

# Wildcat Banking, Banking Panics, and Free Banking in the United States

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**F**rom 1837 to 1865, banks in the United States issued currency with no oversight of any kind by the federal government. Many of these banks were part of “free banking” systems in which there was no discretionary approval of entry into banking.<sup>1</sup> A note received in a transaction might indicate that it was issued by, say, the Atlanta Bank. This banknote was used for payments in transactions and was redeemable on demand at the Atlanta Bank for a specified quantity of specie, gold or silver. These notes were used in transactions just as checks are today. In important respects, though, they were quite different from today’s checks. Notes were passed from one person to another and yet another before being returned to the bank. They were the bank’s obligations, not bank customers’ obligations. Because there was no central bank and no government insurance, the ultimate guarantee of a banknote’s value was the value of the bank’s assets.

Free banking in the United States sometimes has been equated with “wildcat banking,” a name that suggests that opening a bank has much in common with drilling for oil. Drilling for oil is not an obvious analogy for a sound banking system. Use of the word *wildcat* to mean “reckless” or “financially unsound” apparently arose in Michigan in the 1830s, when bankers supposedly established free banks in inaccessible locations “where the wildcats roamed.”<sup>2</sup> In the free banking period such locations benefited banks because they hampered noteholders’ attempts to redeem notes, and banks with fewer notes redeemed could hold less specie and generate higher net revenue for their owners.

More generally, when banks issue notes, a major issue for banking laws and holders of banknotes is enforcement of banks’ contracts to redeem the notes. If a bank issues notes in good faith that they can be redeemed as promised, the issue is simply contract enforcement. If a bank issues notes

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with no prospect that they can be redeemed, the issue becomes prevention of fraud, or what is “essentially counterfeiting.” Milton Friedman (1960, 6) suggests,

It so happens that the contracts in question are peculiarly difficult to enforce and fraud peculiarly difficult to prevent. The very performance of its central function requires money to be generally acceptable and to pass from hand to hand. As a result, individuals may be led to enter into contracts with persons far removed in space and acquaintance, and a long period may elapse between the issue of a promise and the demand for its fulfillment. In fraud as in other activities, opportunities for profit are not likely to go unexploited.

Free banks did not always redeem their notes as promised, and there are fabulous stories of fraudulent activities, stories that appear frequently in histories of free banking and general histories of banking. For example, in an examination report for Jackson County Bank in Michigan in 1938, the state bank commissioners report that they found the account books had accountholders’ names written in pencil and their balances written in pen. In addition, they examined the bank’s specie.

Beneath the counter of the bank, nine boxes were pointed out by the teller, as containing one thousand dollars each. The teller selected one of the boxes and opened it; this was examined and appeared to be a full box of American half dollars. One of the commissioners then selected a box, which he opened, and found the same to contain a superficies only of silver, while the remaining portion consisted of lead and ten penny nails. The commissioner then proceeded to open the remaining seven boxes; they presented the same contents precisely, with a single exception, in which the substratum was window glass broken into small pieces. (U.S. Congress 1839-40, 1109)

Whether or not this story is typical of Michigan’s free banks, free banking in that state in the 1830s was a failure, with noteholders suffering heavy losses. In fact, in his influential history of banking, Bray Hammond concludes that people in states where banking was prohibited “were better off than the people of Michigan, Wisconsin, Indiana, and Illinois,” who had free banking (Hammond 1957, 626).

Was free banking in the United States so bad that people would have been better off with no banks at all? One way of approaching this question is to ask, Did noteholders suffer substantial losses from holding free banks’ notes? If those losses were substantial, were they generally associated with difficulties in enforcing the contract between noteholders and banks, fraud, or both? This issue is not of only historical interest because, as discussed in Box 1, free banks’ notes have similarities to some forms of electronic money. Recent research makes it possible to provide more informed answers to these questions than was possible even as recently as 1980.<sup>3</sup>

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## **The Spread of Free Banking**

After the Second Bank of the United States’ federal charter expired in 1836, the various states provided the legal framework for banking, and there was no banking system operating under federal government law. Prior to free banking, limited-liability organizations were permitted to issue notes if the legislature granted a charter for that specific purpose. Free banking opened up note issuance to limited-liability organizations without discretionary approval by a legislature, as in earlier years, or by a banking regulator, as in later years (Gerald C. Fischer 1968, 177-84). Free banking ended in 1865 when the federal government imposed a tax on state banknotes.

Chart 1 shows a map of the United States in 1860 and the years that the states adopted free banking. Three states adopted free banking in the 1830s: Michigan, Georgia, and New York. The rest that adopted free banking did so in 1849 and later years.

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## **Overview of Free Banking**

The free banking systems in the various states had many things in common.<sup>4</sup> The defining characteristic of free banking is that if the requirements of a given state’s free banking law are met, any person or group of persons is permitted to open a bank.

**Opening a Bank.** Prior to opening a bank, subscriptions for a minimum amount of capital funds were required. When subscribing for stock, a person commonly paid in some of the funds and promised to provide additional funds up to the amount subscribed. The law generally required that a minimum amount of

funds be paid in before the bank could begin operation. Some states also limited the maximum amount of capital in any one bank. An abbreviated balance sheet for a free bank, shown in Table 1, is helpful for understanding free banks' note issuance. The capital funds appear on the balance sheet as equity capital, a liability. The balance sheet also includes an asset, loans to stockholders, to illustrate the offset for capital subscribed but not paid in.<sup>5</sup> In addition to being liable for their subscribed capital, the bank's stockholders often

were subject to double liability: when the bank closed, each stockholder could also be required to pay an additional amount equal to the stockholder's subscribed capital.

**Issuing Currency.** Banks were permitted to issue banknotes that circulated from hand to hand much as Federal Reserve notes do today. In order to issue notes, banks were required to make a security deposit with the state banking authority. The state banking authority then signed the notes and provided them to the bank.

### Box 1

#### Free Banks' Notes and Electronic Money

Will electronic money resemble the banknotes circulated in the U.S. free banking period?<sup>1</sup> Walter Wriston (1995, 1996; Bass 1996), a former Chairman of Citicorp, and others have suggested that money used for transactions on the Internet may resemble nineteenth-century banknotes more than it will today's money.

Actually, only a subset of what often is called electronic money is "money" in the economic sense, and most of that subset is more similar to money orders or cashier's checks than banknotes. The confusion between money and other means of payment arises even in the economics literature, so confusion in the popular literature is not surprising. Friedman and Schwartz (1970, chaps. 2 and 3) provide an accessible discussion of the definition and measures of money. For example, even though a credit card can be used to make purchases, neither a credit card nor its unused balance is money. When someone uses a credit card to buy a dinner, the purchaser is promising to pay later with money.

Some electronic payment schemes, such as one run by a company called First Virtual, make no pretense at introducing electronic money. First Virtual holds buyers' credit card numbers on a computer inaccessible from the Internet and verifies the authenticity of a purchase. In effect, First Virtual adds an intermediary to transactions. Several other payment schemes focus on preserving anonymity for the buyer but do not introduce the equivalent of currency that can be received and spent repeatedly without involving the money issuer or another third party.

The electronic payment schemes closest to electronic currency are the use of "electronic wallets" and "money modules." These schemes, which require hardware not now widely available in the United States, make it possible to transfer balances from one person's wallet or module to another without another party to the transaction.

Compared with paper currency, checks, and credit cards, such electronic currency would have some advantages for buyers and sellers who want to conduct transac-

tions on the Internet. One advantage is that electronic currency can preserve the anonymity of a transaction in the same way that paper currency does. Probably more important to most people, electronic currency could be used for simple transactions on the Internet between people who do not have enough transactions or the reputation to acquire a merchant credit card account. It also is possible that electronic money could be simpler for international transactions than money denominated in local currency, partly because it is relatively expensive to convert from one currency to another in small amounts.

As of this writing, an institution located in the United States attempting to issue private money would confront substantial legal issues and taxes that might make such an issue impractical. The costs of domestic and international communication on the Internet, however, are effectively the same. Hence, despite impediments in the United States, developing private money offshore in a less restrictive jurisdiction could create a viable alternative even for transactions between U.S. residents.

There may be similarities between electronic money and free banks' notes. Electronic money is likely to consist of uninsured liabilities of private individuals or companies. If so, perhaps the most immediate lessons from free banking are that (1) consumers are not sheep waiting to be sheared (2) attention must be paid to the importance of the assets into which the electronic money is convertible and to the issuer's reputation for making the conversion as promised.

#### Note

1. Levy (1994) and Flohr (1996) provide accessible introductions to electronic money. Schneier (1996, 139-47), the standard nontechnical source of information on cryptography, provides some details about how one form of electronic money can be securely implemented and references to discussions of other forms of electronic money.

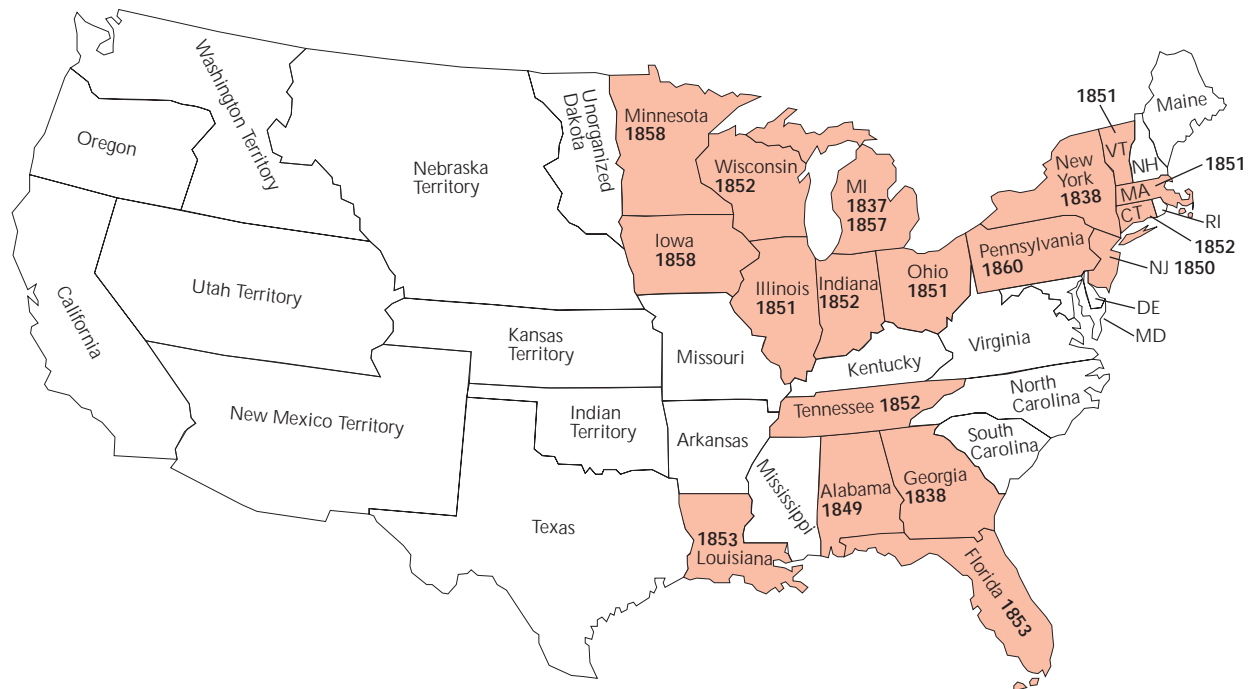
The free banking laws specified acceptable assets that could be deposited. They generally allowed deposits only of selected state bonds, known as state stocks at the time, and U.S. government bonds, both of which traded on the New York Stock Exchange. The marketability of these bonds simplified valuing the notes, which contributed to their widespread use. As Eugene N. White (1995) indicates, it also contributed to eliminating earlier legal restrictions on low-denomination banknotes. As long as the security's value was at least as high as the security deposit required for the outstanding notes, the bank received the interest on the bonds. As Table 1 shows, the bonds deposited were an asset of the bank and the notes were a liability. States required that bonds be valued at the lesser of par value (face value) or market value, and some states permitted banks to issue notes only up to a fraction, for example 90 percent, of the bonds' par or market value.

If the security deposit's value fell below the notes' value, banks were required to add bonds to the security deposit or to decrease their notes outstanding. These changes in bonds or notes were necessary until the se-

curity's value was at least as high as the notes' value. If the bank failed to make up the deficiency in its security deposit within a limited time, the bank was closed, and the bank's security deposit was used to pay noteholders on a pro rata basis. The bank's bonds were sold, and noteholders received the lesser of the proceeds or the notes' par value. Any excess of the bonds' value above the value of outstanding notes was returned to the bank's owners. If the proceeds from selling the security deposit were less than the notes' par value, the noteholders could file suit against the bank and its stockholders for the deficiency up to the limits of the bank's and stockholders' liability. This procedure was used for winding up the security deposit if the bank closed for any other reason as well.

*Par Conversion on Demand of Banknotes Required.* Banks were required by law to convert their notes into specie at the notes' face value on demand. As shown on the balance sheet in Table 1, banks held some specie in order to honor this legal requirement.<sup>6</sup> The free banks were fractional-reserve institutions: they held specie that was a fraction of their outstanding notes.

**Chart 1**  
Free Banking in the United States, 1860



The eighteen states shaded had adopted free banking by 1860. Only Michigan, Georgia, and New York did so in the 1830s, with the rest starting in 1849 or later.

Sources: Rockoff (1975, 3) and Thorndale and Dollarhide (1987, 8).

Banks were penalized for failing to convert notes into specie at par value on demand. If a bank failed to redeem its notes at par on demand, a noteholder could formally protest to the banking authority. The bank had a grace period within which it could redeem the protested notes. Otherwise, the banking authority closed the bank and wound up the bank's security deposit. Even if the bank redeemed the notes during the grace period, some states required the bank to make an additional payment to the protesting noteholder for the time and trouble of protesting the notes.

*Bank Runs Possible.* The requirement that banks convert notes into specie at par on demand created the possibility of a bank run. Because banks held fractional reserves of specie, they could not instantaneously honor all noteholders' requests for specie. Banks could honor such requests only over time as they reduced their outstanding loans or exchanged assets for specie. Hence, noteholders' demand for converting notes into specie could create a liquidity problem for a bank. If noteholders thought it likely that a bank would not be able to continue to convert its notes into specie at par, they had an incentive to exchange the bank's notes for specie. The noteholders then could hold the specie or banknotes issued by another bank and wait to see whether the bank kept its notes convertible into specie.

A more widespread event possible with required convertibility of notes at par is a run on a banking system or, more traditionally and colorfully, a banking panic. For banknotes, a banking panic is a decrease in the demand for banks' notes associated with an increase in noteholders' estimated probability that banks will temporarily or permanently fail to redeem the notes at par value. While "panic" is the traditional name for such an event, people did not generally, if ever, panic in the sense of having "unreasoning fear." Rather, people had good reason to be apprehensive about whether the banks could continue redeeming their notes at par. In a banking panic, unlike a run on an individual bank, noteholders did not simply exchange their specie for notes issued by other banks. Instead, they held the specie or exchanged it for notes issued by banks not in the banking system.

**Locations of Banks.** Free banks were permitted to have an office at only one location. This restriction did not prevent individuals from owning or operating more than one bank if they so wished, however. Scattered records indicate that some people owned shares in several banks in one or more states, but there is no systematic evidence on how common such ownership was.

Some states required that banks locate their offices in an area with a minimum number of people. For example, Illinois in 1857 adopted a law requiring that banks be located in cities, towns, or villages with at least 200 people, and Wisconsin in 1858 adopted a similar restriction. Apparently, these laws were adopted to prevent banks from locating in out-of-the-way places, thereby hampering redemption of their notes.

**Information about Banks' Activities.** Free banking laws required that information be made available to the public about the banks' activities. The laws required that banks submit periodic reports, at least annually and sometimes quarterly, and the state banking authority publish the reports in selected newspapers. The state banking authority also had the power to examine the banks and determine the veracity of their reports.

**Table 1**  
**Abbreviated Balance Sheet for a Free Bank**

Assets		Liabilities	
Bonds deposited with state banking authority	\$50,000	Notes	\$50,000
Loans to stockholders	15,000	Equity capital	50,000
Specie	5,000		
Loans	30,000		
Total	\$100,000		\$100,000

In addition to this required information, various trade publications known as banknote reporters specialized in reporting the values of banks' notes.<sup>7</sup> Under typical circumstances, notes could be exchanged for specie at the issuing bank itself at zero discount: one dollar of notes could be exchanged for one dollar of specie. A bank's notes might well be used in transactions at locations far from the bank, though, and rather than trading at par value the notes would trade at discounts from par at such locations. For example, discount rates for Indiana banks' notes were quoted in New York City. If the discount rate was 1.5 percent for a bank's notes, a person in New York City with \$100 in Indiana notes could exchange them for \$98.50 of specie. A person holding banknotes in New York City or elsewhere could, if it was the more advantageous

course, send the banknotes back to the Indiana bank for redemption at their face value in specie.

Usually, the discount reflected the transportation cost and interest forgone due to the time required to return the notes (Charles W. Calomiris and Larry Schweikart 1991; Gary Gorton 1996). As Gorton (1996) shows, new banks had higher discounts on average because new banks had not yet established a reputation for reliably redeeming their notes. In addition, notes issued by banks that were ceasing operations traded at discounts that reflected the interest forgone due to waiting for redemption and the amount that noteholders expected to receive (Gerald P. Dwyer Jr. and Iftekhar Hasan 1996). Notes issued by banks that were likely to fail traded at discounts greater than usual even before closing. These excess discounts reflected the probability of failure, the payment that noteholders expected to receive, and the interest forgone while waiting for the payment.

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## **Early Experience with Free Banking**

Of the early adopters of free banking, Michigan and New York provide an informative contrast. Michigan's experience commonly is regarded as a fantastic failure of free banking and New York's as a solid success.<sup>8</sup>

**A Fiasco—Michigan in 1837 and 1838.** In 1837, shortly after it became a state, Michigan adopted the first free banking law in the United States.<sup>9</sup> This law was based on a proposed bill in New York and generally was similar to the typical free banking environment outlined above.

There were important differences, though, between Michigan's law and later ones. In free banking systems in the United States, the security deposit was the minimal guarantee of the notes' value. Michigan's free banking law provided that this security deposit consist "either of bonds and mortgages upon real estate within this state or in bonds executed by resident freeholders of the state" (Michigan 1837a, "An Act to organize and regulate banking associations," Section 11). Possible problems with bonds and mortgages on real estate, though, include inflated appraisals and depreciated real estate values when selling large amounts of real estate in security deposits. In Michigan, as bank commissioner Alpheus Felch (1880, 120) indicates, real estate values were far below appraised values when the free banks were closing en masse. The subterfuges possible with personal bonds, which are guarantees by individuals, are obvious.<sup>10</sup>

As events unfolded, Michigan's problems were compounded by a nationwide suspension of specie payments shortly after the state adopted free banking. This suspension of payments occurred for reasons unrelated to free banking in Michigan (Richard H. Timberlake 1993), but it affected free banking in the state. In a suspension of specie payments, banks did not redeem their notes, and under Michigan law, such a suspension by any bank implied that the bank must be closed. In 1838, Michigan amended its law to permit banks to suspend specie payments and after the number of banks quickly doubled further amended its law to prohibit new banks from suspending payments.<sup>11</sup> This suspension was especially problematic for the new Michigan banking system, which did not have an established reputation for reliably redeeming its notes. In addition, it probably did not help that Michigan was a frontier state at the time. Before the advent of the telegraph, let alone modern communications, acquiring information was a slower and more expensive process than today, which would compound the lack of information about the new banks and banking system.

The increase in the number of banks in Michigan was large, and their openings were followed quickly by their demises.<sup>12</sup> In January 1837 there were nine banks in Michigan. By December 1837 there were eighteen banks, and two months later, forty. By September 1839, only nine remained (U.S. Congress, 1840-41, 1449). These numbers are only estimates because it was hard for Michigan's bank commissioners to be sure how many banks ever opened (U.S. Congress, 1839-40, 1107, 1128). In a preamble to recommending repeal of the free banking law, the bank commissioners waxed eloquent, claiming,

The singular spectacle was presented, of the officers of the State seeking for banks in situations the most inaccessible and remote from trade, and finding at every step an increase of labor by the discovery of new and unknown organizations. Before they could be arrested, the mischief was done; large issues were in circulation, and no adequate remedy for the evil. (U.S. Congress 1839-40, 1129)<sup>13</sup>

Commissioners' reports on some banks are readily available along with many accompanying depositions (U.S. Congress 1839-40). In at least a few cases, according to depositions by available bank officials, the banks were started without any intent of ever redeeming notes. In fact, notes were put into circulation with-

out meeting legal requirements such as having the signature of a bank commissioner on the notes or providing the security deposit for the notes. Such activities were illegal under the law, and the simplest interpretation is that the banknotes were fraudulent if not counterfeit.<sup>14</sup>

It is easy to see how issuing notes and absconding with the proceeds could increase the wealth of a bank's organizers. For the cost of printing up notes, the issuer could use the notes to buy other assets and then skip town with those assets. The balance sheet in Table 2 illustrates the strategy. None of the bank's capital is paid in. The bank's capital is exactly offset by a loan to the owners. The notes are created and issued by making a loan to the owners. If the owners provide personal bonds to start the bank or an inflated appraisal on real property, and if they dispose of the notes and avoid their legal liability after the bank closes, they gain by the full amount of the notes' value.

As long as the person initially receiving the notes does not realize that the notes soon will be worthless—otherwise they will not take them—creating the banknotes increases the owners' wealth. Such a situation cannot be expected to persist, however. Receivers of such notes soon will notice their rapid decrease in value and will accept the notes at a discount if they may have a positive value or will not accept them at all if they certainly will be worthless. Free banking's rapid demise in Michigan itself suggests the promptness of such responses.

Estimates of noteholders' losses from these extraordinary developments are rough at best. In January 1839 the bank commissioners estimated that free banks were authorized to issue more than \$4 million of notes and that "at a low estimate, near a million dollars of the notes of insolvent banks are due and unavailable in the hands of individuals" (U.S. Congress 1839-40, 1128-29).<sup>15</sup> It is not clear how many notes were issued. The commissioners indicate that "about forty banks" began operation. Their discussions of individual banks indicate that they thought that about seventeen banks had sufficiently large security deposits to cover their notes.<sup>16</sup> Discussing unredeemed notes, an 1839 Attorney General's report suggests that about \$2 million was outstanding toward the end of 1839, and free banks redeemed these notes at about 39 cents on the dollar (Hugh Rockoff 1985). This redemption rate suggests that noteholders' losses were about 60 percent of the par value of these notes, or on the order of \$1 million to \$1.2 million. Noteholders' actual losses in these banks were reduced by any discount on the notes from their face value when issued.

Even though the estimate is rough, an approximate estimate of noteholders' total losses is \$1.2 million. If the free banks had issued \$4 million in notes at par value, noteholders lost about 30 percent of the par value of all free banks' notes. The 60 percent loss rate based on \$2 million of notes is an overestimate, and the 30 percent loss rate based on \$4 million of notes probably is an underestimate. In either case, noteholders' losses on banknotes are substantial.

**A Success—New York.** The events in Michigan are spectacular, but besides not lasting very long themselves, they also did not persist in the sense that they did not reappear in other states. In 1838, while Michigan was suffering through its debacle, New York passed the free banking law that its legislature had been debating for several years. New York's free banking system is widely regarded as notably successful.

**Table 2**  
**Abbreviated Balance Sheet for a Michigan Wildcat Bank**

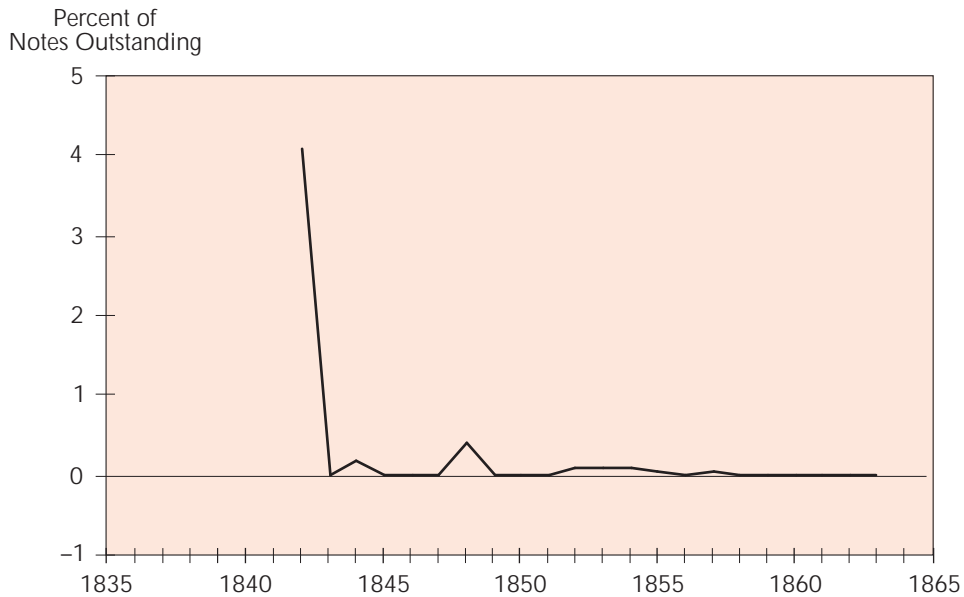
Assets		Liabilities	
Loans to stockholders	\$100,000	Notes	\$50,000
		Equity capital	50,000
Total	\$100,000		\$100,000

New York required that banks' security deposits consist of New York state government bonds or bonds and mortgages on real estate. Available evidence suggests that the bonds and mortgages on real estate were less of a problem than in Michigan.

Chart 2 shows losses suffered by noteholders in New York free banks for the years available, 1842 to 1863.<sup>17</sup> The annual loss rates on New York notes were relatively high in the 1840s—4 percent in 1842, 0.2 percent in 1844, and 0.4 percent in 1848—and then never again as high as 0.1 percent. Noteholders' loss rates of less than 0.1 percent in later years are not obviously more than their losses from inadvertently destroying or misplacing notes.

Losses on total notes give a picture of the typical noteholders' losses, but they do not show the losses suffered by those who held notes issued by the banks that failed—banks that ceased operation and paid noteholders less than the par value of their notes. Chart 3 shows the losses per dollar of notes in failed

**Chart 2**  
**Loss Rate on Total Notes in New York Free Banks, 1842-63<sup>a</sup>**

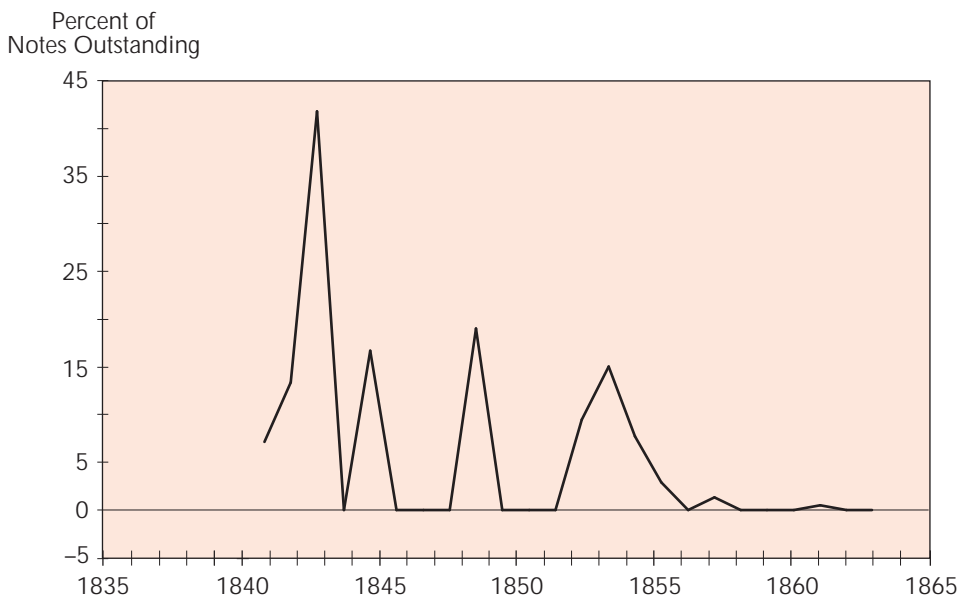


While Michigan's free banking efforts seemed to fail dismally, New York's free banking system is widely regarded as successful.

<sup>a</sup>The only dates for which information is available.

Source: King (1983).

**Chart 3**  
**Loss Rate on Notes in Failed New York Free Banks, 1840-63<sup>a</sup>**



Losses on total notes (Chart 2) give a picture of the typical noteholders' losses, but they do not show the losses suffered by those who held notes issued by banks that failed, ceasing operation and paying noteholders less than the note's par value.

<sup>a</sup>These data include 1840 and 1841 whereas the aggregate losses shown in Chart 2 do not because data on total notes are not available for those years.

Source: King (1983).



New York free banks from 1840 to 1863.<sup>18</sup> For a few years, noteholders' loss rates on these banks' notes are relatively high. Nonetheless, loss rates on failed banks' notes show the same pattern of declining losses over time as do noteholders' loss rates on all notes. The highest loss rate is 42 percent in 1842, within the range of estimated loss rates for Michigan a few years earlier. In the 1840s, the annual average loss rate is 9.8 percent; in the 1850s, it is 3.7 percent; and in the four years of the 1860s, it is 0.1 percent. Although the loss rate borne by those who held failed banks' notes sometimes is substantial, even this loss rate decreases over time.

It is easy to overstate the significance of these losses. This pattern of zero losses by some and sometimes nontrivial losses by others means that in turn misfortune was borne by some and not by others. During this period, banknote reporters made it relatively low cost to be informed about the value of banks' notes. While the more informed had an incentive to shift these losses to the less informed, in the absence of evidence, it is hard to say more.<sup>19</sup> Even the annual average loss rate on notes in the small proportion of banks that failed in the 1850s is only 3.7 percent. The overall loss rate for that decade is less than 0.1 percent.

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## Free Banking in Selected States

As Chart 1 indicates, most states that adopted free banking did so in the 1850s, after New York had about fifteen years' experience with the banking system. Besides experiences of the early adopters of free banking, it is informative to examine what happened in selected states that adopted free banking later and apparently had substantial problems.<sup>20</sup> Extreme examples can be the best teachers, but it is important to realize that they are not representative examples. Indiana, Illinois, and Wisconsin had particularly bad experiences with their free banking systems, as indicated by Hammond's conclusion cited earlier that people in these states would have been better off with no banks at all than with free banking.

**Bank Entry and Failures.** Table 3 summarizes free banks' entry and exit in these three states from the inception of free banking to 1863. In the table, a bank is listed as ceasing operation if it closed and the bank's security deposit was sufficient to redeem all of the bank's notes at their face value. A bank is listed as failing if it closed and the bank's security deposit was not sufficient to redeem all of the bank's notes at their face value.<sup>21</sup> A noticeable aspect of Table 3 is the large

amount of entry and exit. Much of this activity simply reflects people starting banks and later closing them because it was optimal to do so. There is no obvious reason to be more concerned about it than to be concerned about grocery stores beginning and ceasing operation.<sup>22</sup>

While the timing differs between the states, the failures in each state are clustered in specific time periods. In Indiana, 68 banks started in the first three years of free banking in the state, and only 38 existed at the end of that period. Eighty-seven percent of the banks in Illinois closed at the start of the Civil War, and most of them failed. Out of 108 banks at the start of 1861 in Wisconsin, 36 failed and 15 ceased operation in the

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next two years. As mentioned above, these states are not typical. They are chosen for discussion precisely because they have notorious episodes in which many banks closed.

**Wildcat Banking.** Were the occasional large numbers of banks that failed wildcat banks with reckless or financially unsound operations?<sup>23</sup> By themselves, high failure rates do not mean that banks are operating recklessly. Conversely, banks that remain open for a long period may well be operating recklessly.

*Duration before Failure.* Although eventual failure rates are unreliable measures of banks' ex ante riskiness, Arthur J. Rolnick and Warren E. Weber (1984) use the duration of a bank's existence as a measure of whether a bank is a wildcat bank. They define a bank as a wildcat bank if it failed within a year after beginning operation. This definition is relatively straightforward, and it is possible to determine whether any particular bank failed shortly after opening. In addition, it focuses on one aspect of wildcat banking: starting a bank and absconding with one-time gains from starting it. Using this definition, Rolnick and Weber (1984) and

**Table 3**  
**Free Banks Entering and Exiting in Indiana, Illinois, and Wisconsin, 1853-63**

Period	Entry	Ceased Operation	Failed	Closed <sup>a</sup>	Number of Banks
<b>Indiana</b>					
– Dec 53	30				30
Dec 53 – Jul 54	19		1	2	46
Jul 54 – Jan 56	19	7	10	10	38
Jan 56 – Jul 56	2	4		3	33
Jul 56 – Jul 57	5	7	2	3	26
Jul 57 – Jan 58		7			19
Jan 58 – Jan 59	1	4			16
Jan 59 – Jan 60	1				17
Jan 60 – Jan 61	2		1		18
Jan 61 – Jan 62					18
Jan 62 – Jan 63		1			17
<b>Illinois</b>					
– Apr 53	23				23
Apr 53 – Apr 54	8	2			29
Apr 54 – Jan 56	15	9			35
Jan 56 – Nov 56	16	3	2		46
Nov 56 – Jan 58	4	5	2		43
Jan 58 – Oct 58	5	1			47
Oct 58 – Jan 60	29	1			75
Jan 60 – Oct 60	20				95
Oct 60 – Apr 62	5	3	80		17
Apr 62 – Jan 63	8				25
<b>Wisconsin</b>					
– Jan 53	2				2
Jan 53 – Jan 54	8				10
Jan 54 – Jan 55	14	1			23
Jan 55 – Jan 56	10	3			30
Jan 56 – Jan 57	17	2			45
Jan 57 – Jan 58	26	3			68
Jan 58 – Jan 59	34	3			99
Jan 59 – Jan 60	16	8			107
Jan 60 – Jan 61	7	5	1		108
Jan 61 – Jan 62	2	12	35		63
Jan 62 – Jul 62		3	1		59

<sup>a</sup> Unknown whether bank ceased operation or failed. In addition, there are six Indiana banks for which dates of operation are not available. Three of these ceased operation and one failed, and it is unknown whether the other two ceased operation or failed.

Sources: Rolnick and Weber (1982); Economopolous, unpublished data.

Andrew Economopolous (1988, 1990) clearly have shown that wildcat banking was unimportant if not irrelevant in Indiana, Wisconsin, and Illinois.

Rockoff (1975) suggested, for reasons outlined in Box 2, that wildcatting might be due to bonds in the security deposit being valued at par rather than market value. Subsequent research into state laws and regulators' operations in states, though, has found bonds being valued at the lesser of par or market value in every case except New York from 1838 to 1840 (Rolnick and Weber 1984; Economopolous 1988). Legislators in New York and other states learned from New York's problems in its earliest years and did not repeat the mistake.

*Bank Owners Highly Leveraged in Their Ownership.* Rolnick and Weber's measure of wildcat banking is not informative about whether a bank was operating in a highly leveraged and possibly reckless manner. The president of a competitor of free banks suggested that anyone with relatively little funds could organize a free bank (Hugh McCulloch 1888, 125-26). If a bank's organizer has some funds, borrows more, and uses the funds to buy state bonds, then the organizer can use the state bonds as security for notes. In exchange for the deposited bonds, the state banking au-

thority sends notes to the organizer, and the organizer uses the notes to buy more bonds. This process continues until the organizer uses the notes to pay off the original loan. A possible end result of this process is the balance sheet in Table 4. Nothing in the balance sheet suggests a bank with reckless operations. The bank's ratio of notes to capital is one, and the bank has sufficient bonds deposited to pay off noteholders and a substantial loan portfolio. The loans just happen to be loans to the bank's owners.

Why would anyone organize such a bank? As long as it is solvent, the bank receives the interest on the bonds held by the state banking authority. In the example in Table 4, starting with, say, \$5,000, the bank's owner is receiving interest on \$50,000 in bonds. The bank's owner is highly leveraged in this transaction, but it is not apparent on the bank's balance sheet.<sup>24</sup> There are three aspects of this operation that are particularly pertinent. First, the bonds held by the state banking authority are available to pay noteholders.

Second, if the loans are collectible, noteholders are covered even against relatively large losses on the state bonds. The owner is liable for the loan to the bank, and, generally speaking, the owner also is liable for

## Box 2 Valuation of Bonds Deposited as Security

The valuation of bonds as security for banknotes had important effects on how free banking worked. As Rockoff (1975) points out, if the bond security was valued at more than its market value, individuals had an incentive to buy bonds, issue notes, and abscond with the proceeds. For example, if someone could buy \$80,000 worth of bonds at current market prices and the bonds were valued as security at their face value of, say, \$100,000, and the notes could be passed for more than \$80,000, say \$90,000, there is a one-time gain of \$10,000 in starting the bank. If the owner could avoid being sued for noteholders' losses, for example by leaving the court's jurisdiction, this difference between the amount received for the notes and the market value of the bonds created an incentive to start a bank and let it fail quickly.

After a few years of free banking's operation, legislators were aware of this incentive. Initially, from 1838 to 1840, bond security in New York was valued at its par value, which can be and was greater than some bonds' market value. In 1840, New York amended its law to require that the bond security be valued at the lesser of par or market value, a requirement followed by other states.

While addressing one problem, this provision of free banking laws was associated with another problem. Because bonds were valued at the lesser of par or market value, everything else the same, banks found it in their interest not to buy bonds trading at prices much above their par value. Bonds purchased at prices above par value could be used to support notes only equal to the bonds' par value. A smaller issue of notes decreased the bank's loans and its income. If banks are attempting to maximize expected income, other things the same, they prefer not to buy bonds trading well above their par value. Banks' risk aversion can, of course, cause banks to buy bonds trading well above par if such bonds are less risky than bonds trading closer to par value. In effect, banks face a trade-off between their risk and their return, which is absent if bonds are valued at market price, no matter what their par value. This provision may explain why Illinois and Wisconsin banks held large amounts of southern bonds, which had unfortunate consequences when prices of those bonds fell at the start of the Civil War.

the amount of equity capital again should it fail. In the example in Table 4, the owner is liable for an additional \$95,000 over and above the \$5,000 of personal funds invested in the bank. If the bank's owner has substantial additional assets that are difficult to move beyond the jurisdiction of the state's courts, the owner can be forced to make these payments with the result that the noteholders are unlikely to suffer losses.

Third, this banking operation has substantial value to the bank's owners *as long as the bank continues to operate* because the owner continues to receive interest on the state bonds. The owner has no incentive to

**Table 4**  
**Abbreviated Balance Sheet for a Free Bank,**  
**With the Owner Highly Leveraged in Its Organization**

Assets		Liabilities	
Bonds deposited with state banking authority	\$50,000	Notes	\$50,000
Loans to stockholders	45,000	Equity capital	50,000
Specie	5,000		
Total	\$100,000		\$100,000

abscond with funds because the bank's positive present value is due solely to continuing to receive the interest on the bonds, not because of any one-time gain from starting the bank.

Nonetheless, there is a sense in which the bank is a risky venture for noteholders: the ultimate funds available to noteholders are the security deposit and the owner's assets, not the security deposit and a more diversified loan portfolio. Unfortunately, little direct can be said about the value of loan diversification to noteholders without detailed data on banks' loan portfolios and bank owners' assets.

*Remote Location.* A quite different but simple way of thinking about wildcatting is in terms of the word's apparent origin: remote locations that hamper note redemption. Such locations can be associated with reckless operations because outside knowledge about such banks' operations might be quite limited. Did free banks locate in remote and inaccessible places?

Chart 4 shows maps of Indiana, Illinois, and Wisconsin in 1860, indicating the population and the num-

ber of banks in each county. There is no obvious pattern to the location of Indiana banks, other than perhaps some tendency for them to be along the Ohio River on the southern boundary and along state borders generally. Each county with three banks has a major town: from north to south, Indianapolis, Evansville, and Terre Haute. Banks in Wisconsin generally are located in the more populous and more accessible down-state counties. Banks in Illinois generally are located in the southern part of the state near the Ohio River, across the Mississippi River from St. Louis and in Bloomington. A striking aspect of the map for Illinois is the almost complete absence of free banks in the most populous county, Cook County. There were many private banks in Cook County, and these banks made loans there. Illinois free banks themselves made fewer loans than other banks because a usury law applied to free banks but not other lenders, including private banks (F. Cyril James 1938, 233). Free banks could circumvent the usury law by lending their notes to affiliated private banks that made loans at higher interest rates. Hence, while Illinois banks located in accessible locations, they apparently found it expedient to issue notes from offices in less populous locations than Chicago.

**Episodic Factors External to the Banking Systems.** If wildcat banking is not the explanation of why so many banks closed, what is? In the case of Indiana, a change in a law in Ohio was the initiating factor in the Indiana free banks' problems. Indiana banknotes circulated in other states, and evidence suggests that a relatively large amount of Indiana banknotes was used in transactions in Ohio, partly because of relatively high taxes on banks in Ohio (Hasan and Dwyer 1994, 275-78). Indiana's free banks encountered difficulties when Ohio passed a law in May 1854 that made it illegal as of October 1, 1854, for anyone in Ohio to use small banknotes issued by banks in other states. This decrease in the demand for Indiana banknotes resulted in the return of the notes for redemption and decreases in the prices of Indiana bonds, which were about two-thirds of the banks' security deposits.

Chart 5 shows prices of Indiana bonds with a 5 percent coupon for this period. For comparison, Chart 5 also shows the prices of U.S. government bonds and other state government bonds with data available for at least half of the period. As the chart shows, Indiana bond prices were above 96 percent of par through the middle of August 1854, after which they fell about 10 percent for two months. The trough in bond prices is in December 1854. This decrease is after the change in

Ohio's law and coincides with the organized expulsion of notes from Ohio. In the absence of any other developments concerning Indiana's debt, the timing suggests that the decrease in the demand for Indiana banknotes and consequently Indiana bonds was a result of the Ohio law.<sup>25</sup>

In 1861, however, the decrease in bond prices occurred before the Illinois and Wisconsin free banks' difficulties and is an important factor in those difficulties.<sup>26</sup> Chart 6 shows prices of bonds that were 10 percent or more of the aggregate portfolio of banks in either state in 1861; it also shows U.S. bond prices for comparison.<sup>27</sup> All of these bonds have 6 percent coupon rates.<sup>28</sup> The prices of southern and border state bonds fell before the Civil War and then fell dramatically the same week that Confederates fired on Fort Sumter and Lincoln responded by ordering a blockade and calling up troops.<sup>29</sup> The low prices occurred in June 1861, and bond prices increased thereafter to the end of 1862. While bond sales by banks may have affected the bond prices' movements, the Civil War it-

self is the initiating factor that resulted in many banks failing in Illinois and Wisconsin.

**Banking Panics.** Even though the initiating factors are different in 1854 in Indiana and in 1861 in Illinois and Wisconsin, subsequent events are strikingly similar. In each of these instances, there was a banking panic that affected banks in the banking system.

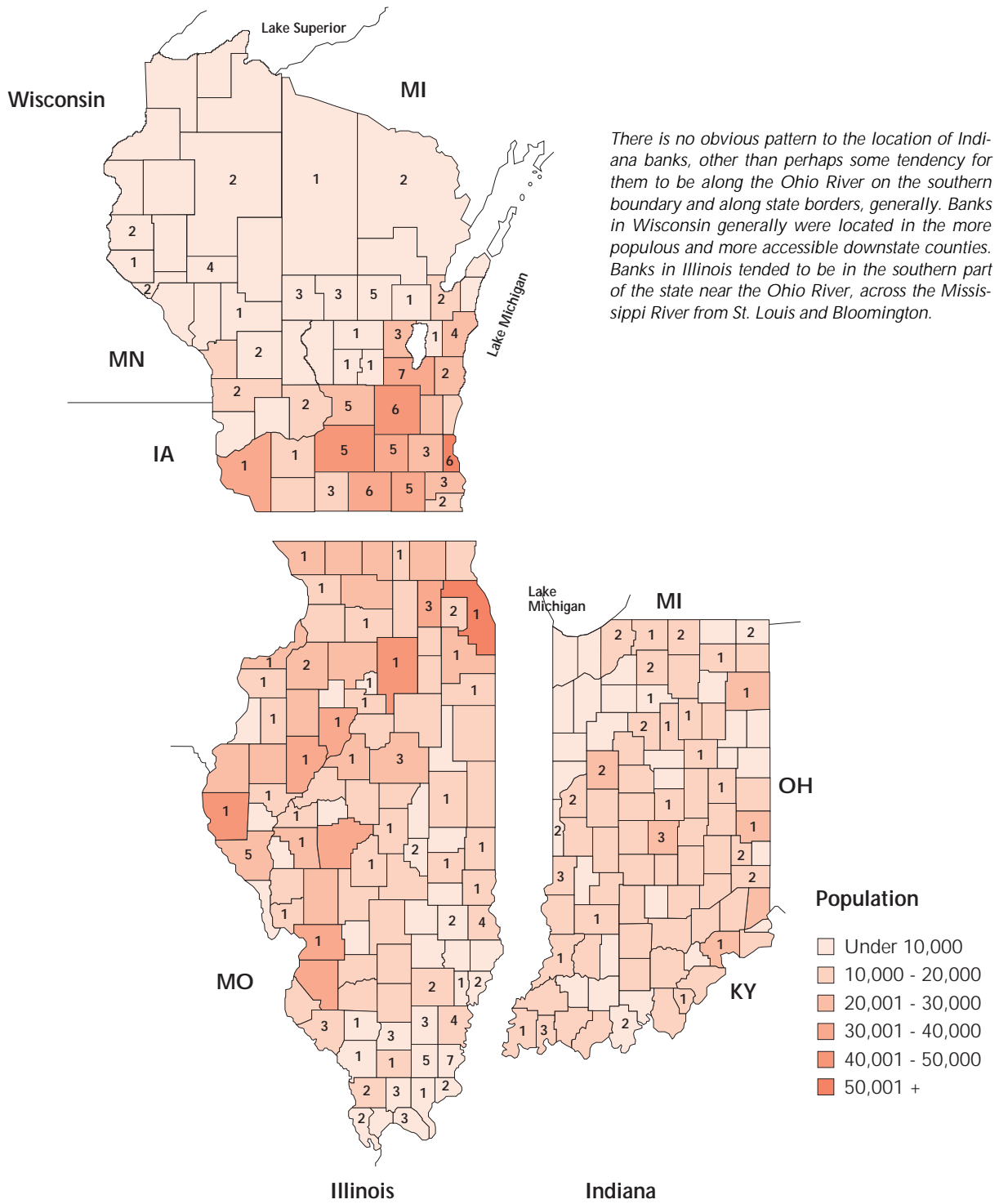
In all three states, discount rates on notes in bank-note reporters indicate that the market value of all banks' notes fell quite substantially. Table 5 shows discount rates for banknotes in each of these states during these episodes. In Indiana at the end of 1853, the discount rates on banknotes were 1.5 percent. By December 1854, almost 90 percent of the Indiana free banks had discount rates of 25 percent or more. A typical New York City holder of an Indiana bank's notes lost almost 25 percent of the notes' value. This loss reflected a change from a situation with expected redemption on demand at face value to a nonzero probability of the bank closing, with delayed redemption of the notes and the possibility of receiving less

**Table 5**  
**Discount Rates on Notes and Changes in Notes Outstanding in Indiana in 1854, Illinois in 1861, and Wisconsin in 1861**

	Indiana	Illinois	Wisconsin
Discount Rates			
Date	12/53	6/60	6/60
Discount rate	1.50	2.25	2.75
Percent of banks with this discount rate and higher	100	97.5	97.1
Date	12/54	6/61	6/61
Discount rate	25	60	20
Percent of banks with this discount rate and higher	89	100	100
Percentage Change in Banknotes Outstanding			
Period	10/54 to 1/56	1/60 to 1/62	1/60 to 1/62
Percentage change	-44.7	-84.2	-59.8

Sources: Discount rates in 1853 and 1854 are from *Thompson's Bank Note and Commercial Reporter*, December 15, 1853, and December 1, 1854. Discount rates in 1860 and 1861 are from *Hodge's Journal of Finance and Bank Reporter*, June 9, 1860, and June 22, 1861. The data on Indiana, Illinois, and Wisconsin banknotes are from U.S. Congress (1863-64, Table 2, 216-17).

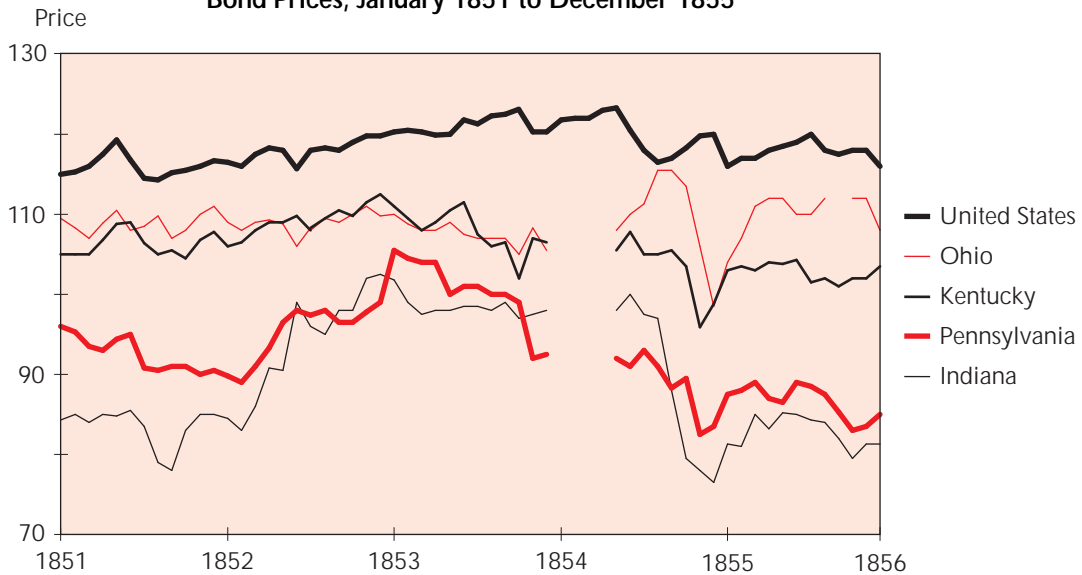
**Chart 4**  
**Population and Number of Free Banks by County in Wisconsin, Illinois, and Indiana, 1860**



*There is no obvious pattern to the location of Indiana banks, other than perhaps some tendency for them to be along the Ohio River on the southern boundary and along state borders, generally. Banks in Wisconsin generally were located in the more populous and more accessible downstate counties. Banks in Illinois tended to be in the southern part of the state near the Ohio River, across the Mississippi River from St. Louis and Bloomington.*

Source: Thorndale and Dollarhide (1987, 381 [Wisconsin], 105 [Illinois], and 112 [Indiana]).

**Chart 5**  
**Bond Prices, January 1851 to December 1855**

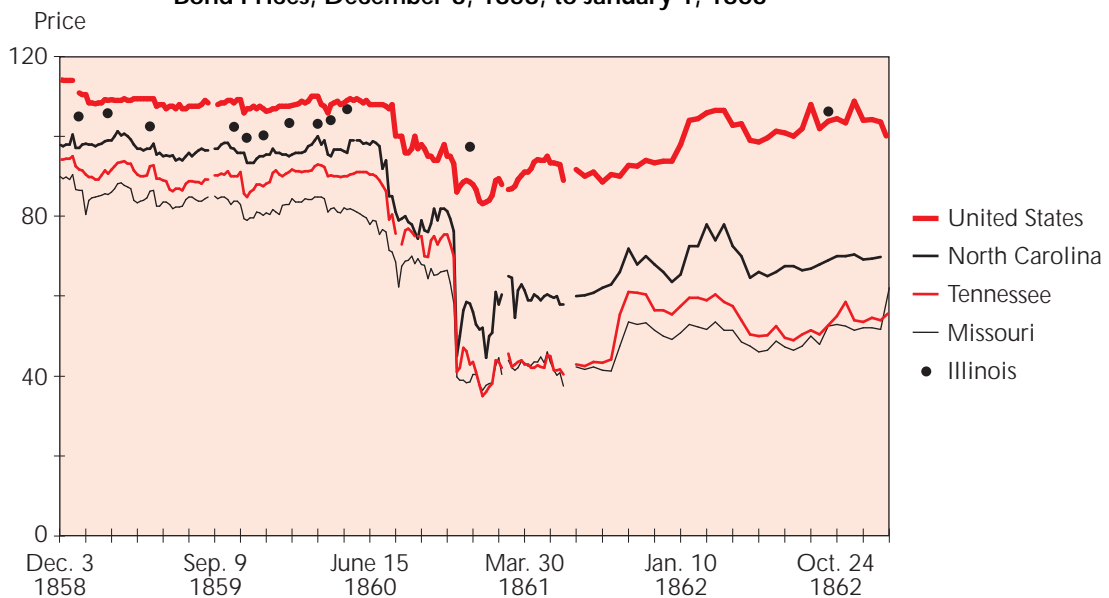


*Indiana's free banks encountered difficulties when Ohio passed a law in May 1854 that made it illegal as of October 1, 1854, for anyone in Ohio to use small banknotes issued by banks in other states. This decrease in demand for Indiana banknotes resulted in the return of the notes for redemption and decreases in the prices of Indiana Bonds.*

Note: Gaps in state data indicate that data were unavailable.

Source: See data appendix (available on request).

**Chart 6**  
**Bond Prices, December 3, 1858, to January 1, 1863**



*The prices of southern and border state bonds fell before the Civil War and then fell dramatically the same week that the Confederates fired on Fort Sumter.*

Note: Only fragmentary data on Illinois bond prices are available.

Source: See data appendix (available on request).

than the notes' face value. In Illinois and Wisconsin in 1861, quite different initiating developments—the onset of the Civil War—had similar effects.

These discount rates are greater than noteholders' losses. While loss rates are not known for all Indiana banks that ceased operations in 1854 and 1855, noteholders' average loss rate even on notes issued by a typical bank known to have failed is 12 percent, and the maximum known loss rate on notes issued by an Indiana bank that failed in 1854 and 1855 is 20 percent. This average loss rate in failed banks is far less than the discount rates of at least 25 percent on almost all banks' notes and also is small in comparison with losses in the 1830s in Michigan and losses in 1842 in New York.<sup>30</sup> Holders of notes from a typical bank in Wisconsin suffered losses of about 7.2 percent, and holders of Illinois notes suffered larger losses, about 22.2 percent.

These developments in all three states also are followed by substantial contractions in the amount of notes outstanding. From October 1854 to January 1856, Indiana banknotes outstanding fell by about 45 percent. From January 1860 to January 1862, Wisconsin banknotes outstanding fell by about 60 percent and Illinois banknotes fell by an even larger 84 percent.

In response to these developments, bankers attempted to coordinate their responses and reassure noteholders that some banks were solvent. In Indiana in 1854 and in Wisconsin in 1861, the free banks suspended payments.<sup>31</sup> A detailed comparison of Illinois and Wisconsin indicates that the suspension of payments had substantial effects (Dwyer and Hasan 1996). The suspension of payments explains much of the difference between 87 percent of Illinois banks closing and 47 percent of Wisconsin banks closing. In addition to decreasing the number of banks that ceased operations, the joint suspension decreased noteholders' losses by about 20 percentage points. Besides being similar in the 1854 and 1861 episodes, bankers' coordinated responses, including the suspensions of payments, are similar to bankers' responses to runs on the banking system in the National Banking period.<sup>32</sup>

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## Conclusion

Free banking in the United States was not the disaster portrayed by some, but it also was not problem-free. The early years of free banking were troubled. Holders of Michigan notes lost 30 to 60 percent of the notes' value. In 1842 holders of New York notes lost 4 percent of the notes' value and holders of failed banks' notes lost 42 percent. With the exception of episodic events that generated atypical losses, free banking's performance improved over time. This improvement is associated with, and possibly due to, adjustments in the laws in response to problems that arose. In the 1850s, a substantial number of states adopted free banking laws.

Free banking in Indiana, Illinois, and Wisconsin are alleged later instances of reckless banking. There is no evidence that free banks in these states generally were characterized by continuing fraud to transfer wealth from passive noteholders to shrewd bankers. There also is little evidence supporting a generalization that these free banks were imprudent, let alone financially reckless. The episodic difficulties faced by free banks were not self-induced implosions. In these instances, banks' losses occurred sporadically when developments outside the banking systems decreased the demand for the banks' notes or decreased the value of the banks' assets. These episodic difficulties resulted in banking panics, and bankers, legislators, and bank regulators dealt with the panics in ways that anticipated developments in the subsequent National Banking period.

Free banking disappeared when it was taxed out of existence by the federal government in 1865. This action was not due to apparent dissatisfaction voiced by citizens of free banking states. In fact, the national banking law adopted during the Civil War included many provisions similar to the free banking laws. Nonetheless, it is an open question whether some feasible banking system other than free banking would have improved people's well-being in free banking states.



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## Notes

1. "Free banking" is the name used for these banking laws at the time, and this usage of the term is clear in context. This period was not one of laissez-faire banking, in which the only laws applied to banks are those applying to similar firms whether or not they are financial institutions. Free banking laws in the United States included many detailed provisions of the laws that applied to banking and not other businesses, some of which had unfortunate effects.

It is ironic that the banks in the United States most similar to laissez-faire banks, private banks, have received little study. It is difficult to know even how many private banks there are at any time, let alone anything about them. Because private banks are not incorporated, do not have limited liability, and are subject only to general laws, there is very little documentary evidence, and none of it is readily available. Individuals or partnerships in the United States long have been unable to issue notes, but private banks face the same issues in the deposit and loan business as do today's commercial banks.
2. According to the *New Shorter Oxford English Dictionary*, the use of the word *wildcat* for a reckless or unsound operation arose in the early 1800s. The usual basis of the name, as in Hammond (1957, 600-601), for example, is the explanation in the text. Dillistin (1949, 60-63) argues for a different, strained interpretation.
3. Rockoff (1975) was the first economist in many years to examine U.S. free banking. L. White (1984) explored free banking in Britain, including its intellectual history, and Rolnick and Weber (1983; 1984; 1985; 1988) wrote an influential series of papers investigating U.S. free banking. In recent years, there has been a torrent of research on free banking all over the world. Dowd (1992) includes nine papers on some of these free banking episodes. Selgin and White (1994) survey much of the research on free banking. This research into free banking is part of an examination of basic issues concerning monetary and banking systems analyzed in recent years by Hayek (1978), Friedman and Schwartz (1986), Goodhart (1988), and others. Other studies include a classic analysis by Smith ([1936] 1990) and more recent analyses by Bordo and Schwartz (1995), Goodhart (1994), Roberds (1995), Schwartz (1993), and Selgin (1993; 1994).
4. This summary is based on Dewey (1910), Hammond (1957), Rolnick and Weber (1984), Hasan and Dwyer (1994), and Dwyer and Hasan (1996).
5. Loans to stockholders generally are not so obvious on available free banks' balance sheets.
6. Although they legally could demand it, noteholders did not necessarily require specie in exchange for the banknotes. They often accepted notes issued by other banks.
7. Dillistin (1949) provides detailed information on the reporters, and Gorton (1996) provides an economic analysis of the discount rates.
8. Georgia is the remaining state that adopted free banking in the 1830s. Georgia never had more than two free banks, however; hence, the history of free banking in Georgia is not particularly informative and is not examined in this paper. Schweikart (1987) and Scott (1989) provide overviews of banking in Georgia before the Civil War.
9. There are no histories of banking in Michigan that include this period. The available information is limited because fire destroyed the Michigan bank commissioners' records (Rolnick and Weber 1983, 1089). Felch's (1880) recollections of this period, during which he was a legislator and a bank commissioner, provide an informative but prejudiced overview. The reports by the bank commissioners printed in the House Executive Documents (U.S. Congress 1837-38, 1839-40) also are informative. Shade (1972) examines the relationship between banks and politics in the Old Northwest: Ohio, Indiana, Illinois, Michigan, and Wisconsin.
10. These problems apparently became clear quickly. The original banking bill including personal bonds in the security deposit was approved March 15, 1837, but was amended to include only bonds and real estate mortgages on December 30, 1837 (Michigan 1838, "An Act to amend an act entitled 'An Act to organize and regulate banking associations' and for other purposes," Section 6).
11. The laws are "An Act suspending, for a limited time certain provisions of law, and for other purposes," approved June 22, 1837 (Michigan 1837b), and "An Act to amend an act entitled 'An act suspending for a limited time certain provisions of law, and for other purposes'," approved December 28, 1837 (Michigan 1838).
12. Shade (1972, 36-37) indicates that the Michigan legislature granted nine new charters in 1836 in addition to the existing charters and passed the free banking law after receiving eighteen requests for new charters in its 1837 session.
13. Given today's banking laws or, for that matter, later free banking laws, it is natural to suppose that banks were required to inform the bank commissioners before opening. This was not the case, though. Free banks in Michigan were required to file applications with the treasurer and clerk of the county in which they intended to open their office, not with the bank commissioners (Michigan 1837a, "An Act to organize and regulate banking associations," Section 1).
14. Dillistin (1949, chap. 2) is the best single source on counterfeiting of free banks' notes.
15. At least one of the commissioners, Alpheus Felch, was not favorably disposed to free banking. He was one of four legislators out of thirty-nine to vote against the original free banking law (Felch 1880, 115; Shade 1972, 37). He also was one of the Supreme Court justices who ruled in litigation in 1844 that the free banking law was unconstitutional (Rockoff 1985, 886). This \$1 million estimate seems to be the estimate that Felch (1880) relies on, contrary to Rockoff's supposition (1985, 887).
16. These evaluations range from tentative ones of "hope no loss" to definite ones of "no possible loss."
17. These losses are the difference between the par value of the notes and the dollar amount received from the banking

- regulator and do not allow for the forgone interest in the meantime or later recoveries from the banks or their stockholders.
18. These data include 1840 and 1841, whereas the aggregate losses do not, because reliable data on total notes are not available for 1840 and 1841 (King 1983, 147).
  19. In Wisconsin in 1861, banks decided not to accept ten banks' notes at par and announced it only after some businesses had paid workers in those banks' notes (Krueger 1933, 82-85). The result was a riot.
  20. At the start of the Civil War, Tennessee free banks had problems similar to those in Illinois and Wisconsin, but the surviving data do not include noteholders' losses (Pierce and Horning 1991).
  21. Noteholders may have been paid the face value of their notes even if the bank's security deposit was insufficient to redeem the notes at face value. The available information from the states' archives is on note redemption by the security deposit, which does not include information on payments from other sources. Even if a noteholder was paid face value, the payment was delayed and the present value would have been less than the face value. There is insufficient information available to reliably calculate such present values. Not having such present values, though, is a second-order problem compared with not having information on all payments to noteholders.
  22. Increased entry, though, can be associated with increased competition, which is desirable. On the basis of raw numbers, Ng (1988) suggests that free banking did not increase bank entry. Using an economic model, though, Economopolous and O'Neill (1995) provide evidence that free banking did increase entry. Bodenhorn (1990) presents evidence that free banking was also associated with more changes in banks' market ranks. Kahn's (1985) computations indicate that free banks had a shorter life expectancy than chartered banks, which is not obviously undesirable anyway. These computations are vitiated, though, by an assumption that the probability of closing is the same every year, an assumption grossly at variance with the data.
  23. Rockoff (1975, 4-5) defines a wildcat bank as a free bank that cannot continuously redeem its notes. He later (1991, 96-103) elaborates on his views of wildcat banking and distinguishes them from Rolnick and Weber's views.
  24. Interestingly, Bodenhorn and Hauptert (1995) provide evidence that free banks issued too few notes to maximize their net revenue.
  25. The relative price of Indiana bonds rose in 1852 at least partly due to a change in the way interest was paid. Before 1853, one-fifth of the interest on the bonds was paid in bonds on which interest would not be paid until 1853. Indiana began paying all of the promised interest in 1853.
  26. Details are provided in Rolnick and Weber (1984), Economopolous (1988), Hasan and Dwyer (1994), Dwyer and Hasan (1996), and the earlier work referenced in these papers.
  27. Movements of northern states' bond prices generally are similar to movements of U.S. bond prices.
  28. Only fragmentary data on Illinois bonds prices are available in *Bankers' Magazine*, the source of the bond prices. There is no evidence of changes in bond prices specific to Illinois in Chart 6, although nontrivial transitory changes could be concealed by the paucity of observations. There is no evidence, though, of events other than the bank failures that might have affected prices of Illinois bonds.
  29. It is less surprising that Missouri bonds fell as much as southern bonds when one recalls that Missouri was under martial law with a provisional state government for the duration of the war (Brownlee 1958). Ratchford (1941, 124-25) indicates that Missouri paid no interest on its bonds from the outbreak of the Civil War until the ratification of a Reconstruction-era constitution in 1866.
  30. The loss rates for Michigan and New York are weighted-average loss rates for all banks, and the loss rates for Indiana, Illinois, and Wisconsin are simple average loss rates across banks.
  31. As in Michigan in 1838, the state legislatures suspended the provision of the free banking laws that would have revoked banks' charters because they failed to redeem their notes.
  32. Dwyer and Gilbert (1989) and Calomiris and Gorton (1991) summarize these later episodes. Sprague (1910) and Friedman and Schwartz (1963) provide detailed information and analysis.

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