The Joint Production of Confidence: Endogenous Regulation and Nineteenth Century Commercial-Bank Clearinghouses

The feasibility of private-market arrangements for the production of money has resurfaced as an important research question (see King 1983 for a review essay). In an early and influential contribution to this literature, Benjamin Klein (1974) emphasized the critical role of consumer confidence in laissez-faire monetary arrangements, and he analyzed "brand names" as potential devices for insuring confidence in private monies. He noted that if monies could not be differentiated, each producer would have incentive to over-issue and would do so, unless constrained by some mechanism involving monitoring and control of individual bank behavior. In this regard, Klein notes (p. 441) that "many banks became members of private protective and certifying agencies, which performed some functions similar to present-day central banks." Commercial-bank clearinghouses (CBCBs), for example, utilized regulatory-like tools such as reserve requirements, deposit-rate ceilings, and bank examinations to influence and control the behavior of member institutions.

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1 Vaugel (1977) claims that guarantees, rather than brand name backing, are more likely to be provided in a competitive money-production environment.

2 Gorton (1983b) and Timberlake (1984) have called still more explicit attention to the strong similarities between the activities of nineteenth century CBCBs and today's Federal Reserve System. Neither of these authors explored in depth the reasons why clearinghouses took on regulatory-like activities, however.

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Based on Klein’s analysis, it is somewhat unclear: (1) what motivated commercial banks to voluntarily participate in such arrangements or, (2) why CBCHs were involved in the production of monetary confidence. In this paper, we argue that the evolution of the CBCH reflects an endogenous “regulatory” response to the problems associated with the asymmetric distribution of information in the banking industry. The nature of these information problems was related to the product mix in the banking sector—in particular, to the proportion of demand deposits relative to bank notes. The capacity of “the market” to monitor and control the behavior of bank managers was increasingly eroded as demand deposits came to supplant bank notes during the nineteenth century. The set of actions of the CBCH represented the substitution of hierarchy (“private regulation”) for a market-based mechanism of control. That “organizations” may dominate markets as allocation and control devices is hardly a new idea (Coase 1937, Williamson 1975, and Stiglitz 1985).

In section 1, we discuss the importance of the banking product mix during the nineteenth century from the viewpoint of information costs. Section 2 describes the role of the CBCH as a monitor/supervisor which provides valuable “screening” services to both member banks and the public. Section 3 examines the behavior of the CBCH during financial panics. In response to the unusual information costs associated with a panic, the CBCH increased the amount of private regulation. The CBCH then reverted to its simpler organizational form following the conclusion of a panic. Private regulation declined and the role of “the market” as a control mechanism increased. Section 4 concludes.

1. BANK NOTES, BANK DEPOSITS, AND INFORMATION COSTS

Bank notes involved a contract between the bearer and the bank to redeem the face value of the note in specie at the bank. The specie value of a bank note to a seller accepting it in exchange was simply the expected value of a bank’s specie promise less the costs of collecting specie at that bank. Even if the expected specie value of a note was par, the collection costs drove a wedge between the par value of a note and its value in exchange for goods. This wedge created an incentive for note-broker businesses to form offering to exchange bank notes for gold or the notes of other banks at discounted rates. Brokers could profit by collecting specie at par at the issuing bank. Such firms indeed did form, and a secondary market in bank notes emerged. The size of the discounts quoted on notes presumably varied with the geographic distance to the issuing bank, the perceived riskiness of that institution and the quantity of counterfeit notes of that institution believed to be in circulation relative to the total issue (Gorton 1986). In “bank-note reporters,” brokers published information on counterfeits along with current quotes on various notes.

Secondary market makers also had strong incentives to monitor the quality of the assets backing bank notes since they collected specie in bulk as the source of their profitability. Their price quotations in turn revealed their information to
buyers and sellers of bank notes. Indeed, merchants commonly consulted banknote reporters in reaching judgments about the exchange values of particular bank notes. Competition among note brokers and publishers of note reporters presumably enhanced the information quality of these price signals (Dillistin 1949, White 1895). To the extent that brokers returned notes to the bank of issue, they also performed a clearing and collection function. Thus, while bank notes typically exchanged for goods and services at a discount, the overall variability in these discounts was constrained by the self-correcting responses of banks, note brokers, and consumers to the recurring signals provided by the secondary market in bank notes.

A demand deposit, unlike a bank note, is both a claim on a bank and on an agent’s account at that bank. This complicates the information required to price a check claim on that deposit. In an exchange mediated by check, the seller of goods must consider (1) whether the check writer has sufficient funds for the check to be collected; (2) whether the check writer’s bank can exchange for specie; and perhaps (3) whether his own bank can exchange for specie at par. While the identity of a buyer “doesn’t matter” with use of a bank note (in the absence of counterfeits), a check-based transaction is agent-specific with respect to risk.

The contractual characteristics of demand deposits accordingly increased the transactions costs associated with this product. These costs in turn precluded the development of a secondary market in claims on such deposits. Such a market would require pricing agent-specific claims on a bank. It would prove extremely costly for specialist note brokers to acquire information on the reliability of individuals as well as banks. Yet such information is necessary to price such a claim since the agent issuing a check can overdraw his balances.

Banks were better able than note brokers to handle the information-related disadvantages of checks. Banks could delay specie payment on checks, for instance, until after checks were collected. This required an accounting system, but such a system was a necessary adjunct to producing demand deposits. Also, banks could assume that some proportion of the checks collected would be held as deposits rather than paid in specie. These deposits could fund income-producing assets. Brokers could not offer deposit-type accounts, at least not without the risk of being considered a bank, and therefore having to submit to chartering requirements and perhaps other regulations.

The contractual differences between bank deposits and notes effectively precluded brokers from competing with banks in the collection of deposits. Accordingly, no “secondary market” in check claims was formed. As a result, the information production of the note brokers concerning the “quality” of individual banks became increasingly less available as the volume of deposits increased relative to notes. Holders of bank liabilities therefore could monitor bank behavior only in a direct and costly fashion.

Banks in the cities had a larger proportion of their liabilities as deposits than as bank notes as early as the late eighteenth century. The Bank of New York reported in 1791 that it had 50 percent more deposits than notes outstanding. Data became regularly available in the 1830s and show a fairly steady decline in the
notes/deposits ratio. In New York state, for example, the notes/deposit in ratio was 1.2 in 1837, 0.74 in 1847, and 0.31 in 1857 (Redlich 1951). Nationally, the trend was less pronounced. The ratio fell from 0.85 in 1835, to 0.79 in 1845, and to 0.67 in 1860 (see Historical Statistics of the United States, p. 995).

Given their informational disadvantages, it may seem curious that deposits came to dominate bank notes rather early in the century, even before the establishment of the first CBCH. But demand deposits do possess certain well-known advantages over bank notes. They are less subject to theft, for example. In addition, writing checks avoids the cost of making change and provides proof of payment. Another less commonly recognized feature of using checks rather than notes to make payments is that checks exchanged against currency or goods and services in local markets at a fixed price. While the specie price of a particular bank’s notes could vary dramatically over time and space, deposits, when acceptable to sellers in transactions, exchanged at par in local transactions. But if deposits were to prove viable in exchange, some mechanism for providing confidence in performance by banks was necessary. This was especially the case since a uniform exchange rate for deposits created incentives for banks to “cheat” by backing deposits with inferior assets. There was no secondary market to “reveal” such behavior as there was with bank notes.

The formation of the CBCH not only reduced the costs of clearing checks, it solved the information problem created by the missing market, by internalizing the secondary market in a unique organizational form. With the CBCH, the apparent defects of the demand deposit product could be turned into distinct advantages.

2. THE CLEARINGHOUSE AS A MONITOR/MANAGER

The CBCH was not initially formed to deal with resource allocation problems which markets handle poorly. Its function was to economize on the costs of check clearing. Prior to the New York CBCH formation in 1853, commercial banks collected checks and other instruments by a daily exchange and settlement with each other bank. Once the clearinghouse formed, the exchange was made with only one party—the clearinghouse itself. Gibbons (1859) estimates that for New York City banks the cost of “conducting this vast amount of business did not exceed eight thousand dollars a year,” which constituted roughly 0.02 percent of deposits in the New York CBCH at the end of 1854.

While the clearinghouse was organized to produce a simple product, check-clearing, it was also capable of producing a by-product—information. When demand deposits dominate bank notes, banks have an exploitable information advantage over their customers concerning the quality of bank liabilities. Banks face incentives to back deposits with high-yielding, risky assets. Customers want to obtain information about the true quality of bank deposits, but face free rider problems. The direct statement of the bank lacks credibility since a “bad” bank has no incentive to reveal its true condition. Customers would clearly gain if
some form of credible supervisor monitored the quality of bank liabilities and disseminated relevant information. Such a supervisor would need enforcement powers to correct contract deviations. The supervisor, in other words, would act as a substitute for the price system; hierarchy (authority) would replace the market.

Such a system would be implemented if it were in the welfare interests of the banks as well as their customers. The gain to an individual bank from industry supervision is identical to that for employees in a firm: colleagues can shirk only at a higher cost. Even though workers see compulsion as costly, they are better off in a number of circumstances by accepting it (Stiglitz 1975). This becomes more true as shirking by colleagues reduces the return to an individual worker or increases his risk. When deposits dominate, banking is characterized by just such a condition, since shirking by one bank can lower the return to another directly. A “bad” bank’s failure or suspension, for example, would induce bank customers to monitor the quality of their own bank’s liabilities. The cheapest way to monitor was to exercise the deposit contract. But if large numbers of customers chose to monitor at once (a bank run), even a “good” bank ran a substantial risk of failure. This externality problem strengthened the demand for supervision, other things equal. The “best” banks would favor monitoring even aside from externalities since disclosure of their status may allow them to capture “ability rents.”

There are strong reasons in favor of quality measurement by the banks themselves. Bank measurement need occur only once per measurement period, for example, but customer measurement involves a great deal of duplication. In addition, bankers possess comparative advantages in judging the quality of the assets backing deposits.

The CBCH was well positioned to provide monitoring and supervision services to the banking industry. The form of the New York clearinghouse, embodied in its 1854 constitution, included a number of aspects similar to institutions commonly identified today as providing screening services, mainly educational institutions. The clearinghouse required, for example, that member institutions satisfy an admissions test (based on certification of adequate capital), pay an admissions fee, and submit to periodic exams (audits) by the clearinghouse. Members who failed to satisfy CBCH regulations were subject to disciplinary actions (fines) and, for extreme violations, could be expelled.

Expulsion from the clearinghouse was a clear negative signal concerning the quality of bank’s liabilities. It suggested that in the collective judgment of the banking community, the probability of nonperformance in the exchange process by the expelled bank was uncomfortably high. The ability of the CBCH to audit a member’s books (to measure quality) at any moment provided strong incentives for prudent behavior by each bank and thus strengthened the credibility of the CBCH signals. Moreover, without access to the clearinghouse a bank had to

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3Suspension was a temporary default on the contract to exchange bank liabilities for specie.

4Gibbons writes: “With knowledge of these facts (debts in excess of specie balances for a sustained period), the Committee visits the bank, and investigates its affairs. If they are found to be hopelessly involved, it is suspended from the exchange at the Clearing House—a last blow to its credit” (pp. 319–20). Dismal from the clearinghouse required only a majority vote.
clear its checks in the more costly manner used prior to the existence of the CBCH. Consequently, expulsion was a potent enforcement threat.

The CBCH also increased the value of other information signals. Each bank in New York City was required by law to publish on each Tuesday morning a statement showing the average amount of loans and discounts, specie, deposits, and circulation for the preceding week. Banks were also required to publish quarterly statements of condition. The existence of the CBCH prevented banks from publishing inaccurate statements and from engaging in excessive “window dressing” of balance sheets.5

The advantage of the CBCH organization were such that within a decade a large number of new local clearinghouses were formed. These typically organized along lines similar to the New York CBCH, but some extended their roles beyond that of monitoring to regulating bank behavior. The Buffalo and Sioux City clearinghouses set interest-rate ceilings on deposits which could be paid by member banks (Cannon 1910).

The New York CBCH did not employ fixed reserve requirements as a supervisor-enforced constraint on members until 1858, when a 20 percent “coin requirement” was established against “net deposits of every kind” (Hammond 1957, p. 713). Reserve requirements were also soon thereafter established in Philadelphia. The reserve requirement did not apply against circulating notes. The CBCH also monitored the extent to which members purchased or borrowed specie from external sources to meet claims. Member banks were, in effect, under implicit contract to the CBCH to avoid “excessive liability management.”6

These activities of CBCHs served to enforce the fixed local exchange rate of one-to-one between specie and demand deposits. By credibly supervising member bank activities and by reducing the costs of clearing checks, CBCHs helped demand deposits become the preferred bank product on the liability side. But one problem remained: how would bank liability holders monitor the monitor?

3. THE CLEARINGHOUSE DURING BANKING PANICS

The behavior of CBCHs was consistent with a hierarchical form of organization focused principally on supervisory kinds of activities. But, while the costs of

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5"It was only when the Clearing House records were brought to such perfection as to give the means of analysis and test beyond dispute, that the positive integrity of those statements could be guaranteed to the public" (Gibbons 1859, p. 325). The CBCH would also investigate rumors about the states of particular member banks. In response to rumors, the CBCH would audit the bank and publish the results. There are many examples of this in the New York City Clearinghouse Association, Clearinghouse Committee Minutes (hereafter, Minutes).

6"A positive principle, or rule of financial government, has been demonstrated by this action of the Clearing House on the city banks—that is, the restriction of loans, by the necessity of maintaining a certain average of coin from resources within the bank. Borrowing from day to day will no longer do. It cannot be concealed." (Italics original, Gibbons 1859, p. 321.)
member-bank "cheating" were raised by the CBCH, it could not eliminate all incentives to cheat. Indeed, by raising the public's perception of the quality of the "average" bank, the CBCH raised the benefit of cheating along with the cost. There remained some incentive, therefore, for bank customers to engage in their own monitoring of bank behavior. A banking panic may be seen as an instance of customer monitoring. Exercising the deposit contract's option feature en masse represents a cheap way for bank customers to monitor the ability of their bank to perform, and, in effect, to monitor the monitoring of the CBCH.

Banking panics were large-scale attempts by bank customers to convert deposits into specie or currency. While the precise causes of banking panics remains a point of dispute, it seems clear that, because of the information asymmetry created by demand deposits, depositors had to rely on aggregate or nonbank-specific information to assess the riskiness of deposits. Increases in business failures or the failure of a single large financial firm could cause depositors to "run" on all banks seeking, in a single act, to withdraw deposits and measure the performance of their individual banks and, implicitly, the performance of the CBCH (Gorton 1984).

From a bank's point of view, there are potentially large costs to such measurement by its customers. The customers can only be convinced of the value of demand deposits if the banks can transform them into specie or currency. With bank notes, the secondary market signaled the value of bank portfolios in an efficient manner. But without a secondary note market, bank claim holders had to rely on nonmarket methods of evaluation. In part because of the high cost of obtaining information on the quality of bank loans, this portion of a bank's assets can be deemed illiquid. If the sale of such illiquid assets is required to meet depositors' demands, then a bank may incur substantial losses. In other words, the excessive measurement by customers which occurs during a panic effectively makes illiquidity the same as insolvency.

With costless, full information, the banking system would never face problems during panics because bank assets could easily be transformed into any other desired securities. But in that case there would never be a panic to start with because depositors would never need to monitor. With an information asymmetry, banks would value some mechanism which allowed for their assets to be transformed into some other security in such a way as to signal to depositors their value. The CBCH provided such a mechanism by inventing a new security, the clearinghouse loan certificate.

The first issue of clearinghouse loan certificates occurred during the panic of 1857; they were issued in every subsequent panic through 1914. The process was straightforward: a policy committee of the CBCH first authorized the issuance of loan certificates. Member banks needing specie or currency to satisfy customers' demands could then apply to the clearinghouse loan committee for certificates. Borrowing banks were charged interest rates varying from 6 to 7 percent and were required to present "acceptable collateral" to be "discounted" by the CBCH. The loan certificates had a fixed maturity of, typically, one to three months. The important feature of the certificates was that member banks could
use the loan certificates in the clearing process in lieu of currency, freeing currency for the payment of depositors' claims. The mechanism of the loan certificate produced a more hierarchical organizational form of the CBCH during panics than existed otherwise. Indeed, during panics when the loan certificate process was operating, the CBCH behaved much like an integrated firm allocating resources by hierarchical decision. In fact, the loan certificates were claims on the clearinghouse, a joint liability of the member banks. If a member bank with outstanding loan certificates failed, the loss (in excess of the value of pledged collateral) was shared by the remaining members of the CBCH.

The loan certificate process in effect internalized the missing market within a hierarchical form. While depositors faced an information asymmetry, the banks themselves were in a position to cope with this problem. The clearing process itself provided information on members, as did clearinghouse audits and member bank reports. Also, banks had the specialized knowledge to value bank assets. Most importantly, individual banks had an incentive to lower the probability of other members' failures because of the information externalities. This meant in practice that no member banks were allowed to fail during a period of panic. Instead, members were expelled from clearinghouse membership for failure to repay loan certificates after the panic had clearly ended and their failure would result in weaker externality effects.

The loan certificate process was available to all members, and consequently, is accurately described as a coinsurance arrangement. But this meant that resources had to be allocated to members, even those which the CBCH perhaps knew would certainly fail, in the interests of all members. Since the interest rate on loan certificates and the discount on collateral did not vary over banks or assets, the central decisions of selecting and approving collateral, and deciding on amounts of certificates were quantity decisions made by the CBCH. Moreover, the CBCH could, at its discretion, demand additional security and requisition aid for particularly troubled banks. The CBCH clearly possessed a great deal of control. It regulated bank behavior substantially during a panic.

Another managerial decision in which the CBCH became involved was when and whether to suspend the right of deposit convertibility, that is, to suspend the

1. The dates of issue, amounts issued, rate of interest, and nature of collateral can be found in the Report of the U.S. Treasury, 1914, p. 589. In the pre-Civil War, "bills receivable, stocks, bonds, and other securities" were acceptable. Also see Sprague (1910), pp. 432–33.

2. In New York the first explicit record of how loan certificates were to function, Minutes, November 21, 1860, does not mention this. It was made clear during the Panic of 1907 (Minutes, October 31, 1907) which was apparently the only occasion when, after the panic, members (two banks) could not repay loan certificates. However, during the first panic the CBCHs faced after formation, a particularly lucid statement of this was adopted by the Boston CH (October 15, 1857). The agreement is quoted in Redlich (1951), p. 159.

3. In the original 1857 agreement included the following:

And it is further agreed . . . that the Clearing House Committee may at any moment call upon any bank for satisfactory collateral security, for any balance thus paid in bills instead of Specie, and each Bank hereby agrees with the Clearing House Committee, and with all and each of the other Banks to furnish immediately such security when demanded.

Quoted in Redlich (1951), p. 159.
option feature of deposit contracts. Suspension amounted to default on the deposit contract, and was a violation of banking law. Nevertheless, suspension occurred on eight occasions during the nineteenth century. In banking panics after 1853, the CBCH played the central role in deciding whether and when suspension was appropriate. Suspension signals that the CBCH believes further liquidation of bank assets to acquire currency or specie is not in the welfare interests of either the suspending banks or their customers (Gorton 1985a).

The transformation of the CBCH into a single firm-like organization during panics was signalled by suspending the weekly publication of individual bank statements, and instead, publishing the weekly statement of the clearinghouse itself. In this way, the clearinghouse avoided identifying weak banks. But, more importantly, with the loan certificate process at work, the aggregate information was the appropriate information. Also, the CBCH did not publish the identity of banks borrowing through the loan-certificate process. Cannon (1910, p. 90) reports that "attempts on the part of the business community were made in vain to discover what banks had taken out in certificates."

For this organizational structure to be successful, the amount of currency released from use in the clearing process through use of loan certificates had to be large enough to signal to depositors that the one-to-one deposit exchange rate was, in fact, correct. But the amount of currency released was limited, and so, during the panics of 1893 and 1907, the clearinghouses directly monetized bank portfolios by issuing loan certificates, in small denominations (as low as 25e), directly to the public. This allowed all the banks' assets to be monetized, if needed.

Depositors were willing to accept loan certificates in exchange for demand deposits (rather than currency) because the loan certificates, being claims on the CBCH, insured depositors against individual bank failure. In this way, the problem of bank-specific risk arising from the information asymmetry was solved, leaving only the risk that the CBCH would fail. But the circulating loan certificates were neither bank- nor agent-specific, so a secondary market could and did quickly develop, allowing the risk of CBCH failure to be priced. This secondary

(footnote 9 continued): In New York the CH Committee had the "power to demand additional security either by an exchange or an increased amount at their discretion. (Minutes, November 21, 1860). But beyond this was power to directly allocate resources by making requisitions on individual banks (Minutes, October 21, 1907). Also, see Minutes, October 18, 1907; October 21–22, 1907; January 9, 28, 1907; February 1, 1908.

Suspension of convertibility occurred during August 1814, Fall 1819, May 1837, October 1857, September 1873, July 1893, and October 1907. Suspension also occurred in the 1860s though this was not related to a major banking panic as in the other cases. Loan certificates were issued during every panic after the formation of the CBCH, including 1860 and 1884. During the crises of 1895 and 1896 the New York City CBCH authorized the issuance of loan certificates, but no member banks applied (Loan Committee Minutes, December 24–31, 1895; August 24, 1896).

For example, the Marine National Bank was punished for acting on its own by unilaterally suspending in May, 1884 (Minutes, May 6, 1884). The New York CBCH avoided suspension during the Panic of 1884.

E.g., Loan Committee Minutes, January 30, 1891; June 6, 1893, November 1, 1907; and Minutes, November 1, 1907.

Gorton (1985b) computes that the U.S. money stock temporarily increased in this way by 2 1/2 percent during the Panic of 1893 and by 4 1/2 percent during the Panic of 1907.
market served as an index of confidence. Initially, a currency premium existed in exchanges of certificates for currency. Over the period of suspension, it gradually subsided until reaching zero, whereupon suspension was lifted. In this way, a market signal was sent from depositors to CBCHs.

During banking panics, the CBCH was operating a miniature capital market, allocating resources by nonmarket means for the benefit of the collective of firms. But once the period of suspension was over, the CBCH reverted to its more limited organizational form. Only by reverting back to the more limited organizational form could the CBCH restore the proper incentives for banks to jointly monitor each other on a continuous basis.

Suppose that once the more hierarchical form of organization had been adopted during a panic, the CBCH did not revert back to its more limited form. Then individual banks, knowing that the loan certificates were available, would have an incentive to make riskier loans since each would believe that the risk could be spread over the other members through the loan certificate process. Clearly, this would not be viable. During the period of suspension when the risk pooling arrangement was in effect, however, banks have incentives to make more risky loans, free-riding on the CBCH. No mention of such a problem appears in the archives of the New York Clearinghouse Association or other sources. The problem apparently didn’t exist because member banks had no funds to make new loans. During panics banks attempted to liquidate loans of existing customers to generate cash. If a member did engage in making riskier loans, however, it was exposed to the risk that the maturity of the loans would be longer than the suspension period, making free-riding less likely. Also, the CBCH required daily reporting of all balance-sheet changes during a panic period.

Only by reverting back to the more limited organizational form did individual banks have the incentives to monitor each other. The externalities from individual bank cheating provided the incentives, and the resulting monitoring made it possible for the panic-form of the CBCH to be effective since the risk exposure of the members had been limited during nonpanic times. Consequently, the changing organizational form and degree of regulation of the CBCH was an integral part of the production of demand deposit services. In the absence of a market to monitor product quality, bank firms were required to jointly produce “confidence” in deposits, but this required a delicate balance between hierarchy and maintenance of market incentives.

4. CONCLUSION

Analysis of the CBCH system focuses attention on the issue most critical to the discussion of competitive banking: the ability of “the market” to control the behavior of bank managers. Hayek (1976) and White (1984) have argued that market forces are capable of controlling banks, and consequently preserving

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confidence in the system, provided that bank liabilities are convertible into some outside money. Klein (1974) has emphasized the role of brand names in establishing and maintaining confidence concerning convertibility. We have argued, however, that, because of information asymmetries, the market's capacity to control bank behavior depends on the banking product mix. In particular, the rising ratio of deposits to bank notes during the nineteenth century resulted in (1) increased monitoring costs for bank customers, and (2) more significant externality problems among banks. The CBCH, originally formed as a simple collective to reduce the costs of collecting checks, became involved in monitoring activities and established mechanisms of managerial control. In fact, the CBCH "regulated" bank behavior.

Our analysis provides a more complete and consistent explanation for the role of private institutions such as the CBCH in the creation of monetary confidence, which has been noted by Klein (1974), Timberlake (1984), and Gorton (1985). It also suggests that the conclusions of Hayek (1976) and White (1984) concerning the efficacy of markets as control mechanisms in banking may be valid only under certain conditions concerning information costs and monitoring technologies.

LITERATURE CITED


Mullineaux (1987) analyzes the role of a different private institution, the Suffolk Bank System, in maintaining confidence in bank notes in New England during the mid-nineteenth century.


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