An Experiment with Multiple Currencies: 
The American Monetary System From 1838-60

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ABSTRACT:
This paper finds that the combination of state regulated bank notes and deposits acting as the principal form of money and heterogeneous bank laws in the antebellum United States led to a loosely fixed exchange rate system where states were capable of exercising limited independent monetary policy. It finds that bank note circulation and deposits moved differently across the states, and based on narrative evidence, it seems states were aware of their ability to affect the money supply of their economies and that some states did in fact try to change their banking systems to do so.

Keywords: Antebellum Banking, Monetary Union, Monetary Policy, Free Banking, Bank Notes.

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1. Introduction:

During debates surrounding European Monetary Unification, the question was often asked, “If the United States of America has always had one currency, why shouldn’t a United States of Europe?” The question begins from a false premise, though; contrary to popular belief, the United States has not always been a full monetary union with a single circulating currency.

The typical interpretation of the history of the United States is as an ongoing currency union since its inception. For example, Hugh Rockoff (2000) questions whether the United States was an optimal currency area but assumes that it operated as a currency area from 1788 to the present with the exception of the Civil War. This paper takes up this assumption by showing that despite being a political union since roughly 1776, the United States has not always operated as a complete currency union with centralized monetary control. In the wake of the demise of the Second Bank of the United States, paper currency in the United States consisted entirely of bank notes issued by private or state-run banks. The Federal Government was not involved in the maintenance of a currency from this time until it issued Federal notes to pay for Civil War expenses. As banks were confined to state borders and regulated by the states, this implies that from 1838 to 1861, there were no US paper dollars, only dollars from New York or South Carolina or Michigan.

Optimal currency area theory examines the question of how broad an area should be spanned by a single currency. The theory describes microeconomic efficiency costs from having many currencies over an integrated economy due to increases in transactions costs and uncertainty and a reduction in the usefulness of money as a unit of account and store of value. Conversely, there are macroeconomic benefits when individual regions can formulate their own monetary policy or use exchange rate policy to cushion shocks between regions. When a group of nations all have one currency, increases or decreases in one region automatically spill into other regions, making both independent monetary policy and exchange rate policy impossible.

Many criticize the currency of 19th century America for imposing unnecessary costs on trade. Accepting the microeconomic costs as given, this paper examines whether any of the theoretical macroeconomic policy benefits of multiple currencies were realized to offset the costs stemming from the decentralization of the medium of exchange. While this has been treated in asides in other papers or through general description, this paper considers if there was, in fact, a system that allowed for independent monetary policy by states, how it worked, and whether states exploited this possibility.

The use of bank notes as money in this period did not cause unit of account problems. Since all notes were in theory redeemable for specie, the unit of account was a “dollar” note or specie. The problem was that the value of any particular paper dollar was variable, thus causing problems for exchange or storing value over time. At its root, the country shared a specie dollar standard, but the volume and the value of bank money could vary across states. Thus a common legal tender and common unit of account existed, and the paper will not argue the states had purely independent currencies. From a contractual perspective, dollars would refer to the common legal tender and bills of exchange could be issued based on this standard, but much like a gold

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1 Mundell (1961) is considered the seminal piece in the field.
standard with gold as the ultimate base and separate currencies within different countries, the presence of locally issued and regulated bank money allowed money supply to vary across states.

The paper looks at two testable questions that come out of this debate. First, did states have the ability to undertake state-level monetary policy, and second did they use it? To answer the first question, I consider whether the national system leaves room for state level monetary policy. Subsequently I examine whether the circulating bank notes acted like state level currencies based on the way the notes were priced. If the exchange rate system was fixed with sufficiently integrated markets or if money were entirely demand determined, it is possible that there was no scope for monetary policy.

The second question considers whether states actually used their control over the banks to practice monetary policy. That is, were they aware of their power to control the money supply, and did they use their regulatory power with the intent of affecting the money supply of their state? To answer this question, the paper examines state by state bank note circulation and deposit data to see if states’ money supplies did in fact move in ways consistent with them being controlled by different regimes. In addition, the paper examines narrative evidence to see if states were aware of their power to control the money supply and whether they acted intentionally to do so.

The results suggest that there was a system of loosely fixed exchange rates amongst the states. In addition, most states did have control of their money supply, policymakers were aware that their actions regarding bank policy could affect the money supply, and some tried to do so intentionally. For example, Louisiana in 1853, Ohio in 1845, and Virginia in 1851, policy makers tried to and succeeded in changing the money supply. States did not, however, always take systematic advantage of this freedom that accompanied the costs of multiple currencies. Due to the time it takes to change bank laws, this was not a swift policy instrument and thus generally could only be used toward long or medium term imbalances in the money supply. Furthermore, emotional and political concerns regarding banking or a focus on the strict bank-related consequences of laws sometimes dominated the debates, outweighing any concern for the impact of bank laws on the money supply. Finally, it does not appear that exchange rate considerations ever directly influenced decisions. Still, while the macroeconomic flexibility was not always pursued, it did exist and on some occasions was used.

Part 2 of the paper will briefly describe the historical setting and previous investigations of the era. Part 3 will consider the scope for monetary flexibility under a multi-currency specie system. Part 4 will examine the bank note system to see if it operated as a multiple currency system. Part 5 will study bank note circulation data for evidence of independent monetary movements. Part 6 will consider narrative evidence and its connection to discount and bank note data. Finally, part 7 concludes.

2. Historical setting and previous literature

While the United States’ Constitution grants Congress the right to coin money, before the Civil War, it did not print paper money. Since specie (gold and silver) and coin were costly to transport, bank notes filled the void of paper money. Bank notes were a dominant portion of the nation’s circulating money supply, and
notes plus deposits were an even larger portion of the overall money supply. One author commented, “Banknotes comprise so large a proportion of the circulating medium that those who will not take them in payment of their debts cannot collect their dues, nor carry on business requiring the use of money.” These notes were non-interest bearing debt which the banks were legally required to redeem for specie on demand. Early in the United States’ history, there were both state banks (banks regulated by the states) and a single national bank (the First Bank of the US: 1791-1811 and Second Bank: 1816-36). During its tenure, roughly 20% of the bank notes which circulated as currency were those of the Second Bank. Also, the Second Bank prevented excessive note issue by state banks by redeeming notes for specie quite often, thus preventing banks from issuing more currency than they could support (Klebaner (1974), Temin (1968), Hepburn (1967)). When the Second Bank was not re-chartered, both the common national currency and the common restraint on state banks disappeared. Afterwards, only the regulations of the states would determine the volume and safety of bank note issues. This is not to argue that the eras of the First and Second Banks were perfect monetary unions, but the 1838-60 period was even more decentralized due to the lack of a national bank.

The Second Bank’s charter expired at the end of 1836 and was immediately followed by financial panics from 1837-9. This study will focus on the actions of states and state banks as this panic subsided until the outbreak of the Civil War. The Federal Government officially re-entered the currency markets during the Civil War by issuing greenbacks and other tradable financial instruments and with the National Currency Act in 1863. In addition, the outbreak of the Civil War greatly disrupted the money markets, and thus the analysis will end with the start of the hostilities.

Had states established identical banking regulations, state bank notes may have continued to act like a single currency, but there was great diversity in the type of bank regimes employed. Many states went through different regimes, changing the bank laws and thus changing the institutions which backed the notes that were the circulating medium of the state. The notes were not necessarily accepted at face value, but sometimes traded at a discount. The type of banking structure greatly influenced the safety and volume of the bank notes as well as the discount at which they traded. Some of these regimes were quite loose, allowing banks to issue notes they had very little hopes of redeeming. Others were extremely tightly run with few (if

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2 Temin (1968) table 3.3 and 5.2, estimates non-specie money as a percentage of the money supply as 58-82% over the years 1838-58. Friedman and Schwartz (1970) estimate non-specie money (notes outside banks + deposits) as 64-83% of the money supply (specie held by public + notes outside banks + deposits) for 1838-60, and using Comptroller (1876) figures for specie, notes, and deposits, and Hepburn (1967) which repeats these figures, for specie held in banks, the percentages are 70-87% for 1838-60. Considering only notes and specie, (notes in circulation / notes in circulation + specie held in public) the figures are: 43-72% using Friedman and Schwartz data and 46-77% using Comptroller. Officer’s (2002) new specie series are lower than the previous estimates and imply an even larger share for bank money than these listed.

3 Duncombe (1841) quoted in Comptroller (1876) p.34.

4 Klebaner (1974) p.19. Author’s calculations using Comptroller (1876) show that the notes of the 1st Bank were 20% of the national bank note supply in 1811; those of the Second bank were 9% in 1820, and 21% in 1829.

5 Dowd (1992) calls the diversity of the bank laws the single most striking feature of the period. Section 5 will discuss many of these examples.

6 See Rockoff (1974) for a discussion of how the rules regarding the type of bond allowed for backing of notes determined the possibility of Wildcat banking, a type of banking where the intent is never to really set up a bank, but rather to issue as many notes as possible and take the proceeds as profit and then close the bank.
any) failures and no losses to note holders. New England states, on the other hand, were constrained in a unique way during this era due to a private arrangement, the Suffolk System. A group of Boston banks forced the surrounding banks to keep a deposit of specie with the Suffolk bank which would guarantee their notes. Notes were quickly returned for redemption in specie if a bank would not join. This system allowed notes throughout New England to circulate at par because there was a guarantee that they would always be accepted at any member bank. As the clearer of notes, the Suffolk bank had the power to control excessive note issue by rapidly redeeming notes for specie. This system involved no government regulation, but was a private sector means of enforcing strong backing of all note issues and effectively created a monetary union of the six New England states.

In the most banking histories of the time, there is generally criticism of the variable value of the bank notes and the costs they imposed on the economy. In his comprehensive history, John Jay Knox (1900, p.305) writes that “much has been laid upon the losses caused by state bank notes prior to the civil war.” Knox himself says some of the losses may have been overstated and that in general banks helped spur the development of the US, but that the banks of the post Civil War era were a great improvement. Some observers appreciate the free bank experiments in many states and the freedom of many economic actors to issue currency, not just the state. Rockoff (1974, 1975b) argued that while wildcat banking did occur in some states, it was not a part of all free banking regimes or of the state bank notes in general. Finally, there have been many studies that have examined the stability of the antebellum bank system. These necessarily consider the stability of bank notes, but tend to focus on microeconomic bank matters or the politics of the day rather than monetary issues. Most recently, Howard Bodenhorn (2000, 2003) elaborated on the importance of banks and the capital market in the development of the US economy before the Civil War.

The macroeconomic implications have received less attention. Sheridan (1996) is perhaps the only piece to regard the Antebellum United States as an open economy with the states representing individual units with their own currencies. He does not, however, present evidence that the bank note market functioned in a manner that the discounts could have operated as exchange rates, nor does he present evidence that states ever tried to influence their money supply or discounts. Instead, he explains how the system would work if in fact the bank note market were an exchange rate system. Jane Knodell (1988) makes a related argument saying the bank note market was divided into regions and claims this provided the West with some freedom from credit contractions in the East. A separate, though related, literature is that which examines the macro

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9 See also Rolnick and Warren Weber (1982a, 1982b, 1988)
10 See for example: Dowd (1992), Schweikert (1987), Shade (1972), Hepburn (1967), Knox (1900) as well as other histories and state specific monographs listed in the reference section.
11 This is not intended as a criticism of Sheridan’s work. In his article, he uses the American antebellum system as an analogy for the European Monetary System and is not trying to prove that the American system works as he claims.
12 Neither Knodell nor Sheridan considers the complications presented by the specie backing of bank notes, something taken up in section 3.
impact of the Second Bank of the US. Both Arthur Fraas (1974) and Marc Senegas (2000) consider the creation of the Second Bank as an act of monetary integration, and Peter Rousseau (2003) views the First and Second Banks of the United States as part of a step to federalize a heterogeneous money. While studying a different era, their argument that the Second Bank was a part of the forming of a currency union is supportive of this paper. As the Second Bank disappeared, the situation reverted to its pre-currency union status.

Rockoff (1974) argues that the discounts were not fluid enough to act as exchange rates in a manner that could have adjusted for shocks. In another article (1975a) he notes the potential for the idea, but states that it is unlikely the system functioned in such a manner. Rockoff, however, only looks at the discounts in a few intervals; later evidence (presented below) implies the system may have actually functioned somewhat like the one Sheridan has conjectured. In addition, Rockoff does not consider whether the system would have allowed independent monetary policy. The next section takes up this possibility.

3. Monetary Flexibility under the Antebellum System

3.1 Mechanics of the specie standard

Given the specie backing of all notes, the system operated in a manner similar to a gold standard, but that does not mean the state was unable to alter the money supply. Transport costs and disconnected markets along with notes and deposits that traded predominantly within their own state generated a system of loosely fixed exchange rates that allowed for semi-independent monetary policy, and one that seems more like a multiple currency area than a currency union. In any specie-standard system, the extent to which there is monetary flexibility depends on the way the specie standard is organized.

Domestic and foreign money supplies are linked in two ways under a gold or specie standard exchange rate system. First, if all countries create a link to gold, they are in a fixed exchange rate regime. How closely correlated their money supplies will be depends on how strictly they are tied to gold. Second, the market can force changes in the money supply if the exchange rate moves outside the gold points and arbitrage becomes profitable. In this instance, participants can convert money into gold or vice versa, move the gold to another location, and alter the supply of money in a specific country. This second channel largely depends on interest parity or expected exchange rate changes. The more disconnected the financial markets or unsophisticated the tools of arbitrage, the greater the possibility for uncorrelated money supplies.

When there is a common currency union, an individual state cannot change the local money supply as money can costlessly flow into other regions. Likewise, in a gold coin standard, when the entire circulating medium is gold, the state has no control over its money supply as the money supply is simply the volume of gold in the country. Even under a gold bullion standard, where paper money circulates, but it is backed one

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13 In a discussion of the Suffolk system, Mullineaux (1987) briefly considers the system as a floating rate system but at the bank, not state level, and he does not consider the macroeconomic consequences.
14 Rockoff (1974) p.144. In fairness to Rockoff he grants that “further research on this point is warranted.”
15 Rockoff (1975b) explicitly assumes that the money supply was completely elastic and demand determined. In doing so, he abstracts from the power of state regulators to alter the money supply via changes in bank laws.
16 See Eichengreen (1992) and Bordo and MacDonald (1997) for discussion of the latitude for monetary policy under the classical gold standard.
for one with gold, the state or central bank is not in a strong position to make changes in the money supply as changes in the supply of gold must automatically translate into changes in the supply of money.

We can use a simple price specie flow model to understand how different mechanics of the gold standard can generate different monetary flexibility. Let there be two states, \( A \) and \( B \), with separate economies governed by a simple quantity equation,

\[
MV = PY
\]

where \( M = \text{money}, \ V = \text{velocity}, \ P = \text{prices}, \) and \( Y = \text{GDP} \). If we think the only circulating medium is gold, then \( M_a = G_a \) and \( M_b = G_b \), where \( G_a + G_b = G_{\text{world}} \). From the quantity equation, if we normalize velocity to 1,

\[
G_a/P_a = Y_a
\]

Money demand is assumed to follow the standard equation:

\[
(M/P)^d = f(Y, R) \quad \text{or} \quad M^d = P f(Y,R)
\]

where demand increases in \( Y \) and decreases in \( R \). The net inflow of gold is equal to the balance of payments

\[
\Delta G = CA + Fin
\]

That is, gold inflows equal the amount of gold coming in due to net exports \((CA)\) plus the amount of gold coming in via financial flows \((Fin)\). In addition, the current account is assumed to be a function of the price level, and financial flows a function of interest rates. Thus:

\[
\Delta G = ca(P/P^*) + fin(R-R^*)
\]

where \( ca(P/P^*) \) is negative and \( fin(R-R^*) \) is a positive relationship.

Thus, if \( Y_a \) doubles while there is no growth in \( Y_b \) or world gold stocks, at first, we see from (2) that \( P_a \) must fall in half. This will increase the net exports of region \( A \) and generate a gold inflow. \( G_a \) will rise; \( G_b \) will fall; \( P_a \) and \( P_b \) will reach an equilibrium where \( CA = 0 \) for both countries and there are no more gold flows. In addition, we may assume that velocity is not constant and that the temporary excess demand for money before the adjustment will generate an increase in the interest rate to equilibrate demand and supply. This will lead to financial inflows so, some of the adjustment takes place through the price level and some through financial markets. Thus, the price level falls less than without financial inflows.

If there are notes backed by gold one for one, the issuing authority will have to immediately respond to changes in the gold stock. Fractional backing, though, opens more room to maneuver for the state. Under a proportional standard, the central bank maintains at least a minimal percentage of gold to back the currency in circulation (i.e. \( G/M > \alpha \)). Now, when gold is sold to the central bank, it is able to adjust holdings of domestic credit to set the money supply at a desired level. If it is close to the proportional requirement, there is little flexibility, but if the central bank has reserves above the required level, it can cushion the local money supply from movements generated by international transactions. In the above example, if state \( B \) had sufficient gold reserves, it could allow the ratio of gold to notes to fall rather than allowing the monetary stock to change in
response to its external deficit. In this way, the local and foreign money supplies can be de-linked by state action. If the financial markets are tightly linked, then the states will not be able to generate a wide interest rate differential without triggering offsetting financial flows which should force the money supplies to stay relatively consistent with one another.

Finally, we may consider the antebellum system. The issuing authority is not a governmental agency but private banks. States, though, could still affect the bank money volume. For state owned banks, the state had direct control over how many notes to issue or withdraw as specie reserves shifted. Even in other states, though, the state had power to alter bank money. First, charters generally controlled the capital and ratio of notes to capital and or notes to reserves. Thus, the state could change charters or issue more charters to change the supply of notes. Since reserve requirements were in the 10-33% range, issuing a new charter or increasing note-issuing capacity of existing banks had a strong multiplier effect. Furthermore, in free banking states, the backing of notes generally took the form of state bonds, rather than specie (though enough reserves of specie to continue redemption was required). The state could change which bonds were eligible for backing and thus change the note-issuing capacity of banks. Finally, with various taxation methods the states could alter the profitability of banks to either increase or decrease the capital dedicated to banks. Thus, the bank money in a state may respond endogenously to money demand as banks respond to the public’s willingness to hold bank money. States, though, could set an upper bound on notes and alter the supply of the domestically issued notes when that bound has been hit. The narrative evidence presented later provides examples of times when it appeared the upper bound on domestic notes was a binding constraint and states relaxed it in a deliberate attempt to increase the money supply.

In the model above, the state could change the $\alpha$ as well as change the amount of gold which is used in circulation as opposed to held as a fractional reserve. Now we can say that the circulating money supply:

$$M_a = N_a + G_{ac} \quad (6)$$

where $N_a$ is domestically issued notes and $G_{ac}$ is circulating specie in state A. The reserves to notes ratio is $a$,

$$G_{ar} / N_a = a. \quad (7)$$

The state has two levers, it can set a law that says $a \geq \alpha$, and it can set the legal limit for $G_{ar}$ (by setting the number of charters and the capital allowances of banks).\(^{17}\) Now, if $Y_a$ were to double, there are two scenarios. In the first case, if $a$ is above the limit $\alpha$, and/or $G_{ar}$ is below its limit, then banks can respond to an increase in money demand by increasing note issue. On the other hand, the volume of legal domestic notes may be at its maximum. In this case, if there is no state action, prices must fall until net exports bring in enough gold to stabilize the price level and equilibrate prices with other regions.\(^{18}\) Alternatively, the state can reduce the

\(^{17}\) Free bank states operate in a less controlled fashion. In these states, though, the authority had control over which bonds could be accepted and at what value they were accepted. This gave the state the same ability to alter the cap on notes that had been issued or at least to alter the profitability of note issue and encourage or discourage banks from engaging in note issue.

\(^{18}\) Again, changes in interest rates and subsequent financial flows should offset this partially.
reserve ratio or increase the level of $G_{ar}$ to allow an increase in notes such that the money supply increases to the extent necessary to offset the growth in the economy.

Thus, there is an opportunity for active independent monetary policy at the state level. Rather than let prices fall and interest rates rise to generate gold flows in the current and financial accounts, the state can increase the money supply to keep prices from falling and interest rates from rising. In many cases, it may be preferable for the state to increase bank money to accommodate the increase in money demand rather than wait for the adjustment. It is important to note that the opportunity for policy action is limited to situations where the binding cap on bank money has been hit or cases where a state may choose to lower the cap to make it binding. Fine-tuning an economy is not possible.

Thus far, the discussion has assumed foreign notes cannot circulate within another state; the next section discusses the fact that out of state notes did circulate some at varying discounts to par. More realistically, if the money supply is far below money demand, as prices fall and gold flows in, some foreign notes will come in as well, trading at a discount. This increases transaction costs and that alone may have been an incentive for the states to change the local money supply.

In addition, the discussion has omitted the exchange rate effect on the current account. This is fair because while changes in discounts can in theory have an effect on the trade balance of a state, it is unlikely because large inter-regional transactions were often carried out with bills of exchange or bank drafts.\footnote{See Bodenhorn (1992) for discussion of bills of exchange and bank drafts.} Further, if the discount on a state’s notes rises due to increased risk of failure, then the risk that the notes will become worthless should offset the increased discount.

If financial markets were tightly integrated, it is possible that a change that weakens the type of backing of notes would trigger higher discounts and would generate redemption of notes for specie which would reverse the money supply changes. However, classic currency speculation was difficult.\footnote{We do not see a typical open-economy interest parity condition because the unit of account for all bank accounts or investments is the same, dollars payable in specie. Investors would not move money to a state based on expectations of an appreciation because there is no possible appreciation. Wherever the investment is made, notes will trade at par both when the investment is made and when it is redeemed. Thus, expected exchange rate changes do not enter into the financial flow equations.} There were no asset markets denominated in the different state currencies making futures or forwards impossible as well as making borrowing in one currency to invest in another impossible. Thus it is difficult for expectations about small discount changes to trigger changes in the money supply.\footnote{It is important to note that simply by changing the volume of notes, states do not necessarily change the discount on the notes from its state. As long as there is sufficient demand for the notes and as long as the increase does not substantially increase the risk of default by the banks, the discount on the notes will continue to be the same as that discount represents the value of a note versus gold, not some sort of relative price between two currencies.}

Interest rate differentials, though, could also trigger investment flows which would reverse or close the differentials. If regional interest rates are tied closely together with an integrated financial market and the exchange rate is fixed, then there is no opportunity for local monetary policy. In this case, only during the suspensions of the late 1830’s and early 1840’s and then again in 1857 would there be any room for autonomy. The United States, though, was not a fully integrated market in the antebellum period.
Evidence in Rockoff and Bodenhorn (1992), and Bodenhorn (1992, 2000) shows that there was a fairly well integrated market in the Northeast and Mid-Atlantic regions, but the rest of the country was only partially integrated, and the frontier seemed somewhat disconnected. The range of the spread over New York for commercial paper was 200 to 400 basis points for individual states in the South, and commercial paper rates in cities like New Orleans, Charleston, and Cincinnati were less correlated than those in New York, Boston, and Philadelphia. Bodenhorn (2000) discusses the relatively high arbitrage costs across cities that allowed these interest rate differentials to appear and sometimes persist for a number of years. These costs were reasonably low from Boston or Philadelphia to New York after 1844 (less than a dollar on 100$), but the rates went as high as 5-8$ in other states and stayed over 2$ even into the late 1850s. Such costs on arbitrage as well as the costs of moving specie (or the risk in purchasing bank notes and using them to transport funds) allowed interest rate differentials. The possibility of such differentials means that states could change the money supply and interest rates through active policy. The financial markets were not completely separate, but were distinct enough that loosely fixed exchange rates did not prevent policy autonomy.

3.2 Variability of discounts on notes

Lastly, it should be noted that due to high transport and arbitrage costs, the gold points should be somewhat wide in this era, especially from the East Coast to the Old Northwest or New South. This allowed exchange rate changes greater than the 1% float of the classical gold standard. In addition, for 2-4 years depending on the state in the late 1830s and in 1857-8, the banks in many states had suspended gold redemption. This means that the exchange rates were not fixed at the time. The wide fluctuations in the discounts during the suspensions may have helped with the adjustment to these shocks by effectively depreciating certain regions by almost 20%. Rockoff (1974, 1975a) notes that the devaluations during the suspensions may have adjusted for changes in the competitive positions of different regions preventing some dislocation and unemployment. In addition, an analysis of the discounts on the notes of different states shows that they are more flexible than previous historical accounts may have implied.

Examining the monthly discount data from the Van Court’s Bank Note Reporter from 1839-58 it is clear discounts on some states did vary over time. For example, the modal discount on notes from Indiana varied from roughly 4% in 1839 to 10% in 1842 back down to roughly 1% for much of the next decade and then to 20% in 1855 when problems with the free bank law in the state led to numerous bank failures. Many states were quite stable over the entire period, but a number joined Indiana in fluctuating from a very low discount, which simply accounted for distance from Philadelphia, to higher discounts that varied over time. Looking at a graph of the modal discount in all states demonstrates that there is a good amount of volatility (see figure 1). Some states’ discounts go above 25% when banks are defunct or in suspension. The focus is kept on the lower discount states which still show some variation over time. Figure 2 shows that while the

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22 Van Court’s reports the discount in Philadelphia for the notes of all banks across the country I thank Gary Gorton and Warren Weber for providing me with the data as well as some analysis, such as Gorton (1989). The data is also now available on the website of the Minneapolis Federal Reserve.
median state kept a relatively low discount, except for in 1857, the top quartile had more variation and the average shows far more volatility as a few states move up and down considerably.

As the figures show, much of the volatility takes place in the first few years of the sample as the banking panics of the late 1830s and the subsequent suspensions made the value of bank notes unstable. In addition, the panic of 1857 and subsequent suspensions had a similar effect on volatility. Over the entire sample, more than half the states had a range of discounts greater than 10 percentage points. Even during the period of calm from 1843-56, 7 out of 29 states had ranges greater than 9 percentage points (see table 1).23

Beyond minor fluctuations, there were what could be called depreciation episodes, when a state’s modal discount is 5 points or more above its own median discount for the entire period and 5 points or more above the median of all states’ discounts for a given month. Using this criteria, there were roughly thirty-two episodes where a states’ bank notes experienced a depreciation for one or more months. A total of 18 states out of the 29 in the sample were affected. The bulk of these episodes occurred during the two broadly defined panic periods 1839-42 and 1857-8, but some occurred in non crisis years.24 These depreciations do not represent intentional exchange rate policy, but they do show that the discounts were not constant.

With the exception of the suspensions, these depreciations were different from today’s depreciations. As with modern currencies, there was frequently an increase in money supply in the years prior to the depreciation. However, unlike a depreciation which reprices a currency at a new more sustainable level, a large depreciation of a state’s bank notes will force banks out of business and bank notes out of circulation because the notes will all be returned for specie (at a profit equal to the discount). The fact that the notes are redeemable for gold places a limit on how high a discount can get and how long it can stay far above par. In cases like Mississippi and Illinois, the discounts stayed high persistently because those states had repudiated banks and the notes were claims on defunct or bankrupt institutions. Thus, depreciations were knife-edged; more than a small amount could lead redemptions which reduced notes in circulation.

Combining these factors that allowed differential bank money growth, some limited flexibility in exchange rates, and room for state authorities to affect equilibrium money holdings shows that there was in fact room for states to engage in independent monetary policy at the time. The next section examines the note market in more detail to show that notes from a state are analogous to currencies.

4. The functioning of the American monetary system

For states to engage in monetary policy, they must not only be able to adjust state level monetary aggregates. Those aggregates mush have some meaning. In addition, to consider states’ notes analogous to state currencies, the notes must be priced coherently and similarly within states. If discounts on notes within a state were not consistent, then it would appear that each state had multiple currencies within its border and weaken the interpretation of bank money as separate currencies.

23 The standard deviation of the discount over time also demonstrates that there was a good degree of volatility in the discounts on bank notes. The unweighted average of the standard deviation of the monthly modal discount for individual states over time is 3.7 percentage points. Half the states have a standard deviation above 2.5 and six of them above 5.
4.1 Bank note pricing: The first evidence that the bank notes were priced in a way reflecting their value is that market prices existed and there was a secondary market. Numerous bank note reporters existed which were published monthly and contained the discount on nearly every note issued in the entire country. One purpose of the reporters was to aid in the detection of counterfeits, but another was to keep merchants abreast on the changing value of different notes.25

Previous studies, notably those of Gary Gorton, have examined the pricing structure of this market.26 Gorton (1991, 1999) uses a pricing model to value notes and finds that the discounts as listed in monthly note reporters accurately priced risk. He finds that discounts took into account the distance from the bank of issue, as to receive the gold which backs notes, note holders had to present the note at the bank itself. Because of differences in information and transport costs, the discounts were different in different states. Distance was not the only factor in price, though; other factors affecting risk also had effects on the prices. These factors, such as regulations, were often constant within a given state. 27

Given that the discounts on notes were viable market prices, the question becomes whether the state of issue mattered or simply the bank. There was some variation within states due to higher discounts on new banks and on those that were in liquidation but were still listed in the reporters. In general, though, there is anecdotal, theoretical, and statistical data to support the hypothesis that bank notes from one state traded at the same discount.

Contemporary accounts of the bank note market tend to refer to notes from a state rather than from a bank. For example, an Iowa banker explained in 1856 that notes from East Pennsylvania, New England and New York were “choice par funds” and notes from Ohio, Indiana, Missouri, Virginia, Maryland, and Kentucky were some of the best notes, while those from Illinois and Wisconsin were not trusted.28 The state of issue, not the bank of issue was important. The exception of course, is the case of defunct banks whose notes are virtually worthless.

It is logical that the notes from the same state would have a similar value. Notes from the same state are from the same distance, and are regulated by the same rules. Furthermore, in many of the free bank states, banks did not create notes themselves. They would deposit the required bonds with the state bank comptroller and then he would give the bank a standardized set of notes. Thus, the notes from a state would look the same

24 Alabama experienced depreciations in 1843-4, Indiana in 1853-4, Michigan in 1845, and Wisconsin in 1854. Illinois and Mississippi in the 1840’s due to suspensions and outlawing banks. 
25 see Dillistan (1949) and Gorton (1989) for discussion.
26 Gorton tests the possible efficiency of private money contracts. His results also show, though, that the bank note market functioned in a manner that took into account the risk of bank failure and that it varied by state, depending on the state regulations. In another study, Gorton (1996) shows that new banks had a higher discount until they had established a sound reputation.
27 The logical discount on a note is the cost of travel to the issuing bank plus the risk of no redemption by the time the note has been presented for redemption. On the other hand, due to differences on the intended use of the note, purchasers may be willing to pay more or less. Merchants already traveling to the destination of the bank of issue do not have to add on the cost of travel. The exchange rate between notes of two states will be quite different depending on the location of the transaction, as in different locations, the distance and information costs will be different, and that there is some room for the prices on the notes to float up and down depending on supply and the demand across different groups of purchasers.
and be stamped that they were regulated by the same agency. Gorton (1996, 1999) formalized this logic and empirically confirmed that the majority of notes issued in one state had the same discount at any given location. Frequently, banks that do not trade at the mode are in default with discounts of 75% or more and are just listed for completeness, and Gorton (1996) confirms that the average non-modal discount is quite high and likely represents defunct banks. Gorton argues that at home, a bank’s notes traded at par because people could easily redeem notes for specie. Furthermore, notes from one area must all involve similar risk, for if one were more risky, it would be redeemed quickly and put out of circulation; similar risk helped generate similar discounts. In addition, the likelihood of bank failure should vary by state because regulation varied by state. Gorton (1999) comments that discounts were “not solely a function of distance from Philadelphia” and also finds that after controlling for distance, discounts on banks in branch systems, in states with insurance systems, or members of the Suffolk system all have lower discount volatility than one might expect.

Examining the discount on each bank in a given state in every month of the sample, I calculate the percentage that trade at the mode. The results vary from 45% to 100% with an unweighted average of 82% and a median of 86%. Many of the states that had unusually low modal percentages (such as Maryland with 45%) seem to have two classes of banks that trade in close relation and with very similar, but not quite identical, discounts; often these were country vs. city banks. In Maryland’s case, over 80% of the banks are generally at the mode or this secondary discount close to the mode.

While Gorton, and the Van Court’s data, show that state of issue and state factors affect discounts, we also note that we can see more than distance having an effect in that there are often wide ranges within the regions. The ranges of discounts within New England and the Mid-Atlantic were tight (the spread within each region never exceeded 1.25% during non-panic times of 1843-56), but the other regions had wide ranges. In the Old South, the largest range was 20% (5% in non-crisis years) and averaged 3.4%. In the New South, the range reached 60% (28% in the placid era) and averaged 8%. Finally, in the Old Northwest, the range reached 63% even in the non-crisis era and averaged 6%. The fact that we see these broad regional ranges helps confirm it is not simply distance but state of issue that affects the discount on a note.

4.2 Bank money and money supply

For changes in state bank money to be considered money supply changes, the volume of notes plus deposits needed to be an important component of a state’s money supply. While the use of deposits was most

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30 The fact that these modal percentages are not 100% suggests that the market was discriminating across notes within a state, and yet the percentages are usually quite high, suggesting most notes from a state were judged to be the same.
31 Reserve requirements varied by state from 12 to 33%, Hammond (1957) p.690; also, states which required bonds be deposited with the state had different rules regarding what was an acceptable bond on deposit. Rockoff (1975a) appendix lists all the bond requirements for free bank laws.
32 The “modal percentage” is one of the statistics Gorton focuses on in Gorton (1989) and Gorton (1996) though none of his published papers contain a summary of these statistics for all states.
33 New England: Maine, Massachusetts, New Hampshire, Vermont, Connecticut, Rhode Island; Mid-Atlantic: Delaware, Maryland, New Jersey, New York, Pennsylvania; Old South: Georgia, North Carolina, South Carolina, and Virginia; New South: Alabama, Kentucky, Louisiana, Missouri, Tennessee; Old Northwest: Indiana, Michigan, Ohio, Wisconsin.
likely restricted to within states given that out of state checks were likely not accepted, bank notes were not entirely contained within the borders of the state from which they were issued. There was no ban on using notes from a different state as there is on using alternate currencies in most countries. There is frequent mention in accounts of the day of bank notes circulating outside their state of issue. Generally, these discussions related to the concern of legislators or bankers regarding the encroachment of “foreign” money into their state. This discussion, though, is often limited to notes from nearby states. An extreme example is that states which banned banking entirely found that notes from other states would partially fill the void that an absence of local bank notes left. When Wisconsin had no banks of issue, its currency came from nearby states as well as illegal private banks (Anderson (1954)). These were exceptions, though, not the rule.

The pricing of the bank notes would tend to bring them back to their origin. A note traded at a higher discount the larger the transport cost to return it to its origin. This left incentives for note traders, who could use scale economies, to bring them back toward their local state and make a profit on the note. Gorton (1991) comments that given the decline in price, and the decrease in the amount of information regarding a bank’s quality as the distance to the local bank grew, there would be a limit on the range of the note. Nathan Appleton (1841) comments that bank notes are not actual currency, but merely a promise to pay specie. Since they are more convenient than specie, though, people tended to use them. He argued that bank notes would always stay within range of where they can be redeemed for that is the entire basis of their worth.

We see from the descriptions of the time, that when a traveler moved from state to state, he or she had to acquire local money. A merchant recalled, “A person starting from New Orleans to New York would have to change his currency several time in order to get funds that would be taken for fares or hotel bills,” (Dillistin (1949), p.46). An often cited passage from a letter to John C. Calhoun describes the way in which different currencies were required in different states “Started from Virginia with Virginia money; reached this river; exchanged $20 Virginia notes for shinplasters and a 3$ note on the Bank of West Union; paid away the $3 for breakfast; reached Tennessee; received a $100 Tennessee note; went back to Kentucky; forced there to exchange the Tennessee note for $88 of Kentucky money…” the passage continues through many more transactions required just to travel around the South (Starnes (1931) p.96). Merchants could establish less costly alternatives, but the passage shows the prevalence of local money.

Finally, banks themselves tried to force money home. Extensive bank notes from “foreign” sources would erode the demand for local bank notes. Banks thus would sometimes try to gather up notes, take them to their source, and demand specie (Anderson (1954), Helderman (1967)). The point should not be overstated though, and the caveat should remain that notes did travel the entire country. A state’s bank note circulation did, however, comprise of a major portion of a state’s money supply and thus changes to the circulation of a state would change that state’s money supply. We next turn to examine these fluctuations.

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35 Bodenhorn (2000) comments that foreign notes and coins would never adequately fill the demand for a circulating medium in prohibitionist states.
36 Rousseau (2003) states that note circulations were primarily local, and Bodenhorn (2000) and Rockoff (1974) among many others use locally issued bank notes and deposits to represent the bank money available in a state.
5. Evidence from bank note circulation and deposit data

5.1 Bank money variation across states

In the next two sections I use monetary data and narrative evidence to demonstrate independent money supply movements across states. The data are taken from the 1876 Annual Report of the Comptroller of the Currency. They are annual data on state bank note circulation and deposits by state from 1834-63. Data for 1834-7 and 1861-3 are somewhat incomplete and overlap with the activity of the Second bank of the United States on the one hand and the disruptions of the Civil War on the other. Thus, the data presented are from 1838-60. I use five regions based on the groupings used by Knox in the 1876 report (described above in note 33). Bank note circulation and deposit data show that the different regions moved fairly similarly over time. All the regions are correlated with the national average at a rate above .79 (table 2 presents correlations). Individual region on region correlations are also high, with only one falling below .76, at .65. The average of the 10 pairings is .84. Since the different regions move together, it does not appear to be different regional economic circumstances driving differences across states. Thus, when we find individual states do not follow the national average or are not correlated with one another, we cannot attribute this to the disparate population and economic growth in different regions. Instead, we see a situation where the country’s regions had fairly similar money supply processes, and yet individual states were often quite different from the overall nation.

These statistics exclude the obvious examples of different monetary patterns, those cases where states banned banks or bank note issue. Florida, Mississippi, and Arkansas had no banks or no bank notes for much of the sample. The state legislatures effectively limited their money supply to specie and whatever notes from other states found their way into the area. Given their dramatic declines in the early 1840s when the notes were banned, these states were clearly uncorrelated with the rest of the country. I excluded them from any of the correlation statistics as they have data for 10 or fewer years out of my sample. Illinois and Wisconsin do not have deposit and note circulation for many years, and thus they are not included in the regional totals (when they appear and disappear, that would generate specious movements in the regional total), but they are included in state by state correlations as they do have more than 10 years worth of data in our sample.

Looking at correlations of state bank money supplies with the national and regional totals is an informative way of seeing that some states had different money supply processes. The average correlation of

37 There is one minor change to the data. The 1876 report data for national totals leaves 1852 blank and lists an amount less than the sum of the states listed for 1853. The 1896 (and subsequent reports) simply interpolates the values from 1851-4 to fill in for both 1852 and 1853. This ignores that many states saw a decline in 1853. I use the sum of the individual state totals for both 1852 and 1853 using interpolations for the small number of states that were blank in that year. In practice, the 1876, 1896, and my series are all correlated at very high levels and the choice has no significant impact on the results. For individual states, interpolations are only used to create regional totals. All state to state correlations use actual data.

38 The data presented is for bank money as a whole: bank note circulation plus deposits. Some, e.g. Greene (1972) p.105, are concerned that deposits were not readily checkable in the way we think of them today and thus not part of the money supply, but by and large, including deposits is standard for the era. See Friedman and Schwartz (1970) for extensive discussion. The results are not significantly changed if one instead uses simply bank note circulation (correlations are slightly lower if only notes are used). Notes and deposits show a correlation of .92 nationally over time and the median state correlation is .87, thus it is not surprising the two definitions yield similar results.
individual state bank money with national bank money was .84 (again, not including long-term prohibition states). Seventeen out of the twenty-five states were correlated with the national total at above .85, but four were below .7 (see table 1). Once again, this is not simply an issue of regional differences; we see that the average state is correlated with its own region (minus its own notes) at .79, but many are quite low including six below .61 (see table 1). Some states’ money supplies are quite different from the nation’s or even their own region’s, implying some freedom for the money supplies of different states to move independently. As noted above, the Suffolk System acted as a constraint on bank notes in New England. We see that New England states are more correlated with their own region than in any other region. No New England state is below .90, and six out of the eleven highest correlations are the six New England states.

We can most clearly see the differences in the ways the bank money supplies of various states moved when we examine state by state correlations. On average, states’ money supplies are correlated at a rate of .70. The New England states are correlated at a rate of .90 with one another, again showing the power of the Suffolk System. The Mid Atlantic are also high, also .90. The Old South was at .80, the states of the New South were only correlated with one another at .65, and the Old Northwest was only correlated at .33. In addition, despite high cross-regional correlations, individual state by state correlations across regions are lower than those within regions. The average correlation of each state with states outside its region is .69. When broken down by region, that average ranges from .56-.75 and is lower than the correlation with states inside the region (see table 2, the exception is the Old Northwest where so many states show unusual money supply processes that none are highly correlated with one another).

While many neighboring states in the New England and Mid-Atlantic regions are highly correlated, states in other regions that one might assume had similar economic circumstances often had different money supply processes. For example, neighbors Indiana and Illinois are only correlated at .50; Ohio and Indiana at .55; Alabama and Tennessee at .31; Alabama and Georgia at .51; Michigan and Illinois at -.12. Even in the more established territories, North and South Carolina were only correlated at .76; and Delaware and New Jersey at .76. These examples are not meant to say that no states moved together. Much of the eastern seaboard was highly correlated. Many states of the New South and Old Northwest, though, display quite different money supply processes.

Population data (from Census (1965)) are available only by decade, making it difficult to track patterns in the money supplies per capita by state over time. In addition, even if all states had similar bank money per capita rates over time, this may be caused by active management of money intended to keep up with changes in the population. Still, we can combine the money and population data in 1840, 1850, and 1860 to get another view of the history of money in the era (see table 3). One of the more striking things about the statistics is the range in both the volume of money per capita and the way that ratio changed over the period. In 1850, the more commercially oriented states like Massachusetts or Louisiana have notes per capita in the 25-30$ range while many states have money per capita in the 5-7$ range. Were money supply run in the same fashion across the country, we might expect states with lower money per capita to increase slightly faster (as we see in the Suffolk states). The Suffolk system members increased money on average of 14$ per capita, the
average growth in each state is 150%. The more rural states, though, increased notably faster; Maine, New Hampshire, and Vermont increased 160-220% while Rhode Island and Massachusetts increased 75-90%. This pattern does not hold up nation-wide. Few states increased with the speed of the Suffolk system and no other region grew in such a consistent fashion. In the Mid-Atlantic region, New York and New Jersey grew 150-210%, but the other states grew 30-40%. In the Old South, South Carolina started with more money per capita and grew faster. In the New South, Alabama shrank its bank money per capita 6$, while Kentucky and Missouri’s increased 5-10$. Finally, in the Old Northwest Wisconsin grew 6$ per capita, a 150% increase, while no other state grew more than 1$ (or 18%). Once again, we see that the different states had very different experiences, evidence that money supplies were moving independently.39

5.2 Comparison with other eras

While the data can show whether some states are more like the national or regional totals than others, we need an outside standard to help interpret the results. To see if these correlation levels are consistent with a fixed rate regime, we can compare them to correlations among nations on the classical gold standard. If the redemption option was truly a constraint that made the relationship of state bank notes similar or tighter than a fixed exchange rate gold standard, we might expect to see similar correlation levels among the money supplies.40 When using M2 data for thirteen countries from 1880-1910, the average correlation nation vs. nation is .84 with gold standard countries having a correlation of .90.41 This is considerably higher than for individual states in the United States where the figure was .70, and quite similar to the Suffolk area where correlations were .90 state to state. We see that the antebellum states have money supply processes which appear more independent than the nations on the classical Gold Standard. The correlations are closer to those of non-gold standard countries with all other countries (the average correlation is .71).42

6. Evidence from the states

In this section I combine narrative evidence with data on discounts and money supplies to show that states were aware of their power over the money supply and sometimes took action accordingly. I rely on a number of broad surveys (Knox, Hepburn, Schweikert, Rockoff) as well individual state by state manuscripts.43 To organize the material, I arrange the states into five banking system categories (the Suffolk

39 Bodenhorn (2000) uses synthetic state level GDP to test money/GDP as well. As it turns out, the correlation of money per capita and money/GDP is extremely high (.97 in 1840, .90 in 1850, and .96 in 1860, and the correlation of the change over time is .91). Thus, adding in population or real economic activity considerations presents a similar picture. 40 I use Weber’s data on M2 for 13 nations and M0 for 10 nations from 1880-1910 (Available on Warren Weber’s website). The nations with data for both are Brazil, Chile, Italy, Germany, Japan, The Netherlands, Norway, Spain, The United Kingdom, and The United States. Canada, Portugal, and Sweden have only M2 data. Of those countries, Brazil, Chile, and Spain were not on the Gold Standard. Portugal’s membership was not consistent after 1891, (see Rodriguez (1997)); it is possible that Portugal should not be included in the Gold Standard group. 41 Portugal is the only country that does not have high correlations. All other Gold Standard countries have average correlations with other Gold Standard nations above .86; Portugal has an average of .67. When Portugal is not included, the Gold Standard average is .95. 42 To look at the banknote circulation alone, we can compare notes in the Antebellum era (state to state correlation of .61) with M0 minus specie in the Gold Standard era, average correlation of .80 for Gold Standard countries. 43 Romer and Romer (1989) use a standardized source to untangle exogenous policy shifts in order to check the effects of monetary policy. We lack a standardized source to uncover exogenous changes in the same way, but instead try to find
system, bank stability focused states, state owned banks, radical policy change states, and prohibitionists) and discuss the extent of monetary policy activity and key examples in each category. I argue all states had, at a minimum, power to affect their money supply. In addition, there is evidence that most were aware of this power, and some took actions which did change the money supply, though not all were intentional. Not all the actions were necessarily deliberate attempts to change money and many may have been more geared at increasing credit (Bodenhorn 2003). I will highlight those examples which appear to have been attempts to change the money supply.

First we can look at the extent to which different state level policies are correlated with higher money growth by looking at panel evidence. Rockoff (1974) looks at the impact of free banking on money holdings in 1860 and finds it is higher in “good” free banking states and lower in states that had had wildcatting. Looking at annual data from 1838-59, if one regresses money growth on dummies for free banking, state-owned banks, and Suffolk system membership, only the Suffolk system dummy generates a significant coefficient (positive in its case) with or without including national money growth (results not shown to save space). If one adds markers for what Rockoff declares are “dead free bank laws” or wildcat episodes (Rockoff 1975a) the wildcat states show significantly higher growth for the years of the wildcatting, but other free bank dummies are not different from zero. Given the broad descriptions and lack of covariates at the annual frequency, the insignificant results are not surprising. Furthermore, the paper has not contended that broad long run policies will affect the money supply but that in certain instances the state may be able to change policies to increase or decrease the money supply. Below, we turn to more specific examples to see if changes in policy appear to have had an affect on money supplies.

6.1 Suffolk (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)

In the Suffolk system bank law mattered less than in other areas because of the private constraint on banks. It is clear that the system maintained both stable discounts and correlated circulation across the six states. Despite the fact that direct monetary control was exercised by private agents, state legislators were aware of their power and in some ways supported the Suffolk system. This support ranged from comments from commissioners which supported the system; to overt policy in Vermont which officially recognized the Suffolk system, taxed non-members, and had different reserve requirements for members and non-members (Knox (1900), Helderman (1967)); to the refusal of Massachusetts to charter a competitor to Suffolk until 1858 (Bodenhorn (2002)); to the fact that free bank laws were tight and not used (Vermont, Massachusetts) (Dowd (1992), Rockoff (1975a)). A notable example of policy affecting money supply is the 1852 free bank law in Connecticut. There were 38 to 45 banks from 1838 to 1851, but, suddenly, twelve new banks appeared in 1852. In addition, bank note circulation jumped from 4.9 million dollars to 10.2 million from 1850 to 1853.

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44 Rockoff sees wildcatting states as negative because he is looking after the wildcatting when money has collapsed rather than during the episode.
45 Rhode Island’s membership was more loose as it operated through the Merchants Bank (Redlich (1968)), and it was the only state to ever have a depreciation (in 1857).
while deposits grew from 2.2 million to 3.5. The law was repealed in 1855, and the circulation fell from 11.2 million in 1854 down to 6.9 million in 1855 while the deposits dropped from 3.9 to 3.5 million.

6.2 Bank-focused states (Kentucky, Louisiana, Maryland, New Jersey, New York, and Pennsylvania)

Many of the Eastern states depended heavily on commerce. Thus, a stable banking system was crucial to their economies. In these states, it appears that banking law was written with this and a stable currency in mind. The states included in this group are highly correlated with the national money supply, and discounts always remained low, with the average being just over 1%. The exceptions were Kentucky, which experienced a very high discount in 1858 following the panic of 1857, and Louisiana, which had very high discounts in 1842 when trying to re-establish its banking system following the panics in the late 1830s.

While these states did not generally try to alter laws to create specific movements in the money supply, three types of examples of monetary policy do arise. The first is that states which had tight banking policy had low monetary growth. Pennsylvania is regarded as a conservative banking state (Knox (1900), Bodenhorn (2003)), and despite being a highly developed part of the country, it had less bank money per capita than the national average and less than any Mid-Atlantic or New England state other than Maine. It was also known to have unusually high rates of return for banks (Rockoff (1975a)).

The second set of examples is that some states passed laws for bank related reasons that had large impacts on their money supplies. New York passed its law for political economy reasons, but concern over excessive note issue caused adjustments in 1840 (Redlich (1968)). New Jersey in general was a chartered state which followed the patterns of New York and the nation in general. It does not appear to have tried active monetary policy, but a subtle change in its laws shows the way bank laws can quickly change the money supply. In 1850-1, along with many other states, New Jersey added free banking to its system. In 1852, it adjoined Virginia bonds to the list of those eligible for backing notes. This became significant in 1853 when Virginia issued a great deal of debt. From 1852-4 (there are no circulation data for 1853) the state total went up 1.8 million dollars (57%, compared to 19% in New York), and deposits rose 46% compared to 34% in New York. This is a typical example of “wildcatting” where banks were set up to issue notes using depreciated bonds as backing and then fold. After this wildcatting, the legislature went back to a strictly chartered system.

The third example is Louisiana. In 1842, it passed a bank law which is generally praised by historians but which was not geared to provide a growing money supply, and in 1845, new banks were banned by anti-bank factions. Many supporting the 1842 law did so because they thought it would restrain money and force prices down (Greene (1972)). By 1850, it was clear that banking had been restricted too tightly and by 1853, even anti-bank Democrats shifted support to a free banking bill because such a tight prohibition on banks had left the state with insufficient currency and bank services (Green (1972)). From 1845 until 1852, the year before the new law, bank money declined 1% while it rose 62% across the country. In 1852, bank money had declined 22%.

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46 The motive for the addition of Virginia bonds is unclear. Rockoff (1975a) states “We have not been able to fathom the motive for this amendment” (p.102). Further research by this author has not illuminated the subject either.

47 Discount data shows that at least 4 of the banks set up in 1852 had very high discounts within 3 years.
fallen to 10.5 million, but over the next two years, it increased to 18.7 million and grew to 22.5 million by 1857. This surge follows money supply ranging from 6 million to 14 million over the previous 9 years. The increase of 117% over five years far exceeded the 55% increase nationwide. This was clear intent to increase money through bank law changes that generated a money supply increase distinct from the overall nation’s.

6.3 States with State-owned Banks (Alabama, Delaware, Georgia, Missouri, North Carolina, South Carolina, Tennessee, and Virginia)

Many states, had state-funded and to some degree, state-run, banks which had a varying degree of control over the banking system in the state. Since note-issue and the volume of loans extended were decisions in part made by an arm of the state, this gave the state direct control over the bank money of the state. Not all states aggressively pursued this potential, more often treating the bank as a development bank aimed at funding projects and businesses, but the power remained nonetheless. As these states were spread across regions, their monetary and discount histories are varied. In part, they differ, because states treated their state banks differently. While some established sound banking and simply used a branch banking system to do it, others were interested in the revenue producing aspect of state banks.

In South Carolina, there was a state bank which operated alongside chartered banks. The legislature saw the maintenance of a currency as its responsibility, but in both South and North Carolina, debates generally centered on issues of private versus state banking. In Georgia, and Alabama the focus of the state banks and debates over them seemed to be more the way in which the banks affected the state’s finances or private versus public banking debates as opposed to actions which affected the bank note circulation. But, the increase in note issue and subsequent banking problems caused broad fluctuations in their circulations and currencies (Schweikert (1987)). Delaware’s bank’s notes comprised 50% of the circulation of the state (Knox, (1900)), giving the state a great deal of power, but there is no evidence it tried to use it. In Missouri, in 1857, a general banking (free banking) law was passed which according to Knox (1900), loosened monetary conditions and eased the complaints of St. Louis businessmen and augmented the state bank.48

There are a number of examples of the impact states could have on their circulation and deliberate policy choices. In 1847, the Governor of Tennessee argued against closing the state bank because it had been successful in providing a sound and safe circulating medium, and when branches were being liquidated, the Governor argued against the closings because the bank “furnished a large part of the circulating medium”. On the other side, some wanted to close the bank to specifically rid the state of paper money, and in 1859 the Governor argued the bank had issued too much currency and he suggested a set of restrictions (Campbell (1932)). This did not represent taking monetary action as much as recognizing how state actions could change the money supply of the state.

In Virginia the state seemed to respond to monetary conditions on a number of occasions. In 1837, the General Assembly decided that there was an excessive demand for credit and passed a general bank law to expedite the chartering process and another to increase the capital allowances on charters already in existence.

48 A jump in bank notes is not evident, but it may have been overwhelmed by the panic of 1857 which caused a reduction in bank notes as people tried to redeem them for specie.
with the state itself providing half of the capital.\footnote{It is difficult to measure the impact of this change given the panics that affected the nation immediately afterwards, but over the next five years, bank money fell 28% as opposed to a drop of 47% nationwide.} In the early 1850’s, there was “an insistent demand for more money than was in circulation” according to Starnes’ reading of Bankers Magazine, and in 1850-1, Virginia allowed small notes to be issued and passed a free bank law (Starnes (1931)). From 1851 to 1853, Virginia saw an increase in bank money of 15% compared to a 28% drop in the rest of the Old South.

6.4 Radical Change States (Illinois, Indiana, Michigan, Ohio, and Wisconsin)

While the banking systems of many of the Eastern and Old South states were well-established by the time the Second Bank of the US expired, for frontier states, banking was an open question. Some elected to eliminate banking altogether, others tried a variety of systems. Since commerce and industry were just beginning, the banks had two main purposes, fund agriculture, and provide a circulating medium for the state. As such, money supply considerations were often crucial when these states constructed their banking system.

Ohio provides another example of changes in bank laws which altered the money supply. As Ohio was first developing, the Governor of the territory said a state bank was needed to provide a uniform currency, and this was frequently echoed. On the other hand, many were in favor of “constitutional money” that is, only gold and silver, and wanted to limit banks. In a report that provides clear evidence of the contemporary understanding of both the power of the state over money and its effects, the minority report at the convention argued “that the prohibition of paper money would fall most heavily on the debtor classes by price depression,” (Helderman (1931)). A state bank was organized in 1845 (Knox (1900)). As the state’s economy boomed, so did bank money; from 1845 to 1851, bank money increased over 500% compared with 58% in the nation. A free bank law passed in 1851, but the Democratic constitution which cut off new banks went into effect that same year. Thus, no new banks formed and the money supply stagnated. While the rest of the country expanded bank money 46% from 1851-6, Ohio increased only 14%. Finally, in 1856, new banks were allowed again. When arguing for a change in the bank law in 1856, the governor explicitly linked the question to currency and also hoped the law would lower interest rates (Shade (1972)).\footnote{In part because of these changes, Ohio has a different money supply process than the nation (correlated at .65) and its own region (correlated at .61).}

Indiana provides a clear demonstration of the impact of law changes on circulation. In the 1830s, the Second bank of the United States supplied most of the Indiana’s currency, and fears that the closing of the bank would lead to a money supply drop and interest rate increases helped spur the opening of the state bank (Shade (1972)). Low note growth helped spur a desire for free banking. The free banking law was passed in 1853, and the money supply exploded. Indiana bonds were accepted at par for backing of notes, but they cost less than that, and this led to wildcatting. Bankers could buy bonds, get notes and distribute them, and have already made a profit (Rockoff (1975a)). While there was a nationwide boom in money from 1853-4, (a 22% increase), there was an even larger jump in Indiana where money increased 88%. As discussed above, Indiana notes depreciated as not all were able to be redeemed, and by 1855, the state took action and passed a
“currency reform” reducing the value at which bonds were accepted. From 1855-6, money in Indiana fell 38%, the only drop in the region and compared to an 8% national increase.

Perhaps the best known example of wildcatting was in Michigan. The free bank law in 1837 was not designed carefully enough, and the suspensions in the panic made it even easier to issue notes without fear of redemption. This law was contested by some because they feared its “inflationary character,” while Whigs supported it arguing “only adequate currency could revive the economy” (Shade (1972)). A legislator recalled, “The public seemed imbued with the idea that to relieve them from the galling burden of indebtedness, and to restore activity and prosperity to the business world, nothing was needed but extensive bank issues,” (Shade (1972)). As with many other examples, this demonstrates the public’s and policymakers’ belief that a change in bank money would matter locally. After the wildcatting, the system collapsed leaving the state with little money. An 1840 Whig press release complained of lack of currency, and they called for a “currency bill” the intent of which was to “allow the farmer to sell his produce at a fair price,” (Shade (1972)). Again, not an example of organized policy, but evidence that the laws affected bank money and people were aware of this.

After the panics, Illinois banned all banks in a wave of anti-paper money fervor. From 1844-51, there were no banks at all. In 1850, during a debate over whether to pass free banking laws in Illinois, one newspaper complained that there was a great shortage of money and that interest rates were as high as 20-25%, and a free bank law did pass in 1851 (Shade (1972)). In Wisconsin, in 1846, there were wide debates on the future of banking. Many of the pro-banks groups argued that banks would help gain control over the money supply, and even some who were opposed to banks worried at the effects of having no paper money (Anderson (1954)). Anti-bank forces won out, and there were no banks until a general bank law went into effect in 1853. According to Anderson (1954, p.22), “the law of 1852 was devoted largely to the regulation of bank notes.” The comptroller issued the bank notes after sufficient bonds were deposited. A clear example of the state determining money supply comes from the actions of the comptroller. Sometimes, the comptroller allowed excessive note issue in violation of the law, another time, the comptroller issued a “depreciation levy” where banks had to send back notes, thus reducing their circulation by government fiat (Anderson (1954)).

6.5 Prohibitionists (Arkansas, Florida, Illinois, Iowa, Mississippi, and Texas)

Some states banned banking altogether, thus removing local legal bank money. Banning banks did not completely eliminate them or bank money, as the example of Iowa shows. At the 1846 convention, anti-bank Democrats won out and placed a “no bank law” in the state constitution. The anti-bank law did not prevent some private banking, especially land-banking that helped people purchase land from the government (Erickson 1971). Its intent was to prevent banks from issuing paper money for circulation.51 The Whig opponents argued that this would only lead to mixed currency from various other states, and notes that found their way to Iowa through normal trade continued to circulate though they often had dubious value. Even the

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50 It is difficult to gauge the effects of the 1856 law change allowing banks again as the law was somewhat strict (Rockoff (1975a)) and the panic of 1857 makes analysis of monetary data difficult.

51 Erickson (1971) says “Iowans outlawed banking mainly to prevent the issuance of paper for circulation” p.54.
anti-bank Democrats realized the costs of such a system and by 1857 were prepared to legalize banks of issue, doing so in an 1857 state convention. These states obviously had atypical money supply movements and demonstrate the power states had over bank note circulation. The states were not able to completely eliminate the circulation of notes, but they prevented a normal money supply expansion. In addition, since notes could not be redeemed within the state, the value of notes became more uncertain and trade more difficult.

6.6 Summary of State Experiences

Because of porous borders, the specie component of the money supply, and the ability of banks to regulate their own circulation and deposits within the constraints set down by lawmakers, precise monetary control by states was impossible, but many states did take action which changed the money supply. While some may be surprised at the thought of active monetary policy so long before the writings of John Maynard Keynes or Milton Friedman and Anna Schwartz, the proper ratio of currency to industry was a matter of debate in the 1830’s-60’s.52 The Ohio report discussing the concern for debtors if there was deflation and the Michigan Whig’s call for enough currency for farmers to get fair prices demonstrates some understanding of the importance of the money supply and the state government’s responsibility to control it. The strong concern of local note issue and its impact on prices also shows that contemporaries believed that local circulation had an impact on the local money supply. After the panic of the late 1830s, governors in Ohio, Illinois, and Indiana blamed the Federal Government for the lack of control of the currency and argued Congress should control it (Shade (1972)). Instead, over time, some states took up this mantle.

Examples from the colonial period present a parallel and demonstrate that the notion of a monetary stimulus was present even before the period under discussion. Richard Lester (1939) discusses note issues in Pennsylvania, New York, New Jersey, and Delaware in the early 1700s. The Pennsylvania 1723 and 1729 issues were specifically issued to spur transactions, stop deflation, and revive the economy, and according to Lester, they were successful. The debates on the subject show that in the colonial times, there was a sense that falling prices, high interest rates, and lack of currency for trade could be combated with note issues.53

In general, many states did make changes to their bank laws which altered their bank money supply. Indiana in 1853, New Jersey in 1852, Connecticut in 1852, New York in 1838-40, and Michigan in 1837 showed how money could explode based on law changes. Prohibitionists showed how money could disappear based on state action. Finally, Louisiana’s tightening in 1845 and subsequent loosening in 1853, Virginia’s relaxation in 1851, Ohio’s loose money from 1845-51 followed by tight money until 1856, and the Wisconsin comptroller’s increase or decrease of note issues on his own show attempts at money policy at the state level where there is evidence of a change in money that was intended.

There were definitely other motivations. Larry Schweikert (1987) argues that in the Old South, commerce was more important than in the New South, and thus sound money was the typical policy. Pure politics of the Whigs and the Democrats were also factors as were emotional responses to bank failures. Changing to a free bank regime could shift banks’ holdings away from specie or other reserve assets towards

52 Dewey (1910) p. 60-1. There was little agreement on what the proper ratio was, but the topic was debated.
53 Mechanics were different because this was fiat money, but this shows monetary policy was known as a tool at the time.
the bonds that they legally had to hold to issue bank notes.\textsuperscript{54} Finally, Bodenhorn (2000, 2003) focuses on states’ attempt to influence credit availability, which, while related to influencing money is certainly distinct.

Still, the discussion of circulation when revising Tennessee’s state bank, the content of the 1852 Wisconsin law, the debates in 1845 Ohio, and the discussions in 1837-40 Michigan show that the volume of currency was an important issue. Especially on the frontier, there is evidence that politicians were concerned with creating a currency with an ample supply and they viewed changes to bank laws as a means to that end.

6.7 The impact on prices and exchange rates and interest rates

The goal of the paper is to show that the system allowed independent monetary movements and that some states pursued them. We are also interested in what the effects of the monetary freedom were. Unfortunately, as the modern monetary policy effectiveness literature shows, it is challenging to untangle a monetary shock from the shocks generating a policy response even with more perfect data. Depending on the path of real output, perfectly flat prices with oscillating money may be evidence of perfect stabilization policy or of no connection between money and prices.

Still, there is some evidence that prices and bank money were related. I use price data from Arthur Cole’s wholesale price study that gives price indices in New York, Philadelphia, Charleston, New Orleans, and Cincinnati and run a panel regression on the rate of inflation from 1836-1860. The dependent variable is the annual rate of inflation in each city. \footnote{In practice, OLS, random effects, and fixed effects regressions were virtually identical. Because the bank money is dated as close to January 1, I use the January price index. Using note circulation instead of bank money yields similar results, but stronger coefficients on the local money. Even when using annual average prices, local notes are significant.} The coefficient on the change in bank money is positive and statistically different from zero at better than 99%, and the \(R^2\) is .23 (Table 4, column 1). The coefficient, though, is .25, implying a relatively small economic impact of a change in bank money. A 20% change in bank money would be required to generate 5% more inflation. Furthermore, it seems possible that common national trends are an important omitted variable. When the percentage change in national bank note circulation (not including the individual state’s circulation) is added, the local notes variable is still significant at 95% and the national at 99%, but the national money coefficient is larger, .42 compared to a coefficient of .09 for the local money.\textsuperscript{56}

It is not clear whether prices are responding to money or money is responding to changes in money demand caused by price changes. I also look at the impact of lagged money. Lagged money has no visible impact (column 3). Given the volatility of prices and money, a year may be too long to still find evidence of an effect. I also examine the impact of money on the average price level for the year (columns 5 and 6). When included on its own, local money is still significant; it drops out when national money is included. As

\textsuperscript{54} Dowd (1992) p.210, claims that this influenced some states to imitate New York’s free bank law. In New York, free banks held almost 60% of the state’s bonds (see Rockoff (1975a) as well). Rolnick and Weber (1988) suggest Minnesota’s decision to allow railroad bonds as backing for notes was made in part to increase demand for the bonds.

\textsuperscript{55} In practice, OLS, random effects, and fixed effects regressions were virtually identical. Because the bank money is dated as close to January 1, I use the January price index. Using note circulation instead of bank money yields similar results, but stronger coefficients on the local money. Even when using annual average prices, local notes are significant.

\textsuperscript{56} The standard deviation of percentage change in local money was 28% and the national (excepting local) rate was 18%, so the impact of a one standard deviation change in local money is an increase in inflation of 2.5% versus a 7.5% rise for national money.
the argument has suggested, in most cases, money supply was endogenous, and without controlling for real factors it is very difficult to measure its impact, it was simply that in some cases, policy makers were able and did choose to alter the money supply. Thus, on average, we would not expect to find strong results.

While there are no examples of states deliberately trying to manipulate the discounts which their notes faced and hence employ exchange rate policy, we do see that states with atypical monetary processes are the same ones that had high variance in the discounts on their notes. A regression of the standard deviation of the discount on a state’s notes against the correlation of its circulation with the national total shows a statistically significant relationship (at 99%) and an R² of .39. The statistical relationship is even more clear when we eliminate those states that prohibited banking for long stretches.

Some of the calls for monetary changes referred to problems with interest rates (e.g. Illinois in 1850). As with prices, without knowing real output, it is difficult to draw out clear impacts. We can, though, examine the commercial paper series referred to above to get some sense for the connection of money and interest rates. If we regress the change in commercial paper rates on the percentage change in bank money, the coefficient is not distinguishable from zero (see table 5)⁵⁷,⁵⁸ On the other hand, if we add change in national money, the local money supply now generates a negative and significant coefficient. The interest rates are expressed such that 1% = .01, so the coefficient implies a 10% increase in local money would generate a drop in local interest rates of a quarter point (25 basis points). I explore this further by regressing the change in the interest rate spread against New York on changes in local money and there is a negative coefficient significantly different from zero at 99% with a size implying a 25% increase in local money would cut the differential by half a point (see table 5, column 3).

The argument of the paper is not that all states pursued active policies, and pooling across states that have made no attempts should weaken the results. Thus, we return to an example for which there is both price and interest rate data to get a clearer picture of how active policy could affect prices and interest rates. As discussed, in 1853, Louisiana increased banking and money grew 117% versus 55% for the nation from January 1852 to January 1857. Prices grew 73% in Louisiana over that time versus an average of 41% across the other four cities. Also, in 1852, New Orleans had the highest commercial paper rate when compared to New York, Boston, Philadelphia, and Charleston, 1 percent above the average of the others, but by 1856, it was the lowest, 2.4 points below the average of the others (because the rates are averages, by 1857, the impact of the panic is seen, and all rates surge). Given that inflation was higher in Louisiana, real rates were even lower. This is only one example, but it points to the effects the paper is suggesting are possible.

⁵⁷ Fixed effects are not included because it would suggest a constant change in R over time. Again, the fixed effects, random effects, and OLS results are very close.
⁵⁸ Table 5 column 4 shows that an equivalent regression on modern data (change in annual average US commercial paper interest rates on the change in the January US money supply from 1971-1997) also yields statistically insignificant results, but few would contend the Federal Reserve has no control over short term interest rates via monetary policy. It is simply that without controlling for other factors, it is difficult to gauge the effects of monetary policy.
7. Conclusion

For twenty-five years, there was no national control of the currency in the United States. While the costs of multiple currencies are undeniable, it should be remembered that the complaints regarding the condition of currency during this time period do not strictly relate to the costs imposed by states having independent money supplies. Many relate to the poor quality of state currencies. Some states were careless or unsophisticated when making changes to their laws, and some free-bank laws allowed wildcatting. Furthermore, because notes were issued by private actors not the states themselves, there were additional costs in ascertaining whether notes were of passable quality. Thus, the efficiency costs of the era could have been reduced without shifting to one centrally managed currency for the entire country.

This paper shows the United States may have accrued some of the macroeconomic benefits associated with multiple currencies as well as the efficiency costs. The system allowed states some macroeconomic flexibility, and some pursued monetary policy and changed bank laws with the intention of changing the volume of currency in circulation. These activist attempts to respond to shocks or monetary shortages could prevent deflation, lower interest rates, and keep the economy liquid. This era shows the tradeoffs a group of regions face between exchange rate stabilization and macro flexibility. Had the country had one policy, it is possible that antibank factions would have slowed the growth of the financial system or that conservative Eastern banking would have imposed their policy on the full nation while states that were just beginning to develop may have been better served by a more rapid monetary growth than the commercial regions. As the tensions in the late 19th century showed, the country was not necessarily an optimal currency area even then.\textsuperscript{59}

The finding that the US was not a full currency union from 1838-60 and that there was scope for semi-independent monetary policy may also generate a reinterpretation of the greenback and gold standard eras, not as simply one where the US fixed to gold, but as a period of monetary unification. The prominence of arguments over monetary policy in the late 19th century were not a random point in history, but came in the wake of unification and show the tensions that can arise from imposing one monetary policy and forcing regions with previously independent monetary policies to choose a single path. In the US, the hard money policy of the East was chosen, much to the chagrin of the Western states. This may have implications for what to expect in the EU going forward.

The results from the paper should not be overstated. Many states did not consider the monetary impacts of their actions, and there is no guarantee that those who did altered the money supply in a manner that was beneficial to their state’s economy, especially when one considers that the means of influencing the money supply was crude. The paper has shown, though, that the combination of state bank money serving as a central component of state money supplies and heterogeneous bank laws allowed the states to exercise monetary policy if they chose, and that some chose to do so. In addition, the results indicate that discussions of the United States as a monetary union should acknowledge that it has not always been a centralized

\textsuperscript{59} Sheridan (1996) among others discusses the regional clashes over monetary policy in the United States in the late 19th century. See Rockoff (2000) for discussion of the United States as an optimal currency area.
monetary union. From 1838-60, when the economic regions were extremely disparate, it operated as a loosely fixed exchange rate regime.
References:


Table 1. Summary of state by state statistics

<table>
<thead>
<tr>
<th>State</th>
<th>% of banks with modal discounts</th>
<th>Range of discounts 1843-56</th>
<th>Range of discounts 1838-58</th>
<th>Correlation of bank money with national</th>
<th>Correlation of bank money with region - self</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>71%</td>
<td>27</td>
<td>39.5</td>
<td>0.40</td>
<td>0.46</td>
</tr>
<tr>
<td>Connecticut</td>
<td>97%</td>
<td>0.75</td>
<td>8.5</td>
<td>0.92</td>
<td>0.91</td>
</tr>
<tr>
<td>Delaware</td>
<td>99%</td>
<td>0</td>
<td>0</td>
<td>0.87</td>
<td>0.82</td>
</tr>
<tr>
<td>Georgia</td>
<td>78%</td>
<td>4.5</td>
<td>19.5</td>
<td>0.83</td>
<td>0.81</td>
</tr>
<tr>
<td>Illinois</td>
<td>78%</td>
<td>88.87</td>
<td>88.87</td>
<td>0.65</td>
<td>0.29</td>
</tr>
<tr>
<td>Indiana</td>
<td>65%</td>
<td>29</td>
<td>29</td>
<td>0.84</td>
<td>0.57</td>
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<td>Kentucky</td>
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<td>59.25</td>
<td>0.97</td>
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<tr>
<td>Louisiana</td>
<td>82%</td>
<td>5.5</td>
<td>40</td>
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<td>0.95</td>
</tr>
<tr>
<td>Maine</td>
<td>88%</td>
<td>0.75</td>
<td>8</td>
<td>0.89</td>
<td>0.92</td>
</tr>
<tr>
<td>Maryland</td>
<td>45%</td>
<td>1</td>
<td>6</td>
<td>0.98</td>
<td>0.96</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>99%</td>
<td>0.75</td>
<td>8</td>
<td>0.89</td>
<td>0.91</td>
</tr>
<tr>
<td>Michigan</td>
<td>84%</td>
<td>64.25</td>
<td>68</td>
<td>0.35</td>
<td>0.47</td>
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<td>Missouri</td>
<td>98%</td>
<td>9.5</td>
<td>10.5</td>
<td>0.74</td>
<td>0.79</td>
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<tr>
<td>North Carolina</td>
<td>99%</td>
<td>2</td>
<td>9</td>
<td>0.95</td>
<td>0.89</td>
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<tr>
<td>New Jersey</td>
<td>67%</td>
<td>1</td>
<td>8</td>
<td>0.96</td>
<td>0.97</td>
</tr>
<tr>
<td>New York</td>
<td>63%</td>
<td>0.75</td>
<td>9</td>
<td>0.97</td>
<td>0.97</td>
</tr>
<tr>
<td>New Hampshire</td>
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<td>0.62</td>
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<tr>
<td>Ohio</td>
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<td>19.5</td>
<td>0.65</td>
<td>0.61</td>
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<tr>
<td>Pennsylvania</td>
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<td>0.95</td>
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<tr>
<td>Rhode Island</td>
<td>98%</td>
<td>0.75</td>
<td>16</td>
<td>0.87</td>
<td>0.93</td>
</tr>
<tr>
<td>South Carolina</td>
<td>91%</td>
<td>2</td>
<td>11</td>
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<td>0.86</td>
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<tr>
<td>Tennessee</td>
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<td>23.5</td>
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<tr>
<td>Vermont</td>
<td>90%</td>
<td>0.75</td>
<td>8.5</td>
<td>0.89</td>
<td>0.91</td>
</tr>
<tr>
<td>Virginia</td>
<td>62%</td>
<td>3.5</td>
<td>19.5</td>
<td>0.95</td>
<td>0.87</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>94%</td>
<td>13.5</td>
<td>18.5</td>
<td>0.86</td>
<td>0.39</td>
</tr>
</tbody>
</table>

States with infrequent data

<table>
<thead>
<tr>
<th>State</th>
<th>% of banks with modal discounts</th>
<th>Range of discounts 1843-56</th>
<th>Range of discounts 1838-58</th>
<th>Correlation of bank money with national</th>
<th>Correlation of bank money with region - self</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mississippi</td>
<td>53%</td>
<td>40</td>
<td>75</td>
<td>-0.64</td>
<td>-0.46</td>
</tr>
<tr>
<td>Nebraska</td>
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<tr>
<td>Montana</td>
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<td>10.5</td>
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<td>0.00</td>
</tr>
<tr>
<td>Arkansas</td>
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<td></td>
<td></td>
<td>-0.48</td>
<td>-0.38</td>
</tr>
<tr>
<td>Florida</td>
<td></td>
<td></td>
<td></td>
<td>-0.68</td>
<td>-0.73</td>
</tr>
</tbody>
</table>

Source: Van Court’s for discount data, Comptroller 1876 for monetary data

Table 2. Correlation of Bank Money by Regions

<table>
<thead>
<tr>
<th></th>
<th>total</th>
<th>New england</th>
<th>Mid atlantic</th>
<th>Old south</th>
<th>New south</th>
<th>Northwest</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>1.00</td>
<td>0.93</td>
<td>0.98</td>
<td>0.95</td>
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<td>0.88</td>
<td>0.86</td>
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<tr>
<td>new south</td>
<td>1.00</td>
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<td>northwest</td>
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<td>total - self</td>
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</tbody>
</table>

State by state correlations

<table>
<thead>
<tr>
<th></th>
<th>average correlation within region</th>
<th>average correlation with states outside region</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>0.90</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>0.75</td>
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<tr>
<td></td>
<td>0.80</td>
<td>0.74</td>
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<tr>
<td></td>
<td>0.65</td>
<td>0.64</td>
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<tr>
<td></td>
<td>0.33</td>
<td>0.56</td>
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Source: author’s calculations based on Comptroller 1876
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<thead>
<tr>
<th></th>
<th>1840</th>
<th>1850</th>
<th>1860</th>
<th>change from 1840-60</th>
<th>Percentage change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>3.77</td>
<td>6.65</td>
<td>10.58</td>
<td>6.81</td>
<td>180%</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>5.30</td>
<td>6.93</td>
<td>14.00</td>
<td>8.70</td>
<td>164%</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>24.06</td>
<td>28.34</td>
<td>44.89</td>
<td>20.83</td>
<td>87%</td>
</tr>
<tr>
<td>Vermont</td>
<td>4.58</td>
<td>10.83</td>
<td>14.60</td>
<td>10.01</td>
<td>218%</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>23.32</td>
<td>27.40</td>
<td>40.72</td>
<td>17.41</td>
<td>75%</td>
</tr>
<tr>
<td>Connecticut</td>
<td>10.29</td>
<td>19.25</td>
<td>28.71</td>
<td>18.42</td>
<td>179%</td>
</tr>
<tr>
<td>New York</td>
<td>11.16</td>
<td>21.52</td>
<td>34.54</td>
<td>23.38</td>
<td>210%</td>
</tr>
<tr>
<td>New Jersey</td>
<td>5.96</td>
<td>9.07</td>
<td>15.70</td>
<td>9.74</td>
<td>164%</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>9.78</td>
<td>11.73</td>
<td>13.52</td>
<td>3.74</td>
<td>38%</td>
</tr>
<tr>
<td>Delaware</td>
<td>14.62</td>
<td>10.29</td>
<td>18.82</td>
<td>4.20</td>
<td>29%</td>
</tr>
<tr>
<td>Maryland</td>
<td>13.33</td>
<td>14.19</td>
<td>18.89</td>
<td>5.56</td>
<td>42%</td>
</tr>
<tr>
<td>Virginia</td>
<td>9.29</td>
<td>11.78</td>
<td>14.38</td>
<td>5.09</td>
<td>55%</td>
</tr>
<tr>
<td>North Carolina</td>
<td>3.68</td>
<td>4.76</td>
<td>7.13</td>
<td>3.46</td>
<td>94%</td>
</tr>
<tr>
<td>South Carolina</td>
<td>11.30</td>
<td>18.05</td>
<td>22.23</td>
<td>10.92</td>
<td>97%</td>
</tr>
<tr>
<td>Georgia</td>
<td>10.85</td>
<td>9.96</td>
<td>12.80</td>
<td>1.95</td>
<td>18%</td>
</tr>
<tr>
<td>Florida</td>
<td>15.42</td>
<td>2.23</td>
<td>-13.19</td>
<td>-86%</td>
<td></td>
</tr>
<tr>
<td>Alabama</td>
<td>18.40</td>
<td>4.89</td>
<td>12.79</td>
<td>-5.61</td>
<td>-31%</td>
</tr>
<tr>
<td>Louisiana</td>
<td>27.70</td>
<td>25.65</td>
<td>44.29</td>
<td>16.59</td>
<td>60%</td>
</tr>
<tr>
<td>Mississippi</td>
<td>63.53</td>
<td>0.27</td>
<td>0.28</td>
<td>-63.25</td>
<td>-100%</td>
</tr>
<tr>
<td>Arkansas</td>
<td>15.44</td>
<td>-15.44</td>
<td>-30.88</td>
<td>-100%</td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>6.40</td>
<td>9.05</td>
<td>16.60</td>
<td>10.20</td>
<td>159%</td>
</tr>
<tr>
<td>Tennessee</td>
<td>5.01</td>
<td>5.22</td>
<td>8.89</td>
<td>3.88</td>
<td>77%</td>
</tr>
<tr>
<td>Missouri</td>
<td>4.13</td>
<td>5.82</td>
<td>9.51</td>
<td>5.38</td>
<td>130%</td>
</tr>
<tr>
<td>Ohio</td>
<td>4.36</td>
<td>7.77</td>
<td>5.14</td>
<td>0.78</td>
<td>18%</td>
</tr>
<tr>
<td>Indiana</td>
<td>4.90</td>
<td>4.01</td>
<td>5.25</td>
<td>0.35</td>
<td>7%</td>
</tr>
<tr>
<td>Michigan</td>
<td>2.85</td>
<td>2.24</td>
<td>0.80</td>
<td>-2.05</td>
<td>-72%</td>
</tr>
<tr>
<td>Illinois</td>
<td>9.51</td>
<td>5.65</td>
<td>3.86</td>
<td>-5.65</td>
<td>-41%</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>3.84</td>
<td>6.65</td>
<td>9.69</td>
<td>5.85</td>
<td>152%</td>
</tr>
</tbody>
</table>

*Source: Comptroller (1876) and Census (1965)*
### Table 4. Relationship between changes in prices and changes in bank money

<table>
<thead>
<tr>
<th>Prices used</th>
<th>1 January</th>
<th>2 January</th>
<th>3 January</th>
<th>4 January</th>
<th>Annual average</th>
<th>Annual average</th>
</tr>
</thead>
<tbody>
<tr>
<td>%Δ in local money</td>
<td>coef (std error)</td>
<td>0.25aa (.04)</td>
<td>0.09a (.04)</td>
<td>0.10a (.05)</td>
<td>0.09a (.04)</td>
<td>0.01 (.04)</td>
</tr>
<tr>
<td>% Δ in national money</td>
<td>coef (std error)</td>
<td>0.42aa (.07)</td>
<td>0.42aa (.08)</td>
<td>0.27aa (.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Δ in local money (lag)</td>
<td>coef (std error)</td>
<td>-0.05 (.05)</td>
<td>0.01 (.05)</td>
<td>0.05 (.04)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Δ in national money (lag)</td>
<td>coef (std error)</td>
<td>-0.05 (.07)</td>
<td>0.03 (.07)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>observations</td>
<td>115</td>
<td>115</td>
<td>110</td>
<td>110</td>
<td>115</td>
<td>110</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.23</td>
<td>0.43</td>
<td>.01</td>
<td>0.40</td>
<td>0.05</td>
<td>0.19</td>
</tr>
</tbody>
</table>

*dependent variable = %change in domestic prices, national money = national – local, state level fixed effects included*

*statistically significantly different from zero at: aa = 99%, a = 95%, b = 90%*

*Source: Cole, Wholesale, for prices and Comptroller 1876 for money*

### Table 5. Relationship between Interest Rates and changes in Money supplies

<table>
<thead>
<tr>
<th>Dep Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Δ Com Paper Rate (local)</td>
<td>Δ Com Paper Rate (local)</td>
<td>Spread vs NY</td>
<td>Δ Com Paper Rate (national)</td>
</tr>
<tr>
<td>era</td>
<td>1837-1859</td>
<td>1837-1859</td>
<td>1837-1859</td>
<td>1971-99</td>
</tr>
<tr>
<td>%Δ in local money</td>
<td>.010</td>
<td>-.027a</td>
<td>-.021aa</td>
<td>.022</td>
</tr>
<tr>
<td>Standard error</td>
<td>.017</td>
<td>.014</td>
<td>.007</td>
<td>.051</td>
</tr>
<tr>
<td>% Δ in national money</td>
<td>.102aa</td>
<td>.017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard error</td>
<td>.017</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>109</td>
<td>109</td>
<td>86</td>
<td>25</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.004</td>
<td>.275</td>
<td>.077</td>
<td>.002</td>
</tr>
</tbody>
</table>

*independent variable = %change in domestic inflation, national notes = national – local, Robust Standard Errors reported. Statistically significantly different from zero at: aa = 99%, a = 95%, b = 90%*

*Source: antebellum: Bodenhorn(2000) for commercial paper and Comptroller 1876 for money, for modern era data: St Louis Fed FRED database. Money in modern era is M1 in January*
The graph is not intended to display any individual state’s pattern as much as to give a sense for the overall variability of the discounts. Data from Van Court’s and author’s calculations.

Figure 2  Summary Statistics of Monthly Modal Discounts