Preliminary and Incomplete Draft – Comments Welcome

Andrew Jackson's Bank War and the Panic of 1837: New Evidence

Eric Hilt*
Wellesley and NBER

Katharine Liang
Northwestern University

Abstract: The role of Andrew Jackson's Bank War in the Panic of 1837 has been the source of politically charged debate over most of the 180 years since the crisis occurred. We study the Panic of 1837 using comprehensive bank-level data, focusing on the role of the pet banks—the network of banks chosen by Jackson's administration to replace the Second Bank of the United States as fiscal agents of the federal government. These banks were granted a privileged position within the banking system, and received massive inflows of public money, which were unlikely to be withdrawn in response to excessive risk taking. This produced a moral hazard problem. Although many different factors contributed to the financial crisis of the late 1830s, an important component of the Panic of 1837 was the collapse of the pet bank system. Panel data regressions reveal that the pet banks saw their net liabilities fall and their banknote discounts rise much more than other commercial banks in the years following the Panic. Counterfactual estimates of the national money supply indicate that the differentially severe contraction among the pet banks accounted for around 30 percent of the overall contraction in bank liabilities in 1837.

* Emails: ehilt@wellesely.edu, katharine.liang@kellogg.northwestern.edu.

1. Introduction

The role of Andrew Jackson's Bank War in the Panic of 1837 has been the source of politically charged debate over most of the 180 years since the crisis occurred. Jackson's critics argued that his veto of the bill to re-charter the Second Bank of the United States removed a check on the banking system and led to unrestrained growth in bank lending, financed by large emissions of banknotes. The growing availability of bank credit fueled speculative purchases of public land until 1836 when Jackson's Specie Circular prohibited payment for federal land with banknotes, eventually causing a collapse. This account of its causes dominated popular and academic analyses of the panic until Peter Temin (1969) refuted it conclusively.[1] Temin showed that the reserve ratio of the commercial banking system did not fall in the years leading up to the panic, as it should have if the traditional account were correct. Instead, Temin pointed toward international forces that led to large specie inflows into the United States as the ultimate cause of the growth of money and credit in the 1830s, and a reversal of those forces as the cause of the crisis. Temin's analysis generally exonerated Jackson's policies, stating that "the economy was not the victim of Jacksonian politics; Jackson's policies were the victim of economic fluctuations" (p. 17).

Yet even if Jackson's Bank War did not have the effects alleged by the traditional account, other elements of his policies toward the banking system may have contributed to the crisis. After the veto, the government's funds in the Second Bank were moved to state banks designated as fiscal agents of the federal government, and most subsequent federal revenues flowed into those institutions. Derided as Jackson's "pets," the chosen banks were often managed by individuals closely tied the Democratic Party, and were granted privileged status in the banking system and lent substantial amounts of public funds. Unlike other bank liabilities, the federal deposits created a stable source of funding that was quite unlikely to be withdrawn in response to excessive risk taking. This created a moral hazard problem, and indeed, Jackson's critics charged that some of the pet banks engaged in "illegitimate and wild banking operations."[2] The panic in fact broke out in New York City following revelations of fraud within two of that city's pet banks, which provoked runs on those institutions. The pressure on the pet banks during the crisis may also have been fueled by the perception that their privileged status had become politically untenable, and that the federal deposits would be withdrawn.

We study the role of Jackson's pet banking system in the Panic of 1837. Some contemporary accounts of the panic, as well as subsequent academic works, have suggested that the deposit banks contributed significantly to the growth of lending in the 1830s. Others have argued that the deposit banks

[1] Works that present their own versions of the traditional account presented above include Bourne (1857), Russell (1875), Trufant (1918), McGrane (1924), Schlesinger (1945), Hammond (1957) and Meerman (1963).
[2] *Banker's Magazine*, November 1857, "Financial Revulsions of 1837 and 1857," p. 397. The quote specifically refers to the consequences of the large federal deposits that accumulated in the West.

were well regulated, and that claims that they lent irresponsibly were "exaggerated" (Willentz 2005: 441; see also Scheiber 1963). In part, this reflects the fact that the impact of the pet banks on the crisis has never been quantified, and most analyses of the pet banks and of the crisis as a whole have mainly relied on suggestive evidence obtained from regional data, or descriptive accounts of plausible mechanisms behind the crisis. We use comprehensive bank-level data and a differences-in-differences design to investigate whether the deposit banks' notes and deposits grew at differential rates in the years leading up to the panic, and whether their liabilities declined differentially during and after the panic. We also look for evidence of differential risk taking among the deposit banks by analyzing their banknote discounts and failure rates. Finally, we aggregate our bank-level data to construct a new estimate of the national money supply and use it to construct counterfactual values of its growth and contraction around the Panic under the assumption that the pet banks' net liabilities had grown at the same rates of other commercial banks. This enables us to quantitatively assess the aggregate effect of the pet banks' differential expansion and contraction on the magnitude of the crisis.

The results indicate that in the two years following the Panic, the pet banks' outstanding liabilities (excluding the federal deposits) declined by 20 percentage points more than other banks'—nearly double the overall rate. Similarly, the note discounts of the pet banks, a market-based assessment of their risk of default, rose by 0.4 percentage points more than other banks, which was also nearly twice as much as the average rate. And although bank failures were uncommon in the wake of the panic, the pet banks' failure rates were about 4 percentage points higher than those of other banks, double the overall failure rate of 1.9 percent. Our counterfactual estimates of the money supply indicate that the aggregate impact of these effects were quite large. Had the liabilities of the pet banks grown at the same rate as those of other commercial banks after 1833, our calculations indicate that the money stock would have been about 16 percent lower in 1836 and would have declined by 30.3 percent less in 1837.

Stock price data from the New York Stock Exchange provide further insight into the value of status as a pet bank. The Deposit Act of 1836 resulted in several publicly traded banks being designated as federal deposit banks. We find that the cumulative returns paid by those banks' stocks rose by around seven percentage points in the following weeks, relative to the shares of other banks that were traded on the NYSE. This difference began to collapse prior to the panic and eventually became deeply negative around the time of the runs on New York's banks, indicating that the Panic was perceived as differentially harmful to those pet banks.

Andrew Jackson staked his 1832 reelection on the destruction of the Second Bank, on the grounds that its monopoly status and exclusive privileges were "dangerous to the liberties of the people."[3] Yet in

[3] The third paragraph of Jackson's veto message states: "The present corporate body…enjoys an exclusive privilege of banking under the authority of the General Government, a monopoly of its favor and support, and, as a necessary

his second term, the federal government proceeded to deposit tens of millions of dollars of public funds into a politically favored group of state-chartered commercial banks—conferring special status and lucrative resources on a set of institutions that already enjoyed exclusive legal privileges, in the form of state banking charters.[4] Jackson's critics alleged that the pet banks used their resources to benefit the Democratic Party, and engaged in reckless lending.[5] Although forces unrelated to Jackson's policies contributed to the boom of the mid-1830s and the subsequent recession, we show that the pet banks were an important factor in the financial crisis of 1837.[6]

This paper advances the literature on the Panic of 1837 in several ways. First, whereas prior work has focused on national or regional data, this paper analyzes comprehensive bank-level data to obtain direct evidence of the role of the pet banks in the crisis. Second, whereas most of the literature has focused on the growth of lending in the 1830s, the analysis of this paper focuses on the bank panic itself, and utilizes the information revealed ex post through the actions of note holders and depositors during the crisis. The variation across banks in the extent to which demand for their liabilities, or the price of their liabilities, fell during the crisis contains a great deal of information about its causes. Finally, the analysis incorporates recent insights into the political significance of early nineteenth century banks and their potential as a source of corruption (Bodenhorn, 2004, 2017; Lu and Wallis 2017). Jackson's Bank War was inspired by political concerns regarding the Second Bank (see Wallis, 2004), yet it replaced the Second Bank with a network of politically affiliated private banks that arguably held even greater potential as a source of corruption. Jackson's allies managed this contradiction with the promise that the regulations they would impose on the pet banks would end the "fluctuations and disasters to which the sudden expansions and contractions of our paper currency has heretofore been liable"[7]—and when that promise was revealed to be false, it became clear that the pet bank experiment would collapse.

In a contribution related to ours, Peter Rousseau (2002) has argued that the Deposit Act of 1836, which led to significant transfers of resources out of New York's pet banks, made that city's banking system more vulnerable, and contributed to the crisis. His analysis therefore emphasizes the New York pet banks as an important factor in the Panic, but only because they lost reserves. In addition, Jane

consequence, almost a monopoly of the foreign and domestic exchange. The powers privileges, and favors bestowed upon it in the original charter, by increasing the value of the stock far above its par value, operated as a gratuity of many millions to the stockholders."

[4] At the time, commercial banks in most states were required to obtain corporate charters; these were granted only through special acts of state legislatures. On the political significance of early state bank charters, see Hilt (2017), Bodenhorn (2006; 2017), and Lu and Wallis (2015).

[5] For example, Bourne (1885: 13-14) states that "The extraordinary privileges which the 'pet banks' enjoyed were eagerly sought for, and frequently granted as rewards for political services. There is no question that this tempting bait was used to strengthen the hold of the administration on the Government."

[6] On the macroeconomic vulnerabilities behind the crisis, see Temin (1969), Weber (2000), Wallis (2002), Knodell (2006) and Williams (2016).

[7] Roger Taney, in *Niles' Register*, 18 October 1834.

Knodell (2006) has challenged Temin's argument that the Bank War was unimportant in the crisis and argued that the closure of Second Bank branches led to substantial entry by new state banks, whose aggressive managers helped fuel the expansion in bank credit. We test for the bank-level implications of both of these theories and find some support for them.[8] Yet our estimates of the effect of the pet banks remain unchanged when we control for variables related to these theories.

Finally, Temin's (1969) analysis of the causes of the Panic of 1837 addressed some arguments closely related to ours, and it is important to distinguish them from the argument of this paper. Some early observers argued that the government deposits were treated by the pet banks as reserves, fueling growth in their lending—which, as Temin observed, would imply that the true reserve ratio of banks should have fallen, whereas it actually remained stable (p. 70-71). The focus on reserve ratios is characteristic of early accounts of the crisis, whose interpretations were often informed by the "hard money" view that the use of banknotes rather than precious metals as money was the fundamental source of economic instability.[9] Yet it is not necessary for the pet banks to have treated the federal deposit as reserves for those institutions to have behaved in a way that contributed to the crisis. The federal deposits held by some of the pet banks were quite large relative to their paid-in capital, and were understood to be different from ordinary deposits, in that they were unlikely to have been withdrawn in response to greater risk taking by the banks' managers. The former may have led banks to exhaust their usual safe lending opportunities, and pursue riskier ones, while the latter would have diminished the disciplining force of depositor monitoring. Even if the deposit banks had maintained high levels of reserves, if they had allocated a substantial portion the deposits to risker assets, they could have had an important role in the crisis. These and other mechanisms unrelated to reserve ratios will be explored.

2. Historical Background: The Bank War and the Deposit Banks

In the early 1830s, the commercial banking system of the United States consisted of hundreds of state-chartered banks, and the federally chartered Second Bank which operated a nationwide network of branches. With $35 million in capital, the Second Bank acted as the fiscal agent of the U.S. government, was a major source of credit, and provided a variety of payments services. The scale of its interactions with state banks enabled it to restrain their note issuance; by redeeming the large quantities of banknotes

[8] It should be noted that not all of the arguments of Rousseau and Knodell have implications that are testable at the bank level; we incorporate their hypotheses into our estimation mainly to rule out that they are responsible for our results.

[9] The intellectual foundations of such views are articulated in Gouge (1833). See also Hammond (1957).

it accumulated for specie, it could force the banks to maintain adequate specie reserves.[10] Although state bankers were jealous of its market share and resented its regulatory role, they also appreciated that the Second Bank promoted financial stability and integration.[11]

The state bankers most hostile toward the Second Bank were those of New York. At the beginning of the nineteenth century, New York City overtook Philadelphia to become the nation's financial center; Wall Street resented that the Second Bank was headquartered on Chestnut Street. Most of New York's banks were regulated by the state's Safety Fund law of 1829, a coinsurance system for banknotes that was touted as an alternative to the Second Bank as a means to ensure the stability of commercial banks. Designed partly by then-governor Martin Van Buren, Democrats in the New York legislature "took up the scheme and pressed for its adoption in the Assembly, on the ground of opposition to the United States Bank, and in order to take the place of that institution."[12] Much more than their counterparts in other states, New York's Safety Fund banks, particularly the largest ones, saw themselves as rivals of the Second Bank.[13]

New York's banks were also closely tied to the state's Democratic Party. The "Albany Regency" rationed bank charters in order to generate monopoly rents that it could allocate to its political allies, and thereby perpetuate its control of the legislature.[14] Not all of the state's banks were controlled by Democrats, but they all benefitted from the restriction on entry produced by the Regency's rationing of bank charters.[15] Limiting entry produced a relatively robust (if oligopolistic) banking system; the patently undemocratic character of the Regency's chartering regime was justified by arguments that it fostered financial stability. But the Regency owed much of its influence over state politics to its alliance with incumbent banks, and the interests of the banks generally aligned with the Regency's.

[10] Hammond (1957) emphasizes the regulatory role of the Second Bank and state bankers' hostility towards it. However, Temin (1969) and Knodell (2017) argue that the regulatory function of the Second Bank was more limited.

[11] McFaul (1972) documents that state banks in many regions of the country did not support Jackson's Bank War. This contrasts with Hammond's (1957) account.

[12] *The Hearald* [NY], 3 May 1837.

[13] As the *Banker's Magazine* put it in its November 1857 issue, "there was … no sympathy on the part of New York in behalf of the then Bank of the United States, as … Wall-street was desirous of having within itself the great regulator of the currency of the Union" ("Financial Revulsions of 1837 and 1857," p.394). For this reason, Jackson's opponents viewed the Bank War as a conspiracy among New York bankers to replace the Second Bank with a new national bank located there (Remini, 1967: 162-63). Some New York banking interests did indeed formulate a plan for a new national bank based in New York (McFaul, 1972).

[14] See Bodenhorn (2006, 2017). Bodenhorn (2006) notes that between 1830 to 1837, only 53 out of the 535 petitions for bank charters in New York were granted.

[15] As in many other states, New York enacted a "restraining law" that prohibited entry into commercial banking without a corporate charter, which could only be obtained by a special act of the legislature.

President Jackson's 1832 veto of the bill to grant a new charter to the Second Bank was strongly supported by New York's Democrats and their allies within the state's banking system.[16] Yet it was also supported by the hard-money faction within Democratic Party, who were the political enemies of New York's banks, and advocated for reforms of the financial system that would lead to the wider use (or even the exclusive use) of precious metals, rather than banknotes, as money. The veto initiated a series of changes in federal banking policy under Jackson, some of which benefitted state banks, whereas others appealed to the hard money faction.

Jackson feared that advocates for the Second Bank might make additional attempts to re-charter that institution, and that the Second Bank might bribe members of Congress as part of the effort. To immediately deprive the Second Bank of the power it wielded through holding the government's funds, Jackson issued an executive order in September 1833 to remove the federal deposits from that institution. This transferred control over the deposits from a corporation chartered by Congress to the executive, substantially increasing the scope of presidential power and producing a political uproar (Remini, 1967). The Senate responded by voting to censure the president, with a resolution stating that he had "assumed upon himself authority and power not conferred by the constitution and laws, but in derogation of both."

The decision to move the federal deposits from the Second Bank was controversial even within Jackson's own cabinet. The charter of the Second Bank stated that the Secretary of the Treasury held discretion over whether the federal government's funds would be kept within that institution. Jackson had to replace the Secretary of the Treasury twice before finding one willing to carry it out. He ultimately settled on Roger Taney, who together with his aide Amos Kendall devised a plan to designate state-chartered banks as fiscal agents of the federal government. Since the scale of the federal deposits was quite large, the possibilities for patronage were considerable, and to critics the deposit banks represented the extension of the "spoils system" into banking.

Selection of the Deposit Banks

Taney and Kendall initially selected seven large banks, all located in cities in the major Eastern seaboard, to take federal deposits. Political favoritism and personal connections were an important part of the selection process, which was evident in the choice of the Union Bank of Maryland, whose president was Taney's close friend.[17] The other banks included The Manhattan Company and The Mechanics Bank,

[16] Hammond's (1957:329) statement that "the Jacksonians' destruction of the Bank of the United States was in no sense a blow at …the 'money power' … It was a blow at an older set of capitalists by a newer, more numerous set" is quite apt.

[17] Some sources say that Taney was responsible for the selections, whereas Schreiber (1963: 197) and Hammond (1957: 412) suggest both Taney and Amos Kendall were important. See also McFaul (1972: 60), and Gatell (1964 :36).

which were the two largest Democratic banks in New York City; the Commonwealth Bank of Boston, whose president was John K. Simpson, a close friend of Amos Kendall and a Democratic state politician; and the Girard Bank of Philadelphia, another Democratic bank. The one bank not prominently associated with the Democrats that was named was the Bank of America, the largest commercial bank in New York. Despite the selection of the latter, the deposits were "in the hands of the politically friendly," as Taney wrote to a Democratic colleague.[18] Eventually, the deposit banks would become pejoratively known by their critics as Jackson's "pet banks."

In the early stages of the pet banking system, the designation of state banks as depositaries was presented as a temporary measure. But in response to receiving drafts for amounts of up to $500,000 at a time from the new deposit banks, Nicholas Biddle, the president of the Second Bank, reacted by severely contracting that institution's lending, producing a recession that came to be known as Biddle's contraction.[19] The resulting financial pressure on the business community galvanized support for the deposit banks in Congress, and the pet banking experiment became a more permanent part of the Jackson Administration. Attributing economic prosperity to the success of the pet banking system became an important part of Jacksonian rhetoric. Following the recovery from Biddle's contraction, Congressman James K. Polk stated that the country "has been prosperous but she is indebted for that prosperity…to the new impulses springing out of the employment of State banks as fiscal agents of the Government."[20]

From January 1834 to June 1836 the deposit banking system grew from seven banks to thirty five.[21] The importance of politics in the selection of the additional deposit banks has been the subject of some debate.[22] Yet even if political affiliations and personal connections were not the only criteria in selecting deposit banks, Taney and his successor Levi Woodbury clearly incorporated political concerns in their choices. And as the system expanded, political favoritism and personal connections began to play a larger role. Many of the banks chosen in the North in particular confirmed critics' perceptions that the selections prioritized political favoritism over financial security.[23] The selections in New England were

[18] Gatell (1964: 36).
[19] Taney had secretly given each deposit bank a $500,000 draft, so that if Biddle attacked them by suddenly redeeming large quantities of their notes, they could retaliate by presenting the Second Bank with bank drafts made payable to themselves. These drafts were massive compared to the total amount of federal funds in the deposit banks at the end of 1833: in the last quarter of 1833, the deposit banks had around $34,000 of the federal deposits while the Second Bank had $9 million (Sen. Doc. 16, Statement A (23rd Cong., 1st Sess.)) But instead of merely holding the drafts for their own protection, some of the banks actually presented them to the Second Bank, without the consent of the Treasury.
[20] Quoted in McFaul (1972: 70-1).
[21] U.S. Treasury Reports in 1833 to 1837. See also Schreiber (1963 : 197).
[22] See Hammond (1957), Scheiber (1963), Gatell (1964), Taus (1943), and Redlich (1951).
[23] Gatell (1964: 58) cites the Moyamensing Bank of Philadelphia, the Clinton Bank of Columbus, the Farmers and Mechanics Bank of Detroit and Mechanics and Farmers Bank of Albany as examples of pet banks that had strong Democratic ties, but were poorly capitalized.

especially likely to have been the product of "pure politics, nepotism, or personal connections."[24] For example, Secretary Woodbury's father-in-law ran the Bank of Portland, in Maine, which was chosen as a deposit bank.

Politics figured less prominently in the choice of deposit banks in the South and West, however. The Treasury offered deposits to banks in South Carolina and Mississippi that had officers who were outspokenly anti-Jackson.[25] It is not particularly surprising that these banks were chosen in spite of their political persuasions. The Southern and Western states relied more heavily on the branches of the Second Bank for banking and had established relatively few commercial banks by the time of the selection.[26] Michigan, Mississippi, Kentucky, Alabama, North Carolina, South Carolina and Virginia all had less than ten banks in January 1836, whereas the New England and Mid-Atlantic states had between twenty and one hundred banks per state. Selecting a depository in a state like Kentucky, where there were only three banks, meant choosing banks in the hands of the political opposition. In some cases, banks in the South even declined to receive public deposits, but as Taney wrote in an executive summary detailing the selections, most of them eventually "surrendered."[27]

Table 1 presents some evidence regarding the selection of the pet banks by comparing the characteristics of the banks chosen in 1833, and in 1836, to those of the other commercial banks not chosen. Turning first to the seven pet banks chosen in 1833, they were all located in major cities, and were larger, older, and had higher reserve ratios on average than the banks not chosen. They were also safer, in the sense that their banknote discounts were substantially lower. But across all these characteristics, the 1833 deposit banks were positively selected, sometimes strongly so.

The bottom row of the table presents a rough indication of their political allegiance: it shows the percentage of the seats held in their state's legislature (for bicameral state legislatures, each house weighted equally) held by the Democratic Party, or their predecessors, at the time when their charters were granted. The pet banks were indeed chartered by more strongly Democratic state governments, although the difference is not statistically significant.

Columns (4) through (6) show that the 1836 deposit banks remained positively selected compared to the average bank, but the differences were considerably smaller, and in some cases were negligible.

---

[24] Gatell (1964: 60).

[25] In addition, Schreiber (1936:197) notes that The State Bank of North Carolina, the Bank of Louisville and the Bank of Michigan at Detroit all had boards that were controlled by Whigs. Gatell (1964: 55) also identifies the Bank of the State of North Carolina as an opposition bank.

[26] Knodell (2006:550) measures the differences in banking services by region and finds that the Northwest and Southeast were more severely under-banked and were more adversely affected by the closing of the Second Bank branches.

[27] 25th Congress 3rd session, *Senate Document 302*, 1833 to 1834. The banks that declined included The Bank of South Carolina, the Agricultural Bank of Mississippi, the Cape Fear (Wilmington NC) State Bank, the Planters and Mechanics Bank of Charleston, and the Union Bank of South Carolina.

They were also chartered by governments whose partisan composition was much more similar to those that chartered other banks.

Status and Regulation of Pet Banks

The federal government's alliance with a select group of state-chartered banks posed political problems for the Democratic Party and for Jackson; it contradicted Jackson's anti-monopoly justification for his war on the Second Bank. Making matters worse, the pet banks were banks of issue, whose circulations expanded following the receipt of the federal deposits, a result that was anathema to hard-money Democrats. A means to address this contradiction was found in the regulation of the pet banks (Scheiber, 1963; McFaul, 1972). The Treasury attempted to use its interactions with the deposit banks to force them to hold high levels of specie reserves, to restrict the circulation of small-denomination banknotes, and generally establish a more stable and "specie-based" money supply.

Federal policy toward the deposit banks was improvised by the Treasury and evolved somewhat over time. Amos Kendall advocated for the establishment of a centralized system that would replace some functions of the Second Bank. By attempting to make all pet banks' notes redeemable in the deposit banks located in the financial centers of the Mid-Atlantic region, he hoped to create a system that would help establish a more uniform currency. The federal deposit banks in New York City accumulated massive amounts of funds through customs duties paid there; that city's deposit banks were induced to hold high levels of reserves, but also placed deposits within a network of state banks. Something like a "sub-pet" system emerged, in which the pet banks became creditors of other banks by holding large balances with them, which could then be adjusted to effect a desired change in banking conditions.[28] In 1835, the deposit banks were also ordered to refuse to accept any banknotes of denominations of less than five dollars for payments to the government; denominations of less than ten dollars were to be refused after March of 1836. These measures were intended to reduce the amount of small bills in circulation and increase the use of coins for small transactions, an important objective for hard-money Democrats.

But these efforts did little to placate critics of the pet bank system. One senator expressed alarm at the unchecked power it gave to the president, and "the perfect control which the executive has...over all these banks…They are fettered, bound by a golden chain, the ring of which is in the hands of the secretary of the treasury."[29] Other critics argued that this control was used to direct credit toward favored borrowers.[30] And supporters of state banking interests objected that too much of the deposits was held in New York, rather than in banks in other regions.

---

[28] McFaul (1972).

[29]Senator Thomas Ewing (Whig-OH), March 17, as reported in *Niles' Register* (April 16, 1836, p. 119).

[30] For example, the *National Gazette* [Philadelphia PA] stated on 26 September 1837 that "we have seen the Treasury dictating to those institutions [Moyamensing Bank and Girard Bank, both pets] that accommodations

Ultimately Congress responded with the Deposit Act of 1836. The Act required that the Treasury select at least one depositary in each state "located at, adjacent to, or convenient to the points or places at which the revenue may be collected or disbursed." It restricted the deposit banks from issuing notes of less than five dollars and stipulated that any bank that suspended specie payments would be discontinued as a depositary. The Act also mandated that the amount of federal funds at any deposit bank could not exceed three fourths of its paid-in capital. As a result of these provisions, the number of pet banks grew from 36 to 81 over the course of six months. The terms of the Act removed some discretion of the Treasury over the pet banks and undermined the Treasury's efforts to use the large pet banks to effect changes in monetary conditions and regulate the banking system.[31]

The Act also provided for the distribution of the federal surplus to the states in proportion to their population. In total, thirty-seven million dollars was planned to be distributed in four equal installments as an interest-free loan starting in January 1837. This would ultimately remove a substantial amount of the federal deposits from the pet banks and weaken their influence within the banking system, further undermining their usefulness to the Treasury. Jackson opposed the measure and drafted a veto message to it, but ultimately came around to the view that it made the pet banking system more politically palatable and signed it.

Because most of the surplus was concentrated in the deposit banks located in financial centers, Woodbury asked Congress if he could prepare for the distribution by reallocating some funds among the deposit banks in a more equitable manner. Congress responded by amending the Act to give the Secretary of the Treasury the power to transfer funds in order to "produce a due equality, and just proportion, according to the provisions of said act."[32] Over the course of the six months between the enactment of the Deposit Act of 1836 and the first installment of the official distribution in 1837, Woodbury ordered around thirty-eight million dollars in "supplemental transfers." Twenty-six million of these transfers were completed by the end of 1836, and the rest in the early months of 1837. These transfers may have created liquidity problems for the banks holding large amounts of federal deposits that were asked to transfer resources to other banks. Contemporary observers noted

Shortly after the Deposit Act President Jackson issued an executive order known as the Specie Circular, which was intended to curb the growth of federal land sales, which he attributed to unrestrained growth of bank credit funded by paper money issuance. The circular went into effect on the 1st of August 1836 and required federal land agencies to accept only specie in payment for public lands under 320

---

should be granted to the merchants." McFaul (1972: 60) also documents that privileged information was passed to Bank of America in exchange for favored access to loans to family members of a Democratic member of Congress.

[31] Remini (1966) argues that the Deposit Act also asserted Congressional authority over the pet banks in order to restrain the power of the president.

[32] U.S. Congress, Senate Doc No. 29, 24th Congress, 2d Session. See Rousseau (2002: 464).

acres; by the 1st of December, it applied to all federal land.[33] Although the effectiveness of Jackson's policy in curbing land speculation has been the subject of some debate, receipts from public land sales remained very high, and the accumulation of specie in the western deposit banks further complicated Woodbury's efforts to equitably distribute the deposits. Another motive for the Specie Circular inferred by Jackson's critics was to provide aid to some of the western deposit banks. By requiring payments for land purchases to be made in specie, the Specie Circular resulted in substantial flows of specie from the east and into western and southwestern deposit banks, some of which faced liquidity problems in late 1836 and early 1837.[34]

But the Specie Circular likely had other unintended consequences. There is no consensus among scholars of the Panic of 1837 regarding the magnitude of the impact of that order. But it may have signaled a shift in federal policy that helped undermine confidence in the pet banks. It also likely made eastern funds costlier for western debtors, worsening their financial positions and contributing to the downturn.[35]

Just as twenty-six million dollars in supplemental transfers was completed at the end of 1836, nine million dollars of the first installment of the official distribution of the surplus was ordered in January 1837. Despite mounting pressures in the money market, Woodbury continued with the second installment on the April 1st. In May, before the third installment could take place, the Panic occurred and banks suspended payments; all but five of the ninety-one deposit banks were stripped of their status under the regulations of the Deposit Act.[36] The suspension essentially marked the end of the pet banking system. In August, Woodbury still carried out the third installment by placing drafts on the former deposit banks; however, these payments were in depreciated currency. The fourth installment was eventually abandoned in the face of mounting federal debt; ultimately only 28 million dollars of the original 37 million planned in the official distribution of the surplus was realized (Schreiber, 1963: 210).

---

[33] See Hammond (1957: 445), McGrane (1924: 79), and Rousseau (2002: 459).

[34] One critic stated in April 1837: "Mr Van Buren continues it in order to prevent the western and southwestern banks from stopping payment; by which the surplus revenue in their hand s would be in danger of being lost, and the states thereby deprived of their respective shares, and the government of its popularity." (*National Gazette* April 19 1837).

[35] "Did it aid the merchant in paying his Northern and Eastern debts? No; it immediately increased the cost to him of such payment, by increasing the rate of exchange whilst, at the same time, it closed upon him all the usual resources for obtaining money. This increase in the rate of exchange increased the danger of a demand upon the banks by the merchants, whilst they had also to answer the demands of their bill-holders, who might wnat to purchase the public lands." *Speech of Mr. King, of Georgia, on the Bill Imposing Additional Duties, as Depositaries, Sept 23 1837*. Washington: Gales and Seaton.

[36] 25th Congress, 3rd Session S.Doc. 30

The Onset of the Panic

In response to concerns regarding the rapidly growing cotton trade with the United States, in the summer of 1836 the Bank of England raised its discount rate and changed its lending policy, rejecting bills of exchange from institutions involved in the financing of the American trade in cotton.[37] This shock gradually cascaded through the financial system, depressing cotton prices and producing defaults among American cotton merchants. In early March 1837, J.L. & S. Joseph & Co., a well-regarded bill brokerage firm in New York, failed suddenly.[38] As the pressure continued the number of firm failures increased. On April 8 the *Journal of Commerce* reported 93 failures in New York. A week later and the *New York Courier and Enquirer* reported that ten to twelve first rate houses, and forty to fifty second rate houses in New Orleans had failed.

The crisis within New York's commercial banking system began on May 2nd, following the publication in the *New York Herald* of the results of an investigation by the New York Bank Commissioners, which had uncovered a scandal at the Mechanics Bank, a major Wall Street pet bank. The bank's president, John Fleming, had entered into a check kiting scheme with the Dry Dock Bank, another deposit bank, and the Wall Street brokerage firm Bullock, Lyman & Co.[39] Fleming had agreed to let the brokerage firm draw checks against him and place them between the Dry Dock Bank and the Mechanics bank. Through their operation, Bullock, Lyman & Co. was able to procure a loan of $254,000. In April, when the price of the Dry Dock Bank stock lost half of its value, Fleming stopped extending credit to the firm. Following their failure in early April, the brokerage firm owed the Dry Dock Bank up to $141,000. After the revelation of the scandal, Fleming, the cashier John Leonard and the vice president resigned under pressure from the board of directors.[40] Although the Mechanics Bank emphasized that the change of officers was not due to financial difficulties and ensured that Mr. Fleming would remain on the board of directors, his untimely death set off panic amongst note holders and depositors, and a run began that day.

Following the run on the Mechanics bank, attention shifted to the Dry Dock Company. Rumors spread that New York City banks were refusing to accept Dry Dock notes. Predictably, this ignited a run on the bank. Despite bank officers' assurances that all Dry Dock bills would be redeemable at any bank,

[37] Williams (2016) argues that that liberalizations in British banking laws helped fuel the growth of trade credit from the United Kingdom to the cotton-producing regions of the United States.
[38] Joseph & Co. was a major creditor of the New Orleans cotton factors Herman Briggs & Co., who failed about a week earlier. Rockoff (2014: 17), Temin (1969) and Lepler (2013) consider this failure of those firms as the beginning of the Panic.
[39] Check kiting is a type of fraud that involves taking advantage of the duplicate money in the banking system during delays in processing a check. The scheme often requires the use of accounts at several different banks so money can be moved between them.
[40] *New York Herald 2* May1837.

the drain of the Dry Dock's specie reserves was unrelenting.[41] The Panic quickly spread to note holders of other banks, triggering a "general run" on all of the banks in New York City. *The Commercial Advertiser* estimated that six hundred thousand dollars of specie were withdrawn on the 8th and seven hundred thousand on the 9th. After a private meeting on the 10th of May, New York banks collectively decided to suspend specie payments.[42] The next day, banks in Mobile, Philadelphia, Hartford, Baltimore, Providence and upstate New York suspended. As the news traveled, the suspensions continued: Boston, Maine, and Washington D.C. on the 12th; New Orleans on the 13th; Cincinnati on the 17th; and Charleston, North Carolina, and Indiana on the 18th. Within a little over a week, nearly all of the banks in the United States had suspended payments.

3. The Pet Banks and the Panic: The Argument

The main hypotheses of this paper are that (i) the pet banks engaged in excessive risk-taking in the years prior to the crisis, and (ii) faced a collapse of public confidence as the Panic broke out in May of 1837, suffering differentially.

Hypothesis (i) reflects the incentives faced by the pet banks. In contrast to other bank liabilities, the federal deposits were unlikely to be withdrawn in response to perceptions of an increased risk of default. This diminished the disciplining effect of depositor scrutiny on bank managers' behavior. And the federal deposits held by many of the pet banks were quite large. Figure 1 presents data on the amount of deposits held by each deposit bank in November 1836 (and therefore reflects the effects of some of the supplemental transfers ordered by the Treasury), ranked by the banks' paid-in capital. The average ratio of federal deposits to paid-in capital was just over 80 percent among the pet banks, and it exceeded 100 percent for several of them.

In addition to the tens of millions of dollars they were lent, the deposit banks were given special status within the banking system. The Treasury initially guaranteed their notes, and although that decision was later reversed, the Treasury worked closely with the deposit banks to regulate other banks, and at times passed privileged information to them. The deposit banks' notes were at least in some regions given special status, in that they were among the only bank notes accepted for payments for federal land purchases (prior to the specie circular).[43] That some figures in the Democratic Party may have directed the deposit banks to make loans for political purposes may have indicated that the banks

[41] *Commercial Advertiser* 8 May1837.
[42] *The Commercial Advertiser* 10 May 1837.
[43] *Niles' Register*, April 23 1836, p. 138, 135.

were politically important to the Democratic Party, and therefore would be protected from excessive scrutiny or punitive regulations.

One clear measure of the significance of the status as a federal depositary can be found in banks' valuations. As stock prices embody expectations of future profits, the change in the share price of a newly chosen deposit bank should provide a market-based measure of the value of pet bank status. Relatively few of the deposit banks' shares were actually traded on exchanges, but price quotations for several of them can be found on the New York Stock Exchange. The Deposit Act of 1836 resulted in the creation of a number of new deposit banks in both cities, all of which were publicly traded before the designation. We therefore use the Deposit Act to analyze the value of pet bank status, using weekly NYSE share prices from Sylla, Wilson and Wright (2005).

Figure 2 presents the graphical evidence. Panel (a) of the figure shows the equal-weighted average difference in cumulative returns between eleven banks that were ever designated as deposit banks, compared to thirteen other banks that were never designated as deposit banks, from 1835-39. For comparison purposes, Panel (b) of the figure presents cumulative returns for an equal-weighted index of the 59 most liquid stocks on the NYSE.[44] The blue vertical line denotes the date when the Deposit Act passed, which resulted in the designation of new deposit banks. Prior to the Deposit Act, three of the eleven banks in the 'treated' group were deposit banks; following the Deposit Act, the remaining eight banks became deposit banks.[45] Changes in the difference between the two groups following the Deposit Act therefore reflect the effect of designation as pet banks. As the line in the figure clearly shows, the banks designated as deposit banks saw a rapid and substantial increase in their valuations. This is a clear indication that market participants believed that status as a deposit bank was quite valuable; the difference in cumulative returns increases by about seven percentage points.

The magnitude of this increase can be understood by comparison to some of the overall market movements in panel (b). The period between the failure of Josephs & Co. and the suspension witnessed a sharp decline among all stocks of around 30 percentage points. This implies that the increase in returns following designation as pet banks was equivalent in absolute magnitude to just over 20 percent of the size of the market decline prior to the suspension. This is clear evidence that deposit bank status was regarded as quite valuable. However, it should be noted that the deposit banks that were chosen in 1836 in New York tended to be smaller and less well established than the original 1833 deposit banks there, so

[44] In the years 1836 and 1837, quotations for many more securities can be observed on the NYSE, but many of them trade relatively infrequently.

[45] We do not know the exact dates when each pet bank was named as a depositary. However, the Treasury's summary of the transfer drafts to the new depositaries indicates that many were made within a month of the Deposit Act.

the designation as depositaries may have been unusually valuable for the 1836 banks analyzed in the figure.

In the figure, the values of the pet banks begin to collapse relative to the other banks around the time of the Josephs & Co. failure, which marked the beginnings of panic conditions in New York's financial markets. One interpretation of this pattern is that status as a pet bank was only perceived to be valuable in good times, when federal revenues were abundant and the risks of losses on bad loans were relatively slight. This might imply that market participants knew that the pet banks were making high-risk loans on dubious collateral—and were perhaps best able among all banks to take advantage of the booming markets of the mid-1830s—but when a downturn came, they would suffer differentially as a result.

This pattern would be consistent with some commentary from the period. Contemporary observers noted that the financial dislocations spreading throughout the southwest and west, particularly as speculation in land markets collapsed in early 1837, would "occasion heavy losses to the deposite banks, and some of those too will unquestionably fail" *(National Gazette*, 22 April 1837).[46]

It is also significant that the bank runs began in response to a scandal among two New York pet banks, and one of them, the Dry Dock, was among the very first to suspend.[47] The revelation that some of the pet banks had engaged in fraud may have shaken the confidence of the noteholders and depositors of all deposit banks, and caused those institutions to suffer greater declines in their liabilities in the crisis, as noteholders ran on them and deposit holders liquidated or transferred their accounts to the extent they could. In Panel (a) of Figure 2, the runs correspond to the beginning of a period when the cumulative difference in returns between pet banks and other banks becomes quite negative, although they would later recover.

But hypothesis (ii), that the deposit banks faced a collapse of public confidence and were subject to differentially severe runs during the panic, may also have had a political component. The pet banking system was a classic example of what Wallis (2006) has termed systematic corruption. In such a system, political agents manipulate economic rents by limiting entry to a select few: politics corrupts economic development. This was an obvious contradiction for an administration that made heavy use of antimonopoly rhetoric and represented a coalition of interests that included a hard-money faction opposed

[46] For example, Baker (1857: 175) concluded that "Some of the 'pet banks' were ruined by the possession of government funds, which, in the frenzy of a partisan triumph, they either mistook for their own, or else lost all discretion in the management of their trust; and the banks among whom the 'surplus revenue' was distributed can trace many a bad debt to the possession of these unexpected deposits, and which some of the more prudent banks had the caution and sagacity to decline."

[47] Critics of the pet banks also noted that the other early suspension was that of the deposit bank in Natchez, Mississippi, on the same day as the Dry Dock. (*Proceedings and Debates of the Convention of the Commonwealth of Pennsylvania to Propose Amendments to the Constitution*, vol. VI; 2 December 1837, p. 118.)

to banks of issue. The Democrats were accused of "electioneering through treasury banks," utilizing the resources of the pets to get Martin Van Buren elected to succeed Andrew Jackson as president.[48] One critic of the deposit banks claimed in December 1837 that

> If the present system of deposit banks continued, every state in the Union would soon be under the control of the great central power at Washington. The public money in the deposit banks was used for the purpose of plunder, and enriching bank and government favorites; and those who permitted it, partook of the profits, no doubt. Nothing would secure us from this great abuse, but cutting up, by the roots, this tree of evil.[49]

The Democrats could rationalize their creation of the pet bank system by claiming that it prevented another monster federal bank from emerging, and by attempting to use the pet bank system to create a more stable and specie-based money supply. But an incipient crisis revealed that the promised stability had not, in fact, been achieved. Instead, it revealed that Jackson's "humble efforts to restore a constitutional currency" had in fact created significant financial instability, culminating in a general suspension—a currency of inconvertible paper, rather than the 'constitutional' one of specie. This completely undermined the rationale for the pet bank system and made the adoption of some other system in which the former pet banks would no longer enjoy special status all but inevitable. The note holders and private depositors of the pet banks likely feared that the federal deposits would be withdrawn, which could have resulted in significant losses as they sold off assets to meet the demands of the federal government. In fact in April 1837, as the panic began to unfold in New Orleans, rumors circulated in that city of a "Treasury order calling upon the Deposite Banks to send the amount of public revenues in their vaults to Washington."[50] Although such rumors of the government running on the banks were unfounded, they likely reflected a realistic fear. And the Deposit Act did mandate that any bank that suspended convertibility would lose its status as a deposit bank.

Before the bank runs actually broke out, representatives of New York's banking community traveled to Washington to meet with President Van Buren to ask for assistance.[51] But Van Buren, so closely tied to New York's Safety Fund and pet banks, found it politically impossible to publicly support the banks, and refused their requests.[52] This illustrates how the contradictions between Jacksonian anti-monopoly and anti-bank rhetoric, and the Treasury's relationship with the deposit banks, created problems for the banking system and likely contributed to the crisis.

---

[48] Mackenzie (1846: 124).
[49] *Proceedings and Debates of the Convention of the Commonwealth of Pennsylvania to Propose Amendments to the Constitution*, vol. VI; 6 December 1837, p. 225.
[50] *New York Herald*, 26 April 1837.
[51] The assistance that was sought was an end to the Specie Circular, which New York's bankers felt had contributed to the stringency, and a special session of Congress for additional legislation to aid the banking system.
[52] This episode is chronicled in the *Enquirer* (various issues.)

In what follows, we test our hypotheses by analyzing changes in individual banks' liabilities and note discounts over time, and also by studying failure rates. If the pet banks engaged in excessive risk-taking prior to the crisis or faced a collapse of public confidence as the panic broke out, we should expect that their liabilities would have fallen, and their note discounts should have risen, to a greater extent than those of other banks, in the period following the panic.

Some recent contributions to the analysis of the Panic of 1837 have proposed hypotheses related to ours, which we will incorporate into our analysis. For example, Rousseau (2002) argued that the supplemental transfers from the deposit banks in 1836—in particular, those that were directed across state lines, which Rousseau argues were more likely to be made in specie—contributed to the panic, particularly in combination with the Specie Circular, which further drained specie from New York's banks. Rousseau's analysis builds on earlier contributions from Timberlake (1960) and Schreiber (1963), which argued that the transfers ordered by the Treasury created a liquidity problem for New York's banks, although they emphasized different elements of the transfers.[53]

Some elements of Rousseau's theory, such as the importance of the Specie Circular, which affected all banks, are not amenable to testing at the bank level. However, his hypothesis regarding the importance of the transfers can be tested, since if the transfers created liquidity problems for the deposit banks, then those that were directed to pay out greater amounts relative to their size should have been more adversely affected.[54] In a sense, Rousseau's theory offers an alternative to ours; his is a story of the pet banks being differentially affected, but only due to the transfer payments. We will therefore test whether the deposit banks fared worse following the crisis even if one controls for transfer payments.

In another recent contribution related to ours, Knodell (2006) explores potential mechanisms through which the Bank War may have contributed to the crisis. She focuses on three interrelated forces: greater entry among state banks to replace the role of the Second Bank; more liberal credit policy among the state banks; and the retention of reserves among the federal depositaries on the frontier, whose lending fueled the boom in land sales. Knodell's analysis is focused on the boom, not the bust, and its clearest implications are for regional data, rather than bank-level data. However, we can incorporate the implications of Knodell's reasoning into our analysis by testing whether new banks in locations where a Second Bank branch had operated fared worse in the crisis.

[53] Timberlake (1960) points to the official distribution of the surplus in 1837, which he argues was largely conduced in specie. Schreiber (1963: 936) suggests that both the interstate and intrastate transfers in 1836 and 1837 were in specie but that the transfers in 1836 were larger and had a greater impact than those in 1837.

[54] The transfers may also have been important because if they signified declining support for the deposit bank system. But this is not Rousseau's argument, and it is not testable at the bank level.

4. Data and Empirical Framework

This paper utilizes two main datasets. The first was collected by Warren Weber and includes essentially all published balance sheet data for American commercial banks from 1794 to 1863 (Weber, 2008). These data were used to calculate reserve ratios and net liabilities outstanding for each bank. The second, collected by Gary Gorton and Warren Weber, contains the monthly note discount quoted in Philadelphia for banks located throughout the United States from 1830 to 1858 (Gorton and Weber, nd).[55] The bank names in these datasets were matched to lists presented in different volumes of the *Annual Report of the Secretary of the Treasury* to identify the deposit banks in 1833, 1835 and 1836. Additional information on the banks was obtained from Weber (2005). Finally, data on the transfer drafts drawn as part of the supplemental transfers in 1836 was collected from in a report from Treasury Secretary Woodbury published by the U.S. Senate in 1836.[56] And data on the official distribution of the surplus ordered by the Deposit Act was obtained from a House Document from 1837.[57]

Table 1 presents summary statistics for the variables utilized in most of the analysis of the paper. The analysis will focus on the period 1835-1839, in order to exclude the effects of the Panic of 1839, which was related to but distinct from the Panic of 1837 (Wallis, 2001). The first row presents the average values of the banknote discounts observed for this period. As these data included some extreme outliers, the top 1 percent of values were trimmed from the dataset. This produced a final sample of 28,958 observations from 551 banks, with a mean value of 1.597 percent over the 1835-39 period.

The amount of outstanding banknotes and deposits are presented in the second row. For the deposit banks, we include only individual deposits and exclude the amounts of federal funds held at the bank. The frequency with which different states' banks were required to submit financial reports varied substantially; in several states, no bank data was reported either for the crucial periods of January 1836 and May 1837 when the Panic broke out, or between the outbreak of the Panic and the end of 1838. These banks cannot be observed during the peak of the credit expansion or the downturn caused by the panic

[55] The original data comes from the *Bicknell's Reporter, Counterfeit Detector, and General Prices Current*.
[56] U.S. Congress *Senate Document* no. 29 24th Congress 2nd session (20, December 1836) page 8-20. Complying with requests from the Senate on the 23rd of June, Secretary Treasury Woodbury submitted a report in December 1836 showing date and amount of transfers between individual banks starting from the 23rd of June 1836. There were 449 separate transfers ordered between July 6, 1837 and December 15, 1836, with payment dates ranging from July 31, 1836 to April 15, 1837. The average payment amount was around $84,700, but drafts ranged from $10,000 to $500,000.
[57] U.S. Congress *House Executive Document* No. 30, 25th Congress 1st session (Sept 1837) page 72-81, and 101-45. On September 25, 1837, Woodbury submitted a report on the amounts drawn in compliance with the Deposit Act of 1836. The statement contains the date of the order, the number of the installment, the amount, which bank the draft was drawn on and to which state the draft was payable to. There were 338 separate transfers ordered between January 1837 and June 1837 with an average amount of around $81,964 but exhibiting high variability.

and are therefore excluded from the analysis.[58] This results in a sample of 4,235 observations of log circulation and deposits from 495 different banks, with a mean value of 12.177. Information on these banks' locations, ages, and capital are presented in the rows that follow.

Three Outcomes

We study three bank outcomes. The first is log value of circulation and deposits—the total outstanding liabilities of each bank (with the federal deposits of the deposit banks excluded). The amount outstanding reflects the state of demand for a bank's liabilities, and therefore reflects the level of confidence in the safety of banks. During the Panic of 1837 this fell for the banking system as a whole, but the amount by which particular banks' outstanding liabilities fell varied considerably. We interpret changes in the amount outstanding for each bank as a reflection of changes in the level of depositor and noteholder confidence in that institution.[59] For example, in the case of New York, contemporary accounts of the bank runs in May of 1837 suggest that their intensity varied across banks, and were particularly severe with the Dry Dock and Mechanics Banks, which were tainted by scandal. Our hypothesis is that deposit banks faced greater declines in demand for their liabilities than other banks.

The suspension of convertibility of bank liabilities into specie complicates the interpretation of these data somewhat. Suspension halted the runs, and enabled banks to issue new liabilities that did not need to be convertible into specie.[60] However, even under suspension, the amount the bank was able to issue would still have been constrained by the level of demand, and also the expectation that the suspension would resume. Another possible source of concern regarding this outcome is that the management of a bank could exercise discretion of the amount of their liabilities outstanding, and potentially reduce them in order to strengthen the bank's balance sheet. That is, some component of an observed decline in bank liabilities might reflect managerial conservatism, rather than a decline in confidence in the bank by noteholders and depositors. It is difficult to rule out this possibility, but it should be noted that even if declines in liabilities were undertaken for this reason, their effect on local monetary conditions would be similar.

Fortunately, the second outcome we study, the level of banknote discounts, is not subject to these concerns. Banknotes were non-interest-bearing debt claims that could be redeemed on demand for specie at the issuing bank. In general, the discount represented the cost of bringing the note back to the issuing

[58] One might imagine that the inclusion of time fixed effects in the empirical analysis should address this problem. However, we face the problem that many individual banks reported information at widely varying dates. Our time fixed effects therefore group observations over ranges of dates. See below.
[59] Wallis (2001: 31) uses aggregate balance sheet items in his analysis of the role state debt played in of the Panic of 1839. He interprets the level of deposits as a measure of confidence in banks.
[60] On the operations of suspended banks during this era, see Hammond (1957: 478).

bank for redemption, but an extensive literature has shown that it also revealed information about bank-specific risks.[61] Changes in the level of note discounts for a particular bank over time therefore reflect changes in the perceived risk that the bank will default on its notes, and therefore provide a market-based measure of bank risk. It should be noted, however, that banknote discounts likely behaved somewhat differently from the quantity of liabilities outstanding, so we should not expect their determinants to be exactly the same. For example, in periods of rising demand for a bank's liabilities, the quantity outstanding likely expanded, whereas the discounts on the notes may have remained unchanged at a very low level. Banknote discounts changes reflected only changes in the probability of default, which would not have had a one to one correspondence with changes in the quantity of outstanding liabilities.

The average level of these note discounts over the 1835-39 period is presented in Figure 3. As one might expect, the time series exhibits a substantial spike following the May 1837 Panic and suspension, and then falls rapidly following the resumption of convertibility of bank liabilities into specie in May of 1838.

The third outcome we study is bank failures, during the months of May 1837 through June 1838. These events were relatively uncommon—only 1.9 percent of the more than 600 banks in existence at the time of the crisis actually failed—and did not constitute an important determinant of the impact of the crisis. Yet a differentially high failure rate among the deposit banks would provide additional evidence in support of our hypothesis of greater risk taking among those institutions.[62]

Empirical Framework

To investigate whether a collapse of confidence in the pet banks contributed to the severity of the Panic, we employ a differences-in-differences design. The baseline model is as follows:

$$y_{it} = \alpha_i + \gamma_t + \delta petbank_i \times postpanic_t + \beta \boldsymbol{X}_{it} + \epsilon_{it} \quad (1)$$

where y_{it} represents either the level of log circulation plus deposits or the level of the banknote discount; α_i and $\gamma_t$represent individual bank and time fixed effects, **X** is a vector additional controls, such as pre-panic levels of bank characteristics interacted with a post-panic indicator and/or regions interacted with a post-panic indicator. The post-panic indicator is equal to one for May 10 1837 and all subsequent dates. Standard errors will be clustered at the bank level. The banknote discounts are reported at uniform times for all banks, so our time fixed effects are for each month for which we have data.

However, the balance sheet data is reported at irregular intervals which vary substantially across banks. Figure 4 depicts the dates when individual bank statements are observed, by state. Each dot

[61] See Gorton (1996, 1999), Ales et al (2008) and Jaremski (2011).

[62] At least one deposit bank, the Dry Dock Bank of New York, closed its doors and ceased publication of its accounts, and yet was somehow not shut down by bank regulators—and recommenced operations in 1842. If the deposit banks were more likely to receive such favorable treatment, their failure rates may be understated.

represents a bank statement; the red vertical line represents May 10 1837. In some states, there is regular reporting, with information provided once per year—or even more than once per year—for all banks. In other states, the dates are completely irregular. We address this issue by grouping all of the dates into quarters, and we include fixed effects for each quarter in our dataset.

The main parameter of interest is δ, which reflects the difference-in-differences in each outcome for deposit banks, relative to the other banks. If the deposit banks faced differential pressure during the Panic, then this should be negative for bank liabilities, and positive for banknote discounts (which are positive amounts reflecting the difference between the market price of the notes and their face values). However, our framework can accommodate other possible determinants of changes in bank outcomes, including those predicted by Knodell (2006) and Rousseau (2002). For example, Knodell's analysis would predict that new banks, and banks in the cities in the South and West that formerly had branches of the Second Bank should have been more likely to expand their operations excessively. And this should have been particularly true of any banks created after the Bank War in those frontier cities where Second Bank branches had been located. To test whether these factors contributed to the severity of the Panic, we can estimate the following variation of (1):

$$y_{it} = \alpha_i + \gamma_t + \delta petbank_i \times postpanic_t + \theta_1 newbank_i \times postpanic_t + \theta_2 westbranch_i \times postpanic_t + + \theta_3 westbranch_i \times newbank_i \times postpanic_t + \beta \boldsymbol{X}_{it} + \epsilon_{it} \quad (1a)$$

where $newbank_i$ is an indicator for banks created after the Bank War and $westbranch_i$ is an indicator for banks operating in a city in the West or Southwest that had held a branch of the Second Bank. Knodell's reasoning would imply that we should expect all three of the theta parameters to be negative.

Rousseau (2002) presents somewhat more of a competing hypothesis. In his analysis, the pet banks should have been affected mainly through the transfer payments they made in 1836. If we therefore estimate:

$$y_{it} = \alpha_i + \gamma_t + \delta petbank_i \times postpanic_t + \sum \lambda_j transfers_i \times postpanic_t + \beta \boldsymbol{X}_{it} + \epsilon_{it} \quad (1b)$$

the inclusion of the transfer variables should produce substantial negative estimates for the λ coefficients, and reduce the estimated value of δ from (1).

5. Results: Panel Data Estimation

Before proceeding with the estimation of equation (1) and its variants, which will focus on measuring the difference in differences in bank outcomes for the post-Panic period as a whole, it is helpful to examine the differences between the pet banks and the other banks over time. Figure 5 plots the time-varying differences between deposit banks and the other banks, as estimated from regressions

with time and bank fixed effects.[63] As shown in Panel (a) of the figure, the pet banks' liabilities were growing more rapidly than those of other banks up to the time of the Panic, at which point the differences begin to decline. This suggests that the pet banks were expanding their operations even more than other banks, until the Panic struck, and the pattern was reversed. Panel (b) shows that the differences in banknote discounts were initially stable and negative (meaning that pet banks were perceived as safer than other banks) for most of the pre-Panic period, although the difference began to rise in late 1836 and early 1837. Then in May of 1837, the difference increased substantially and became positive, and rose as high as 1.5 percent in April 1838. Figure 3 shows that the average banknote discount overall in that month was about 2.5 percent, so the additional discount on the deposit banks' notes was equal to 60 percent of the overall mean. This is clear evidence that the Panic affected the pet banks differentially. It should also be noted that there are no apparent long-run trends evident in the figure; any estimated average differences for the post-Panic period are therefore unlikely to be the outcome of violations of the parallel trends assumption.

Table 3 presents results of regressions of equations (1), (1a) and (1b) for the log value of circulation plus deposits. Column (1) presents estimates from a specification with only bank, quarter and region x post-panic fixed effects; column (2) adds interactions between log capital, location in a major city, and the 1836 reserve ratio with a post-Panic indicator. Both specifications produce a substantial, negative estimate for the pet banks, relative to other banks. The estimate reported in column (2) indicates that the outstanding liabilities of the deposit banks fell by an additional 18.5 percent in the post-Panic period.[64] Considering that the average change in outstanding liabilities for all banks in the post-Panic period was -20.1 percent, this is a very substantial effect.[65]

Column (3) presents the results for equation (1a)—the Second Bank variables. The new bank indicator has the hypothesized negative sign but is imprecisely estimated. Consistent with Knodell's hypothesis, the estimated effect of a location in a city that had had a Second Bank branch is very large and negative. However, the stronger test of the Knodell hypothesis is the interaction between western cities that had Second Bank branches, and the indicator for new banks. Interestingly, the estimated effect is actually positive, indicating that new banks in those cities did better than other banks. This implies that it was not the new entrants but the existing banks in those cities that suffered differentially following the Panic.

Column (4) presents estimates of equation (1b), with the transfer draft variables included. Rousseau (2002) emphasizes the importance of the 1836 interstate transfers, but other authors have

[63] That is, the figure plots values of δ_t from regressions of the form: $y_{it} = \alpha_i + \gamma_t + \sum \delta_t \, petbank_i \times time_t + \epsilon_{it}$.
[64] -18.53% = $100 \times (e^{-0.205}\text{-}1)$.
[65] The average difference is calculated from a regression with bank fixed effects.

emphasized the importance of the 1837 transfers, so those, along with the intra-state transfers, are included as well. But as we are interested in analyzing the influence of the transfers on the decline in bank liabilities, we include the net value of the 1836 transfers (with net recipients receiving a negative value.) Consistent with Rousseau's analysis, the 1836 transfers do have a significant negative effect, whereas the other transfer variables do not. But again, the deposit bank variable remains essentially unchanged. This suggests that the 1836 transfers aggravated the problem for the pet banks, but they were not the whole problem. Column (5) presents the results of a specification including all of the different covariates. Most of the estimates remain generally the same.

Table 4 presents the results for regressions with the banknote discount as the dependent variable. Columns (1) and (2) present estimates for different versions of equation (1), and these imply a strong effect for the deposit banks. The estimate in column (2) implies that the deposit banks' note discounts rose by 0.414 percent relative to those of other banks, an indication of differentially elevated perceptions of risk. The average level of the banknote discount prior to the Panic was 1.38 percent, so this differential increase was equivalent to 30 percent of the initial level.

In the remaining columns, where versions of equation (1a) and (1b) are presented, the estimated effect for the deposit banks remains consistently large. However, many of the other parameter estimates are somewhat different from those reported in Table 3. Banknote discounts reflect default probabilities, which should be reflected in changes in the amount of outstanding liabilities of banks, but the correlation between these two outcomes may not have been that strong. Accordingly, one might imagine that the determinants of changes in banknote discounts may have been somewhat different from the determinants of changes in the amount of bank liabilities outstanding, and this is clearly reflected in the data. For example, whereas the estimates reported in Table 3 indicated that being a new bank and being located in a major city had little effect on changes in banks' outstanding liabilities, those variables had very large and significant effects on changes in banknote discounts. The estimates in column (3) imply that banks located in major cities saw their note discounts rise by nearly 50 percent less. The latter effect was likely produced by the efficiency of banknote markets in major cities, which had a disciplining effect on note issuance both before and after the Panic.[66]

Column (3) presents results for equation (1a), with the Second Bank variables included. These results are quite different from those of Table 3. New banks saw their note discounts rise an additional 27 percent (an effect 68 percent as large as that of being a deposit bank). And whereas Table 3 reported a very large effect of locations in western cities that had been the locations of Second Bank branches on bank liabilities, here, the estimated effect of those locations is actually negative, indicating a smaller

[66] See, for example, the model in Gorton (1996).

increase in banknote discounts. The sign of the western branch interaction with the new bank indicator is positive, consistent with the Knodell analysis. But both parameters are imprecisely estimated, which suggests that we should not ascribe too much importance to the magnitudes of the estimates.

Column (4) presents estimates for equation (1b), with the transfer draft variables included. Here, the point estimate for the 1836 interstate transfers is positive, indicating elevated risk of default. This is consistent with Rousseau's (2002) analysis.

Finally, Table 5 presents results for regressions investigating the determinants of firm failures. Unlike those of Tables 3 and 4, these regressions are purely cross-sectional, and include all banks for which data is available. The results in column (2) indicate that conditional on bank characteristics such as size and reserve ratios, the deposit banks had much higher failure rates. Neither the Second Bank nor the Deposit Act variables have statistically significant effects on failure rates, and their inclusion does not alter the estimated effect of status as a deposit bank. This elevated failure rate is consistent with the pet banks taking on excessive levels of risk, and facing differentially severe runs in the panic.

6. Macroeconomic Impacts of the Deposit Banks: Counterfactual Analysis

The preceding analysis has presented evidence that the deposit banks were affected differentially by the Panic: their outstanding liabilities declined, and their banknote discounts rose, to a substantially greater extent than those of other banks. A limitation of those results, however, is that they cannot address the overall importance of the contraction among the pet banks. Even if they suffered differentially, they were relatively few in number (83 out of around 600 commercial banks), so it is not clear whether they could have accounted for a substantial portion of the overall contraction in bank credit.

In order to address this question, we aggregate Weber's (2008) bank-level data to construct new national and regional estimates of total net liabilities of the commercial banking system.[67] Our new series improves upon that of Temin (1969), who utilizes less-detailed Treasury reports.[68] We then use the new

[67] Net liabilities are defined as Notes + Deposits + ("due to other banks" – ("due from other banks" + "notes of other banks")). This is consistent with Temin's definition.

[68] The process of aggregating the data from individual banks up to the national level was made complex by two interrelated problems: first, banks in different states reported balance sheet information at irregular times, sometimes more than once per year; and second, some banks did not report any information at all in particular years. To address the former, the bank data was grouped into year bins, and the latest report for each year was taken (including reports that were made up to two weeks in the following January.) Given that the year 1836 saw a significant contraction late in the year, for that year only, the maximum value was taken if there were multiple observations, so that the "peak" could be observed. And for 1837, only data observed after May was utilized, so that the effect of the Panic could be seen. To address the problem that data was missing for a large number of banks for particular years, a spline was fitted to the data for banks with missing data between other observations.

series to construct counterfactual estimates of the money supply, to analyze the specific contribution of the deposit banks to the growth of the money supply in the 1830s and the contraction in 1837.

Ideally, one would want to compare the observed level of the money supply to the one that would have prevailed if, contrary to fact, the Second Bank had been rechartered and the pet bank system never created.[69] But to do so requires strong and potentially contradictory assumptions. Instead, we will construct a counterfactual estimate of the growth of the money supply under the assumption that the deposit banks' net liabilities grew at exactly the same rates as those of the other banks. We accept that the Bank War occurred and compare the world we observe with the pet banks to a counterfactual alternative in which no banks are designated as depositaries or given special status, because something like an independent treasury system was adopted. This enables us to measure the effect of the differential growth and contraction of the deposit banks on the national money supply, and therefore, the effect of the deposit banks' particular status and behavior on the panic and its aftermath. If the behavior of commercial banks not designated as depositaries can be taken as a reasonable indication of what the pet banks' behavior in a world in which there were no pet banks would have been, then our counterfactual estimates are valid.

Figure 6 first presents our new estimates of the money supply, both nationally and by region. In each panel of the figure, the black line presents the value for all commercial banks, and the blue line presents the value with the deposit banks excluded. We assess whether or not these data are reasonable by comparing them to Temin's in Figure 7, which also compares the reserve ratio constructed using the same methods with Temin's. The data are generally quite similar, although there are some notable differences. In particular, our estimates of the reserve ratio are smoother and generally show a gradual increase over time; this is even more consistent with Temin's central point that the reserve ratio did not fall than Temin's own data.[70]

In Figure 6, the changing distance between the two lines illustrates the contribution of the deposit banks to the growth (and subsequent contraction) of the money supply around the Panic. As the figure makes clear, the deposit banks played an important role in the growth in bank liabilities in 1834-36, and in their contraction beginning in 1837, for the United States as a whole. In the upper left panel of the figure, the two lines grow more distant in the years leading up to the Panic, and then move closer together. The relative importance of the pet banks in different regions, however, varied somewhat—they

[69] Using regional data, Knodell (2006) performs calculations closely related to this.

[70] Another important difference, however, is that our data do not show a large increase in 1834, corresponding to the effects of Biddle's contraction. Temin (1969: 59-68) presents a careful analysis of the causes and consequences of the contraction and increase in reserves. We are still working to understand the differences between his series and ours.

were much more important in the Mid-Atlantic, Southeast and Southwest than they were in New England or the old Northwest.

These comparisons are suggestive, but they do not constitute clear evidence that the pet banks contributed disproportionately to the crisis through excessive risk-taking. The pet banks included many large commercial banks, so their contribution to the money supply was necessarily substantial. The question is: how much did the pet banks' special status, reflected in behavior that was different from those of other banks, actually contribute to the expansion and contraction in the money supply? In order to address this question, we construct counterfactual measures of net liabilities, where we start in 1833, and assume that total net liabilities of the pet banks grows in each year at exactly the same rate as those of other banks.[71]

Our counterfactual data (in blue) are compared to our estimates of the money supply (in black) in Figure 8. In general the counterfactual values show less growth between 1833 and 1836 and less of a decline in 1837. Comparing the two national series gives a sense of the quantitative significance of the pet banks' status. Our estimated value for total net liabilities for all commercial banks declines by $85.45 million between 1836 and 1837. Our counterfactual value declines by only $59.55 million. This implies that the differential behavior of the pet banks was responsible for $25.9 million, or 30.3 percent, of the overall decline. Given the vulnerabilities of the financial system related to cotton markets and public land sales, it seems quite likely that a significant economic downturn would have happened in the absence of the pet banking system; it would, however, have been significantly less severe.

Finally, one other characteristic of the counterfactual calculation is worth noting. For the nation as a whole, and particularly for the Mid-Atlantic region, the counterfactual values of the money supply decline to a greater extent in 1839-40 than the actual money supply. This reflects the far-reaching impact of the suspension of the Bank of the United States of Pennsylvania, the state-chartered successor to the Second Bank.

7. Conclusion

Andrew Jackson's Bank War was politically momentous, contributing to the development of American political parties and strengthening the relative power of the presidency among the institutions of American government (McCormick, 1966; Remini, 1967). It was also a significant institutional

[71] Let m_{pt} represent net liabilities of the pet banks in year *t*, and let m_{nt} represent net liabilities of the non-pet banks, so that the true value of total net liabilities is $M_t = m_{pt} + m_{nt}$. To construct the counterfactual for year *t+1*, we apply the growth rate of m_{nt} to it m_{pt}: $\hat{m}_{pt+1} = m_{pt} \times \left(\frac{m_{nt+1}}{m_{nt}}\right)$. The counterfactual value of the money supply is then $\hat{M}_{t+1} = \hat{m}_{pt+1} + m_{nt+1}$.

reform, closing down the national bank in response to concerns regarding its exclusive legal privileges and potential to corrupt American democracy. But it led to the creation of a new system that rivaled the Second Bank in its potential for corruption: the pet banks. The pet banks received huge inflows of public money, and the incentive structure they faced led them to allocate those funds in relatively risky ways, which contributed to the crisis. The contradiction between Jacksonian antimonopoly rhetoric and pet banking practice likely contributed to the inconsistent nature of the Treasury's stance toward those institutions.

This paper has used comprehensive bank-level data to analyze the role of the pet banks in the Panic of 1837. The results indicate that in the two years following the Panic, the pet banks' outstanding liabilities (excluding the federal deposits) declined nearly twice as much as other banks', and that their banknote discounts rose nearly twice as much. They also failed at much higher rates than other banks, although the overall failure rates were relatively low. Our counterfactual estimates of the money supply indicate that if the pet banks had behaved in the same way as other commercial banks, the money stock would have been about 16 percent lower in 1836, and would have declined by 30.3 percent less in 1837.

These results imply that Temin's (1969) exoneration of Jackson's polices was too broad. Temin correctly pointed to failures of economic reasoning among Jackson's critics, and conclusively refuted their claim that the Bank War led to significant increases in the issuance of banknotes relative to the amount of reserves held in the banking system. Yet even if the bank war did not have that effect, it may have intensified the boom-and-bust cycle of the Panic in other ways. The network of politically allied pet banks created by the Treasury to replace the Second Bank likely engaged in excessive risk taking in response to the exclusive status and abundant resources conferred upon them. Financial crises often follow periods of rapid credit growth—they tend to be "credit booms gone wrong" (Schularik and Taylor, 2012). The 1830s were no different, with the pet banks helping fuel the credit boom and taking on particularly risky collateral. As a period of stringency emerged, due in part to changes in the lending policy of the Bank of England, the confidence of depositors, noteholders, and stockholders in the deposit banks was shaken. Although it had many other causes, the Panic of 1837 was the collapse of the pet banking system.

References

Adams, S. P. 2011. "How Choice Fueled Panic: Philadelphians, Consumption, and the Panic of 1837." *Enterprise and Society* 12 (4): 761-89. doi:10.1093/es/khr 019.

Ales, Laurence, Carapella, Francesca, Maziero, Pricila, and Warren E. Weber. 2008. "A Model of Banknote Discounts," *Journal of Economic Theory* 142, 5-27.

Baker, Henry F. 1857. "Banking in the United States: An Historical Sketch of Banking in the State of Indiana," *Bankers Magazine* VII (3): 161-179.

Bancroft, Hubert H. 1914. *The financial panic of 1837, The Great Republic By the Master Historians.*

Bodenhorn, Howard. 2003. *State Banking in Early America: A New Economic History*. New York: Oxford University Press

Bodenhorn, Howard. 2006. "Bank Chartering and Political Corruption in Antebellum New York: Free Banking as Reform." In Goldin and Glaeser, eds., *Corruption and Reform: Lessons from America's Economic History*. Chicago: University of Chicago Press.

Bodenhorn, Howard. 2017. "Opening Access: Banks and Politics in New York from the Revolution to the Civil War." *NBER Working Paper Series*, number 23560.

Bourne, Edward Gaylord. 1885. *The history of the surplus revenue of 1837: being an account of its origin, its distribution among the States, and the uses to which it was applied*. New York & London: G. P. Putnam's Sons.

Calomiris, Charles W., and Gary Gorton. 1991. "The Origins of Banking Panics: Models, Facts, and Bank Regulation." *Financial Markets and Financial Crises*. Chicago: University of Chicago Press.

Calomiris, Charles W., and Mark Carlson. 2015. "Interbank Networks in the National Banking Era: Their Purpose and Their Role in the Panic of 1893." Working paper.

Calomiris, Charles W., and Stephen H. Haber. *Fragile by design: the political origins of banking crises and scarce credit*. Princeton, NJ: Princeton University Press, 2015.

Catterall, Ralph C. H. 1960. *The Second Bank of the United States*. Chicago: University of Chicago Press.

Darling, Arthur B. 1924. "Jacksonian Democracy in Massachusetts 1824-1848." *The American Historical Review* 29(2): 271-87.

Dubin, Michael J. 2007. *Party Affiliations in the State Legislatures.* Jefferson, NC: McFarland & Co.

Engerman, Stanley L. 1970. "A Note on the Economic Consequences of the Second Bank of the United States." *Journal of Political Economy* 78 (4): 725-28. doi:10.1086/259665.

Gatell, Frank Otto. 1964. "Spoils of the Bank War: Political Bias in the Selection of Pet Banks." *The American Historical Review* 70 (1): 33-58.

Gibbons, J.S. 1858. *The banks of New-York, their dealers, the clearing house, and the panic of 1857*. New York: D. Appleton & Co.

Gorton, Gary. 1996. "Reputation Formation in Early Bank Note Markets," *Journal of Political Economy* 104(2): 346-97.

Gorton, Gary. 1999. "Pricing free bank notes." *Journal of Monetary Economics* 44 (1): 33-64. doi:10.1016/s0304-3932(99)00014-8.

Gorton, Gary, and Warren E. Weber. nd. *Quoted Discounts on State Bank Note Discounts in Philadelphia, 1832-1858.* Research Department, Federal Reserve Bank of Minneapolis.

Gouge, William. 1833. A Short History of Paper Money and Banking in the United States, to Which is Prefixed an Inquiry into the Principles of the System. Philadelphia: T.W. Ustick.

Hammond, Bray. 1957. *Banks and politics in America from the Revolution to the Civil War*. Princeton, NJ: Princeton University Press.

Hilt, Eric. 2017. "Early American Corporations and the State." In *Corporations and American Democracy*, edited by William J. Novak and Naomi R. Lamoreaux. Cambridge: Harvard University Press.

Jaremski, Matthew. 2011. "Bank Specific Default Risk in the Pricing of Bank Note Discounts," *Journal of Economic History* 71(4): 950-75.

Knodell, Jane. 2006. "Rethinking the Jacksonian Economy: The Impact of the 1832 Bank Veto on Commercial Banking." *The Journal of Economic History* 66 (3) doi:10.1017/s0022050706000258.
Knodell, Jane Ellen. 2017. *The Second Bank of the United States: "Central" Banker in an Era of Nation-building, 1816-1836.* London: Routledge.
Lepler, Jessica M. 2013. *The many panics of 1837: people, politics, and the creation of a transatlantic crisis*. New York: Cambridge University Press.
Lu, Qian, and John Joseph Wallis. 2017. "Banks, Politics, and Political Parties: From Partisan Banking to Open Access in Early Massachusetts." in *Organizations, Civil Society, and the Roots of Development*, ed. Lamoreaux and Wallis. Chicago: University of Chicago Press.
Macesich, George. 1960. "Sources of Monetary Disturbances in the United States, 1834-1845." *The Journal of Economic History* 20 (3): 407-34.
Mackenzie, William L. 1846. *The Life and Times of Martin Van Buren*. Boston: Cooke & Co.
McCormick, Richard P. 1966. *The Second American Party System*. Chapel Hill: University of North Carolina Press.
McFaul, John M. 1972. *The Politics of Jacksonian Finance*. Ithaca: Cornell University Press.
McGrane, Reginald Charles. 1924. *The panic of 1837; some financial problems of the Jacksonian era*. Chicago: University of Chicago Press.
Meerman, Jacob P. 1963. "The Climax of the Bank War: Biddle's Contraction, 1833-34." Journal of Political Economy 71 (4): 378-88. doi:10.1086/258785.
Mihm, Stephen. 2013. "The Fog of War: Jackson, Biddle and the Destruction of the Bank of the United States." In *A Companion to the Era of Andrew Jackson*, 348-75. doi:10.1002/9781118290767.ch17.
North, Douglass C. 1966. *The economic growth of the United States 1790-1860: the social ethics of U.S. economic policy*. New York, NY.: W.W. Norton & Company.
Pennsylvania. 1837-1838. *Proceedings and Debates of the Convention of the Commonwealth of Pennsylvania to Propose Amendments to the Constitution*, vol. VI. Harrisburg: Packer, Barrett and Parke.
Redlich, Fritz. 1951. "The Molding of American Banking: Men and Ideas [1781-1910]."
Remini, Robert V. 1958. "The Albany Regency." *New York History* 39 (4): 341-55.
Remini, Robert V. 1967. *Andrew Jackson and the Bank War*. New York: W.W. Norton.
Rezneck, Samuel. 1935. "The Social History of an American Depression, 1837-1843." *The American Historical Review* 40 (4): 662. doi:10.2307/1842418.
Roberts, Alasdair. 2012. *The first Great Depression: economic crisis and political disorder in the United States, 1837-1848*. Ithaca: Cornell University Press.
Rousseau, Peter. 2002. "Jacksonian Monetary Policy, Specie Flows, and the Panic of 1837." *The Journal of Economic History* 62 (2): 457-87. doi:10.3386/w7528.
Russell, John E. *The panics of 1837 and 1857 : an address by Russell, John E. 1834-1903* . 1875.
Scheiber, Harry N. 1963. "The Pet Banks in Jacksonian Politics and Finance, 1833-1841." *The Journal of Economic History* 23 (2): 196-214.
Schlesinger, Arthur Jr. 1945. *The Age of Jackson.* Boston: Little, Brown & Co.
Schularik, Moritz, and Alan M.Taylor. 2012. "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008," *American Economic Review* 102(2): 1029-1061.
Smith, Bruce D., Warren E. Weber, and Arthur J. Rolnick. 2000. "The Suffolk Bank and the Panic of 1837." *Federal Reserve Bank of Minneapolis Quarterly Review*, 3-13.
Smith, Norman W., and J. Van Fenstermaker. 1967. "The Development of American Commercial Banking: 1782-1837." *The Economic History Review* 20 (1): 202. doi:10.2307/2592081.
Sylla, Richard E., Wilson, Jack W., and Robert E. Wright. 2005. *Price Quotations in Early United States Securities Markets, 1790-1860.* ICPSR04053-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research, 2005-08-24.
Temin, Peter. 1969. *The Jacksonian economy*. New York: Norton.

Timberlake, Richard H. 1960. "The Specie Circular and Distribution of the Surplus." *Journal of Political Economy* 68 (2): 109-17. doi:10.1086/258289.
Trufant, Samuel A. 1918. *Review of banking in New Orleans, 1830-1840: history of the panic of 1837*. New Orleans.
United States. Department of the Treasury. 1830-1840. *Annual Report of the Secretary of the Treasury on the State of the Finances*. https://fraser.stlouisfed.org
U.S. Congress, *House Executive Document No. 18*. 25th Congress, 2d Session, 1837
U.S. Congress, *House Executive Document No. 13*. 25th Congress, 2d Session, 1837
U.S. Congress, *House Executive Document No. 30*. 25th Congress, 1st Session, 1837
U.S. Congress, *House Executive Document No. 227*. 25th Congress, 3rd Session, 1839
U.S. Congress, *Senate Document No. 29.* 24th Congress, 2d Session, 1837, 1837
U.S. Congress, *Senate Document No. 79*. 25th Congress, 2d Session, 1838
U.S. Congress, *House Executive Document No. 13.* 25th Congress, 3rd Session, 1838
U.S. Congress, *Senate Document No. 471*. 25th Congress, 2d Session, 1838
U.S. Congress, *Senate Document No. 312.* 24th Congress, 1st Session, 1838
U.S. Congress, *Senate Document No. 86*. 23th Congress, 1st Session, 1838
Van Fenstermaker, J. 1965. "The Statistics of American Commercial Banking, 1782–1818." *Journal of Economic History* 25(3): 400-13. doi:10.1017/s0022050700057375.
Wallis, John Joseph. 2001. "What Caused the Crisis of 1839?" Working paper. doi:10.3386/h0133.
Wallis, John Joseph. 2004. "The Concept of Systematic Corruption in American Political and Economic History." In Goldin and Glaeser, eds., *Corruption and Reform: Lessons from America's Economic History*. Chicago: University of Chicago Press. doi:10.3386/w10952.
Weber, Warren E. 2003. "Interbank payments relationships in the antebellum United States: evidence from Pennsylvania." *Journal of Monetary Economics* 50 (2): 455-74. doi:10.1016/s0304-3932(03)00008-4.
Weber, Warren E. 2005. *Census of Early State Banks in the United States*. http://cdm16030.contentdm.oclc.org/cdm/singleitem/collection/p16030coll4/id/12/rec/1
Weber, Warren E. 2006. "Early State Banks in the United States: How Many Were There and When Did They Exist?" *Journal of Economic History* 66 (2). doi:10.1017/s0022050706000180.
Weber, Warren E. 2008. *Balance sheets for U.S. Antebellum State Banks*. Research Department, Federal Reserve Bank of Minneapolis. http://cdm16030.contentdm.oclc.org/cdm/about/collection/p16030coll5
Willentz, Sean. 2005. *The Rise of American Democracy.* New York: W.W. Norton & Co.
Williams, Geoffrey Fain. 2016. "'Lending money to people across the water': The British Joint Stock Banking Acts of 1826 and 1833, and the Panic of 1837." Working paper.

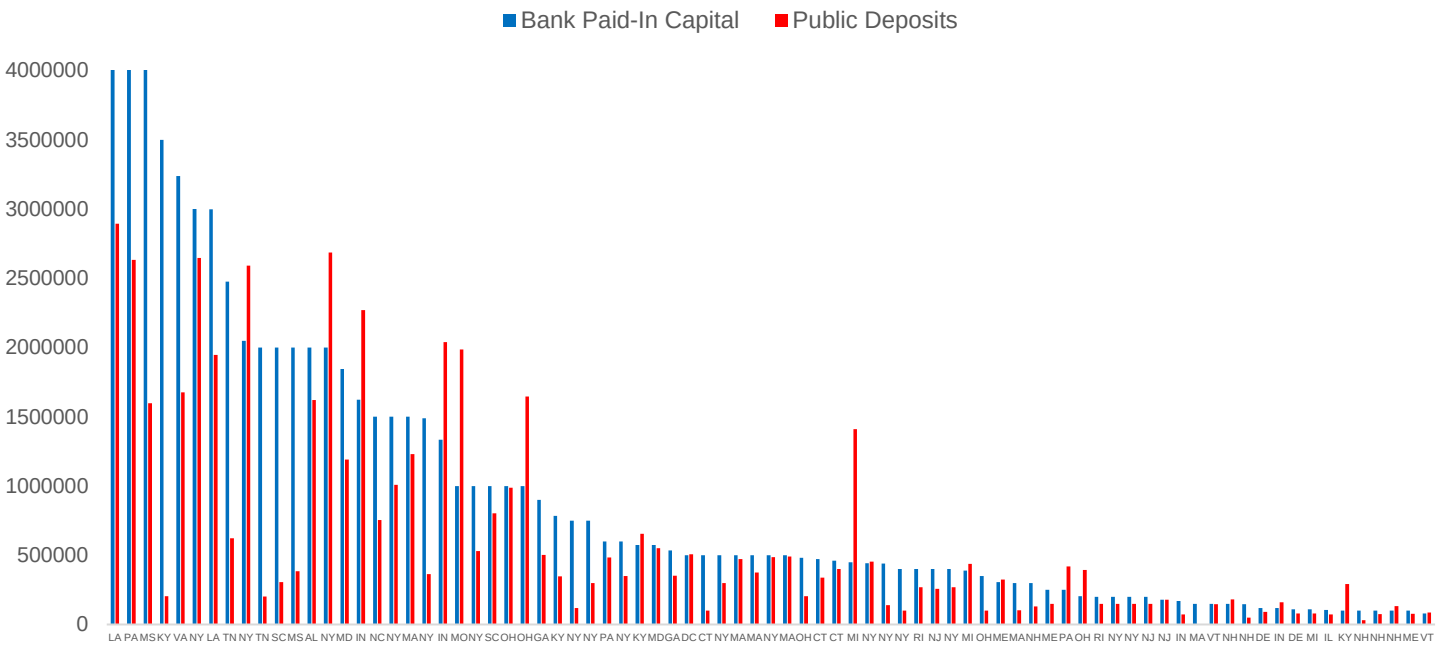
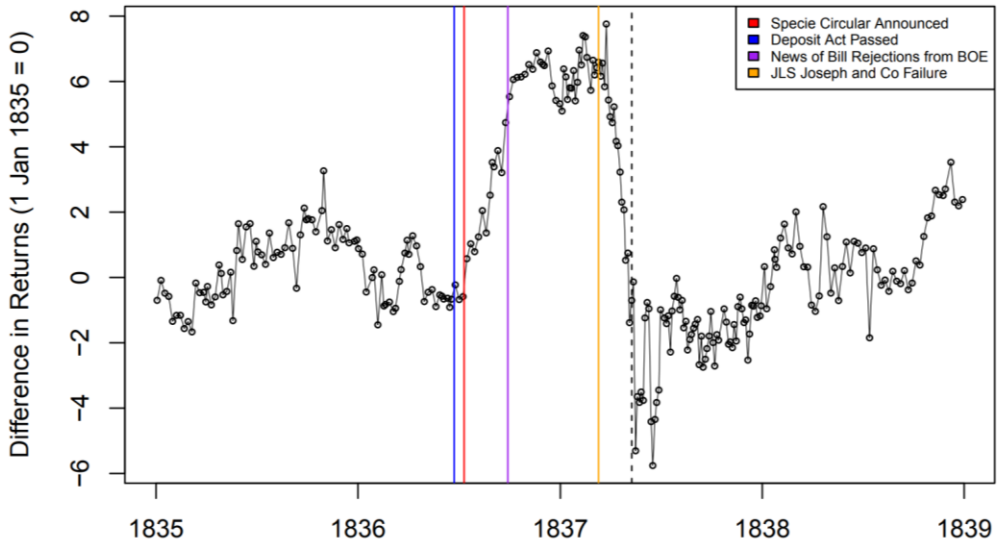


Figure 1: Deposit Banks, November 1836

This figure presents the paid-in capital, and public deposits, of deposit banks in November1836. The banks are sorted by paid-in capital. Paid-in capital is in blue, and the public deposits are in red. For banks whose paid-in capital is greater than $4 million, their capital is shown as $4 million., along with the amount of federal deposits they held. Each bank is labeled by the two-letter abbreviation for the state where it was located. Total federal deposits were $47 million.

(a) Pet Banks v. Non-Pets



(b) All Stocks

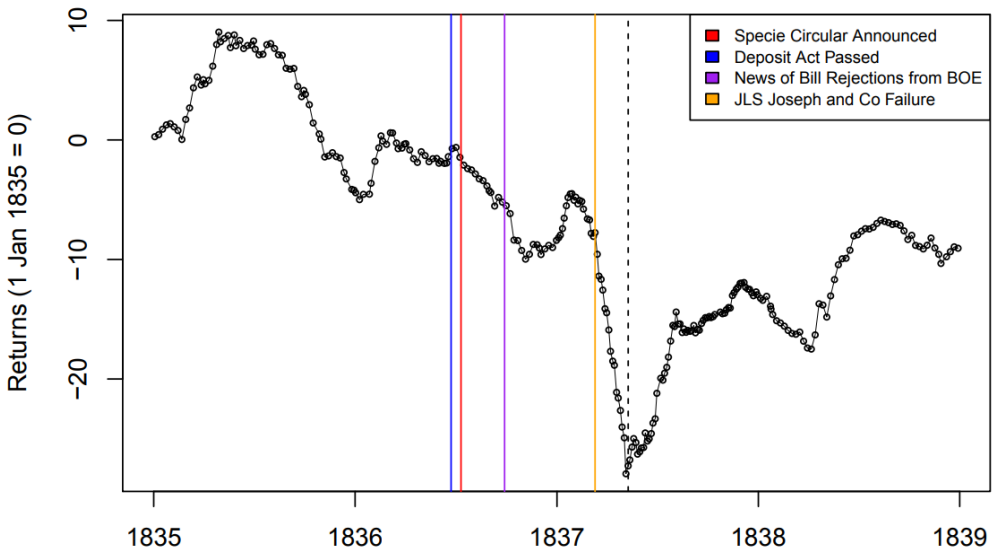


Figure 2: Cumulative Returns, 1835-39, Deposit vs. Non-Deposit Banks, and Overall
Panel (a) in the figure presents difference the equal-weighted average difference in returns for 11 banks that were ever designated as pet banks vs. 13 other banks, from 1835-39. The blue vertical line denotes the date when the Deposit Act passed, which resulted in the designation of new deposit banks. Prior to the Act, 3 of the 11 banks in the 'treated' group were deposit banks; following the Deposit Act, all 11 banks became depoist banks. Changes in the difference between the two groups following the Deposit Act therefore reflects changes in the status of the treated banks. Panel (b) presents equal-weighted cumulative returns for the 59 most liquid stocks on the NYSE.

Figure 3: Average Monthly Banknote Discounts, 1835-59

This figure presents the average values of the banknote discounts observed over the months of 1835-39. Source: Authors' calculations from Gorton and Weber (n.d.).

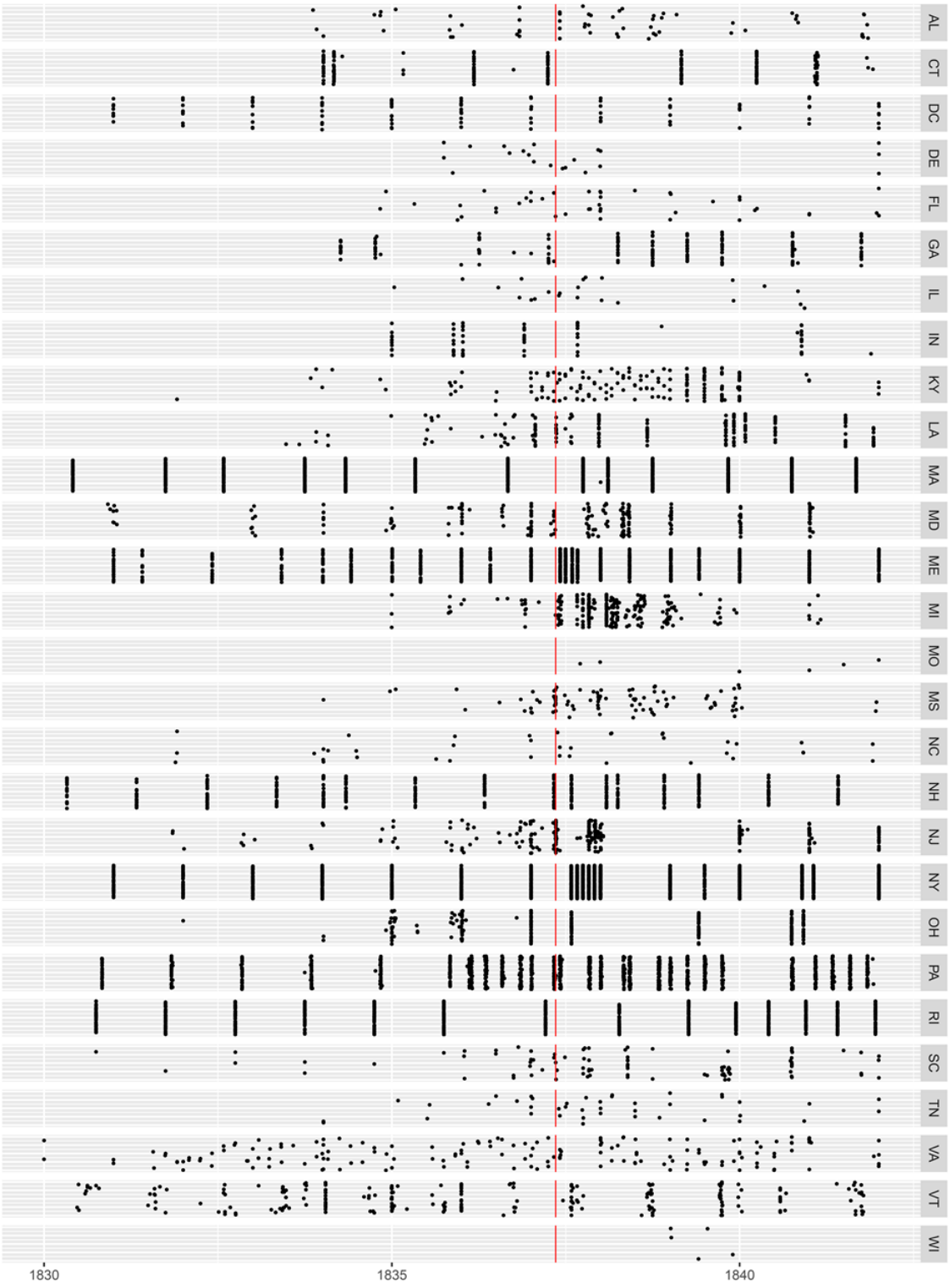
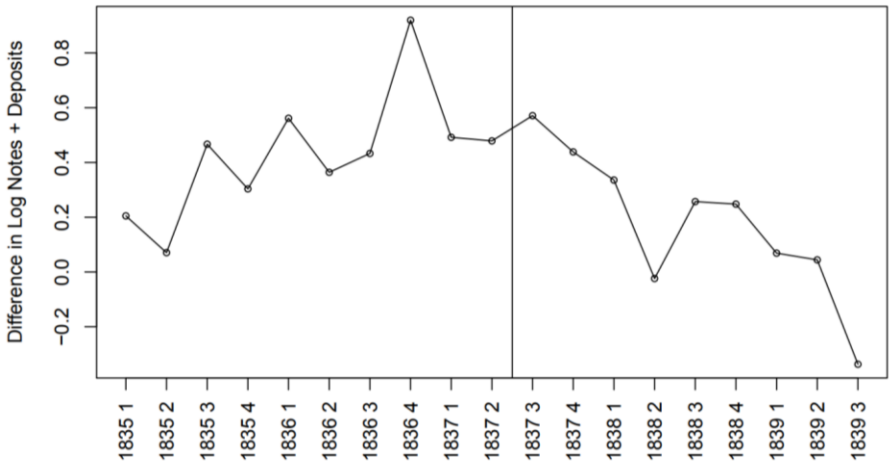


Figure 4: Timing of Reports of Individual Banks, by State

Row headings in the figure indicate states. Each dot represents the report of a bank. Dates are labeld at the bottom of the figure; the red vertical line denotes May 10 1837. This figure illustrates the variation across and within states in the timing and frequency of individual bank reports.

(a) Log Circulation Plus Deposits



(b) Banknote Discounts

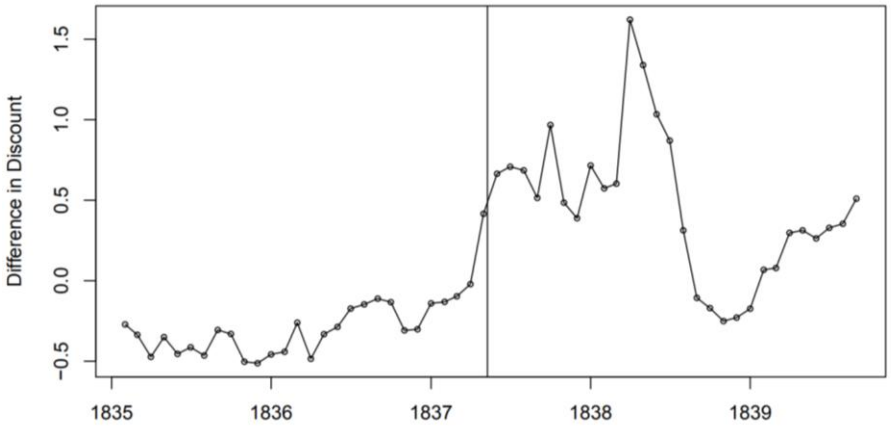


Figure 5: Estimated Differences, Pet Banks v. Other Banks, 1835-1839

The figure presents differences between the pet banks and other banks over time, as estimated from regressions with bank fixed effects and time fixed effects. Panel (a) presents quarterly differences in the average values of log(circulation + deposits), and Panel (b) presents monthly differences in the average values of banknote discounts. The vertical line indicates the beginning of the Panic, and corresponds to the quarter or month closest to May 10 1837.

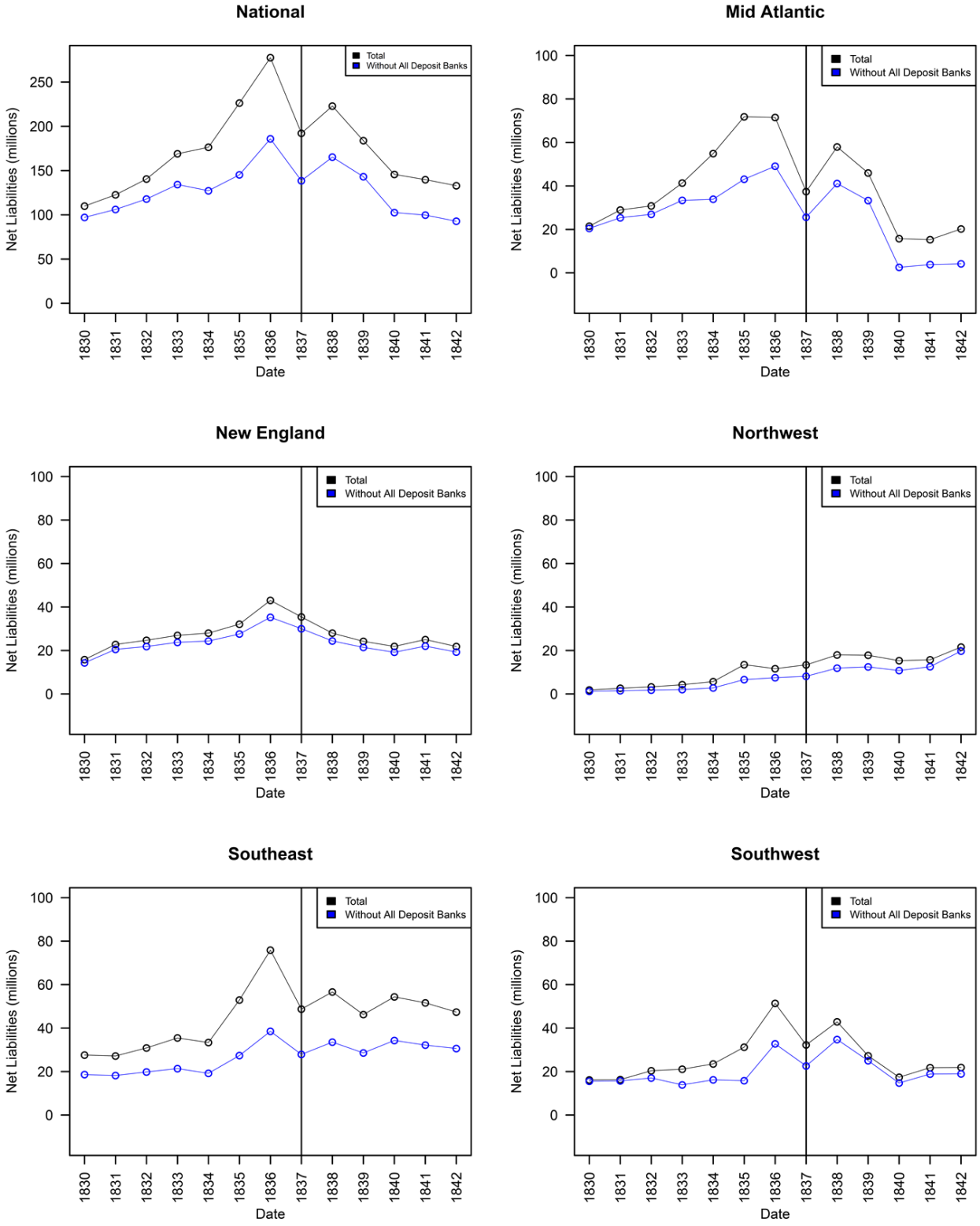


Figure 6: Total Net Liabilities, All U.S. and by Region, 1830-42

The black lines represent total net liabilities; the blue lines are for all banks except the deposit banks. Source: Authors' calculations from Weber's (2008) dataset of commercial banks.

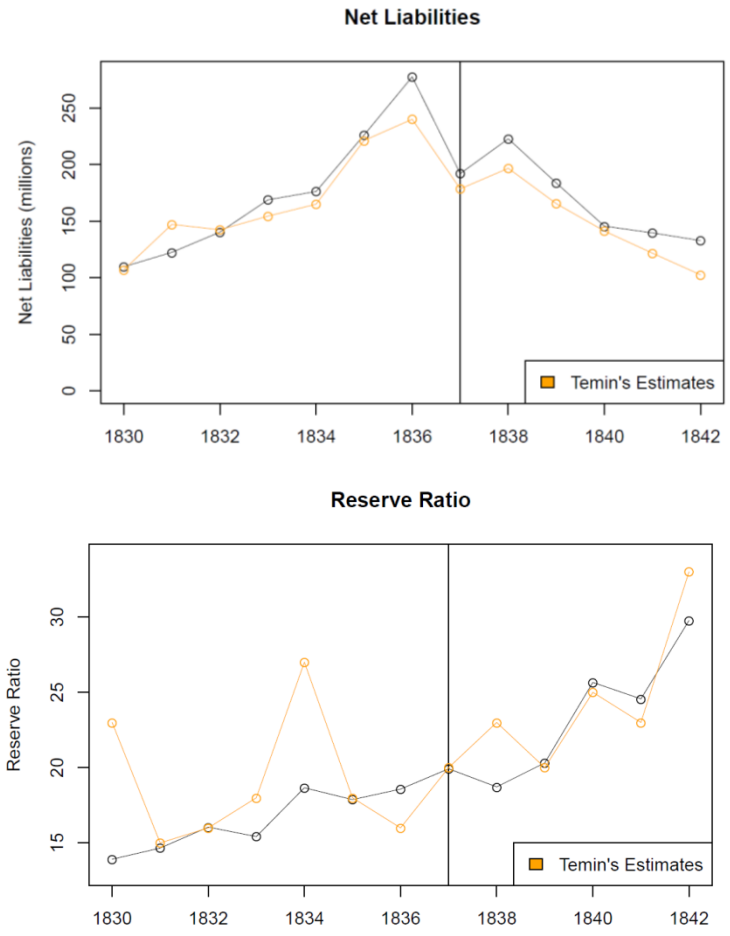


Figure 7: Net Liabilities and Reserve Ratio, all U.S., Comparisons with Temin (1969)
The black lines present our estimates of net liabilities and the reserve ratio for all commercial banks. The yellow lines present Temin's estimates.

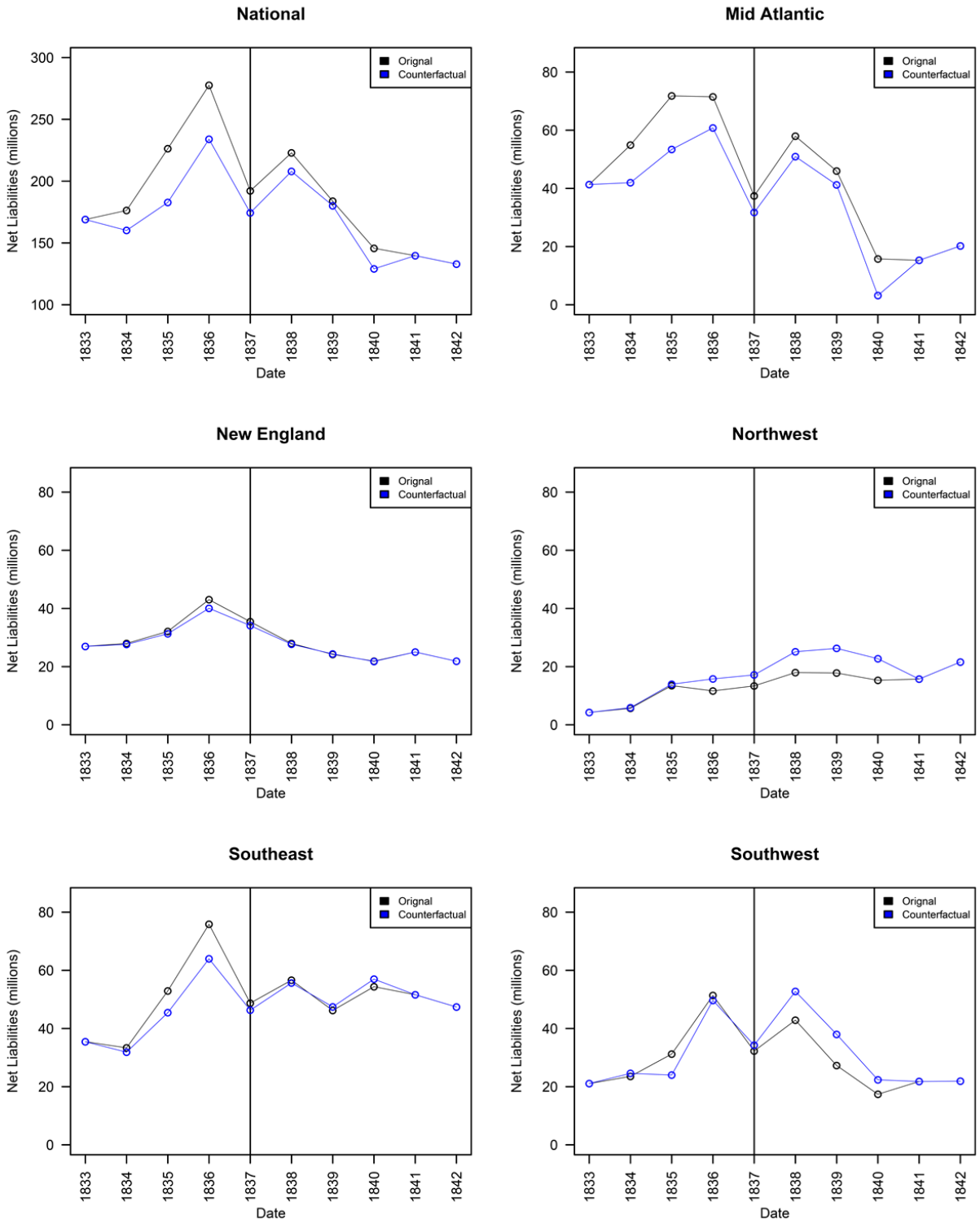


Figure 8: Total Net Liabilities, Actual vs. Counterfactual

The black lines represent total net liabilities; the blue lines present counterfactual estimates produced by assuming the pet banks grew at the same rate as all other banks.

Table 1:
Characteristics of Deposit Banks vs. Banks Not Chosen

	Deposit Banks Chosen in 1833 (1833 Characteristics)			Deposit Banks Chosen in 1836 (1836 Characteristics)		
	Dep. Banks	Others	Diff.	Dep. Banks	Others	Diff.
	(1)	(2)	(3)	(4)	(5)	(6)
Age	16.690	10.554	6.136	13.265	11.765	1.760
	(13.289)	(10.857)	(4.713)	(12.722)	(10.748)	(2.071)
Located in Major City	1.000	0.287	0.713**	0.463	0.229	0.245**
	(0)	(0.453)	(0.027)	(0.505)	(0.421)	(0.082)
Log(Total Assets)	14.800	12.889	1.912**	13.837	13.030	0.820**
	(0.430)	(0.987)	(0.173)	(1.183)	(0.983)	(0.204)
Log(Circulation + Deposits)	13.449	11.940	1.509**	12.825	12.156	0.721**
	(0.405)	(0.946)	(0.162)	(1.209)	(0.925)	(0.193)
Reserve Ratio	0.320	0.161	0.159	0.150	0.124	0.026+
	(0.344)	(0.202)	(0.121)	(0.087)	(0.133)	(0.015)
Banknote Discount	0.286	1.182	-0.897**	1.033	1.230	-0.197
	(0.488)	(1.490)	(0.187)	(0.839)	(2.115)	(0.200)
Dem. Share of Charting Legislature	0.632	0.574	0.058	0.610	0.583	0.027
	(0.314)	(0.264)	(0.127)	(0.248)	(0.274)	(0.046)

This table presents comparisons of mean characteristics between the banks chosen as deposit banks and those that were not, in 1833 and in 1836. Standard errors in parentheses. The standard errors in columns (3) and (6) are estimated from regressions with robust standard errors. In columns (1) and (2), the characteristics are taken from 1833 financial statements of banks, and the banknote discount is from December 1, 1832. In columns (4) and (5) the characteristics are taken from 1836 financial statements, and the banknote discount is from December 1, 1835. The bottom row presents the seats held by the Democratic Party or by its predecessors (such as the Democratic-Republican Party) as a fraction of the total seats held by that party and parties known to oppose it, such as the Whigs, National Republicans, or Federalists, where available, as reported in Dubin (2007).

Table 2:
Summary Statistics

	Obs	Banks	Mean	SD	Min	Max
Banknote discount	28,958	551	1.597	2.448	0	30
Log (Circulation + Deposits)	4,235	495	12.177	1.181	7.342	15.803
Bank Characteristics						
Age	4,235	495	12.025	10.999	0.521	55.156
Deposit Bank	4,235	495	0.149	--	0	1
Location in major city	4,235	495	0.274	--	0	1
Loc in western city w/ Second Bank branch	4,235	495	0.061	--	0	1
New bank (created after 1832)	4,235	495	0.394	--	0	1
Region: Mid-Atlantic	4,235	495	0.339	--	0	1
Region: New England	4,235	495	0.416	--	0	1
Region: Old Northwest	4,235	495	0.086	--	0	1
Region: Southeast	4,235	495	0.113	--	0	1
Region: Old Southwest	4,235	495	0.045	--	0	1
Log(Capital)	4,235	495	12.397	1.082	10.228	15.8024

Table 3:
Regressions: Log(Circulation + Deposits)

	(1)	(2)	(3)	(4)	(5)
Post May 1837 x					
Deposit bank	-0.174+	-0.205*	-0.189*	-0.266**	-0.267**
	(0.091)	(0.090)	(0.094)	(0.086)	(0.094)
Bank characteristics					
Located in major city		0.058	0.071	0.058	0.071
		(0.081)	(0.078)	(0.081)	(0.077)
Log(1836 capital)		0.022	0.022	0.025	0.024
		(0.024)	(0.024)	(0.024)	(0.025)
Reserve ratio, 1836		0.020*	0.021*	0.021**	0.022**
		(0.008)	(0.008)	(0.007)	(0.007)
Second Bank variables					
Western city that had Second Bank branch			-0.809**		-0.824**
			(0.156)		(0.162)
New bank			-0.082		-0.088
			(0.071)		(0.071)
Western Second Bank branch x new bank			0.616**		0.610**
			(0.204)		(0.206)
Deposit Act variables					
Net transfers, 1836 (% of capital)				-0.134*	-0.144*
				(0.063)	(0.069)
Transfers, 1837 (% of capital)				0.011	0.058
				(0.208)	(0.231)
Constant	12.420**	12.394**	12.407**	12.391**	12.404**
	(0.249)	(0.244)	(0.241)	(0.239)	(0.236)
Observations	4,235	4,235	4,235	4,235	4,235
R-squared	0.907	0.907	0.909	0.908	0.909
Bank FE	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES
Region x Post-1837 FE	YES	YES	YES	YES	YES

This table presents estimates of equations (1), (1a) and (1b), for the period 1835-39. Bank fixed effects and quarter fixed effects (that is, one for each of the quarters in the sample) are included in each specification. Standard errors clustered by firm are presented in parentheses. **, * and + denote significance at 1 percent, 5 percent and 10 percent, respectively.

Table 4:
Regressions: Banknote Discounts

	(1)	(2)	(3)	(4)	(5)
Post May 1837 x					
Deposit bank	0.347*	0.414*	0.397*	0.805*	0.777*
	(0.158)	(0.167)	(0.166)	(0.319)	(0.317)
Bank characteristics					
Located in major city		-0.507**	-0.470**	-0.484**	-0.448**
		(0.156)	(0.167)	(0.151)	(0.162)
Log(1836 capital)		0.129	0.151+	0.106	0.128
		(0.090)	(0.092)	(0.090)	(0.091)
Reserve ratio, 1836		0.005	0.002	0.006	0.002
		(0.004)	(0.005)	(0.005)	(0.005)
Second Bank variables					
Western city that had Second Bank branch			-0.723		-0.708
			(0.676)		(0.654)
New bank			0.269+		0.268+
			(0.143)		(0.141)
Western Second Bank branch x new bank			0.464		0.462
			(0.734)		(0.710)
Deposit Act variables					
Net transfers, 1836 (% of capital)				0.361+	0.362+
				(0.202)	(0.207)
Transfers, 1837 (% of capital)				-0.802	-0.767
				(0.654)	(0.657)
Constant	5.912**	4.253**	4.214**	4.401**	4.356**
	(0.283)	(1.186)	(1.382)	(1.193)	(1.389)
Observations	28,958	27,936	27,936	27,936	27,936
R-squared	0.693	0.688	0.689	0.689	0.690
Bank FE	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES
Region x Post May 1837 FE	YES	YES	YES	YES	YES

This table presents estimates of equations (1), (1a) and (1b), for the period 1835-39. Bank fixed effects and quarter fixed effects (that is, one for each of the quarters in the sample) are included in each specification. Standard errors clustered by firm are presented in parentheses. **, * and + denote significance at 1 percent, 5 percent and 10 percent, respectively.

Table 5:
Regressions: Bank Failures

	(1)	(2)	(3)	(4)	(5)
Deposit bank	0.033	0.047+	0.047+	0.043	0.043
	(0.027)	(0.025)	(0.025)	(0.029)	(0.029)
Bank characteristics					
Located in major city		0.024	0.025+	0.026+	0.027+
		(0.015)	(0.015)	(0.015)	(0.016)
Log(1836 capital)		-0.019*	-0.017+	-0.021*	-0.020*
		(0.010)	(0.010)	(0.010)	(0.010)
Reserve ratio, 1836		-0.059+	-0.062+	-0.067+	-0.070+
		(0.035)	(0.036)	(0.037)	(0.038)
Capital/Asset ratio, 1836		0.015	0.010	0.022	0.017
		(0.064)	(0.066)	(0.062)	(0.064)
Second Bank variables					
Western city that had Second Bank branch			-0.005		-0.006
			(0.016)		(0.018)
New bank			0.014		0.015
			(0.013)		(0.013)
Western Second Bank branch x new bank			-0.025		-0.021
			(0.016)		(0.019)
Deposit Act variables					
Net transfers, 1836 (% of capital)				0.034	0.035
				(0.030)	(0.031)
Transfers, 1837 (% of capital)				0.061	0.061
				(0.067)	(0.069)
Constant	0.015**	0.241*	0.217*	0.267*	0.243*
	(0.005)	(0.109)	(0.109)	(0.113)	(0.114)
Observations	637	637	637	637	637
R-squared	0.010	0.022	0.025	0.032	0.035
Region FE	YES	YES	YES	YES	YES