columns 3-6 explore the impact of downstream respondent suspensions, and are limited to just under 1,400 banks (6% of banks within this subsample suspend during our timeframe). The results indicate that the suspension of at least one of a given bank's respondents relates to an increase of three to four percentage points in its own probability of suspension, and that a one standard deviation increase in the proportion of respondents in suspension is associated with a two percentage point increase. This also reflects a near-doubling of the suspension probability. Columns 7 and 8 include all potential independent variables of interest to address whether the previous results are simply capturing the same relationship in two different ways, rather than isolating two different channels of transmission of the shock. The results show that, for a bank with both upstream correspondents and downstream respondents, failures from both directions increased the chance of failure.

For all specifications, we find that the fraction of bank suspensions within a given bank's city is strongly associated with that bank's likelihood of default. This is reasonable in that citywide runs were understood to be a major driver of bank suspensions. Even controlling for this factor, however, correspondent relationships remain significant drivers of bank suspensions. For the restricted sample of banks with respondents, we find that banks with membership in a clearinghouse are less likely to suspend. This fits with previous work on the proposed risk-pooling functions that clearinghouses took on during panics (e.g., Jaremski 2015). We also include a control for whether or not the bank was in a city with a clearinghouse, for the simple reason that these represent many of the cities that experienced runs (e.g.,

Chicago, Milwaukee, Kansas City, and Denver). The inclusion of both variables makes it clear that although cities with clearinghouses did not avoid bank runs, controlling for membership in a clearinghouse helped prevent a given bank's suspension. The results also indicate that being located in a populous county decreases the incidence of suspension, but a higher population in the bank's particular city or town increases suspension rates. This likely reflects the Panic's concentration in regions outside of New York and the Northeast, but nonetheless in larger cities within those other regions.

Our findings reinforce the importance of the correspondent network as a propagation mechanism for financial contagion during the Panic. Moreover, suspensions seemed to spread both up and down the correspondent network. This result concurs with Calomiris, Jaremski, and Wheelock (2020), who find that during the Great Depression both correspondent and respondent failures significantly increased the probability of bank suspension.

3.2 The Impact of the NYCH Suspension

The New York clearinghouse partially suspended payments to downstream banks on August 3, 1893, fundamentally changing the nature of the Panic. Prior to this, reserves held by New York banks had declined sharply as banks in the interior became increasingly concerned about depositor withdrawals and drew down their deposits with reserve agents. The partial suspension of payments led many downstream banks that had been freely redeeming deposits to limit payouts to their customers, and created a premium on currency that would last through August. While the first phase of the Panic was characterized by deteriorating banking conditions spreading from the interior up to banks in New York, now financial unrest spread from the New York suspension down to respondents unable to access their deposits with reserve agents. In this subsection we examine whether the character of bank suspensions changed with the suspension of payments from the NYCH.

To do this, we restrict our outcome variable based on whether a suspension occurred before or after the suspension in New York. The first two columns of table 2 replicate our earlier probit specifications on the role of correspondent suspensions but include only those failures occurring before the August 3 suspension, while columns 3 and 4 only include bank failures following the August 3. (Of the roughly 550 suspensions during the Panic, around 130 occurred after August 3rd, while the other 420 suspended before.) The results indicate that while the suspension of an correspondent was a significant predictor of bank failure prior to the suspension of payments by the NYCH, it ceased to be an important factor afterward. This suggests that once all major banks in New York had suspended, respondents were more or less equally unable to utilize their relationships with correspondent banks effectively. Thus, the failure of a correspondent no longer figured importantly in a given bank's suspension, as even in the absence of such a failure banks were unable to access their interbank deposits or to rely on their New York correspondents.

Table 3 similarly investigates whether the importance of respondent failures differed during the two phases of the Panic. Columns 1 and 2 examine the impact of respondent suspensions on pre-NYCH suspension failures, while columns 3 and 4 do the same for post-NYCH suspension failures. In contrast to the upstream results, the importance of respondent failures remains consistent throughout the two phases of the Panic. This indicates that while the upstream channel became subsumed in the New York suspension, the failure of respondents remained an important risk factor for banks that themselves served as upstream correspondents.

Our results suggest that the role of correspondent relationships in transmitting financial shocks depended on the context and nature of the financial panic. Once New York banks suspend payments and all respondent banks are unable to access their funds with reserve agents, the importance of a correspondent failure disappears. These conditions, however, do not alter the significance of financial difficulty in a

Table 2. Bank Suspensions and Upstream Correspondents, Before and After NYCH Suspension (Marginal Effects)

	Pre NYCH Suspension		Post NYCH Suspension	
	(1)	(2)	(3)	(4)
Upstream Correspondent Suspended	0.035***	0.032***	0.003	0.003
	(0.004)	(0.005)	(0.003)	(0.003)
Fraction of Other Banks in City Suspended	0.130***	0.120***	0.043***	0.039***
	(0.012)	(0.013)	(0.010)	(0.011)
Non-National	0.008**	0.013***	0.002	0.001
	(0.003)	(0.004)	(0.002)	(0.002)
Clearinghouse Member	0.003	-0.004	0.006	0.010
	(0.007)	(0.007)	(0.007)	(0.008)
Clearinghouse City	0.016**	0.013	-0.005	-0.009
	(0.008)	(0.009)	(0.007)	(0.006)
ln(Capital)		0.001		-0.001
		(0.002)		(0.002)
ln(City Population)		0.010***		0.003**
		(0.002)		(0.001)
ln(County Population)	-0.012***	-0.022***	-0.001	-0.003*
	(0.002)	(0.003)	(0.001)	(0.002)
Urbanization Rate	0.006	0.010	0.001	0.002
	(0.008)	(0.011)	(0.007)	(0.008)
Ratio Farm Output to Total Output	-0.029***	-0.010	0.001	0.006
	(0.005)	(0.008)	(0.004)	(0.005)
Pseudo R-squared	0.11	0.13	0.04	0.06
N	12,627	8,232	12,627	8,232

The table presents estimates of marginal effects from probit regressions of the incidence of bank suspension on selected covariates. Standard errors appear in parentheses beneath the marginal effects and are clustered at the city level.

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 3. Bank Suspensions and Downstream Respondents, Before and After NYCH Suspension (Marginal Effects)

	Pre NYCH Suspension		Post NYCH Suspension	
	(1)	(2)	(3)	(4)
Downstream Respondent Suspended	0.017**	0.022**	0.028**	0.022*
	(0.008)	(0.011)	(0.013)	(0.011)
Fraction of Other Banks in City Suspended	0.086***	0.099***	0.125**	0.070**
	(0.032)	(0.034)	(0.057)	(0.034)
Non-National	0.002	0.007	0.012	0.015
	(0.005)	(0.008)	(0.012)	(0.011)
Clearinghouse Member	-0.009**	-0.013***	-0.005	1.374***
	(0.004)	(0.005)	(0.013)	(0.285)
Clearinghouse City	0.088**	0.098**	-0.010**	-0.002***
	(0.042)	(0.041)	(0.004)	(0.000)
ln(Capital)		0.003		0.007
		(0.004)		(0.006)
ln(City Population)		0.015*		0.005
		(0.009)		(0.005)
ln(County Population)	-0.010**	-0.029***	-0.004	-0.011
	(0.004)	(0.011)	(0.007)	(0.007)
Urbanization Rate	-0.006	-0.016	0.019	0.012
	(0.011)	(0.014)	(0.026)	(0.015)
Ratio Farm Output to Total Output	-0.023	-0.015	0.002	0.023
	(0.017)	(0.024)	(0.024)	(0.018)
Pseudo R-squared	0.16	0.17	0.29	0.42
N	1,371	1,162	1,371	1,162

The table presents estimates of marginal effects from probit regressions of the incidence of bank suspension on selected covariates. Standard errors appear in parentheses beneath the marginal effects and are clustered at the city level.

* $p < .1$, ** $p < .05$, *** $p < .01$

respondent bank.

3.3 Temporary vs. Permanent Bank Closures

Of the approximately 550 banks that suspended during the Panic of 1893, nearly 30 percent would reopen by the end of October. In this subsection we investigate whether the impact of correspondent failures differs for bank that suspended and subsequently reopened versus banks that ended their operations permanently. This distinction speaks to whether the closure of a correspondent bank represents a problem of liquidity or of solvency for the bank in question. Carlson (2005) outlines potential reasons that such a closure might contribute to either liquidity or solvency issues. The closure of a correspondent bank could decrease a bank's liquidity by interfering with its access to deposits at that correspondent, but could also lead to solvency issues by inhibiting the bank's ability to clear checks and drafts. If the primary impact of a correspondent closure is to create a liquidity problems for the bank, we might expect such closed banks to be more likely to reopen once the Panic subsides. If the closure of a correspondent represents a significant threat to the solvency of a given bank, however, a permanent closure might be more likely.

The specifications in tables 4 and 5 examine this relationship separately for temporary bank suspensions and permanent closures. Table 4 focuses on correspondent suspensions and finds that they are significant predictors of both temporary suspensions and permanent closures. The difference in magnitude is largely a reflection of the difference in base rates of temporary versus permanent suspension.

Table 5 shows the impact of respondent closures by nature of bank suspension, with columns 1 and 2 capturing the impact on temporary suspensions and columns 3 and 4 illustrating the effect on permanent closures. Interestingly, while the coefficients are of a similar magnitude as before, they are significant only for permanent closures. Overall, correspondent suspensions seem to pose both liquidity and solvency issues for affected banks, while respondent suspensions were more closely linked to

Table 4. Bank Suspensions and Upstream Correspondents, Temporary Suspensions vs. Permanent Closures (Marginal Effects)

	Suspended and Reopened		Closed Permanently	
	(1)	(2)	(3)	(4)
Upstream Correspondent Suspended	0.011***	0.009***	0.028***	0.027***
	(0.002)	(0.003)	(0.004)	(0.005)
Fraction of Other Banks in City Suspended	0.052***	0.055***	0.114***	0.097***
	(0.006)	(0.007)	(0.012)	(0.013)
Non-National	-0.005***	-0.002	0.017***	0.018***
	(0.002)	(0.002)	(0.003)	(0.004)
Clearinghouse Member	0.005	0.002	0.002	-0.003
	(0.004)	(0.004)	(0.008)	(0.007)
Clearinghouse City	0.001	0.003	0.012	0.005
	(0.005)	(0.005)	(0.009)	(0.008)
Clearinghouse City				
ln(Capital)		-0.000		-0.000
		(0.001)		(0.002)
ln(City Population)		0.004***		0.009***
		(0.001)		(0.002)
ln(County Population)	-0.004***	-0.007***	-0.009***	-0.018***
	(0.001)	(0.002)	(0.002)	(0.002)
Urbanization Rate	0.008*	0.005	-0.000	0.007
	(0.005)	(0.006)	(0.008)	(0.010)
Ratio Farm Output to Total Output	-0.006*	0.004	-0.023***	-0.010
	(0.003)	(0.005)	(0.005)	(0.007)
Pseudo R-squared	0.11	0.11	0.08	0.11
N	12,627	8,232	12,627	8,232

The table presents estimates of marginal effects from probit regressions of the incidence of bank suspension on selected covariates. Standard errors appear in parentheses beneath the marginal effects and are clustered at the city level.

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 5. Bank Suspensions and Downstream Respondents, Temporary Suspensions vs. Permanent Closures (Marginal Effects)

	Suspended and Reopened		Closed Permanently	
	(1)	(2)	(3)	(4)
Downstream Respondent Suspended	0.011	0.011	0.017*	0.022*
	(0.007)	(0.007)	(0.010)	(0.012)
Fraction of Other Banks in City Suspended	0.086**	0.092***	0.072**	0.073***
	(0.037)	(0.034)	(0.030)	(0.027)
Non-National	0.001	0.003	0.006	0.013
	(0.005)	(0.006)	(0.007)	(0.009)
Clearinghouse Member	0.007	0.009	-0.012**	-0.012***
	(0.013)	(0.015)	(0.005)	(0.005)
Clearinghouse City	-0.001	-0.001	0.070	0.074*
	(0.009)	(0.010)	(0.044)	(0.038)
Clearinghouse City				
ln(Capital)		0.001		0.006
		(0.003)		(0.004)
ln(City Population)		0.006		0.014*
		(0.007)		(0.008)
ln(County Population)	-0.006	-0.012	-0.009**	-0.027***
	(0.004)	(0.009)	(0.004)	(0.010)
Urbanization Rate	0.002	-0.000	-0.005	-0.013
	(0.011)	(0.012)	(0.012)	(0.013)
Ratio Farm Output to Total Output	-0.023	-0.014	-0.012	0.004
	(0.017)	(0.019)	(0.015)	(0.021)
Pseudo R-squared	0.23	0.21	0.13	0.17
N	1,371	1,162	1,371	1,162

The table presents estimates of marginal effects from probit regressions of the incidence of bank suspension on selected covariates. Standard errors appear in parentheses beneath the marginal effects and are clustered at the city level.

* $p < .1$, ** $p < .05$, *** $p < .01$

permanent closures.

4 Banks in the New York Clearinghouse

Although 1893 was characterized by large numbers of bank failures outside of New York, within the city only one national bank and three state banks closed their doors, with one of the three reopening almost immediately. Thus, examining the impact of respondent failures on New York banks requires studying more than bank failures alone. To do this, we collect weekly bank balance sheet data and stock price data from the *Commercial and Financial Chronicle*. The balance sheet data for the NYCH banks run from April 22 through June 10, 1893. Although their publication was halted at that point to protect the weaker New York banks from being targeted for runs, 126 of the 585 bank failures in 1893 occurred on or before June 10. Thus, these balance sheets still offer an opportunity to examine the impact of respondent failures on the well-being of banks in New York. Given that the bulk of the bank failures occurred after the clearinghouse ceased publication, however, we use weekly data on the stock prices of New York banks to extend the analysis through the entirety of the Panic and to test whether differential exposure to respondent failures was reflected in the public's valuation of these banks.

4.1 Weekly Balance Sheets of New York Banks, April 22 through June 10

We now use linear regressions to estimate the relationship between respondent suspensions and the various balance sheet variables reported by NYCH banks during this period. Table 6 shows the impact of downstream suspensions on the logs of total loans, deposits, and specie reserves. The specification in panel A uses the number of respondents suspended each week for each New York bank on the right hand side. We also include bank-level fixed effects and fixed effects for weeks. The bank-level fixed effects control for factors such as the size of the bank, the number of correspondents, and numerous other characteristics that are fixed for each bank throughout the pe-

riod, while the time effects allow us to capture the differential effect of respondent failures across New York banks while controlling for the aggregate progression of the Panic week by week. The high correlation of various balance sheet items with one another precluded their inclusion as control variables in each of the regressions. The results suggest that the suspension of a respondent is associated with a 1-2% decline in both deposits and loans at the New York bank in question. The presence of time fixed effects facilitates our interpretation of the regression as capturing a differential impact on balance sheet quantities across banks with varying exposures to respondent suspensions. Banks that were subject to respondent suspensions fared worse during the early phase of the Panic than banks that were not.

Table 6. NYCH Bank Balance Sheets and Respondent Suspensions

	(1) ln(Deposits)	(2) ln(Loans)	(3) ln(Specie)
Panel A			
Respondents in Suspension	-0.015***	-0.018***	-0.007
	(0.003)	(0.002)	(0.005)
N	455	455	455
Panel B			
ln(Assets of Suspended Respondents)	-0.078***	-0.075***	-0.056**
	(0.015)	(0.011)	(0.024)
N	455	455	455
Panel C			
Fraction of Respondent Network in Suspension	-0.316	-0.433***	-0.100
	(0.220)	(0.169)	(0.347)
N	455	455	455
Controls for all panels:			
Week Fixed Effects	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

The specifications in panels B and C use the total assets of suspended respon-

dents and the fraction of respondents in suspension for each bank, respectively, on the right hand side. The results focusing on the assets of suspended respondents support the negative effect of suspensions on the loans and deposits of New York banks, and now also show significant declines in specie. When suspensions are measured as a fraction of the total respondent network in suspension, the estimates are generally less precise but still uniformly negative. Taken together the results suggest that suspensions in a New York bank's downstream respondent network directly affected how well that bank fared during the Panic. Furthermore, the contraction in lending from New York banks illustrates an important channel through which respondent suspensions impacted real economic activity throughout the Panic. These results fit well with the Great Depression findings of Mitchener and Richardson (2019) that respondent suspensions led to a decline in deposits of reserve agents and a resultant contraction in lending and economic activity.

4.2 Weekly Stock Prices of New York Banks, April through October

Although the clearinghouse ceased publishing bank-specific balance sheet information after June 10, as Rousseau (2011) stresses, bank stock prices in the National Banking period still reflected the public evaluation of how well different banks fared in the face of financial distress. Indeed, over 1893 stock prices fell for 53 of the NYCH banks while rising for only seven and remaining unchanged for nine. To capture these kinds of effects, the OLS specifications reported in table 7 use weekly stock prices collected from the *Commercial and Financial Chronicle* over the period April 29 to October 28 to examine the link between respondent suspensions and the market valuations of New York banks. In the analysis, all bank stock prices are normalized, and both bid and ask prices are utilized to maximize the information available.[1] Column 1 includes an indicator variable for whether the New York bank had a respondent that was currently in suspension during that week. Column 2 instead uses the fraction of respondents that were currently in suspension, while column 3 focuses on

the total assets of respondents in suspension. All three specifications account for the possibility that suspended respondents could reopen as the Panic progressed, as some did. The results from column 1 indicate that when a New York bank saw a respondent suspend, they experienced a 1.3 percent decline in their stock price that week. The results from the alternate measures of respondent suspensions further support their negative impact on a bank's stock price. Once again, time and bank-specific fixed effects are included to ensure that the impact from respondent closures is capturing the differential impact between banks over time of such closures. Overall, the results strongly indicate that New York banks suffering from a high degree of respondent suspensions fared significantly worse than their fellow clearinghouse members throughout the Panic.

Table 7. NY Bank Stock Prices and Closed Respondents

	Dependent Variable: Bank Stock Price		
	(1)	(2)	(3)
Respondent Suspended	-0.013***		
	(0.004)		
Fraction of Respondent Network Suspended		-0.110**	
		(0.050)	
ln(Assets of Suspended Respondents)			-0.002***
			(0.001)
Week Fixed Effects	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes
N	1,358	1,358	1,358

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Taken together, the results in this section point to the suspension of respondent banks as a key channel for weakening the financial position of central reserve city banks in New York. As the Panic developed and intensified, hundreds of banks in the interior began to close, and the New York banks most closely linked to these closures fared the worst. Such banks saw their deposits and specie decline significantly and

reduced their lending as a result. As the Panic progressed through July and August, respondent failures continued to imperil the financial situation of upstream New York banks, as reflected in their share prices. Even without a wave of bank failures in New York City, the failures of respondent banks still had visible impacts on banking outcomes in the nation's financial center.

5 Conclusion

The network of correspondent banking relationships in the National Banking period offered a way for banks forbidden from branching to nonetheless settle payments made by draft or check, invest in financial securities, and borrow short-term in major financial markets. In times of crisis, however, the network also became a primary conduit for transmitting financial stress throughout the system. During the Panic of 1893, failures of respondent banks in the interior put pressure on their correspondents, increasing their likelihood of closure and draining their reserves and deposits. Similarly, failures of correspondents threatened the ability of their downstream partners to access interbank deposits and meet the withdrawal needs of their customers. Correspondent failures contributed both to temporary bank suspensions as well as permanent closures. While the downstream channel remains important throughout the Panic, the failure of correspondents ceases to matter after the New York clearinghouse banks suspend payments.

Despite the lack of bank failures in New York City, evidence from weekly balance sheets and from bank stock prices indicates that the failure of respondent banks did have a tangible effect on New York banks. Respondent failures contributed to the contraction of loans by New York banks that exacerbated the real effects of the Panic on the U.S. economy. Further, stock prices indicate that equity investors knew of the risks faced by specific New York banks and were able to adjust their valuations as banks saw their downstream respondents suspend. New York banks whose respondent networks were concentrated in panic cities such as Chicago, Denver, Kansas

City, and Nashville fared worse than those more closely tied to banks in cities that did not suffer runs, such as Philadelphia, Boston, and New Orleans. These findings provide further evidence that the U.S. interbank correspondent network, necessitated by the prohibitions on branch banking during this period, destabilized the banking system and contributed to the severity of banking crises. While the Federal Reserve by construction was intended to relieve systemic pressures by providing a lender of last resort, and federal deposit insurance was later instituted to avoid bank runs, the persistence of legislation aimed at protecting individual unit banks from competition with larger and better diversified multi-unit banks kept the U.S. banking system prone to less severe disruptions of both local and aggregate nature throughout the 20th century, with some remnants of those policies remaining to this day.

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