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What Determined Banks Specie Reserve: New Evidences from Illinois Free Banks

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Abstract

This paper empirically examines the historical allegation of fraudulent behavior of bank management by scrutinizing the balance sheet of individual bank and finds none of the Illinois free banks was without specie reserve. Applying econometric tools to balance sheet items, this paper identifies that deposit liabilities and banknotes in circulation were significant determinants of specie reserves for antebellum banks. Specie reserve was positively related to deposit liabilities and negatively related to banknotes in circulation. The elasticity of specie demand for deposits and banknotes was 22 and 51 percent respectively. Other liabilities like banks equity capital and notes of other banks insignificant.

JEL classification numbers: G20, G21,
Keywords: Free Banks, Bank-notes, Deposits, Specie reserves and Illinois

1 Introduction

Bank liquidity management has been historically an important issue of interest to bank regulatory authorities, examiners, bankers and bank depositors. The importance of this issue had its origin during the early US banking period. During Chartered Banking when banks failed for their failures to meet depositors demand, liquidity (specie) reserve became an issue. It became also a serious concern during the free banking period when

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specie was the most liquid money and was the legal tender. The study of specie reserve has become more important for the banks of antebellum period for several reasons.

The establishment of free banking system introduced some unique features in the US banking history. Free banking departed from the patronage of chartered banking and was a more democratic system in which the establishment of banks was relatively easy. Any group or association with the minimum capital prescribed by state law could open a bank, and permission to open a bank was almost automatic if the condition of minimum capital was met. Capital requirements varied from state to states. In Illinois a minimum capital was $50,000.

Second, each bank used to issue its own note in the market. There were some thirty thousand varieties of banknotes in circulation (Salim and Samad 2009) during pre Civil War. Maintaining public confidence in bank notes required their easy conversion into specie. However, there was no legal reserve requirement of specie reserve against banknotes or demand deposits issued. The free banking law of New York, for example, initially required a 12.5 percent specie reserve ratio against notes, but the specie reserve clause was repealed after two years. Specie reserve policy differed among states, and during the economic panic of 1857, banks stopped specie payments. As a result, the convertibility of notes into specie—even for otherwise solvent banks—became an issue of public concern.

Third, under the free banking system banks were neither subject to US Federal and State regulation nor subject to any reserve requirement. Free banks were completely deregulated. Each bank was its own in determining its specie reserve depending upon its choice of trade-off between the risk and the return and liabilities issued.

Fourth, free Banks specie reserve determinants, antebellum banks of Illinois in particular, were not econometrically determined and evaluated properly against historical allegation that free banks were “wildcat” banks and their ”cash were sometimes of nails and broken glasses with a layer of coins on the top”(Hammond, 1952).

While commercial banks were not subject to any minimum reserve by law, while banks issued a wide variety of notes and while their conversion of banknotes and deposits was critical for banks survival, the exploration of the specie reserve behavior of deregulated banking industry and the determination of significant factors for specie reserve are essential for understanding the commercial banking liquidity management.

In addition, whereas there are a few studies at a macro and the US Federal level, there is no econometric study at the state level that identified factors that are significant for the liquidity reserve (specie) of Illinois antebellum banks.

Identifying significant factors that determined the specie reserve of free banking system is an important contribution of this paper to the antebellum banking literature.

This paper is organized as follows: A brief survey of antebellum banking literature is provided in Section 2. Section 3 outlines liquidity theory, major balance sheet items and their characteristics. Data, methodology, model and model variables are discussed in Section 4. Empirical results and conclusions are provided in Section 5.

2 Survey of Antebellum Banking Literature

The introduction of free banking system was an important episode in the US banking and monetary history. However, the antebellum banking history is relatively obscure and the banking literature of this period is relatively less extensive. Until Hammond’s (1957)

publication, antebellum banking era passed almost unnoticed in terms of references. There was not much reference found in the literature. More importantly, Illinois free banking has been rather scantily studied.

Bray Hammond (1957) called free banking as ' fraudulent banking , 'widcat', and 'legal swindle'. Banks were alleged to have no specie reserve. Banks -"cash were sometimes of nails and broken glasses with a layer of coins on the top".

New studies found new revelation. Free banks failure cannot be blamed for wildcat banking or fraudulent banking. Rockoff (1972) study of free banking found that free banking failures were caused by the par valuation clause of bond holding. When par value of bond was higher than the market value it was profitable for a bank to issue notes to the amount of par value and then close the banks when redemption of banknotes was challenged.

Weber and Rolnick study (1982, 1984) did not support Rockoff's view. According to them, free banking failures were caused by the fall of southern bond prices. Free Banks held large quantities of southern bonds in their asset portfolio as collateral for backing their notes in circulation. The news of Civil War had adverse effect on portfolio risk when the prices of southern bond plummeted. The value of Southern bonds became insignificantly low and could not any longer support the liabilities issued by banks-notes. Banks failed to redeem their own bank-notes on demand and the failure of redemption caused bank run and free banks failures. Economopoulos (1992) provided support in favor of the falling bond price hypothesis in Illinois.

Samad (1991) discussed three important aspects of Illinois Free Banking. One of them was the issue of wildcat banking in Illinois. 'Wildcat' banking refers to the phrase that the free banks hided in places where wildcats lived and were hard to have accesses, with the implication that banks could not be found to redeem their notes. After a micro level examination of the location of each 141 banks (Samad 1991) found that the claim was an exaggeration. Only three free banks could be the possible candidates for wildcat banking in Illinois. The location of these three banks was not found in the 6^{th} and 7^{th} U.S. Census. Rashid and Samad (1996) led support to Samad (1991) that the portfolio management of the Illinois of free banks was not fraudulent.

White (1984) study focused on Scottish free banking system and its success. White observed that while the English Banking system including the Bank of England had history closure, the Scottish free system operated "successfully more than a century" (White, 1984, P. ix). Unlike the English banking system dominated by central bank, the Bank of England and the characteristic of having pyramids of notes and deposits, Scottish banking system "did not develop of an inverted pyramid structure of specie reserve". It rather maintained a system of each "tub on its own bottom. Each bank held onto its own specie reserve" (ibid, P. 43).

Rothbard (1989) and Sechrest (1989) studies were basically responses and challenges to White's studies. According to Rothbard, Scottish banking system never rested with specie nor was it cyclically stable (P.230). According to Sechrest (1989), specie convertibility against notes and deposits issued by "unprivileged private banks" did not happen, in most cases, in Scottish banking system. Scottish banks took the advantage of "option clause" which allowed bankers to delay redemption for six months (Sechrest 1989, P. 24).

Selgin (1988) study is a theoretical contribution to the development of free banking. The central point of his study is that privately competitive banks, if unregulated, are compelled to be regulated by market forces. Excess issue of notes and inconvertibility are incompatible in a competitively free market banking industry.

None of the above studies [(Rockoff, 1992), Weber and Rolnick (1982, 1984) Economopoulos (1992), White (1984), Rothbard (1989), Sechrest (1989), and Rashid and Samad (996)] dealt with specie reserve issues and nor did they examine factors determining specie reserve and their significance.

Scott (1999) dealt with antebellum banking. He compared the banking lessons of Georgia with South Carolina. Georgia's banking was a gross failure. Bodenhorn (2002), in his book "State Banking in Early America" had a chapter on free banking where he deliberated, mainly, on the issue of banknotes. According to him, free banks had under-issued banknotes relative to profit maximizing banks and the free banknotes were less seasonal elastic. Dewyer (1996) examined the allegation of free banks' wildcat banking, " a name that suggests that opening a bank has much in common with drilling an oil in well"(p. 1) and found "little evidence that banks were imprudent" (p. 1). He found little evidence that the free banks of Indiana, Illinois and Wisconsin were imprudent. Dewyer and Hafer (2001) estimated the exante riskiness of the free banks portfolio to predict which were likely to fail. Weber (2005) study focused on compiling a new data set of all the U.S. state banks from 1782 to 1861 and claimed that his new data series were superior to existing ones. Arnnon (1993) provided a critical explanation of the decline of the free banking. According to him, "the explanations for its decline proposed by some 20th century advocates of free banking (Vera Smith (1936) White (1984) were incomplete" (p.2). Dowd (1992) investigated the experience of relatively unregulated banking system in nine different counties: Australia, Canada, Colombia, China, France, Ireland, Scotland, Switzerland, and the United States during the19th century.

Hilderlith and Rockoff (1973) focused on the state level liquidity function of banks. They found that banks liquidity was positively related to bank deposits. However, their study concentrated on the banks of the eastern cities of Boston, New York and Philadelphia and did not include Illinois antebellum banks.

3 Liquidity Theory, Balance Sheet Items, and their Characteristics

Why did banks need specie reserve when there was no such requirement from the state or US federal government? Liquidity reserve (specie) was required for public confidence and to meet the day to day liquidity (specie) needs of (i) depositors (ii) noteholders , and (iii) other liability holders.

In addition, banks liquidity reserve provides the highest level of safety to banks. Based on liquidity theory, if a bank liability-holders—depositors and banknote-holders—suspect that a bank is in short of liquidity and is unable to pay their liquidity on demand, they turn on bank to withdraw their deposits. A bank facing unexpected withdrawal of large deposits, eventually may lead to a run out of cash and leads to a *bank run* and bank failure. A bank failure may be contiguous. A failure of particular bank resulting from illiquidity may lead to a bank run for the entire banking system. This is likely to happen in a fractional reserve system and most likely to happen when there was no regulatory reserve requirement as it was during the free banking periods when each bank was its own.

A study liquidity reserve and determining significant liquidity reserve factors need the understanding of free banks portfolio allocations. A generalized balance sheet of antebellum banks major items in the portfolio of assets and liabilities is provided in Table 1.

Table 1: Free banks major balance sheet items

Assets	Liabilities
Capital stock deposited as security for banknotes	Capital stock paid in and invested according to law
Specie reserve	Depositor's deposits
Notes of other banks on hand	Banknotes in circulation
Deposits with other bank	Other banks' deposits
Total assets	Total liabilities

3.1 Characteristic Features of Balance Sheet Items

3.1.1 Capital Stock deposited as security for banknotes (CAPCOL)

Among the major items in the portfolio of assets capital stocks had unique characteristics. Capital stocks deposited were collaterals for banknotes. Under the Article 28 of the Illinois free banking law, each free Bank was required to deposit capital in U.S. bonds or state bonds to Illinois State Auditor's Office as security to support the amount of banknotes in circulation. "Whenever any person, or a association of persons, formed for the purpose of banking under the provision of this act shall lawfully transfer to and deposit with auditor any portion of public stocks, issued or to be issued, …..such a person or association of persons *shall be entitled to receive from the auditor equal amount of such circulating notes".*

There was also a call provision. Banks were issued a call notice to deposit additional bonds or retire notes if the value of bands deposited as security against notes in circulation fell.

The most important characteristic of bond deposits was that banks had no access to these deposits unless bank was officially declared closed. Banks could not sell any part of bond deposits to get cash even if they were in dire need. The features that these bond deposits were strictly used as security and banks had no access to them unless banks were officially declared closed are contrary to the feature of modern banking. Modern banks have access to their securities.

This important feature of bond deposits has special implication for banks liquidity reserve. Since banks had no access to bond deposits, banks had to discount this feature in their liquidity management. Banks were in deed of more specie reserve since they had no access to bond deposits.

3.1.2 Notes of other bank on hand

Notes of other bank held in bank vault were asset and did not earn interest. Why held up then? Firstly, banknotes were held up to reduce the threat of rival banks. Banknotes market was competitive. Each bank wanted to have a larger share of notes market as well for maximizing profits. One of the ways free banks could control notes market was by wiping out the rival banks. By keeping a large amount of other banknotes and presenting them for at a time redemption into specie was a great threat for rival bank. Because of failure to redeem banknotes into specie could forfeit bank business. Keeping banknotes of other banks minimized the threat of existence.

Secondly, it minimized the need of specie reserve as the banknotes of other banks were redeemable into specie. In time of emergency, other banknotes were redeemable into

specie. Thus, the higher amount of other banknotes held up, the lower the need of specie reserve.
Thirdly, keeping rival banks' notes also served for banks clearing house.

3.1.3 Specie reserve on hand (SPCH)

Unlike today's regulatory fractional reserve system, there was no legal requirement for specie reserve. Each bank was its own for determining specie reserve. Antebellum banks need specie reserves for a variety of purposes. (i) Specie was the legal tender money during the antebellum banking. Due to scarcity of specie, banknotes were used as a medium of exchange. However, banks were required to pay specie on demand. (ii) Banks issued deposits. These deposits were collected in specie. So, banks had to pay specie to depositors on demand. (iii) Banks had to maintain specie reserves for loans and discounts.
The implication of specie of reserve was that the higher the amount of specie reserve, the higher the liquidity for a bank and lower the probability of bank failure resulting from liquidity shortage. A higher liquidity reserves provided a bank to a higher advantageous position in terms of its reputation, deposit mobilizations and competitive edge in note markets.

3.1.4 Deposit with other banks (DWOBK)

Keeping deposits with other banks' account served as a third line of defense for liquidity purposes. Not all banks maintained deposits with other banks.

3.1.5 Capital stock paid in and invested (EQCAP)

It is bank's equity capital. Capital requirement varied from state to states. In Illinois, the minimum capital requirement was $50,000. Bank capital was required to be paid in cash or in US or state bonds deposited with State Auditor's Office before the opening of bank.
Bank capital plays an important role and serves many vital functions. The first, a bank provides protection to depositor-creditors. The protection of depositors has been the primary focus of regulatory interest in bank capital accounts. Banks generate assets though their liabilities, including deposits and equity capital. These assets, loans in general, are risky. Loans may be default or depreciate in value. The depreciation of loan value, real estate value in particular, leads to housing market crash, as it did in 2008-2009, and bank failures in the U.S. The higher the asset risk, the higher the need for capital in protecting bank depositors and creditors. Adequate capital is, therefore, a must.
The second reason for the need of capital is that it provides funds to finance the operation of banks including the acquisition of fixed assets.
Third, in case of bank failure, bank liability-holders could turn on bank capital for the recovery of their money invested.

3.1.6 Deposit due to depositors (DEPOS)

Deposits were a significant liability of free banks. Like any conventional bank, free banks used to mobilize deposits. The deposit liability of free banks had two interesting characteristics. First, free banks did not pay interest on deposits (Economopoulos, 1999 p. 425) but were required to pay specie on demand. Why did people deposit? First, deposits in bank vault were safe. Second, is the reason to avoid bank run originating from the

failure to pay depositors. Depositors in Illinois did not have lien and could not foreclose a bank for its failure to pay specie on demand. Why would a free bank need specie reserve then? Banks need specie reserve for avoiding a run on. Bank specific shock of specie shortage not only led to a closure of the bank but also led to economy-wide bank run. In order for avoiding such a situation to happen, bank management was maintained liquidity (specie) reserve against depositors' deposits. The second reason for maintaining a large specie reserve against r deposits was that the variability of deposits around its mean, that is the coefficient of deposit variation was very high and (presented in Table 1) higher than that of banknote in circulations.

3.1.7 Banknotes in circulation (BKNCIR)

Banknotes were an important liability for the note-issuing banks. Banknotes were required to be redeemed into specie on demand. The convertibility was guaranteed by bond deposit. Failure to redeem banknote/s into specie could forfeit banking license. So, banks required specie reserve. The higher the amount of banknotes issued by a bank, the higher the need of specie reserve for avoiding the risk of non-redemption of banknote.

The issue of banknote liabilities had important characteristic. Firstly, banknotes were used as a medium of exchange although specie was the legal tender of the period. The issue of bank-note was necessitated due to shortage of specie supply. The free bank that could issue more medium of exchange (i.e. bank-note) could support more bank clients and deposit. Secondly, all loans were finance through bank-notes. All free banks supported their loan financings through their own designed notes and there was no Federal or State regulator to limit their note issues. Only restriction that was in place to limit the note issues was the redemption clause that a bank must redeem its notes into specie on demand. A failure to redeem its notes on demand could forfeit its banking license.

Thirdly, Banknote was an important source of income for a bank. Banknotes were issued to finance the credit needs of entrepreneurs, businesses, and merchants. Thus, the larger the amount of banknotes issued to finance loans the higher the profits for a bank.

Banknotes did not have any maturity date or interest expense (Economopoulos, 1990, P 426). So, the longer the period of banknotes in circulation the longer the maturity of banknotes and the lesser the specie reserve needed. As long as banknotes were in circulation, banks were not required to redeem into specie.

3.1.8 Other bank's deposit:

Other bank's deposit in bank vault is a liability. However, an examination of individual bank balance sheet shows that most banks did not have other bank deposits on hand.

3.2 Summary characteristics of two liabilities:

Banknotes and deposits were the two most important liabilities antebellum banks of Illinois. Both these liabilities had important characteristics. (i) Due to scarcity of specie, banknote was used as a medium of exchange. (ii) Banknotes were required to be convertible into specie. (iii) A failure to redeem a banknote into specie on demand could forfeit the banking license of a bank. This was a common provision of the free banking Act of Illinois and in other states that opted for free banking.

The Free banking Act of Illinois, like any other states, provided safety provision to depositors. (i) Banks deposits were required to be convertible into specie on demand and

(ii) Both noteholders and depositors had lien on bank assets in case of bank failures.

3.2.1 Descriptive statistics of major balance sheet items

Descriptive statistics of major balance sheet items, presented in Table 2, provide more insights and explanations for historical allegations.

Table 2:Descriptive statistics of major balance sheet items of Illinois antebellum banks during 1860[2]

	SPCH	DEPOS	BKNCIR	EQCAP	NOBKH	DWOBK
Mean	4960.73	43782.52 (11.3%)	115986.7 (4.2%)	69975.99	9908.98	55316.95
Median	2000.00	29225.81	84097.00	50000.00	6152.50	37480.00
Maximum	72912.40	1250524.4	651736.00	652500.00	37440.00	632223.4
Minimum	90.00	200.00	8966.00	14511.11	68.58	685.00
Std. Dev	12843.53	38871.76	98661.52	84108.47	9291.40	100906.4
Kewness	4.59	0.822	2.69	5.33	1.17	4.80
Kurtois	23.67	2.60	12.58	33.12	3.38	26.38
Jarque-Bera (Probability)	1301.49 (0.0000)	2.50 (0.28)	468.50 (0.0000)	400.00 (0.0000)	8.39 (0.01)	1806.35 (0.0000)

Table 2 shows that the most important liabilities of banks were, in terms amount, banknotes in circulation, (BKNCIR) and deposits (DEPOS). The average banknotes and deposits were 115,986.7 and 43,782.52 respectively during 1860. The average equity capital was 69975.99 was higher than deposit liabilities. The other banks notes held were the least liabilities of banks. The average of other banks notes was 9908.9.

The amount of average specie reserve, in Table 2, shows antebellum banks specie reserve was not fraudulent and neither " cash were sometimes of nails and broken glasses with a layer of coins on the top" as mentioned by Hammond (1857). Banks maintained significant amount specie reserve against notes and deposit liabilities during 1960. The percent of specie reserves against deposits and notes liabilities were 11.3 and 4.2 respectively.

The examination of balance sheet of individual bank shows that only one bank in Illinois did not have specie reserve. However, that particular bank did not have any deposit or any other liability save banknotes. The notes of the bank were secured by bond deposits with state auditor's office.

A further insight about banks liquidity reserve can be seen from yearly specie reserve ratio against banknotes and deposits presented in Table 3.

[2]Only banknotes in circulation (BKNCIR) is reported as BKCIR is equal in amount to capital stock deposited. Parenthesis below BKNCIR and DEPOS provides percent of specie reserve.

Table 3: Yearly Specie Reserve ratio of Illinois Free Banks

Year	**Specie reserve($)**	**Banknotes in circulations($)**	**Deposits($)**	**Specie/Banknote Ratio**	**Specie/Deposit Ratio**
1853	414,431.8	1,351,778.00	522,476.29	0.30	0.79
1854	565,152.04	2,283,523.00	1,286,102.25	0.24	0.44
1855	759,474.87	3,420,985.00	1,267,234.91	0.22	0.60
1856	635,810.65	5,534,945.00	1,002,399.54	0.11	0.63
1857	333,239.0	5,238,930.00	658,521.0	0.06	0.50
1858	269,585.87	5,707,048.00	640,958.99	0.05	0.42
1859	223,812.00	8,981,723.00	697,037.00	0.02	0.32
1860	302,905.26	11,010,837.00	807,763.00	0.03	0.37
1862	104,018.00	619,286.00	400,213.00	0.16	0.26

Source: Samad, 1991

The yearly specie reserve of Illinois free banks, in Table 3, decreased over years but was never zero. The decrease of liquidity reserve (specie) might have been due to (i) increased management skill and experience. When bank acquired skills and insights of management, liquidity management became efficient. Efficient bank management (measured by bank's ages of operation) reduced bank's specie reserve. (ii) Public confidence in bank management enhanced as there was no bank failure in Illinois nor there was any suspension of specie payment after 1857.

Table 3 also shows that the yearly specie reserve ratio against deposit liabilities was higher than that of banknotes. Although banks were not required to hold specie reserve against demand deposits, prudent bankers maintained high liquidity (specie) reserve against deposits for avoiding bank run. They were aware that a bank specific run could trigger an economy wide bank run.

The reason for low liquidity reserve against banknotes can be explained from bank loan character supported by banknotes. A long run loans earned lower interest rate because banknotes issued to support the long term loan could not be redeemed in a short period. Thus, the longer the period of loans, the lower the specie reserve.

On the other hand banks higher specie reserves against deposits can be explained by its higher coefficient of variation. A comparative coefficient of variation of bank deposits and banknotes in circulation is provided in Table 4.

Table 4: Illinois banks coefficient of variation for deposits and banknotes during 1860

Variables	Mean	Standard deviation	Coefficient of variation
Banknote (BKNCIR)	115986.71	9866.0	0.085
DEPOSIT (DEPOS)	43782.52	38871.76	0.887

Table 4 shows that the coefficient of the variation of deposit liabilities around mean was significantly lower than that of banknotes. The average coefficient of variation of banknotes was 8.5 percent compared to 88.7 percent of deposit liability.

4 Data, Methodology and Model Variables

4.1 Data

Data are obtained from various House of Representatives EX. Docs and Illinois State Auditor Biannual Reports, Springfield. Regression data for 1860 are obtained from individual bank's balance sheet.

4.2 Methodology

Regression method is used for estimating the liquidity reserve need of Illinois free banks. Before running regression pairwise correlation is tested and its results are provided in Table 5.

Table 5: Correlation matrix of variables

	SPCH	NOBKH	EQCAP	DWOBK	DEPOS	BONDCL	BKNCIR
SPCH	1.000	0.372	0.077	0.123	0.483	0.213	-0.232
NOBKH	0.372	1.000	-0.148	-0.197	0.447	-0.254	-0.255
EQCAP	0.077	-0.148	1.000	0.965	-0.214	0.476	0.476
DWOBK	0.123	-0.197	0.965	1.000	-0.083	0.405	0.399
DEPOS	0.483	0.447	-0.214	-0.083	1.000	-0.373	0.407
BONDCL	-0.23	-0.254	0.476	0.476	-0.373	1.000	0.996
BKNCIR	-0.232	-0.235	0.476	0.476	-0.407	0.999	1.000

All of the variables, in Table 5, are discussed in Section III. Table 5 shows that there is a very high correlation between banknotes in circulation (BKNCIR) and capital stocks deposited as security (BONDCOL) and between bank equity capital (EQCAP) and deposit with other banks (DWOBK). Since there is high correlation, BONDCOL and DWOBK are omitted to run the regression.
The model is estimated as:

$$SPECi = \alpha_0 + \alpha_1 DEPOSi + \alpha_2 BKNCIR + \alpha_3 EQCAP + \alpha_4 NOBKHi + \alpha_5 DWOBK + e \quad (1)$$

Dependent variable:
SPECi: Specie reserve of bank i.

4.2 Independent Variables

DEPOSi = Depositors' deposit of bank i. Deposits were a significant liability of free banks. As discussed in Section III. It is expected that

$$\frac{dSPCH}{dDEPOS} > 0$$

BKNCIR= Banknotes in circulation for bank i. The banknote of the free banks of Illinois was an important liability for banks. The Illinois law required banks to pay specie on demand. A failure to pay specie on demand forfeited banking license. It was naturally expected that the higher the banknote, the higher the specie reserve. That is,

$$\frac{dSPCH}{dBKNCIR} > 0$$

NOBKHi=Notes of other banks held up by bank i. Notes of other banks held up (NOBH) were always redeemable into specie on demand and was, therefore, considered as liquid as cash for banks holding them. Usually, specie reserve and notes of other banks are considered be substitute products. A bank with higher deposit of other bank-notes did not need more reserve. So, it is expected that

$$\frac{dSPCH}{dNOBKH} < 0$$

EQCAPi = Bank capital paid. It was banks equity capital paid in and invested. If bank capital paid and invested in risky bonds to earn high rate of return, or it is invested in long term maturity bonds, it is expected that

$$\frac{dSPCH}{dEQCAP} > 0$$

All variables in model (1) are measured in natural log and are defined above

5 Empirical Results

The result of estimated model is provided in Table 6.

Table 6: Regression result of model 6

Dependent Variable: SPCH				
Method: Least Squares				
Sample (adjusted): 10 91				
Included observations: 18 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NOBKH	0.037375	0.567647	0.065843	0.9485
EQCAP	0.015911	0.044489	0.357633	0.7264
DEPOS	0.221742	0.121738	1.821471	0.0916
BKNCIR	-0.519793	0.201032	-2.585625	0.0226
C	31562.28	19224.15	1.641804	0.1246
R-squared	0.547664	Mean dependent var		12697.59
Adjusted R-squared	0.408483	S.D. dependent var		21937.40
S.E. of regression	16872.08	Akaike info criterion		22.53484
Sum squared resid	3.70E+09	Schwarz criterion		22.78217
Log likelihood	-197.8136	F-statistic		3.934918
Durbin-Watson stat	1.804680	Prob(F-statistic)		0.026269

Regression result, Table 6, shows that the variables of model explain 54.7 percent of the variation of Illinois free banks specie reserve.
The model's overall regression is statistically significant. This is supported by F-statistics. F-statistics 3.93 and is significant.
The high Darbin-Watson statistic 1.8, reported in Tables 6, suggests that the estimates do not suffer from multicollinearity for the variables in the model.
The signs of variables, in Table 6, shows that specie reserves were positively related to deposit liabilities (DEPOS) and significant. The coefficient of DEPOS is 0.22 and is significant with 9 percent level of significance. The finding of this paper is consistent with the finding of Hilderlith and Rockoff (1973) who found that the liquidity reserves of eastern city banks were positively related to bank deposits. This paper also finds the elasticity of specie demand for depositor's deposits was 22 percent.
The coefficient of banknotes in circulation (BKNCIR) is negative (-0.51) and is significant at a 2 percent level of significance. The negative sign can be explained by following reasons.
First, the examination of Illinois banking clause revealed that antebellum banks were required to maintain a dollar collateral for each dollar banknote. That is, banknotes were supported by an equivalent amount of capital stocks deposited as security. This characteristic reduced the necessity of specie reserve.
Secondly, banknotes were, usually, issued against loans for a longer period. Long period loans earned lower interest rate. In order to earn a lower interest rate, borrowers did not return banknotes for specie redemption.
Thirdly, each note-issuing bank kept significant portion of other bank's notes in order to avoid retaliation of note redemption. The keeping of other bank's notes in the reserve meant less need for specie reserve. Fourthly, banknote market in Illinois was less volatile than deposit market. This was substantiated by low coefficient of variation. The coefficient of variation of banknotes was 0.085 as compared to 0.88 of deposit liability.

It is, therefore, consistent that $\frac{dSPCH}{dBKNCIR} < 0$

The sign of EQCAP is positive and consistent as expected in the model and is not significant.
The sign of NOBK is negative and is not significant.

6 Conclusion

This paper studied individual bank's balance sheet of all free banks operated in Illinois during 1852-1861 for examining historical allegation and determining banks determinants os specie reserve.
This paper finds no evidence in support of historical allegation that banks liquidity management was deceptive. The generalized allegation of thin layer of specie on the top of "broken glasses and nail" is not sustainable in Illinois.
This paper finds that two most important determinants of antebellum banks specie reserves were deposit liabilities and banknotes in circulation. They are significant a 9 percent and 2 percent level of significance respectively. The elasticity of specie demand for deposits and banknotes was 22 and 51 percent respectively.

Banks equity capital and notes of other banks in hand were not significant determinants of the specie reserves Illinois free banks.

References

[1] Bullock, Charles J (1900). Essays on the Monetary History of the United States. New York: Macmillan.

[2] Dowd, Kevin. (1992), The Experience of Free Banking. (ed) London: Routledge

[3] Dwyer and R.W. Hafer (2001). "Bank Failures in Banking Panics: Risky Banks or Road to kill?", Workinng Paper #2001-13, (July) Federal Reserve Bank of Atlanta.

[4] Dwyer and Gerald P. Jr (1996). "Wildcat Banking, Banking Panic, and Free Banking in the United States", *Economic Review* (December), Federal Reserve Bank of Atlanta, 1-20

[5] Economopoulos, A.J. (1990), "Free Bank failures in New York, Wisconsin: A portfolio Analysis", *Explorations in Economic History*, **27**, 249-264.

[6] Hammond, Bray. (1957), *Banks and Politics in America from Revolution to the Civil War*. Princeton: Princeton University Press.

[7] Hinderliter, Roger. H. and Rockoff, Hugh. (1973), "The Management of Reserves by Ante-bellum Banks in Eastern Financial Centers.*" Explorations in History* **11**, 37-53.

[8] Meyers, M. (1931), *The New York Money Market: Vol. I. Origins and Development*. New York: Columbia University Press.

[9] Rashid, S. and Samad, A. (1996), "Portfolio Management of the Free Banks of Illinois: An Examination of Historical Allegation." *The Review of Austrian Economics* **9** (1), 55-76.

[10] Rockoff, H. (1974). "The Free Banking Era: A Re-Examination", *Journal of Money, Credit and Banking*, **6**, 141-167.

[11] Rockoff, H. (1972), The Free Banking Era: A Re-Examination. Dissertation in American History. New York: Arno Press

[12] Rolnick , H. (1984). "The Causes of Free Bank Failure: A Detailed Examination", *Journal of Monetary Economics*, **14**, 1-14.

[13] Rolnick, A., and Weber, W.E (1983),"New Evidence on Free Banking Era." *American Economic Review* **73**, 1080 – 1091.

[14] Rolnick, A., and Weber, W.E. (1982), A new Exploration of Free for Free Bank Failures. Research Department Staff report 79, Federal Reserve Bank of Minneapolis.

[15] Rothbard, N. Murray (1989). "The myth of Free Banking in Scotland", The Review of Austrians Economics, **2**, 229-241.

[16] Samad, A. (1991), *The Free Banking Experience in Illinois*. Unpublished Ph.D. Dissertation: University of Illinois.

[17] Scott, Carole. (1999). "Banking lesson from Antebellum South", B-Quest, pp.1-17 Sechrest (1993) Free Banking: Theory, History, and a Laissez-faire Model, Quorum Books, Westport, Connecticut.

[18] Sechrest, J. Larry (1989). "White Free Banking Thesis: A case of mistaken indentify", The Review of Austrians Economics, **2**, 247-257.

[19] Selgin, G.A. (1988), *The Theory of Free Banking: Money Supply under Competitive Note Issue*. NJ: Totowa, Rowman & Littlefield

[20] Sylla, Richard. (1971-1972), "American Banking and Growth in Nineteenth Century: A Partial View of the Terrain." *Explorations in Economic History* **9**, 197-227.
[21] Temin (1975), "The Panic of 1957." *Intermountain Economic Review*, **6**, 1-12.
[22] Temin, Peter. (1969), *The Jacksonian Economy*. New York: W.W. Norton & Co.
[23] Weber, E. Warner. (2005). "The State Banks in the United States: How Many Were There and When Did They Exist?", **W** # 634, Federal Reserve Bank of Minneapolis.
[24] White, L.H. (1984), *Free Banking in Britain: Theory, Experience and Debate,* 1800 -1845. NY: Cambridge University Press.