Essays in Economic & Business History
2024, 42 (1): 15-37
Published November 7, 2024

A Case Study in Banknote Pricing During Financial Chaos: The Illinois Experience During the First Summer of the Civil War

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Abstract

This case study of the Illinois banking market shows how the private market managed the crisis in the banknote market during the first year of the Civil War. Banknotes backed by southern bonds started their decline with the election of Lincoln causing their values to fall below par. The Illinois legislature acted swiftly to shore up the banking system, but the start of the Civil War upended the market. A series of private market agreements failed to stabilize prices at face value leading to chaos in the banknote market resulting in fluctuating prices for different banks. The Wright Bros., a private banker, took the lead by publishing weekly banknote prices of over 100 banks during a 20-week period. The discounts on banknotes were significant and the evidence suggests that the banknotes were not efficiently priced. Banknote prices were not very sensitive to the market value of the bonds securing banknotes. While Wright Bros. did set prices based, in part, on the market value of the bonds, market and bank-specific risks and the reputation of the bank were the major factors differentiating prices.

JEL Classifications: N2.

Keywords: Free Banking, Banknote Pricing, Financial Market Efficiency.

[1] While working on this paper during his sabbatical, Scott Deacle passed away.

ISSN 2376-9459 (online) LCC 79-91616 HC12.E2

Introduction

Research has shed light on the level of integration of the antebellum financial market. Howard Bodenhorn (1992), Gary Gorton (1996), and John James (1978) showed how state-sanctioned banks, private bankers, and brokers moved rapidly to a national market as the telegraph and railroads reduced informational and transaction costs. Interest rates and banknote price differentials among regions were nearly equal across America by mid-century (Bodenhorn 2000, 121).[2] Banknotes were priced based on bank-specific risk, the technology available to market participants, and the reputation of the bankers (Gorton 1996, 1999; Jaremski 2011; Haupert 1994; Bodenhorn 1998).[3]

Unlike previous work, this study will focus on a particular private banker, a free banking state, and a unique period in U.S. history; the private banker was Wright and Brothers (hereafter Wright Bros.), the state was Illinois, and the period was the year after the election of Lincoln. The study examines how the Chicago private market responded to the financial crisis brought upon by the Civil War. One of the stabilizing forces of the period was the private banker, Wright Bros., who consistently provided price information on Illinois banknotes.

Private bankers entered and exited freely and carried on the business of banking except for the ability to issue banknotes, which could only be issued by state-sanctioned banks.[4] After 1836, there were two basic state banking systems: chartered and free banking. In states that issued special charters from the legislature, banknotes were secured by the assets of the bank while in states that allow banks to enter freely, banknotes were secured by a portfolio of state-issued bonds held by the state auditor. Illinois was a free banking state that allowed any state-issued bond to be held as security for its banknotes. Southern state bonds generally accounted for over 42 percent of all bonds held by the Illinois state auditor ("the Auditor").[5] With the start of the Civil War, the Illinois banking market faced a severe test when southern bond prices dropped by over 30 percent. While many Illinois banks held exclusively southern bonds, many others diversified their portfolios with Northern bonds, and some banks held portfolios that were exclusively Northern bonds. After the firing on Fort Sumter the decline in both northern and southern bonds was too great for the market to maintain par redemption and banknote prices started to float. Banknote prices varied considerably providing a case study of banknote pricing during a period of turmoil. Was pricing arbitrary or did market-makers make offers consistent with what other researchers have found—bank-specific assets and risks, transaction costs, and reputation?

Pricing decisions by market-makers were not made in a vacuum. The main Illinois newspapers—*Chicago Daily Tribune* (hereafter "the *Tribune*" or CDT) and *Illinois State Journal* (or ISJ)—were vigilant in keeping the public aware by publishing bond holdings of banks and, at times, market value estimates of the portfolios.[6] Along with public information

[2] Bodenhorn (2000, 180-184) highlighted several private bankers that had a national presence in which they opened offices in major cities.

[3] Technological change, in the form of the railroad and the telegraph, lowered the cost of note redemption and made financial information flow much faster. The reductions in travel times were dramatic. For example, between 1836 and 1862 the travel time between Philadelphia and Boston was cut by 65 percent to fourteen hours. See Gorton (1999).

[4] Private bankers were personally liable for all their debts, while state-sanctioned banks limited the liability of the stockholders.

[5] For the purpose of this study border states were included as southern states. The southern state bonds held by Illinois free banks were predominantly issued by the border state of Missouri and three of the four states which seceded after the firing on Fort Sumter in April 1861 (North Carolina, Tennessee, and Virginia).

[6] Our study is unique in that it uses the bond portfolio of each bank and the prices of the bonds in the market to develop estimates of the value of each bank's bond portfolio. We are approximating a

on Illinois free banks, the state was one of the most financially networked states in the union in 1861. Not only were there more than 100 free banks operating, but there were also 116 private bankers operating in over half of the counties, each having a corresponding relationship with New York City (hereafter NYC) banks (*Banker's Magazine* 1861).[7] Many of these private bankers bought and sold banknotes and they would have had quick access to NYC bond prices. Wright Bros. published weekly banknote price data for over 100 Illinois free banks for over 20 weeks in 1861.[8] Although it was not the only publisher of banknote prices, Wright Bros. was the most consistent publisher of rates and was the standard for the market. Given access to information on banks, bond prices in NYC, and the diversity of bond portfolios, one would expect that Wright Bros.'s banknote pricing would reflect the fluctuations in the market and the conditions of the banks.

The article will proceed as follows. In the next section, an overview of the Illinois free banking legislation and market is given to provide the context for the financial turmoil of 1861. The Illinois provisions worked effectively until the 1860-1861 crisis even with some market fluctuations. The following section gives a chronology of events that illustrates how a private market for banknotes responded to financial stresses. The final section analyzes the pricing of Illinois banknotes by the Wright Bros. It presents the empirical models tested, a description of the data, and the results. The findings suggest that while Wright Bros. did not fully adjust banknote prices to the market values of bonds backing the notes, it was systematically pricing notes based on risk factors.

Overview of the Illinois Free Banking Market

Illinois free banking law, enacted in 1851, was a typical free banking law that required banknotes to be backed by a portfolio of state bonds. Illinois had one of the more liberal bond provisions. While some free banking states restricted the acceptable states, Illinois allowed 6 percent coupon bonds from any state paying interest semiannually. At first free banks received banknotes equal to 100 percent of the bond's market value, but no greater than par. After 1857 banks received banknotes on only 90 of the bond's market value. Banks were required to redeem banknotes into specie upon request. If the bank failed to honor the request, noteholders could register a "protest" to which the bank had ten days to respond before the state would start liquidation proceedings.

Bonds were held by the state auditor who maintained the accounting of notes issued and estimated the market value of the portfolio. The auditor collected the coupon payments and would place them in reserves for the banks until they were withdrawn by the banker. A quarterly report, typically published in Chicago and Springfield newspapers, was issued by the Bank Commissioners to the public. This report, typically published in Chicago and Springfield newspapers, included detailed bonds held (at par) and circulation. When the market value of a bank's portfolio fell below the notes issued, the Bank Commissioners issued a call on the bank. The bank had the option of returning banknotes or delivering additional bonds. If the bank failed to respond to the call, the Bank Commissioners had the right to liquidate the bank by selling the bonds and paying off the noteholders at pro rata share of the portfolio value. In

best estimate of the banknotes' value. This contrasts with Jaremski (2011), who used an unweighted average of 16 bonds to account for economic conditions. He did not look at banks' actual portfolio compositions.

[7] *Banker's Magazine* provided a directory of private bankers across the country. While most private bankers had NYC correspondents as would be expected in an integrated market, Illinois had one of the largest networks of private bankers among the states. A considerable number of private bankers also owned free banks (see Economopoulos 2021).

[8] W.W. Wright was a private banker from Cleveland, Ohio and George S. Wright had an office in Cincinnati.

some cases, banks would notify the commissioners that they were voluntarily closing; these banks typically fully redeemed their banknotes.

The call provision was a two-edged sword. The intent was to maintain the value of the collateral and security for noteholders, but it was also a signal to the public that the notes were no longer fully backed. Calls gave notice to bankers that they would have to fortify their banks with additional capital or reduce notes issued. There was no legally-bound call period; it was up to the Bank Commissioners to determine the time the banks had to put up more securities or reduce their note circulation. There were four calls before the election of 1860; two came when there was a general decline in bond prices in 1854 and 1857 and two came when a particular state bond took a significant drop. The first call came after the general bond crisis of 1854 and went out to all banks holding Missouri and Virginia bonds (Illinois Bank Commissioners 1855). The names of the banks were not published in the press, but published reports by the auditor showed that 30 of the 31 banks at the time held one or both of the securities. The free banks responded to the call or they decided to voluntarily close operations. Those that closed redeemed their notes at par. Early in 1857 Missouri bonds fell sharply and another call went to a group of banks (ISJ 1857). Banks' names were not published in the press at the time of the call, but were published after the fact. By the end of September, all the banks except two had complied. A third call went out after the general bond market took a dive in October of the same year. Most banks complied although some decided to close their doors. Since the start of free banking, 69 free banks had entered the market with 28 exiting, two of which were unable to redeem their notes at par (*Western Railroad Gazette* 1857). The fourth call on 18 banks came in February of 1860 when Missouri Bond prices declined to $80 (*The Press and Tribune* 1860). April 1st was the deadline set by the commissioners. *Banker's Magazine* commented that "it is possible that an improvement will take place in the stock market before that date" (1860, 824). The Auditor reported a month after the call that all banks made up their deficiencies with additional bonds (*The Weekly Pioneer and Democrat* 1860). Overall, the call provision was effective in securing banknotes, maintaining market discipline, while allowing the market to freely function.

While there is no record of the discounts of banknotes for banks under call, one can assume that note brokers would likely take advantage of the announcements. Bankers and brokers would be keenly aware of the value of notes and would increase the discount for those under call. But if one expected bond prices to rebound or banks to comply with the call, the discount may have been small. One merchant even advertised that they were willing to accept "suspended" banknotes at par (ISJ 1857).[9]

The Election and the Beginning of the Downfall

The 1860 election of Lincoln started a chain of events in the financial markets that impacted Illinois free banks throughout 1861. Table 1 provides a timeline that summarizes the flurry of key events that merchants, bankers, and public officials took to help stabilize the market. They first attempted to maintain circulation at near-par values through legislation and private agreements, but these attempts failed which led to a market-based organized floating banknote price market.

[9] During the general decline in bonds, all banks throughout the country suspended specie payments. While this was a violation of the law, states did not act against the banks. During these suspensions, some merchants would only accept coins while others would accept suspended notes. Some states did enact law setting dates for the resumption of specie payments.

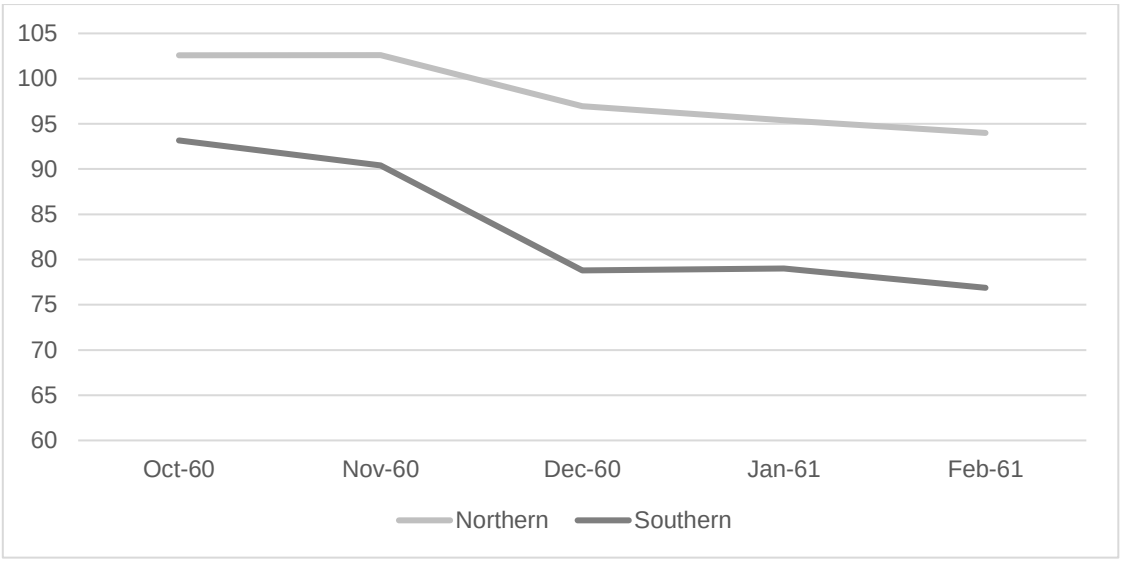
Table 1
Chronology of Key Events

Date	Event
November 6,1860	Lincoln was elected
November 16, 1860	Bond prices drop 5%
November 20, 1860	Bank Commissioners called 22 banks
December 1, 1860	Tribune urges public to hold banknotes
December 19, 1860	Bank Commissioners extend call
February 18, 1861	Illinois Legislature amends banking law
April 1, 1861	32 Illinois banks thrown out by private bankers
April 12, 1861	Firing on Fort Sumter
April 26, 1861	571 Merchants pledge to accept banknotes at par
May 14, 1861	Rumor of two banknote lists by bankers
May 15, 1861	Merchants/Wholesalers accept banknotes at market
May 18, 1861	Railroad Association posts banknote price list
May 28, 1861	E.I Tinkham establishes clearinghouse for banknotes
June 19,1861	Wright and Brothers publishes first banknote list
August 15, 1861	Deadline for declaring agent in Chicago/Springfield
November 25, 1861	Wright and Brothers post last banknote price list

The turmoil in the financial markets started with the presidential election and threat of secession. By the end of November, southern state bonds dropped an average of 15.6 percent and northern state bonds dropped 5.4 percent (see Figure 1) from preelection highs. These declines prompted a call on 22 Illinois free banks by the Bank Commissioners on November 20 (Galena Daily Advertiser 1860). Two days after the call, Chicago private bankers "threw out" seven of the banks; these banks would no longer accept the banknotes at normal rates (CDT 1860b).[10] The called banks were grandfathered under the old bond reserve regulation and were to resolve their deficiency within 35 days (CDT1860c).

Although there were estimates of discounts between 15 to 25 percent, the optimistic *Tribune* in a series of articles during the last week of November 1860 expected banknote prices to return to normal. They first urged noteholders to hold onto their notes: "Our impression is that they will soon be worth considerably more, and they will reach nearly if not par within a few weeks. Let those who can keep them for the present at least" (CDT 1860a). Three days later they noted that "the rise in Missouri stocks (bonds) with the coupons soon to be paid, will nearly make up half the deficit called for by the Bank Commissioners" (CDT 1860b). Finally, they observed "most people are wisely holding what they have ... They will doubtless be worth more than they are now and most will be probably taken at par. They are now about at 80 cents on the dollar" (CDT 1860c).

[10] The exact operational definition of being "thrown out" is unclear. There were over 20 private bankers listed in the Chicago Directory (BM 1861). There were seven leading private bankers who made public pronouncements (CDT 1861f). It is clear that some banks were exchanging these at notes at a discount. Others may have refused to exchange them at all. By April 8, 1861, six of the 22 banks made good on the call.



Source: Gerald Dwyer, R.W. Hafer, and Warren Weber (1999).
Note: Bonds were issued with $100 face value.

Figure 1
Average Bond Prices for Northern and Southern Bonds in NYC

Whether banks were not responding to the call or it was the optimism of the press, the Bank Commissioners decided to extend the call period on December 19 "to 60 and probably to 90 days. The proposal was received with satisfaction in business circles, for it is thought by that time the stocks will have so risen as to meet the deficiency of the call and rendered it unnecessary" (CDT 1860d). To keep the public informed they published the names of the banks and their deficiencies five days later (CDT 1860e).

Soon after the extension, South Carolina seceded from the nation and by February 1, 1861, six other southern states followed. Only one of these seven states, Louisiana, had a position in the portfolios of Illinois free banks, but this position was small with Louisiana bonds comprising only 4 percent of banks' portfolios on average.[11] While bond prices stabilized from December to February, the legislature amended the banking law in February 1861 to shore up the banking system (CDT 1861a).[12] The new legislation restricted any new banknote issue to be backed only by Illinois bonds and incentivized banks to swap their current holdings of bonds for Illinois bonds or bonds of states whose market value exceeded par. For the next six months, the 90 percent note restriction on the bonds was waived and notes were issued at full market value. The legislation also included provisions regarding the current state of affairs:

- They issued a temporary suspension of the call provision until July 1, 1861. Thereafter, when a bank was deficient for 60 days the Bank Commissioners could make a call and the bank had 30 days to comply.
- For banks currently under call or protest, the Auditor was allowed to exchange banknotes for bonds. The exchange rate would be based on the current market value of the portfolio.[13]
- Banks were required to have an agent in Chicago or Springfield by August 15, 1861, or they would forfeit their charter.

[11] Most of these southern state bonds were not actively traded in NYC; only Louisiana was available.

[12] The Auditor issued an interpretation of the provisions (CDT 1861d).

[13] The *Tribune* reported on June 15 that the Auditor witnessed the burning of $100,000 banknotes per day (CDT 1861q).

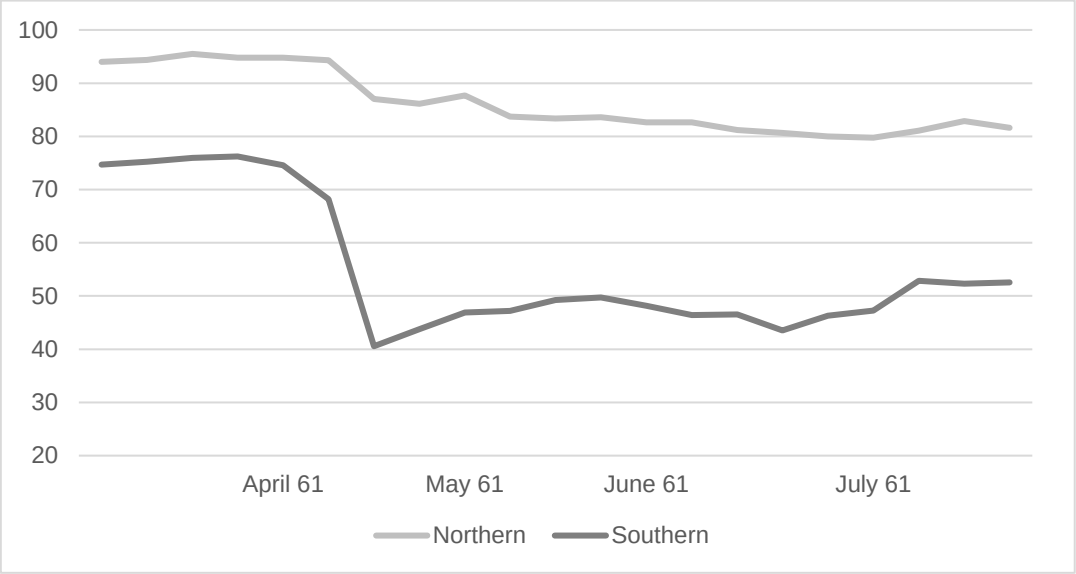
The Beginning of the End

The uneasiness of the banknote market came to a point on April 1, 1861, when the Chicago private bankers "threw out" an additional 32 banks:

> The reason which induced this policy … as they had been thrown out all over the country, and their bills were coming upon our bankers in packages of thousands of dollars, it was the only course that was left them. (CDT 1861b)

The *Tribune* listed the banks with the market value of their banknotes calculated by a legislative committee in January. These values ranged from 70 cents to 91 cents on the dollar. Market values of the banknotes were recalculated by the *Illinois State Journal* using current bond prices (April 1) showing all of the banks except one had improved from January. Most banknote market values increased from 2 cents to 6 cents and a few of them were close to par. Three days later, on April 4, the Bank Commissioners' Quarterly Report was published containing free banks' bond portfolios and banknote circulation. The *Tribune* commented that "three months more will increase their value by July coupons, if in the meantime prices do not decline" (CDT 1861c).

The *Tribune*'s hopes were soon dashed when bond prices collapsed a week later soon after the firing on Fort Sumter (April 12); southern bond prices fell an average of 40 percent from the time of the amended banking law (see Figure 2). "Uncurrent" money was discounted between 40 to 70 percent (CDT 1861e). There was an attempt by the market—merchants and bankers—to stabilize banknote values. On April 26, over 500 Chicago merchants partnered with seven private Chicago banks to receive banknotes from 75 free banks at normal ("current") prices (presumably at discount rates prior to the fall). Banks agreed to accept and exchange banknotes "to receive and pay out currency in payment of debts and general transactions of business …" (CDT 1861g).



Source: Dwyer, Hafer, and Weber (1999).
Note: Bonds were issued with $100 face value.

Figure 2
Average Bond Prices for Northern and Southern Bonds in NYC

The coalition between merchants and banks to maintain par circulation lasted less than two weeks. On May 14, cracks in the coalition appeared in the press. Apparently, private bankers internally set up two lists of free banknotes: a "short list" of banks whose notes were valued at par and a "long list" of all other free banknotes valued at a discount. Merchants who wanted to purchase NYC exchange could only use banknotes from the "short list". Private bankers would only issue "long list" notes to customers and hoard "short list" notes. Thus, "short list" notes were effectively trading at a premium. Merchants realized private bankers were hoarding the few banknotes trading at par and at a May 15 meeting merchants claimed that "banks had 'sorted' the currency retaining all that was secured by Northern stocks and paying out only that which rested on the bonds of the rebel states" (CDT 1861h). This was the straw that broke the camel's back. The merchants decided to allow the price of banknotes to float and agreed to accept all banknotes "for what it will bring in exchange with one percent added" (CDT 1861h). Wholesalers adopted the same policy the following day on May 16.

The *Tribune* continued to inform banknote holders by publishing information on the bond portfolios of all banks the following day, circulation of the banks gathered from the March 31, 1861 Auditor's Report, and current bond prices (CDT 1861i). The *Tribune* divided the banks into three groups: banks holding northern bonds (the "short list"), banks holding only southern bonds, and banks with both, and they included the most recent prices of the bonds. The purpose was for readers to "… determine with sufficient accuracy the value of the circulation of any of the banks on the list" (1861k, 4).

With over 100 free banks, the pricing of banknotes according to their market value would have been a monumental task and an extraordinary cost. The first signs of order came the following day, May 18, when eight executives from the railroad industry published a price list of 68 free banks for their customers (CDT 1861j). This list ("the Railroad list") placed banks into six pricing categories starting with par and descending in ten-cent increments. The group pledged that the Railroad list would be updated weekly. The Railroad list was soon adopted by the merchants and the *Tribune* (CDT 1861k) and by May 27 it was widely accepted (CDT 1861l).[14]

While the Railroad list was a means to regain some order in the market for goods and services, the railroads were not in the business of banknote exchange. Although the Railroad list did not represent offer prices, it appeared that the note brokers would base their own prices on it. Anecdotally, the *Tribune* reported one day that they heard that patrons could exchange notes at 10 percent below the Railroad list price in the morning and 20 percent at the end of the day (CDT 1861m). The next day the *Tribune* reported that the railroads had lowered the prices on their list (CDT1861p**)**.

At the request of "leading citizens", E.I. Tinkham, a private banker in Chicago (and an owner of a free bank), agreed to establish a "Clearing House" for banknotes on May 27. Tinkham collected banknotes, exchanged them with the Auditor for bonds, sold the bonds, and noteholders would get "exactly what they are worth" less a commission of 2 percent of par (CDT 1861m). Another clearinghouse was soon opened in Springfield by Ridgley & Company.[15] These clearinghouses were made possible by the February amendment to the banking law that allowed the redemption of banknotes into bonds for banks under the November call (ISJ 1861b). The E.I. Tinkham and Ridgley & Company clearinghouses were a means to price arbitrage the called banks' banknotes. By mid-July almost $4 million in banknotes were withdrawn from circulation, a 34 percent decrease (CDT 1861q).

[14] It appeared that the free banks respected the list since two banks notified the railroad pricing committee that they complied with the call (CDT 1861o).

[15] There is one published list of redemption rates by Ridgely and Company for 16 banks. The price received averaged about 14 cents higher than published average banknote prices for the month (CDT 1861t).

On June 24 the *Tribune* published the June 14 Bank Commissioners' quarterly report. The detailed report included all free banks with their bond portfolios, the banknotes issued, and the deficiency of banks on the call list (CDT 1861s). The Bank Commissioners also provided some expectations on future calls and liquidations. They listed only 17 banks that were not on the call list and had no plans to make another call for another month. For those who were on the call list and did not comply, liquidation would commence on August 15 (CDT 1861s).

Wright Bros. Steps In

Whether or not Wright Bros. was privy to the Bank Commissioners' report, on June 19, five days after the report, it published its first list of prices in five-cent increments which soon became the market setter. Wright Bros. stated it would meet any price in the market (see Figure 3). It continued to publish the list at least weekly, sometimes more frequently. For a short time, competing price lists were published in the same newspaper by other brokers, but Wright Bros. became the sole advertiser of rates for the whole period. In a short two months, the chaos from the dramatic decline in bond prices came to some order, albeit with great loss. Noteholders faced rates set by the market, while buyers adjusted prices based on perceived risk and the bond market.

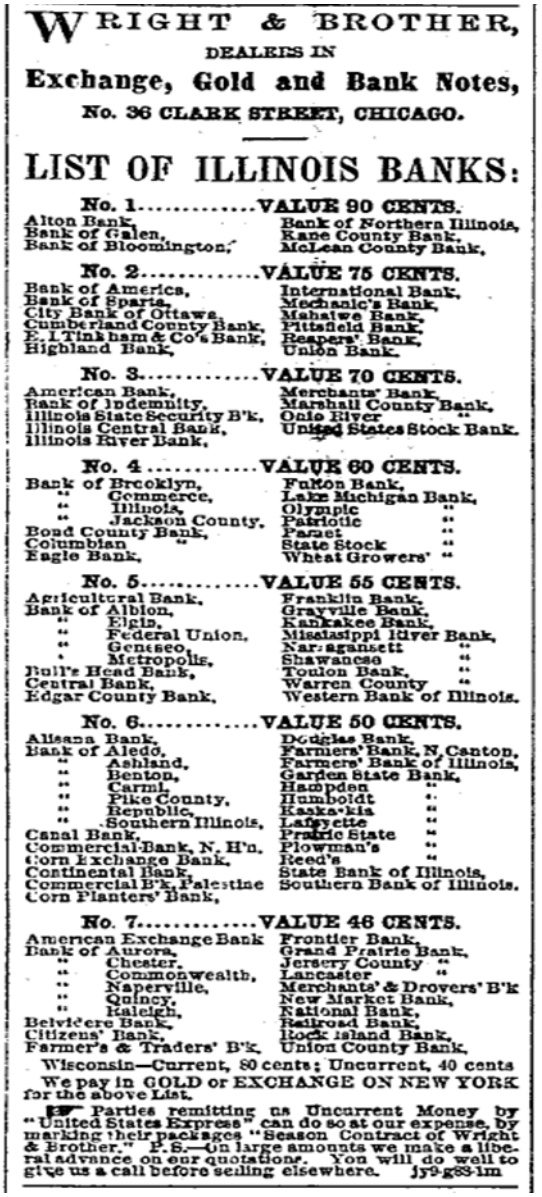
The August deadline for declaring agents in Chicago and Springfield passed by quietly in the press. Only a handful of banks announced their agents and the Auditor started liquidating banks in late August. Typically, the Auditor placed newspaper notices of the banks that were being liquidated. Notices of redemption rates of liquidated banks first appeared in October and the liquidations were almost complete by November. When the Bank Commissioners' Report was published in the *Illinois State Journal* that same month, it listed over 50 percent of the banks liquidated, 29 others in the process of selling the bonds, and only 13 surviving (ISJ 1861a). Wright Bros.'s last advertisement was published on November 25. So came to an end the sorting out of free bank banknotes in the market.

Wright Bros. Banknote Pricing: An Overview

Prior to the Railroad list, there were no formal quotes published on the free banks in Chicago. Banknote brokers and private bankers had only the Bank Commissioners' Report of bonds and newspaper calculations of rejected individual banks. The Railroad list served the needs of the railroads by publishing prices for a selected group of free banks. It was not until Wright Bros.'s advertisements that the market had a complete list of Illinois banknotes. Since it advertised that it would meet any price, we treat Wright Bros.'s list as the market offer price for Illinois banknotes. With the Wright Bros. publishing weekly rates in the *Tribune* from June 19 through November 25, the market had an anchor. Initially, 104 to 108 free bank prices were published, but, as noted above, the Auditor completely liquidated the bonds of some banks beginning on October 7.[16] Consequently, the number of banks in the Wright Bros. list began to decline, falling to 89 on October 16, 82 on October 23, 74 on October 30, and then 47 on November 6 (the last day in our data set).[17] On November 25 Wright Bros. posted its last advertisement for banknote prices and on November 28 an advertisement stated that Wright Bros. was withdrawing its regular listing due to a scarcity of Illinois currency (CDT 1861w).

[16] The Wright Bros.'s list was for banks that were currently operating during the 1861 period. The Bank Commissioners' Reports would also include information on banks that previously failed.

[17] Although redemption rates were published by the Auditor in October for some banks, the Nov 6 list price priced them at Wright Bros.'s rates. Wright Bros. finally published the Auditor rates in its November 14 advertisement.



WRIGHT & BROTHER,

DEALERS IN

Exchange, Gold and Bank Notes,

No. 36 CLARK STREET, CHICAGO.

LIST OF ILLINOIS BANKS:

No. 1.....VALUE 90 CENTS.

Alton Bank,
Bank of Galen,
Bank of Bloomington,
Bank of Northern Illinois,
Kane County Bank,
McLean County Bank,

No. 2.....VALUE 75 CENTS.

Bank of America,
Bank of Sparta,
City Bank of Ottawa,
Cumberland County Bank,
E. I Tinkham & Co's Bank,
Highland Bank,
International Bank,
Mechanic's Bank,
Mahaiwe Bank,
Pittsfield Bank,
Reapers' Bank,
Union Bank.

No. 3.....VALUE 70 CENTS.

American Bank,
Bank of Indemnity,
Illinois State Security B'k,
Illinois Central Bank,
Illinois River Bank,
Merchants' Bank,
Marshall County Bank,
Ohio River "
United States Stock Bank.

No. 4.....VALUE 60 CENTS.

Bank of Brooklyn,
" Commerce,
" Illinois,
" Jackson County,
Bond County Bank,
Columbian "
Eagle Bank,
Fulton Bank,
Lake Michigan Bank,
Olympic "
Patriotic "
Panet "
State Stock "
Wheat Growers' "

No. 5.....VALUE 55 CENTS.

Agricultural Bank,
Bank of Albion,
" Elgin,
" Federal Union,
" Geneseo,
" Metropolis,
Bull's Head Bank,
Central Bank,
Edgar County Bank,
Franklin Bank,
Grayville Bank,
Kankakee Bank,
Mississippi River Bank,
Narragansett "
Shawanese "
Toulon Bank,
Warren County "
Western Bank of Illinois.

No. 6.....VALUE 50 CENTS.

Alisana Bank,
Bank of Aledo,
" Ashland,
" Benton,
" Carmi,
" Pike County,
" Republic,
" Southern Illinois,
Canal Bank,
Commercial Bank, N. H'n,
Corn Exchange Bank,
Continental Bank,
Commercial B'k, Palestine
Corn Planters' Bank,
Douglas Bank,
Farmers' Bank, N. Canton,
Farmers' Bank of Illinois,
Garden State Bank,
Hampden "
Humboldt "
Kaskaskia "
Lafayette "
Prairie State "
Plowman's "
Reed's "
State Bank of Illinois,
Southern Bank of Illinois.

No. 7.....VALUE 46 CENTS.

American Exchange Bank
Bank of Aurora,
" Chester,
" Commonwealth,
" Naperville,
" Quincy,
" Raleigh,
Belvidere Bank,
Citizens' Bank,
Farmer's & Traders' B'k,
Frontier Bank,
Grand Prairie Bank,
Jersey County "
Lancaster "
Merchants' & Drovers' B'k
New Market Bank,
National Bank,
Railroad Bank,
Rock Island Bank,
Union County Bank.

Wisconsin—Current, 80 cents; Uncurrent, 40 cents

We pay in GOLD or EXCHANGE ON NEW YORK for the above List.

☞ Parties remitting us Uncurrent Money by "United States Express" can do so at our expense, by marking their packages "Season Contract of Wright & Brother." P. S.—On large amounts we make a liberal advance on our quotations. You will do well to give us a call before selling elsewhere. jy9-g83-1m

Source: *Chicago Daily Tribune*, July 17, 1861.

Figure 3

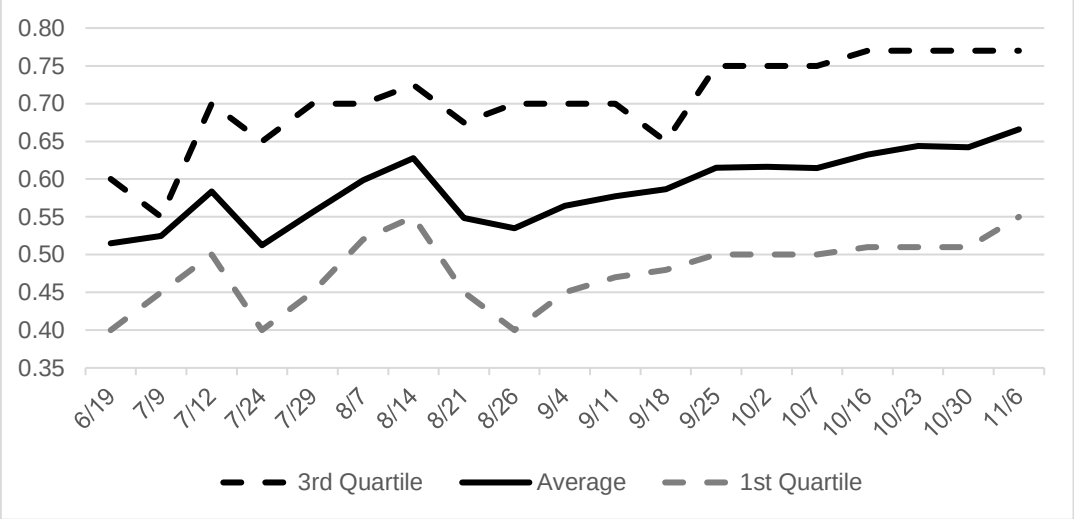
Image of Typical Wright & Brother Advertisement.

To supplement the Wright Bros. list, we also include prices for Marine Bank, a note-issuing free bank located in Chicago that appears in the Illinois Bank Commissioners' and Auditor's records but does not appear in the Wright Bros.'s advertisements. Marine Bank's owner, Jonathan Young Scammon, published advertisements in the *Tribune* throughout the period under examination that stated that he would redeem its notes at par (CDT 1861u).

Banknote holders faced significant losses when banknote prices are compared to their face value. Wright Bros. discounted banknotes well below par for most of the period (see Figure 4 below).

From the initial quotes until a week before their last advertisement the average price trended upward, yielding an overall average price of 58.5 cents. The quartiles deviation from the mean were fairly stable suggesting a consistent pattern in pricing. Starting in mid-August the trend in prices was more stable. August 15 was the date when banks declared agents and the Auditor started to liquidate free banks. On October 16 following the first round of

liquidations, redemption rates were declared by the Auditor. For these banknotes, the discount offered by Wright Bros. should reflect the transaction costs for Wright Bros. to convert banknotes into specie.



Source: prices advertised in the *Chicago Daily Tribune*, June 19 to November 6, 1861

Figure 4

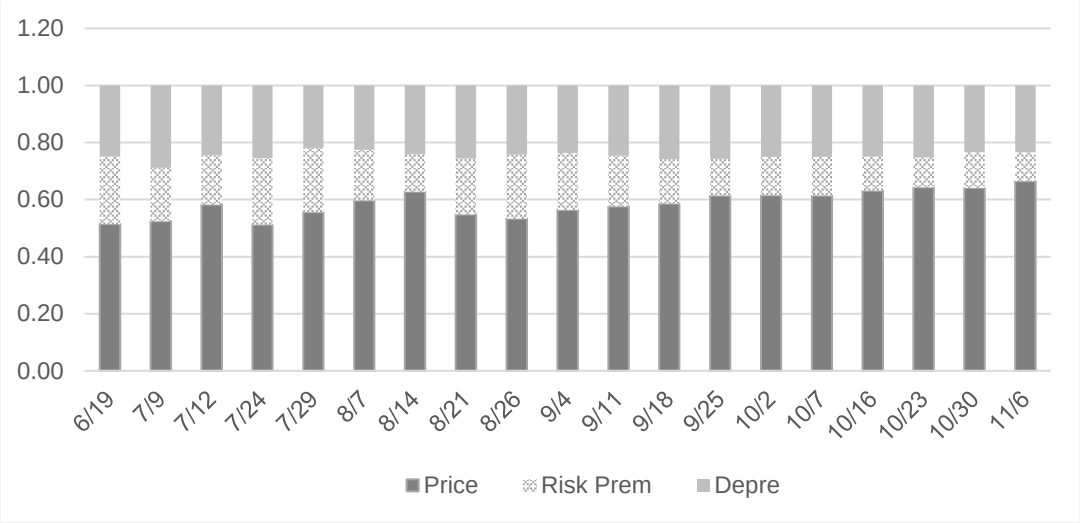
Wright Bros. Banknote Pricing, June to November 1861.

From the initial quotes until a week before their last advertisement the average price trended upward, yielding an overall average price of 58.5 cents. The quartiles deviation from the mean were fairly stable suggesting a consistent pattern in pricing. Starting in mid-August the trend in prices was more stable. August 15 was the date when banks declared agents and the Auditor started to liquidate free banks. On October 16 following the first round of liquidations, redemption rates were declared by the Auditor. For these banknotes, the discount offered by Wright Bros. should reflect the transaction costs for Wright Bros. to convert banknotes into specie.

Under normal conditions where notes were fully backed by the bonds, the price would be discounted equal to transaction costs. In 1861, the discount would include the depreciation of the bonds, transaction costs, and risk factors. An estimate of the market value of the banknotes can be calculated using the Bank Commissioners' Bond Report of May 1861 which contained the bonds and banknote circulation held by each bank and the weekly price data on most bonds traded published by Dwyer, Hafer, and Weber (1999).[18] Bond prices were not available for Illinois bonds, but since these bonds were accepted by the Auditor at par for banknotes, it was assumed that they had a market value equal to par.[19] Banknote price decomposition over the period is illustrated in Figure 5.

[18] In most cases, bond price quotes did not contain the maturity dates of the bonds. Bond prices would reflect the probability of default. In normal circumstances, state bonds would have a small probability of default. The Confederate States of America enacted a law in May 1861 to sequester interest payments to northern bondholders until the war ended (John C. Schwab, 1901).

[19] The Bank Commissioners provided the portfolio value of banks that were deficient. Using the portfolios of three banks that held Illinois bonds and southern bonds, we were able to estimate the price of Illinois bonds based on the published price of the other bonds at the time of the report. The average price of Illinois bonds was $98. Thus, using par value was a reasonable assumption.



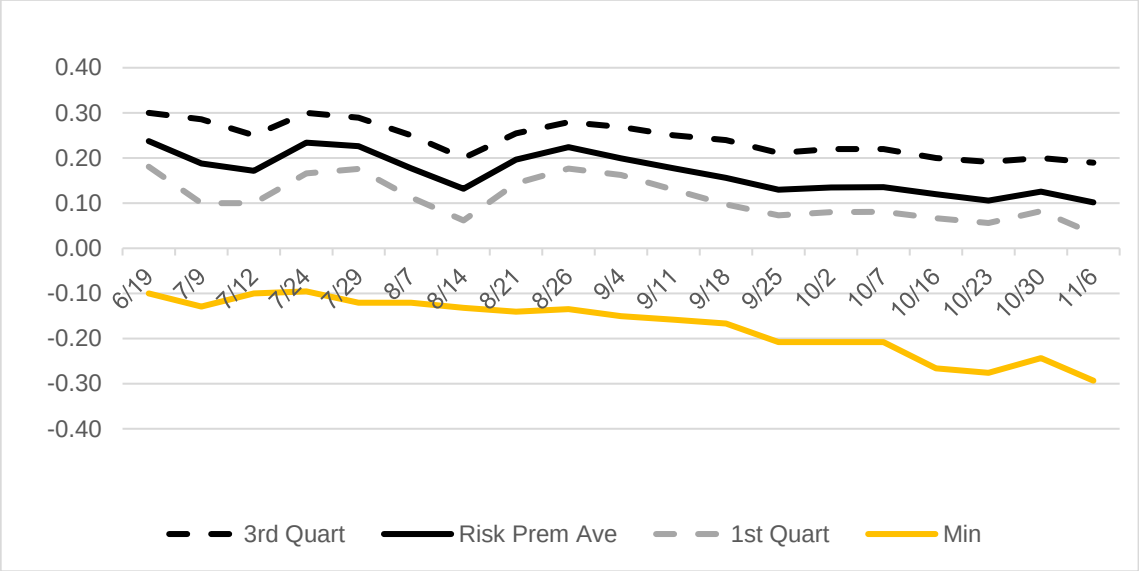
Note: The average risk premium is calculated by estimating the market value of each bank's portfolio. The risk premium includes the transaction costs which are assumed to be constant over this period.

Figure 5

Decomposition of Banknote Value Averages for Illinois Free Banks, June to November 1861.

The average banknote price increased over the period as more bank portfolios were sold by the Auditor and redemption rates were known. The market value of the average portfolio was steady over the period ranging between 25 to 26 percent below par value.[20] The average risk premium was at a high of 24 percent and by the end of the period it was about 11 percent. While the averages varied slightly over the period, the individual characteristics of each bank could vary greatly. Figure 6 shows the variation in the risk premium among the free banks. The risk premium primarily ranged between 10 and 30 cents on the dollar, although with a declining trend. For a few banks, the premium was negative, where the price set by Wright Bros. was greater than the market value estimate of the banknotes. Several reasons could explain the negative risk premium. First, Wright Bros. may have expected or had insider information about a bank that was planning to make good on its banknotes and was planning to operate throughout the Civil War. The Bank Commissioners' report in November showed that some of these negative premium banks had swapped southern for northern bonds since the last report. (This is a limitation of our data.) Second, in some cases, this information about a commitment to continue was known when a bank announced that they had complied with establishing an agent or advertising a commitment to redeem at par regardless of the market value of the portfolio (CDT 1861r). This was the case with Reaper's Bank, Union Bank, and Mechanics Bank (CDT 1861v). Finally, the pricing of notes by Wright Bros. could reflect estimates of the value of banks' assets. For example, one of the banks, Bank of Galena, held a specie reserve close to 200 percent of their circulation (Illinois Bank Commissioners 1860).

[20] The actual depreciation was higher since many of the banks received banknotes equal to 90 percent of the bond's market value.



Source: Dwyer, Hafer, and Weber (1999), *Chicago Daily Tribune*. Our calculations.

Figure 6

Risk Premium of Illinois Free Banknotes, 1861.

Analysis of the Wright Bros.'s Banknote Pricing

Theory of Banknote Pricing

The free banking states designed their banking systems with the intention that banknotes would circulate near par (face) value. Banknotes issued by free banks would circulate at par near their issuers' location and at a discount further away due to transaction costs. Researchers have found that the prices published by banknote reporters were associated with standard economic asset-pricing theory. Bodenhorn (1998), Gorton (1996), and Jaremski (2011) also argue that risk factors contributed to pricing decisions in the secondary market. Gorton (1996) found that experience and reputation, proxied by the age of the institution, lowered the discount rate due to lower risk. Using data from New York City and Philadelphia, Jaremski (2010) found that banknote discounts could be explained by specie suspensions, falling prices of bonds in bank portfolios, and undiversified portfolios. Using monthly data from a banknote reporter from 1838-1843, a period of falling asset prices, Bodenhorn (1998) showed that banknote discounts would increase as early as two years before the failure of established banks and that discounts fell when troubled banks improved their portfolios. Gorton (1999) argued that the price of a banknote is a function of the travel time to the issuer as well as the issuer's reputation as measured by the age of the bank. The consensus of research is that the discount rate on banknotes is a function of the prices and quality of assets held by the issuing bank, transportation costs, and the bank's reputation. While these attributes influenced banknote prices during periods of calm when markers were relatively orderly and well-functioning, the question arises of whether these attributes retained their influence in disorderly markets such as those associated with a banking or financial crisis. Specifically, we ask if Wright Bros. was pricing banknotes systematically for bond values and risk?

Data

Several sources were used to gather data for the analysis: the Bank Commissioners' Report for financial information, the *Tribune* for Wright Bros.'s prices, Illinois Auditor Reports and *Banker's Magazine* for ownership, and Dwyer, Hafer, and Weber (1999) for bond prices. If Wright Bros. was efficiently pricing banknotes the change in banknote prices should mirror the market value of the portfolio controlling for bank-specific risks. Two periods were examined to assess Wright Bros.'s pricing policy. The first period captures the significant drop in bond prices caused by the Civil War. The second period assesses Wright Bros.'s pricing policy over time during a period of moderate bond price movements.

As noted above, Wright Bros.'s pricing data started on June 19. In order to capture the change in banknote prices, a proxy was constructed for free banks before the start of the Civil War. On April 4 the Bank Commissioners published in the *Tribune* estimated banknote market prices of all (108) individual free banks. We assign prices in five-cent increments to free banks. Banks that were not on the rejection list were assumed to be current. Current Chicago free bank notes were priced at par and non-Chicago banks were priced at a 5 percent discount. All banks on the rejection list were assigned a price at the nearest five-cent increment below the estimated market value of the portfolio. Free bank bond portfolio estimates for the banknote prices from June 19 were based on the Bank Commissioners' report of June 4.[21] From these data, changes in banknote prices and the market value of bond portfolios were calculated.

In addition to banknote prices and the market value of the bonds, the redemption costs and perceived risk were collected. The redemption costs could be approximated by the distance to the bank from Chicago (or the location of the clearinghouse plus the commission). Risk factors can be based on the character of the institution as well as its financial strength. Several variables were used to capture bank-specific risk including measures of reputation and bank-specific financial information. Reputation measures the quality of the ownership. Quality could cut both ways. Ownership could signal a commitment to solvency while it could also show poor decision-making. Banks that honored past margin calls provided an implicit commitment to keeping the bank afloat. Six banks made good their deficiencies and were announced in the *Tribune*. While all free bank owners were personally liable up to their capital invested in the bank, some owners had a greater stake in honoring their banking commitments. Because private bankers were prohibited from issuing banknotes, many found it beneficial to establish a free bank. Thirty-nine percent of free banks had at least one Illinois private bank owner (Economopoulos 2021).[22] Furthermore, since country private bankers needed to network with Chicago bankers, the Chicago banker would have insider information about the character of the institution. Ownership could also have a poor reputation from poor portfolio decisions. Thirty-two banks were "thrown out" three days before the Bank Commissioners' report. These banks had significant deficiencies and were priced at a discount in April. Could they be punished even more after the financial turmoil? Finally, a clear signal to the market of ownership's commitment was establishing an agent in Chicago or Springfield.[23] By law, banks were to announce their agent by August 15. If prior actions signaled future actions, it is expected that announcing an agent would reduce the discount rate and raise the price of the bank's notes.

[21] Bonds were published in the *Tribune* until June 24. See footnote 19 for pricing issues relate to Illinois bonds.

[22] Out-of-state private banks were owners of free banks but were excluded since out-of-state ownership was less involved in the local community.

[23] Less than 2 percent of the banks announced that they established an agent. However, some banks survived the turmoil and operated until 1864 (about 8 percent of the sample), but there was no notice published by the Auditor.

A bank's financial condition is critical in assessing bank-specific risk. Eighty-six percent of the banks in the sample submitted financial reports to the Commissioners prior to the Presidential election. The amount of specie held or the outstanding amount of banknotes enabled banknote brokers to determine default risk. Since the reports provided information on banks, and some information is better than no information, we expect banks publishing their financial statements will have had a smaller discount (higher price) than newly-established banks. As noted above, some banks had significant specie reserves which would have also lowered their risk. Finally, the size of the circulation could be a risk factor to prospective banknote purchasers. Banks with smaller circulations were more likely to meet their obligations with other bank assets and personal commitments of stockholders than banks with larger circulations.

The April 4, 1861 Bank Commissioners' report listed 108 banks. Table 2 provides a summary of banknote prices and firm-specific characteristics. Before the fall in bond prices, the average price for banknotes was close to par and was backed by a bond portfolio that was a few cents above the banknote price. By the time Wright Bros. published its first list on June 19, the average price had dropped 43 cents while the value of the average portfolio dropped by only 27 cents, a widening of the gap of over 16 cents on average. This gap could be explained by the heightened risks of the individual banks.

Table 2
Illinois Free Bank Summary Statistics

	Pricing Summary			
	Mean	Maximum	Minimum	Median
Banknote Price April 4, 1861	0.945	1.00	0.70	0.995
Bond Market Value April 4, 1861	0.963	1.15	0.739	0.975
Banknote Price June 19, 1861	0.514	1.00	0.40	0.450
Bond Market Value June 19, 1861	0.696	1.043	0.437	0.645
Decline in Banknote Price	0.445	0.595	-0.005	0.450
Decline in Bond Market Value	0.268	0.552	-0.027	0.280
	Firm-specific Statistics			
Private Banker Ownership	0.389	1	0	
Made Margin Call	0.046	1	0	
Thrown Out	0.340	1	0	
Circulation ($)	94,113	415,160	1,721	75,715
Specie ($)	2,497	44,706	0	530
Distance from Chicago (miles)	241.2	373	0	269

Private bankers made up 39 percent of the sample and it is expected that they would have had lower risk than the banks that were thrown out for poor management who made up 34 percent of the sample. At the time of the April 4 report, free banks averaged $94,113 banknotes in circulation with the largest having over $400,000 in notes circulating and the

smallest bank having $1,721. Specie held by the typical free bank was insufficient to cover banknote deficits. While the average bank held close to $2,500, at least one bank held 18 times more specie and half of the banks held less than $530.

Econometrics of Bank Note Prices

We analyze the factors influencing Wright Bros.'s pricing decisions. We first examine Wright Bros.'s first pricing announcement. Wright Bros. had sufficient time to gather information about the creditworthiness of banknotes as well as having the Railroad list available to them. We look at the change in banknote prices prior to the April 12 drop in bond prices and the first Wright Bros. price list on June 19. We employ cross-sectional data that includes the change in the market value of the bank's portfolio and firm-specific characteristics related to redemption costs and risks. Our specification is as follows:

$$\Delta Price_i = C_o + C_1\, \Delta BanknoteMV_i + C_2\, Distance_i\, (+\, \gamma\, Bank\ Risk_i) + \mu_i$$

where Price is the price of a banknote advertised by Wright Bros., BanknoteMV is an estimate of the market value of a banknote based on the bank's bond portfolio, Distance is a proxy for redemption costs,[24] and Bank Risk is a vector of bank risk factors. BanknoteMV was calculated by dividing the estimated value of the bond portfolio by the circulation of the bank in the last Bank Commissioners' report. It is expected that the discount rate would be positively related to banknote value. If markets were efficient, the pricing of banknotes would be expected to move on a one-to-one basis, holding other factors constant. In essence, the coefficient would be near 1. Distance is the number of miles the bank is from Chicago.[25] The further the distance from Chicago, the greater the discount due to higher transaction costs. Bank Risk includes reputational variables and financial information of the bank. We include three reputational dummy variables. If a bank was owned by a private banker, Bank Own took on a value of one, otherwise zero. If a bank responded to a margin call, Margin Call took on a value of one, otherwise zero, and if a bank was thrown out by the Chicago private bankers on March 31, Thrown Out was given a one, otherwise zero. We include three financial variables. Old, a dummy variable, indicated that the bank submitted a financial report to the Bank Commissioners on October 31, 1860, and received a value of 1. If the bank entered after the October report, there was no financial information on the banks, except the bond portfolio, and Old received a value of zero. The circulation (Circ) of the bank listed by the Bank Commissioners in the April 4 report, and Specie held by the bank in the October report were also included. Both values were logged.

Results of Wright Bros.'s First Pricing Announcement

We present results for three models in Table 3. Model 1 is the Gordon model where the banknote price is a function of the bond portfolio and the transaction costs for redemption. Both variables are statistically significant. If Wright Bros. was pricing the notes efficiently, we would expect a coefficient close to one. However, this is not the case. A change in the value of the bond portfolio of one dollar prompted Wright Bros. to change note prices by only 62 cents, so Wright Bros. did respond to the market movements of the bonds backing the notes, but not as efficiently as we expected. The null hypothesis of the coefficient being equal to one

[24] Distance could also capture a bank's risk premium. Banks located in inaccessible areas were called wildcat banks.

[25] While the effective distance for Wright Bros. is the miles to Springfield where they can redeem the banknotes into bonds, the distance will also reflect the contemporary view that banks further away from Chicago were inherently riskier.

can be rejected at the 1 percent level of statistical significance. A bank located a distance of 100 miles from Chicago saw a change in banknote prices of two cents. Wright Bros. charged about five cents on the dollar for the average free bank.

Table 3
Wright Bros. Pricing of Illinois Free Banknotes, June 19, 1861

	1	2	3
ΔBanknoteMV	0.626***	0.661***	0.662***
	(0.053)	(0.059)	(0.070)
Distance	0.0002*	0.0001	0.0001
	(0.0001)	(0.0001)	(0.0001)
Bank Own		-0.017	-0.002
		(0.019)	(0.021)
Old		0.027	
		(0.021)	
Margin Call		0.094**	0.102**
		(0.042)	(0.049)
Thrown Out		-0.052***	-0.041**
		(0.018)	(0.020)
Log(Circ)		0.033**	0.029*
		(0.013)	(0.017)
Log(Specie)			-0.007***
			(0.003)
Constant	0.213***	-0.104	-0.059
	(0.041)	(0.145)	(0.188)
N	108	108	94
Adj R^2	54.1%	59.8%	59.5%

Note: ( ) denotes robust standard errors; *p<0.05 **p<0.01 ***p<0.001

Models 2 and 3 include the bank risk factors. While the coefficient on change in the market value of the bank portfolio is still significant and has a slightly larger impact on pricing decisions, the distance coefficient is no longer significant. Distance measures the cost of redemption but it could also be a proxy for risk. The change in the coefficient size when the bank risk factors were introduced suggests there was some omitted variable bias in Model 1.

Bank ownership as well as operating in 1860 (Old) had no impact on Wright Bros.'s pricing decision. However, information on a bank's specie reserves from the 1860 Bank Commissioners' report did have a statistically significant but economically small influence on the pricing decisions of Wright Bros. A 10 percent increase in specie reserves led to a 0.07 cent decrease in the change of the note's price. For the average free bank, the change would be approximately $250 of specie. A 10 percent increase in circulation, or about $9,400 for the typical bank, leads to a 0.3 cent increase in the change of banknote prices.

Banks that were in trouble factored into Wright Bros.'s pricing of banknotes. However, the signs are the opposite of what was expected. We expected that banks that made good on their call (Margin Call) and bolstered their portfolios would have a negative change in price since their reputation would have indicated that they would again refortify their deficit and Wright Bros. would have priced in that expectation. However, the coefficient on this variable was positive. On average, banks that made their call early were priced 10 cents lower than other banks. This suggests that Wright Bros. did not consider making a call as a signal of commitment to continue in the market. We also expected that banks that were "thrown out", suggesting higher perceived risk, would have had a positive change in price relative to non-thrown out banks, but the findings indicate otherwise. The coefficient was negative by about 5 cents on average. Wright Bros.'s change in price was less than "current" banks that were not thrown out. The evidence could suggest that banks, though meeting the call, were priced near par on April 4 but were badly managed and Wright Bros. penalized them. Those that were thrown out were already discounted from the start.

Results of Wright Bros.'s Pricing During the Summer of 1861

We next examine the discount rates charged by Wright Bros. from June 19, 1861 to the first week of November when the bond market had stabilized. How sensitive was Wright Bros.'s pricing to weekly changes in the market? The following fixed effects model employs a panel data set of weekly prices of all banks:

$$Price_{it} = B_0 + B_1\ BanknoteMV_{it} + B_2\ Market\ Risk_t + B_3\ Redeem\ Date_{it} + B_4\ Agent_{it} + \gamma\ Time_t + \zeta\ Firm_i + v_{it}$$

Price and BanknoteMV are as defined previously. Market Risk is the market risk premium calculated as the difference between the current return of the bond portfolio of all free banks held by the Auditor less the return of US Treasuries.[26] The bond portfolio return is a weighted average of state bond current returns. The risk premium would change weekly as the market price of the bonds changed. In the sample the average risk premium was 12.5 percent, with a high of 14.6 percent and a low of 11.95 percent. Redeem Date is the announced date of the redemption rates by the Auditor. The Auditor applied for a court order to take possession of the bonds to sell in New York (ISJ 1861a). It took approximately 30 days before the Auditor announced the redemption rate for the banknotes. The first announcement for several banks took place on October 7 and periodically additional banks were posted. In the month of October, redemption rates were posted for 34 banks and nine were posted in November. At this point the value of the notes was known with certainty. Even so, Wright Bros.

[26] Since maturities on bonds were not available, current yields were used.

continued to set prices on these banks and so the discount should reflect the transaction cost of redemption. Redeem Date is a dummy variable which takes a value of 1 in the weeks in which the redemption rate was known, otherwise zero. If the price was reflected in the market value of the bonds, risks, and reputation, then the coefficient on the Redeem Date would be zero. If there were market inefficiencies the coefficient would be non-zero, albeit more likely to be negative in which Wright Bros. overcharged for banknotes. Finally, Agent is the date on which the free bank announced the agent and location for banknote redemption. This variable takes a value of 1 on the date and thereafter, and zero otherwise. Time and Firm are fixed effect dummies for weeks and firms, respectively.

We present our results in Table 4, column 1. While the market value of the bond portfolio was significant in the initial pricing of banknote it appears that weekly changes in the value of the portfolio had no impact on Wright Bros.'s later pricing decisions.

Table 4
Wright Bros. Pricing of Illinois Free Banknotes, June-November, 1861

	1	2
BanknoteMV	0.0259	0.343*
	(0.070)	(0.184)
S.Banknote MV		-0.353**
		(0.169)
Risk Premium	-8.541***	-8.446***
	(0.713)	(0.756)
Agent	0.172***	0.172***
	(0.035)	(0.035)
Redeem Rate	-0.004	-0.003
	(0.007)	(0.007)
N	1998	1998
Adj R^2	0.60	0.60

Note: ( ) denotes robust standard errors; *p<0.05 **p<0.01 ***p<0.001

What may be the reason for the unresponsiveness of banknote discounts to the market value of bond portfolios? Did Wright Bros. differentiate between free banks that held northern bonds and free banks that held southern bonds? Free banknotes secured by northern bonds would be in higher demand and Wright Bros. could have been more responsive to Northern bond price changes. Southern bonds were deeply discounted due to risk and any small movements in price may not have prompted them to change the discount. To examine if Wright Bros. differentiated between banks holding northern bonds from southern bonds we add an

interaction term. The market value of the bond portfolio (BanknoteMV) was multiplied by the percentage of the portfolio that was secured by southern bonds. The new variable's (S.BanknoteMV) coefficient would be added to the BanknoteMV coefficient to determine the sensitivity of the discount to the portfolio value and the bond composition. Our expectation would be that banknote prices for banks holding more northern bonds would be more sensitive to market movements relative to banks holding more southern bonds, so the interaction term would have a negative sign.

Column 2 of Table 4 presents our results including the interaction term. These results do indeed suggest that portfolio composition as well as the market value of the notes had a significant impact on how Wright Bros. priced free banknotes. The degree of change depended on the percentage of southern bonds held. For a free bank that secured its banknotes with only northern bonds, which yielded S.BanknoteMV = 0, Wright Bros. responded to market movements in the portfolio but it was only a partial response to the market movements. For every dollar change in value, the price of the banknote only adjusted by 34 cents. A movement of 15 cents in the market value of a 100 percent Northern bond portfolio would have prompted Wright Bros. to move the bank into a new five-cent pricing category. This was not the case for banks that held southern bonds. The larger the percentage of southern bonds backing banknotes the less responsive was Wright Bros. in changing prices. A free bank that held 100 percent of its portfolio in southern bonds was effectively ignored by Wright Bros., with the coefficients on the terms BanknoteMV (0.343) and S.BanknoteMV (-0.353) almost exactly offsetting oneanother.[27] These banks were deeply discounted; 35 banks held 100 percent southern bonds and their average price was 41 cents on the first price list (June 19), one cent above the minimum. Wright Bros. changed prices for other firm-specific reasons.

Yet Wright Bros. was responsive to the overall movement in the market risk. A one percent increase in the market risk led to an 8.5 cents drop in the price of a banknote. Given that the median weekly change in the risk premium was 0.03 percent, the minimum change was -1.3 percent, and the maximum change was 1.7 percent, it would appear that Wright Bros. would change prices infrequently due to the market movements, and only then when there was a large movement in risk.

Free banks were immediately rewarded by announcing that they were going to establish an Agent in either Chicago or Springfield. Prices for these banks increased on average by 17.2 cents. Finally, the announcement of the redemption rates by the Auditor did not influence the pricing decisions of Wright Bros. If Wright Bros. was not pricing banknotes fairly, it would be expected that the coefficient would be statistically significant as they adjusted to the new information, but this was not the case.

While the NYC market discounted southern bonds at the start of the war based on a set of expectations, these expectations would have changed with each battle. Wright Bros. and any other private banker kept abreast of bond prices and they may have reacted to the war news. The fixed effects model included time dummies and these dummies would capture weekly time-relevant information such as war news. All of the coefficients are statistically significant and are valued relative to June 19 prices. The coefficients on the time dummies are given in Figure 7.

Hope for an early resolution of the war was dashed when the Southern army defeated the North at the First Battle of Bull Run on July 21. This was the first major battle since the firing on Fort Sumner.[28] News of the battle's outcome reached Chicago on July 23 with a front-page headline "Great Battle—Disastrous Retreat of our Troops—Panic among the Federal

[27] The joint test that the sum of the coefficients equal to zero could not be rejected.

[28] The Civil War Site Commission (1993) categorized over 300 battles. The Battle of Bull Run was listed as a Class A—Decisive Battle: "having a decisive influence on the campaign and a direct impact on the course of the war" (ibid.,16).

Troops…". On July 24 prices dropped on average 16 cents from their June 19 levels. While there was only one other major Class A engagement in 1861 after Bull Run, prices eventually returned to June 19 level.

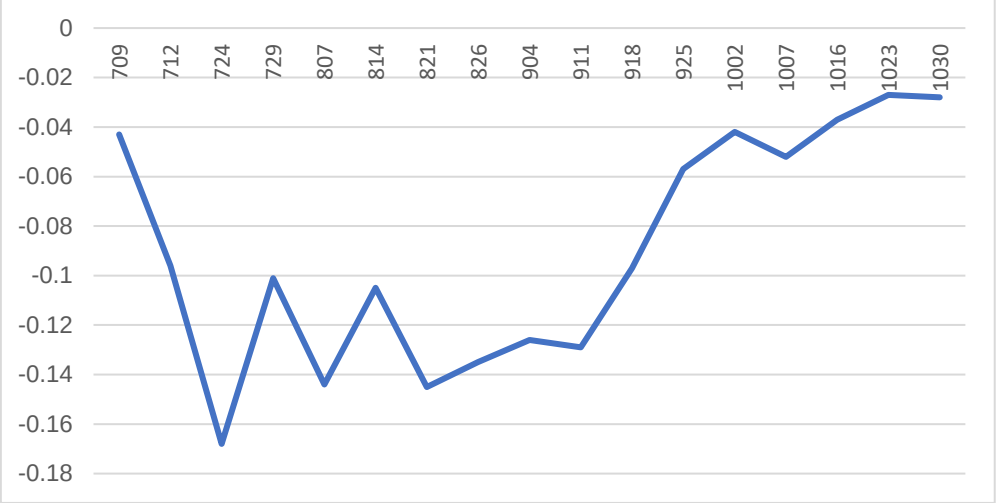


Figure 7
Coefficients on Time Dummy Variables from Fixed Effects Model.

Conclusions

The Illinois banknote market was in turmoil in the summer of 1861. Bond prices backing the notes depreciated 20 to 30 percent and attempts were made to keep the banknotes circulating near par. When these attempts failed, the market took over and started to price individual bank banknotes. Wright Bros. stepped in and helped organize the market by setting and offering prices for the notes. What were the basis of these prices? Did Wright Bros. fairly price these notes based on their portfolio value and risk? Was Wright Bros. efficient in pricing banknotes?

The results indicate that Wright Bros. reacted to the market movement in bond prices. Although their reaction was not what would be expected from an efficient market—a one-to-one correspondence—our results show that Wright Bros. required a much larger change in the bond portfolio's value before it would change price. Although bond portfolio composition influenced the prices set, Wright Bros. was less responsive to bond portfolios including southern bonds. In fact, Wright Bros. did not respond to banks that were 100 percent backed by southern bonds. It also priced the banknotes based on various risks and information available to it. With the uncertainty of payment of southern Bonds, Wright Bros. adjusted prices based on market risk. Information about bank financial strength also influenced how a banknote was priced. Wright Bros. valued the specie reserves of the free banks and their commitment to continue in the market, and showed bias towards banks that had large circulations. It also appears that Wright Bros.'s pricing responded to reputation. Banks that were thrown out or had responded to a call by the Bank Commissioners were penalized.

The view that free banking markets were primitive and wild has been debunked by a great many researchers. Even in the financial crisis initiated by the Civil War the market found ways to stabilize the monetary system and operate with a degree of efficiency in complex and uncertain circumstances. Wright Bros., representing the private sector, was systematic in valuing banknotes, but they were able to charge a premium above the clearinghouse price. Risk dominated Wright Bros.'s pricing decisions and only major movements in the value of the bonds would alter discounts, especially for banks secured by southern Bonds. Noteholders who had the opportunity to deal directly with a clearinghouse would have fared better. Data

limitations prevent a definitive conclusion concerning market efficiency, but it is safe to say that given the large supply of banknotes and the limited supply of specie and par currency, the public suffered significant losses.

Acknowledgements

The authors would like to thank the referees for their helpful comments.

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