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Lessons from a Laissez-Faire Payments System: The Suffolk Banking System (1825–58)

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Should the Federal Reserve maintain its strong presence in the U.S. payments system? Or should the Federal Reserve exit and allow "the market" to produce its own mechanism for making payments? While U.S. history is replete with examples of payments systems that appear inefficient and suggest a role for government, some recent research on payments systems in the United States argues that private markets are capable of producing safe and efficient payments arrangements.

The classic, often-cited example of a privately created and well-functioning payments system is the Suffolk Banking System that existed in New England between 1825 and 1858 (see, for example, Whitney 1878, Lake 1947, Redlich 1947, and Calomiris and Kahn 1996). The Suffolk Bank of Boston operated the first regionwide note-clearing system in the United States. A result of the System was that the notes of all New England banks circulated at par throughout the region. The System's achievements have led some (Lake 1947, p. 206, and Calomiris and Kahn 1996, p. 795) to conclude that unfettered competition in the provision of payments services can—and, in the absence of government intervention, likely will—produce an efficient payments system. In this paper, we argue that a closer examination of the history of the Suffolk Banking System calls into question this conclusion.

Before the Civil War, U.S. paper money consisted almost entirely of state banknotes—liabilities of the bank of issue that were redeemable in specie on demand. Locally, banknotes could be exchanged at par because they were redeemable on demand. But once they circulated beyond the community of the bank of issue, the notes typically were exchanged at a discount.

In the normal course of business, virtually every bank received the notes of other banks, a fact that is apparent from the balance sheets of individual banks during this period. For example, in Maine and Massachusetts, 98 percent of all individual bank balance sheets show the bank holding notes of other banks. In New York and Pennsylvania, the fraction is between 85 and 90 percent. Thus, during this period, banks had a substantial need to clear obligations among themselves.

In the mid-1820s, the Suffolk Bank created in New England an arrangement for banknote clearing that, at the time, was unique in the United States. The Suffolk Bank started a net-clearing system for banknotes. The Suffolk System operated as follows: Members of the System were required to keep an interest-free deposit at Suffolk (or at one of the other Boston member banks). Suffolk then accepted and net-cleared all the banknotes its members deposited at par. By the early 1830s, most banks in New England had become members, and, because of Suffolk's par-clearing policy, notes issued by members of the System were exchanged at par throughout the region.

What is most remarkable about the Suffolk Bank is that for more than 25 years, it earned extraordinary profits and was the only net clearer of banknotes in

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New England. Why was Suffolk so profitable? And why did it take so long for another provider to enter the market? Our answers to these questions are based on Suffolk's having benefited from large economies of scale and scope and from finding ways, including some help from government, to protect its market share.

We find, therefore, that the Suffolk Banking System may not support the case for a laissez-faire approach to the payments system. The history of the Suffolk Banking System suggests that note clearing is a natural monopoly. And there is no consensus in the literature about whether or not the unfettered operation of markets in the presence of natural monopolies will produce an efficient resource allocation.[1]

We proceed as follows. In the next section, we present the history of the Suffolk Bank as it evolved from an ordinary Boston bank into a note-clearing bank for all New England. Then, we document the Suffolk Bank's extraordinary profits by showing that it was more profitable than any other bank in New England during the period that the Suffolk Banking System was in operation, and we argue that the Suffolk Bank had a monopoly on the note-clearing business in New England. Following this, we interpret the Suffolk Banking System's history, and we suggest that the note-clearing business may have been a natural monopoly. We also suggest ways that the Suffolk Bank was able to maintain its extraordinary profits for so many years before a new entrant was able to drive it out of business. In the concluding section, we draw some lessons from the Suffolk Banking System and recommend further lines of research.

THE HISTORY AND EVOLUTION OF THE SUFFOLK BANKING SYSTEM

Origins, 1818–25

Before the Civil War, virtually the entire circulating medium of the United States consisted of privately issued banknotes. These notes were issued primarily by state banks that operated according to provisions of the charter granted by the state in which they were located. For the most part, banknotes were redeemable in specie on demand, although penalties for nonredemption were often minimal.

By the early 1800s, the Commonwealth of Massachusetts had chartered several banks located not only in Boston, but also in other parts of Massachusetts and in the province of Maine. The banks of Boston soon became concerned about the quantity of country banknotes (also known as *foreign money*) circulating in Boston (Redlich 1947, pp. 67–68). The banks thought that the extensive circulation of country banknotes was limiting their banknote business and reducing their profits.

In 1803, the Boston banks mutually agreed to stop accepting foreign money from their customers in an attempt to increase the banks' share of total Boston note circulation. The result of this collusion, however, was much different from what the banks of Boston expected. Instead of driving country banknotes out of circulation, the take-no-notes policy led others (known as *banknote brokers*) to take up the business of buying and redeeming country banknotes. After 1803, a person in Boston who received a country banknote 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 in specie. Consequently, despite the boycott by the city banks, country banks were still successful at getting their notes to circulate in Boston. According to Mullineaux (1987, p. 887), between 1812 and 1844, more than half the notes circulating in Boston were country banknotes.

In time, the success of the note-brokering business (and the lack of success in driving country banknotes out of circulation) led some Boston banks to reconsider their policy of not accepting foreign money. Indeed, the Boston banks established their own note-brokering operations some time after 1804, and the discount on country banknotes was driven down to 3 percent in Boston (Lake 1947, p. 184).

[1] For an example of a paper that demonstrates how a Pareto-efficient equilibrium can exist in a market with a monopolistic provider of one or more goods, see Edlin, Epelbaum, and Heller (1996).

In 1814, the New England Bank (of Boston) introduced an important modification in note-brokering arrangements. The New England Bank followed the strategy of purchasing the notes of country banks and allowing country banks to redeem them at the market rate of discount if they kept a permanent, non–interest-bearing deposit with the New England Bank. The activities of the New England Bank and other note brokers drove the average discount on country banknotes down to 1 percent by 1818.

In 1818, the Suffolk Bank became the seventh bank to be chartered in Boston. Shortly after starting operations, Suffolk entered the note-brokering business. Suffolk's note-brokering activity was much like the New England Bank's. Suffolk bought country banknotes from merchants, individuals, and other banks at a discount. Suffolk would then permit a country bank to repurchase its notes at the same discount paid by Suffolk—on two conditions: One was that the country bank maintain a permanent, non–interest-bearing deposit of $5,000 with the Suffolk Bank. The other was that the country bank 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 full redemption.

Shortly after Suffolk entered the market for country banknotes, the discount on country banknotes declined from 1 percent to 0.5 percent. Because Suffolk's competitors were attracting most of the business (by 1820 only a handful of country banks were holding permanent deposits with Suffolk), Suffolk began to question the value of this business. By the end of that year, Suffolk decided to end the purchase of notes of nonparticipating banks. Suffolk found that the cost of returning notes of nonparticipating banks was not much less than the discount at which the notes were purchased. Competition had made note brokering hardly profitable (Redlich 1947, p. 72).

In April 1824, Suffolk devised a new strategy for dealing with country banknotes. It formed a coalition with the six other Boston banks to export country banknotes with the goal of eliminating foreign money from the city of Boston. Each coalition member contributed between $30,000 and $60,000 for a total of $300,000. This fund was to be used by Suffolk to purchase country banknotes at "the same or less discount than the New England Bank, or other banks in Boston, received it, and should send it home for redemption" (Whitney 1878, p. 15). Such purchases were to continue indefinitely until country notes ceased to circulate in Boston. As with earlier attempts to drive foreign money out of Boston, this attempt was also unsuccessful.

The System in Operation, 1825–58

The failure of its note-presentment strategy did not lead the Suffolk Bank to exit the foreign money business. To the contrary, it was soon to become the dominant player in this market. In May of 1825, the coalition of city banks, having all but given up on driving country banknotes out of Boston, suggested that Suffolk allow other banks to deposit all their country banknotes with Suffolk, which would establish a system to net clear the banknotes it received. No longer would Suffolk merely buy country banknotes in order to send them back to the issuing bank for redemption. Instead, Suffolk would accept and clear at par all country banknotes that participating banks chose to deposit. By 1826, most of the city banks had withdrawn from the coalition and had become members of the Suffolk Bank's note-clearing business, the Suffolk Banking System (Suffolk Bank 1826; Mullineaux 1987, p. 890).

The Suffolk Bank's note-clearing business was similar in many ways to its old note-brokering business. As before, to participate in the system, a country bank had to maintain a permanent, non–interest-bearing deposit with Suffolk or with another Boston member of the Suffolk Banking System: For each $100,000 of capital, the bank had to hold $2,000 on deposit. And, as before, a country bank had to maintain an additional non–interest-bearing deposit that was, on average, sufficient to redeem its notes received by the Suffolk Banking System. Boston banks had to hold only a permanent, non–interest-bearing deposit. This deposit was initially set at $30,000 but was gradually reduced to $5,000.

A major innovation was associated with this new arrangement. Banknotes were cleared by netting the accounts of participating banks. Prior to this time, no net-clearing system for banknotes had been established in the United States.[2] For example, the (Second) Bank of the United States, which dealt heavily in the notes of state banks, practiced gross clearing, simply presenting each state bank's notes for redemption in specie. In addition, Suffolk offered loans—in effect, overdraft privileges—to members of the System. As we will argue, these innovations made the business attractive to all participating banks and ultimately very profitable.

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

The process of net clearing had value to Suffolk Banking System members because it lowered the cost of redeeming banknotes. Because fewer notes had to travel back to the issuing bank for redemption, less specie had to be physically shipped among banks at a time when such shipment was relatively costly.

The net clearing of banknotes opened up another business to Suffolk. Suffolk became a major lender to other banks. As a net clearer, Suffolk offered the analog of overdraft privileges (at a price). Moreover, by holding member bank deposits and clearing member banknotes, Suffolk could establish strong relationships with banks and likely had an advantage over other potential lenders in monitoring banks' activities. In short, we think that Suffolk was able to exploit economies of scope in combining its clearing and lending activities.

By the end of 1825, Suffolk had to make some adjustments to its business. Because Suffolk had more than $1,183 in losses due to deficiencies (counterfeit and irredeemable banknotes), it entered into a special agreement with the head of its foreign money department. "[I]n consideration of $1,050 per annum, in addition to his regular salary, he should give bonds to indemnify the bank for all deficiencies, counterfeits, mutilated or uncurrent bills in his department" (Whitney 1878, p. 18). This agreement, while modified over time, lasted for the life of the business. The agreement is of some significance in the history of the Suffolk Bank, because it indicates that Suffolk paid to shed much of the risk associated with its day-to-day clearing operations.

In its early stages, the Suffolk Banking System was relatively small in both its clearing and its lending activities. By the end of 1825, the Suffolk Bank was receiving about $2 million a month in country banknotes. This volume of note clearing was dwarfed by the Suffolk Bank's later activities. For instance, the Suffolk Bank cleared $9 million a month in 1841, $20 million a month in 1851, and close to $30 million a month by 1858 (Trivoli 1979, pp. 15, 21). To put these numbers in perspective, monthly clearing in 1825 amounted to approximately one-half of the stock of notes in circulation in Massachusetts; in 1841 and 1851, it was equal to the entire stock of notes circulating in Massachusetts; and in 1858, it was slightly less than one-and-a-half times the stock of notes circulating in Massachusetts.

During its first years as a net clearer, Suffolk earned relatively low profits from this role. Until 1833, Suffolk's dividends (which are routinely used as a measure of profits; see Calomiris and Kahn 1996) were no higher than those of an average bank in either Boston or Massachusetts. According to Redlich (1947, p. 75), the earnings from note clearing were so low initially that "the organization was in danger of being discarded by about 1830."

By the early 1830s, however, the Suffolk Banking System's membership had grown dramatically. By 1836, close to 300

[2] There was net clearing in other countries by this time, however. See, for example, the discussion of note clearing in Scotland in Kroszner (1996).

banks—the vast majority of banks in New England—were members of the Suffolk Banking System. And while participation in the System was voluntary—members did receive the benefits we have mentioned—state governments also created some additional incentives to join the System. In 1842, a Vermont law gave a substantial tax advantage to banks that were Suffolk Banking System members. And a Massachusetts law passed in 1843 prohibited banks from paying out the notes of other banks, which also gave banks incentives to clear notes through the Suffolk Banking System.

The increase in the size of the Suffolk Banking System eventually turned into a healthy increase in profits for the Suffolk Bank. Before 1825—that is, before the Suffolk Bank got into the note-clearing business—its annual dividend averaged 6.5 percent. Between 1826 and 1830, it fell slightly to 6.0 percent. Between 1830 and 1840, however, Suffolk's average annual dividend jumped to 7.4 percent. Between 1840 and 1850, the average annual dividend was more than 8 percent, and between 1850 and 1855, it was 10 percent.[3] Moreover, in 1839, Suffolk paid out of its growing surplus a one-time 33.3 percent dividend (Whitney 1878, p. 41). [In 1852, Suffolk once again accumulated a large surplus, but, according to Whitney (1878, pp. 41–42), the surplus was not divided among the stockholders because it was stolen by the bank's bookkeeper.] As we discuss below, Suffolk's profits were impressive not only relative to its past performance, but also relative to all other banks in New England.

Demise, 1858–60

While Suffolk's earlier attempts at note brokering and note presentment were disappointments, its note-clearing business proved very popular and profitable. The Suffolk Banking System grew and prospered for more than three decades. The political situation changed in the early 1850s, however, and a competitor emerged that, in a surprisingly short period, drove Suffolk out of the note-clearing business.

Opposition to the Suffolk System developed soon after Suffolk started its note-clearing business, but some 30 years passed before another note-clearing business emerged (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 of country banks 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. Members of the group argued that Suffolk was essentially charging too much for the services rendered, and they wanted an alternative. They proposed that a new note-clearing bank be established and that the stock of this new venture be held only by member banks, so that all members of the system could share in the profits. But opponents of the new bank prevailed.[4] The opponents argued that there did not appear to be a need for another note-clearing business, that the Suffolk System 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 later (Lake 1947, pp. 193, 195).

Starting in the late 1840s, Suffolk started to shift (or attempt to shift) more of its costs and risks to member banks. In 1849, Suffolk adopted the policy of refusing to receive notes for redemption "unless they were assorted into two packages, one containing Boston bills only, and the other issues of other banks" (Whitney 1878, p. 41). Suffolk thereby shifted some of its operating costs onto member banks. However, much more significant were three events related to the Suffolk Bank's net-clearing business.

Throughout the operation of the Suffolk System, Suffolk had sent all Rhode Island notes to the Merchants' Bank of Providence, which then cleared them with the Rhode Island banks. In 1852, Suffolk imposed a new minimum charge of 50

[3] Parenthetically, we do not think that the latter increase in dividends is attributable to changes going on within the Suffolk Banking System. The California gold discoveries led to some inflation. All short-term nominal interest rates in New England seem to have risen at this time (Homer and Sylla 1991).

[4] According to Kroszner (1996), the request for a charter was tabled in the state legislature by supporters of Suffolk.

cents per $1,000 of country money received from the Merchants' Bank. This action induced the Rhode Island banks to revive the proposal for the formation of a competitor to Suffolk whose stock would be owned by member banks (Lake 1947, p. 193). This proposal did not yet take off, but it would shortly.

It was also the case that Suffolk had always been exposed to some default risk on the notes it held between the time the notes were deposited and the time they cleared. Suffolk was even potentially exposed to similar risks on notes that were deposited by System members with other Boston banks (Whitney 1878, p. 46). In 1853, the Exchange Bank (of Boston) refused to redeem the notes of two Connecticut banks whose notes it had originally taken. The Exchange Bank had deposited the notes with Suffolk, and the issuers of the notes had defaulted. As a result, Suffolk reminded other Boston banks of its long-held policy "that the notes of country banks would be received only on condition that all notes would be redeemed by the agent banks" (Lake 1947, p. 194). A dispute with the Exchange Bank ensued in which the Exchange Bank claimed that it could not agree to Suffolk's terms, because it was illegal for it to guarantee the liabilities of a third bank. Suffolk's response was to notify the correspondents of the Exchange Bank that it would not accept their notes in the future. As a result, at least some of the Exchange Bank's correspondents transferred their deposits to Suffolk. The Exchange Bank was then soon to become an important supporter of a Suffolk competitor (Lake 1947, p. 194).

Finally, in 1853, Suffolk announced that it would receive no foreign money after noon each day "because the labor of sorting the bills was so great that the clerks . . . had to work late at night to complete their labors" (Lake 1947, p. 195). In response, the other Boston banks threatened to withdraw their deposits with Suffolk and form a new bank unless Suffolk took country notes until 2 p.m. They argued that "the Suffolk Bank was obtaining profits large enough to enable it to employ enough clerks to handle all country bills received" (Lake 1947, p. 195). On this issue, Suffolk conceded.

In 1855, a charter was granted to the Bank of Mutual Redemption (BMR). This bank was intended to clear notes and make loans to member banks—as Suffolk did—and, moreover, its stock was to be owned entirely by banks that were members of the system. Apparently, the support of the Exchange Bank was instrumental in the granting of a charter to the BMR (Redlich 1947, p. 75).

Despite the support of the Exchange Bank and the Rhode Island banks for a Suffolk competitor, the BMR had difficulty raising enough capital to begin operations. Indeed, it did not succeed in raising the necessary capital to open its operations until 1858. Nevertheless, when the BMR opened, 143 banks (roughly half the banks in New England) were stockholders (Dewey 1910, p. 95).

The BMR operated much as the Suffolk System did. It required the maintenance of a permanent deposit and a clearing balance. But, unlike Suffolk, the BMR paid interest on its deposits at a rate of 3 percent per year.

The reaction of Suffolk to the entry of the BMR into the note-clearing business was at first combative. Suffolk initially intended to fight the BMR and began by refusing to redeem the notes of BMR members through the BMR. Suffolk's argument in doing so was that the BMR held no deposit with Suffolk and, hence, that banks clearing through the BMR were not entitled to the same treatment as Suffolk System members. Hence, notes issued by members of the BMR and received by Suffolk were sent to the issuing bank for immediate redemption.

In its opening salvos with the BMR, Suffolk was supported neither by the other Boston banks nor by the Commonwealth of Massachusetts. On October 11, 1858, the BMR was admitted to the Boston clearinghouse. "On the same day the [Massachusetts] Bank Commissioners . . . formally advised the Suffolk Bank . . . that it should either continue to receive the bills of all the banks which had withdrawn their deposits and to present them at the BMR or it should decline to receive from its depositors the bills of such banks" (Lake 1947, pp. 200–01). The lack of support from the Boston banks and the attitude of the state bank commissioners apparently averted an open fight between Suffolk and the BMR.

Suffolk's next step was quite different. On October 16, 1858, Suffolk announced that it would withdraw altogether from the foreign money business. This announcement does not appear to have been an idle threat, because Suffolk did leave the business in 1860. And Suffolk's proposed withdrawal from its note-clearing activities apparently was a threat with teeth. Because the BMR could not handle anything like the entire volume of note clearing in New England, "the bank presidents asked the Suffolk Bank to continue receiving country money until February 28, 1859. They were met with a brusque refusal. Finally, a compromise was reached by which the banks were to make arrangements individually with the Suffolk Bank or Mutual Redemption bank. Under the terms made by the Suffolk Bank country money would be received for a charge of twenty-five cents per $1,000" (Lake 1947, pp. 202–03). The 50 cents per $1,000 that Suffolk charged the Merchants' Bank of Providence in 1853 thus appears to have exhibited a large monopoly-pricing element. Indeed, even the 25 cents per $1,000 charge seems high relative to Suffolk's average costs, which, according to Whitney (1878, pp. 53-54), were 10 cents per $1,000 cleared.

This was the end of the Suffolk Banking System and the beginning of the BMR. The operation of the BMR apparently benefited the country banks, whose note circulation rose (while that of the Boston banks fell) from 1858 to 1859. The BMR, however, was not profitable, and it ceased to pay interest on deposits when Suffolk halted its own note-clearing operations in 1860. The BMR did not pay its first dividend until October 1860 and then only at the (semiannual) rate of 2 percent.

THE SUFFOLK BANK'S PROFITABILITY

In another paper (Rolnick, Smith, and Weber 1997), we use annual data on bank dividends and prices of Boston bank stocks to document several facts about the profits of the Suffolk Bank relative to those of other Massachusetts banks. In this section, we summarize those results and present evidence that the Suffolk Bank appears to have been a monopolist in the provision of note-clearing services.

In Rolnick, Smith, and Weber (1997), we show that the Suffolk Bank's profits appear fairly similar to those of other Massachusetts banks until 1833. From 1834 until 1858, however, the Suffolk Bank was consistently more profitable than any other Massachusetts bank. Several kinds of evidence support these conclusions. One kind is aggregate evidence on dividend payments. In Rolnick, Smith, and Weber (1997), we show that until 1833, the Suffolk Bank paid dividends at a rate comparable to the average (or the median) of those paid by other banks in Massachusetts. However, from 1834 to 1858, Suffolk consistently paid dividends at a rate that was 2 percentage points higher than the typical rates paid either by other large Boston banks or by Massachusetts banks in general. This aggregate evidence is supported by a bank-by-bank comparison of dividend rates over the period from 1834 to 1858. This comparison indicates that although there were some years in which a small number of banks paid dividends at rates equal to or even slightly higher than those paid by the Suffolk Bank, no bank did this consistently. Further, those banks whose dividends occasionally rivaled the Suffolk Bank's were almost exclusively small, non-Boston banks.

Rolnick, Smith, and Weber (1997) also looks at prices of the stock of Boston banks during this period. These data come from Martin (1886), who compiled the yearly high and low stock prices of bank stocks in the Boston stock market. For each year from 1834 to 1858, with only the exception of 1839 and 1840, the lowest price paid for shares of Suffolk

Figure 1

Due to Other Banks
Suffolk As a Percentage of Total
Massachusetts

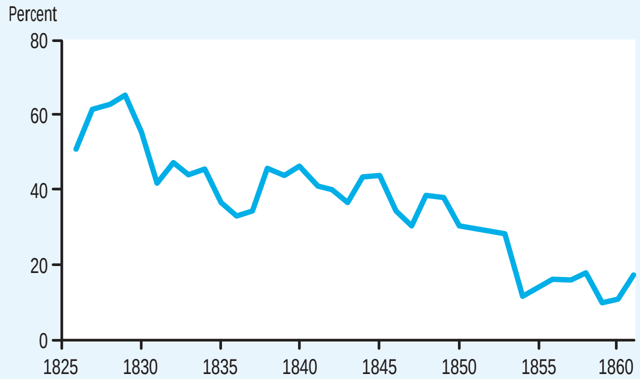
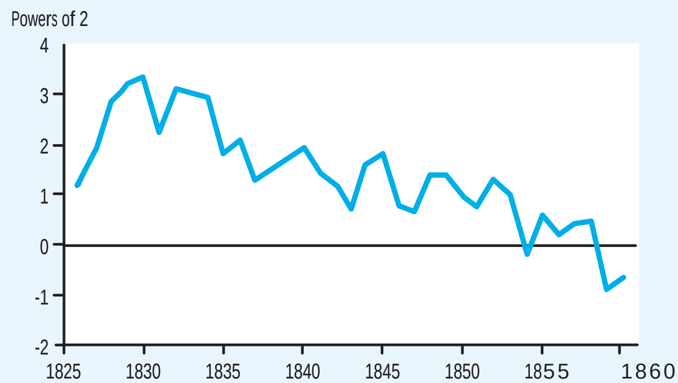


Figure 2

Due to Other Banks
Ratio of Suffolk to Next Largest



Bank stock was higher than the highest price paid for the shares of any other bank in Boston.

These findings allow three important points to be made with respect to the Suffolk Banking System. First, to borrow Whitney's phrase, "the [Suffolk] business was very remunerative" (1878, p. 41). Second, the fact that the Suffolk Bank routinely earned higher profits than other large Boston banks suggests that, by the early 1830s, the Suffolk Bank was acting alone in the net-clearing business, rather than as the representative of a larger coalition of Boston banks. Moreover, when the Suffolk Bank first began to earn unusual profits in 1833, there was no corresponding increase in the profits either of other large Boston banks or of Massachusetts banks in general. Third, Suffolk's profits were *always* high. Thus, its high *average* profits cannot be viewed as compensation for some unusual risks it was taking.

We now present evidence that the Suffolk Bank had substantial market power and may have been a monopolist in the provision of note-clearing services, at least during the period from 1834 to 1858. We begin by establishing that the Suffolk Bank was by far the largest holder of interbank deposits.[5] We show this in Figures 1 and 2.[6] In Figure 1, we show the Suffolk Bank's share of the interbank deposit market. From 1828 to 1854, the Suffolk Bank consistently held between 30 and 50 percent of all "due to other banks" held by Massachusetts banks. In Figure 2, we plot the ratio of the Suffolk Bank's holdings of "due to's" to the next largest Massachusetts bank. The vertical axis in this figure is in terms of powers of 2, so that zero indicates that Suffolk's holdings are equal to those of the next largest bank, 1 indicates that Suffolk's holdings are twice as large as those of the next largest bank, and so forth. From this figure, we see that in most years, the Suffolk Bank's holdings of such deposits were at least twice as large as those of the next largest bank.

Next, we show that the identity of the banks that ranked below Suffolk in terms of the volume of interbank deposits changed frequently over time. We show this in Table 1, where we show the banks that ranked among the top five in terms of the volume of "due to" annually from 1825 until 1860. As expected from Figure 2, the Suffolk Bank virtually always has the largest amount of "due to's." However, no other bank consistently held a large share of the interbank deposit market. Up to 1845, the New England Bank and the State Bank were the banks that most frequently ranked behind the Suffolk Bank in terms of the share of the interbank deposit market. However, after 1840, those two banks were replaced in the rankings by the Merchants' Bank of Boston and the Globe Bank, and after 1850, the Bank of

[5] Clearly, it was necessary for banks to hold deposits with a bank that was performing clearing services on their behalf.

[6] The sources for the data used in all figures is given in Rolnick, Smith, and Weber (1997).

Table 1

Ranking of Massachusetts Banks by Amount Due to Other Banks, 1825–60

	1st	2nd	3rd	4th	5th
1825	City	New England	Other	Union	M&M/Tremont
1826	Suffolk	City	New England	M&M/Tremont	Other
1827	Suffolk	City	New England	Union	Other
1828	Suffolk	New England	Union	Other	State
1829	Suffolk	State	New England	Union	Other
1830	Suffolk	City	State	New England	Other
1831	Suffolk	New England	State	Globe	Other
1832	Suffolk	New England	Other	Union	State
1833	Suffolk	Globe	Other	State	Other
1834	Suffolk	State	City	Globe	Merchants’
1835	Suffolk	Merchants’	Other	New England	State
1836	Suffolk	Merchants’	Other	State	New England
1837	Suffolk	Merchants’	State	New England	Other
1838	Suffolk	Globe	Merchants’	New England	State
1839	Suffolk	Globe	Merchants’	New England	Other
1840	Suffolk	Merchants’	Globe	State	Other
1841	Suffolk	Merchants’	Globe	Other	Other
1842	Suffolk	Merchants’	Globe	Other	State
1843	Suffolk	Merchants’	Globe	State	New England
1844	Suffolk	Merchants’	Globe	Other	New England
1845	Suffolk	Merchants’	Globe	Other	Other
1846	Suffolk	Merchants’	Globe	Other	State
1847	Suffolk	Merchants’	Globe	State	Other
1848	Suffolk	Merchants’	Globe	M&M/Tremont	Other
1849	Suffolk	Merchants’	Globe	New England	M&M/Tremont
1850	Suffolk	Merchants’	Other	New England	Commerce
1851	Suffolk	Merchants’	Commerce	Globe	New England
1852	Suffolk	Commerce	Merchants’	M&M/Tremont	Exchange
1853	Suffolk	Merchants’	Commerce	Other	M&M/Tremont
1854	Merchants’	Suffolk	Commerce	Exchange	Globe
1855	Suffolk	Commerce	Merchants’	Other	Other
1856	Suffolk	Merchants’	Commerce	Exchange	Globe
1857	Suffolk	Merchants’	Commerce	M&M/Tremont	Other
1858	Suffolk	BMR	Merchants’	Commerce	Globe
1859	BMR	Suffolk	Merchants’	Other	Commerce
1860	BMR	Suffolk	Commerce	Merchants’	Exchange

Commerce displaced the Globe Bank in the rankings.[7]

We have already argued that a bank engaged in net clearing on a large scale might easily exploit economies of scope by also acting as an interbank lender. Rolnick, Smith, and Weber (1997) documents that the history of the Suffolk Bank is

[7] All of these banks were located in Boston.

indeed consistent with this idea. Between 1833 and 1858, the Suffolk Bank consistently held at least 15 to 20 percent of all interbank loans. Moreover, the large increase in the Suffolk Bank's profits coincided with a substantial increase in its position as an interbank lender. Indeed, in 1833, the Suffolk Bank held three times as many interbank loans as any other Massachusetts bank. In contrast, in 1831, the Suffolk Bank had interbank loans approximately equal to those of several other banks. This fact clearly suggests that the Suffolk Bank's profits derived, at least in part, from the exploitation of economies of scope in interbank lending.

AN INTERPRETATION

In this section, we attempt to interpret the facts we have just summarized and to answer the question, Why did it take over 25 years for another New England bank to enter Suffolk's market? We begin the interpretation with an observation that has been made by many other historians of the Suffolk Banking System: Suffolk was a monopolist.[8] We also think that Suffolk was a relatively sophisticated monopolist. Its pricing practices involved a two-part tariff from 1826 on and even more elaborate nonlinear pricing schemes (and price discrimination) at later points.

These pricing practices seem to have made Suffolk very effective at garnering surplus. The data indicate that while Suffolk's profits rose dramatically in 1833, this was not true for other banks in Boston or Massachusetts. The data are therefore consistent with the notion that whatever surplus accrued to members of the Suffolk Banking System was primarily captured by Suffolk itself.

Moreover, we think that the Suffolk Banking System was a natural monopoly. It is not hard to construct arguments that there are economies of scale in net clearing and that these can be captured fully only by a system with a single net clearer. It is also not hard to construct arguments that the agent doing net clearing has cost advantages as a provider of overdrafts and as an interbank lender. Thus, we think there is a strong presumption that Suffolk was able to exploit both economies of scale and economies of scope in its activities. And, indeed, the Suffolk Bank became unusually profitable only as it began to fully exploit both types of economies.[9]

This history of the Suffolk Banking System is, of course, fully consistent with this view. Suffolk was not an unusually profitable bank until it became a large enough player in both note clearing and interbank lending. And at least equally telling is the observation that Suffolk was not willing to split its market with the BMR. The failure of the market to sustain two net clearers is, in our minds, very suggestive of natural monopoly.

We should emphasize at this point that the presence of a monopoly—either natural or otherwise—in no way necessarily implies that any economic inefficiencies were associated with the operation of the Suffolk Banking System. Indeed, as shown by Edlin, Epelbaum, and Heller (1996), the presence of a monopolist that can engage in price discrimination and levy two-part tariffs is often fully consistent with Pareto efficiency.

In addition, if Suffolk was a natural monopoly, there is another important question. If the Suffolk experiment were repeated at another time and in another place, would we expect the Suffolk outcome to be replicated? Or, more generally, would we expect the market to produce an efficient outcome? The answer to this question can hardly be an unequivocal yes. There are many reasons, some of which are reviewed in Sharkey (1982), why the market might not produce an efficient outcome in the presence of a natural monopoly. And even an unchallenged monopolist with great powers of price discrimination and with the power to engage in nonlinear pricing need not attain an efficient allocation of resources under all cost conditions, as noted by Edlin, Epelbaum, and Heller (1996).

In general, the ability of the market to produce an efficient outcome with a natural monopoly depends strongly on cost and demand conditions in the market and on the relative strategic positions of

[8] Whitney (1878), Lake (1947), Redlich (1947), and Bodenhorn (undated) all conclude the same thing.

[9] Of course, there may be economies of scale and scope only over certain ranges of activity, as noted by Sharkey (1982). At some point, congestion costs may reverse decreasing average costs.

other potential market participants.[10] Thus, even if one views the Suffolk experience as supportive of the notion that the free market can be an efficient provider of payment services, we do not see that one can conclude that the free market *will* lead to the efficient provision of payment services under any possible configuration of market conditions.

All of this leaves us with two final questions: How was Suffolk able to deter the entry of a competitor until 1858? And how was the BMR able to enter in 1858 and drive Suffolk out of the note-clearing business?

With regard to the first question, we think it is useful to view the industrial organization of note clearing in New England as the outcome of a game played between the Suffolk Bank and potential rivals. Through the historical accident of being asked by the other large Boston banks to be the net clearer, Suffolk was handed the position of the incumbent in the industry. Several models of industry organization in the presence of a natural monopoly exist. Although the underlying game in each of these models differs, a general implication is that the incumbent monopolist will be able to earn monopoly profits over an extended period if it enjoys some type of strategic advantage over potential entrants.[11]

One form of such a strategic advantage is some kind of barrier to entry. In the case of the Suffolk Bank, one could think of a barrier to entry as the cost that a potential entrant would have to bear in trying to sign up banks for a rival net-clearing network. These costs are sunk because they would have to be borne by the potential entrant even if the rival never actually entered the note-clearing business. Of course, Suffolk would have already borne these costs, so they would not be relevant to its decision regarding whether or not to continue in the business. Another form of strategic advantage is the threat of predatory pricing. In the case of the Suffolk Bank, predatory pricing could have consisted of offering interest on deposits should a rival have entered. Note that even though Suffolk never engaged in offering interest on deposits, such a threat still could have been implied. The fact that we have no record of such a threat may simply mean that the implied threat was successful. In that case, offering interest on deposits would have been out-of-equilibrium behavior because entry by a rival would never have occurred.

With regard to the second question, we think it is useful to continue to think in terms of the game described above. From the viewpoint of the relative strategic advantages in a game between an incumbent and potential entrants, the BMR was a potential entrant unlike any existing bank because its charter permitted its stock to be owned only by banks. In other words, the BMR was a rival that would be owned by its customers. This situation would change the nature of the game because now the rival would have a strategic position that was different from that of previous potential challengers. Its position might also be interpreted as lowering the sunk costs faced by the potential entrant, because one bank could see other banks' commitments to joining the competing system through their purchases of stock in the BMR.

Two other points are of interest with regard to the entry of the BMR. One is Suffolk's reaction, which ultimately was to withdraw from the net-clearing business. This is consistent with our interpretation of net clearing as a natural monopoly. The other is what the BMR did with regard to offering interest on deposits. When the BMR first entered the market, it offered interest on deposits. Once the BMR had driven Suffolk out of the market, however, it adopted Suffolk's strategy of not paying interest on deposits. This is consistent with our interpretation of temporarily paying interest on deposits as predatory pricing behavior.

CONCLUSION

Between 1825 and 1858, the Suffolk Bank of Boston operated the first region-wide note-clearing system in the United States. The Suffolk Bank, chartered by the Commonwealth of Massachusetts in 1818, evolved from an ordinary Boston bank into

[10] See Bagwell and Ramey (1996) for an interesting discussion of how even an entrenched monopolist with a large productive capacity can lack the strategic wherewithal to deter entry.

[11] See, for example, the model in the papers by Dixit (1980) and Ware (1984) in which the incumbent enjoys the strategic advantage of being able to make a capacity commitment before the potential entrant. In the Bagwell and Ramey (1996) reformulation of the model, the strategic advantage goes to the potential entrant, however.

a note-clearing bank for all of New England. We document that it earned extraordinary profits for over 25 years and that it had a monopoly in the interbank deposit and loan markets. From this we infer that it also had a monopoly on note clearing. Our interpretation of Suffolk's history suggests ways that Suffolk was able to maintain its extraordinary profits for so many years and also suggests that the note-clearing business may have been a natural monopoly. The latter observation is of some importance because there is no consensus in the literature about whether or not the unfettered operation of markets in the presence of natural monopolies will produce an efficient resource allocation.

Future research should focus on whether or not the Suffolk Banking System was truly unique. Some have argued that a Suffolk-type system did not exist in other parts of the country. We think it would be useful to better document the types of note-clearing arrangements that existed elsewhere to determine how they differed from the Suffolk Banking System, and if they were different, what factors would account for the observed features of different payments systems.

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