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ABSTRACT

In the summer of 1931, a financial crisis began in Austria, spread to Germany, forced Britain to abandon the gold standard, crossed the Atlantic, and afflicted financial institutions in the United States. This article describes how banks in New York City, the central money market of the United States, reacted to this trans-Atlantic trauma. New York's money-center banks anticipated the onset of a financial crisis, prepared for it by accumulating substantial reserves, and during the European crisis, continued business as usual. New York's leading bankers deliberately and collectively decided on the business-as-usual policy in order to minimize the impact of the panic in the United States. New York banks' behavior changed only after the Federal Reserve raised discount rates to stem gold outflows in the fall of 1931.

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1. Introduction

Scholars debate how the financial crisis of 1931 crossed the Atlantic. Explanations fall into two broad classes. A traditional class, commonly called "golden fetters," emphasizes how the financial crisis triggered gold flows from the United States, forcing the Federal Reserve to defend its gold reserves by raising interest rates, reducing economic activity and weakening domestic banks (Friedman and Schwartz, 1963; Eichengreen and Sachs, 1985; Eichengreen, 1992; Temin, 1989 and 1993). An alternative class emphasizes the crisis's direct impact on the behavior of banks, either due to declines in values of their foreign investments or withdrawals by their depositors, particularly the largest institutions in the United States operating in the money-center of Manhattan (Accominotti, 2016; James, 2009; Morsy, 2002; Ritschl and Sarferaz, 2014; Richardson and Van Horn, 2009 and 2011). Both explanations appear plausible. Evidence indicates that both golden fetters and bank balance sheets transmitted the crisis from Austria, where it began, to Germany, and then to Britain (Accominotti, 2012; James, 1984, 1986, 2009; Park, 2013; Schnabel, 2004a, 2004b; Temin, 1993, 2008).

Regarding trans-Atlantic transmission, however, the debate persists, largely because scholars have yet to assemble and analyze the types of detailed commercial-bank balance sheet data that would enable them to resolve this issue. Our essay fills this lacuna in the literature. We are the first scholars to assemble and analyze data illuminating the behavior of banks in the central-money market of the United States before, during, and after the financial crisis swept through Europe and spread to America. The money-center banks were the largest financial institutions in the United States. They held more than one-third of the financial assets in the nation. A subset of these banks had substantial foreign exposure, both on the asset and liability sides of their balance

sheets, because they solicited foreign accounts; had expertise investing overseas; and operated branches in Europe, Latin America, and Asia.

Our data enable us to compare the impact of the European crisis on banks with and without foreign exposure. The banks without foreign exposure serve as a control group. Changes in their balance sheets should have been driven by domestic factors. The banks with foreign exposure are the treatment group. Changes in their balance sheets may have been influenced both by domestic and international factors. Comparing changes in the balance sheets and behavior of the control and treatment groups, before and after financial panics in different nations in Europe, and before and after the Federal Reserve raised interest rates, illuminates the impact of these events.

Our analysis begins with microdata. We examine a panel consisting of all extant balance sheets for every bank in New York city and state. The panel spans the year 1931. The data's frequency is approximately quarterly. The panel contains information about banks' foreign liabilities, assets, and branches. This information enables us to estimate the impact of the European crisis on banks with more or less foreign exposure. We conduct this exercise for all banks in New York State and also while limiting our sample to banks in Manhattan. In the first exercise, the control group includes all banks in New York with limited foreign exposure, including numerous banks in New York's industrial and agricultural heartland. These banks resembled the thousands of country banks operating in smaller cities and towns throughout the United States. In the second exercise, the control group consists of banks in Manhattan with limited overseas linkages. These banks resembled banks operating in reserve cities throughout the nation. We examine the four chief components of commercial banks' balance sheets: on the liability side, (i) owners' equity and (ii) deposits; on the asset side, (iii) illiquid earning assets such as loans, and (iv) liquid safer assets such as cash and reserves. We ask if these components declined more in absolute or relative

terms for banks with substantial foreign exposure than banks with limited foreign exposure. During the crisis, we find that the balance sheets of banks with foreign exposure remained stable relative to banks with little or no foreign exposure, whose balance sheets contracted to a greater degree. The stability of the former relative to the latter suggests that the European crisis did little to alter the balance sheets of the American banks exposed to it.

Our analysis continues with aggregate data. The aggregate data set has a weekly frequency, which enables us to differentiate the impact of events occurring close together, such as Britain's departure from gold in September 1931 and the New York Fed's increase in the discount rate in October 1931. Our aggregate data's geographic coverage enables us to compare banks in New York City to banks in the rest of the United States. As with the microdata, the aggregate data allows us to test whether the chief categories on the balance sheets of banks with substantial foreign exposure declined in response to the financial crisis in Europe in absolute terms or relative to banks with less foreign exposure. The aggregate data also allows us to ask how commercial banks' balance sheets responded to the Federal Reserve's discount-rate increases in October 1931. That response lies at the heart of the golden fetter's hypothesis.

Our analysis shows that balance sheets of banks outside of Manhattan, which on average had less exposure to foreign financial shocks, changed more during the financial crises in Austria, Germany, and Britain than the balance sheets of banks in Manhattan, which had more exposure to shocks from overseas. During the German and British crises, deposits and loans of banks in New York remained stable, while deposits and loans declined for banks in the rest of the United States. In response to the Federal Reserve's decision in October to raise discount rates in order to slow gold outflows, however, deposits and loans of banks in New York City declined swiftly,

substantially, and to a greater degree than deposits and loans of banks in the rest of the United States.

High-frequency data on loan interest rates in New York City and the rest of the nation exhibit a similar pattern. Interest rates on commercial bank loans declined gradually from the start of the contraction in 1929 until the onset of the European crisis in May 1931. Rates remained stable during the crisis in Europe. Some rates began to rise after Britain abandoned the gold standard. All interest rates rose rapidly after the New York Fed raised its discount rate in October of 1931. This pattern is consistent with the golden-fetters theory that the Federal Reserve's reactions to gold flows transmitted the European crisis to the United States banking system.

Finally, we examine evidence about the policies pursued by money-center banks and the logic underlying those policies. Our review of this evidence is concise, because we discuss the documentary record at length in a related paper (Richardson and Van Horn, 2009), and we present statistical evidence from micro-data sources in two companion papers (Koch, Richardson, Van Horn 2016 and 2017). Here, we demonstrate that Federal Reserve member banks in the money-center of Manhattan reduced leverage (the ratio of assets to equity) rapidly after 1926 in both absolute terms and relative to member banks in Chicago and in reserve cities throughout the United States. The qualitative evidence explains why New York's money-center banks deleveraged rapidly during the latter half of the Roaring 20s. New York's banks worried about bubbles in equity markets and overexpansion of industry. They anticipated a bust in the United States and a crisis in Europe, particularly Germany. They prepared for these possibilities by accumulating equity and reserves (or in other words, by deleveraging). During the crisis in Europe, New York's leading bankers deliberately and collectively decided on the business-as-usual policy in order to minimize the impact of the international financial crisis in the United States.

The remainder of our paper is organized as follows. Section 2 discusses the literature on the competing hypotheses. Section 3 examines our panel of microdata. Section 4 examines aggregated data of several types. Section 5 discusses the rationale behind the surprising behavior of New York's big banks. The concluding section discusses the implications of our analysis, describes the limits of our findings and the research that remains to be done, and reconciles our findings with those of other scholars.

2. Channels of Contagion During the International Financial Crisis of 1931

The international scope of the financial crisis of 1931 distinguished it from its predecessors. Contemporaries acknowledged that fact and strove to explain the crisis's international transmission (Hawtrey, 1932). Those efforts continued for decades. Temin (1993) summarizes this scholarship and describes conclusions concerning the channels through which the financial crisis flowed through Europe and across the Atlantic. The first is the impact of capital flows on central bank policies, particularly in nations on the gold standard, which must raise interest rates to defend gold reserves. Scholars have long labelled this channel 'golden fetters,' a phrase coined by John Maynard Keynes. The second is the effect of financial crises on commercial banking systems. Crises can impact banks' directly, by reducing the value of their assets, lowering their owners' equity, inducing them to hold larger cash reserves, or driving away their depositors. In some cases, financial crises create a contagion of fear, during which depositors simultaneously pull funds from many (or even all) financial institutions, disrupting financial intermediation for an economy as a whole. Temin's taxonomy reflects the conventional academic wisdom of the early 1990s. At that time, the principal explanation for the trans-Atlantic transmission of the crisis was the first channel, golden fetters. The fetters were beliefs about

how a central bank should operate under a gold standard. These beliefs compelled the Federal Reserve to defend their gold reserves by raising interest rates, even at the expense of domestic firms and financial institutions. The Fed acted after the crisis on the European continent forced Britain to abandon the gold standard, and fear that the United States might do the same induced investors to shift funds from the United States. To stem this outflow, the Federal Reserve substantially raised discount rates, which depressed consumption and investment, forced hundreds of banks out of business, and deepened the depression (Friedman and Schwartz, 1963; Eichengreen and Sachs, 1985; Eichengreen, 1992; Temin, 1989 and 1993). Golden fetters were also thought to be a factor spreading the financial crisis from Austria to Germany, and from Germany to Britain.

Views changed after a series of papers documented the transmission of shocks among European nations via banks' balance sheets. James (1984, 1986, 2009) demonstrated that the German crisis manifested itself as a run on German banks, which were structurally weak and fundamentally unsound, due in part to their own actions but also to public policies that generated inflation, weakened banks' balance sheets, and eroded confidence in financial institutions and markets. Schnabel (2004a, 2004b) found that "in Germany, the banking problems manifested themselves in a protracted retreat of depositors from the great branch banks.... The intensity of deposit losses was correlated with the banks' liquidity and solvency positions…. Given these banks' large shares of foreign deposits, the deposit withdrawals weakened the Reichsbank's reserve position and exacerbated the currency problems" (Schnabel, 2004b, p. 877). Accominotti (2012) showed that the crisis on the continent directly shocked Britain's financial system by triggering runs on London merchant banks financially exposed to central Europe, particularly

Germany; forcing the merchant banks to liquidate substantial assets to meet creditors' demands; and compelling the Bank of Britain to react to merchant banks' problems in ways that contributed to the pound's collapse. Park (2013) showed that the crisis on the continent altered the way in which London's clearing banks transformed deposits into assets, leading to a reduction in lending to industry.[1]

Scholars argue that similar mechanisms transmitted the financial crisis from Europe to the United States. James (2009) writes that

> "the European bank failures of the summer of 1931 in turn translated into a new shock for the U.S. economy, and some of the major money-center banks became vulnerable to investor and depositor panics. Relatively few accounts of the American depression fully take into account the role that the European collapse played in fanning financial uncertainty, in leading banks to call in loans – in short, in pushing the U.S. economy into the Great Depression."

Morsy (2002) and Ritschl and Sarferaz (2014) show that German and American macroeconomic aggregates were correlated, and negative shocks in German time series precede declines in economic activity in the United States. The effect is particularly pronounced for banking data, suggesting that shocks to German banks directly affected American financial institutions.

The money center banks in Manhattan and other banks in New York seem to be likely candidates linking the financial systems in Germany and the United States. Aguado (2001, p. 199) shows that an intricate system of cross-deposits set up by the Austrian Central Bank covertly directed funds via banks in New York City to the Creditanstalt to

[1] A debate exists about the transmission of the 1931 crisis via the balance sheets of London clearing banks. A series of studies including Capie, Mills, and Wood (1986), Billings and Capie (2011), Feinsten, Temin, and Toniolo (1997), and Grossman (1994) demonstrate the stability of London's clearing banks, whose losses from the crisis in Central Europe neither threatened their solvency nor triggered runs by depositors. Park (2013) shows, however, that the crisis did alter the way in which London's clearing banks transformed deposits into assets, leading to a reduction in loans to industry.

compensate it for taking over the bankrupt Bodencreditanstalt. Losses on these cross-deposits threatened the solvency of institutions involved in the scheme, including prominent banks operating in Manhattan. Manhattan's money-center banks had other significant exposures to European shocks. Foreign deposits in New York City banks exceeded $700 million. Acceptances in New York City banks on the account of German banks and firms totaled over $300 million. Ninety-day loans to German municipalities amounted over $100 million. Long-term German debt originated by New York banks totaled over $1 billion (Kuczynski, 1932).

Manhattan's money center banks also participated in a circular flow of funds that linked them to financial institutions in Europe. The New York banks loaned funds to Germans, who used the funds to pay war reparations to the British and French, who in turn used the funds to repay war debts, which returned the funds to the United States. This flow of funds stopped during the financial crisis of 1931, when difficulties beset banks throughout Europe, forced Germany to shut down its banking system in July, and forced Britain to abandon the gold standard in September. This debt exceeded the capital of all banks in New York City by an order of magnitude.

Banks in New York City also possessed substantial quantities of foreign bonds. On June 30, 1931, foreign bonds amounted to 1.46% of total assets at New York City's national banks, which was three times the rate (0.47%) of national banks in Chicago (Comptroller of Currency, 1931, pp. 54-7). A high fraction (38.2%) of claims against foreigners (including foreign bonds and all other foreign assets) reported by New York City's banks were against Germany. A lower fraction (13.8%) were claims against debtors in the United Kingdom. Much of the remainder (25.4%) were claims against individuals and organizations in other

European nations. A lower, but still substantial, share of short-term (less than 1 year) foreign liabilities reported by New York City's banks were debts owed to individuals and firms from the United Kingdom (9.75%) and Germany (3.65%) (Board of Governors, 1943, pp. 558-595).

Given these facts, it seems plausible that shocks to the European liabilities and assets of banks in New York could have transmitted the crisis from Europe to the United States. Then, like now, Manhattan was the center of the United States financial system. New York City's banks included the largest financial institutions in the United States and collectively held about one-third of the nation's aggregate commercial-bank assets. The money-center banks in New York had correspondent relations with the majority of commercial banks in the United States; substantial direct and indirect links to stock, bond, and commodity markets; branch offices or correspondents in major European cities; and a substantial share of the foreign exposure of all financial firms in the United States (Mitchener and Richardson, 2013 and 2016; Richardson, 2007).

Scholars have found that domestic financial shocks affected the operation of banks in New York. Calomiris and Wilson (2004) showed that banks in New York City reduced lending in response to negative asset shocks and increases in solvency risk. Mitchener and Richardson (2013, 2016) document the transmission of domestic financial shocks through the interbank network to the balance sheets of banks in the central reserve cities of New York and Chicago. This interbank amplification affected aggregate lending substantially. Scholars have also found that more banks failed in New York City during the European financial crisis than at any other point in the Great Depression.

We investigated the correlation between European and New York bank failures in an earlier essay (Richardson and Van Horn, 2009). We began with the observation that banking failures in New York City peaked during the financial crises in Germany. We anticipated proving that financial links between German borrowers and New York lenders triggered the simultaneous surge suspensions. We could not, however, confirm that conjecture. We were surprised to find that no banks in New York failed because of links to Germany or due to foreign loan losses of any type. All banks in New York with financial exposure to Germany and other European nations survived the contraction of the early 1930s, and most paid dividends throughout the downturn.

The simultaneity of bank failures in Germany and New York proved to be coincidental. The surge in New York bank suspensions occurred because politicians pressured the superintendent of banks for reasons unrelated to events overseas, and the superintendent responded by increasing the frequency and rigor of bank inspections and closing an inordinate number of banks. When political pressure subsided, so did suspensions of banks. The timing and targets of the superintendent's actions were unrelated to events in Europe.

Despite that finding, it is possible that the balance-sheet dynamics which transmitted the financial crisis from Austria to Germany and from Germany to Britain could have transmitted the crisis across the Atlantic. The crisis in Europe could have shocked the foreign liabilities and assets of banks in New York, which could have induced them to change their behavior and transmit those shocks to their counterparties, which included most financial institutions and markets in the United States. If they occurred, these shocks and responses should be reflected in changes on the balance sheets of banks in New York and throughout the United

States. We look for those patterns, but do not find them. Instead, we demonstrate that New York banks responded little if at all to financial events in Europe from June through September 1931, until gold outflows induced the Federal Reserve Bank of New York to rapidly raise discount rates in October. Banks rapidly responded to the Fed's policy changes, which appear to be the principal channel transmitting the European crisis to financial institutions in the central money market of the United States.

3. Analysis of Microdata from the Money Center of Manhattan

This section analyzes how individual banks in the money center of Manhattan reacted to the European financial crisis in the summer and fall of 1931. To determine the impact of international events, we compare the behavior of banks with substantial foreign exposure to the behavior of banks with little (or no) foreign exposure. We examine four key components of commercial banks' balance sheets. On the liability side, these include (i) owners' equity and (ii) deposits. On the asset side, these include (iii) illiquid assets earning high returns, such as loans to individuals and firms, as well as (iv) liquid safe assets earning low returns, such as cash and funds deposited in reserve repositories (typically either the Fed or money-center correspondent banks). For banks with substantial foreign exposure, we ask if any of these four components declined in absolute terms or relative to the balance sheets of banks with less foreign exposure. The banks with the most foreign exposure operated in the money-center of Manhattan. We compare their behavior to two control groups: banks operating in Manhattan with less (often little or no) foreign exposure, and banks operating in Manhattan or elsewhere in New York State.

We measure foreign financial exposure along seven dimensions in June of 1931 or at the nearest available date: (i) balances payable in dollars due from foreign branches of American

banks, (ii) due from banks in foreign countries, (iii) due to banks in foreign countries, (iv) time deposits of other banks and trust companies in foreign countries, (v) foreign government bonds owned, (vi) other foreign securities owned, including bonds of foreign municipalities, and (vii) number of foreign branches.[2] Variables (i), (iii), and (iv) represent liabilities. These amounts could be withdrawn by foreign individuals and firms. Rapid withdrawals by those parties might have forced New York banks to raise cash by selling assets, to rebalance their portfolios, or to borrow in the interbank market or from the Federal Reserve. They may also have caused concern among domestic depositors, forcing New York banks to raise rates paid to depositors or accumulate additional reserves. In extreme circumstances, the heightened concerns could have triggered runs among domestic depositors or in interbank markets. Variables (ii), (v), and (vi) represent assets. These amounts could be lost if events reduced the market value of these assets or prevented foreign borrowers and counterparties from paying the amounts that they owed. Large losses might have forced New York banks to write off losses, decrease dividends, raise new capital, or rebalance their portfolios. Large losses may also have caused concern among domestic depositors, triggering deposit flows, interest rate changes, and in certain circumstances, runs and panic. If these reactions occurred, they should be apparent in the data that we collect.

Table 1 indicates the values of these variables for the 36 banks in Manhattan with the most foreign exposure.[3] The tables last row indicates the average of these variables for all other banks

[2] For Federal Reserve member banks, we gather this data from call reports, from reports published by the Comptroller of the Currency, from materials contained in the archives of the Federal Reserve Bank of New York, and from the New York Times and Wall Street Journal. For state chartered banks that did not belong to the Federal Reserve, we gather this information from the reports of the state bank superintendent. For variables not included in the state superintendent's report for 1931, we take the information from Rand McNally Banker's Directory, the New York Times and Wall Street Journal, or the superintendent's report for the nearest available year. See data appendix for additional details.

[3] Except for foreign branches, our micro data on foreign exposure does not indicate exposure to particular nations (or even continents). The absence of this information forces us to assume that total foreign

in New York state. For most of these banks, the level of foreign exposure was low. This was true for most banks in the United States. Prior to 1913, American banks did little foreign business. None operated foreign branches. Few financed international trade. International financing was dominated by European banks, particularly British. The Federal Reserve Act of 1913 enabled American banks to expand internationally. The Act authorized nationally chartered banks to open foreign branches, to extend loans collateralized by foreign assets, and to extend and purchase trade acceptances (which had been forbidden before). In subsequent years, some states liberalized rules regarding foreign lending and operations, but most banks in the United States continued to focus on local markets. New York did liberalize regulations for state chartered banks, but evidence indicates that non-member state-chartered banks had few foreign investments. For example, for 1929, 1930, and 1931, the state-bank superintendents indicate that no state-chartered banks held foreign currency or foreign postage stamps (although private banks in the state did hold some of each). The Comptroller of Currency's reports for the same years indicate that state-chartered banks and trusts in New York held foreign bonds amounting to 1.51 percent of total assets.

Table 1 highlights the concentration of foreign exposure among the largest banks in Manhattan, which were also the largest banks in the United States. As the table indicates, banks that scored highly on one of these seven dimensions of foreign financial exposure often scored

exposure is good proxy for exposure to foreign shocks during the international financial crisis. We do not believe that our conclusions would, or could, be changed by the addition of more detailed data on New York bank's foreign assets and liabilities. Our regression results depend upon the relative ranking of banks with more or less foreign exposure. Re-ranking the top 10 banks – those with substantial foreign exposure – in any order yields equivalent regression results. Our results, in other words, would not be changed if we knew which of those top 10 banks had more or less exposure to European risks. That knowledge could change our rankings among those banks, but would not alter our conclusions. We should also note that no evidence exists suggesting that any banks had exposure concentrated in particular European nations, and if they followed standard operating procedures, all would have been diversified in that respect. The city and state level data which we discuss in the next section does, in fact, demonstrate that banks diversified portfolios across counties, although on average, the share of assets due from clients in German (and also central Europe and Britain) was three times higher for Fed member banks in New York City than Fed member banks in Boston and Chicago.

highly on most or all of them, raising the issue of multicollinearity. To address this issue, we can create an index of foreign exposure from the first principal component of the seven measures of foreign financial exposure. The first component is the linear transformation of the variables that explains the greatest possible variance in these vectors. Banks for which the value of the index is highest have the most foreign financial exposure. Banks for which the value of the index is lowest have the least foreign financial exposure. Our index appears to be broadly representative of all measures of foreign exposure. It loads positively and with roughly the same magnitude (from 0.28 to 0.51) on all seven variables. Our index of foreign exposure appears in the last column of Table 1.

Figures 1 through 4 compare our index of foreign exposure to changes in bank balance sheets of banks in Manhattan during the crisis on the continent. In each figure, the horizontal axis indicates the level of foreign financial exposure. The vertical axis indicates the change in a balance sheet variable between the call date on June 30, 1931 and the call date in September 29, 1931. The June figures come prior to the onset of the German crisis. September figures come a month and a half after the German crisis peaked, less than two weeks after Britain abandoned gold, and a few weeks before the Fed increased discount rates to stem gold outflows from the United States.

Figure 1 examines the percentage change in surplus and profits. Undivided profits accrued on a banks' balance sheet when the bank earned profits but its board of directors had not yet committed those funds to pay dividends or increase surplus. Surplus increased when a board of directors decided to reinvest profits in their business rather than pay dividends. Surplus decreased when a bank wrote of losses from unprofitable investments. Surplus and profits were the key components of a banks' retained earnings, and along with paid-up capital, constituted stockholders' claims to the assets of the bank. A decrease in either category indicated that expenses

exceeded revenues, which typically occurred when banks wrote off investment losses. For banks with the highest levels of foreign exposure, surplus and profits changed little during the international financial crisis, despite the fact that the largest banks transferred large sums to loan loss reserves. In many banks with little (or no) foreign exposure, surplus and profits fell sharply.

Long run trends in these variables, described in section 5 of this essay and in Koch, Richardson, Van Horn (2016), help to interpret these patterns. Banks in Manhattan with significant foreign exposure were profitable institutions. Throughout the Roaring ‘20s, they raised new capital, increased surplus, and raised retained earnings. In late 1929 and early 1930s, they also increased their loan loss reserves. During the international financial crisis in 1931, they ceased raising new capital, ceased increasing surplus, and ceased retaining earnings, since during that quarter, losses roughly offset revenues. The banks with little or no foreign exposure in Manhattan to which we compare them were also profitable institutions during the Roaring ‘20s, but many of these banks suffered substantial losses during 1931 and 1932, often due to declines in values of their investments in local industries. During the international financial crisis of 1931, retained earnings at many of these banks changed little, but a fraction of these banks experienced large losses which they charged to their capital accounts. If banks with large foreign exposure had suffered these losses, we should expect to see a different picture. Banks with high foreign exposure would have written off losses and reduced retained earnings. The figure shows that was not the case.

Figure 2 examines the percentage change in deposits. The largest losses in deposits occurred in banks with the lowest levels of foreign exposure. Banks with substantial foreign exposure lost deposits at a below average rate. Banks with less foreign exposure, on average, lost a larger percentage of deposits than banks with more foreign exposure, although outcomes varied

greatly for banks lacking foreign exposure. If foreign depositors had withdrawn large sums from their accounts in the United States or if American residents withdrew funds from banks with foreign exposure, perhaps because they feared for their solvency, the opposite pattern would have appeared. Banks with more foreign exposure would have lost more deposits than their counterparts with less foreign exposure. Figure 1 and our regression below indicate that this did not happen.

Figure 3 examines the percentage change in highly liquid, safe assets: cash and due from banks. Again, changes appear uncorrelated with foreign exposure. Banks with substantial foreign exposure finished the crisis with a quantity of liquid assets similar to that which they possessed at the beginning. Two banks with substantial foreign exposure did reduce holdings of cash and reserves. Mitchener and Richardson (2016), however, showed that these banks altered the asset-side of their portfolios in response to domestic, rather than foreign, drains. In contrast, some banks with little foreign exposure stockpiled liquid assets. Other banks with little foreign exposure lost liquid assets. These patterns reveal no correlation between changes in liquid assets and foreign exposure, which runs counter to the patterns expected if the financial crisis in Europe was impacting the operations of New York's money center banks.

Figure 4 examines the percentage change in loans. Once again, changes appear uncorrelated with foreign exposure. On average, lending declined at all banks. The declines at banks with moderate or high levels of exposure were similar to each other and also similar to the average decline at banks with little or no foreign exposure, although the experience for smaller banks with less foreign exposure varied widely, with a few substantially increasing and a few dramatically decreasing the fraction of their portfolio in loans. These changes in lending were triggered, in part, by outflows of deposits from banks in New York and also from the changing composition of commercial bank balance sheets, as banks reduced holdings of loans and other less

liquid assets and increased holding of bonds and other more liquid assets (Mitchener and Richardson 2013 and 2016).

Table 2 tests the statistical significance of the patterns apparent in Figures 1 through 4. Columns 1 to 4 report results for all banks in New York State. The dependent variable are the percentage change in (1) retained earnings, (2) deposits, (3) liquid assets, and (4) loans from call at the end of June, before the German crisis, to the call at the end of September, after the British crisis. In each regression, the key explanatory variable is our index of foreign exposure. The control variables include bank size (measured as log of total assets), the cash-to-deposit ratio, the capital-to-asset ratio, and whether the bank had a national or state charter. Columns 5 to 8 report results for the same specifications, but only for banks in New York City that were members of the Federal Reserve System. For each regression, we fail to reject the null hypothesis of no correlation between the outcome and foreign exposure. These regressions demonstrate that banks with higher levels of foreign exposure did not experience larger declines in the key components of their balance sheets than banks with less foreign exposure.

We report regressions on our index of foreign exposure because regressions of this type resolve threats to inference posed by multicollinearity. The variables on foreign exposure are highly correlated with each other and with the size of the bank. This multicollinearity could result in erroneously failing to reject null hypotheses, in cases where it should be rejected, and also possibly erroneously over or under estimating the values of coefficients.

Our regressions are robust to reasonable permutations. We continue to fail to reject the null hypothesis when we include other control variables, drop all control variables, include additional principal components of the data on foreign exposure (up to all 7), or drop the principal components and instead regress the balance sheet characteristics directly on the various measures

of foreign exposure. We continue to fail to reject the null hypothesis if we measure foreign exposure in levels or as a share of each banks' total assets. We continue to fail to reject the null when we derive the principal components of foreign exposure in levels or as a share of foreign assets and regardless of whether we measure foreign exposure at call in December 1929, June 1931, or December 1931, or the average of all of those dates. We also fail to reject the null hypothesis if we measure outcome variables in December 1931 or December 1932.[4]

Our analysis of the microdata yields a clear conclusion. Foreign exposure had little (or no) relationship to changes in bank balance sheets in the summer and fall of 1931. This pattern suggests the financial crisis in Europe, which occurred at that time, had little (or no) direct impact on banks in New York City. The crisis in Austria, Germany, and Britain does not appear to have altered the balance sheets or behavior with substantial exposure to foreign financial risks. If anything, banks with high levels of foreign financial exposure performed better than other institutions during the global financial crisis of 1931. This pattern is the opposite of what one would expect if linkages conveyed financial shocks across the Atlantic via commercial banks at the center of the United States financial system.

4. Analysis of Aggregate Data

The database analyzed in the previous section exists only for selected dates and only for banks in New York state. We cannot use it to compare the behavior of banks in New York to the

[4] Our results also do not change if we analyze data on New York banks' holdings of German assets and European correspondents, which is reported Accominotti (2016). We demonstrate this by incorporating the data on German assets held by New York City banks reported by Accominotti (2016) into our data set. We then regress changes in balance sheet characteristics on Accominotti's measures of exposure to German assets and European correspondents (repeating all of our regressions and robustness checks). These regressions indicate that Accominotti's measures of exposure to the European crisis were uncorrelated with changes in the balance sheets of commercial banks in New York city and state in the fall of 1931. We also add Accominotti's measures of foreign exposure to our database, extract a new set of principal components, which summarizes variation in his data set and ours, and then repeat all of our regressions on our new index of foreign exposure (and all robustness checks). The results of this exercise are statistically indistinguishable from the results reported in Table 2.

behavior of banks in other locations or to distinguish reactions to events that occurred within short spans of time (such as Britain's abandonment of gold and the Fed's reaction a month later). To accomplish these tasks, we examine data with broader geographic coverage and higher time frequency. The only extant high-frequency information is the data on weekly reporting banks. This data set reports selected balance-sheet aggregates for a sample of banks inside New York City and for another sample of banks in 100 cities outside of New York. We supplement this high-frequency information with call-report data on balance sheets of banks aggregated by city, state, or in some cases, for the entire United States. This data set has a lower frequency, either quarterly, semi-annual, or annual, depending on the level of aggregation, but contains more information from banks' balance sheets, particularly information about foreign exposure.

The Comptroller of Currency's Annual Report for 1931 reports the foreign exposure of all nationally-chartered banks in the United States aggregated at the state and reserve-city level and of all state-chartered banks in the United States aggregated for at the state level. Data are reported at the end of June, a few weeks before the financial crisis began in Germany. At that time, New York banks possessed numerous European branches, while banks in Chicago, Boston, and elsewhere in the United States reported none. Banks in Chicago, Boston, and a few other cities had branches overseas, but all of these were located in the Caribbean, Latin America, and Asia. At this time, the volume of banking business in the region led the the Federal Reserve Bank of Boston operated a branch in Havana, Cuba, whose primary purpose was clearing checks.

The OCC reports a series of financial statistics related to foreign exposure. We summarize the data for national banks in New York, Chicago, and Boston – which after New York were the cities whose banks had the largest foreign exposure – in Table 3. The table shows that 81 percent of all deposits in the United States due to banks in foreign countries were held by banks in New

York City. Fifty-three percent all of deposits of United States banks due from banks in foreign countries were deposits of banks in New York City. Roughly a quarter of all loans payable in foreign countries and a sixth of all foreign bonds were held by New York City banks. Foreign bond holdings as a fraction of total earning assets was three times higher for national banks in New York City than national banks in Chicago.

Column (7) indicates total short-term indebtedness between banks and bankers in the United States and their foreign clients in Germany. The Federal Reserve System began to collect this information (as well as short-term lending and borrowing with clients in all foreign nations) with a survey in the spring of 1931. The Federal Reserve Banks in New York, Chicago, and Boston collected the information from member banks in their respective cities. We take this information from a memo in the archives of the Federal Reserve Bank of New York (FRBNY 1931). Column (10) indicates the ratio of short-term German assets to total earnings assets of national banks in each city. New York banks clearly have the largest exposure, amounting to more than 12% of earning assets at the onset of the international financial crisis, relative to 4.6% and 2.6% in Chicago and Boston respectively.

In addition, the OCC shows that state-chartered banks in Illinois and Massachusetts, including all of those in Chicago and Boston, held no German, no European, and no other foreign bonds, because regulations in those states prohibited them from doing so. Hence, the total holdings of foreign bonds by banks in New York City was substantially higher on aggregate and as a fraction of total resources than for banks in Chicago and Boston.

In sum, banks in New York City possessed more foreign exposure that most banks in the United States. The only close comparisons were the cities of Boston and Chicago, but most of Boston's foreign exposure lay in the Caribbean and Latin America.

Weekly reporting data enables us to examine the aggregate behavior of banks in New York City and compare it to banks operating elsewhere. This high-frequency data also enables us to examine reactions to events discussed at length by contemporary observers and retrospective researchers. The first event is the stock market crash on October 24, 1929, which contemporaries saw as a harbinger of the economic contraction and which researchers believe contributed to the contraction. The second event is the banking panic that began with the collapse of Caldwell and Company on November 7, 1930. Caldwell's collapse triggered a wave of bank failures that peaked with the closure of the Bank of United States in December 1930. The Bank of United States was located in New York City and was one of the largest banks to fail during the Depression. Friedman and Schwartz named this wave of failures the First Banking Panic. The third event is the closure of the largest bank in Austria, the Creditanstalt, on May 11, 1931. The Creditanstalt's collapse triggered the crisis that spread throughout Europe. The fourth event is the German Banking Holiday on July 14, 1931, which marked the peak of the panic in that nation. The fifth event is Britain's abandonment of the gold standard on September 19, 1931. The last event is the New York Fed's decision to raise its discount rate on October 9 and 16, 1931.

Figure 5 examines weekly reporting data on deposits in New York City. Time deposits increased gradually until panics beset the U.S. banking system in the fall of 1930 and gradually declined thereafter. Demand and interbank deposits exhibited higher frequency fluctuations. During the stock market crash in the fall of 1929, demand and interbank deposits rose rapidly, as investors pulled funds from equity markets and placed them in convenient and safe commercial banks.[5] After a few months, demand and interbank deposits returned to their old level and then

[5] See Richardson, Komai, Gou, and Park (2013) for details about how the stock market crash impacted commercial banks in Manhattan and the New York Fed.

trended upward until banking panics beset the U.S. banking system in the fall of 1930. Demand and interbank deposits declined thereafter. The decline accelerated after Britain abandoned the gold standard. The decline ended in early 1932, during the Fed's expansionary open-market purchase program.

Figure 6 examines loans and investments of weekly reporting banks in New York City from 1929 to 1933. Changes in trends and levels occur but appear unrelated to events in Austria and Germany. Events on the continent appear (at most) to have been correlated with temporary fluctuations on banks' balance sheets. Bigger changes in patterns occur after the stock market crash, the collapse of Caldwell and Company, the Fed's decision to dramatically raise interest rates in October 1931 following Britain's abandonment of the gold standard, and early 1932, when the Fed began implementing expansionary open market operations.

Since the exact timing of the change in weekly reporting data may be difficult to determine from graphs, we turn to statistical tests for breaks in time series. For each weekly reporting data series, we test for breaks in levels, rates of change, and trends. We test for changes in levels by regressing each weekly reporting variable on a constant. We test for changes in rates of change by calculating the weekly rate of change for each series and regressing that rate on a constant. We test for changes in trends by regressing the weekly reporting variables on a constant and a time trend. We then use the method of Bai-Perron to determine the number and significance of the structural breaks in the coefficients of these regressions. We conduct these calculations on weekly reporting data spanning the years 1919 through 1934.

Table 4 reports break dates found in the years 1929 through 1932 (note that many breaks occur outside of this interval, although we do not report them). For the weekly reporting banks in New York, the levels of most series have breaks near or in the months following the peak of the

business cycle in 1929 and another break near the Fed's open market purchase campaign in 1932. Breaks appear for total loans and investments near the end of November 1931, about a month after the New York Fed raised interest rates to defend the gold standard. Breaks appear for loans on securities and time deposits during the weeks in October when the New York Fed raised rates. The only series that breaks around the time of the German crisis is balances with domestic banks. For all of these series, the rates of change exhibit fewer significant shifts in the years 1929 through 1932 and no breaks near the crises in Germany.

Similar patterns arise when testing for breaks of trends over time. Trends of aggregate lending changed in 1929 and 1932. The trend for investments in government securities changed when banking panics began to beset commercial banks in the fall of 1930. The trend of investments in other types of securities changed near the peak of the business cycle in 1929 and changed again soon after the New York Fed raised its discount rate in October 1931. The trend of demand deposits changed a month later.

Outside of New York, we see similar patterns. The levels and trends of most series break in late 1929 or early 1930 near or following the business cycle peak and stock market crash. The levels and trends of lending and investment variables exhibit another break during the spring or summer of 1932, coinciding with the Fed's open market purchase campaign. Trends for all deposit variables change in mid-September 1931; for demand and interbank deposits, the break coincides with Britain's abandonment of the gold standard. For time deposits, the break occurs two weeks later.

Overall, we run 54 Bai-Perron unknown structural break tests. These tests reveal numerous breaks coinciding with major events, such as the stock market crash in 1929 and Britain's abandonment of the gold standard in September 1931, as well as changes in Federal Reserve

policies, particularly the increase in the discount rate in October 1931 and the expansionary open market campaign of 1932. These tests reveal only two breaks coinciding with the financial crisis in Germany; both breaks are for the series for the balances with domestic banks. These domestic breaks are discussed in Mitchener and Richardson (2016). We discuss the link between their paper and ours in our concluding section. But given the number of tests that we run, the small number of break dates associated with the German crisis could be attributed to random chance.

Bai-Perron tests help to detect large and persistent changes in time series. Short-run responses to particular events are better illuminated by event studies. We present a series of these in Figures 7 through 9. Figure 7 illustrates movements of demand deposits in and outside New York after the crisis began in Germany. The vertical axis indicates the percentage change in demand deposits since the last reporting date before the beginning of the crisis (week zero). The horizontal axis indicates the weeks since the crisis began. The graphs end with the onset of the next crisis, when Britain departs gold. The graph shows that in New York City, demand deposits increased slightly in the weeks following the German crisis and remained near or above the pre-crisis level for five weeks. Outside of New York, however, demand deposits fell immediately and continued to fall for the next seven weeks.[6]

Figure 8 indicates how the movement of demand deposits differed between New York and other cities in response to three crises. The dashed line indicates the differential response to the German crisis. It is calculated by subtracting the percentage change outside of New York from the percentage change inside of New York (visually, this is the distance between the lines in the previous figure). Subtracting the series outside of New York from the series inside of New York

[6] A similar pattern appears when examining data detrended either with an HP filter or after subtracting the linear trend from the two months prior to the European crisis. These tests reveal that in the months prior to the European crisis, the weekly reporting series of interest in and outside New York exhibited common trends, which the Figures 7 and 8 control for by subtracting the latter from the former.

controls for trends common across the series. The solid line indicates the differential response to Britain's departure from the gold standard in September 1931. The dotted line indicates the differential response after the New York Fed raised its discount rate in October 1931. Each of these lines indicates how movements of deposits in New York City banks differed from movements of deposits in banks outside of New York, after controlling for common trends. The figure's message seems clear. After the crises in Germany and Britain, demand deposits rose in New York relative to demand deposits in banks in cities outside of New York. After the New York Fed raised its discount rate, however, demand deposits in New York initially fell relative to the rest of the nation, but over the next month, as Federal Reserve Banks in other districts raised their discount rates toward those in New York, the changes in New York and the rest of the nation came to resemble each other.

Figure 9 illustrates similar event studies for the change in loans other than loans to brokers or collateralized by securities. The bulk of these loans financed working capital for wholesalers, retailers, and small manufacturers. The results resemble those for demand deposits. After the German and British crises, lending by New York banks rose relative to banks outside of New York. Following the Fed's decision to increase discount rates, however, lending by New York banks declined relative to other reporting banks.[7] Similar patterns arise when one examines total loans and investments, just investments, or just loans on securities.

The results of Figures 7 through 9 should be summarized in comparative context. During and after the financial crises in Germany and Britain, the balance sheets of banks in New York City changed less than balance sheets of banks in other reporting cities. Yet, banks in New York

[7] Mitchener and Richardson (2013, 2016) address this divergence and demonstrate that it persists until the Banking Holiday

collectively had more exposure to foreign financial shocks, than banks elsewhere in the United States. The minimal reaction of New York balance sheets makes it unlikely that foreign shocks were having large, direct effects on commercial banks in the United States. If foreign shocks were having this direct effect, they should be apparent in the balance sheets of banks in New York, which had the most exposure to foreign shocks, and they should be apparent when comparing New York banks to banks in the rest of the nation, which had less foreign exposure. The minimal reaction of New York balance sheets also makes it unlikely that changes in balance sheets and behavior of Manhattan's money-center banks transmitted shocks from Europe to rest of the nation. A transmission may have occurred through some other mechanism. A chronological correlation is clear. Outside of New York, bank balance sheets did change during and immediately after the crises in Germany and Britain. These changes, however, were minimal in banks and cities with direct and substantial exposure to foreign financial shocks, making it unlikely that crisis was transmitted through the financial networks radiating from the money-center banks in Manhattan. Banks in Manhattan, however, did respond rapidly and substantially to the increase in discount rates in October 1931. Their responses were larger and more rapid than those of reporting banks outside of New York.

The picture painted by data on weekly reporting banks can be sharpened by data collected during call reports. Call reports contain a full description of banks' balance sheets at four points in time during the years 1929, 1930, and 1931. A call occurred on October 4, 1929, three weeks before the stock market crash; on March 25, 1931, 6 weeks before the Creditanstalt collapsed; on June 30, 1931, two weeks before the German bank holiday; and September 29, 1931, less than two weeks after Britain abandoned gold and a few weeks before the Fed increased discount rates to

defend the gold standard. The extant call reports are aggregated at the level of states and reserve cities, including New York.

For banks in New York City, total assets rose steadily during the Roaring 20s, nearly doubling between the trough in 1922 and the peak in 1930. Growth ceased between the stock market crash and collapse of Caldwell. After the post-Caldwell panic, assets declined gradually. The downward trend continued during the European financial crises in 1931. The descent accelerated after the New York Fed raised the discount rate to defend the gold standard in 1931. The largest drop in the entire series occurred between the call in late September 1931 (a few weeks after Britain departed gold and just before the Fed raised rates) and December 1931 (the first call after the Fed's rate increase), when assets fell by nearly 10 percent, from $8.25 billion to $7.46 billion. During the next call interval, between December 1931 and June 1932, assets fell another 10 percent, to a nadir of $6.72 billion.

Figure 10 depicts portfolio allocations of member banks in New York city from 1919 to 1935. From 1922 to 1929, the composition appeared stable. Banks invested roughly half of their assets in loans; about a tenth of their assets in government securities, corporate securities, and reserves with the Federal Reserve respectively; and a little more than a tenth of their assets in cash and near-cash items such as bankers' balances. These proportions remained roughly constant on banks' balance sheets during the sharp recessions of 1923 and 1926 and rapid booms which follows (which are collectively referred to as the Roaring 20s). The pattern changed when financial panics began in the United States. After the stock market crash, banks began investing a lower fraction in loans. The largest drop in the lending share occurred after the Fed raised interest rates in the fall of 1931. The share of bank portfolios invested in government bonds began to increase after the collapse of Caldwell and Company triggered panics among banks in the United States. By the

summer of 1934, bank portfolios contained more government securities than commercial loans. Together, government securities and reserves with the Fed comprised half of bank investments. Reserves with the Fed began to rise after the Fed raised discount rates in October 1931. The banking crises in Austria, Germany, and Britain do not appear to be associated with substantial movements in balance sheet ratios or break points in trends. The pattern of investments did not change noticeably after these events.

Interest rates in New York City also changed little in response to the crisis in Europe. Figure 11 illustrates this point, plotting prevailing interest rates each week for four types of loans. For all loan types, interest rates fall from the beginning of the year until June. The trend appears unchanged by the crisis in Austria. In the summer, interest rates on all loans stabilize, and on three important categories – stock market call loans, commercial paper, and bankers' acceptances – remain unchanged for five months. This period of stability began before the German crisis and the standstill agreement among Germany's key creditors. It also included broad categories of financial instruments unrelated to German investments and generally used for purely domestic investing. For stock exchange call loans and commercial paper, the period of interest rate stability continued until the New York Fed raised interest rates in October. For bankers' acceptances and stock exchange 90-day time loans, interest rates began rising after Britain abandoned the gold standard, with increase continuing and accelerating after the New York Fed raised the discount rate to stem gold outflows.

Similar patterns appear in rates charged for commercial loans by banks in principal cities, which we plot in Figure 12.[8] Commercial-loan rates declined continuously from the beginning of the contraction in 1929 until the New York Fed raised interest rates in October 1931. In that week,

[8] These data come from *Banking and Monetary Statistics 1914 to 1941*, Table 125, p. 464.

loan rates jumped in New York as well as in cities throughout the United States. The increase in New York was the second largest increase during the Great Depression. The largest increase coincided with the banking holiday in March 1933. New York's increase relative to rates increases in northern and eastern cities was the largest of the contraction. New York's increase relative to southern and western cities was the second largest of the contraction. The largest relative increase occurred in the month of the banking holiday.

A quick summary of our analysis of aggregate data may be useful. During the 1930s, changes in the balance sheets of New York City's banks appear to have coincided with financial crises in the United States, and to a lesser extent, with Britain's abandonment of the gold standard. They appear to have had little correlation with events in Austria and Germany. Banks in New York had more exposure to European financial shocks than banks outside New York. Yet, New York banks reacted less to events in Austria, Germany, and Britain. New York banks' balance sheets did, however, respond substantially to the Federal Reserve's increase in interest rates in October 1931. In sum, on most measures, New York banks reacted little to the European crisis until foreign gold flows forced the Federal Reserve to raise interest rates to defend the gold standard.

5. Policies of New York's Money-Center Banks

The previous sections demonstrated that the balance sheets of New York City's money-center banks changed little during the financial crises in Europe. This section explains why. New York's money-center banks were able to ride out the storm because they had been building capital buffers for several years. Information from an array of sources helps us understand the motivations underlying these patterns, how New York's leading bankers reacted to the German crisis, and what they believed were the reasons for the reactions of others, particularly their depositors.

The increase in capital is illustrated in Figure 13, which displays the leverage of member banks in New York City. Leverage is defined as the ratio of a banks' total assets to owners' equity, or the inverse of the capital ratio. When a bank raises capital, all else being equal, leverage falls. The figure demonstrates that New York City's member banks began deleveraging at the end of 1926. Their leverage ratio fell rapidly in absolute terms as well as relative to the leverage ratio of banks in Chicago and in reserve cities throughout the United States, which the New York ratio had typically resembled in the past. Their leverage ratio reached 3.2 in March 1931, before the crisis began in Austria, and reached 3.1 in September 1931, which we believe was the lowest leverage measured for Fed member banks in New York City during the twentieth century.

The narrative record reveals that events in Germany worried bankers in New York, who responded to the crisis by organizing aid for German counterparties and coordinating actions with the Federal Reserve. New York's bankers worried about the financial fallout from the German crisis. Documents from the archives of the Federal Reserve Bank of New York illuminate their concerns. The nature of these records summaries of private discussions among financiers and policymakers makes them particularly informative. The documents come from the Office Correspondence files of Governor Harrison. The governor constantly communicated with the leaders of commercial banks, who communicated with each other and with subordinates overseas. The governor also hosted meetings between bank presidents and leaders of the Federal Reserve.

The records reveal that after troubles beset banks in Austria, New York bankers expected the crisis to spread to Germany. A confidential cable sent in May, from F.F. Beer, an agent in Germany, to George Davison, president of Central Hanover Bank and Trust Company, indicated that Austrian problems would have dire consequences for German banks. One week after the Creditanstalt failed, Beer wrote that

> ”when I was in Vienna, I was able to get a clear picture of the extent of these losses and of the impossibility to open the bank again. It was immediately then that I cabled you that I expect again a very serious crisis for Germany and recommended to withhold from doing any new business” (Harrison Collection, Office Memoranda, 1928-1931).

The remainder of the cable described the culmination of the Austrian crisis, ties between Austrian and German banks, and how links between Germany and the United States could transmit the crisis across the Atlantic.

In June 1931, as tensions grew in Germany, New York bankers discussed how to handle their German accounts. On July 3, ten commercial bank presidents told Governor Harrison that they would not restrict withdrawals of German clients. All German accounts would remain open for business. Credit lines would be maintained at least in their present position and in some cases unused lines would be reopened.[9] George Davison’s name was on that list, even though Central Hanover’s agents had warned him of the depth of German problems and advised him not to conduct new business with German clients.

On July 15, when the German crisis crescendoed, eleven presidents of New York commercial banks met with Governor Harrison to discuss the situation. The bankers agreed to honor all checks and cable orders to the extent of available credit limits. They also agreed to maintain acceptance lines and accept new bills within existing lines. Finally, they agreed to maintain all deposits in, advances to, and loans for German banks.

On this same day, a front-page story in the *New York Times* described the New York Fed’s extension of its credit line to the Reichsbank. The credit line of $100 million, originally established on June 25, was extended because depleted resources made it impossible for Germany to repay a huge central bank credit within a short space of time.[10] Articles on the German crisis and links

[9] Harrison Collection, Office Memoranda, 1928-1931.
[10] American Loan Renewed *New York Times*, July 15, 1931, p. 1.

between the German and United States financial systems frequently appeared in newspapers. The articles indicate that the public knew of New York's exposure to the German crisis. The public could have reacted to that information by withdrawing deposits from endangered institutions. The public, however, did not do that.

Domestic depositors did not react, because they had little (and probably no) concern for the solvency of New York's leading banks, which were well capitalized and had substantial contingent capital on call. All of New York's leading banks paid dividends throughout the depression. New York's leading bankers were concerned about depositor flight and told Governor Harrison that they believed their actions would reassure depositors and maintain confidence. They wanted all of their customers know that they had the ability to fulfill all of their commitments to all of their customers; that their promises were strong; that they would not renege on anyone.

On July 22, the same committee of eleven bank presidents met again and formally requested that the New York Federal Reserve handle all German acceptance credits, deposits, and etcetera. Governor Harrison "indicated that this was impossible."[11] The next day, Governor Harrison briefed the Hoover Administration on New York banks' agreement to repay German deposits and maintain credit lines. The administration concluded that there was no need for it to take action. This indicates that banks in New York City bore the brunt of the crisis in Germany. The Federal Reserve System and the Hoover Administration did not step in to save the financial system.

On July 30, a group of German bankers submitted a proposal concerning German acceptance credits in New York. An expanded committee of seventeen New York bank presidents approved the terms of the proposal. The proposal indicated that

[11] Harrison Collection, Office Memoranda, 1928-1931

> ”present acceptance credits may be renewed as they fall due. The German firms or merchants for whom the original credits were established will be required to meet their obligations as they come due by paying marks to the Reichsbank; but the proceeds will not be required to be remitted to this side but may be utilized for further credits here for import purposes” (Wall Street Journal, August 6, 1931).

The New York banks communicated their plan to leading banks throughout the United States and received confirmation that they would conform to its conditions.

While some New York banks lost deposits during the German crisis, contemporaries attributed these losses to domestic events, rather than to events overseas. This conclusion appears clearly in the records of a meeting at the New York Federal Reserve on September 11, 1931. A committee of eleven presidents of the largest banks in the city discussed recent events with the New York Fed’s governors. New York banks lost a total of $200 million in deposits in the previous year, most during the month of August 1931. The presidents attributed the withdrawals to loss of confidence following the failure of nine banks. The superintendent of banks seized these institutions after raising regulatory standards in the wake of the failure of the Bank of United States, which led to accusations of laxness by the superintendent. The minutes of the meeting report a consensus that recent bank failures have had their effect upon the psychology of small depositors in banks. The withdrawals in August stemmed from fear among domestic depositors who were reacting to the superintendent’s sudden seizure of banks previously perceived to be safe. The minutes mention neither the German crisis nor foreign deposits when discussing the decline in deposits during August.

In testimony to Congress in February 1933, Winthrop Aldrich, chairman and CEO of Chase National Bank of New York, also never mentioned the crises in Germany or Austria or concerns that these events might have altered operations within or changed perceptions of his bank or other

money-center institutions with substantial European exposure. Instead, he attributed banking problems that occurred in the fall of 1931 to general fears for the value of the dollar.

> "The worst of our whole trouble come from the end of September, 1931, into the middle of June, 1932. England's abandonment of the gold standard caused a great scare regarding the standard of value itself. Creditors and investors everywhere called loans, refused new credits and sold investments…. Whatever else we do, we must not invite a repetition of this panic regarding the standard of value itself."

That quote represents the general thrust of Aldrich's testimony, which emphasizes the economic impact of expectations for inflation, deflation, and the stability of the exchange rate; those expectations depended, in turn, upon international events – like Britain's abandonment of the gold standard – and domestic policies – like raising interest rates and balancing the budget deficit – that determined the stability of the gold standard.

A clear description of New York banks' capital policies appears in articles in the *New York Times* published in early July 1931. These articles describe money-center banks' accumulation of loan loss reserves and efforts to strengthen their balance sheets. In the spring of 1931, National City Bank transferred $20 million from surplus to loan loss reserves. The Chase National Bank set aside $35 million to write down bonds and other securities to market values and to provide reserves against contingencies. Irving Trust, Central Hanover, and Bank of Manhattan Trust transferred to reserves $10 million, $5 million, and $3.5 million respectively. Banks took these actions (and announced them publicly) in order to "maintain themselves in an impregnable position while financial conditions are depressed and uncertain (*New York Times*, July 5, 1931)." The *Times* noted that "by conserving their strength during the present depression the banks expect to reap their reward in the period of rising business activity to follow. Apart from the benefits to themselves, they expect to be able to assist the revival in business by liberal extension of credit" (*New York Times*, July 5, 1931, p. 27).

In a series of papers (Koch, Richardson, and Van Horn, 2016a and 2016b), we demonstrate the magnitude of New York banks' preparations for the financial crisis of the early 1930s. We show that in 1927, New York's largest commercial banks held roughly $10 in capital for each $100 in assets, while New York's smallest commercial banks held about $17 in capital for each $100 in assets. Here, we measure size by total assets. The largest banks are those in the top size decile. The smallest banks are those in the smallest decile. From 1928 through 1931, as fears of financial crises grew, all banks in New York build capital buffers. The largest banks – which included all banks with substantial foreign exposure – accumulated the most capital. By the end of 1930, the largest banks had roughly the same capital to asset ratio as the smallest banks, with both groups holding approximately $17 in capital for each $100 in assets. By the middle of 1931, when the New York Times published the articles which we cite above, the largest banks' capital-to-asset ratios exceeded those of the smallest banks (and of all other size deciles), with the largest banks, on average, holding over $18 in capital for each $100 in assets.

6. Discussion

This essay examines how banks at the center of the United States financial system in New York City reacted to the financial crisis in Europe during the summer and fall of 1931. The behavior of New York's money-center banks which had substantial exposure to financial shocks in Europe changed little, if at all, during and in reaction to the financial crisis in Germany, Austria, and Britain. The behavior of banks in New York City changed substantially, however, after the Federal Reserve Bank of New York's raised interests by 2 percentage points in two weeks during October 1931.

Why did New York's money-center banks react little, if at all, to the crisis in Europe? Their response was muted because they had expected a crisis to occur and had prepared for it. New York's money-center banks feared that a downturn and commercial-banking crisis would follow the economic and financial boom of the Roaring Twenties. They also feared a downturn and financial crisis in Germany. To protect themselves from these possibilities, they accumulated reserves and liquidity that enabled them to absorb losses on German assets and outflows of European deposits. These preparations began in 1928 and continued for the next three years. We discuss evidence for this pro-cyclical accumulation of capital and compare it to the behavior of modern money-center banks in a companion essay (Koch, Richardson, and Van Horn, 2016b). Preparing during a boom for the bust to follow enabled the commercial banks at the heart of New York's money market to survive the contraction of the early 1930s, and during the German crisis, to ride out the shock and continue operating without altering their behavior. The accumulation of reserves during good times was a symptom of conservative financial philosophies that dominated commercial banking during the first half of the twentieth century.

The precautionary measures and timing of events in New York distinguishes the behavior of New York bankers from the standstill agreements negotiated among German creditors. New York banks began building capital buffers and reducing German exposure in the late 1920s, years before the German crisis, and years before Germany's creditors negotiated their collective standstill policy. Key market interest rates in New York City appear to have been "pegged" since late May 1931 (Crum and Hubbard 1932, p. 15). New York's leading bankers reported to the Federal Reserve Bank of New York that they would honor all obligations to German clients in early July, before Montagu Norman of the Bank of Britain reported "persuading" New York bankers of the necessity for such actions, before an international conference in London from July

20 to 23 recommended freezing German credits, and before creditor nations negotiated standstill agreements in August and September (Forbes 1987, p. 574; James 1984, p. 82). New York banks entered into international negotiations with their preparations complete and their policies set. While New York banks agreed to an international standstill policy toward Germany, in the absence of such an agreement, their behavior may have been no different. Their principal clients were banks, firms, and investors in the United States. Minimizing domestic fallout from the international financial clients advanced the interests of their clients and themselves.

The crisis in New York differed, in many respects, from the crisis overseas. London is an example. English accepting banks, particularly merchant banks in the city's financial center, suffered large asset losses and substantial deposit withdrawals as a consequence of the financial crisis in Central Europe. Accominotti's recent research (2016) explains why London's merchant banks suffered severely during the crisis while New York's money-center banks did not. The merchant banks in London that suffered the most were those that specialized in financing trade in Germany, Austria, Central Europe, and the Baltic. Those banks had the majority of their branch offices, correspondent linkages, and loan exposure in Germany and Austria. New York's money-center banks, in contrast, had only a small fraction of their overseas branches, correspondents, and loan exposure in nations caught up in the crisis.

Accominotti's observation complements our explanation of financial stability in New York. The exposure of New York's money center banks to the European crisis was small relative to the size of their entire balance sheet. This made it possible for New York banks to build adequate capital buffers by increasing the rate at which they retained earnings for a few years or even a few quarters. London's merchant banks could not do this. They could not diversify, like New York's money-center banks, because their profitability stemmed from specialized human

capital (both knowledge and relationships), which they developed by focusing their resources in particular regions, such as Germany, Austria, the Baltic, and Central Europe. They could not build capital buffers sufficient to safeguard their firms from a shock that destroyed the basket in which they had invested all of their assets.

Our findings also shed light on the broader debate about trans-Atlantic contagion that initially inspired our research, particularly the time-series studies such as Morsy (2002) and Ritschl and Sarferaz (2014). Their conclusions may remain correct, with the caveat that the channels transmitting shocks from Germany to the United States did not run through the links of deposit, debt, and lending between New York's money-center banks and Germany or other nations in Europe. Our paper has tested that channel. Our results rule it out. Other potential channels remain. Possibilities include the effects of the German crisis on U.S. equity and debt markets, or on exports from the United States to Central Europe, or on expectations or confidence of U.S. investors and consumers.

The latter seems like a promising possibility. It could explain the pattern revealed in this essay and in Mitchener and Richardson (2013, 2016). During the German Crisis, demand deposits from individuals and firms flowed out of banks around the United States. The withdrawals were so large that country banks struggling to meet them had to draw down their interbank balances in reserve cities. In New York, the interbank outflows were sizeable, but demand deposits from firms and individuals did not decline. The stability of demand deposits in New York is a puzzle. It may be evidence that New York banks' keep-calm-and-carry-on strategy worked. They publicly proclaimed their resilience in the face of this crisis; they had built capital buffers that made them, in the words of the *New York Times*, "impregnable" to financial shocks like events in Europe.

Banks in the rest of the United States did not build such large capital buffers and may have done less to convince depositors of their strength.

Finally, our findings also shed light on traditional theories about the international transmission of financial shocks during the late 1920s and early 1930s. Peter Temin (1993) describes the channels by which the financial crises of 1931 could have crossed the Atlantic. These include bank balance sheets, golden fetters, and contagion of fear across national boundaries. Our research tests the bank balance-sheet channel, and finds that balance sheets of banks in New York did not transmit the European financial crisis to the United States. Given that banks in New York were more exposed to foreign financial shocks than banks elsewhere in the United States, it seems unlikely that direct balance-sheet linkages played a principal role in the crisis's initial trans-Atlantic transmission. Our event studies using high-frequency data test the golden-fetters theory. Our findings are consistent with this conjecture. The balance sheets of banks in New York City and in the rest of the United States responded to the Fed's discount rate increases in October 1931 by lowering the quantity of loans and raising prices (i.e. reducing loan supply). This pattern is consistent with the golden-fetters theory that the Federal Reserve's reactions to gold flows disrupted commercial bank intermediation by increasing banks' cost of funds and weakening banks' balance sheets.

The withdrawals and disintermediation among banks in the United States interior and through the interbank network in July through September of 1931, however, remain unexplained. This may have been due to a crisis of confidence that spread from Europe to banks in the United States without afflicting banks in Manhattan or their depositors, as the Federal Reserve Bank of New York argued in its Annual Report for 1931. This issue deserves further research.

Appendix: Sources of Data

The extant data on New York's commercial banks for the 1930s consists of periodic snapshots of financial institutions gathered by various authorities, at varying frequencies, at different points in time, and filtered via various methods. This appendix describes each of those data sets.

The first snapshot contains information aggregated from call reports of Federal Reserve member banks operating in New York City. The data begins in 1919. The number of variables expands in 1928. Calls occurred periodically. Early in the 1920s, the calls occurred three times per year. The time between call dates varied considerably. One of the calls almost always occurred at the end of the calendar year. The others occurred at intervals of one to ten months. Later in the 1920s and throughout the 1930s, the calls occurred four times each year on regular schedule, with the time between calls varying from two to four months.

The second snapshot contains data aggregated from weekly reporting banks in New York City. The Federal Reserve did not disclose the identity of weekly reporting banks, but did indicate that this set of sixteen banks contained more than 75% of the deposits of all member banks in New York City (Federal Reserve 1947 pp. 145-8). All of these banks also contributed to data set number one.

The third snapshot contains information aggregated from the call reports of all nationally chartered banks operating in New York City. These calls occurred from three to six times each year. After 1923, the schedule became standardized with one call in between late February and mid-April (typically mid-March), one call on the last business day of June, one call between mid-September and mid-October, and one call on the last business day of December. The extant series extends back to 1869.

The fourth snapshot contains information aggregated from the balance sheets of banks chartered by the state of New York. These calls occurred four times each year, on a regular schedule, similar to that of the Office of the Comptroller of the Currency (OCC). The extant series extends back to the 1890s.

Each of these aggregate snapshots has strengths and weaknesses. The first and second cover roughly the same set of Federal Reserve member banks, but the information has been processed via different filters. The first filter provides more detail on a larger set of banks over a longer time period but fewer times per year with varying lengths of time between observations. The second filter provides high frequency and regularly spaced observations but with less detail on a smaller set of banks over a shorter period of time. The third snapshot provides the longest data series with the broadest set of balance sheet information, typically 18 categories on the asset side of the balance sheet and 24 variables on the liability side of the balance sheet, but the information exists only for nationally chartered banks. The fourth data set covers a different set of banks (state chartered) over a long period. Some overlap exists between the first and third snapshots (national banks) and the first and fourth snapshots (state chartered banks that joined the Federal Reserve System). All four aggregate data sets cover a longer period at a higher frequency than the micro data available from individual banks.

Data on the balance sheets of individual banks comes from several sources. The Superintendent of Banks of the State of New York published the balance sheets of state chartered banks and trust companies at four dates during the year (described above). Details include the composition of assets (e.g. loans by type of collateral, stocks, bonds, discounts, cash, and deposits in other banks) and the composition of liabilities (e.g. time deposits, demand deposits, borrowings from banks, capital, surplus, and undivided profits).

The OCC published balance sheets for banks with national charters. The balance sheets reported five categories of assets and seven categories of liabilities. The balance sheets appeared once each year, for the fall call through 1927 and for the December call thereafter. The OCC did not publish the remaining call reports, and they have not been found in the OCCs archives. The OCC also published call reports aggregated at the reserve city, state, and Federal Reserve district levels. These aggregated balance sheets appeared more frequently and contained more information than the individually published reports.

The Federal Reserve did not publish call reports from individual banks. The Fed retained microfilm copies of some of its original records. For state-chartered member banks, balance sheets and income statements survive for the December and June calls for 1929 through 1933. For national banks, balance sheets survive from the December 1929, 1931, and 1933 calls. Income statements survive from the December 1929, June 1931, and December 1931, and December 1933 calls. The balance sheets provide detailed data about banks foreign exposure. Schedule G indicates holdings of foreign government bonds and other foreign securities. Schedule I indicates balances due in dollars and foreign currencies from foreign banks and foreign branches of U.S. banks. Schedule J indicates balances due to banks in foreign countries. Schedule L indicates time deposits of foreign banks and trust companies. Schedule D indicates the number of branches in foreign countries. A balance sheet also exists for each foreign branch, which provides additional information about overseas operations. The microfilmed call reports also contained examiners comments on the financial health of each institution. These assessments indicated the extent of each banks losses on investments (both past and predicted) and recommendations as to whether the bank should remain in operations, increase its reserves, consolidate with another institution, or cease operations.

The Senate Hearings on the Sale of Foreign Bonds or Securities in the United States report loans to Germany arranged by banks in New York and outstanding when the banking crisis ignited on the continent. The hearings also describe the exposure of these banks to other forms of foreign financial risk. Rand McNally Bankers Directory provided information about balance sheets; foreign branches; correspondent networks; and services provided to depositors, such as trust accounts, brokerage accounts, and assistance with international transactions. Rand McNally published data biennially from the June and December call dates. Rand McNally covered both national and state chartered banks. Rand McNally standardized balance sheet information, aggregating assets into four categories and liabilities into four categories.

Polk's Bankers Encyclopedia provided information similar to that in Rand McNally. The principal difference was the publication date, in March and September (rather than July and January), and the date of the data, which was gathered from spring and fall call reports (rather than end of June and end of December). The dates of the fall and spring call reports varied from jurisdiction to jurisdiction and year to year, complicating efforts to attribute Polk's data to specific days (or even months).

Newspapers also published financial information about individual banks. The New York Times and Wall Street Journal published balance-sheet data for banks operating in New York City. Banks supplied copies of their call reports to the newspapers. The newspapers published information from the largest banks at most call dates, but information for mid- range banks less frequently, and information for smaller banks about once per year. Banks also purchased advertisements that listed data from their latest call reports. Some of the larger banks advertised their financial condition more frequently. From newspapers, we have collected balance sheets of all national banks in New York City for all call dates in 1931.

These data sources enable us to construct a panel indicating the financial condition of all banks in New York City during 1931. The panel contains information for national and state banks at all call dates. We gather date on foreign exposure from the sources described above. The data, which we report in Table 1 at the micro level and Table 3 at the aggregate level, come from a range of dates. These differ for Fed non-member and member banks. Data on non-member banks comes from 30 June 1931. Data about foreign branches of Fed member (national) banks (Table 1, columns 2 and 8) is from 30 June 1931. Data on national bank balance sheets comes from 30 June 1931. We hand collect this data from their call reports published in the *New York Times* at that date and a new archival source.

Some foreign exposure data, particularly (Columns 3 through 7 of Table 1) comes from the call-report in Dec 1931. This is post-crisis. It could be a threat to inference, as the referee indicated, because the numbers might have changed. But, national-bank call-report information aggregated for New York State and City, which exists for all call dates, shows limited movements in the categories that we use to generate our index of foreign exposure during 1931. Furthermore, our regressions do not use the raw data. Our index of foreign exposure ranks banks' exposure relative to each other. We recover similar rankings using (a) call-report data for 1929 or (b) only data available on 30 June 1931. These alterative indices yield results identical to those in our essay. We describe these robustness checks in the body of our paper.

Measures of foreign financial exposure for state-chartered banks requires additional explanation. State chartered banks were not allowed to operate foreign branches. So, in Table 1, columns (2) and (8) are zero for all state-chartered banks. Columns (4) and (5) were zero (or extremely close to zero) because state-chartered non-members received few interbank deposits and therefore had close to zero due to banks (foreign or domestic) on their balance sheets. There is no

reason to suspect or evidence suggesting that any of their limited due to banks was from foreign banks.

Due from banks in foreign countries (column 3) is not an item on state-commercial bank-balance sheets, but for several reasons, it is unlikely that state-chartered commercial banks deposited funds in financial institutions overseas. One, interbank deposits in banks in reserve and central reserve cities in New York state counted as a portion of state-chartered banks legally required reserves. Interbank deposits overseas did not. Two, for several years in the mid-1920s, New York's state-commercial bank-balance sheets separately reported interbank deposits in the Federal Reserve Banks (about 40% of total interbank deposits) and other legal reserve repositories (about 55% of total interbank deposits). Only a small fraction of interbank deposits were in other locations; the preponderance of those would have been New York bank's correspondent deposits in other states. For the years in the mid-1920s with this data it is clear that NY's non-member banks had few (if any) deposits overseas. Three, almost all state-chartered commercial banks in New York possessed at least one correspondent bank in Manhattan with overseas branches and overseas correspondent accounts. The few that did not could easily open a correspondent account with a money-center bank in Manhattan. All of the money-center banks in New York belonged to the Federal Reserve System. One service offered by money-center correspondents was processing foreign transactions for respondent banks and their clients. In sum, for state-chartered banks outside the Fed System, there seems to be little incentive to and large costs from depositing funds in banks overseas. There is no evidence that they did so.

The last issue to clarify is information about foreign bond holdings. The New York State bank superintendent's annual report for 1931 (and for other years) did not indicate holdings of foreign bonds of individual banks. Instead, bank balance sheets reported total bond holdings. NY

State's superintendent, however, did report foreign bond holdings on 30 June 1931 to the OCC, which published this information aggregated for all state-chartered banks in NY State, all state-chartered bank and trust companies in NY State, all national banks in NY State, all national banks in NY City, and all member banks in NY City. For each of these groups, we can calculate the fraction of bonds which were foreign (as well as the fraction of total assets which were foreign bonds). We've estimated the foreign bond holdings for each bank by multiplying their total bond holdings by the average fraction of foreign bonds held for banks of their charter type and location.

Aggregate data on foreign exposure, which we report in Table 3, comes from reports of the Comptroller of Currency. The comptroller collected data for national banks directly from the institutions themselves and collected data on state-chartered banks by soliciting it from state regulatory agencies. All aggregated call-report data on foreign holdings – both for national and state-chartered banks – comes from call reports collected on 30 June 1931. We also use aggregated data on foreign assets and liabilities of weekly reporting banks and their clients. This data was collected monthly.

An additional source provides high-frequency information about the financial condition of individual banks. The report originated at the New York City Clearing House. It indicated demand, time, and foreign-branch deposits for all clearinghouse members. It contained a few other balance sheet items for each bank. The *New York Times* published the report in a column entitled "New York Weekly Bank Statements." The column included similar information about sizeable banks that did not belong to the clearinghouse.

A source of information about the strategies and logic of New York City's money-center banks survives in the archives of the Federal Reserve Bank of New York. During the 1920s and 1930s, leaders of the New York Federal Reserve frequently spoke to and corresponded with

directors of money-center banks in New York City. These conversations often included the Governor of the New York Fed, George Harrison. Harrison wrote detailed memos concerning his conversations and kept copious amounts of correspondence, both incoming and outgoing. When he retired, he left his office records with the Federal Reserve Bank of New York. We examined Harrison's notes and correspondence concerning the financial situation in the spring, summer, and fall of 1931. His correspondence dwelled at length on the financial crisis in Germany and Austria, its potential effects on banks in New York City, and the steps that money-center banks had taken and were taking to prepare for likely contingencies.

Harrison's information was likely to be accurate, since he had years of experience working in the financial sector, a dense network of business contacts, and frequent interactions with financiers (professionally and socially) that enabled him to crosscheck and verify the veracity of the information that he received. Harrison also endeavored to ensure that information he received from financiers remained private. Harrison designated much of his notes and correspondence as confidential and retained the records in his own office to ensure control of the flow of information from his source. We believe that we are the first scholars to have access to Harrison's records. Harrison's materials illuminate strategies pursued by banks in New York City and the rationales behind those policies.

Another source substantiates information gleaned from Harrison's records. During the 1920s and 1930s, the principal financial periodicals including the New York Times, Wall Street Journal, Bradstreet's Weekly, Duns Review, Commercial and Financial Chronicle, and Bankers Magazine periodically published articles describing policies pursued by money-center banks and the logic underlying those strategies. The reporters who wrote these articles attributed their information to discussions with leaders of large banks, although the seldom disclosed their sources,

preventing us from directly verifying their accounts. The congruence of information published by competing periodicals adds credence to common claims, as does their agreement with information gathered from Governor Harrison's memoranda.

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Tables

Table 1: Foreign Exposure of National and State Banks in Manhattan, 30 June 1931

Bank Name	Paid-up Capital	Balances Payable in Dollars Due from Foreign Branches of U.S Banks	Due from Banks in Foreign Countries	Due to Banks in Foreign Countries	Time Deposits of other Banks and Trusts in Foreign Countries	Foreign Government Bonds Owned	Other Foreign Securities Owned, Including Municipal Bonds	Foreign Branches	Index of Foreign Exposure
	$ Mil	$ 1,000	$ Mil	$ 1,000	$ 1,000	$ 1,000	$ 1,000		
Chase National Bank	148.0	3,849.0	2.2	52,644	30,293	19,795	-	5	32.874
National City Bank of New York	110.0	-	12.6	94,300	20,200	4	-	74	31.749
Irving Trust	50.0	-	9.4	50,100	13,500	12,000	3,195	-	22.262
Guaranty Trust Co. of New York	90.0	4.6	6.3	76,300	12,100	4,674	4,533	8	21.298
Bank of America	36.8	0.4	6.4	19,300	-	3,779	4,154	-	10.428
New York Trust	12.5	-	1.4	16,900	7,400	10,200	200	-	8.924
Public National Bk & Trust	8.3	-	0.1	619	-	3,662	4,238	-	4.813
First National Bk	10.0	-	-	17,100	-	2,571	2,074	-	4.010
Marine Midland & Trust	10.0	-	1.7	1,512	250	366	1,206	-	2.195
Bank of Manhattan Trust	22.3	-	-	2,218	-	5,046	124	-	2.046
Bank of New York & Trust	6.0	-	1.3	3,111	11	736	725	-	1.747
Commercial National Bk. & Tr.	7.0	-	1.6	2,963	100	-	700	-	1.634
Corn Exchange Bk & Trust	15.0	-	0.5	677	-	1,484	1,013	-	1.583
Chatham Phenix National Bk & Tr.	16.2	-	0.7	1,927	-	316	1,084	-	1.412
Manufacturers Trust	27.5	-	0.7	2,702	-	618	257	-	0.897
Grace National Bank	1.5	-	0.2	2,369	832	113	470	-	0.809
Brooklyn Trust	8.2	-	0.5	570	-	474	192	-	0.461
Federation Bank & Trust	0.8	-	-	4	-	475	372	-	0.263

Liberty National Bank	3.0	-	-	47	-	76	491	-	0.233
Bank of Europe Trust	1.0	-	0.1	36	-	388	84	-	0.042
Amalgamated Bank	0.7	-	-	48	-	56	255	-	0.023
Harbor State Bank	0.2	-	-	28	-	58	175	-	-0.040
Harriman National Bk, & Tr.	2.0	-	0.1	140	-	112	98	-	-0.043
Fifth Avenue Bank of New York	0.5	-	-	159	-	14	50	-	-0.071
Fulton Trust Co. of New York	2.0	-	-	-	-	241	75	-	-0.076
International Trust	3.2	-	0.1	63	-	-	37	-	-0.140
American Union Bank	2.0	-	-	32	-	36	49	-	-0.150
Continental Bank & Trust	6.0	-	-	-	-	35	72	-	-0.151
Bank of Yorktown	1.5	-	-	-	-	15	55	-	-0.151
J. Henry Schroder Trust	0.7	-	-	-	-	12	64	-	-0.175
Midwood Trust	1.0	-	-	-	-	36	18	-	-0.188
Merchants Bank of New York	0.4	-	-	7	-	50	17	-	-0.192
Clinton Trust	0.5	-	-	-	-	29	20	-	-0.204
Globe Bank & Trust	1.5	-	-	-	-	22	65	-	-0.209
Times Square Trust	2.0	-	-	4	-	-	20	-	-0.212
Pennsylvania Exchange Bank	1.0	-	-	-	-	177	-	-	-0.232
All Other Banks		-	-	-	-	12		-	-0.233

Note: For all other banks, we estimate holding of foreign bonds from data on each banks' total bond holdings and data on average holding of foreign bonds for banks of their charter type and location. See Appendix A for details. In the table for all other banks, we indicate their average holding of foreign bonds of all types.

Sources: Described in text and Appendix A.

Table 2: Foreign Exposure and Changes in Bank Balance Sheets, Fall 1931

	All Banks in New York State Percent Change in ...				Member Banks in New York City Percent Change in …			
	Surplus & Undivided Profits	Deposits	Liquid Assets	Loans And Discounts	Surplus & Undivided Profits	Deposits	Liquid Assets	Loans and Discounts
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Index of Foreign Exposure	0.0002	0.0019	0.0037	-0.0049	0.0109**	0.0005	-0.0059	-0.0006
	(0.0045)	(0.0042)	(0.0128)	(0.0037)	(0.0048)	(0.0092	(0.0169	(0.0088
Log Assets	0.0074	-0.0049	-0.0179	0.0032	0.0132	0.0025	0.0192	-0.0135
	(0.0061)	(0.0057)	(0.0174)	(0.0054)	(0.0155)	(0.0300)	(0.0552)	(0.0294
Cash-Deposit Ratio	-0.0241	0.1026***	0.3045***	0.0968	-0.0224	0.1078	0.0932	0.4049
	(0.0434)	(0.0401)	(0.1230)	(0.0839)	(0.0447)	(0.0864)	(0.1587)	(0.2908
Capital-Asset Ratio	0.2918	-0.6499***	-0.9709**	-0.2386	0.4233	-0.7341	-0.7377	-0.0923
	(0.1881)	(0.1738)	(0.5320)	(0.1571)	(0.2722)	(0.5262)	(0.9670)	(0.5037
National Bank	0.0149	-0.1950	-0.2943	0.0261	0.0133	-0.2046	-0.3502	0.0577
	(0.1369)	(0.1267)	(0.3882)	(0.1126)	(0.1278)	(0.2470)	(0.4539)	(0.2348
R-squared	0.0109	0.0491	0.0223	0.0161	0.0589	0.0804	0.0451	0.0537
Number of Observations	342	342	343	341	49	49	49	48

Notes: Columns 1-4 report results for all bank and trust companies in New York State. Columns 5-8 report results for all Federal Reserve member bank and trust companies in Manhattan. Standard error appears in parentheses below estimate. Control variables include log of total assets, capital to asset ratio, cash to deposit ratio, and an indicator variable for national banks. *, **, *** indicate significance at the 10%, 5%, and 1% levels.

Table 3: Foreign Exposure of National Banks in Leading Cities, 30 June 1931

Reserve City	Due to Banks in Foreign Countries	Due from Banks in Foreign Countries	Earnings, Foreign Exchange Department	Loans Payable in Foreign Countries	Foreign Securities - Government Bonds	Foreign Securities - Municipalities and Other	Short-Term German Debts	Total Bonds and Securities	Total Loans and Discounts	German Debts as Percentage of Earning Assets
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	$1,000s									
New York	228,017	63,587	10,916	13,702	41,098	39,860	468,000	1,249,774	2,522,210	12.4%
Chicago	7,708	2,920	784	13,939	2,019	2,022	28,900	178,685	444,327	4.6%
Boston	16,215	27,001	369	14,409	8,387	7,930	22,100	250,654	605,119	2.6%
United States Total	278,594	120,064	15,262	51,861	230,979	245,469	519,000	7,674,837	13,177,485	
	Percent of United States Total									
New York	81.8	53.0	71.5	26.4	17.8	16.2	90.1	16.3	19.1	
Chicago	2.8	2.4	5.1	26.9	0.9	0.8	5.6	2.3	3.4	
Boston	5.8	22.5	2.4	27.8	3.6	3.2	4.3	3.3	4.6	
	Percent of City's Earning Assets									
New York	6.05	1.69	0.29	0.36	1.09	1.06				
Chicago	1.24	0.47	0.13	2.24	0.32	0.32				
Boston	1.89	3.16	0.04	1.68	0.98	0.93				

Sources: Data for columns (1) to (6), (8), and (9) from the *Annual Report of the Comptroller of the Currency for 1931* (OCC 1932). Column (1), Table 53, pp. 646-650; Column (2), Table 53, pp. 646-650; column (3), OCC 1931, pp. 67-70; column (4), OCC 1931 pp. 46-49; column (5), OCC 1931 pp: 54-7; column (6), OCC 1931 pp: 54-7; column (8), OCC 1931 pp. 46-49; column (9), OCC 1931 pp. 46-49. Data for Column (7) from Federal Reserve Bank of New York, memo on "Foreign Funds, Gold Position, and Credit Policy," February 18, 1932. Column (10) is column (7) divided by column (8) plus (9).

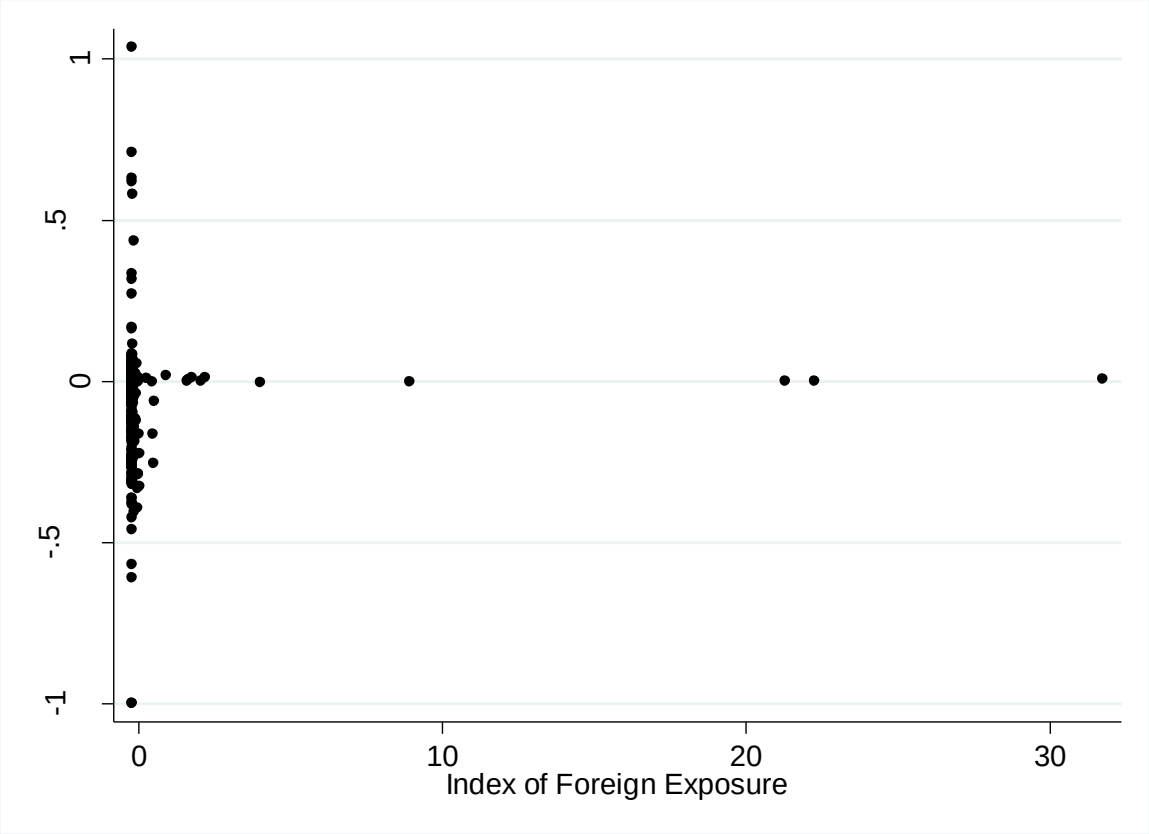
Table 4: Bai-Perron Break Dates for Balance Sheet Information on Weekly Reporting Banks

Reporting Banks Inside New York City						
	Level of …		Percentage change in …		Trend Over Time in …	
Loans and Investment, Total	7/22/1929	11/23/1931			9/9/1929	1/11/1932
Loans, on securities	7/1/1929	10/12/1931			3/31/1930	6/13/1932
Loans, other	4/7/1930	6/20/1932			7/8/1929	6/13/1932
Investments, US government securities	12/30/1929	5/02/1932				11/10/1930
Investments, other	12/23/1929	5/02/1932			6/24/1929	10/26/1931
Balances with Domestic Banks	5/6/1929	7/27/1931				7/20/1931
Net Demand Deposits	9/2/1929	1/04/1932				12/14/1931
Time Deposits	6/17/1929	10/19/1931		10/27/1930		9/21/1931
Interbank Deposits	5/19/1930	7/11/1932	7/08/1929	2/29/1932		10/7/1929
Reporting Banks Outside New York City						
	Level of …		Percentage change in …		Trend Over Time in …	
Loans and Investment, Total	11/25/1929	3/28/1932	11/11/1929	5/02/1932	9/23/1929	4/25/1932
Loans, on securities	4/7/1930	6/20/1932			3/31/1930	6/13/1932
Loans, other	4/7/1930	6/20/1932	9/09/1929	11/23/1931	8/26/1929	5/9/1932
Investments, US government securities	12/30/1929	5/02/1932			9/30/1929	3/28/1932
Investments, other	12/30/1929	5/02/1932		5/04/1931	6/24/1929	10/26/1931
Balances with Domestic Banks	5/19/1930	7/11/1932			5/13/1929	8/17/1931
Net Demand Deposits	5/13/1929	10/19/1931				9/14/1931
Time Deposits	5/7/1928	1/04/1932	12/02/1929	4/18/1932	3/11/1929	9/28/1931
Interbank Deposits	8/5/1929	9/28/1931		2/29/1932	4/1/1929	9/14/1931

Note: Reported break dates are the last week of the old pattern. The new pattern begins in the subsequent week.

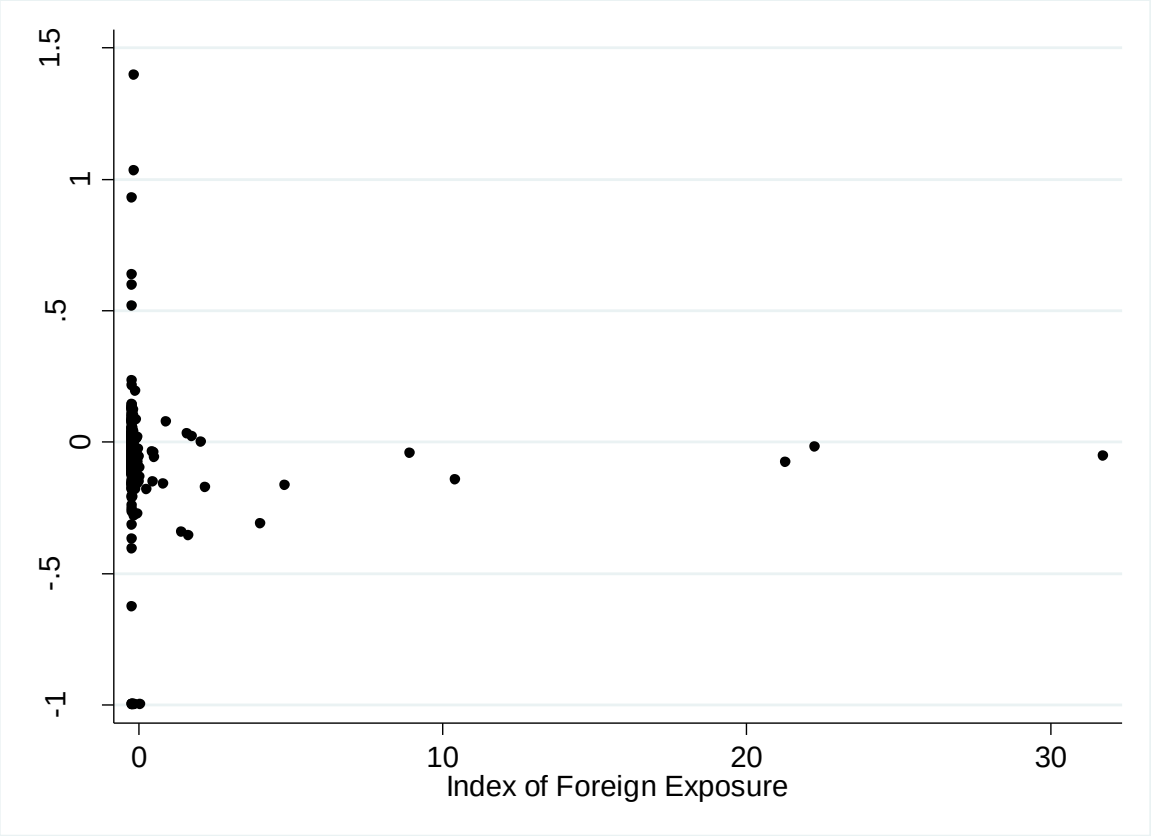
Figures

Figure 1: Surplus and Profits, Percentage Change from June 30, 1931 to September 29, 1931



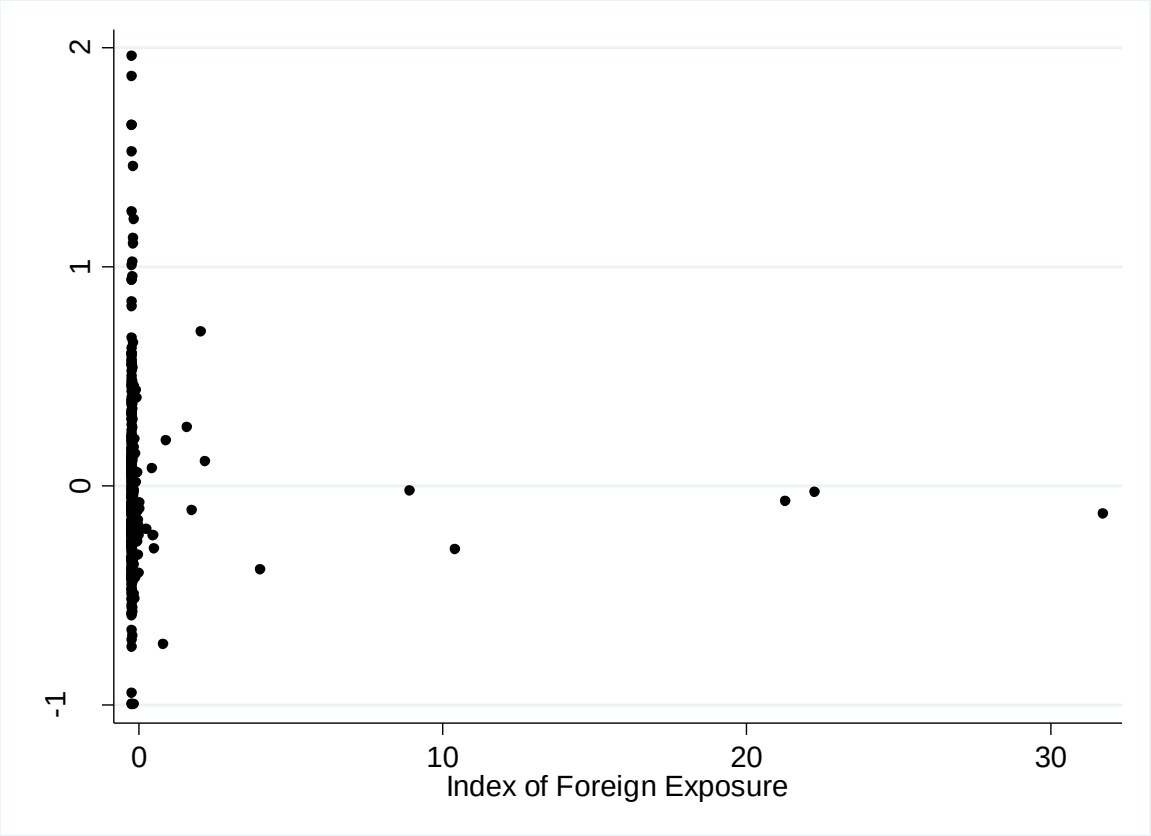
Source: See text.

Figure 2: Total Deposits, Percentage Change from June 30, 1931 to September 29, 1931



Source: See text.

Figure 3: Liquid Assets, Percentage Change from June 30, 1931 to September 29, 1931



Note: Liquid assets include cash, due from banks, and bonds.
Source: See text.

Figure 4: Loans, Percentage Change from June 30, 1931 to September 29, 1931

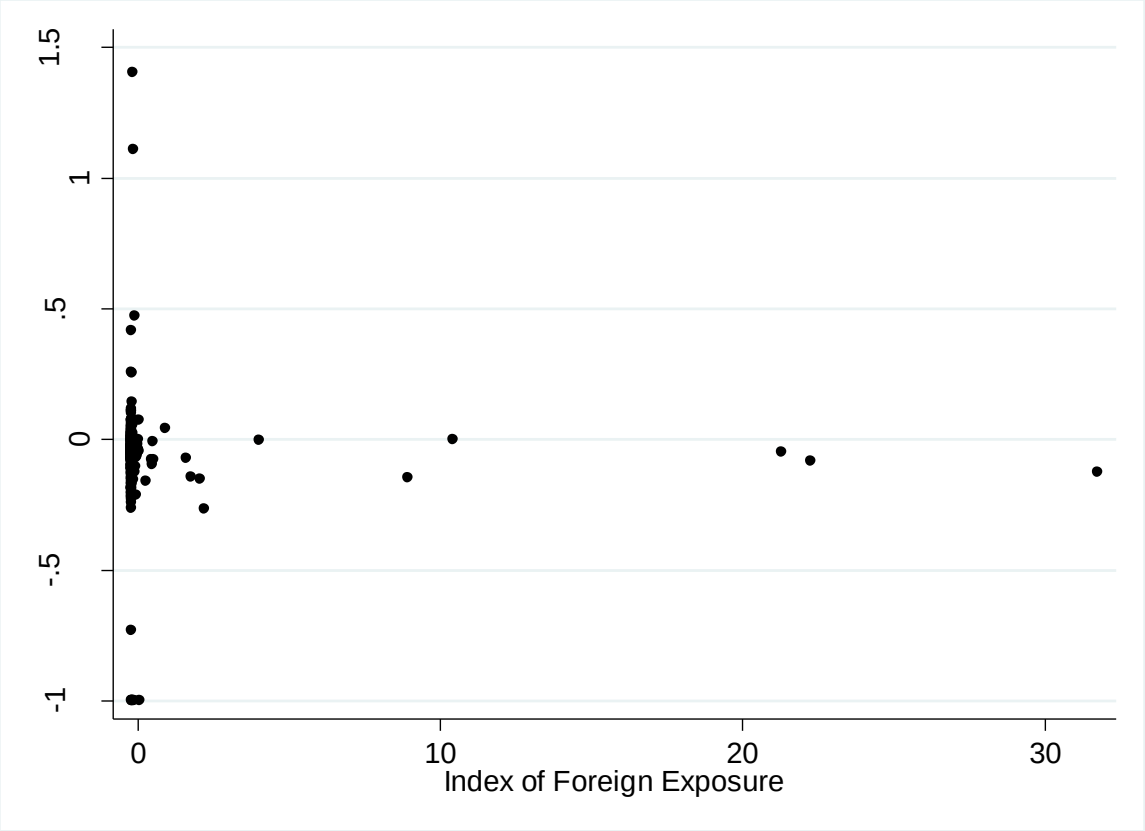


Figure 5: Deposits of Weekly Reporting Banks in New York City, 1929-1933

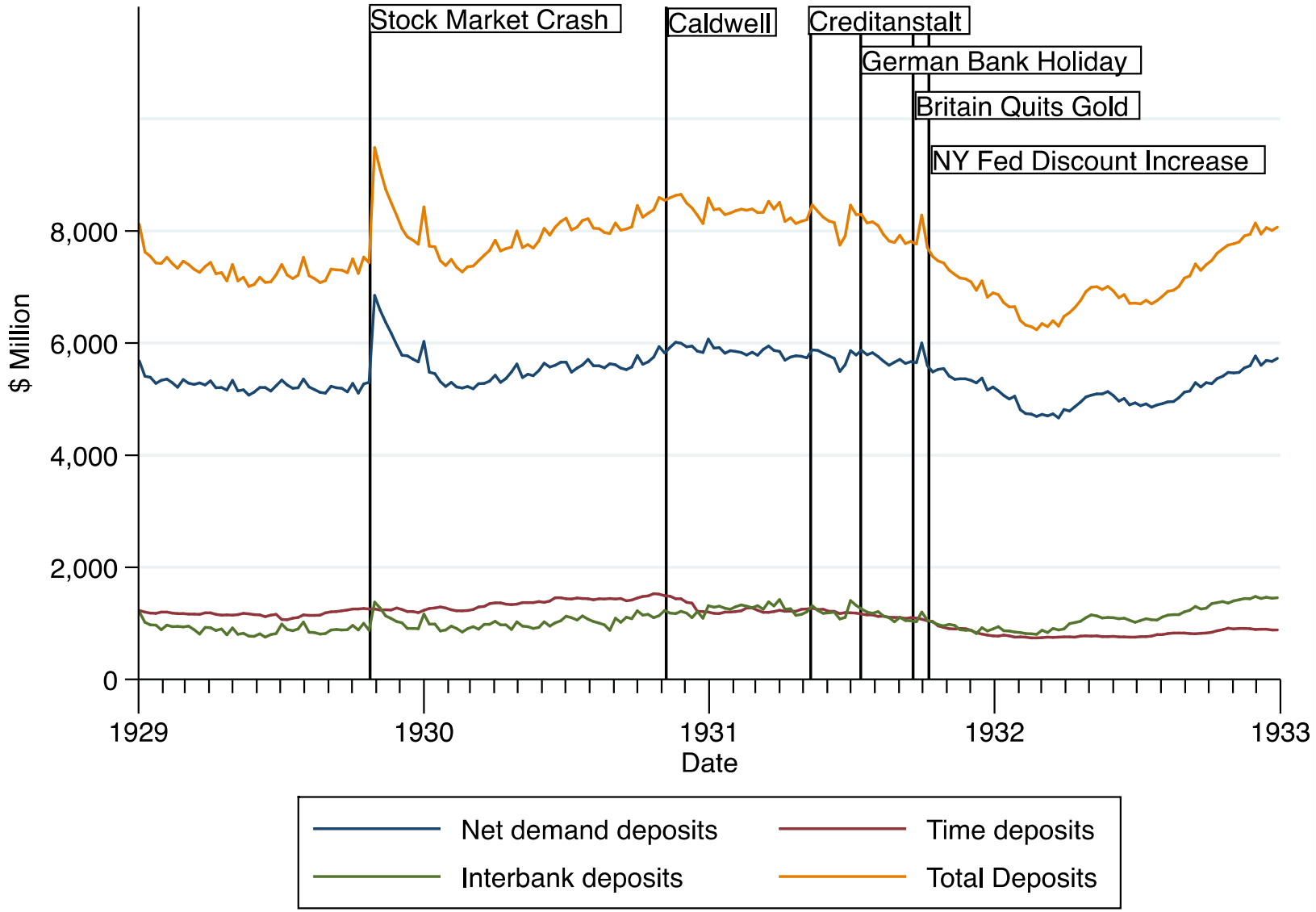


Figure 6: Loans and Investments of Weekly Reporting Banks in New York City, 1929-1933

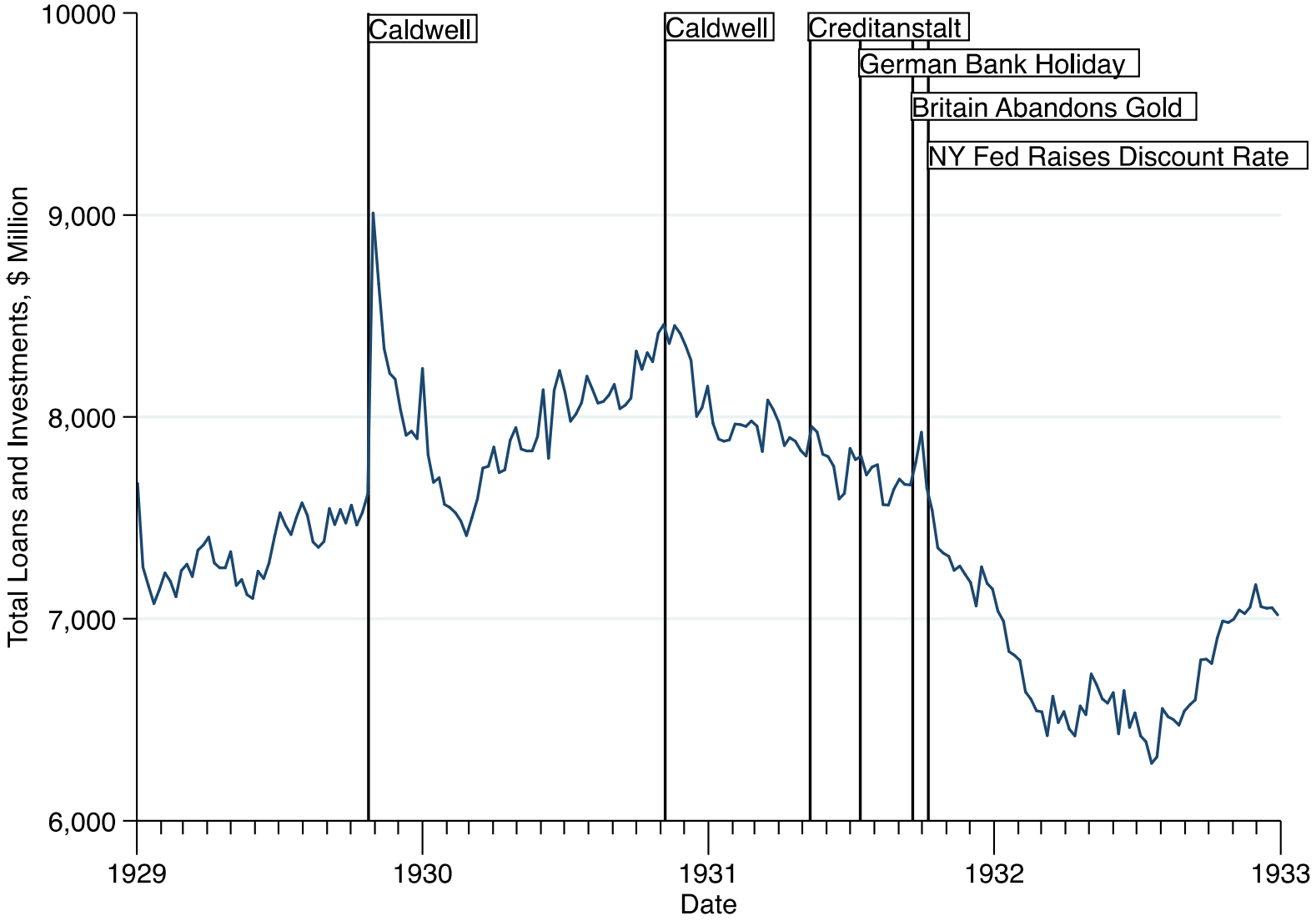


Figure 7: Demand Deposits at Weekly Reporting Banks during the German Crisis

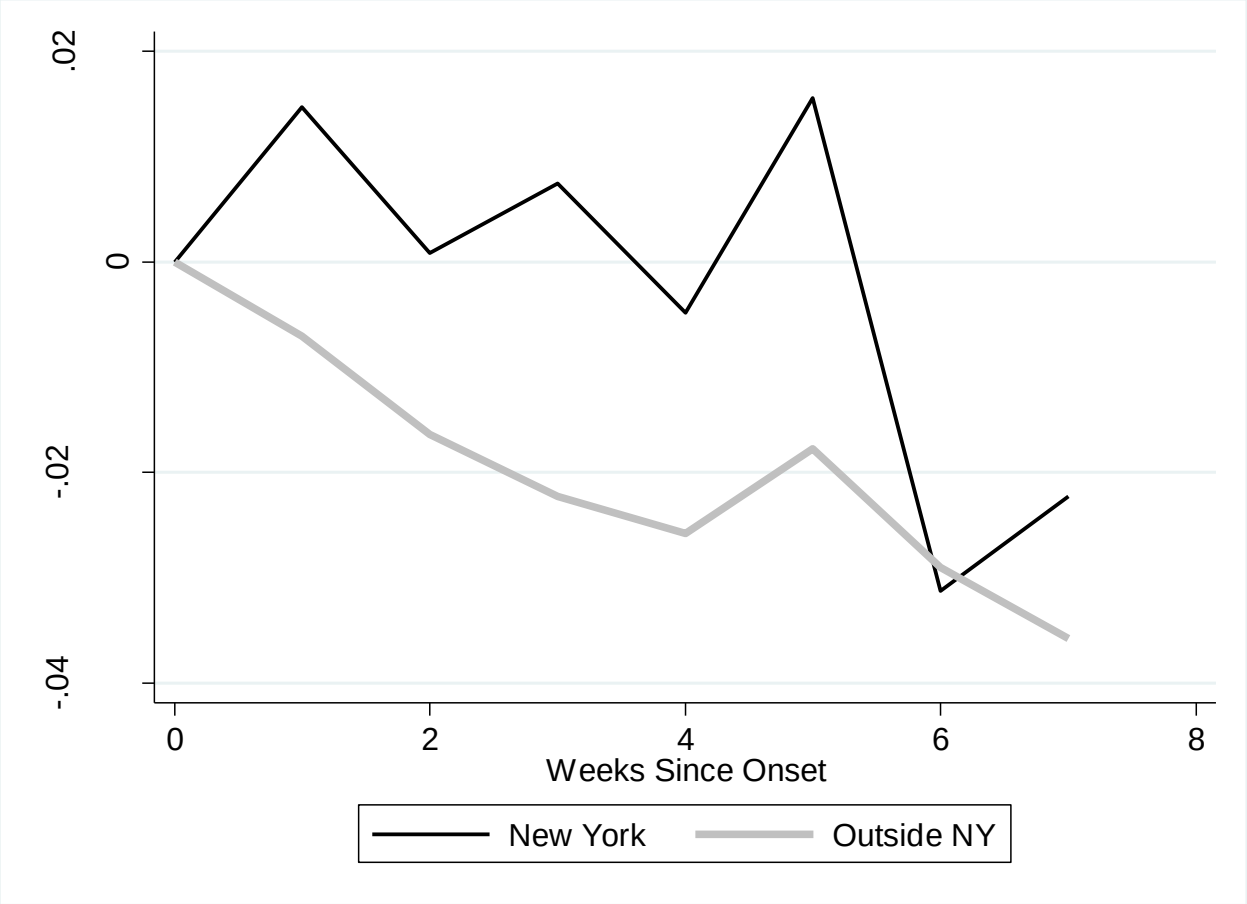


Figure 8: Changes in Demand Deposits in in Weekly Reporting Banks in New York Relative to Outside of New York during Three Financial Crises.

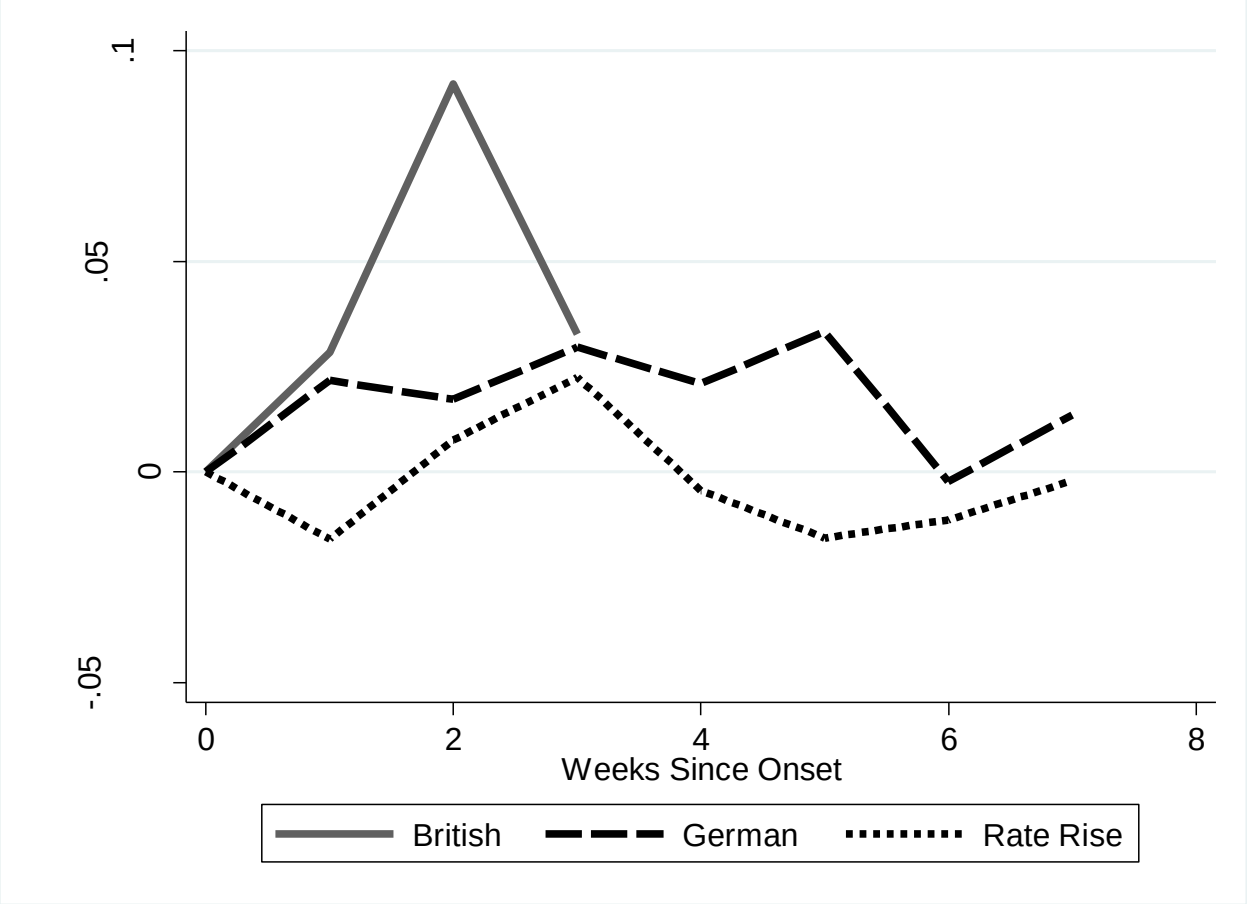
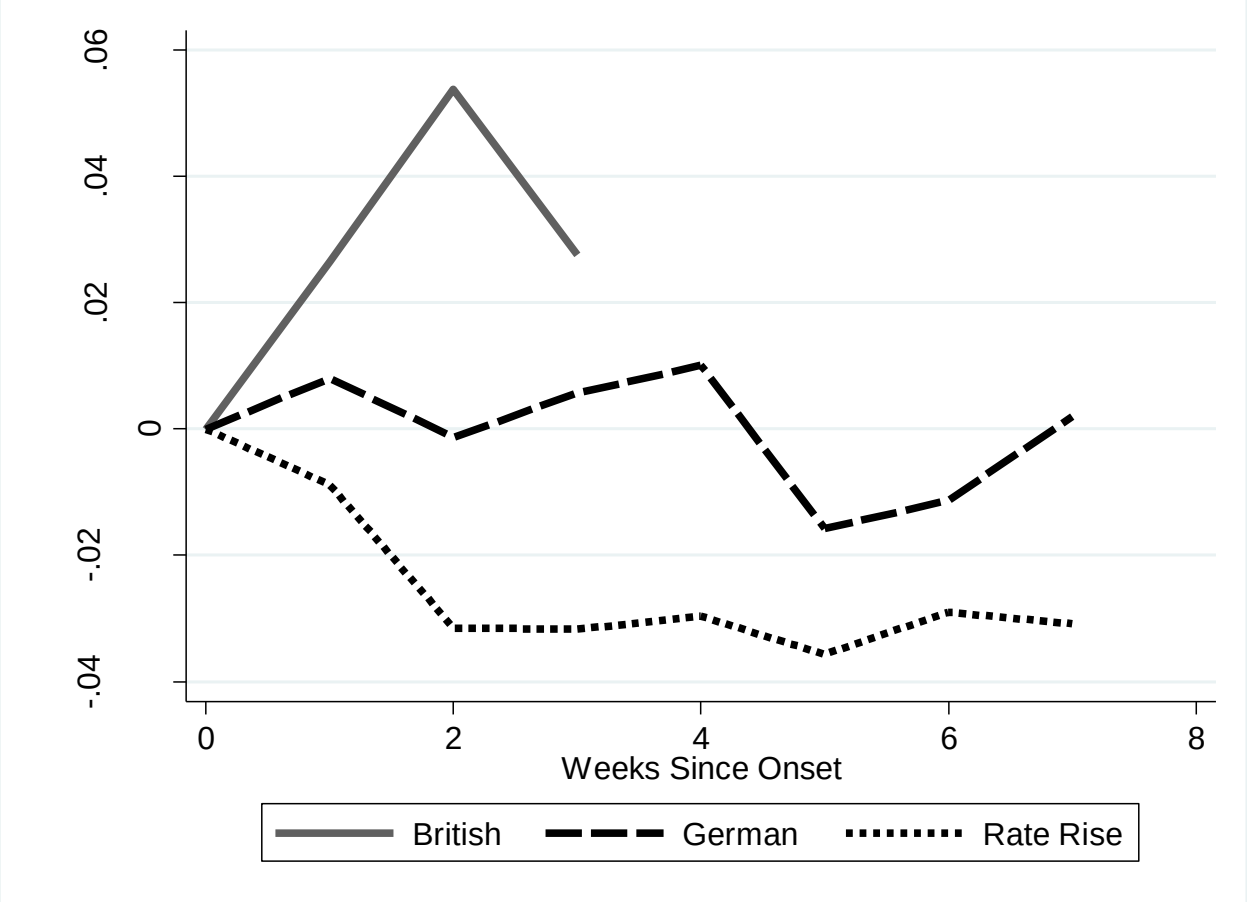


Figure 9: Percentage Change in Loans in Weekly Reporting Banks in New York Relative to Outside of New York during Three Financial Crises.



Note: The figure depicts changes the percentage change in all loans other than loans on securities.

Figure 10: Composition of Assets, New York City Fed Member Banks at Call Dates, 1919-1935

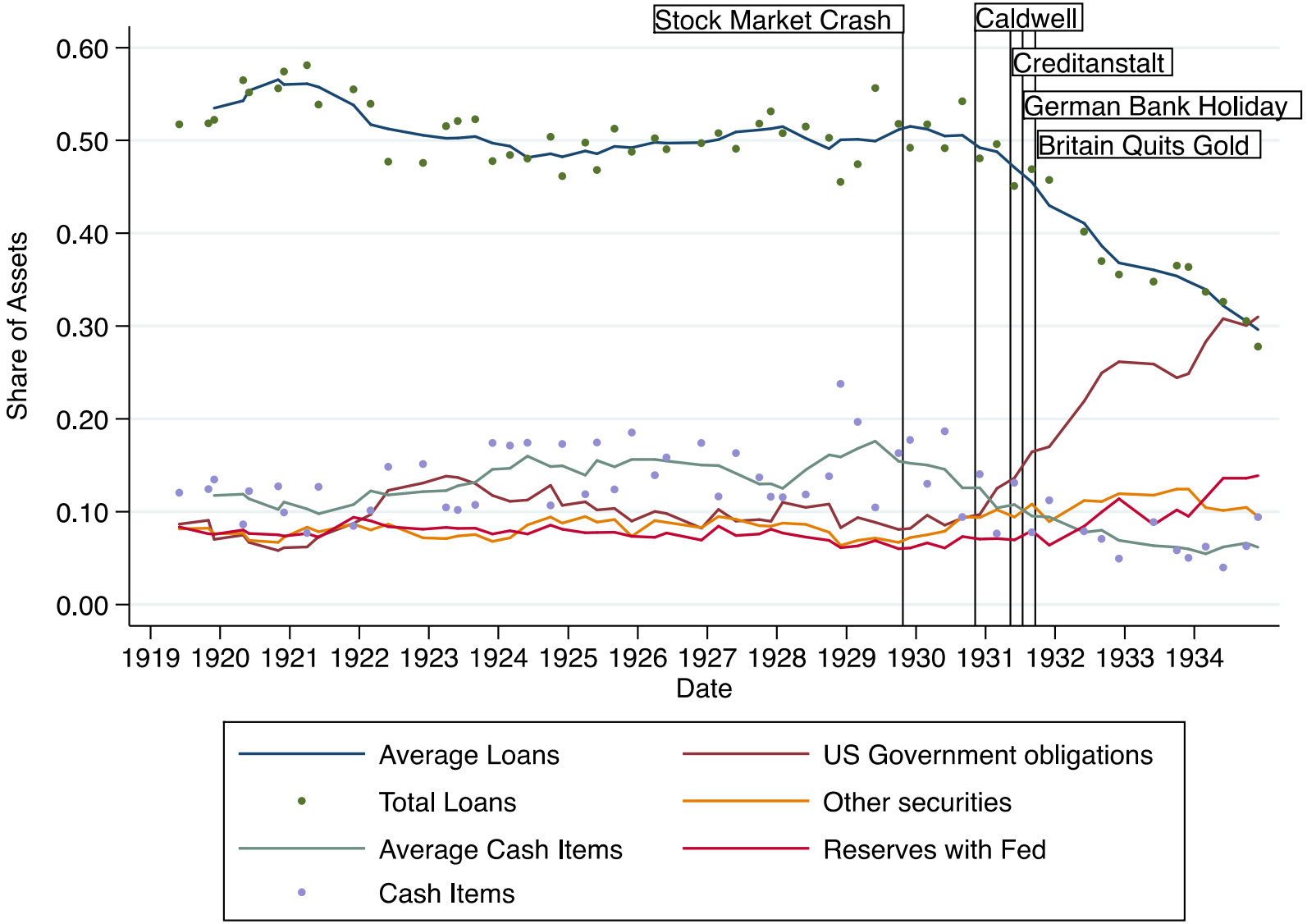
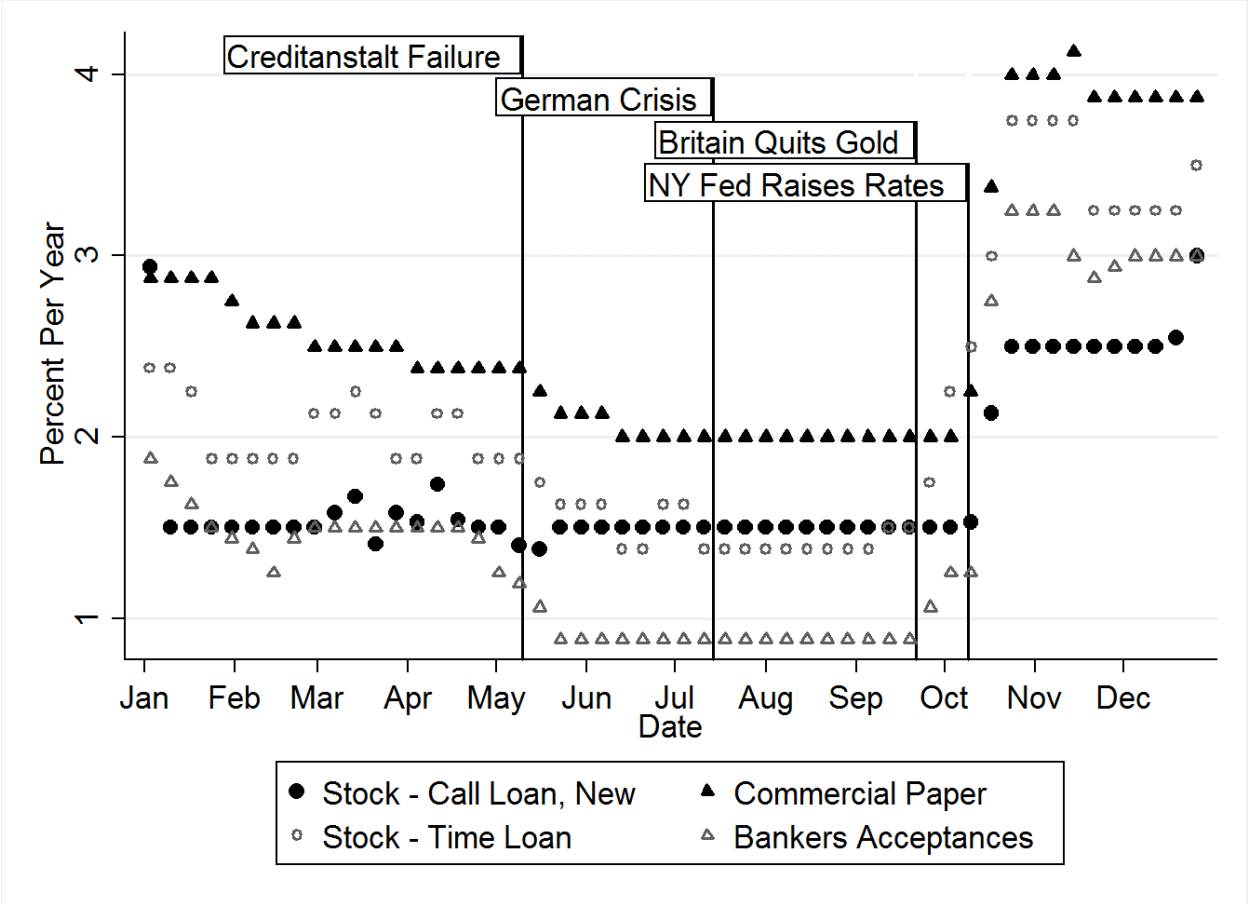
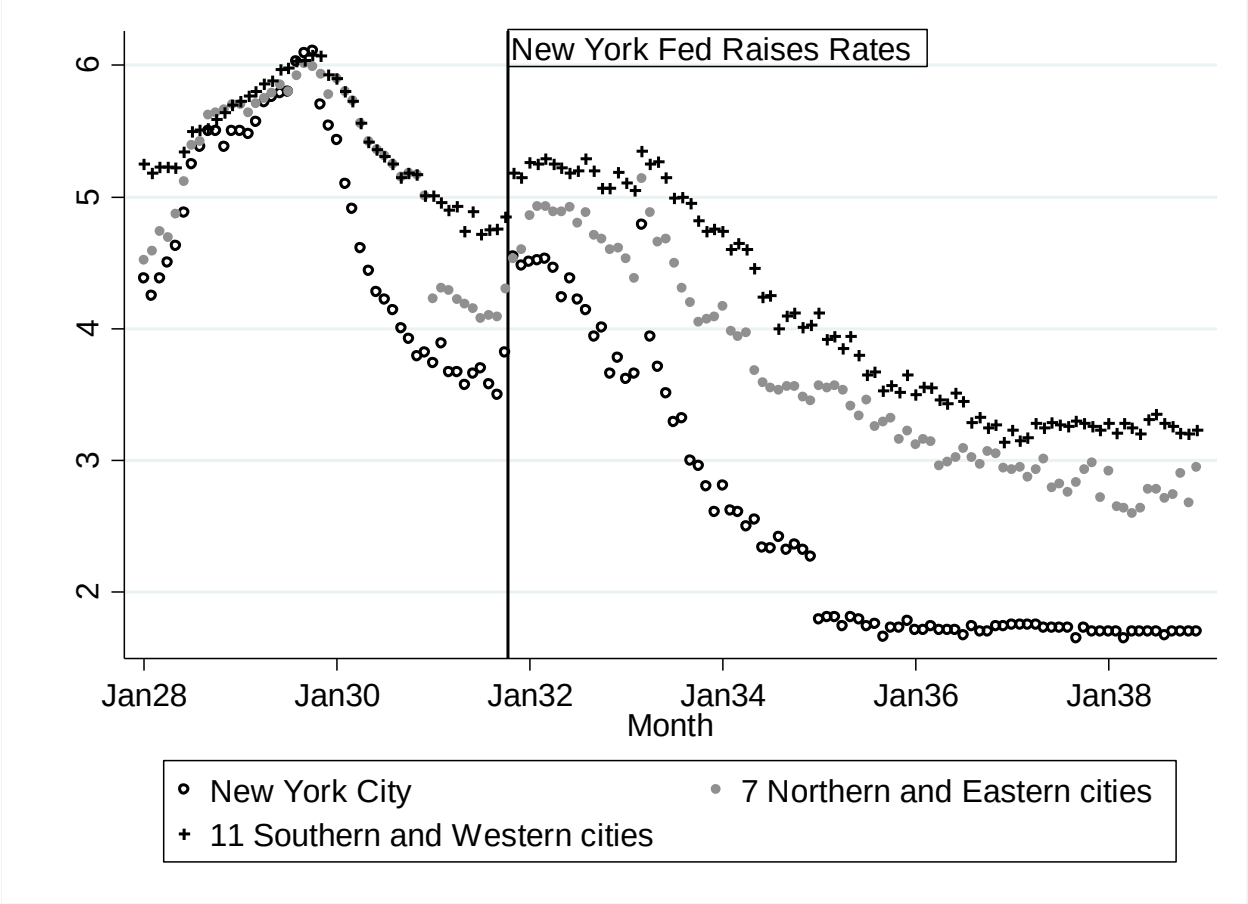


Figure 11: Interest Rates in New York City, Weekly, 1931



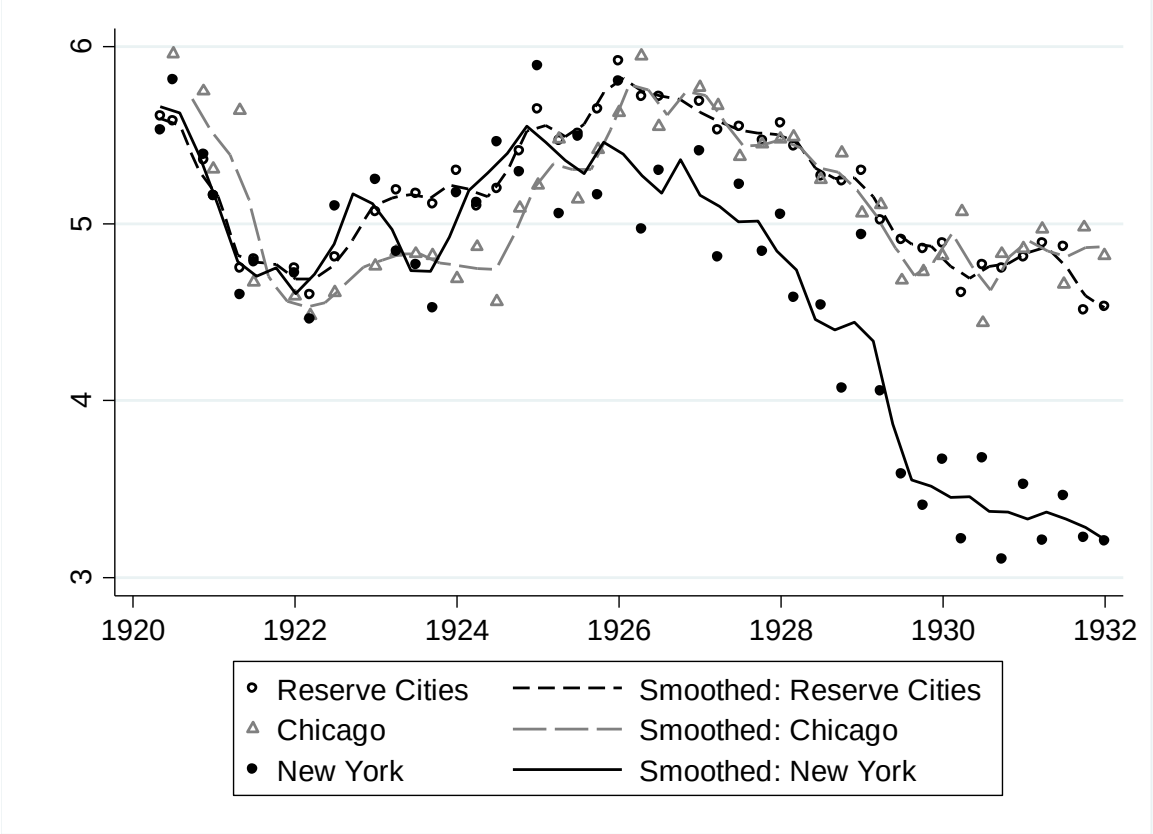
Note: The data are weekly averages of rates changed by leading banks in New York City. See Board of Governors (1943), Table 121, for details.

Figure 12: Interests Rates on Commercial Loans in New York and in Other Cities, Monthly, 1928 to 1938



Note: The data are prevailing rates on commercial loans reported by Federal Reserve member banks in selected cities. See Board of Governors (1943), Table 125, for details.

Figure 13: Leverage of Federal Reserve Member Banks in New York, Chicago, and Reserve Cities Throughout the United States, 1920 to 1931.



Notes: Data is presented for all calls for reports of condition from May 1920 through December 1931. Leverage is the ratio of assets over equity. Equity is defined as the sum of paid-up capital, surplus, undivided profits, and all other retained earnings including reserves for contingencies. The lines plot weighted averages of the data smoothed with a polynomial filter that places more weight on observations near time *t* and less weight on observations farther from *t*.
Source: Board of Governors 1943.