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CAUGHT IN THE HEADLIGHTS: REVISING THE ROAD KILL HYPOTHESIS OF ANTEBELLUM ILLINOIS BANK FAILURES

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Illinois had a dismal free banking experience, with over 80% of its free banks failing by the start of the Civil War. Researchers agree that a dramatic change in bond prices was the catalyst, and some have shown that the riskiest banks, ex ante, were the most likely to fail. This study examines how Illinois free banks adjusted their portfolios in the face of increased political and financial risks prior to Abraham Lincoln's election as president. Lincoln's nomination in May 1860 and the Democratic Party schism in June 1860 raised the likelihood of secession and the potential for a significant decline in Southern bond prices. Given this heightened risk, did free bankers reduce their exposure to such a decline? In general, it appears that the free bankers took risks commensurate with expected returns and the uncertain political climate, purchased the most readily available bonds, and had sufficient backing to withstand a moderate decline in Southern bond prices. The dramatic price decline soon after the election appears to have caught many banks by surprise, like a deer caught in the headlights.

Introduction

Contemporary observers of the pre-Civil War, or *antebellum*, US banking system frequently characterized it as being chaotic, with episodes of "wildcat" banking. Without sound regulation, bankers ran fly-by-night operations that mainly issued notes without serving as functional intermediaries, according to this view (Hammond 1957 and Knox 1903). For example, in Illinois from 1851 to 1861, 91 out of 112 free banks closed without the ability to redeem their notes at par. Economic historians have sought to find alternative explanations for the system's relatively frequent bank failures. Arthur Rolnick and Warren Weber's (1983, 1984) reviews of antebellum banking suggest the failures were caused not by lack of regulations but rather by a particular regulation: the requirement for free banks to hold long-term bonds to back their banknotes, which were short-term liabilities. This regulation was a recipe for bank panics when bond prices experienced significant downturns. The ex post evidence is clear. When bond prices dropped significantly, bank panics ensued, and some unprepared banks failed.

Gerald Dwyer and R.W. Hafer (2004) examine whether loosely regulated banks took excess risks or were instead impacted by a sudden, unexpected crash in bond prices. In other words, were bankers reckless in their decisions, like a groundhog that, without looking before crossing, slowly waddles across a busy road? Or were they like the proverbial deer, crossing a seemingly dark rural highway at night, only to be surprised by the appearance of the headlights of a speeding automobile before becoming "road kill?" Although the sudden decline in bond prices was a factor in bank failures, Dwyer and Hafer also found that ex ante (measured before panics) bond portfolio risk exposure to runs on notes were also associated with an increased probability of failure. Matthew Jaremski (2010) extends Dwyer and Hafer's work by linking the probability of failure to a lack of diversification within a bank's asset portfolio. Jaremski found that banks with more loans and fewer notes (which corresponded to lower investment in bonds) were less likely to fail.

These studies, however, do not examine whether free bank managers adjusted their portfolios to reduce the likelihood of bankruptcy as new risks became apparent. Such adjustments may not have prevented failure, but they may have reduced losses to noteholders and, ultimately,

stockholders. In addition, these studies used bond data with missing prices for some of the bonds held by the Illinois free banks that could have changed the bank's estimated risk-return profiles. In this study, we incorporate bond price data from a new source, the *American Railroad Journal*, in which 40 months of prices from 1856-1859 are available. We add this to existing data available in the Richard Sylla, Jack Wilson, and Robert Wright online database on early US security prices (available at http://eh.net), Dwyer, Hafer, and Weber's (1999) research on bond prices of the era, *The Banker's Magazine and Statistical Register*, and reports written by the Illinois State Auditor—an agency that kept data on free bank bond transactions over time. These data will provide a more complete assessment of the risk of the free banks. A detailed description of this data is available in the Appendix.

Furthermore, this study will include an analysis of bond portfolio composition and bond transactions by Illinois free banks prior to two significant drops in bond prices – one associated with the Panic of 1857 and one associated with Abraham Lincoln's election as President in November 1860. Following the Republican Party's nomination of Lincoln for president in May 1860, the corresponding increase in the default probability of bonds issued by Southern state governments could have been anticipated by many free bank managers.[1] We do not expect all of them to have adjusted their portfolios, but at the margins we expect at least some to have adjusted their portfolios to adjust their risks, given that a full five months passed before Lincoln's election. The events in the months leading up to the election should have provided sufficient uncertainty regarding debt issued by Southern state governments to encourage free bank managers to reduce risk in their portfolios. By looking at portfolio management during this period, the analysis will provide evidence to help answer the question of whether free bankers were active managers of risk with a goal of preventing failure.

[1] We use the term "Southern states" to denote those states that allowed slavery. Later in the paper we identify Border States as slave states that did not join the Confederacy.

We examine Illinois free banks' risk management practices using measures related to their bond holdings over time. With the assembled data, it is possible to examine whether they properly accounted for historical bond price volatility when constructing their bond portfolios. We estimate the portfolios' value at risk (VaR), yields on the bonds, and bond price volatility to help assess Illinois free bank managers' risk-return decisions. We also develop a measure of bond availability to determine whether banks were purchasing the most readily available bonds in the months leading to Lincoln's election. By looking at these measures near key events and the changes that free banks made to their bond holdings in response to those events, we assess whether banks prudently managed the risk of Southern secession before the election of 1860.

Background: Free Banking in Illinois

As in in most states that allowed free banking, the 1851 Illinois free banking law was modeled after legislation passed in New York in 1838 which had worked effectively there. The law granted banks charters without requiring legislative approval as long as the banks met certain capital requirements. These requirements included a minimum investment of $50,000 in certain types of state or federal bonds that were deposited with the Illinois State Auditor. Stockholders were personally liable for bank debts up to the amount of their investment in the bank, a responsibility known as double liability. For the purposes of securing bank notes, the values of US and state bonds were set equal to their average prices in the previous six months of trading in New York City. Prior to 1857 banks were allowed to issue notes in amounts up to 100 percent of this measure of market value, with some additional restrictions based on the bond's coupon rates. Starting in 1857 banks would receive notes equal to 90 percent of the market valuation up to the bonds' par values, but they could not issue notes in excess of their bond's par value (Illinois General Laws 1857, 24). After Lincoln's election and the ensuing crash in Southern bond prices, the legislature restricted note-backing bonds to Illinois and US bonds. The free banking system in Illinois would end soon after, when the legislature enacted an entirely new banking system to be approved by referendum at the November 1861 election.

Free banknotes functioned as paper currency. By law, each bank was required to redeem its notes on demand for gold specie. Free banks therefore exchanged their notes with the public in order to issue loans as well as to increase their gold specie reserves (Rolnick and Weber 1988). The law also included a provision that charged the bank commissioners to "inspect the securities filed …so as to determine whether or not any change has been made…in respect to the sufficiency of such securities to meet the liabilities" (Illinois General Laws 1851, 171). If they judged that some banks' securities were found to be insufficient to meet the liabilities, the commissioners issued "calls" on those banks requiring them to post additional securities as collateral or turn in banknotes within 90 days. Prior to 1857, the bank commissioners reported to the legislature that they had made calls, but there was no public record of the banks that were called. A new set of commissioners were named in 1857, and under their charge the names of the banks, the amounts of their deficiencies, and the deadlines to comply with the calls were made public. Between 1857 and 1861, five calls were made: Two in 1857, prior to that year's "Panic"; one in early 1860 after a significant drop in Missouri bond prices; one in late 1860 after the presidential election; and one in April 1861 after the firing on Fort Sumter (Illinois Bank Commissioners 1858 and 1861, Banker's Magazine 1860).[2] In some cases free banks chose to close, and the Illinois auditor sold the bonds in New York City. If the Illinois auditor did not have sufficient funds to fully redeem the notes, noteholders were compensated in gold specie based on their *pro rata* share of the bank's outstanding note circulation (Illinois General Assembly 1851, 167-169).

Facing Price and Call Risk

Between the law's enactment in 1851 and the first year of Lincoln's term in 1861, 91 Illinois free banks failed. As evidence that bond price risk was a significant challenge for bank managers, 89 banks closed during times of falling bond prices. Absent a system-wide panic or the prospect

[2] The cited reports can be found in volumes for the years in the parenthetical citations, even though some of the reports were not written in those years.

of secession and war, bond price risk largely depended on the issuing state's financial and economic conditions. In addition, many state governments issued bonds for internal improvements, typically railroads. In Missouri, for example, the bonds were issued to railroads that in turn sold them to raise capital for improvements. The railroads paid the equivalent of coupons to the state so it could pay bondholders. The failure of a bond-funded project increased the burden on the state's general budget, decreased the certainty of bond payments, and drove prices down. As the likelihood of secession increased during the late 1850s and early 1860s, the default risk on Southern-state government bonds developed a component of political risk.

These risks were compounded by "call risk," the possibility that Illinois' bank commissioners would issue a call on a bank because its bonds' value had declined more than 10 percent. If banks' bond portfolios were not well-diversified, a decline in a single bond's price could lead the bank commissioners to require more collateral. Banks typically received 90 days to comply. This call would also alert the bank's noteholders to heightened redemption risk, leading them to demand specie.

Bank managers could manage these risks several ways. One way, of course, was to purchase bonds with low ex ante risk of default. Portfolio diversification offered another avenue for risk management. As Jaremski (2010) and Andrew Economopoulos (1990) show, free banks could further mitigate their risks by increasing the proportions of loans and specie on the assets sides of their balance sheets. Increases in loans, which primarily had short terms to maturity in the *antebellum* era, reduced liquidity risk. Increasing specie relative to notes reduced redemption risk. The banks could also diversify their liabilities by increasing deposits relative to banknotes.

The Bond Market Facing Illinois Free Bankers

For free bankers to diversify and manage risk, they needed access to a wide variety of bonds with prices near market value. Howard Bodenhorn (2000) argues that by the middle of the nineteenth century the US financial market was sufficiently advanced for all participants to understand the risk and return choices they faced. Greater technological capacity had recently emerged, with some market news and orders travelling over telegraph

wires or railroads. Bond prices were quoted daily in major city publications, small-town newspapers, and trade publications such as *The Bankers Magazine* and *American Railroad Journal*. As the speed of capital flows increased during the first half of the nineteenth century, US financial markets became more integrated.

This integration was made possible through the network of relationships between country banks, private banks and city banks. Illinois free banks could access the New York City bond market through correspondent New York City banks. They could also tap a network of Illinois "private" banks with agents in New York City. (Private banks did not issue notes but performed other bank functions. See Richard E. Sylla (1976).) *Bankers Magazine* (1860) published a directory that shows Illinois had 143 private bankers in 1860, 134 of which maintained relationships with New York City agents.

Although it was becoming easier to buy and sell bonds, some bonds appear to have been easier to buy and sell than others. To gain a sense of which states' bonds were most liquid during this time, we gathered data published between June and July in each of the years 1858, 1859 and 1860 in *The New York Daily Tribune*, which reported when various bonds were traded in the New York City market. Table 1 summarizes the assembled data on state bond trading frequency on the Morning Board and Second Board (afternoon trading). Four of the five most actively traded bonds in the market were issued by Southern states. Banks appear to have had access to Missouri, Tennessee and Virginia bonds on most days. Northern state and United States bonds, however, changed hands less frequently and in smaller amounts.

The light volume of Northern bonds could have been driven by limited supply as well as high demand from banks that bought and held those bonds to maturity. New York free banks, for example, could only use US or New York bonds to back their bank notes. Southern bonds may have traded more frequently than Northern bonds because they were issued more frequently during this period (see the two rightmost columns of Table 1). Contemporary researchers (Warga 1992; Pasquariello and Vega 2009) find that recently issued ("on-the-run") bonds trade more frequently

than "off-the-run" bonds. This relationship appears to have held in the antebellum era as well.

Table 1
Bond Trading Activity in New York City and State Debt, 1858-1860

	Morning Board^		Second Board^			
Bond Issuer	*% of Days Traded*	*Average Trade (1,000s)*	*% of Days Traded*	*Average Trade (1,000s)*	*State Debt 1857 (Millions)+*	*# of State Issues 1858-60**
MO	97%	$36.64	72%	$15.54	$25.0	2
TN	73%	$14.12	40%	$ 9.18	$10.6	3
VA	71%	$ 9.08	39%	$ 7.77	$27.5	2
NC	35%	$ 4.79	18%	$ 5.67	$ 9.1[1]	3
OH	33%	$ 0.50	5%	$ 1.00	$24.0[3]	2
US	12%	$ 2.54			$65.0[4]	2
MI	6%	$ 4.78			$ 2.3	0
LA	4%	$ 7.17	2%	$ 1.67	$10.1[1]	1
NY	3%	$ 0.50			$33.9[2]	1
KY	3%	$ 1.17			$ 5.7[1]	0
ILL	3%	$ 2.33			$12.8	1
GA	3%	$ 1.00			$ 3.7[1]	2
MN	2%	$ 3.33			$ 5.3[5]	1

Sources: ^ *New York Daily Tribune*, various issues, 1858-1860*;* + *Banker's Magazine* Vol. 12; 1. *New York Times*, Sept. 11, 1861; 2. *New York Times*, Feb. 4, 1858; 3. *New York Times*, Nov. 29, 1858; 4. *New York Times*, Jan. 6, 1860; 5. *New York Times*, Apr. 19, 1858 *Illinois Auditor Ledgers

Based on bond issue dates recorded in the Illinois Auditor reports, it appears that new bond issues occurred annually for almost all of the most frequently traded states, but less often for the infrequently traded states. The auditor reports indicate that free banks could easily acquire bonds of infrequently traded states when they were newly issued. Several examples suggest this was the case. One Illinois bond issue bore an issue date of July 1, 1859, but the Illinois auditor recorded eight free banks depositing $684,000 of these bonds during a two-week period *before* July 1, 1859

(suggesting a private placement) and another $432,000 in the two months after. During that 10-week period, only three banks deposited non-Illinois bonds. We find a similar pattern for New York bonds with issue dates in July and August 1860. During those two months Illinois banks deposited $110,000 of those bonds, which represented 49 percent of all New York bonds deposited by Illinois free bankers. Ohio issued a bond on September 26, 1859, and $6,000 of that issue was deposited by an Illinois free bank on September 30. Auditor records show $54,000 in Iowa bonds deposited by two free banks within two months of their issue date (July 15, 1858), even though Iowa bonds were not traded in New York City during this period.

Thus, it appears that infrequently traded bonds were purchased by the free banks, but it was through local markets and near the time of their issue. The markets were integrated, and at times Illinois banks had a wide range of bond options to diversify their portfolios, but there is evidence of a liquidity advantage for recently-issued bonds. This would have given the bonds of many Southern states, which issued bonds more frequently than Northern states, an advantage in the marketplace. For banks that wanted to make significant purchases—such as a new bank or a bank expanding its note issue to support demand from a thriving agricultural economy—Southern bonds were likely to be the most readily available.

The Panic of 1857, a Bumper Crop, and the Civil War Crisis

Our study focuses on the response of Illinois free banks to the secession crisis. But to fully understand their response, we consider the events associated with a period of turbulence related to Missouri bonds and the broader financial crisis known as the Panic of 1857. At the beginning of 1857, 48 free banks had deposited bonds at the Illinois auditor. About 60 percent of the banknotes were backed by Missouri state government bonds. Missouri bond prices dropped by 8 percent from the beginning of the year to May 1, probably driven in part by the Supreme Court's March 1857 *Dred Scott* decision. Many of these bonds supported the construction of railroads that connected eastern parts of Missouri with the Kansas territory. "Bleeding" Kansas, as it was known at the time, was the subject of an intense battle between pro-slavery and "free soil" forces,

with free soil enthusiasts using railroads to move people and belongings to settle the new territory and hence, control its politics on slavery. Charles Calomiris and Larry Schweikart (1991) note that during this period, the prices of Western railroad securities appear to have moved to some degree in response to news about free soil prospects. The *Dred Scott* decision was a setback to free soil interests for a number of reasons, among them that it made the expansion of slavery in the territories more likely.

In response to the drop in Missouri bond prices, the bank commissioners issued a call. All but two banks complied. Two months later, on July 28, a second call was issued on 27 banks. They had until November 6 to comply (*Illinois State Journal*, October 24, 1857). In the meantime, the early features of the Panic of 1857 emerged. Commercial paper rates rose, and the bond market experienced a broad decline in prices as participants demanded liquidity. On October 12, New York City banks suspended the payment of specie. At this low point in mid-October, Missouri bonds had depreciated by 29 percent, while bonds from Illinois, the second largest issuer in banks' bond holdings, had depreciated an average of 52 percent, mostly during the previous month. From that point, bond prices recovered and returned to pre-crisis levels by the first of the new year, and banks ended the suspension of specie by April 1858 (*Bankers Magazine* 1858; Calomiris and Schweikart 1991). As a result of the call and market turbulence, however, six Illinois banks ceased operations, with four of the six closing voluntarily and redeeming their notes at par. The other two redeemed their notes below par (Illinois Bank Commissioners 1858).

Following the Panic of 1857, the Illinois banking market began to grow again, and the national bond market remained relatively stable until 1860. By the beginning of 1860, 75 banks were operating in Illinois, up from 45 at the end of the Panic. In 1860, Illinois free bankers encountered a mixture of good news from the farming-dependent Illinois economy and troubling news from neighboring Missouri and the national political scene. Regarding Illinois farms, George Dowrie (1913, 155) writes, "The year 1860…was the most prosperous one in the history of Illinois agriculture up to that time. The crops were unparalleled in size and excellence… and bank currency was in great demand for crop moving." Note issue increased over 22 percent from January to October of that year, according

to the auditor's records. On a more ominous note, in early 1860, the Missouri Governor proposed a 15 percent increase in the state debt to complete railroad projects, while the Legislature proposed a 25 percent increase in the state government's debt limit (*Bankers Magazine* 1860). Although the legislation was never approved, the prospect of an increase in the supply of Missouri bonds caused their prices to drop seven percent. In response, the bank commissioners called 18 banks with insufficient collateral. Some in the market, however, believed that a call would not cause managers to suspend operations. *Banker's Magazine* reported,

> "The banks are allowed until the 1st of April to respond, and it is possible that an improvement will take place in the stock market[3] before the date which will render unnecessary any action on their part." (1861, 824)

As the magazine suggested, Missouri bond prices rebounded by the call deadline (though they fell again later in 1860). All called banks continued operations and made reports in October 1860. In fact, with the agricultural sector demanding more notes, the number of banks had grown to 101 by then.

The national political climate during this period was far from stable. Some political leaders strived for compromise between the North and South, but those following the news of the day could see forces splitting the two sections of the country apart, particularly the pivotal 1860 presidential election.[4] The Democrats convened to nominate a candidate in April 1860, but they could neither agree on a candidate nor a platform and agreed to meet again in June. In May, a new party, the Constitutional Union Party, emerged with its own candidate for president, Tennessee

[3] In those days, the securities that are now called "bonds" were called "stock."

[4] Our information on the political environment immediately before the Civil War comes from a standard college American history textbook, Brinkley *et al.* (1991). We also draw from Hofstadter (1938) and the "Republican Party Platform of 1860," posted online by Gerhard Peters and John T. Woolley, *The American Presidency Project*. http://www.presidency.ucsb.edu/ws/?pid=29620. Sept. 15, 2015

Senator John Bell, and a platform advocating compromise to save the Union. That same month, the Republicans nominated Lincoln on a platform that opposed the expansion of slavery in territories that had not been admitted to the Union as states, a position that Southern political leaders would not accept. Reconvening in mid-June, the Democratic Party split, with a Northern faction nominating Illinois Senator Stephen Douglas and a Southern faction nominating Vice-President John C. Breckenridge. Southern states had over $120 million in debt prior to the Civil War (*New York Times* September 11, 1861, 2). Throughout the ensuing political campaign, some Southern leaders warned that if the Republicans won, Southern states would secede from the Union, a clear signal of increased default risk in those states' bonds.

Lincoln won the November presidential election without the electoral votes of any Southern states. In the following month, Southern bond prices dropped between 20 percent and 35 percent, prompting the Illinois bank commissioners' fourth call since 1856. The call list included 22 of 101 banks, 17 of which were on the previous call list. Within a month's time, the bank commissioners were ready to issue another call on "nearly all the remaining banks, but refrained due to the impact it would have on the financial markets" (Illinois Bank Commissioners 1861, 216). Although the call and subsequent near-call were due to falling bond prices, the situation appeared to be fundamentally different from those surrounding previous calls. On previous occasions when bond prices had dropped suddenly, such as the Missouri bond price dip in early 1860 noted above, media coverage reflected perceptions that the declines were temporary. In this case, however, with war looming, there was less confidence that the market for Southern bond prices would rebound. The fates of many Illinois free banks were sealed when Southern bond prices fell an additional 30 percent after the shots that started the Civil War were fired at Fort Sumter on April 12, 1861. The Illinois legislature enacted new requirements limiting new bonds to Illinois or US issues. Legislators also discussed repealing the existing banking system. These two legislative actions essentially put a hold on any action by the banks. Only a few banks submitted bonds to cover the call. Most reduced note circulation or failed.

Free Bankers' Portfolio Decisions: 1856-1860

It appears, ex post, that banks were reckless to hold significant portions of their portfolios in Southern bonds. However, ex ante decisions may show measured and prudent behavior given the information at hand, perceived risks, expected returns, and availability of each state's bonds. To evaluate the free bankers' decisions, we first give a general overview of the changes in free banks' bond holdings between October 31, 1856 and October 31, 1860, just before the election. This general overview includes summary statistics and a risk measurement that will reflect the ex ante information available to free bankers—value at risk (VaR)—which many banks calculate today to assess potential losses. Second we examine in greater detail the changes in free banks' bond portfolios during the crucial period between May 15, 1860 (three days before Lincoln won the Republican nomination) and October 31, 1860 (six days before Lincoln's election). We examine changes in the regional composition of bond portfolios, the availability of each state's bonds, and the possibility that banks in Southern Illinois had a geographical affinity for Southern bonds. Third, we examine two channels other than bond trading through which free bankers could mitigate risk: increasing specie relative to banknotes and limiting note issue. Fourth, we examine free bankers' risk and reward decisions before the 1860 election by examining bond flows, yields, and yield-to-volatility ratios according to the bond issuers' state, rather than their region. Finally, we review several newspaper articles from the period to give a sense of "the view from the ground."

Changes in Free Bank Bond Portfolio Composition: 1856-1860

Illinois bankers could adjust their portfolios at the margins by avoiding Southern bonds when enlarging their portfolios, or they could have maintained their portfolios' sizes by swapping Southern bonds with Northern bonds. These adjustments would not only reduce call risk, but more importantly also reduce stockholder losses in the case of a general decline in Southern bond prices. To assess Illinois bankers' responses to market-wide increases in risk, we examine changes in their bond portfolios' composition around the Panic of 1857 and then from the end of the Panic until the 1860 election. We use data from Illinois auditor reports

and business newspapers published during the period. A description of the data and how they were gathered is in Appendix I.

Table 2 describes the movement of bonds between November 1856 and October 1858 for banks that survived the Panic and appeared in both Illinois Auditor reports for those months. Illinois bank commissioners made two calls in 1857. The table segments banks into those that were not called and those that were. The groups differ in how they adjusted their bond portfolios. Banks that were *not called* reduced their overall bond holdings and, by extension, their banknote issues. Notably, they reduced their Northern and federal bond holdings, which auditor records indicate were primarily from Illinois, and Border state bonds, of which Missouri bonds comprised 99 percent. (Border States were the four slave states—Delaware, Kentucky, Maryland, and Missouri—that remained in the Union during the Civil War.) The uncalled banks appear to have become more conservative. Banks that were *called* increased their bond holdings (and banknotes) with a significantly larger percentage going toward Northern bonds—over 10 times their original holdings because they were a small percentage of the portfolios to begin with. The movement increased the Northern weight in the portfolios by eight percentage points. Missouri bonds were a smaller percentage of both groups' portfolios, with the called group shedding over four percent of its (predominantly Missouri) Border state holdings. Coupled with the growth of other Southern bond holdings, the weight on called banks' Border state bonds fell 18.1 percentage points. The called banks made more substantial changes than the uncalled banks, and they did this largely by shedding more of the Missouri bonds that were most volatile during the Panic.

After 1857, the Illinois banking market recovered and grew. Table 3 summarizes Illinois free banks' bond holdings in October 1858 and October 1860, as reported by the Illinois auditor.[5] Illinois free banks deposited bonds from 15 different state and federal issuers with the state auditor. A majority were from Southern states, whose chances of seceding increased substantially between 1858 and 1860. By the end of 1860,

[5]No copy exists of a published bond report in 1859. A January 1860 bank condition report did not include bond data.

however, free banks moved towards Northern bonds, which grew from 17.2 percent to 31.5 percent of their portfolios.

Banks also continued to shift from bonds issued by Border States, which were still primarily issued by Missouri. The movement from Missouri bonds went in roughly equal proportions to bonds of states that

Table 2: Portfolio Composition Changes, Called and Uncalled Banks, Nov. 1856 to Oct. 1858

Bank Type	*Total % Δ*	*Northern % Δ*	*Northern Δ in % Weight*	*Southern % Δ*	*Southern Δ in % Weight*	*Border % Δ*	*Border* Δ in % Weight*
Uncalled (n=23)	-21.2%	-26.0%	-1.6%	-17.7%	1.15%	-37.6%	0.4%
Called (n=22)	26.9%	1006%	8.3.%	74.6%	9.8.%	-4.7%	-18.1%

*About 99 percent of Border state bonds came from Missouri. The other 1 percent were from Kentucky.
Source: Illinois Auditor Reports, 1856 and 1858

Table 3: Illinois Free Bank Bond Portfolio Composition, Oct. 1858 and Oct. 1860

	Oct. 1858	*Oct. 1860*
% Northern State and Federal Bonds	17.2%	31.5%
% Southern State Bonds	82.8%	68.5%
% Confederate State Bonds	34.2%	47.3.%
% Border State Bonds	48.6%	21.2%
Average Number of Bonds Held	3.08	3.74
Undiversified (Holding one state's bond)	16.7%	12.9%
Maximum Number of Bonds Held by One Bank	9	9
Percentage of Banks 100% Northern	6.3%	7.9%
Percentage of Banks 100% Southern States	54.2%	31.7%
Percentage of Banks 100% Confederate	33.8%	12.9%
Percentage of Banks 100% Border	10.4%	1.0%
Number of Banks	48	101*

Northern state and federal bonds include bonds issued by the Illinois, Michigan, Minnesota, New York, and Ohio state governments as well as the U.S. government. Sothern state bonds include bonds issued by the state governments of Georgia, Kentucky, Louisiana, Missouri, North Carolina, South Carolina, Tennessee, and Virginia. Confederate state bonds come from those Southern states except for two Border states, Kentucky and Missouri. Among banks with undiversified portfolios in October 1858, two held only Illinois bonds, six held only Missouri, and one held only Michigan. Among banks with undiversified portfolios in October 1860, three held only Illinois bonds, two held only U.S. bonds, one held only Michigan, one held only Missouri, and two held only Tennessee.
*The October 1806 report included 106 banks, but we exclude five that were winding down.
Source: Illinois Bank Commissioners Reports, 1858 and 1860

remained in the Union and bonds of states that joined the Confederacy. The percentage of undiversified banks, holding only one state's bonds, fell from 16.7 percent to 12.9 percent. The fraction that exclusively held Southern bonds declined from 54.2 percent to 31.7 percent percentage points, while the fraction that exclusively held Northern bonds increased slightly, from 6.3 percent to 7.9 percent. On average, Illinois banks held bonds from 3.08 states in October 1858, a figure that rose to 3.74 in October 1860. Thus, it appears that there were some modest adjustments towards diversification and regional risk reduction.

Free Bank Bond Portfolio Value at Risk: 1858-1860

These adjustments, however, must be assessed in the context of the perceived risks in the bond market and the banks' entire bond portfolios. The effect of adding a bond on a portfolio's standard deviation depends on the covariances of the new bond's prices with those of the existing bonds as well as the variance of the new bond relative to that of the portfolio. Using weekly data on state bond prices, we estimated an ex ante measurement of the price risk facing banks, their bond portfolios' weekly value at risk (VaR).[6] As Table 4 shows, one year after the Panic of 1857, banks that held portfolios of Southern bonds were exposed to lower price risk than banks that held Northern bonds. On average, banks that were called in early 1857 and tended to purchase Southern bonds had lower VaRs. Thus, based on historical pricing patterns, banks reduced their portfolios' price risk by moving to Southern bonds in the aftermath of the Panic.

[6] In this study, we use the 1 percent VaR for weekly returns, which is an estimate of the greatest weekly decline in the value of the portfolio that would occur in 100 observations – the first percentile of possible returns. Two years of weekly prices were used to calculate the VaRs. The general formula for the VaR of the bond portfolio is: $VaR = SD_p * Z_\alpha$, where SD_p *is* the standard deviation of the portfolio $SD_p = \sqrt{\sum_{i=1}^{N} w_i^2 \sigma_i^2 + \sum_{i=1}^{N} \sum_{j=1}^{N} w_i * w_j * COV\ (R_i, R_j)}$, w_x is the portfolio weight on bond *i or j*, $COV(R_i, R_j)$ is the covariance of the returns on bonds *i* and *j*, and *N* is the number of bonds in the portfolio. Z_α is the first percentile of the standard normal distribution (-2.326).

In October 1860, the state bonds' price risk, as calculated by VaR, was substantially lower than in October 1858 (Table 4). This reflects the relative calm that returned to the bond market after the Panic of 1857. More than 80 percent of Illinois bank bond portfolios had VaRs of less than 6 percent, well below the 10 percent decrease in value that, under state law, triggered a call. There was, however, a substantial shift in the way geography influenced VaR. At the end of October 1860, portfolios with lower VaRs held greater proportions of Northern state bonds. The strong demand for and short supply of Northern bonds, coupled with strong supply of Southern bonds and increased political risk, led to VaR increases for banks with greater proportions of Southern and Border state bonds. The highest VaRs belonged to banks that held over 70 percent of their portfolios in Southern bonds. Banks entering after the Panic were likely to hold Southern bonds that had relatively low volatility during the Panic but became more volatile in the following years.

To examine further whether banks that entered the Illinois market after the Panic of 1857 were more conservative in their bond portfolio selections, several regressions were run with VaR as the dependent variable (Table 5). Model 1 is a simple univariate model to test if banks that entered after 1857 (new) exhibited different VaR from those that operated prior to the panic (established). A binary variable received a value of one for observations on banks that entered post-panic, while previously established banks received a value of zero. Model 2 adds the bank portfolios' percentage of Southern bonds as a control variable. In Model 3, we examine if new banks' proportion of Southern bonds reduced VaRs by interacting the new bank binary variable with the Southern bond percentage. Finally, Model 4 keeps the Southern bond percentage variable but drops the new bank binary variable in favor of a binary variables that takes the value of one depending on whether the banks deposited bonds after May 1860, when Lincoln was nominated.

Table 4
Value at Risk (VaR) of Bank Bond Portfolios in October 1858 and October 1860

October 1858					*October 1860*		
VaR	*All Banks*	*Called in 1857*	*Not Called in 1857*	*% Southern*	*VaR*	*All Banks*	*% Southern*
0-10.00	3	3	0	70.1%	0-3.99	21	30.3%
10.01-12.99	14	4	10	48.2%	4-4.99	39	59.5%
13.00-15.99	25	15	10	18.8%	5-5.99	22	70.0%
Over 16.00	6	0	6	9.0%	Over 6.00	19	12.3%
Average VaR	14.0	13.1	14.6		Average VaR	4.93	

This table presents characteristics of Illinois bank bond portfolios categorized by their Value at Risk (VaR). The column "Banks open in 1858" presents the number of banks in each VaR bucket that were open as of the Illinois Auditor's 1858 report. "Post-1858 Banks" presents the number of banks in each bucket that were open after that report, while "Post-May 1860 Banks" presents figures for banks that opened after the May 1860 report.
Source: Illinois Bank Commissioner Reports, 1858 and 1860

Table 5
VaR Analysis of 1860 Portfolios between Pre and Post 1857 Panic
(t-stats)

	Model 1	Model 2	Model 3	Model 4
Intercept	5.514	4.359	4.242	3.915
	(34.8)*	(17.5)*	(11.46)*	(16.5)*
New After 1858	-1.075	-0.830	-0.653	
	(-5.05)*	(-4.29)*	(-1.46)	
% Southern Bonds in Portfolio		1.488	1.64	1.752
		(5.40)*	(3.72)*	(6.15)*
New After 1858 * % Southern			-0.249	
			(-0.44)	
Deposited After May 1860				-0.452
				(-2.26)**
R Squared	19.7%	37.5%	36.2%	32.9%
Observations	101	101	101	101

*, ** Statistically significant at the 1%, 5% levels.

The results (Table 5) indicate that banks entering after the Panic, in general, held portfolios with lower VaRs, as implied by the negative sign and statistical significance of the New After 1858 coefficient in Models 1 and 2. Without controlling for Southern bonds (Model 1), these banks' VaRs were 107.5 basis points lower than those of established banks. When we control for the percentage of Southern bonds in the portfolio (Model 2), the new banks' VaRs were on average 83 basis points lower than established banks. Holding constant the percentage of Southern bonds, new banks were apparently selecting bonds that had greater price stability. If a bank held a portfolio of 100 percent Southern bonds, it would increase the bank's VaR by 148.8 basis points, about 34 percent more (for an existing bank) than a bank with no Southern bonds (Model 2). And if the new banks held portfolios of 100 percent Southern bonds, their VaRs would be higher than an established bank by 65.8 basis points. In Model 3, the coefficients on both the new bank binary variable and the interaction term are not statistically significant, perhaps because the two variables are strongly correlated. We reserve discussion of Model 4 for below.

Free Bank Bond Activity from Lincoln's Nomination to the Eve of the Election

If political risk contributed to banker's expectations, bond flow data should show that banks deposited more Northern bonds relative to Southern bonds between May, when Lincoln became the Republican candidate, and the November 1860 presidential election. The auditor's ledger records the date, bond issuer, and amount of every free bank bond transaction during this time period. Table 6 shows the flow of bonds from May 1860 to October 1860 (shortly before Lincoln's election), with banks categorized as those that existed in May 1860 and new entrants after May 1860. Existing banks added Southern bonds, but they added Northern bonds at a faster rate. For new entrants, however, Southern bonds clearly were the bonds of choice. Political risk does not appear to have been the most important factor in bond purchases for these banks.

Table 6
Percentage of Bond Flows between May 1860 and October 1860

Bank Type	*Northern*	*Southern*	*Border*
New Entrants (n=20)	29%	71%	0%
Existing Banks (n=81)	62%	38%	0.3%

Source: Illinois Auditor Register of Bank Securities, 1854-1860

Table 6 illustrates overall differences in flows, but it does not show whether banks added, subtracted, or swapped bonds, and whether these transactions diversified their portfolios. Table 7 breaks bond transactions after Lincoln's nomination into three groups: adding bonds, subtracting bonds, and swapping bonds. The table does not distinguish between new and existing banks. All new banks added bonds to their portfolios during this period. Consistent with a banknote expansion resulting from the bumper crop, more than 50 percent of banks added bonds to their portfolios during this period. Thirty-one banks diversified by adding bonds from states that they were not holding prior to May 1860. Sixteen banks diversified their portfolio by adding bonds from one area, nine added only Southern bonds, and seven added Northern bonds. Banks deposited two-and-a-half times more Southern bonds

than Northern bonds, and the banks that added Southern bonds exclusively added a higher percentage relative to their portfolio values than those that added Northern bonds exclusively. Among banks that added both Northern and Southern bonds, more Southern bonds were added as a percentage of portfolio values. Among the seven banks that withdrew bonds, none withdrew bonds of both regions. Three banks withdrew Northern bonds only, and four withdrew Southern bonds only. Nine banks swapped bonds from one state for bonds from another. Five banks swapped Northern bonds for Southern bonds, while one bank swapped Northern bonds for Southern bonds. All other swaps involved bonds from the same region.

Table 7
Bond Transactions After Lincoln's Nomination

Banks Adding Bonds^{+}	*Total*	*Northern only*	*Southern state^ only*	*Both*
Number	54	8	22	24
Increased diversification	31	7	9	15
Value added in Par Value (thousands)	$2,917	$234	$939	N = $610 S = $1,132
% of Portfolio		28%	51%	N = 26% S = 35%

Banks Withdrawing Bonds	*Total*	*Northern only*	*Southern state^ only*	*Both*
Number	8	3	4	0

Banks Swapping Bonds	*Total*	*Northern for Southern state*	*Southern state for Northern*	*Same Region for Same Region*
Number	9	5	1	3

^ Includes border states. + Banks that entered are included in this estimate. Thirty-six banks made no transactions.
Source: Illinois Auditor, *Register of Bank Securities,* 1860

This diversification was significant. At the time of Lincoln's nomination, managers of existing banks had to weigh the cost of adjusting their portfolios in response to new political risks against the reduction in risk those adjustments would bring. Returning to our regression analysis (Table 5), Model 4 tests whether these adjustments were followed by lower VaRs. The binary variable that takes the value of one for banks that made a transaction after May is associated with a lower expected portfolio VaR of 45 basis points. Thus, it appears that many bankers were broadening their portfolios and lowering exposure to falling bond prices.

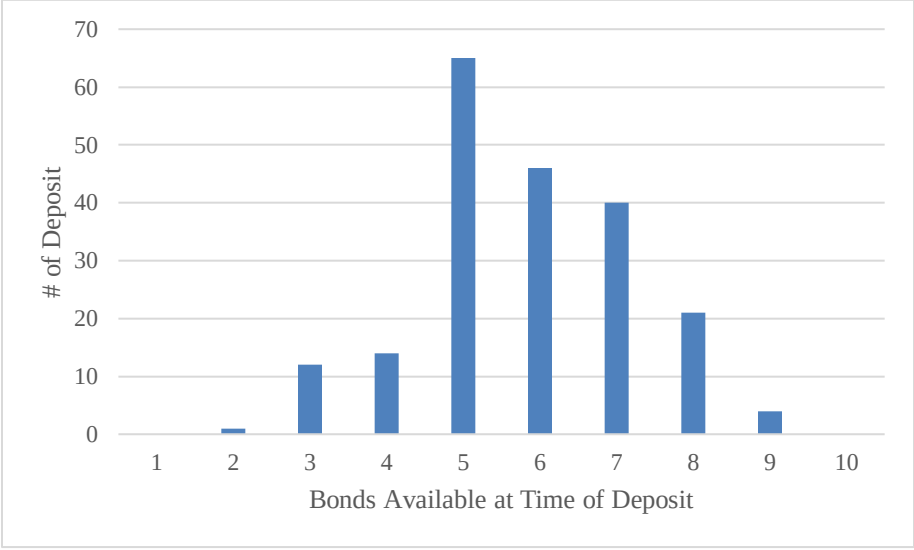
Bond Availability

We can rule out two possible explanations of bond transactions during this time period: calls by the bank commissioners and replacement of maturing bonds. There were no calls from May through October, and the auditor's records show no bonds on deposit with maturity dates during the period. Bond availability, however, may have played a role in bankers' choices. As noted above, Illinois banks could purchase bonds on the New York City market, but market data from the period indicate some bonds, particularly Southern bonds, were more easily purchased there than others. We classify a bond as *available* if there was sufficient trading in New York City to meet an individual banks demand at a point in time. State *i*'s bond is considered available for purchase on the New York City market by bank *j* in week 0 when

$$\sum_{i=0}^{n} BD_{ij0} < \sum_{t=-2}^{-1} BNYC_{it}$$

where BD_{ij0} is the amount of bonds from state *i* deposited by bank *j* in the current week ($t = 0$) and $BNYC_{it}$ is volume of bond *i* sold in New York City in week *t*. We assume that the two weeks prior to the deposit was sufficient time for a bank to review relevant bond transactions and prices in New York City and place an order with its purchasing agent. If the right side of the equation is greater than the left side, we deem this bond available to the bank for purchase. There were 249 deposits made by Illinois free banks between May 15, 1860 and October 31, 1860. The number of bonds available at the time of each deposit is illustrated in Figure 1 below. On average there were 5.8 bonds available to free bankers. Our examination of the records finds that free banks with the fewest options (three bonds or less) were, in general, new entrants

from which the state required a minimum initial deposit of $50,000 in bonds. Given that bonds issued by 13 different states and the federal government traded in New York City then, free banks had access to about 45 percent of the available issuers. Available bonds types, percentages of bonds purchased, and average bond prices for the period are presented in Table 8. With the exception of Missouri bonds, which were suffering from the state's railroad trouble, there is a strong correspondence between bond availability, price, and purchase by Illinois free banks.



Sources: *N.Y. Daily Tribune*, May-October, 1860. Illinois Auditor, *Register of Bank Securities*, 1860

Figure 1

Availability of Bonds in New York City

Tennessee, Virginia, and North Carolina bonds were available nearly all of the time, and they comprised two-thirds of free bank deposits during this period. The only non-Southern bonds that were regularly available in New York City at this time were US bonds, which comprised an additional 12 percent of free bank purchases. Table 8 also shows that premium bonds were less available in New York City than discount bonds. Among premium bonds, only US bonds regularly had sufficient trading volume to cover the amounts deposited by free banks. We find, however, that Illinois and New York bond

deposits recorded by the auditor exceeded their trading volume in New York City. For Illinois bonds, this can be explained by the home state bonds' availability through private bankers. The New York bonds likely came to Illinois through private placements. In July of 1860, the New York state government auctioned $1.2 million in bonds. One of the bidders was Thompson Brothers, which had correspondent relationships with one rural Illinois and two Chicago private banks (*Bankers Magazine* 1860).

Table 8
Availability of State Bonds for Purchase, May to October 1860

State	*% Available*	*% of Purchases*	*Average Price ($)*
MO	100%	0%	81.88
TN	99%	43%	90.23
VA	99%	12%	91.80
NC	89%	12%	97.41
US	80%	12%	102.23
IL	47%	7%	105.61
LA	42%	2%	97.58
KY	16%	0%	104.48
GA	10%	1%	103.11
OH	10%	1%	105.66
NY	6%	9%	101.26
MI	2%	1%	103.08
MN	2%	0%	NA

Notes: This table shows data on the availability of state and US bonds on the New York City market and the frequency of their purchase by Illinois free banks between May and October 1860. The "% Available" column shows the percentage of bond deposit dates on which bonds issued by each issuer were available to free banks in sufficient quantity on the New York market. The "% Purchases" column shows the percentage of deposit dates on which each issuer's bonds were deposited by Illinois free banks. The "Average Price" column shows in dollars the average price of each issuers bond between May and October 1860.
Sources: N.Y. Daily Tribune, May-October, 1860; Illinois Auditor, *Register of Bank Securities*, 1860.

In summary, the data provide evidence that free bank had choices, but most of these choices were Southern bonds. Among non-Southern bonds, only US bonds were available in sufficient quantity in New York City to meet free banks' needs at any given time. Illinois bonds and newly issued northern bonds were also available through the alternative channel of private bankers. These northern and US bonds traded at a premium, and the substantial purchases of them during the period—US, Illinois, and New York bonds were 28 percent of free bank purchases—indicates that some free bankers were willing to forsake yield for safety.

Geographical Preference

Table 8 above suggests that Tennessee bonds were both available and attractive to Illinois free banks during this period. The relatively high current yield could have motivated Illinois bankers to purchase them, but another possible reason was an affinity among Southern Illinois bankers for bonds from a relatively nearby area. We designate banks as from Southern Illinois if they were located in that region as defined by George W. Smith in his history of the area (1912). Today, this area is generally located south of US Interstate Highway 70. Table 9 suggests that location was a factor, but not as one would expect.

Table 9
Bond Purchasing Activity from May to October 1860
According to Location

Location	*% of Deposits of Northern States Bonds*	*Total Bonds Deposited (millions)*	*% of Portfolio Northern State Bonds Before May 1860**	*# of Banks*	*# of Banks Depositing Northern Bonds*
Northern Illinois	12%	$1.36	36%	26	11
Southern Illinois	44%	$1.68	32%	32	17

* Includes only banks operating prior to May, 1860.
Source: Illinois Auditor *Register of Bank Securities,* 1854-1860

Northern Illinois banks made $1.36 million in bond deposits, 12 percent of which were northern state (or federal) bonds. On the other hand, Southern Illinois banks made $1.68 million deposits, 44 percent of which were northern state bonds. Clearly, the Southern Illinois banks were selecting lower risk, lower current yield bonds than their counterparts. Perhaps this region was more sensitive to the political realities of what would happen if Lincoln won the election.

A nuanced portrait of Illinois free bank bond purchases and risk management emerges from the above analysis. Free banks were exposed to considerable risks on the eve of the 1860 presidential election, with only a minority of banks moving away from Southern bonds. After Lincoln's nomination more Southern bonds were purchased than Northern bonds. A third of all banks diversified their portfolios during this period, but about half of them moved towards *intra*-regional diversification rather than *inter*-regional security. These purchases, however, lowered their ex-ante price risk. Even though Northern states, particularly Illinois in 1859 and New York in 1860, provided opportunities to free bankers by issuing new bonds, we conclude that there was not a significant movement away from Southern bonds even after the threat of Southern bond default increased when Lincoln was nominated. Demand for banknotes drove bond purchases, and Southern bonds on the whole had liquidity and yield advantages relative to Northern bonds, meaning that the Southern bond exposure may not have been imprudent. In fact, as measured by portfolio VaR, most banks were safe from declines in bond portfolio values large enough to warrant a call from the bank commissioners.

Use of Specie or Banknotes to Mitigate Bond Portfolio Risk

The preceding evidence suggests that some free bankers managed their bond portfolios' price risk, but many exposed themselves to greater political risk by holding Southern bonds. Perhaps they offset this risk by holding greater levels of specie. If free banks were unable to exchange specie for notes, the auditor was authorized to place the bank into liquidation. Since the value of bonds fluctuated, specie could also offset bond portfolio price risk. That said, banks may have held greater amounts of specie for other reasons. For instance, they may have held deposits for retail customers or other banks which would require specie reserves. Additionally, the population of the surrounding

area may have influenced banks' specie holdings. Less-populated areas, due to their isolation, would have been less likely to face sudden surges in specie demand and could minimize reserves. However, if the cost of acquisition of specie was high for banks in small towns, they may have needed to keep larger inventories of specie relative to city banks.

Of 106 banks listed on the auditor's October 31, 1860 bond report, balance sheet data are provided for 92.[7] These data were used to estimate a simple OLS regression model to assess whether bond portfolio risk is associated with more specie relative to note issue, controlling for the population of the municipality (in thousands) in which the bank operated, according to the 1860 US Census. The results were as follows:

Specie/ Banknote Ratio	**= 0.088 + 1.67(Dep/TL) - 0.00179(South Bonds) – 0.0083(Pop)**			
t	**= (0.921)**	**(6.98)*** **	**(-1.45)**	**(-1.89)***

Adjusted R^2 = 35.1% Observations = 92

The results suggest that free bankers held larger reserves for banknotes as deposits grew relative to liabilities, but the percentage of Southern bonds backing notes had no impact on reserves. The bank location's population did impact specie holdings, as greater population was associated with less specie relative to banknotes. Bank managers did not appear to weigh the bonds' political risks when determining their specie reserves.

Free banks may not have held additional specie to mitigate political risks because they viewed the regulatory overcollateralization of banknotes as sufficient cushion for falling bond prices. Free banks could also have reduced risk by reducing the issuance of banknotes. For each bank, we calculated a measure called the *reserve cushion* (RC), the market value of the bank's bonds

[7] Five of the listed banks were closing, but the auditor listed them if they still had bonds in their possession. Nine of the listed banks were active but did not submit a report either because they had only recently begun operations or they simply failed to report.

plus its specie reserves less its banknotes, all divided by the market value of the bonds:

RC = (MV of Bonds + Specie – Banknote Issue)/MV of Bonds

On October 1, 1860, one month before the Illinois Auditor's November 1 report, 92 free banks submitted condition reports to the bank commissioners. From the auditor's bond ledgers we identified bonds submitted during the month of October, except by those banks that entered the market in October. By making adjustments to portfolios reported in the November auditor's report, we estimated the bond portfolios of free banks on October 1, 1860, 38 days before Lincoln's election. The market value of each bank's bond portfolio was estimated using New York City prices for the first week of October. If New York City prices were not available that week, we used prices reported in other cities at that time. For Illinois and New York bonds with no market price data, we used par value, a conservative estimate. Table 10 shows free bank reserve cushion figures based on those calculations.

Table 10
Bank Reserve Cushions Before the 1860 Election

Activity After Lincoln's Nomination	*No. of Banks*	*Average RC*	*% of Banks RC<0*	*Average RC (with 10% decline in Southern bonds)*	*% of Banks RC<0*
Did not Deposit	44	23.7%	14%	17.1%	36%
Deposited Bonds	48	8.9%	6%	1.3%	42%
Only Southern	24	7.3%	12.5%	-1.3%	58%
Only North	8	13.1%	0%	8.8%	13%
Both	16	9.4%	0%	1.5%	38%

Notes: This table presents an analysis of Illinois free bank reserves on the eve of the 1860 presidential election. Reserve cushion (RC) is the market value of the bank's bonds plus its specie reserves less its banknotes, all divided by the market value of the bonds.
Sources: October 1, 1860 Bank Commissioner's Report; November 1, 1860 Illinois Auditor Bond Report; Illinois Auditor Register of Bank Securities, 1854-1860

Free banks that did not deposit bonds during this time appear to have been waiting out the storm by holding an average reserve cushion of 23.7 percent. However, had there been a call on October 1, 14 percent of those banks would have been on the list with negative RCs. Banks that deposited bonds held a reserve cushion near 9 percent, but a few of them, 6 percent, would have been on the hypothetical call list. Breaking down the group according to regional composition of deposits, we see that banks that deposited only Southern bonds had the smallest average RC and the greatest proportion of banks with negative RCs. Such banks would, on average, have held negative RCs if Southern bond prices declined 10 percent. Banks purchasing Northern bonds, on the other hand, held significant RCs (13.1 percent) and were better able to withstand a 10 percent decline in Southern bond prices.

Greater Risk Compensated by Greater Return

Free banks may have maintained their weights on Southern bonds because they paid high enough yields to compensate for the risk. To estimate yields to maturity (which were not published at the time) on bonds held by Illinois free banks, we combined prices listed in newspapers with maturity dates and coupon rates in the Illinois Auditor's records. With some states issuing multiple bonds with different maturity dates, we computed a yield-to-maturity "index" for each state using the mid-points of the set of maturities of each state's bonds outstanding. We also estimated indexes of current yields, which paralleled yields to maturity for these bonds. As Table 11 shows, bond purchases generally followed yields except for Missouri and US bonds. Four of the top five bond purchases by free banks were also bonds that happened to be the most actively traded in New York City (Table 1). Missouri yields were the highest at the time, but no bank was willing to add them as collateral after May. In fact, during this time period banks were shedding Missouri bonds. Yet bankers were willing to take the risks associated with Tennessee, Virginia, and North Carolina bonds, which carried relatively high yields compared to Northern and federal bonds.

Table 11
Net Flows and Average Yields of Selected Bonds
from May 1860 to Oct 1860

Bonds	*% of Total Net Flow*	*Average Yield to Maturity*	*Average Current Yield*	*Yield-Volatility Ratio*[*]
Tennessee	46.0%	6.70%	6.61%	.0546
Virginia	12.0%	6.70%	6.54%	.0763
US	10.7%	4.61%	5.55%	.0785
Illinois 6's	10.1%	5.30%	5.69%	NA**
North Carolina	9.9 %	6.20%	6.13%	.0414
Louisiana	2.0%	6.17%	6.19%	.0226
Ohio	0.1%	5.43%	5.46%	.0502
Missouri	-1.3%	7.9%	7.38%	.0935

*One week forecast for the week of November 2, 1860.
**Insufficient price data to make calculation.
Source: Illinois Auditor *Register of Bank Securities*, 1860.

To examine further whether weighting portfolios heavily with riskier southern state bonds could be justified ex ante by higher expected rewards, we estimated reward-to-volatility ratios at the time of Lincoln's nomination for bonds for which we had sufficient data on market prices. We use the bonds' yields to maturity to measure reward and estimates of the standard deviation of their prices to measure volatility. The standard deviation estimates are generated with ARCH(1) models of the bond prices (see Appendix II for details). While the reward-to-volatility measure is imperfect—yield to maturity doesn't measure expected return and price volatility doesn't correspond to yield—the figures give a reasonable approximation of the risk-return combination these bonds presented their holders. Our calculations indicate that the greater volatility of Southern and Border state bonds was in many cases compensated by proportionally greater yields. The two most

purchased Southern bonds (Tennessee and Virginia) had greater reward to volatility ratios than Ohio bonds. Even though these bonds carried greater price risk, they compensated holders with expected return commensurate with that risk. The third most purchased bond (US) had the second-highest reward-risk ratio, but also the lowest yield. A final point is that Illinois free banking regulations prevented note issue greater than bonds' par values. For bonds that sold above par, in this case Ohio and US bonds, free banks' effective return on banknote issue was lower than for bonds selling at or below par. This may also help explain why those bonds were in less demand.

The View from the Ground in 1860

Although in hindsight, it seems clear that the United States was heading toward civil war in 1860, it may not have been as apparent to those living then. The evidence of diverse activity within the banking system could reflect the variety of news bankers received about the election. Newspapers of that period presented diverging opinions about the likely outcome of the election and the implications if Lincoln won. Reviewing presidential candidates' positions, the *Clarksville* (Tennessee) *Chronicle* commented that "the defeat of the Republican party is of the most vital importance…Mr. Lincoln and his cohort of abolitionists is making a desperate attempt to curtail the growth and spread of this Southern tree (slavery), and if possible to uproot it entirely." The *Glasgow* (Missouri) *Weekly Times* wrote that the split in the Democratic Party would lead to a Lincoln victory, but added that "Old Abe would cure them of secession." In Illinois there was an expectation of Lincoln being elected, but some argued that it would not cause great change. The *Ottawa* (Illinois) *Free Trader* published an article that claimed that Lincoln and the Republicans had actually endorsed the *Dred Scott* decision

Even after Lincoln's election, it was not clear whether all slave states would secede. Some, primarily in the heavily slave-dependent cotton belt, left the Union almost immediately. But others, including Tennessee, did not leave until Lincoln called for troops after the skirmish at Fort Sumter. In the presidential election, Tennessee (along with Virginia and Kentucky) gave its electoral votes to John Bell, a centrist candidate. Furthermore, in a statewide referendum on February 9, 1861, a majority of Tennessee voters rejected a proposed secession convention (*Memphis Daily Appeal* February 21, 1861, 2).

The bank commissioners commented on the default risk of Tennessee bonds in their January 11, 1861 report, writing that the "State would be amply able to provide payment for their indebtedness…" (Illinois Bank Commissioners Report 1861, 215). If the bank commissioner's views were widely held by others in the market, the significant increase in purchases of Tennessee bonds made reasonably sound business sense. Relative to other states, the relatively low economic and political risks for the bonds coupled with a high yield would have made the bonds an acceptable choice.

Conclusions

Recent research on the free banking era, known for bank panics and failures, has shown that regulations governing note issue contributed to bank instability when bond prices dropped. Previous research (Dwyer and Hafer 2004; Jaremski 2010) has found that ex ante measures of risk are positively associated with subsequent failure of Illinois free banks. We extend this research to assess whether Illinois free bankers tried to prudently manage their risks between Lincoln's nomination in May 1860 and his election in November 1860 to avoid insolvency or reduce losses.

In a market of more than 100 banks, there was a spectrum of choices made by the bankers. A significant segment—mainly established and experienced banks—moved to reduce their risk exposure by increasing their purchases of Northern bonds, diversifying bond holdings, reducing what bankers today would call their VaR, and maintaining a reserve to protect noteholders. But at least a third of the market was on the edge of being called, and a substantial fraction of free banks held a significant portion of Southern bonds in their portfolios even up to the election. The nomination of Lincoln did not dissuade those free bankers from adding to their Southern holdings. Banks entering after Lincoln's nomination deposited twice as many Southern bonds as Northern bonds.

We find several reasons that this continued tendency to buy or hold Southern bonds did not reflect reckless behavior. Data on bond trading volume from the time period indicate that Southern bonds typically carried a significant liquidity advantage over Northern bonds. In addition, based on yield-to-volatility ratios, Illinois banks could be interpreted as having taken advantage of an attractive risk-expected return relationship. Historical bond prices indicate that a significant event—one out of a hundred—would not

impair their capital or bank note reserves to a degree that would render them insolvent. In general, most bankers appeared to make defensible decisions about managing their risk exposure. This banking market appears to have reflected experience from the Panic of 1857 and a degree of uncertainty over the period's political situation. Some free bankers, accustomed to the calls by the commissioners, appeared to have taken advantage of regulatory protocol by holding negative reserve cushions. The political prognosticators in the news and in the legislatures did not provide any clear guidance. It is possible that many bankers were doing what many of us would have done in a similarly complex situation—they were waiting to see what would happen next before changing course. If that was the case, then they were less like groundhogs lumbering across busy roads than previously thought and more like deer caught in the headlights of a rural highway at night, soon to become "road kill."

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Appendix I: Data

Data on bank bond portfolio holdings were gathered from the Illinois auditor's monthly bond registration ledgers. These ledgers recorded the date, state, and par value of the free banks' bonds as well as the dates on which banks withdrew the bonds from their portfolios. The data in the ledgers served as the basis of the free banks' annual reports to the legislature. We used the annual report of October of 1858 and the monthly registration ledgers to calculate monthly holdings and net bond flows for all Illinois free banks from October 1858 to October 1860.

Bond price data were gathered from several sources, presented in Table A1. Many price series come from the database presented in Dwyer, Hafer, and Weber (1999), which those researchers gathered from the "Notes on the Money Market" section of *The Bankers' Magazine and Statistical Register* as well as *The New York Times'* summary of daily trading on the New York Stock Exchange. Dwyer, Hafer, and Weber's data set is our main source of prices for Georgia, Kentucky, Louisiana, Missouri, North Carolina, Ohio, Pennsylvania, Tennessee, US, and Virginia bonds. The data are weekly observations on those bonds' prices from January 1855 through November 1865. New York bonds and the Illinois "47" series bonds are not included in Dwyer, Hafer, and Weber's database, but *The Bankers' Magazine* contains these prices on a twice-per-month basis from early 1856 to through early 1859 and less frequently after that.

Although it primarily listed railroad security prices, the *American Railroad Journal* also published some US and state security prices from 1856 to 1861. We used this source for data from 1856 to 1859 on Illinois 47s, bonds from New York, Georgia, Kentucky, Louisiana, Missouri, North Carolina, Ohio, and Tennessee.

These prices allowed us to fill in some remaining gaps in our data and the Dwyer, Hafer, and Weber data. Finally, we included in our calculations some prices from the data set posted on The Economic History Association's Web site by Sylla, Wilson, and Wright. We include from this data set prices on South Carolina, Michigan, Minnesota, and Iowa bonds as well as prices on Illinois "6" (six percent coupon) bonds.

The information for the vast majority of bonds was available. But for some bonds, representing a small fraction of the Illinois banks' portfolios, pricing data were scarce. These bonds included those issued by Iowa, Michigan, Minnesota, and South Carolina as well as some alternate issues from Illinois. While recognizing there is a tradeoff between quality and quantity, we believe the latter was more valuable in assessing ex ante portfolio risk. We decided to use as much bond price information as possible, developing estimates of some missing prices and approximations for some statistics. When information on state securities was intermittent, prices were interpolated to fill the weekly gaps so that correlations and price changes could be calculated.

In some cases, bond prices did not overlap for a limited number of periods, making direct calculation of correlations impossible. In these cases, one of two types of proxies were calculated. One was the multiplication of common correlations. For instance, there were no overlapping prices for Michigan and Illinois during one of the two year periods being examined. But correlations could be calculated between Illinois and South Carolina, and between South Carolina and Michigan for some of the observations. Thus a proxy for the correlation between Illinois and Michigan was computed by their multiplication. A second proxy was the substitution of a correlation that most reflected the two bonds. Missing data on some of the Illinois bonds prevented direct calculation of their correlations with other bonds. But data were available for two similar bonds from New York, and we assume that price correlations between New York state bonds would hold for Illinois state correlations. A simple average of the prices of the two other Illinois state securities was used as a proxy for an Illinois bond issue, the Interest 1860 bond, since default risk was likely similar to the other Illinois bond issues and correlations should have been similar.

Table A1: Price Data during the *Antebellum* Period of Bonds Held by Illinois Banks

Source	Period	Bonds	Availability
Dwyer, Hafer, & Weber	Weekly from 1855-1861	GA, KY, LA, MO, NC, OH, VA, TN, US	Consistent, occasional missing observations
The Bankers' Magazine and Statistical Register	Bimonthly 1855-1861	IL47, NY	IL47 and NY, scarce after 1859
American Railroad Journal	Weekly 1856-1858, 3/1859	GA, KY, LA, MO, NC, OH, TN, IL47, NY	IL47, NY: Consistent data 1856-1859 Others: Consistent, filled missing observations from Dwyer, et al. series
Sylla, Wilson, & Wright	Weekly 1857-1860	SC, MI, MN, IA, IL6	IL6: 2 years, MI: Over 1 year MN, IA: Less than 1 year SC: Scattered for few months at a time

Sources: Gerald P. Dwyer, Jr., et al. *Weekly U.S. and State Bond Prices*. Federal Reserve Bank of St. Louis. http://alfred.stlouisfed.org/release?rid=264. J. Smith Homans, ed. *The Bankers' Magazine and Statistical Registrar*. Vol. 13 (Vol. 8 New Series) 1858-1859. Henry Poor, ed. *American Railroad Journal*. Vol. 29-32: New York: J.H. Schultz, 1856-1859. Richard E. Sylla, Jack Wilson, and Robert E. Wright. "Price Quotations in Early U.S. Securities Markets, 1790-1860." *Economic History Association*. http://eh.net/database/early-u-s-securities-prices/

Appendix II: ARCH Modelling

Adapting the procedure introduced by Engle (1982), our ARCH(1) models specify the conditional mean of a given bond's price (P_t) as the sum of a constant (α) and an error term (ε_t). The error is the result of a stochastic process, and the conditional variance (h_t) of the error depends on the squared values of the previous period's error term (ε_{t-1}). Because the variance of a random variable does not change with the addition of a constant, the conditional variance of the price P_t is equal to the conditional variance of the error, h_t, in this formulation.

$$P_t = \alpha + \varepsilon_t \quad (1)$$

$$\varepsilon_t = \sqrt{h_t} e_t \quad (2)$$

$$h_t = \omega + \gamma \varepsilon_{t-1}^2 \quad (3)$$

$$e_t \sim N(0,1) \quad (4)$$

According to the ARCH(1) model, periods of calm are predicted after periods of calm (when errors, ε_t. are small), while periods of high price volatility are predicted after periods of high price volatility (when errors, ε_t. are large). We estimated the models' parameters with the method of maximum likelihood using data from June 1858 through November 1860.