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HUGH ROCKOFF\*

# The Free Banking Era

## *A Reexamination*

### INTRODUCTION

During the two decades preceding the Civil War the regulation of banking in the United States was left to the states. Various schemes were tried, but the most famous and most controversial was free banking. The term free banking meant something very specific at this time: it meant a banking system with free entry and a bond-secured note issue. Free entry provided that any potential banker who could raise a certain minimum of capital could start a bank wherever he chose. Under the older system of chartered banking, the potential banker had to secure a special grant from the state legislature. The bond security provision of the law worked in the following way. Banks were allowed to issue paper currency redeemable in gold or silver under free banking as well as under other regulatory systems. But under free banking, designated government bonds had to be deposited with a state authority as security for all circulating notes issued by a bank. The bank, so long as it remained solvent, was entitled to the interest on the bonds. But should it fail to honor its notes, the state would sell the securities and reimburse note holders out of the proceeds.

Free banking was intimately related to wildcat banking, the formation

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of banks with note issues of far greater volume than they could hope to continuously redeem. While something similar to wildcat banking could and did happen under the older system of chartered banking, it was less likely because it required the initial cooperation of the legislature.

Judged by its ability to survive, the free banking law proved reasonably successful. Free banking laws were first passed in Michigan in 1837 and in New York and Georgia in 1838, an understandable response to the destruction of the Second Bank of the United States, and the resulting increase in the importance of state laws in regulating the banks. On the eve of the Civil War over half the states, including the most populous, had free banking laws. As late as 1858 free banking laws were passed in Iowa and Minnesota, and Pennsylvania adopted free banking in 1860. Michigan's legislature passed a free banking law in 1857, even though an earlier law produced disaster. Thus, the National Banking Act passed during the Civil War, a sort of national free banking act, was the continuation of a movement that was well underway and perhaps accelerating in the decade preceeding the Civil War.

But traditionally, historians have judged the experiment, at least in the western states, a failure. However, despite the attention paid to American monetary history during the past decade, this episode has not been reexamined. The purpose of the present study is to begin such a reexamination in the light of the extant quantitative data, frail as it is, and modern monetary theory.

Our primary effort will be aimed at filling three omissions in traditional interpretations. The first omission is an explanation of the diversity of experiences under superficially similar free banking laws. The most striking contrast is between the free banking laws passed in Michigan and New York in the late 1830s. These laws appear very similar on the surface and their historical roots are entwined. Yet free banking in Michigan was a disaster giving rise to some of the most famous stories of wildcat banking, while the New York law (after some initial rough sledding) was the basis for one of the most successful banking systems of the ante-bellum period. No serious evaluation of free banking can be completed without an explanation of why some free banking laws exploded in "hyper-inflations" while others did not.

Some writers have hinted that the source of instability was the security provision [15, p. 164; 19, pp. 55-56]. However, these suggestions do not constitute an analytically complete statement. This issue is treated in section 2.

A second important omission from traditional interpretations, at least from a modern point of view, is that they make no attempt to quantify the damage produced by wildcat banking. This issue is treated in sections 3 and 4. A third omission from traditional interpretations is the failure to ask whether free banking could have produced any benefits for the

states which adopted it. We discuss one possibility, a more efficient allocation of bank capital, in section 5.<sup>1</sup> Before plunging into these issues however, it will be useful to examine the behavior of a bank-issued currency.

### I. THE ECONOMICS OF A BANK-ISSUED CURRENCY

During the free banking era, as we have noted, paper currency was issued by banks. The specie price of bank notes varied depending on the location and condition of the issuing bank. This state of affairs has attracted considerable attention because it appears to differ so greatly from our present system. The market's response, generally, was a system of private brokers who exchanged bank notes for specie, discounting the notes as a charge for their services. The discounts they charged were published in "bank note reporters." These were periodicals which listed each bank by state and city, and the discount (as a percentage of the face value) on its notes currently prevailing in the financial center where the reporter was published. The reporter also described any counterfeits. The specie paying banks would typically be listed at a small discount from par. Another group of banks was the "broken" banks, and the notes of these would often not be acceptable at any price.

Some observers have deduced that the ante-bellum banking system was chaotic from a count of failed banks and counterfeits in bank note reporters [26, pp. 177-78]. However, any deduction about the state of the currency must be made carefully because the reporters generally listed counterfeits and bank failures even if the notes had been removed from circulation years before. The reason for this was that someone who had managed to save a stock of worthless notes might reintroduce them at some later date. A detailed comparison of a pair of bank note reporters by the same publisher issued in December of 1846 and November of 1843 revealed that slightly more than ninety percent of the banks listed as broken, failed, closed, or fraudulent in the 1846 reporter had also been listed in the earlier issue. In this particular case the danger in using bank note reporters for making inferences concerning the state of the ante-bellum banking system is similar to making inferences about the state of the banking system in the 1940s from a list of failed banks going back to the early part of the depression.

Table 1 displays the nationwide pattern of discounts for selected dates. It shows that most banks were at small discounts from par, discounts that decreased over time, perhaps as a result of improvements in transportation and communication.

<sup>1</sup>The classic histories of nineteenth century banking [13, 26], generally eschew quantitative measurement. They tend to concentrate on the safety of bank notes and deposits [28].

TABLE 1

DISCOUNTS ON BANK NOTES AT PHILADELPHIA, SELECTED DATES, 1845-58 (Percents)\*

State	November 1845	November 1850	November 1855	November 1856	November 1857	November 1858
New England	1/2	3/8	1/4	1/4	3/4	3/8
New York	3/4	3/4	1/2	1/2	1	1/2
New Jersey	3/4	0	1/4	1/4	3/4	1/4
Pennsylvania	0	0	0	0	0	0
Delaware	0	0	0	0	0	0
Maryland	1/4	1/2	1/2	1/2	5	1/2
Virginia	1	3/4	1	1	10	5/8
North Carolina	1-1/2	1-1/4	1-3/4	1-1/4	10	1
South Carolina	1-1/2	1	1	3/4	10	1
Georgia	2	1	1	1	10	1
Alabama	5-1/2	3-1/2	5	5	5	3-1/2
Mississippi †	80	75	?	?	?	?
Louisiana	2	1	1/4	1-1/4	5	3/4
Tennessee	2-1/2	2-3/4	2-1/2	5	20	1-1/2
Kentucky	1-1/2	1-1/2	1	1	10	3/4
Missouri	1-3/4	1-1/2	1	1	10	1
Ohio	2	1-1/2	1	1	10	3/4
Indiana	2	1-1/2	5	5	10	2
Illinois	70	75	2	2	20	1-1/2
Michigan	65	3	1-1/2	1-1/2	10	1-1/2
Wisconsin †	?	?	2	2	20	1-1/2

\*Sources: Various issues of *Van Court's Counterfeit Detector and Bank Note List*.

†The ? for Mississippi and Wisconsin indicates that these notes were of doubtful value, and only purchased under special circumstances. The table gives the modal discount.

An implication of this pattern of discounts is that it is unlikely that there were large fluctuations in the rate of exchange among regions during the free banking era except during the suspensions of specie payments in the early 1840s and late 1850s. This would seem to eliminate the possibility of regional devaluations curing incipient unemployment regularly. However, further research on this point is warranted. The devaluations that could take place during suspensions (note the large discounts in November, 1857) might have been sufficient to have reduced unemployment when the competitive position of particular regions deteriorated.

Whatever the benefits from flexible exchange rates, a heterogeneous currency did make exchange less efficient. Each time a transaction took place the seller had to make some judgment about the quality of the particular set of bank notes being offered. Clearly the process of making this judgment used real resources, particularly labor, that would not have been used if the currency were homogeneous. Moreover, because of the inconvenience of the paper currency, people were led to use larger amounts of specie than otherwise. In 1859 the ratio of specie outside the treasury to the total money supply was .41. Twenty-five years later, under the National Banking system, the ratio was only .15 [12, pp. 7, 224-25; 32, p. 648].

Nevertheless, it seems unlikely that the heterogeneous nature of the

currency was a major brake on economic growth, for in many crucial respects the system was little different from that which prevails today. Locally we use demand deposits. But these are not generally acceptable as a means of payment. Each time we wish to make a purchase by check from a businessman we force him to make some judgment about the quality of the money we are offering. Instead of having to worry about different kinds of bank notes a merchant today must worry about different kinds of deposits which could be as numerous as his customers. Counterfeiting currency is now rare, but forged checks and insufficient balances are a constant irritation. Yet no one today would argue that the heterogeneity of our deposit money is a serious impediment to the growth of national income.

This analogy can be extended. Since deposit money is not generally acceptable it is more convenient when traveling to use currency or traveller's checks. During the free banking era people used bank notes locally but switched to specie (or possibly the notes of some well-known bank) when traveling. Today without much complaint we pay a small charge for travelers' checks. During the free banking era one had to pay a similar charge to a broker who exchanged "foreign" money for the local currency.

We do not wish to argue that the system worked perfectly. A national currency might have been preferable. But in the light of the close similarity between the workings of the ante-bellum system, properly understood, and our present-day system, the inefficiency of a heterogeneous currency should not be exaggerated. It should also be remembered that free banking did not add to the heterogeneity of the currency except as it led to an increase in the number of banks. To the contrary, free banking greatly reduced economic heterogeneity by standardizing the assets that banks held against notes. In New York the particular kind of security backing the note was stamped on it. It was even possible under free banking for all of the free banks to use the same type of note in order to inhibit counterfeiting.

## II. THE CONNECTION BETWEEN FREE BANKING AND WILDCAT BANKING<sup>2</sup>

Wildcat banking was made possible by the free entry provision of the free banking law. But whether it was profitable depended on the design of the bond security provision. Let us consider several cases.

First, suppose the market value of the eligible bonds was less than the "legal value" (the value of the notes that could be issued on a bond). Under this condition it obviously paid to set up a zero reserve bank providing the notes could be placed in circulation at close to par before the enterprise went bankrupt.

<sup>2</sup>This section was stimulated by [5, pp. 86-95].

The “income statement” of a wildcat bank of this sort with a circulation of \$100 might look like this:

Market value of notes issued		\$100
—Market value of bonds (or mortgages) deposited		90
Net Income		\$ 10

This simple model explains several important cases of wildcat banking. In Michigan (in 1837) mortgages on land were eligible and they were accepted at par [21, p. 80]. It was thus possible to create a mortgage on a worthless piece of property, have it certified as being valuable by some friends, and then transfer it to a wildcat bank in exchange for a mass of bank notes. This seems to be the process by which many of the Michigan wildcats issued currency. Others were simply frauds which operated in violation of the free banking law.

It should be noted, however, that there was an important difference between Michigan’s experience with wildcat banking (the nation’s first) and later episodes: Michigan’s occurred during a legal suspension of specie redemption. Thus, the situation in Michigan was unique, a group of men could issue bank notes with practically no cost to themselves and unchecked by the need to redeem the notes in specie. However, while the free banks were not required to redeem their notes in specie they were required to have 30 percent of their authorized capital on hand in the form of specie when they began operation. The often quoted complaint of the Michigan bank commissioners, “gold and silver flew about the country with the celerity of magic; its sound was heard in the depths of the forest, yet like the wind one knew not whence it came or whither it was going,” [36, p. 1129] referred to attempts by the wildcat bankers to evade this requirement.<sup>3</sup>

It is interesting to note that some 20 years after her first disastrous experiment with free banking Michigan passed a second free banking law. The eligibility requirements were far more strictly drawn than for the first [23, p. 366]. The monetary statistics of the resulting banking system clearly show that there was no wildcat banking. Michigan’s two free banking laws were not part of a controlled experiment. Nevertheless, the contrasting experiences under the two laws appears to be strong evidence that the source of wildcat banking was to be found in the provisions of the free banking law rather than in something else, for example, in the conditions of frontier life.

Indiana’s experience with wildcat banking was perhaps another example of the simple model. According to the free banking law, bonds were to be accepted only at the minimum of the market and par values, so that there does not seem to be room for a banker to have received notes

<sup>3</sup>It has been quoted by [14, p. 28] among many others.

worth more than the bonds deposited as security [18, p. 24]. But according to one authority the auditor may have valued Indiana bonds at par [2, p. 172]. This could have been done because the auditor was not aware of the significance of the distinction between the par and market values. In a ‘‘currency reform’’ which took place in 1855, the security provision of the law was considerably rewritten and the requirement was changed so that banks received at most \$91 dollars worth of notes for every \$100 dollars of bonds deposited [18, p. 34]. No wildcat banking took place after this change in the law.

The clearest case of the simple model occurred in Minnesota [25]. The initial version of Minnesota’s free banking law was passed in 1858. In this version only bonds of the United States, Minnesota, and other states approved by the banking authority were eligible. Soon after passage, however, this part of the law was amended to extend eligibility to the Minnesota State Railroad Bonds. These were to be issued on behalf of certain railroads in exchange for mortgage bonds. When the railroads applied for the bonds due them under the law, the governor refused to issue the bonds unless a first lien on the assets of the railroads was given to the state. The railroads refused, and took their case to the Supreme Court of Minnesota. The ruling was in favor of the railroads. The nature of the ruling along with threats of repudiation made in certain newspapers led to a rapid depreciation of the bonds in the market. This need not have caused wildcat banking, because under the free banking law the banking authority was empowered to reduce the price at which he accepted depreciated bonds. Under the circumstances, however, the banking authority was reluctant to take this step because it might appear to be a repudiation of the state’s debt. The railroad bonds, virtually worthless in the market, were accepted at 95 percent of par. The result was wildcat banking.

There is certainly one and perhaps several episodes of wildcat banking which do not seem to fit the simple model we have been using. However, a natural extension of it seems sufficient to cover these cases.

Suppose that a wildcat bank could expect to survive for as long as, say, one year. Then, even if the value of the notes issued was no greater than the market value of the bonds deposited, the interest earned on the bonds might be sufficient to induce wildcat banking.

The ‘‘income statement’’ of such a bank with a circulation of \$100 might be as follows:

Market value of notes issued	\$100
+ interest on bonds	6
+ surplus returned to shareholders	4
	\$110
– Market value of bonds deposited	\$104
Net income	\$ 6



New Jersey's episode seems to fit this model. The free banking law of New Jersey passed in 1850 provided that bonds of the United States, New Jersey, or Massachusetts could be deposited. The value of the notes that could be issued was set equal to the par price of the eligible bond with the additional provision that the market price be at or above par. There were no signs of wildcat banking during the first year of operation. However, in 1851 the free banking law was amended to permit banks to deposit bonds issued by New York, Ohio, Pennsylvania, and Kentucky. These were all somewhat closer to par although above it. Finally, the law was altered in 1852 to permit banks to deposit Virginia's bonds [10, pp. 52-64]. The latter amendment soon provided a bitter lesson in the danger a state faced if it linked its currency to the debt of another state.

About one year earlier Virginia had passed a law which permitted her government to issue debt from time to time. In subsequent years Virginia greatly increased her debt. The largest addition was made in 1853 when some \$4.6 million was issued, surely one of the largest deficits of any state in the ante-bellum period [34, p. 554]. Part of this debt was absorbed by New Jersey's free banks during a rapid expansion of the free banking system. Wildcat banking in New Jersey was similar in style to that in the western states [8, pp. 76-77].

It appears that wildcat banking could have been prevented if the laws had required a free bank that failed to pay damages to note holders in addition to the face value of the note, and if this protection had been assured by demanding that the value of the bonds deposited exceeded the value of the notes issued by an amount sufficient to pay such damages. A damage rate which suggests itself on a priori grounds would be the normal rate of interest, since this is what the note holder could have earned had he invested in some safe alternative.

So far we have discussed wildcat banking in a very different way from what is usual. We have emphasized the bond security provision and state debt policies. We have not even mentioned the remote areas in which wildcat banks were located, or the various tricks used to keep notes in circulation. Of course wildcat banks used these tactics. The more notes they could get into circulation, the greater their profit. However, it is not usually recognized that in at least two ways the bond security provision contributed to the tendency of banks to locate in hard-to-reach places. First, under free banking, the state banking authority was empowered to sell *all* of the securities of the bank if a *single* note holder was refused specie. Thus, the banker who did not want to honor demands for specie had few alternatives to locating his bank as far as possible from the principle area of circulation. A second factor was the knowledge each note holder possessed that should a bank fail all of the notes would be redeemed on a *pro rata* basis out of the proceeds from the sale of the deposited bonds, and usually in the banking authority's office in the state capital

or in the state's major commercial center. Thus each note holder separately had an incentive to let someone else bear the costs of seeking out the wildcat banker, and, being refused specie, of informing the banking authority.

The framers of the free banking laws were apparently walking a tightrope. If they made the gap between the market price of bonds and the "legal price" small or negative they risked, as we have seen, wildcat banking. If they made the gap slightly larger they would produce a "sound" free banking system as was the case in New York, Ohio, and Louisiana. If they made the gap still larger the free banking law could prove abortive. To take one example of the latter phenomena, Massachusetts's free banking law was passed in 1851 but no banks were organized under it until 1859. Massachusetts limited the bond holdings of free banks to bonds of states in New England (which had small debts), and to bonds issued by towns in Massachusetts. The state securities sold at substantial premiums in the 1850s. Yet the par price of the bonds was the legal maximum. Moreover, the bond had to be made equal to one yielding 6 percent, so its par value, for the purposes of the law, was reduced by one-sixth if it yielded 5 percent. As the decade drew to a close a number of free banks were started on the basis of securities issued by towns in Massachusetts. These securities were, presumably, somewhat cheaper since they were more liable to default.

### III. LOSSES ON BANK NOTES

A bank failure was, in the first instance, a transfer from the note holder to the wildcat banker that left the net wealth of the community unchanged. But the uncertainty and inconvenience caused by wildcat banking could have produced decreases in total real income. In this section we examine the redistribution of wealth, while the efficiency effects are dealt with in section 4.

Table 2 presents an estimate of the losses ultimately suffered by holders of free bank notes through the year 1860. It includes losses due to wildcat banking as well as losses due to ordinary mismanagement and bad luck. For the most part the estimates were compiled from standard secondary sources. When, as sometimes happened, somewhat arbitrary adjustments had to be made, a procedure which tended to bias the estimate upward was followed.

In interpreting Table 2 it is useful to distinguish between the states which had "sound" free banking laws, that is, with adequate bond security provisions, and those which did not. In the former, with the exception of New York, losses were mild. In New York most of the losses came in the early years of the law when the security provision allowed the bonds of states besides New York to be used.

TABLE 2  
LOSSES SUFFERED BY HOLDERS OF FREE BANK NOTES FROM THE FIRST YEAR  
OF FREE BANKING THROUGH 1860\*

State	First Year	Loss (dollars)	State	First Year	Loss (dollars)
Vermont	1851	24,500	Michigan	1857	—†
Massachusetts	1851	0	Wisconsin	1852	0
Connecticut	1852	0	Minnesota	1858	96,900
New York	1838	394,700	Iowa	1858	—
New Jersey	1850	6,000	Georgia	1838	3,000
Pennsylvania	1860	0	Florida	1853	—
Ohio	1851	77,600	Tennessee	1852	0
Indiana	1852	227,900	Alabama	1849	—
Illinois	1851	21,300	Louisiana	1853	0
Michigan	1837	1,000,000	Total		1,851,900

\*Each estimate is rounded off to hundreds. The dates refer to the years in which the free banking laws were passed and are taken from the statutes of the various states. In some states additional losses occurred during the Civil War due, generally, to the depreciation of southern bonds. For a list of leading references and assumptions used in estimating the losses, see the Appendix.

†—signifies that little or no banking was done under the free banking law.

The experience under wildcat banking was quite varied. In Michigan the notes in many cases, although not all, became worthless. If the estimate in Table 2 were correct, the total volume of wildcat money would have amounted to about 11 percent of the annual income of Michigan in 1840 [9, p. 98].

However, while the bank commissioners refer to \$1,000,000 as a low estimate, it is likely that they had in mind the face value of the wildcat issues. Even from the first, many of these notes may have borne heavy discounts for it appears that the public caught on rather quickly to the condition of the wildcat banks. The bank commissioners had already closed a number of banks and had officially reported their findings in March of 1838. Disenchantment was sufficiently widespread by April of 1838 to induce the legislature to suspend the free banking law [22, pp. 246-47]. Thus, the true condition of the wildcats was surely common knowledge sometime early in 1838. Since few of the wildcats were organized until after the general suspension of specie payments in June of 1837, the life span of the typical Michigan wildcat was about six months at the most.

The episodes of wildcat banking which occurred in the 1850s were apparently not as costly to the note holder. In Indiana, for example, it appears that losses were frequently less than 5 percent. Moreover, many of the notes were probably accepted initially at some discount from their face value. It is even conceivable that some note holders made money from the wildcat bankers by taking the notes from the banker at a larger discount than prevailed when the notes were finally redeemed by the state. Seventeen free banks, a substantial number for a frontier state such as Indiana, survived to the Civil War.

Today, after nearly three decades with almost no bank failures, we might

regard the failures that occurred in Indiana as catastrophic, but contemporaries took a more tolerant view. To illustrate this we quote at length the state auditor's view of the damage:

The experiment of free banking in Indiana, disastrous as it has been in some particulars, has demonstrated most conclusively the safety and wisdom of the system. The original bill was crude and imperfect, admitting of such construction as held out to irresponsible men inducement and facilities for embarking largely in the business of banking, without the ability to sustain themselves in a period of revulsion.

That revulsion came . . . and yet the loss to which the billholder was necessarily subjected, in many cases, did not exceed five percent, and in no case exceeded twenty percent of the amount in his hands. [37, pp. 183-84.]

The other episodes of wildcat banking were more similar to Indiana's experience than to Michigan's.

Few reliable estimates comparable to those in Table 2 exist for the non-free banking sectors of the banking system, or for deposits.<sup>4</sup> The upshot is that our estimate must be judged as it stands. Nevertheless, it seems to be a rather small number. It means that by 1860 note holders had probably lost less through the failure of free banks, including the wildcats, than they stood to lose in that year from a 2 percent inflation [12, p. 225]. Undoubtedly, this estimate could be considerably refined. But it seems unlikely that the unearthing of new data will require a substantial upward revision.

#### IV. TOWARD A MEASURE OF THE EFFECT OF WILDCAT BANKING ON THE EFFICIENCY OF EXCHANGE

We would like to know whether in addition to the redistribution of wealth to which Table 2 is addressed, there was also a decrease in the income of the community as a whole. Our analysis follows Bailey's examination of the cost of anticipated inflation [1]. To explicate the argument we will use Figure 1. Here the cost of holding bank money in cents per dollar per year is measured along the vertical axis, while the amount held is measured along the horizontal axis. The vertical distance between the demand curve,  $DD$  and the horizontal axis is a measure of the marginal productivity of money. The area under the  $DD$  curve is thus the total value of monetary services. This relationship permits a deduction of the efficiency costs of wildcat banking. Suppose that the cost of holding money given a "sound" banking system would be  $C_a$ . This cost might be simply the interest on U.S. treasury bonds, a safe alternative to money. Under

<sup>4</sup>An estimate by Jay Cooke placed losses on all bank notes at \$50 million per year [24 vol. 1, p. 327]; also quoted in [6, p. 21].

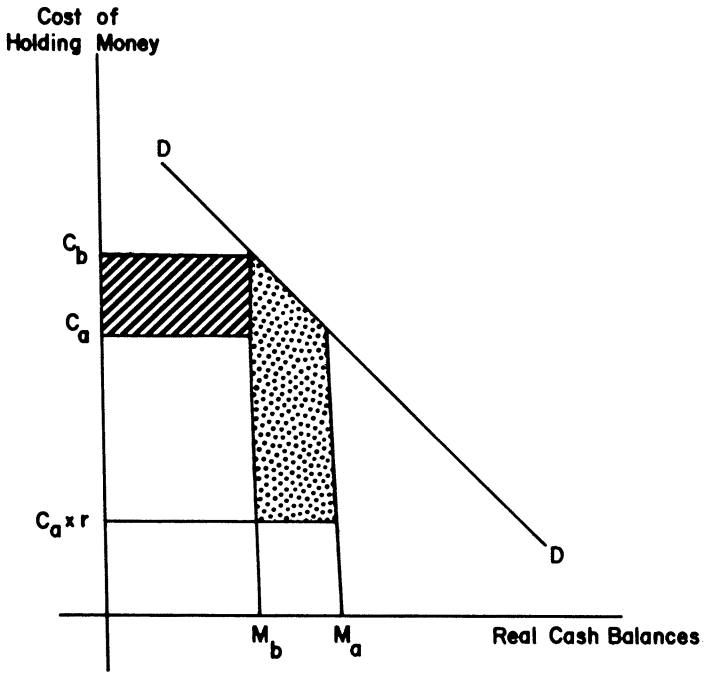


FIG. 1. The Demand for Money

wildcat banking, costs would be higher, say  $C_b$ , because from time to time a money holder would expect to discover that part of the money he held had been issued by wildcat banks. For example, if the yield on U.S. bonds were 5 percent, and if a money holder expected that over the course of a year 5 dollars out of a 100 would turn out to be worthless because they were issued by wildcat banks, then the total cost of holding money would be 10 percent per year. Returning to Figure 1, people would wish to hold only  $M_b$  of real money balances under a regime of wildcat banking.

The cross hatched area in Figure 1, the expected loss rate ( $C_b - C_a$ ) multiplied by the total amount of money held,  $M_b$ , is the amount of wealth that people anticipate will be lost due to wildcat banking. We can consider the cross hatched area a pure transfer from note holders to bankers leaving the wealth of society as a whole unchanged. However, this transfer produces a loss in efficiency.

The value of the services produced by the money which is not held under wildcat banking but which would be held under a "sound" banking system is the entire area between the  $DD$  curve and the horizontal axis bounded by  $M_b$  and  $M_a$ . The social cost of these services is the product in alternative uses of the resources used in producing this amount of money.

For simplicity, assume that the social cost is simply the amount of specie held by banks multiplied by the interest rate—hence it is represented by the line  $C_a xr$  where  $r$  is the reserve ratio. A more complete analysis would have to take notice of the use of other forms of physical capital (bank buildings and furnishings) and labor in producing money. The efficiency cost of wildcat banking, then, is the stippled area in Figure 1, the total value of the services of money that society loses, less the resources saved when the production of monetary services is reduced.

It is important to emphasize that the stippled area is a measure of the amount of resources saved by the use of money which would otherwise be used in precisely those activities which historians have designated as having been effected by the quality of the currency in the free banking era. The labor used by merchants in carefully examining the currency offered to them is the most frequent example. Another is the inconvenience experienced by travellers who had to convert their home bank notes into notes circulating in the region they were visiting. Perhaps most important is the return from productive capital which is foregone because people must hold larger balances of specie.

To directly apply the logic embodied in Figure 1 we would need to know the stock of bank money, the expected loss from wildcat banking, and the elasticity of the demand for money with respect to the cost of holding it. Unfortunately, direct estimates of the latter two are out of the question. Forming an estimate of the expected loss from the data fragments we possess would involve making extremely arbitrary assumptions about how expectations were formed. Moreover, the elasticity of demand cannot be estimated because regional interest rates have not been developed for the ante-bellum period.

However, we were able to estimate a rough substitute for the true demand function which allows one to obtain an idea, albeit an imprecise idea, of the losses from wildcat banking. This substitute is a cross-state demand function which includes a dummy variable that takes the value 1 in states which had experiences with wildcat banking and 0 in states which did not. The coefficient on this variable will be a product of the elasticity of demand and the cost of holding money, provided that we have taken account of the other important variables.

The actual regression that was run was an ordinary least squares regression of the following form

$$M = \alpha + \beta_1 W + \beta_2 U + \beta_3 F_1 + \beta_4 F_2 + \epsilon \quad (1)$$

where

$M$  = the stock of bank money per capita,  
 $W$  = wealth per capita,

- $U$  = urbanization,  
 $F_1$  = a dummy variable which takes the value 1 if the state experienced wildcat banking and 0 if it did not,  
 $F_2$  = a dummy variable which takes the value 1 if the state had a "sound" free banking system and 0 if it did not,  
 $\epsilon$  = a random error term,  
 $\alpha, \beta_1, \beta_2, \beta_3,$   
 and  $\beta_4$  = the coefficients to be estimated.

The use of wealth was suggested by demand for money studies based on modern data which indicate that wealth or income is an important variable. Urbanization was considered a good proxy for the demands for money generated by commercial and industrial activity. However, this interpretation is open to challenge, urbanization may be a proxy for variables effecting supply. For example, a greater density of banks may induce people to hold more money. Or it may even be a proxy for our unobserved regional interest rates. But even if one of these alternative interpretations apply we can still use the reduced form equation to estimate the monetary deficit in the wildcat banking states. Experimentation with a number of other variables failed to reveal a strong relationship with per capita money holdings. The  $F_2$  dummy was added so that we could compare wildcat banking directly with chartered banking.

The equation was estimated for the year 1860. This was the only year in the ante-bellum period that met the twin requirements that it be a census year so that wealth estimates would be available, and that it follow the major wildcat banking episodes. In fact, the latter requirement was only partially met for Wisconsin and Illinois. Money was defined as the sum of deposits and currency (net of currency held by banks) for the year 1860. The monetary data was taken from the summaries given in the *Report of the Comptroller of the Currency for 1876*. Since the *Report* generally gives the data for the end of the preceding year, the comptroller's series were backdated one year. After deleting those states for which the data was obviously incomplete, we had a sample of 27 observations. The nominal money holdings were then deflated by the number of free people [32, pp. 12-13; 33, p. 7]. The wealth index was constructed by summing the state by state estimates of real and personal property given in the census of 1860 [30, p. 319]. This index was then deflated in the same way as the money index. The urbanization variable is simply the percentage of the total population living in communities with population greater than 2,000 [31, pp. (1-30)-(1-37)].

Two specifications of the basic equation are presented below. One uses a broad definition of the states in which free banking produced wildcat

banking, viz. Florida, Tennessee, Indiana, Illinois, Michigan, and New Jersey, (variable  $F_1$ ) and a broad definition of the states with sound free banking systems, viz. New York, Ohio, Louisiana, and Virginia, which adopted a conservative variant of free banking (variable  $F_2$ ). A second specification used a narrow definition of wildcat banking including only those states which experienced intense episodes, viz. Indiana and Michigan (variable  $F_1^*$ ), and a narrow and more proper definition of those states with sound free banking systems, excluding Virginia (variable  $F_2^*$ ).

These regressions are reported below along with the  $t$  statistics in parentheses and the  $R^2$  statistics corrected for degrees of freedom.

$$M = -8.56 + .017W + 54.02U - 6.55F_1 + 10.32F_2 \quad (2)$$

(-1.97)      (4.79)      (5.64)      (-1.86)      (2.56)

$$R^2 = .72$$

$$M = -9.47 + .018W + 55.91U - 7.81F_1^* + 10.88F_2^* \quad (3)$$

(-2.14)      (4.62)      (5.63)      (-1.67)      (4.80)

$$R^2 = .69$$

Other definitions of  $F_1$  and  $F_2$  produce similar results.

If we use the coefficient on  $F_1$  or  $F_1^*$  to estimate the loss from wildcat banking we get a rather surprising result. Taking a linear approximation, the stippled area in Figure 1 is given by the following formula,

$$L = (M_b - M_a) x \left[ c_a x(1 - r) + \frac{1}{2} x(c_b - c_a) \right] \quad (4)$$

where  $L$  stands for the loss from wildcat banking. If we assume, for example, that the risk free rate of interest,  $c_a$ , was 10 percent, that the expected loss from wildcat banking,  $c_b - c_a$ , was 10 percent and that the reserve ratio  $r$  was also 10 percent—three assumptions which bias the estimate upwards—and use the coefficient on  $F_1$  as an estimate of  $M_b - M_a$ , then we get the following results:

$$L = 6.55 [.10(1 - .10) + .5(.10)] = \$.92 \quad (5)$$

If we use the coefficient  $F_1^*$  the result is

$$L = \$1.09 \quad (6)$$

Thus, the *residual* effect of wildcat banking was to lower income per capita in the effected regions by about \$1.00.

This finding, however, can be subjected to a number of substantial



criticisms. For example, wildcat banking may have affected the reserve ratios of the banks—banks may have been forced to hold greater reserves because people were more likely to return their notes if signs of trouble developed. In terms of Figure 1 wildcat banking may have shifted the  $C_a x r$  curve upward. Thus, a calculation of the loss that included the cost of holding greater bank reserves might lead to a different conclusion. And, indeed, there did exist substantial interregional differences in bank reserve ratios of a sort that would lead one to believe that western banks had to hold large specie reserves because the public was worried about wildcat banking.

Introducing banking reserve ratios explicitly into the analysis, however, involves two vexatious problems. First, the effect of other economic variables on bank reserve ratios, such as interest rates or the distance between banks, must be taken into account. Second, and more important, the relevant ratios are not known. Gold and silver are clearly what count for the economy as a whole, since the economy must give up real resources to secure these and only these reserves. But when we examine separate states, notes or other assets issued in other states have the same property. In general we do not have information on the net balance of bank notes or other assets between any one state and the rest of the economy. For these reasons we have not been able to isolate the effect of wildcat banking on the reserve ratios of banks in the effected regions.

Perhaps the most serious objection to the analysis is that it involves comparing one ante-bellum banking system with another. The real point at issue, it might be argued, is whether the heterogeneity of the currency led to losses in comparison with the centrally-directed monetary system that existed before 1840 and the federally regulated system that existed after the Civil War. We can still use Figure 1. But, now the horizontal axis records bank money balances for the economy as a whole. The cross-hatched area would represent the expected loss due to the discounting of bank notes used in interregional trade. However, this area could no longer be interpreted as a pure transfer, since the discounts would in part reflect the cost of the resources used in handling uncurrent money. The situation is similar to the analysis of a tax on an ordinary commodity when the proceeds of the tax are spent on socially wasteful activities.

Stanley Engerman has attempted to measure the effect of the destruction of the Bank of the United States on the economy by determining what national income would have been in the 1850s had the economy been able to operate on the same specie-money ratio that prevailed in the 1830s, while maintaining the stock of money that existed in the 1850s [11]. Using this framework, Engerman showed that the cost of destroying the Bank of the United States, or from our point of view the cost of the late ante-bellum banking system, was small, about .15 of 1 percent of national income on an annual basis. It is true that per capita holdings of bank money

TABLE 3  
BANK PROFITS IN NEW YORK, BOSTON, AND PHILADELPHIA,  
1849-59\*±

Year	DIVIDENDS AS A FRACTION OF THE PAR VALUE OF CAPITAL			DIVIDENDS AS A FRACTION OF NET WORTH		
	New York	Boston	Philadelphia	New York	Boston	Philadelphia
1849	8.79	8.06	9.79	7.63	7.33	8.14
1850	8.70	8.36	10.60	7.33	7.33	9.04
1851	9.38	7.82	10.30	7.51	6.88	8.61
1852	9.03	7.78	10.27	7.69	6.87	8.70
1853	8.85	8.08	11.13	7.84	7.32	9.30
1854	8.87	8.65	11.40	7.86	7.71	9.54
1855	9.08	7.98	11.00	8.08	7.09	9.52
1856	8.61	7.81	10.26	7.72	7.10	9.00
1857	7.73	7.73	7.12	6.91	7.00	6.18
1858	6.91	7.43	8.03	6.20	6.76	6.74
1859	7.56	7.31	8.03	6.78	6.70	6.74

\*The first three columns are unweighted averages for all banks in the city. The second columns are the corresponding column to the left multiplied by the aggregate ratio of par capital to par capital plus surplus.

†Sources: 1. *Dividends*. Boston; Joseph G. Martin, *A Century of Finance* (New York: Greenwood Press, 1969) pp. 99-101, 108-11. New York, 1849-51; *Hunt's Merchants' Magazine*, vol. XXIII, p. 89, and vol. XXVII, p. 92; 1852-59; *Banker's Magazine*, vol. XIV, pp. 556-57. Philadelphia, 1849-55; *Banker's Magazine*, vol. X, p. 978; 1856-59; *Communication of the Auditor General of Pennsylvania Relative to Banks and Savings Institutions*, 1856, 1857, 1858, and 1859, passim.

2. *Capital and Surplus*. Boston and New York; *Annual Report of the Secretary of the Treasury on the Condition of the State Banks* (in the House Congressional Documents), 1849-1859. Philadelphia, *annual Report of the Secretary of the Treasury*, 1849-1850, 1859; *Communication of the Auditor General*, 1851-1858.

increased greatly in the post-bellum era. But it seems reasonable to conjecture that a large part of these increased holdings could be attributed to the decline in interest rates, the increase in wealth, and the increase in urbanization.

## V. THE EFFECTS OF FREE ENTRY ON THE ALLOCATION OF BANK CAPITAL<sup>5</sup>

A fundamental question concerning free entry is whether it improved the allocation of bank capital. However, there is no easy way of determining whether a particular allocation is more or less efficient than some other. Economic theory suggests that the rate of profit on capital is a good index of the efficiency of allocation so long as there is no significant divergence between the social and the private rates of return. We have, therefore, assembled some of the surviving data on the rates of return to capital in banking that allow a comparison between free banking and non-free banking states. We begin by comparing bank profits in the three major ante-bellum financial centers. Table 3 gives the average dividends as a percentage of par capital and as a percentage of par capital plus surplus for dividend-paying banks.

The outstanding feature of this table is the consistently high profits earned by the Philadelphia banks. The simplest explanation for the high profit rate of Philadelphia's banks is the existence of monopolies fostered

<sup>5</sup>This section can be usefully compared with [29], which discusses post-bellum banking market structure.

TABLE 4  
COMPARISONS OF BANKS IN NEW YORK CITY, BOSTON, AND PHILADELPHIA, 1850-60\*

Ratio	New York City			Boston			Philadelphia		
	50	60	%	50	60	%	50	60	%
Dividends to market price of bank stock†	8.25	7.25	-1.6	7.61	6.68	-1.6	8.04	7.21	-1.4
Capital to population	40	60	4.1	174	231	2.8	107	27	-13.8
Earning assets to total assets	.79	.80	.1	.87	.87	0.0	.76	.86	1.2
Equity to total liabilities	.33	.40	1.9	.54	.52	-.4	.34	.35	.3
Notes to deposits	.17	.10	-5.3	.45	.39	-1.4	.36	.24	-4.1

\*Sources: Balance Sheets: U.S. Congress, House Document 122, 32nd Congress, 1st Session, pp. 78, 79, 118-127, 196-203. U.S. Congress House Document 77, 36th Congress, 2nd Session, pp. 98, 150, 159, 171-184. Stock prices are from the *Banker's Magazine*, population from the Censuses, and the dividends from the sources listed in Table 3.

†The dividend price ratios are for 1851 and 1859. The percent symbol refers to the annual percentage rate of change.

by the unwillingness of the legislature to charter new banks. Contemporary observers were certainly aware of the lack of bank capital in Philadelphia. Consider the following item from the *Philadelphia North American* which was reprinted in the *Banker's Magazine*:

The Southwark [bank] was again refused an increase of capital at last session of the legislature, though, as will be seen [from its dividend rate] it is one of the best banks in the city, and were the legal sanctions granted, might easily obtain subscriptions to any desired amount of new capital. [3, p. 996.]

It is conceivable that Philadelphia's banks held riskier portfolios than did Boston's, but this argument is less plausible for New York. Some evidence is presented in Table 4. The dividend price ratios for several years are given. They do not show a significantly higher rate for Philadelphia in comparison with that which would be expected for New York if its banks held riskier portfolios. However, the dividend price ratios are lower for Boston, indicating that these banks may have had a more conservative investment policy. Perhaps, the key factor here was the high capitalization rates in Boston.<sup>6</sup> The dramatic fall in bank capital per capita in Philadelphia—the product of a stable amount of capital and rapidly growing population—and the otherwise similar nature of its portfolio tend to confirm the diagnosis based on contemporary observations.

The problem of allocating bank capital was more difficult in the areas of new settlement. For here the rate of growth of population, and changes in the distribution of population were more intense, so that errors in the allocation of bank capital were more costly. There is abundant qualitative evidence that allocation by state governments on the frontier was unsatisfactory.

<sup>6</sup>An econometric study of bank portfolio behavior [16] produced similar results.

In Indiana the state bank, an often praised monopoly partly owned by the state, was set up before the railroads were built. The railroads, of course, completely altered the importance of various communities making the allocation of capital among the branches of the state bank uneconomic. People felt that it was time for a "new shuffle and deal." The upshot was that the legislature allowed the charter of the first state bank to expire and adopted free banking in its place [20, pp. 124–25].

In Tennessee, a state owned bank was formed as a relief measure during the depression of the late 1830s. At its very inception the decision on where to locate branches involved the directors in a statewide controversy. While commercial demands for banking facilities were taken into consideration in the location of the branches, there was continual dissatisfaction. The location of the branches was a subject of debate each time the legislature met and in each gubernatorial campaign during the life of the bank [7, pp. 96–97]. In Missouri the chief source of controversy was the contention by St. Louis businessmen that the state bank did not allocate sufficient capital to satisfy the rapidly growing needs of St. Louis. In the late 1850s the legislature answered this criticism by chartering a new set of privately owned banks. While this law was not, strictly speaking, a free banking law, it did include a bond security provision [4, pp. 241–48, 253–56].

Free banking in Ohio was not preceded by a state owned bank, but rather by a system of chartered banks with standard provisions. Nonetheless, the belief was widespread in 1850 that Ohio was suffering from a lack of banks. Her newspapers pointed out that Ohio was third in population but far from third in bank capital. Papers in Cincinnati and Cleveland complained that these rapidly growing cities were being denied bank capital under the charter system. These arguments helped overcome the opposition and secure passage of the free banking law in 1851 [17, p. 208].

Examples of this sort, evidence of a widespread belief that free banking would improve the allocation of bank capital on the frontier, do not prove that in fact that free banking could or did improve the allocation of bank capital. But together they seem to establish a presumption that something was wrong with the older system of chartered banking.<sup>7</sup>

There exists little quantitative evidence by which one can gauge the impact or potential impact of free banking legislation on western banking systems. The best evidence is for Ohio, where we can examine bank profits before and after the free banking law of 1851. This information is presented in Table 5, along with bank profits in certain other states for comparison. It does appear that in Ohio profits were high before free banking and were lowered as a result of it. While the low initial profits of the free banks could be attributed to a "start up" period, they could not be attributed

<sup>7</sup>An alternative interpretation of these complaints is that they represent the traditional plea of the farmer for "easy" credit.

TABLE 5  
BANK PROFITS IN OHIO BEFORE AND AFTER FREE BANKING\* †

Banks	1850	1851	1852	1853
1. Ohio, free banks	—	—	—	8.2
2. Ohio, state banks	15.0	15.3	—	13.7
3. Ohio, independent banks	13.6	14.1	—	10.1
4. Ohio, old banks	12.1	12.4	—	—
5. State Bank of Indiana	10.0	9.4	9.4	9.6
6. Bank of Kentucky	10.5	9.0	13.0	10.0
7. Banks of New York City	9.2	9.6	—	8.9
8. New England Municipal Bonds	5.1	5.1	5.0	5.0

\*Sources: Dividends were obtained from the sources listed below the appropriate balance sheet information where necessary was obtained from the annual reports on the condition of the state banks made by the secretary of the treasury and printed as House documents.

(1-4) Charles Clifford Huntington, *A History of Banking and Currency in Ohio Before the Civil War* (Columbus, Ohio: Heer Printing Co., 1964), pp. 212, 213, 278-79, and 293-94; (5) William F. Harding, "The State Bank of Indiana," *Journal of Political Economy*, 3 (December, 1895), p. 23; (6) Gen. Basil W. Duke, *History of the Bank of Kentucky* (Louisville: John P. Morton & Company, 1895), p. 140; (7) Table 3; (8) Sidney Homer, *A History of Interest Rates* (New Brunswick, New Jersey: Rutgers University Press, 1963), p. 287.

†Profits are defined as the ratio (as a percentage) of dividends to nominal capital. These rates are similar to more sophisticated ratios. The old banks were individually chartered. The state banks were similar except that each contributed to a common "safety fund" for the relief of note holders of failed banks. The independent banks were bond secured but entry was limited.

to the restrictions imposed by the bond security system since the independent banks also faced these restrictions.

The preceding discussion relies on intraregional comparisons. To gauge the impact of free banking it is also worthwhile examining measures of efficiency available for all states. One measure is the density of incorporated banks with respect to population. This is a rough index of the number of banks a potential customer faces when he enters the market as a depositor or borrower. Table 6 gives the number of incorporated banks per hundred thousand in 1840, 1850, and 1860. The most striking feature of the table is the smaller ratio of banks to population in the free banking states in 1860, the opposite of what one might expect from stories about wildcat banking, although the high ratio for Wisconsin in 1860 is an exception.

A second supplementary measure which suggests itself is the number of unincorporated banks. If the state authorities were restrictive in the issue of charters, or if incorporated banks were taxed heavily, then we would expect to see private banks developing as substitutes. We know little of the activities of private banks in the ante-bellum period. They were not limited liability institutions, nor could they issue bank notes. But it seems reasonable to suppose that they could offer some competition to the incorporated banks in the issue of deposits and the making of loans.

Table 7 presents data on the private banks from the *Banker's Almanac*; 1859 and 1860 are among the best years for our purposes because the list of private bankers was gradually lengthened as users of the *Almanac* noted omissions. The higher ratio for the free banking states tends to contradict the hypothesis that free banking reduced the private banking sector, confirming the results from Table 6. However, it appears in both

TABLE 6  
INCORPORATED BANKS PER 100,000 INHABITANTS BY STATE, 1840, 1850, and 1860\*

State	BANKS PER 100,000 IN 1840	BANKS PER 100,000 IN 1850	BANKS PER 100,000 IN 1860
States with Operative Free Banking Systems in 1860†			
New York	3.91	6.52	7.89
Louisiana	13.35	5.60	1.84
Ohio	2.43	2.93	2.35
Indiana	1.90	1.42	2.89
Illinois	1.89	—	5.47
Wisconsin	3.23	—	14.18
Minnesota	—	—	1.74
Avg.	4.45	4.12	5.19
All Other States			
Maine	9.36	5.49	11.31
New Hampshire	9.12	6.92	15.95
Massachusetts	15.45	13.16	14.88
Vermont	5.82	9.87	12.70
Rhode Island	56.88	46.62	51.43
Connecticut	10.00	9.97	16.09
New Jersey	6.97	5.31	7.44
Pennsylvania	2.85	2.29	3.06
Delaware	—	6.52	10.71
Maryland	4.47	3.94	4.51
District of Columbia	13.64	—	—
Virginia	2.18	2.32	4.12
North Carolina	1.33	2.07	3.12
South Carolina	2.36	2.09	2.84
Georgia	4.20	1.99	1.70
Florida	9.26	—	1.43
Alabama	1.18	.26	.83
Mississippi	—	.16	—
Arkansas	10.20	—	—
Kentucky	2.18	1.93	3.71
Tennessee	2.77	2.20	2.97
Michigan	1.89	1.26	.27
Iowa	—	—	1.93
Missouri	.78	.88	3.56
Kansas	—	—	1.87
Nebraska	—	—	3.45
Avg.	8.23	6.26	7.82

\*Sources: Banks: U.S. Comptroller of the Currency, *Report 1876*, pp. xcvi-ccxi. Population: U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1857* (Washington, D.C., 1960), pp. 12-13.

† In some of these states other kinds of banks were important.

cases that the free banking effect is obscured by regional factors, making a simple point-in-time comparison insufficient.

The potential gains from an improved allocation of bank capital were small when viewed in relation to the economy as a whole. The par value of bank capital in 1859 was \$422 million [35, p. xcv]. Thus, if banks earned a monopoly profit of, say, 2 percent on the average, the total transfer would amount to an annual flow of \$8.44 million, and this is an overestimate—many states had free banking laws. A calculation of

TABLE 7  
INCIDENCE OF PRIVATE BANKS BY STATE, 1859 AND 1860\*

STATE	NO. OF PRIVATE BANKS 1859	RATIO OF PRIVATE TO INC. BANKS 1859	NO. OF PRIVATE BANKS 1860	RATIO OF PRIVATE TO INC. BANKS 1860
States with Operative Free Banking Systems in 1860				
New York State	35	.14	33	.13
New York City	79	1.46	78	1.42
Louisiana	14	1.17	10	.77
Ohio	143	2.70	148	2.85
Indiana	46	1.24	36	.97
Illinois	124	2.58	136	1.84
Wisconsin	37	.38	17	.16
Minnesota	33	16.50	25	10.00
Avg. †		3.27		2.27
All Other States				
Maine	3	.04	3	.04
New Hampshire	n.a.	n.a.	n.a.	n.a.
Massachusetts	18	.10	15	.08
Vermont	n.a.	n.a.	n.a.	n.a.
Rhode Island	7	.08	4	.04
Connecticut	1	.01	1	.01
New Jersey	n.a.	n.a.	n.a.	n.a.
Pennsylvania	86	.99	82	.91
Delaware	2	.17	2	.17
Maryland	18	.56	11	.35
District of Columbia	8	—	6	—
Virginia	20	.32	18	.28
North Carolina	6	.21	5	.17
South Carolina	2	.10	3	.15
Georgia	13	.46	10	.34
Florida	7	n.a.	9	4.50
Alabama	14	2.33	19	2.38
Mississippi	15	n.a.	12	n.a.
Arkansas	1	n.a.	2	n.a.
Kentucky	33	.89	31	.69
Tennessee	18	.46	9	.26
Michigan	58	19.33	50	12.5
Iowa	100	—	76	6.33
Missouri	31	.84	32	1.07
Kansas	4	4.0	7	4.67
Nebraska	7	3.5	4	2.67
Avg.		1.91		1.88

\*Sources: Private Banks 1859, 1860: *Merchant's and Banker's Register*, 1859, pp. 26-40; 1860, pp. 28-42. Incorporated Banks, States, 1859, 1860: U.S. Comptroller of the Currency, *Report*, 1876, pp. xcvi-cxxi. Incorporated Banks, New York City, 1859, 1860: U.S. Congress, House Document 112, 35th Congress, 2nd Session (1859) pp. 116-17; U.S. Congress, House Document 49, 36th Congress, 1st Session (1860) pp. 113-14.

† In some of these states other kinds of banks were important.

the pure efficiency loss might well produce an even smaller flow. A flow of \$8.44 million in 1859 would have been only 8.28 per capita [32, p. 7]. Thus, the main import of this section is for an understanding of the development of the banking system rather than the economy as a whole.

## VI. CONCLUSIONS

The following facts and conclusions can be drawn from our reexamination of the free banking era:

1. Free banking laws were passed in eighteen of the thirty-two states, with Michigan passing two laws, one in 1837 which was subsequently repealed, and a second law in 1857. In nine states, little or no banking was done under the law, or it was given only a brief trial before the Civil War. In three states, New York, Ohio and Louisiana, some of the "soundest" banking of the era was accomplished under free banking laws. In Tennessee and later in some of the states which initially experienced wildcat banking the system was a more modest success. Six states, Michigan (after 1837), Indiana, Illinois, Wisconsin, Minnesota, and New Jersey, experienced wildcat banking. In one of the latter, Minnesota, this was clearly due to efforts by the state to force its bonds to a higher price than they were currently bringing in the market. In three states, Wisconsin, Illinois, and New Jersey, wildcat banking can be traced to the linking of the supply of currency with the debt of another state. In only one of the 19 free banking experiments, Michigan (after 1837), did wildcat banking result from a system of currency backed by privately issued securities.

2. Wildcat bank notes lost most of their value only in the first episode in Michigan. In other cases the losses were much less. More typical of free banking was the average loss of 15¢ on the dollar for failed banks in New York.

3. Simple regressions suggest that episodes of wildcat banking had a mild long-run impact on the services people derived from holding money in the effected regions.

4. The evidence for or against the proposition that free banking improved the allocation of bank capital is too slender to support firm conclusions. However, it does appear that New York City benefitted from free banking in its competition with Philadelphia for financial leadership, and that in the West free banking was, or at least appeared to be, a way of solving the vexatious problem of how to allocate bank capital in a region of new and rapid settlement.



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## APPENDIX

The following list gives the leading references and assumptions used in estimating the losses in Table 2. In a number of cases, other sources had to be consulted.

1. *Vermont*. We have discovered only one free bank which failed: the South Royalton. Its notes were secured by mortgages and Virginia bonds. A. W. Kenney, "The Banks," in *History of Royalton Vermont*, ed. by Evelyn M. Wood Lovejoy (Burlington, Vermont: Free Press Printing Co. 1911), pp. 502-506. The mortgages may have produced considerable losses. Total losses were estimated as an arbitrary 20 percent of the South Royalton's circulation of \$122,570 in August 1856. U.S. Congress, House Doc. 87, 34th Congress, 3rd Session (1857), p. 27.

2. *Massachusetts*. U.S. Congress, House Ex. Doc. 25, 37th Cong. 3rd Sess. (1862), p. 41.

3. *Connecticut*. None of Connecticut's free banks failed during the life of the free banking law which was repealed in 1855. For a list of the Connecticut free banks see Forrest Morgan, ed. in chief, *Connecticut as a Colony and as a State, or One of the Original Thirteen* (Hartford Connecticut The Publishing Society of Connecticut, 1904), vol. 3, p. 211.

4. *New York*. Carroll Root, "New York Bank Currency," *Sound Currency* 2 (February, 1895), p. 19.

5. *New Jersey*. Losses were compiled from the summary sheets to the annual statements of the banks appearing in the legislative documents of New Jersey.

6. *Pennsylvania*. John Tom Holdsworth, *Financing an Empire: History of Banking in Pennsylvania* (Philadelphia: S. J. Clarke Publishing Co., 1938), pp. 583-585.

7. *Ohio*. According to Huntington only 7 bond security banks had failed through 1857. Charles Clifford Huntington, *A History of Banking and Currency in Ohio Before the Civil War* (Columbus, Ohio: F. J. Heer Printing Co., 1964), p. 249. Assuming that each was a free bank and had the average circulation of a bond secured bank in 1857, and that the rate of loss was, say, 10%, we get an estimate of 68,000. In addition I have added a ten percent loss for two banks existing in 1858 and 1860 but which failed to report in February 1861.

8. *Indiana*. U.S. Congress, House Ex. Doc. 102, 34th Cong. 1st Sess. (1856), pp. 181, 182, 185, and similar reports on other dates.

9. *Illinois*. George William Dowrie, *The Development of Banking in Illinois, 1817-1863*, (Urbana, Illinois: University of Illinois Press, 1913), pp. 152-153 and U.S. Congress, House Doc. 76, 26th Cong., 2nd Sess. (1861), pp. 220-221.

10.-11. *Michigan*. U.S. Congress, House Doc. 172, 26th Cong. 1st Sess. (1839), p. 1129. It was deduced from other evidence that there were no failures under the law of 1857 through 1860.

12. *Wisconsin*. Leonard Bayliss Krueger, *History of Banking in Wisconsin*, Studies in the Social Sciences and History, No. 18 (Madison, Wisconsin: the University of Wisconsin, 1933), p. 69.

13. *Minnesota*. Discounts: Sidney Patchin, "The Development of Banking in Minnesota," *Minnesota History Bulletin* 2 (August, 1917), p. 160. Circulation: U.S. Congress, House Doc. 49, 36th Cong. 1st. Sess. (1860), p. 296.

14. *Iowa*. Howard H. Preston, *History of Banking In Iowa* (Iowa City: State Historical Society of Iowa, 1922), p. 75.

15. *Georgia*. Bank note reporters published in the 1840's listed two free banks in Georgia: the Ruckersville Banking Company and the Exchange Bank. See, for example, *Bicknell's Counterfeit Detector and Bank Note*

*List*, November 1, 1843, p. 27. The former bank apparently redeemed all of its notes; *Laws of Georgia, 1853-1854*, p. 192. For the Exchange Bank we have used its maximum reported circulation; U.S. Congress, House Doc. 226, 29th Cong. 1st. Sess. (1846), p. 680.

16. *Florida*. J. E. Dovell, *History of Banking in Florida, 1828-1954*, (Orlando, Florida: Florida Bankers Association, 1955) pp. 44-46, and *passim*. This estimate is uncertain.

17. *Tennessee*. Claude A. Campbell, *The Development of Banking in Tennessee* (Nashville, 1932) pp. 150-151. U.S. Congress, House Doc. 49, 36th Cong., 1st Sess. (1860), p. 169.

18. *Alabama*. Theodore William Mathews, *Statutory Protection of Bank Creditors Prior to the Civil War* (unpublished Master's thesis, University of Chicago, 1930), p. 242.

19. *Louisiana*. George D. Green, *Finance and Economic Development in the Old South* (Stanford, California: Stanford University Press, 1972), p. 23.