

The United States' Experience with State Bank Notes: Lessons for Regulating E-Cash*

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Right of regulating coin given to Congress for two reasons: For sake of uniformity; and to prevent fraud in States towards each other or foreigners. Both these reasons hold equally as to paper money.

James Madison, 1786

We do not pretend, that a National Bank can establish and maintain a sound and uniform state of currency in the country, in spite of the National Government; but we do say that it has established and maintained such a currency, and can do so again, by the aid of that Government; and we further say, that no duty is more imperative on that Government, than the duty it owes the people, of furnishing them a sound and uniform currency.

Abraham Lincoln, 1839

1. Introduction

For well over a hundred years, the United States has benefited from having a safe and uniform currency. Since 1863, banks have been essentially prohibited from issuing notes that do not have the full backing of the federal government, and since 1879 virtually all currency has circulated at par. The possible introduction of privately-issued electronic monies has some people concerned that the situation could change, however. The concern is that, without government backing, these electronic monies will be unsafe currencies that do not always circulate at par. As a result, market participants could be subject to unnecessary risks and transactions costs.

The historical experience that appears to give rise to most of these concerns is that of the United States from its founding until the establishment of the National Banking System in 1863. This was a period in which individual banks were subject to state regulation, but the notes they issued had few government guarantees, either implicit or explicit.¹ During this period the notes of hundreds of different banks were in circulation, bank failures were relatively frequent, and bank notes traded at varying discounts outside their local area. In some cases, the discounts were substantial.

Based in part on this historical record, many have concluded that the relatively unregulated creation of privately-issued money is subject to a "lemons" problem. In the absence of government intervention, there may exist an incentive for banks to issue "low quality" currencies that are either hard to redeem – and hence that carry discounts – or that are subject to large default risk. In addition, the existence

¹ There are some cases where a bank was actually owned by a state and had the backing of the state for its notes. However, these are the exceptions rather than the rule.

of discounts that differ across the currencies of different issuers potentially implies the presence of high transactions costs for the users of these currencies.² While lemons problems and discounts on bank notes may arise with privately-issued monies, it may also be the case that "the market" will devise various methods for addressing them.

In this paper, we attempt to provide some preliminary historical evidence on the issues raised above:

1. Is there a lemons problem with respect to private money creation that cannot be well-addressed by market-mechanisms?
2. Can market mechanisms lead to the uniform par circulation of privately-issued monies?

With respect to the first question, we believe that United States history suggests a relatively unequivocal answer. So long as the convertibility of notes on demand was required, state bank notes were relatively safe assets, and their holders were subject to only very moderate default risk. With respect to the second question, our answer is far more equivocal at this point. It is true that in at least one instance – the so-called Suffolk Banking System of New England – there was a long period during which the notes of almost all banks circulated at par throughout a relatively large region. However, it appears that Suffolk enjoyed some governmental protection of its note-clearing monopoly. Further, we have not been able to document that par circulation over a large region with multiple issuers was ever attained elsewhere without government intervention. These observations, then, raise the possibility that New England's par circulation was not the result of competitive market forces although we are hesitant to state this as a firm conclusion and think that this issue should be studied further.

The remainder of the paper proceeds as follows. The next section discusses the evidence on the safety of notes issued by state-chartered banks. Here we show that most banks were relatively long-lived and that although bank failures were relatively common, with some notable exceptions, losses to noteholders were relatively small. The third section considers the extent to which state bank notes constituted a uniform currency. It begins by discussing the discounts on bank notes. Here we show that banknotes typically exchanged at discounts except in New England where the Suffolk Banking System led to the par pricing of the notes

²Concerns about the magnitude of the transactions costs arising from the use of multiple currencies motivates phenomena like the desire for a monetary union in Europe.

of that region's banks. We conclude by discussing the observations about Suffolk that might lead to the conclusion that par circulation of privately-issued monies will not occur without some government intervention.

2. The safety of private bank notes

The experience of the United States with privately issued bank notes in the period prior to the establishment of the National Banking System has been conventionally portrayed by historians and others as a period in which unscrupulous bankers set up short-lived (in existence for a year or less) banks whose major purpose was to issue large quantities of notes of dubious value and then go out of business. Allegedly, this was particularly true of the Free Banking Era (1837-1863) during which so-called wildcat banks supposedly issued large quantities of notes and located their redemption offices in hard to find places with the result that the public ended up holding worthless pieces of paper and suffering large losses.

However, the more recent literature, which largely focuses on the Free Banking Era, paints a much more favorable picture in several regards:

1. Although there was a large amount of entry and exit into banking during this period, banks were not, in general, short-lived institutions.
2. During periods of general convertibility of bank notes, the notes generally were safe, low-risk monies.
3. In those cases when a bank went out of business, generally, its notes were eventually paid off at par or at a small discount. There were a few exceptions, however, in which noteholders suffered large losses. "

In this section we examine the experience with bank notes during the period prior to the establishment of the National Banking System. We present new evidence for the states of Maine, Massachusetts, and Maryland. We also review previous evidence we have collected on the experiences of New York, Indiana, and Wisconsin under free banking.³

Because this history may not be familiar to many readers, we begin with a discussion of how banks operated under bank charters and free banking laws.

³We recognize that our selection of states does not include any from the South, which may bias our discussion toward making bank notes look safer than they in fact were. We hope to remedy this defect in the near future.

Then we discuss the longevity of banks and the overall safety of bank notes prior to the establishment of the National Banking System.

2.1. State-chartered and free banks

During the colonial era, the English colonies in North America had virtually no chartered banks.⁴ The first bank chartered in the United States was the Bank of North America in Philadelphia. It was chartered by the Continental Congress in 1781. However, from this time until the establishment of the National Banking System, with the exception of the First and Second Banks of the United States, state governments authorized and regulated the business of banking in the United States. To start a bank, one obtained permission from the state in which the bank was to be located.⁵

States granted banking privileges in two ways. Before 1836 a bank had to receive a special charter from its state legislature, which was often granted under a proviso that the bank would help finance some desired public project. With the demise in 1836 of the Second Bank of the United States and the loss of its branches throughout the country, many states were in need of increased banking services. To help fill the hole left by the closing of the Bank of the United States, many states eventually decided to pass what were called free (or general) banking laws. Such laws made it unnecessary to receive a special legislative approval to open a bank. Instead, under free banking laws, the essential requirement was that a bank back its note issue by providing the state's banking authority with collateral in the form of state and federal bonds. Between 1840 and 1863 many banks were started under these laws.

2.1.1. State-chartered banks

A bank charter was a legislative action permitting a bank to be established and setting the conditions under which it could operate. At least for a time, individuals and partnerships could also engage in the activities that we would consider banking – issuing notes and discounting. The advantage to having a charter was that it limited the liability of shareholders. The liability limits were not usually as strict as those in place today, however. Double liability (shareholders could not

⁴Two banks operated briefly in Massachusetts around 1740.

⁵One notable exception to this policy occurred in 1791 when the Bank of the United States received a 20-year charter from the federal government. This charter expired in 1811; Congress renewed it in 1816, but revoked it in 1836.

only lose the value of their equity, but were also liable for an amount equal to the value of their shares) was quite common, for example.

The charter a bank obtained specified the amount of capital the bank was to have. Changes in the amount of capital typically required legislative approval.

Shares of bank stock were sold by subscription; payments for stock were usually permitted to be made in several installments. Not all the payments had to be made in specie. It was quite common for a bank charter to require that the first installment, say, a third, be paid in specie or the notes of specie-paying banks. Later installments, however, could be paid in state bonds. In some cases, it was possible to pay for later installments with stock notes – shareholders would pledge their existing stock holdings as collateral for loans, which they then used to pay the next installment. A charter usually permitted a bank to begin operations once a specified amount of capital had been paid in the form of specie.⁶

In the vast majority of cases, bank charters also contained provisions that limited the activities a bank could undertake. On the liability side of the balance sheet, there were restrictions on the quantity of notes a bank could issue, usually expressed as a ratio to capital. Thus, a charter might restrict a bank's circulation to its capital or to twice its capital, for example. There were often also restrictions on the minimum denomination of the notes that could be issued. Such minimum denomination restrictions became universal around 1830. These minimums were commonly \$1 and were sometimes \$5.⁷ In some cases, a bank was permitted to have only a specified fraction of its circulation in notes with denominations of less than \$5.

In general, charters did not explicitly state that banks had to redeem their notes in specie on demand. However, after 1810 there were usually penalty provisions for nonpayment. Some of these provisions required a bank to pay interest to noteholders (at rates of between six and twelve percent) for the period of time

⁶In many cases the charter would also provide for the state to have partial ownership by reserving a certain amount of capital for the state to buy. (In some states there were banks where the state was the sole owner.) Typically, the state did not pay for this capital with specie but rather with state bonds. This was a method for the state to obtain revenue from the note issuing capacity of banks. (States were not permitted to issue notes directly because of the Constitutional prohibition on states' issuing bills of credit.) States would earn the difference between the dividends paid by the bank and the interest rate on their bonds. States also obtained revenues from banks through taxes, which were levied either on their capital or their note issue (circulation) or were simply flat yearly fees.

⁷A minimum denomination restriction of \$1 in 1830 would be approximately equivalent to a \$16 restriction today.

that specie payments were suspended. Others stated that a bank would forfeit its charter if it suspended payments; these penalties were rarely enforced, however.

Other restrictions on bank liabilities limited either total liabilities or liabilities other than circulation to some multiple of the bank's paid-in capital.

On the asset side of the bank's balance sheet, the charters contained restrictions on the activities a bank could engage in. Two common restrictions were prohibitions on holding real estate, except the land and buildings necessary to conduct business, and on the buying and selling of merchandise. Another was on dealing in public stocks (bonds), although some banks were required by their charters to buy the stocks of railroad or canal companies.⁸

2.1.2. Free banks

When a state enacted a free banking law, the "free" did not mean that the state established laissez-faire banking. Banks established under free banking laws had to operate under certain restrictions that will be described below. The "free" simply referred to the fact that entry into banking was free in the sense that no special legislative action was required in order to obtain a charter to establish and operate a bank.

Although there were some differences in the various state laws under which free banks operated, the free banking laws shared some key provisions. These provisions were all part of the first free banking law, which was passed by the New York legislature in 1838.⁹ The key provisions were as follows:

1. Collateral constraint. Free banks had to deposit designated state (and in some cases federal) bonds with the state banking authority as security for all notes issued. They could issue notes (N) only up to some fraction (α) of minimum of the market (p) or par value of the collateral deposited (B); that is,

$$N \leq \alpha \min(p, 1)B.$$

Typical values for α were 1 and 1/1.1, the latter arising when the laws stated that bonds deposits had to be 110 percent of note issue.

⁸For a more complete discussion of the typical provisions of state bank charters prior to the establishment of the National Banking System, see Dewey (1910).

⁹To be factually correct, the first free banking law was passed by the Michigan legislature in 1837. However, the Michigan law was modeled almost verbatim on the legislation that was under consideration in New York at the time, although New York did not pass its free banking law until the next year.

2. Demand redemption. Free banks had to pay specie for notes on demand. Failure to redeem even one note meant that the state could close the bank and sell off all the collateral deposited with the state and any other assets to pay off creditors. In many cases noteholders had first lien on the assets of the bank.
3. Limited liability. Shareholders in free banks had limited liability, but its form was usually of the double liability variety and, thus, similar to that enjoyed by the shareholders of state-chartered banks.

2.2. The longevity of banks

Some historians have contended that the period prior to the establishment of the National Banking System was characterized by the entry and exit of a large number of short-lived banks. In this section, we show that while it is the case that there was a large amount of turnover in the banking industry during this period, typically banks were not short-lived institutions.

The period prior to the establishment of the National Banking System was certainly characterized by a large amount of entry into and exit out of the banking system. This is shown in Table 1. There we show that in the six states we have studied to this point, 1108 banks existed during this period.¹⁰ Of this number, 461, or slightly over 40 percent, went out of existence before 1861.

However, the banks that were entering and exiting during this period were generally not short-lived. This is shown in Table 2, where we display the frequency distribution of bank lives for the states in our sample. Some summary statistics for the lengths of time banks were in existence are also given in that table. There we see that banks in Massachusetts were in existence for an average of 20.5 years with a median existence of about 14 years. Maryland and Maine banks were in existence for an average of about 18 and 13 years, respectively, with a median existence of about 8 or 9 years. Banks in New York were in existence for a shorter period of time (mean and median of about 8 years), but it must be remembered that a much shorter period of time is being considered for New York than for Massachusetts, Maine, and Maryland. Banks in Wisconsin were in existence for an even shorter period of time (mean and median of about 4 years), but the time period considered is also quite short. The only state for which it could be

¹⁰ Actually, this is an undercount of the actual number of banks that existed in these states, because we are only counting free banks for New York, Indiana, and Wisconsin. We will remedy this as the study progresses.

argued that banks were short-lived is Indiana, where banks were in existence for an average of only 2 years with a median existence of 1 year.¹¹

The evidence in Table 2 seems to indicate that banks in the West were in existence less long than banks in the East. Our discussion above attributes much of this to the fact that the period of time being covered is shorter. This conjecture should be explored further.¹²

2.3. Noteholder losses

Historians often described the bank notes issued prior to the establishment of the National Banking System with such colorful names as “shinplasters” and “red dogs” issued by “wildcat” banks. Such descriptions suggest that these bank notes were risky instruments issued by banks of dubious quality. The implication is that noteholders suffered large losses when these banks went out of business. In this section, we present evidence that this impression is not correct. In general, as long as convertibility was maintained, bank notes were safe, low-risk monies during this period. Further, in general, when banks went out of business, their notes were eventually paid off at par or at a small discount. There were a few exceptions, however, in which noteholders suffered large losses.

We first present evidence that bank notes were safe, low-risk monies. This evidence is presented in Table 3, some of which is selected from Rolnick and Weber (1983). In Table 3, we calculate the expected value in 1861 of a randomly selected bank note held as of the date of various condition reports. These expected values are computed by multiplying the circulation of each bank in the condition report by the rate at which noteholders were paid off and dividing the result by the total circulation.

¹¹Our computation of the lengths of time banks were in existence are underestimates in a way for two reasons. First, if a bank is ever listed in a statement of bank balance sheets, then we have computed the time in existence as the difference between the time it first appears and the time it last appears. Since the time between such reports is a year, on average, our estimates could be low by as much as two years. Second, we assume that all banks went out of existence in 1863. However, many banks continued to exist under national bank charters after this time. The time they existed as national banks is, thus, not included in our estimates.

¹²In examining at the evidence on longevity, we discovered that the longevity of banks in Baltimore was quite a bit longer than that for other Maryland banks. Specifically, we found that the average length of time Baltimore banks were in existence was 28.7 years (median 26 years) as compared to only 12.9 years (median 7 years) for non-Baltimore banks. However, we did not find such a longevity difference for banks in Boston as compared with other Massachusetts banks.

The evidence shows that free bank notes were relatively safe, although the degree of safety varied over states and over time within a state. The notes of New York free banks were the safest; the expected value of a randomly selected New York bank note never fell below 99 cents on the dollar, and for many years this expected value was one dollar. The safety of notes issued by banks in Massachusetts was the next best. In all years, these notes had an expected value of at least 85 cents, and in several years, these notes had an expected value of one dollar. The safety of notes issued by Maine banks was very similar to that of notes issued by banks in Massachusetts. In several years, these notes also had an expected value of one dollar, and the expected value of these notes was always 78 cents or better.¹³

Wisconsin's experience was at first very similar to New York's, but the safety declined over time to a low of 88 cents on the dollar in 1861. This occurred because all of Wisconsin's bank failures occurred in 1860 and 1861. Our computations show that the Maryland bank notes were always subject to some risk, albeit small.¹⁴ Indiana's banking problems occurred within two or three years after its free banking act became law in 1852. This is shown by the expected value of 92 cents in 1853. However, as early as 1856, Indiana's experience was also very similar to New York's and Maine's. (As this study progresses we will perform similar computations for Massachusetts.)¹⁵

The fact that when free banks failed they were more likely than not to pay their notes off at par is shown in Table 1. In the fourth and fifth columns of that table, we report, for those banks for which we were able to obtain the information, whether their notes were redeemed at par or below par when the bank closed. We find that, in general, banks that went out of business were twice as likely to redeem their notes at par than not to. New York banks were particularly good in this regard; they were about 3-1/2 times more likely to redeem at par than not to.

¹³The expected value of 82 cents for 1820 is computed assuming zero redemption values for the notes of the Castine, Passamaquoddy, and Winthrop banks, for which we have no redemption rate information as of yet. To the extent that the noteholders of these three banks did not suffer total losses, this expected value is an underestimate.

¹⁴This is due, to some extent, to the way we treated the large number of Maryland banks for which we had no information on redemption rates. The computations in the table assume that the redemption rate for these banks was zero. When the same computations are performed assuming a redemption rate of unity, the expected values are all 99 cents or higher. The notes of the banks in Baltimore were always perfectly safe because there were no failures of Baltimore banks.

¹⁵The discussion of the experience of New York, Wisconsin, and Indiana is adapted from Rolnick and Weber (1983).

The exceptions were Wisconsin and Maryland banks, which were about equally likely and less likely to redeem at par, respectively.¹⁶

Finally, we present some evidence that there were cases in which noteholders suffered large losses. This evidence is presented in Table 4, where we present in the first column the average loss per dollar for the notes of banks that did not redeem their notes at par. We find that there is quite a range – from a high of 70 cents on the dollar for Maine to a low of 15 cents or less for Maryland and Indiana. We find that the average loss per dollar was 56 cents for Massachusetts and around 25 cents for New York and Wisconsin. This evidence suggests that if one happened to be holding the note of a bank just before it was to fail (close and redeem its notes below par), then one could have potentially suffered a large loss.

3. Discounts on private bank notes and the Suffolk Banking System

In the previous section we have shown that privately issued bank notes provided a relatively safe currency. Although bank closings were common, in most cases noteholders did not suffer losses when banks closed. Further, there were a large number of long-lived banks. The result was that at most times, holders of bank notes could expect to lose very little even if they were to hold the note for a long period.

In this section we examine whether privately issued bank notes provided a uniform currency. We find that bank notes circulated at par in the town where the issuing bank was located. However, with one major exception, bank notes usually traded at a discount outside their locality. The major exception was the system of par circulation was known as the Suffolk Banking System. Between 1826 and 1858, the notes of up to 300 different banks circulated at par throughout New England. (These states include Connecticut, Maine, Massachusetts, New Hampshire, Vermont, and Rhode Island; although Rhode Island is a special case, as we discuss below.)

¹⁶This result for Maryland may change as we obtain more information on the rates at which banks that went out of business redeemed their notes.

3.1. The discounts on bank notes

Before the establishment of the National Banking System (at least after 1825) the banking system of the United States was characterized by a large number of banks each issuing its own individual notes. Table 3 gives an idea of how many note issuing banks were existence at various times for the six states in our sample. For example, in 1845 there were over 200 note-issuing banks in existence just in Maine, Massachusetts, New York, and Maryland. By 1855, the number is close to 400 for the six states we consider. It was certainly not the case that the notes of all of the banks in existence were in circulation in any locality. However, it certainly was the case that individuals, particularly merchants, could expect to encounter the notes of many different banks, both local and "foreign", in the course of their transactions.

Since banks could fail and since counterfeiting was widespread, people used publications, generically called bank note reporters and counterfeit detectors, to aid them in deciding at what price to accept a particular bank note. It is from these publications that we draw our inferences about the degree of uniformity of bank notes as a currency. In particular, Gorton (1993) presents an extensive set of data on bank note prices collected from *Van Court's Counterfeit Detector and Bank Note List*. It was published monthly in Philadelphia from February 1839 through December 1858 and listed prices at which bank notes would trade in that city. The notes of banks in 29 states are covered in Gorton's sample.

The evidence that bank notes traded at par in the local area comes from Gorton's finding that the notes of Philadelphia banks were quoted at par in *Van Court's*. The evidence to support the contention that bank notes did not trade at par outside the local area comes from Gorton's finding that virtually without exception the notes of banks outside Philadelphia were quoted at a discount in *Van Court's*. For example, in the 1840s notes of Maine banks traded at discounts of 1/2 percent; this decreased to 1/4 percent in the 1850s. Notes of banks in North Carolina traded at discounts of between 1 and 2 percent, and the notes of banks in Virginia trade at discounts of between 1/2 and 2 percent over the period covered by Gorton's data. Notes of most of the banks in Ohio were at discounts of between 2 and 10 percent in the majority of years. (There were zero discounts on notes of two Ohio banks that were explicitly payable in Philadelphia.)

3.2. The Suffolk Banking System

We find, therefore, that in most parts of the country, bank notes circulated at a discount outside the city or town in which the bank of issue was located. However, there was one major exception to this nonpar pricing of bank notes. After 1825, the notes of virtually all the New England banks exchanged at par when circulating within the region. Since the New England experience was so different from the rest of the country, we believe it is useful to determine if competitive market forces led to this outcome or if some noncompetitive arrangement allowed the Suffolk Banking System to prosper and yield a uniform currency throughout the New England states. To this end, we take an in-depth look at the history of Suffolk and at how it was able to maintain par exchange. The history is suggestive, but not conclusive; consequently, our conclusions are somewhat tentative. We suspect that the Suffolk Banking System and the par exchange that resulted was not the outcome of competitive market forces and that achieving a uniform currency is likely to require some degree of government intervention.

The par exchange of New England bank notes was clearly not the purposeful outcome of a government intervention. Rather, par exchange was a spin-off from an innovation the Suffolk Bank brought to the payment systems. The Suffolk Banking System, a coalition of the Boston banks established in the spring of 1824, developed into the first net clearing, par exchange system in the United States.¹⁷ By the 1830s virtually all New England banks were members of the Suffolk System.

The Suffolk Banking System appears to have evolved from a competition between the city banks of Boston and the country banks of New England for control of the Boston's bank note market. According to D. R. Whitney (1878), as early as the turn of the century, the city banks of Boston had tried to drive out this "foreign" money. Allegedly, in 1803 they agreed among themselves not to accept foreign notes from their customers. The result, however, was much different than the city banks had expected. Instead of driving the country bank notes out of circulation, their take-no-notes policy led to a new business known as note brokering. After 1803, if someone in Boston received a country bank note, they could sell it to one of the city's brokers. The brokers made a profit by buying notes at a discount and transporting them back to the banks of issue for full redemption.

¹⁷Par exchange did occur in other parts of the country when arrangements existed between two banks in different cities to hold each other's redemption deposits, but these arrangements held for only a limited number of currencies. (See Fenstermaker 1965.)

Consequently, despite the alleged boycott by the city banks, country banks were still successful at getting their notes to circulate in Boston; indeed, while there is some dispute over the data (see Mullineaux, 1987, p. 887), country bank notes appear to have remained a large part of the notes circulating in Boston.

The success of the note brokering business led some Boston banks to reconsider their policy of not accepting foreign money. The New England Bank of Boston was the first. In 1814 it announced that it would purchase country bank notes at a discount somewhat lower than the 3 percent rate that the note brokers were offering. By 1818, the year the Suffolk Bank became the seventh bank to be chartered in Boston, the discount was down to 1 percent. The next year Suffolk decided to enter the note brokering business.

Suffolk based its note brokering business on obtaining non-interest bearing deposits from a large number of country banks. Suffolk would buy country bank notes from merchants, individuals, and other banks at a discount. It would then allow a country bank to purchase its notes from Suffolk at the same discount on two conditions. First, the country bank had to maintain a permanent non-interest bearing deposit of \$5,000 with the Suffolk Bank. Second, the country bank had to maintain an additional non-interest bearing deposit as a redemption fund. Suffolk sent the notes of nonparticipating country banks, country banks that refused to make such deposits, home for redemption.

As competition increased in the note brokering business, the discount on country bank notes declined and so did the profits. Shortly after Suffolk entered the business, the discount on country bank notes declined from 1 percent to 1/2 percent. Suffolk did not have much success in attracting country banks as clients. By 1820 only a handful of country banks were holding permanent deposits with Suffolk. By the end of that year, Suffolk decided to end the purchase of notes of nonparticipating banks, as the cost of returning these notes to the bank of issue was not much less than the discount at which the notes were purchased.

The business did not improve much over the next few years. Competition in the note brokering business had made it "hardly profitable" (Redlich 1968, p. 72). So in 1824, Suffolk changed its strategy. In April of that year, Suffolk set out to drive country bank notes out of the city. It formed a coalition with the six other Boston banks, each of which contributed between \$30,000 and \$60,000 for a total of \$300,000 in order to purchase foreign bank notes, present them for redemption, and thereby drive foreign bank notes out of Boston. With this fund, the new Suffolk strategy was to purchase as many country bank notes as possible and return them for redemption.

A year later, however, the strategy was altered in a most innovative way. The note exportation strategy became a note-clearing strategy. Suffolk's partners decided that the Suffolk System could improve profits by becoming a clearing house for country bank notes rather than being an exporter of these notes. No longer would Suffolk buy country bank notes so that they could be sent back to the issuing bank for redemption. Instead, Suffolk would accept and clear—at par—all the foreign notes that participating country banks choose to deposit.

The new Suffolk System was similar in many ways to the old. Participating banks were banks that held deposits at Suffolk. As before, a country bank had to maintain a non-interest bearing, permanent deposit account: for each \$100,000 of capital, the bank had to hold \$2,000 in deposit. And, as before, a country bank had to hold an additional non-interest bearing redemption fund sufficient to redeem all its notes that were received by the Suffolk System. City banks only had to hold a non-interest bearing, permanent deposit. This was initially set at \$30,000, but was gradually reduced to \$5,000.

The clearing of bank notes worked as follows: Each day, the notes deposited by participating banks at Suffolk would be sorted, and the following day the net amount posted to the account of the appropriate bank. The notes of nonparticipating banks would be sent to the issuing bank for redemption as quickly as possible.

Within a few years the number of country banks with accounts at Suffolk grew dramatically. And by 1836 close to 300 banks, virtually all the banks of New England, were members of the Suffolk Banking System. While participation was generally voluntary, a Vermont law passed in 1842 gave a substantial tax advantage to banks that were Suffolk members. And a Massachusetts law passed in 1843, which prohibited banks from paying out other bank notes, encouraged country banks to join the Suffolk System.

While similar in some respects to the old system, the new Suffolk Bank System was much more appealing to the country banks for several reasons. First, participating banks could deposit, at par, their foreign bank notes; thus, participating bankers no longer had to travel to each issuing country bank to redeem notes, and much less specie had to be transported between banks. Second, the notes of the New England banks circulated at par throughout the region; thus, their notes tended to stay in circulation longer than otherwise because note brokers no longer profited from bringing notes back for redemption. And third, participating banks could borrow from Suffolk, at a time in U.S. banking history when interbank lending was not well developed. If a participating bank's redemption

fund was insufficient to cover the net debit, the Suffolk offered overdraft credit at 2 percent per month. Only if the debt exceeded both the redemption and the permanent account for too long were the notes sent back to the country bank for redemption.

The city banks also benefited from this new system. Like country banks they too could deposit at Suffolk their holdings of country bank notes, where they were accepted at par. In addition, city banks could share in the profits of the Suffolk Banking System. Although the Suffolk Banking System was not jointly owned by the consortium of city banks that established the System, Suffolk devised a way to have city banks share in the profits generated from note clearing. Above we noted that participating country banks had to hold non-interest bearing permanent and redemption accounts with Suffolk. There was, however, an exception to this policy. A country bank also could be a member of the Suffolk Banking System if it had a city bank serving as its redemption agent, that is, if the country bank had a city bank that would agree to redeem its notes at par in specie or in notes of other country banks that were members of Suffolk. The city bank then could require the country bank to hold non-interest bearing permanent and redemption accounts at its bank and, in this way, share in the profits from note clearing. However, as we argue below, in general, city banks either did not choose to take advantage of this option or they did not find it very profitable.

We think there is one other way that the Suffolk Banking System benefited the banks of New England as well as the general public. Suffolk replaced all other bank noteholders as monitors of bank risk. While we previously argued that on average bank notes were relatively safe, there was always some possibility of default. Before the Suffolk Banking System, each holder of the bank notes, especially banks and note brokers, bore the risk of default and of monitoring the New England banks. To a great extent, after 1826, because Suffolk bore the default risk, it became the monitor of bank risk; and replacing many monitors with one should have been a significant savings of resources.

Over the next 34 years, Suffolk's note clearing business grew rapidly until it dominated the market. In the summer of 1824, Suffolk was receiving around \$300,000 a month in country bank notes; by the end of 1825, it was receiving \$2 million a month; by 1841, \$9 million a month; by 1851, \$20 million per month; and by 1858 Suffolk was receiving close to \$30 million per month (Trivoli 1979, pp. 15, 21).

Along with the increase in business came a healthy increase in profits. One measure of Suffolk's profitability was the increase in its dividend payments. In

Table 5, we show the semi-annual dividends Suffolk and other banks paid to stockholders. Before 1826, that is, before Suffolk got into the note clearing business, its semi-annual dividend averaged 3.25 percent. Between 1830 and 1840, its semi-annual dividend averaged 3.7 percent. (Moreover, according to Whitney, in 1839, Suffolk paid out of its growing surplus a one time 33.3 percent dividend.) Between 1840 and 1850 the semi-average annual dividend was over 4 percent. Between 1850 and 1855, it was 10 percent. (According to Whitney, in 1852, Suffolk once again accumulated a large surplus, but this time the surplus was not to be divided among the stockholders because it was stolen by the bank's bookkeeper.) Consistent with this impressive string of dividends, Suffolk bank stock, from 1825 to 1858, was the highest priced bank stock in Boston (Whitney 1878, pp. 6-31).

Another measure of Suffolk's success is how profitable it was compared to other banks. The average semi-annual dividend Suffolk paid over its most profitable years, 1845 to 1855, was 4.7 percent. This compares to a 3.75 percent dividend paid by all non-Boston banks (all the country banks of Massachusetts). Suffolk's profits were also high relative to all the other Boston banks. Indeed, the profits of the other Boston banks look very much like the profits of the non-Boston banks. They paid an average dividend of 3.75 percent over the years 1845 to 1855. That the profits of these city banks were so much lower than Suffolk's is somewhat of a mystery, for, as we argued above, it appears that the city banks could have shared in the profits of Suffolk if they had chosen to.

Country banks did not have this option. Indeed, country banks eventually did form a coalition of banks to start their own note clearing business. It took much longer for a competitor to enter this market, however, than one might have expected. Once a competitor did enter, it quickly drove Suffolk out of the business, suggesting that there were increasing returns in the net clearing of bank notes.

Opposition to the Suffolk System developed shortly after Suffolk started its note clearing system, but a competitor did not appear until well over 30 years had passed (Lake 1947, pp. 192-93). In 1826 a convention of country banks met in Boston to discuss a coordinated effort to oppose Suffolk, but no agreement was reached. Ten years later, a group opposed to Suffolk's control of the market tried to obtain a charter for a new bank for the sole purpose of establishing a note clearing system that would compete directly with the Suffolk Banking System. The group argued that Suffolk was essentially charging too much for the services rendered, and they wanted an alternative. They proposed that a new net clearing bank be established and that the stock of this new venture be held only by banks, so that all banks could share in the profits. But the opponents of the new bank

prevailed. They argued that there did not appear to be a need for another note clearing business, that the Suffolk was working well, and that until the country banks acted as a group to request another, no action should be taken. Such a concerted request was not forthcoming until almost 20 years had passed (Lake 1947, pp. 193,195).

In 1855, the Massachusetts legislature granted a charter for a note clearing bank which was to be known as the Bank of Mutual Redemption (BMR). It appears that a special charter was needed because the BMR was to be owned by banks. More specifically, half the BMR's stock had to be owned by New England banks, and half of that stock had to be owned by Massachusetts banks (Lake 1947, p. 196). Since there was some mistrust of BMR at first, the capital was slow to materialize, and the BMR did not begin operations until 1858. In contrast to Suffolk, the BMR offered interest on its redemption account, and within a short period of time took a large portion of the clearing business away from Suffolk. By 1860 Suffolk had left the net clearing business.

3.3. Other par currency note clearing systems

Given the profitability of the Suffolk System, it is surprising that, with possibly one or two exceptions, Suffolk imitators did not appear in other parts of the country. Except in Rhode Island and Ohio, there were no other par exchange, note clearing systems. Moreover, Rhode Island's clearing system was not independent of Suffolk, and the Ohio system was not established until 1858. The only other possible imitator of Suffolk was a New York note clearing system, but that system never succeeded in getting country bank notes to exchange at par.

An imitator of Suffolk can be found in Providence, Rhode Island, but it looks more like a subsidiary of Suffolk than an independent system. According to Redlich (1968, pp. 260, 261, footnote 34), sometime before 1836, a note collection and clearing business was established by the Merchants Bank of Providence. Consequently, the note clearing business was somewhat different in Rhode Island than it was in the rest of New England. Rhode Island country banks held their clearing deposits with the Merchants Bank instead of with the Suffolk Bank. They were required to hold non-interest bearing, permanent deposits ranging from \$1,000 to \$3,000. (Redlich makes no mention of a redemption deposit and no mention of the role other Providence city banks played in this arrangement.) Once a bank made a permanent deposit, the Merchants Bank then received, at par, the bank's deposits of all New England bank notes. Like Suffolk, if at the end of the day,

participating banks had net debits that exceeded their permanent deposits, Merchants offered short-term lending. The Merchants clearing system was available only to Rhode Island banks, and Merchants acted as the correspondent for these banks. That is, Suffolk sent all Rhode Island notes it received to Merchants, and Merchants sent all New England notes, other than Rhode Island's, to Suffolk. The relationship between the two clearing banks, however, was not on an equal footing. "While the Suffolk Bank charged the Merchants Bank interest whenever the latter was the debtor, the Merchants Bank was not entitled to the corresponding charge, when it was the creditor" (Redlich 1968, p. 261).

The only other imitator of Suffolk that was reported to have a par exchange, net clearing system was in Ohio, but it was formed in the late 1850s. The banks of Ohio, according to Lake (1947, p. 189) established a voluntary system based on the Suffolk plan in 1858 in the Cincinnati trade center. However, we know very little about this system; in particular, we do not know how successful it was in achieving par exchange.

A net clearing system that we know failed to achieve par exchange developed in New York in the 1850s. Influenced by the success of Suffolk, the Metropolitan Bank of New York was chartered in 1851. It first appears to operate as a redemption office; that is, it looks more like the old Suffolk Bank redemption business. For those country banks that kept deposits at Metropolitan, it would act as its redemption agent and split the redemption discount with the country banks. Within a few years, at least one other city bank was competing with Metropolitan. But it still was not until 1858 that a net clearing system emerged; and New York never achieved a par currency (Redlich, 1968, p. 79).

4. Conclusion: Lessons learned from the Suffolk Banking System

We reviewed the history of the Suffolk Banking System in hopes of determining whether competitive or noncompetitive forces led to a uniform currency throughout the New England states. We do not think the history is conclusive on this issue, but we do think it is suggestive. In contrast to Charles Calomiris and Charles Kahn (1996), who suggest that the Suffolk System was the outcome of unfettered and self regulated markets, we find that Suffolk was more like a protected monopoly than a self-regulated system and that is how Suffolk was able to earn above-market profits for over 30 years. Without such protection, such a cooperative effort among a relatively large number of participants (city and country

banks) would have been difficult to maintain. In fact, once the legal barrier to entry into the note clearing business was lifted in Massachusetts, Suffolk closed its operations. That we could not find another Suffolk type note clearing system elsewhere in the country supports the view that the Suffolk System was not a natural outcome of market forces.

Suffolk was aided by state governments in two ways. First, they encouraged membership. Recall that in 1842 Vermont passed a law that gave a substantial tax advantage to Vermont banks that were Suffolk members; and that in 1843, Massachusetts passed a law that prohibited banks from paying out other bank notes. Both laws created strong incentives for banks to join the Suffolk System. Second, and maybe most important, recall that for over 30 years the Massachusetts' legislature did not allow other banks to compete with Suffolk.

We think our interpretation is further strengthened when we see that Suffolk exited the business shortly after the Massachusetts legislature chartered a competitor.

Finally, we find additional support in the fact that there appears to have been no other Suffolk-type systems in other parts of the country. While there were a few attempts to establish note clearing systems, none appeared to have had a very long life. And we could find no other note clearing system that evolved into a par system, even for a short period of time. Calomiris and Kahn (1996, p. 767) point to state-imposed strict limits on interbank note clearing to explain why New York failed to achieve a Suffolk-type net clearing system. We do not see how these limits were that restrictive. And even if they were, we still find it surprising that banks in other mid-Atlantic states (e.g., Philadelphia) did not enter the business. Hence, it appears that note clearing was not an easy business to succeed at without some government protection.

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Table 1-Number of Banks, Closings, and Failures in Six States

State	Time period	Total Number of Banks	In Business in 1861	Went Out of Business	Redeemed Notes		No Information
					At Par	Below Par	
Maine	1790-1861	126	69	57	39	18	0
Massachusetts	1790-1861	231	181	50	34	13	3
Maryland	1790-1861	58	32	26	11	11	4
New York	1838-1863	449	289	160	122	34	4
Indiana	1852-1863	104	15	89	38	24	27
Wisconsin	1852-1863	140	61	79	42	37	0
Total, all states		1,108	647	461	286	137	38

Table 2 -- Longevity of Banks in Six States

Years in Existence	Maine	Massachusetts	Maryland	New York	Indiana	Wisconsin	All States
1 or less	4	12	7	85	72	17	197
1 to 2	8	4	2	19	2	17	52
2 to 3	4	4	3	25	7	24	67
3 to 5	17	13	5	30	7	38	110
5 to 10	39	56	19	172	16	38	340
10 to 15	13	33	0	69	0	6	121
15 to 25	19	24	7	48	0	0	98
25 to 50	22	75	6	0	0	0	103
Over 50	0	10	9	0	0	0	19
Mean	13.3	20.2	18	7.9	2	4.3	
Median	9	14.1	8	8	1	4	

Table 3—Bank Note Safety and Circulation in Five States

State	Date of Condition Report	Expected Value of a Randomly Selected Dollar Bank Note (\$)	Note Circulation of All Banks (\$)	Number of Banks	Average Circulation per Bank (
Maine	1803 (June)	1.00	198,880	2	99,440.00
	1807 (Jan.)	.782	1,226,477	6	204,412.83
	1811 (June)	1.00	783,763	6	51,087.94
	1815 (Jan.)	.983	566,933	12	47,244.42
	1820 (Jan.)	.816	1,380,577	15	92,038.47
	1832 (June)	1.00	919,583	18	51,087.94
	1837 (Jan.)	.957	1,912,418	55	34,771.24
	1845 (Oct.)	1.00	2,116,380	35	60,468.00
	1850 (Oct.)	1.00	2,654,092	32	82,940.83
	1856 (Jan.)	.970	5,077,248	75	67,696.64
	1859 (Jan.)	1.00	3,886,549	68	57,155.13
Maryland	1837 (Jan.)	.971	3,310,835	21	157,658.81
	1841 (Jan.)	.963	2,529,843	21	120,468.71
	1845 (Jan.)	.981	2,607,683	20	130,384.15
	1850 (Jan.)	.954	3,091,408	21	147,209.90
	1855 (Jan.)	.987	4,118,197	29	142,006.79
	1859 (Jan.)	.998	3,977,971	32	124,311.59
Massachusetts	1803 (June)	1.00	1,565,189	7	223,598.43
	1807 (Jan.)	.862	1,532,940	17	90,172.94
	1811 (Jan.)	.850	2,474,472	16	154,654.50
	1815 (Jan.)	.948	2,144,900	26	82,496.15
	1820 (Jan.)	.977	2,605,766	29	89,854.00
	1825 (June)	.967	4,091,411	48	85,237.73
	1830 (June)	.947	5,124,090	63	81,334.76
	1835 (Sept.)	.940	9,751,719	108	90,293.69
	1840 (Oct.)	.996	9,112,882	115	79,242.45
	1845 (Nov.)	1.00	14,339,686	104	137,881.60
	1850 (Sept.)	.998	17,005,826	126	134,966.88
	1855 (Aug.)	1.00	22,887,162	167	137,048.87
	1857 (Oct.)	1.00	21,858,908	174	125,625.91

Table 3—Bank Note Safety and Circulation in Five States
(Continued)

State	Date of Condition Report	Expected Value of a Randomly Selected Dollar Bank Note (\$)	Note Circulation of All Banks (\$)	Number of Banks	Average Circulation per Bank (\$)
New York	1843 (Nov.)	.997	3,362,737	50	67,254.74
	1845 (Nov.)	.999	5,544,311	67	83,750.91
	1850 (Dec.)	.998	13,197,995	130	101,523.04
	1855 (Sept.)	1.00	23,169,329	239	96,942.80
	1860 (Dec.)	1.00	23,900,049	279	85,663.26
Wisconsin	1853 (July)	1.00	301,748	8	37,718.50
	1855 (Jan.)	.991	740,764	23	32,207.13
	1860 (Jan.)	.896	4,429,855	107	41,400.51
	1861 (Jan.)	.882	4,283,175	108	39,659.03
Indiana	1853 (Dec.)	.922	3,167,547	30	105,584.90
	1856 (Jan.)	.997	1,448,318	32	45,259.94
	1860 (Jan.)	.990	1,108,396	17	65,199.76
	1861 (Jan.)	1.00	1,035,664	18	57,536.89

Table 4- Estimated Losses to Note holders in Six States

	Average Loss in Dollars	
	Per Dollar	Per Bank
Massachusetts	.56	40,679.95
Maine	.70	46,045.56
Maryland	.14	21,664.57
New York		
before October 1841	.26	21,724.29
in and after October 1841	.26	14,264.96
Wisconsin	.24	13,598.69
Indiana		
before 1856	.11	17,069.76
in and after 1856	.15	5,114.83

Table 5 - Semi-annual dividends of Massachusetts Banks

Date	Bank	Mean	Median	Mode	Min	Max
1820 (Jan.)	Suffolk	3.50				
	Seven Boston Banks	3.50	3.50	N/A	3.00	4.00
	MA, non-Boston	3.13	3.00	3.00	1.25	5.00
1825 (June)	Suffolk	3.00				
	Seven Boston Banks	2.67	3.00	3.00	2.00	3.00
	MA, non-Boston	3.11	3.00	3.00	2.00	4.50
1830 (June)	Suffolk	3.00				
	Seven Boston Banks	2.58	2.50	N/A	2.25	3.00
	MA, non-Boston	2.91	3.00	3.00	2.00	4.00
1835 (Sept.)	Suffolk	4.00				
	Seven Boston Banks	3.00	3.00	3.00	2.50	3.50
	MA, non-Boston	3.11	3.00	3.00	1.00	4.00
1840 (Oct.)	Suffolk	4.00				
	Seven Boston Banks	3.15	3.00	3.00	2.75	3.50
	MA, non-Boston	2.93	3.00	3.00	2.00	4.00
1845 (Nov.)	Suffolk	4.00				
	Seven Boston Banks	3.20	3.00	3.00	3.00	3.50
	MA, non-Boston	3.23	3.00	3.00	1.50	5.00
1850 (Sept.)	Suffolk	5.00				
	Seven Boston Banks	4.00	4.00	4.00	3.50	4.50
	MA, non-Boston	4.01	4.00	4.00	1.61	20.00
1855 (Aug.)	Suffolk	5.00				
	Seven Boston Banks	3.93	4.00	4.00	3.50	4.00
	MA, non-Boston	3.93	4.00	4.00	0.00	5.00
1859 (Oct.)	Suffolk	4.00				
	Seven Boston Banks	3.86	3.50	3.50	3.00	5.00
	MA, non-Boston	3.74	4.00	4.00	3.00	5.00