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# Privately Issued Money in the US

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**Abstract** In recent years, there has been a revival of privately issued money. Due to the general lack of successful or even widely circulating private currency, it can be challenging to get a clear view of its efficiency using modern data. The U.S. historical period, however, offers a unique environment to examine the topic as private bank money made up a sizable portion of the money supply. Moreover, the period presents a wide range of regulation, including spans with and without the presence of a central bank or monetary authority. This chapter begins by highlighting the general history of privately issued money in the United States from 1790 through its elimination in the 1930s. Topics include the rise of state bank notes, the switch to national bank notes, clearinghouse currency, the Aldrich-Vreeland emergency currency associations, and the decline of private currency. It then examines open topics in the literature and provides suggestions for study going forward.

Keywords: private currency, banks, bank notes, clearinghouses, and financial regulation

JEL CODES: E42, G21, N11

## INTRODUCTION

The recent popularization of Bitcoin and other cryptocurrencies has renewed interest in privately issued money. Despite this rise, currency issued and controlled by governments and central banks still dominates the money supply. In fact, only a couple private currencies have been issued in the United States since 1935 and most of those (e.g., Berk Shares and Ithaca Hours) only circulate within a small geographic area. This, however, has not always been the case. Privately issued bank money made up a large portion of the nation's money supply before the Great Depression. Therefore this historical period offers a unique environment to understand how private currency could operate in an economy alongside federal currency. This chapter examines the rise and fall of the various historical private currencies as well as the major open questions that are still being examined.

Though the American colonies and Continental Congress issued large amounts of paper money, their record was shabby at best. Most of the currency issued before 1790 circulated at steep discounts pre-redemption, and some were either repudiated or never fully redeemed.. As a result, the nation's earliest politicians had reason to be suspicious of government issued currency, especially paper currency. The Constitution, therefore, stripped states of the ability to issue currency and the Treasury issued relatively little currency itself. Even as late as 1860, all government issued currency consisted of gold or silver coins. The coins were heavy, difficult to carry in large quantities, and often were worth more on the commodity market than as currency due to the bi-metallic system which maintained fixed exchange rates of silver and gold until 1900. When Congress gave in and first issued paper money to support the Civil War, the number of notes was constrained. Congress began to allow paper currency to grow with the issue of silver certificates after 1878, but again it was for a larger purpose: appeasing Western political interest groups. It was not until after the creation of the Federal Reserve in 1914 that privately issued money was marginalized and eliminated.

The banking system was responsible for almost all of the privately issued money in the United States before the modern period. Bank notes were collateral-backed notes issued by individual banks and were used alongside federal currency in everyday transactions. The notes were likely a necessity of an under-monetized economy. Alternatively, private clearinghouse associations issued clearinghouse loan certificates (as well as checks and notes) as temporary currency in order to provide emergency liquidity during panics. The issues were passed back and

forth between banks in order to satisfy their clearing obligations but sometimes also circulated more generally. Lacking a central bank until 1914, these certificates allowed banks to protect their limited reserves and prevented them from having to liquidate their assets on an already depressed market.

These private currencies also experienced changes over time. Bank notes in the antebellum period were loosely regulated by individual states, whereas the National Banking Acts and surrounding legislation replaced state bank notes with federally regulated national bank notes. The Aldrich-Vreeland Act of 1908 supplemented the clearinghouse system by allowing currency associations to form and provide emergency currency during panics.

The promise for productive research on privately issued money is greater now than at any time in recent memory. This is because scholars are only beginning to unlock the potential of disaggregated data contained in national, state, and local government documents as well as the archives of contemporary newspapers and financial press. At the same time, the recent interest in understanding the issue and efficiency of private money has led to new models and questions that can be examined using historical data. There is little doubt that the combination of data and tools have created an unprecedented opportunity to uncover lessons from the past that can further our understanding of monetary conditions today.

## **RISE AND FALL OF PRIVATE CURRENCY IN THE UNITED STATES**

The slow growth of federal currency provided an opening for privately issued money. Before the Great Depression, the banking system created many different types of currency. This section highlights the various types of private money that were issued in the United States using the most recent research on the period.

### ***Rise of Bank Notes***

Deposits during the antebellum period were not a high debt priority or in much demand. States, therefore, gave banks the right to monetize their assets. By promising to pay the full value in specie whenever demanded, banks split large illiquid assets into smaller liquid ones. The notes were denominated in dollars and resembled modern paper currency. Every note provided the denomination, the type of backing assets, and the name and location of the issuing bank. The note thus provided the relevant information for its use in either transactions or redemption. The

issuing bank designed its notes uniquely and often depicted the bank president or concepts that were important to the bank (e.g., agriculture, manufacturing, and railroads).

Before 1837, each bank petitioned for a unique charter from its state legislature. The note requirements of these banks (called charter banks) varied greatly over place and time, but generally allowed notes to be backed by any type of asset. Starting with Michigan in 1837, a series of free banking laws altered this trend by installing a well-defined set of requirements (Hammond 1957; Bodenhorn 2003). Seeking to protect noteholders, the new laws required free banks to purchase state or federal debt as security for each note. In a few states, other assets were allowed such as real estate in Michigan and New Jersey, railroad bonds in Minnesota, and slaves in Georgia (Rockoff 1972; Jaremski 2010). The bank then deposited those bonds with a state representative and received an equal value of bank notes in return. The state representative held the bonds as note collateral and only relinquished them when the bank returned an equal (or lesser) number of notes for destruction. If even a single request for note redemption was unmet by a bank, the state representative would close the bank and liquidate the collateral bonds to redeem any outstanding notes. The state only had to make sure the collateral was worth as much as the outstanding notes to prevent losses, and as a result, they placed little control on the number of notes a bank could issue. A bank could issue more notes as long as they had collateral.

An implication of these note requirements was that the security and acceptance of notes were tied to the government bond price level. If bond prices fell, then the real value of the bank's capital and backing declined while its notes were to be redeemed at the same value. Banks thus had to take losses redeeming notes at par or refuse to redeem the notes and shut their doors. State officials were tasked with making calls on banks for extra bonds when the collateral dropped below a set amount.

The notes easily circulated as currency in a local environment where banks (and their notes) were well known, but mechanisms arose to allow them to circulate more widely. Outside the local area, a merchant first had to determine that a note was legitimate, and then trust that it would be redeemed at face value when presented for repayment. Private note brokers alleviated these issues by identifying and purchasing notes at a percentage discount from their face value (see Dillistin 1949 and Gorton 1989 for a detailed description of brokers and reporters). Similar to modern currency exchangers, brokers advertised the notes they were willing to buy and sell and their corresponding prices. As the number of notes and brokers grew, note reporters began to

bundle and publish the prevailing discounts in a city as a periodical. Note reporters also provided each note's originating location, physical description, and a description of any counterfeit notes. A merchant could thus verify a note's provenance and discount by examining the reporter's description, although, as described by Mihm (2008), reporters did not perfectly protect merchants from counterfeits. Identification was on small details, and notes were often faded and worn from use.

In addition to note brokers and reporters, another institution arose to allow notes to circulate more effectively. The Suffolk System (established in 1818) offered to clear the notes of any participating bank at par so long as it held funds in an account at the Suffolk Bank. By holding a large number of other banks' notes, the Suffolk Bank had the leverage needed to force a participating bank to hold a safe portfolio through the possibility of presenting its notes for immediate redemption in specie. The arrangement was so popular that the system allowed nearly all of the bank notes of New England to circulate very close to par. In 1858, the Bank of Mutual Redemption took over the note clearing from the Suffolk Bank and operated until the mid-1860s.

As a result of these institutions, thousands of notes circulated in the economy by the 1860s. Bank notes dominated the amount of federal currency through 1840 and remained of similar size through 1860. Notes also exceeded bank deposits for most of the period. Banks likely preferred notes to deposits because they circulated as currency and did not quickly return to be cleared. As such, banks could issue large numbers of notes yet only keep a fraction of their value in the vault as cash. The public may also have preferred notes because deposits in most states were not subject to reserve requirements, while bank notes were subject to these (Mitchener and Jaremski 2015). About two-thirds of banks had more circulation than deposits in 1860. Putting this in the aggregate context, private bank notes made up at least a third of M1 before 1860.

### ***Switch to National Bank Notes***

The Civil War changed the nature of note issue. Tasked with financing the Union army, Secretary of the Treasury Salmon Chase pushed for national bank regulation after the initial federal bond issues led to the specie suspension of 1861. The resulting National Currency Act of 1863 and the National Banking Act of 1864 adopted the relatively stringent structure of New

York's free banking law, and added even more requirements to prevent bank losses and create a market for national debt.

Most of these new requirements affected the issue of bank notes. First, they avoided free banking's attachment to risky state debt by requiring the use of Treasury bonds to back national bank notes at 90 percent of their value. This change raised the cost of issuing notes and reduced the number of notes that national banks could issue. Second, they placed a \$300 million ceiling on national bank note circulation. The effect of the ceiling was felt almost immediately, but since the ceiling was raised in 1872 and eliminated in 1875, it did not have much of a long term effect. Third, they required national banks to redeem their notes at par in a large city, meaning a merchant only had to find the bank's redeeming agent in the city to be assured of full payment.

In 1863 and 1864, most state banks had converted over to a national charter. Not satisfied with the remaining state banks, Congress passed a 10 percent tax on state bank notes in 1865. Striking a different tone than the other legislation, Selgin (2000) argues that the tax was intended to drive the remaining high-quality state bank notes out of circulation and limit money supply growth. Hammond (1957) posits the tax was responsible for the collapse of state banking. State banks with high note issues had one of three options: convert to a national bank charter to keep issuing notes, quickly attract a large number of deposits to supplement the loss of bank notes, or close their doors. As a result, over 225 state banks closed after the tax was implemented, leaving less than 250 state banks still in operation at the end of the decade (Jaremski 2013). The majority of closures occurred in the Midwest where population, capital requirements, and deposits were low. The pattern suggests that many banks did not have the capital necessary to convert to a national charter or deposits necessary to remain a state bank when confronted with the tax.

As expected, the regulation dramatically changed the structure of bank notes in the country. State bank notes declined to zero and national bank notes rose up to take their place. That said, the growth of national bank notes was relatively stagnant and declined relative to GDP over the postbellum period. Growth remained slow even after national banks were allowed to issue bank notes up to the full value of their collateral in 1900.

The legislation also led to the elimination of bank note discounts. Because notes were backed by national debt and redeemable in major cities, merchants no longer had to worry about

redemption. As a result, national bank notes circulated at par throughout the country, and most note brokers either started their own banks or went out of business.

### *Clearinghouse Certificates*

Another type of private currency was issued by the banking system: clearinghouse loan certificates. New York City established the first U.S. clearinghouse association in 1853 to lower the costs of clearing checks and bank notes. Before its creation, banks had to send a representative to every other bank in the area in order to redeem their debt. Clearinghouses provided a central location and time to clear debt every day. Each member bank would then only have had to send a representative to the clearinghouse. Following New York's lead, banks in other large financial centers formed their own associations. As a result, clearinghouses had spread across major cities in nearly every state. (For more information on clearinghouses, see Cannon 1910, Timberlake 1984, Gorton 1985, and Gorton and Mullineaux 1987)

The clearinghouse system evolved to do much more than clear bank debt. As the Panic of 1857 approached, depositors and country banks began to withdraw their deposits. The New York clearinghouse decided to create clearinghouse loan certificates and distribute them to qualified member banks. The certificates were backed by collateral from the receiving bank, but they were drawn on the clearinghouse, making them a joint-liability of the members. If a member defaulted, then the remaining members bore the loss in proportion to their capital stock. Member banks, therefore, could conserve their limited currency reserves by settling their clearinghouse obligations with certificates rather than federal currency or bank notes. Though they did not have a choice of whether to accept loan certificates, lending banks gained interest on the certificates. The banks could thus refrain from selling assets at fire sale prices. That said, the certificates were designed with large denominations to prevent them from circulating outside of the banking system. (Gibbons 1859; Calomiris and Schweikart 1991)

Later panics pushed clearinghouses to innovate. The Panic of 1873 ushered in the use of certified checks. These checks differed from loan certificates because receiving banks did not have to give up collateral. The lack of collateral made them easier for banks to issue and they could keep safe assets on their balance sheets. Clearinghouses created low denomination clearinghouse notes during the Panic of 1893. Unlike clearinghouse loan certificates and certified checks, these notes could be issued to anyone and operated as a makeshift currency. Some

clearinghouses issued notes as low as \$0.25 to help make change during the Panic. The use of small denomination notes rose during the Panic of 1907 with some clearinghouses even printing blank checks made out to "bearer" so that banks could quickly fill in the needed amount. (Andrew 1908; Cannon 1910)

By the creation of the Federal Reserve, clearinghouse associations were issuing large amounts of emergency funds during panics. For instance, the Comptroller of the Currency (1908, pp. 65-66) reported that at least \$248 million in clearinghouse loan certificates were issued during 1907. The public also took notice of the actions of clearinghouses. Newspapers in New York and Chicago both reported on the stabilizing functions of clearinghouses during the Panic of 1907 (Moen and Tallman 2000). The clearinghouse thus had a variety of effects during panics. The loan certificates and certified checks impacted those inside of the banking system, clearinghouse notes helped those outside of the banking system, and the clearinghouse's actions provided a public signal of stability. Cannon (1910, p. 96) calls them "one of the finest examples the country has ever seen of the ability of the people when left to themselves to devise impromptu measures for their own relief".

### ***Emergency Currency under the Aldrich-Vreeland Act***

While only temporary, the issues of clearinghouses were treated as a form of currency in their local areas, propping up the banking system until the market had settled. Hepburn (1924, p. 352) states: "This temporary currency performed so valuable a service...in moving crops and keeping business machinery in motion, that the government, after due deliberation, wisely forbore to prosecute [the issue of currency]." The National Banking Acts prevented national banks from issuing currency outside of national bank notes, whereas the state bank note tax prevented state banks from issuing currency without the sizable tax. The government thus could have prosecuted the clearinghouse members. The importance of clearinghouses' action during the Panic of 1907 even inspired Congress to take action. The resulting Aldrich-Vreeland Act of 1908 was a substantial step in financial regulation and created another form of private emergency currency.

First, the Act created the National Monetary Commission that was tasked to provide long-term recommendations on how to secure the banking system and prevent future panics. The Commission produced detailed reports on the banking experiences of the US, Canada, Mexico,

and many European Countries. These findings ultimately led to the creation of the Federal Reserve System.

Second, the Act allowed the formation of currency associations that could issue emergency currency when invoked by the Secretary of the Treasury. Any group of 10 national banks or more with at least \$10 million in combined capital could form a currency association. The associations lay dormant during most years and did not require the fees or supervision of clearinghouses. However, during a panic, the members could exchange a broad range of securities (not just government bonds) for national bank notes at the association. The notes were largely indistinguishable from regular national bank notes and circulated as such. The emergency currency was taxed at an increasing rate over time to encourage banks to redeem their issues after the panic subsided.

Despite the period's susceptibility to panics, emergency currency under the Aldrich-Vreeland Act was only issued in 1914. The outbreak of World War I put intense pressure on the world's financial system as investors grew worried and pulled out of stocks. When the London stock exchange was shut down, investors started dumping securities on the New York Market. Treasury Secretary McAdoo shut down the New York Stock Exchange and authorized the use of emergency liquidity through currency associations. In total, currency associations issued \$385 million of emergency liquidity in addition to the certificates issued by clearinghouses. As a result, the panic was largely aborted. (Silber 2007; Jacobson and Tallman 2015)

### ***Decline of Private Currency***

The arrival of the Federal Reserve System in 1914 ushered in many changes to the banking and monetary systems. The Fed was intended to create a flexible currency and facilitate the payments system. With the exception of the clearinghouse issues, the nation's money supply was relatively inflexible before 1914. National bank notes required high quality collateral backing. Therefore during panics and seasonal spikes in demand, the money supply often contracted due to depositor withdraws rather than increasing to provide extra liquidity (Sprague 1910; Wicker 2000). Clearinghouse liquidity was often too little too late. The situation also prevented the government from exerting much control over the money supply.

To help solve these issues, the Federal Reserve began to issue federal currency by way of Federal Reserve Notes and Federal Reserve Bank Notes. This issue augmented the federal

currency that was already in circulation. The Fed also created the discount window which allowed member banks to borrow short-term funds simply by exchanging accepted collateral regardless of whether a panic was occurring or not. This mechanism allowed the Fed to inject both seasonal and emergency liquidity into the financial system and banks did not have to wait for authorization by the Treasury or clearinghouse association. The Federal Reserve's founding was associated with reduced seasonal variability of interest rates and increased seasonal variability of lending (Miron 1986).

As national banks were forced to join the Fed, pressure started to build against national bank notes. Banks had some decision-making power to customize their notes before 1914, but began to be pushed towards standardized formats. In the mid-1930s, the bonds that could be used to collateralize national banks notes were retired and national bank notes were consolidated into Federal Reserve notes. The move gave the Federal Reserve more control and coordination over the physical portion of the money supply.

The creation of the Federal Reserve also eliminated the need for emergency currency from clearinghouses or currency associations. Banks no longer had to wait for others to authorize the issue of emergency currency. As a result, the Aldrich-Vreeland Act was allowed to expire and clearinghouses were integrated into the Fed's nation-wide clearing system.

## **OPEN RESEARCH QUESTIONS**

This section provides a guide to the open questions and trends in research on historical privately issued money. The survey is selective in its choice of topics and literature coverage due to the wide range of possibilities for productive research in the area. Those seeking to pursue research in these topics would do well to start with the references discussed here and follow up with the literature cited in each of these sources.

### ***Efficiency of Private Money***

Given the modern discussions, the most relevant questions regarding the nation's historical experience with private currency concern its efficiency. The U.S. historical period presents a largely unique environment for studying this phenomenon. Not only did these periods contain a tighter and a looser regulatory approach to private bank notes, but they also include stretches when private currency circulated with and without the presence of a central bank. The

historical narrative and data thus provide a testing environment for a large number of potential situations and questions.

The literature provides no clear answer as to whether private currency was efficient. Authors have remarked on both sides of subject. For instance, Cagan (1963, p. 20) writes that the United States “could not so easily have achieved its rapid industrial and commercial expansion during the second half of the nineteenth century with the fragmented currency system it had during the first half”, whereas Selgin (2000, p. 600) writes the “because state banks of issue could have accommodated market demands that national banks failed to satisfy, consumers might have been better served had state banknotes been allowed to survive”. Despite the question's importance, most studies have been theoretical or descriptive in nature. The majority of the econometric or data-driven studies focus either on (1) the determinants of bank note discounts or (2) the relationship between banks and economic growth.

Since over half of all banks closed before 1862, the issue of bank notes could have posed a very real problem for the economy, but the collateral of each note largely minimized the losses. For instance, Rockoff (1974), King (1983), and Rolnick and Weber (1988) find that aggregate losses ranged between 2 and 4 percent per year. At the same time, several banks left behind note losses over 60 percent. The liquidity benefits of notes might simply have outweighed these losses, but it is also possible that the pricing of bank notes shielded noteholders. If discounts reflected the fundamentals of the issuing bank and the collateral backing, then noteholders would be informed of and compensated for their exposure. Banks might even have been pressured to reduce their risk in order to allow notes to circulate further. The bank note discount literature thus examines the extent that notes were dynamically priced.

Comparing reporters from Cincinnati, Cleveland, New York City, and Philadelphia, Gorton (1996) and Ales et al. (2008) highlight several stylized discount facts. First, “local” bank notes almost always traded at par, because holders could easily demand payment from a local bank. As banks were required to redeem their notes at par, a local discount could only exist if the bank was closed or suspended. Second, most, but not all, “foreign” notes circulated at a discount and discounts were asymmetric across locations. For example, Indiana notes were discounted in New York City (NYC) and Philadelphia, yet NYC notes were not always discounted in Indiana. Moreover, Indiana notes had different discounts in NYC than Philadelphia. Third, bank-level variation existed. Banks in the same city often traded at different discounts in other locations.

The empirical evidence shows that the discounts reflected the cost to redeem the note and the probability of default. Gorton (1996) shows that notes from distant banks received an excess discount. Bodenhorn (1998) shows that banks that were about to close often received a high discount, indicating that note brokers were pricing bank-specific risk into their discounts. Linking balance sheet data with discounts, Jaremski (2011) shows that bank discounts were correlated with the size of a bank's note circulation and the market value of its collateral assets. Therefore, even in the absence of modern regulations or reporting, discounts seemed to have mitigated risk. Further work by Selgin (2000) also argues that this discount process drove "bad" state bank notes out of circulation, leaving the relatively safe notes to widely circulate.

The literature makes a convincing case that private bank notes filled the currency needs of the developing nation and market mechanisms were able to increase their circulation and efficiency. However, it neither accounts for all the costs associated with bank notes nor makes a comparison with federal currency. For starters, the thousands of different bank notes introduced frictions to the market, as merchants had to subscribe to a bank note reporter or take time to consult a local note broker. This is not to mention the large number of counterfeit notes or the potential that a bank would close before a note reporter was updated. The important question, therefore, is whether the replacement of private bank notes with federal paper currency would have influenced economic growth in either direction. The recent collection of antebellum balance sheets by Weber (2008) as well as the collections of bank note discounts by Weber (2011) and Weber and Gorton (2011), however, now enable a much deeper study of the liquidity benefits of bank notes.

The analysis of finance-led growth is the second literature that relates to the efficiency of bank notes. Instead of focusing on bank notes specifically, it focuses on the effect of banks in general. Because notes made up a large portion of the bank's liabilities especially in the antebellum period, it is reasonable to connect the effect of banks to the effect of bank notes. Analyzing the period before 1850, Rousseau and Sylla (2005) argue that the "Federalist financial revolution" of the 1790s and its system of state-chartered banks helped to set the nation on a path of modern economic growth. They examine the effect of the aggregate number of banks on business incorporations. The analysis, however, stops before the creation of the majority of the free banks. As Cagan was particularly critical of free bank notes, the analysis cannot directly disprove his arguments. Separating free and charter banks at the county-level after 1850,

Jaremski and Rousseau (2013) find that free banking did not have an immediate impact on local economic growth, yet charter banks had positive effects on both manufacturing and urbanization. They argue that the high risk of free banks was responsible for the difference as short-lived banks were unlikely to provide many loans and individuals were unlikely to hold their bank notes. Another county-level study by Jaremski (2014) suggests that destruction of state banks caused by the National Banking Acts and the state bank note tax positively impacted manufacturing and urban development by encouraging the exit of free banks that were not growth promoting and concentrating new, more stable national banks in certain locations.

The evidence suggests that not all banks were growth promoting. However, none of these studies successfully test for the efficiency of note issue. First, the studies of growth look at whether a bank was present rather than the size and quality of its note issue. Second, the county-level results might not directly translate into nation-wide GDP growth. The studies identify local growth which means that one has to sum up all counties to gain an overall effect. Similarly, the studies focus on the results for manufacturing and urbanization rather than agriculture. As agriculture made up more than half of all economic activity, the analysis misses an important element of GDP. For instance, Jaremski (2014) focuses on the rise of the Manufacturing Belt as a result of the increased banks in certain areas, yet does not separately analyze the effect of decreased state banks in the agricultural regions of the South and Midwest. The removal of state bank notes might have been a particular blow to the economies of agricultural areas. The high capital requirements and restrictions on mortgage lending of national banks prevented many from being established in rural and agricultural areas, and without the ability to issue notes, state banks were slow to fill the gaps. Third, notes circulated beyond their place of issue suggesting that the effect of banks on the local community potentially does not represent the total effect of banks or bank notes.

The competition and eventual removal of national bank notes after the establishment of the Federal Reserve also has received little attention even though it has the clearest implications for the modern period. For instance, how did national bank notes respond to monetary policy and what was the effect of their removal? The Federal Reserve Era also has the benefit of having better data because the Fed began to collect more comprehensive information.

### *Note Issue Paradox*

Another open section of the historical literature focuses on the size of bank note issues. Many authors including Friedman and Schwartz (1963) and Cagan (1965) have argued that national bank notes were under issued. The hypothesis states that notes were more profitable than the typical loans funded by deposits and capital, and thus banks should have issued as many notes as allowed by the bonds in the system. Based on Friedman and Schwartz's numbers, note issue would have been profitable in every period except the period of temporarily high bond prices in the 1880s. That said, notes still only made up 28 percent of the maximum in 1900 when prices had returned to normal. It was not until after the creation of the Federal Reserve and World War I that note issue had risen to 80 percent of its maximum.

At the aggregate-level, many studies including Cagan and Schwartz (1991), Duggar and Rost (1969), Champ et al. (1992), and Wallace and Zhu (2004) have pointed toward redemption costs as a potential explanation. The explanation, though, is generally built around theoretical discussions or proxy measures, which do not provide a complete picture. Champ et al. (1992), for instance, focus on the amount of national bank note redemptions at the Treasury. They take the finding that half of outstanding notes were redeemed each year as evidence that national bank notes were not considered as valuable as federal currency for reserves. Diving deeper into the data, however, shows that most of the redemptions were either worn out notes, a bank's reduction of its own circulation, or the destruction of the notes of closed banks. Less than a fourth of all redemptions were for other reasons, suggesting the theory is not as powerful as the total number of redemptions might imply.

Another recent explanation for the aggregate picture is the issue of silver certificates. Created as a compromise to western farmers and miners, the government agreed to buy a certain amount of silver with notes redeemable in silver under the Bland Allison Act of 1878 and the Sherman Purchase Act of 1890. Proposed by Champ and Thomson (2006), the argument is that the increased circulation of federal currency reduced the need for bank notes. They find that the circulation of silver certificates took off after Congress started allowing the creation of one, two, and five dollar certificates in 1886. Bank note circulation also experienced its largest declines after 1885. The study, however, relies heavily on aggregate timing that is not exactly perfect. For instance, circulation began to rebound before silver certificates stopped being issued.

Another side of the literature has gained traction in explaining the puzzle by looking at disaggregated measures of bank note issue. James (1978) finds that the under issuance displays a

regional pattern with southern and western banks issuing many fewer notes. He argues that the pattern is driven by the high profitability of loans in agricultural and developing areas. That said, the theory does not explain why banks in other regions did not continue to expand their note issues over time.

Calomiris and Mason (2008) disaggregate the data a step further by looking at bank-level data for 1880, 1890, and 1900. They argue that the aggregate picture obscures important dynamics. Specifically, they find an important role for the bank-specific limits put on national bank note issue. After accounting for the requirements, they find that many banks were at either the minimum or maximum notes allowed by their bond holdings and capital. Their regression analysis supports James' findings in that the opportunity cost of lending is an important determinant of whether a bank is at the maximum or minimum circulation allowed. They also find that high bond prices are associated with lower circulation, and the lack of a bounce back after bond prices fell in the 1890s was due to a compositional shift in banks. New national banks issued few notes and closed national banks often issued the maximum amount. On the other hand, they find little evidence for the redemption cost hypothesis.

The evidence presented by Calomiris and Mason (2008) is convincing, but there are several questions left to be addressed. First and foremost, the authors do not analyze the choice of bonds and capital. Their approach measures note issue relative to the maximum amount of notes a bank could issue based on their bond holdings and capital stock. Banks could still have decided to purchase more bonds or increase their capital in order to take advantage of the profits of issuing more notes. This gap prevents a direct aggregation to the national-level and an immediate connection to studies such as Friedman and Schwartz (1963).

Second, only examining three years of data prevents a clear examination of the trends and dynamics behind bank decisions. Were the changes immediate with declines in bond price and were they at the behest of banks or note holders? The recent work by Champ and Thompson (2006) on silver certificates could also be integrated into a time-series or panel analysis. On a related note, the selected dates miss two critical events. Stopping in 1900 prevents a view of the effect of the Gold Standard Act of 1900 which increased the amount of notes that could be issued for every dollar of collateral bonds and the general profitability of note issue. The Act should have allowed banks to issue a large amount of new notes without buying any more bonds, but the

bounce back was small relative to the potential. The period also misses the run up in notes to the near maximum during the early 1900s.

Third, the low bank note issues of Southern and Western banks (as well as urban banks) remains unexplained despite the inclusion of opportunity cost variables. The availability of data on weather, crop selection, or even crop prices, for instance, might help to better identify the effect of opportunity cost changes on bank note issue.

It is also worth noting that the note issue puzzle extends to the antebellum period. Dual studies by Bodenhorn and Hauptert (1995, 1996) examine the profitability of bank note issue before 1860. The earlier study shows that New York free banks behaved similarly to national banks in that they issued notes much below their maximum. The authors argue that this finding makes sense because the National Banking Acts were based on the New York Free Banking Act. The later study argues that deposits and loan issue might have been an equally profitable alternative to note issue during the period. The parallels between the two literatures suggest that conclusions drawn on one period might also apply to the other.

### *Clearinghouse Mechanisms*

The role of clearinghouses in panics is quite well known, but our knowledge is based almost entirely on the New York City clearinghouse. The New York City clearinghouse, however, might not be the best to examine as it issued clearinghouse loan certificates rather than notes or checks. The descriptions of the role of notes and checks mainly come from the few bits and pieces of other clearinghouses described by Cannon (1910) and other authors. Moreover, New York City's role as the largest financial market and central reserve city might prevent conclusions from being generalized to every clearinghouse. The literature has also tended to focus on the bigger picture of clearinghouse actions rather than the detailed mechanics of clearinghouse currency. For instance, Jaremski (2015, 2016) examines the effect of the presence and membership of clearinghouses on bank portfolios and failures, but even though he examines many clearinghouses, he assumes them to be the same and does not account for the specific actions of each. Along these lines, there are several important gaps in the literature.

First and foremost, the literature lacks a general knowledge of the actions of clearinghouses outside of New York and Chicago. Even the Comptroller of the Currency only

reported clearinghouse currency statistics for a handful of the major cities. As a result, we do not know how much currency was issued in total or the full extent of the variation across location. We also do not have enough information to calculate whether the issue of clearinghouse loan certificates had a larger or smaller effect than the issue of clearinghouse notes or checks. Specifically, we might expect clearinghouse loan certificates or notes to have a bigger effect on the banking system, but clearinghouse checks to have a bigger effect on the local economy. The increasing number of historical newspapers going up online should help shed light on these topics.

Second, the literature lacks knowledge of how clearinghouse currency was used, circulated, and retired. Most studies have looked at the effect of a bank receiving clearinghouse funds during a panic, yet they do not examine why a bank requested funds or even whether they used them. While all members were mutually liable for the issues, the actual decision on whether to request and use funds is quite important. For instance, in at least one panic, all member banks of the New York City clearinghouse were required to take out clearinghouse loan certificates even if they chose not to use them (Hoag 2016). On the back end, we also know relatively little of how clearinghouse currency was unwound. Each loan certificate, note, and check had to be redeemed in full by the specific bank that issued it. Therefore, before redemption, the bank had to track down all of its currency. There is at least one story of a bank simply declaring that they would not be paying any more interest in order to encourage others to redeem the certificates; however, this might be an exception rather than the rule.

Third, the literature is relatively silent on how regulators and bank examiners felt about clearinghouses and their members, let alone their currency. Did they fear the moral hazard implications of emergency liquidity or did they give members the benefit of the doubt due to their ability to gain liquidity during panics? The availability of national bank examiners reports in the National Archives would allow a much deeper insight into the actions taken by clearinghouses and the thoughts of examiners about those actions.

## **CONCLUSION**

The early monetary history of the United States is a history of privately issued money. Despite the Treasury issuing federal currency, private money filled in the gaps and circulated across the nation. Seminal works such as Hammond (1957) and Friedman and Schwartz (1963)

provide important insights about the broader trends driving this evolution, but inadequate data often precluded these works from moving beyond aggregate statistics and anecdotal evidence. The recent advent and continued collection of micro-level data, however, has opened the door to address key questions in the historical narrative that have never been fully answered. Due to the world's relatively lack of good examples of private currency, the historical period thus provides an important testing ground for understanding the efficiency of privately issued currency.

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