

## LIQUIDITY MANAGEMENT OF THE US FREE BANKS DURING THE ANTIBELLUM PERIOD

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### ABSTRACT

*The purpose of this paper is to examine whether the liquidity reserve policy of the United States commercial banks during the free banking period from 1850 -1863 was consist with the sound norm of the banking practices. By examining the aggregate balance sheet data of the period, the paper evaluates portfolio risks, liquidity risk in particular and seeks to identify the determinants of liquidity reserve the free banks operated during the free banking period when banks, in most states, were subject to neither reserve requirements nor federal regulation. By applying econometric tools, the paper finds that the cash reserve management of the free banks was a significantly positive function of bank-note and deposit proportion, a negative function of loan proportion. Bank capital was not a significant determinant for specie reserve.*

**Keywords:** *Free banks, Specie reserve, Banknotes*

### I. INTRODUCTION

Commercial banks of the United States during the early banking period, 1791-1836 were highly regulated and controlled by the government through the governance of bank charter. Obtaining a bank charter was highly difficult and was often political and corrupt.(Samad, Miah 2006, Bodenhorn, 2003, ). The chartered and regulated banking system of the period was replaced by a new banking system which was known as “free banking” in American banking history. The free banks were no longer subject to government regulations and management. Federal government completely withdrew its regulations and supervision over commercial banks. Each bank was its own for its portfolio risk management.

Management of bank portfolio, liquidity in particular, was dependent on its decision. Banks were free to issue liabilities such as banknotes and deposits. Each bank was free to issue its own designed banknotes in the market. The issue of banknotes was tempting for banks because banks issued loans by their own banknotes. The higher the circulation of banknotes the higher the income for a bank. However, banknotes were a critical liability for the issuing bank. Failure to redeem a banknote into specie on demand could bring foreclosure to the free banks.

Free banks issued deposits also. Banks were required to pay depositors specie on demand. A failure to pay specie on demand could trigger a run on a bank. A bank run originating from a specific bank could cause an economic wide bank run. In this sense, portfolio decision such as banknotes, deposits and maintaining adequate specie reserves played an important role in

the free banking era. Banks survival in the market was largely dependent on specie reserve and redemption.

It is a natural question: how free banks did behave in providing liquidity to note-holders and depositors when there was no provision reserve requirements and nor there was any central bank as a lender of the last resort for salvaging a commercial bank, should any one them was in need of liquidity. New York was the only state that initially introduced 12.5% reserve requirement against notes [Dowd, 1992, p. 207] and subsequently removed the clause. It is this feature– the absence of reserve requirements against banknotes and deposits liabilities and withdrawal of state and federal government regulation, and their impacts on banking business–has been the focus of research enquiry for a long time. The two important questions relevant to this context are:

First, did free banks maintain adequate liquidity reserve consistent with sound banking practices when there was no federal or state regulatory authority regulating bank behavior, in particular when free to issue bank-notes as a medium of exchange?

Second, what were the factors that determined the liquidity position of the banks when the holding of specie reserves had high opportunity cost? In other words, what were the factors that had significant impact in determining cash reserve requirement of the free banks? The higher the specie reserves the lower the amount of loans and income for a bank.

The answer to the first question was unfavorable until recently. The conventional view, in general, is that unregulated behavior led to unsound management practices and numerous bank failures and huge losses by note-holders. Free banks with no regulation meant “wild cat” banks and numerous bank failures (Hammond 1957, Lockett 1980). Free banks used to issue excessive notes far more than they could support by specie reserve–reckless and fraudulent behavior. The recent studies by Rolnick and Weber (1982, 1983 and 1984), Rashid and Samad (1996), and Rockoff (1974), and Economopoulos (1988) found evidence that it was not the absence of regulation but the falling of asset prices that led to numerous free bank failures. Free bank failure was attributable neither to “wildcat” banking nor to fraudulent banking practices.

With regard to the second question (what factors determined the liquidity reserves of the banks) we do not have any answer yet.

Liquidity reserve is an important field of portfolio management of the free banks. There are no studies that focused on the issue of determining the factors for banks liquidity (specie) reserves during the period. The main focus of this paper is directed to this second question, that is, to identify the underlying factors determining the liquidity reserves, specie reserves in particular, of the free banks of the United States during the free banking era 1850-1863.<sup>1</sup>

The paper is structured as: Section 2 provides the survey of past literature. Section 3 discusses the rational for liquidity reserve, the growth of US commercial banks, and their assets and liabilities. Section 4 outlines methodology, model, and data. Section 5 provides empirical evidence and conclusions.

## **2. SURVEY OF LITERATURE**

The antebellum banking history, free banking in particular, has late been a subject of serious interest from different perspectives. Hayek (1976) provided an important foundation for free

banking research. He argued for a laissez-faire banking system. According to him, it is not the regulated banks but the banks under laissez-faire can provide stability of money and price level for an economy. Rockoff's (1974) pioneering thesis provided that free banks failed because of the bond valuation provision the Free Banking Act provided. According to Rockoff, the free banking failures in Illinois, Indiana, and Wisconsin were caused by the par valuation provision of the Free Banking Act of the state. Rockoff investigated the case of wildcat banking and found there were infrequent occurrences. The studies by Economopoulos (1990), Rolnick and Weber (1983, 1984), and Samad (1991) did not find such evidence in Illinois. Samad (1991) in his dissertation found that Illinois strictly observed the market valuation provision. Rolnick and Weber (1983, 1984) made an important revelation about the failure of the free banks during the free banking period. They asserted that the free banks failed because of the sharp decline of bond/asset prices that backed the bank notes in the market. When bond prices backing the bank-notes in circulation decline, the bank-note holders panicked and rushed for redemption. This ultimately led to the failure of free banks. They found evidence in Minnesota, Wisconsin, Indiana, and New York. Economopoulos (1998) investigated the bank failures in Illinois and found evidence in support of the failing bond prices hypothesis. He says, "...the fall of the bond price was a major factor in the free bank failures" (P.262). The author's study (1990) examined the portfolio behavior of Wisconsin's free banks and found that the "solvent banks held more loans and specie, and issued more deposits and less bank-notes than the closed. Rashid and Samad (1996) studied the portfolio behavior of Illinois free banks in connection with the historical allegations. By examining the aggregate data, their study found the historical allegation to be false—that "cash were sometimes of nails and broken glasses with a layer of coins on the top" (Hammond, 1957). Samad and Miah (2006) examined the portfolio behavior between the chartered and the free banks behavior of the United States and found no significant differences in the portfolio management behavior. Daily (1934) focused on factors for the development of Chicago based commercial banks including the free banks in Illinois. Shade's (1972) study for Illinois was devoted mainly to the political issue of bank referendum and the Free Banking Act.

[Hinderliter and Rockoff (1973) noted that banking historians are generally "more concerned with distributing praise and blame among banks and legislators than with searching for potential economic determinants. Myers (1931) asserted that cash reserve was important for banks for New York. However, the specie reserve practices of the banks were "unsophisticated". Peter Temin (1969) found no evidence of reckless or fraudulent banking practices in New England although specie reserve was the minimum in the state<sup>2</sup>. Economopoulos (1990) found that solvent banks, in general, used to hold more loans and specie reserve than those held by the closed banks in Wisconsin and New York. The study of the Illinois free bank by Rashid and Samad (1996) found that the free banks of Illinois held wide a variety of assets in banks' portfolio, and the value of these assets exceeded those of liabilities. In an attempt to find determinants, Hinderliter and Rockoff (1973) provided an econometric study for the liquidity reserve of the banks located in the cities of the Eastern States—Boston, New York and Philadelphia and found that banks' reserve holding was positively related to their deposits as a proportion—a notion of management consistent with rational banking practices. Their study focused on the liquidity reserve holding of the banks of only three cities – Boston, New York

and Philadelphia with New York being the only city (or state) which had free banking. So, their finding could not be accepted as a generalized conclusion for free banks.

The review of the free banking literature provides no evidence for the study of the present topic, that is, the factors determining the liquidity reserve of the free banks for the period, 1850–1863.

## 2.1 Rational for Liquidity Reserve

The banks of the free banking period were a depository institution. As a depository institution banks used to mobilize deposits from the public, issue various liabilities, and provide loans. The need for specie (liquidity) reserve could be understood from the major liability components of free banks aggregate balance sheet Table 1.

**Table 1**  
**Major Liabilities of Free Banks in 1850**

<i>Item</i>	<i>Amount (million)</i>	<i>% of total</i>
Capital stock paid in and invested according to law	217.3	43.8
Amount due to depositors	146.3	29.5
Notes or bills in circulations	131.4	26.5
Total liabilities	495	100

It appears from the aggregate balance sheet of the bank, bank-notes in circulation and deposits from public, equity capital, that is, capital stock paid in and invested according to law, were major items in the liability of the banks.

### **Bank-notes**

Among liabilities, bank-note in circulation was the most significant liability to free banks. Banknotes in circulation constituted a significant item in the liabilities. It appears from the aggregate balance sheet in appendix that it constituted 26.50 % of the total liabilities of the free banks.

The important characteristic of bank-notes of Illinois free banks was that (i) each free bank used to issue its own design notes. These notes were freely used as a medium of exchange. This was mainly due to the scarcity of specie in the economy. (ii) The banknotes were required to be convertible into specie on demand. The free banking Act required that banknotes be redeemed into specie (liquid cash) on demand. A failure to redeem the banknote on demand resulted in forfeiture of banking license. (iii) From other banks' perspective that held the banknotes of the other banks in their portfolio, banknote was as good as liquid asset. Banknotes could be sent to the issuing bank for immediate redemption.

Although there was no law governing banks to keep specie reserve, each free bank maintained specie reserve in its bank-vault for several reasons. (i) To avoid forfeiture of bank license. Failure to pay specie on demand could invoke bank license. (ii) To enhance the value and reputation of banknotes.

## **Deposits**

Like today, the free banks of the antebellum period used to mobilize deposits from public. Free banks had added incentive to attract and hold deposits. Deposit was also an important source of bank funds for loan demands. Secondly, banks did not pay interest. It was common practice of the time that bank deposits did not earn any interest (Economopoulos, 1999 p. 425). Deposits were the most important liabilities of the free banks. The balance sheet in Table 1 reveals that it constituted 29.5 % of the bank liabilities.

The important characteristic of deposit liability was that (i) free banks were obligated to pay specie to depositors on demand. Although there was no legal requirement for a liquidity reserve against deposits, rational and prudent behavior suggested banks to keep adequate specie reserve for economic reason. A bank's failure to pay specie on demand could provide signal in the market that the bank in question was running shortage of liquidity which could easily, in turn, led to a run on bank.

## **Capital**

Under the Free Banking Act of 1851, free banks' capital was invested in U.S. and or state bonds. The law required that the market value—not the par value—of the bond was considered in case of backing banknotes in circulation. The balance sheet in Table 1 reveals that equity capital constituted 43.8 % of the total liabilities of free banks in 1850

Specie reserve was, thus, required to meet the liability obligations of the banks, and for public confidence.

### **3.2 Growth of free Banking**

Although the free banking act was first passed in 1837, most of the states adopted the free banking system during the period 1850–1863. During this there was a rapid growth of banks, bank capitals, deposits and note-circulations. Along with the growth of liabilities, there was also a corresponding growth of bank assets including specie reserve. The growth and growth rate of the free banks, their assets and the liabilities are presented in Table 1.

Table 2 shows the following important points:

- (1) The average growth rate of banknotes in circulation was 6.2%, and was higher than the deposit growth rate of 5.7%.
- (2) The average growth rate of specie reserve was higher than that of growth rate of banknotes. The growth rate of specie reserve was 7.5% compared to the growth rate of banknotes in circulation of 6.2%. and deposit of 5.7%. The high growth rate of specie holding compared to the growth rate of banknotes in circulation is an indication that the liquidity reserve management or practices of the free banks was not reckless or fraudulent. Reserve of specie holding against bank-notes was an immediate and primary consideration for the free banks for a number of reasons. (a) Notes were a medium of exchange (b) Bank notes must be redeemed by specie of the bank by law. Failure to redeem its notes forfeits bank license. (c) Note market provides signals to other markets including deposits. As long as a bank maintained reputation of note redemption, a large deposit withdrawal due to panic was unlikely, and bank did not have worry for

**Table 2**  
**Growth of Free Banks, Assets and Liabilities (Selected Items) During 1850-1863\***

<i>Variable</i>	<i>Total</i>	<i>Maximum</i>	<i>Minimum</i>	<i>Mean</i>	<i>SD<sup>a</sup></i>
Banks	17,780 (0.78)	1601 (.61)	750 (-.17)	1270 (0.06)	300
Specie	974 (0.97)	104.5 (0.40)	45.4 (-0.20)	69.6 (0.075)	22.17
Notes <sup>b</sup>	358 (1.989)	58.1 (1.3)	16.3 (-0.25)	25.62 (0.153)	10.1
Loans <sup>c</sup>	7,998.8 (0.68)	696.80 (0.36)	364.20 (-0.15)	571.34 (0.052)	118.13
Deposits	3,780.80 (1.44)	503.70 (.40)	146.30 (-.17)	270.05 (0.11)	92.28
Circulations <sup>d</sup>	2,576 (0.80)	238.70 (.40)	131.40 (-.27)	184.0 (.062)	30.19
Capital	4,716.40 (0.74)	429.60 (0.45)	207.90 (-0.12)	336.89 (0.057)	83.69

\* All figures are in \$million except growth rate. The figure in the parenthesis represents the growth rate of the variable.

a = Standard deviation

b = Banknotes of other bank held as reserve.

c = Loans and discounts

d = Banknotes in circulations

the depositors. Banks could continue to attract new deposit to supplement existing specie reserve. Given 7.5% growth of specie reserve and 6.2% growth in notes in circulation, indicates that the free banks could still have 1.3% specie reserve left over to meet depositors' demand. In other words, free banks' liquidity reserve was adequate enough (in terms of growth) to meet the demand for noteholders and yet left a surplus of 1.1 to meet depositors' demand.

- (3) The average capital growth rate of the banks was 5.7% during the period 1850-1863. During the period loans and discounts grew at an average of 5.2%. This indicates that even if the loans of the free banks suffered a loss at the rate 5.2%, the bank could have a surplus net worth of .5 percent (=5.7-5.2). It suggests that the practices of loans and discounts, and the note issue policy by the banks of the free banking period was not inconsistent with a sound norm of banking practices.

When the proportion of specie reserve against various liabilities is examined, it provides more evidences in favor of sound cash management practices by the free banking system. Cash to various liabilities is presented in Table 2.

**Table 3**  
**Specie Reserve Ratio Against Various Liabilities of the Free Banks**

<i>Variables</i>	<i>Mean</i>	<i>S.D.</i>
Specie/Deposit	0.26	0.038
Specie/Circulation	0.38	0.96
Specie/Deposit & circulation	0.153	0.026

It appears from Table 3 that an average specie reserve of the free banks against demand deposits and banknotes in circulation was 26 percent and 38 percent respectively. The liquidity reserve (specie) of the banks was, thus, not consisting of thin layer of specie on the top of “broken glass” as claimed by early historians. Specie reserve of the banks was a significant percentage of banknotes and deposit. The average growth rate of specie reserve against deposit and banknotes combined was 15.3%. If banknote reserve of other banks (15.3%) mentioned in Table 2 are added with the specie reserve, the growth rate of the total liquidity reserve of the free banks against the major liabilities i.e. banknotes and deposits becomes 30.6% which was very significant.

It is thus established that the banks of the free period maintained adequate liquidity reserve in the portfolio of the banks. The paper now turns to the question what factors determined the specie reserve of the free banks.

#### **4. MODEL AND VARIABLES**

The safety of a bank under the free banking period was dependent upon the public confidence on the bank. The confidence function for a bank may be stated in terms of two variables as:

$$\text{Confidence} = f(\text{NW}, \text{L})$$

where NW stands for net worth which equal total assets minus total liabilities, L stands for liquidity reserve, and is measured in terms of specie held in the portfolio of a bank as a proportion to total asset.

The higher amount of net worth (NW) is cushion for a bank’s unexpected assets losses. It protects a bank’s liability holders. A higher amount of equity capital serves as a shock absorber. Thus, the higher the amount of equity capital the greater is the NW, and the higher the net worth, the higher is the public confidence on the bank.

Similarly, the higher the amount of liquidity reserve, (L), the greater is the confidence of public on the bank. Banks maintain cash reserve for two most important reasons: (1) depositors must be paid on demand and, therefore, bank must keep adequate cash in order for depositors’ confidence on the banks (2) For the free banks, the noteholders of the bank must be paid in specie. That is, the notes of the bank must be redeemed into specie on demand. So, in order to keep the confidence of noteholders of the bank, bank was required to keep adequate cash in their portfolio. Thus, the confidence function of the bank consists of two variables- capital (NW) and liquidity reserve, L.

The liquidity reserve of a bank, in turn, depends on several variables such as:

$$L = L(\text{EQ/LA}, \text{BKN/LA}, \text{DEP/LA}, \text{LO/TA}, \text{NOBK/TA})$$

where L stands for liquidity (specie) reserve and L(EQ/LA, BKN/LA, DEP/LA, LO/TA, NOBK/TA) stands for liquidity as a function of five variables:

- EQ/LA is equity capital as a proportion of the total liability. It is denoted by CPTL.
- BKN/LA is total bank notes in circulation as a proportion of total liability. It is denoted by BKNTL
- DEP/LA is total deposit as a proportion of total liability. It is denoted by DEPTL

- LO/TL is the total loan as a proportion to total liability. It is denoted by LOTL
- NROBK/TA is total note reserve of **other** banks as a proportion of total asset. It is denoted by NROBKTA.
- L is measured as a proportion of specie reserve to total asset. It is denoted by SPTA.

The model used for determining the liquidity reserve is provided below.

$$SPTA = \alpha_0 + \alpha_1 CPTL + \alpha_2 BNTL + \alpha_3 DEPTL + \alpha_5 LOTL + e \text{ equation 1}^3$$

where each of the variables of the equation (1) were defined and discussed before. The historical features of these variables provide the following expected sign:

$\delta SPTA/\delta CPTL < 0$ . The higher proportion of capital to total liability, the greater is the confidence level, and the lower is specie reserve ratio.

$\delta SPTA/\delta BNTL > 0$ . The higher the proportion of banknote to total liability, the greater is the risk, and the lower is the confidence level. Therefore, bank needs more specie reserve for increasing confidence level.

$\delta SPTA/\delta DEPTL > 0$ . The same is the case with the deposit. That is, the higher proportion of deposit to total liability, the lower is the confidence level. So, bank needs more specie reserve.

$\delta SPTA/\delta LOTL < 0$  The higher the proportion of loan to total liabilities, the lower is the need for specie reserve.

#### 4.1 Data

The data used in this paper are annual time series for the period 1850 – 1863. All of the data except specie, capital are obtained from the US Historical Abstract since the Colonial Times. The data for specie and capital are obtained from the Office of the Controller of Currency Report 1876.

### 5. EMPIRICAL RESULTS AND CONCLUSIONS

The equation 1 is estimated by using OLS. The results of the estimated regression equation are presented in Table 4

Dependent Variable: SPTA

Sample: 1 14

Included observations: 14

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
LOTL	-0.020840	0.098283	-0.212041	0.8368
DEPTL	0.784812	0.271026	2.895709	0.0177
CPTL	1.016907	0.306051	3.322671	0.0089
BKNTL	0.752193	0.289292	2.600113	0.0287
C	-0.722774	0.291665	-2.478097	0.0351
R-squared	0.691611	Mean dependent var		0.081711
Adjusted R-squared	0.554550	S.D. dependent var		0.012310
S.E. of regression	0.008216	Akaike info criterion		-6.493018
Sum squared resid	0.000608	Schwarz criterion		-6.264783
Log likelihood	50.45113	F-statistic		5.045988
Durbin-Watson stat	2.544447	Prob(F-statistic)		0.020655



The results of the estimated equation provide support in favor of the liquidity management hypothesis of the free banks. The value of R-square of the regression equation 1 is .69. That is, 69 per cent of the variation of the specie reserve to total assets of the free banks are explained by four independent variables—CPTL, BKNTL, DEPTL, and LOTA.

The overall explanatory power of the model provided by F-statistics = 5.45 is significant and is supported by its probability of 0.0. This indicates that the explanatory power of the regression equation is high and statistically significant.

The higher Durban-Watson value of 2.54 suggests that there is no serio-correlation in the error term.

The coefficients of the major variables—DEPTL, CPTL, and BKNTL—are consistent with the expected sign of the model and highly statistically significant.

The sign for the co-efficient of bank-note to total liability, BKNTL was expected to be positive. It is positive and statistically significant. The statistical significance is provided by t-value of 2.6 and its low p-value of 0.02. The issue of bank-notes paused risk for banks. A failure to redeem banknote into specie could forfeit banking license. So, rational bankers used to hold more cash reserve when they issued more bank-notes. The sign is consistent with the sign found by Hinfilder and Rockoff (1973).

The sign for the coefficient of deposit to total liability, DEPTL is positive and consistent with the expectation of the model. The coefficient is statistically significant at a zero percent level of significant. This is supported by the high t-value of 2.89 and the low p-value of 0.017. The sign of DEPTL is consistent with the sign found by Hindfilder and Rockoff (1973). As deposit liability increased, free bank managements required more specie reserve in their portfolio. Failure to pay specie on demand bank deposits could provide adverse signal to note-market and, thus lead to a run on bank. In order to avoid such a run on bank, rational bankers used to hold more cash reserve.

The sign for the coefficient of capital to total liability CPTL was expected to negative but it turns out positive and significant. The sign is contrary to what Hinderliter and Rockoff (1973) found in their study at the micro level. One of the plausible reasons for positive sign is that a large percentage of banks' equity capital was locked up in bond investment, and these bonds were held as collateral to support note liabilities of the banks. The free banks did not have access to that capital. So, a higher capital increased public confidence on free banks but did not reduce the liquidity reserve requirements of the banks. So, it might be possible that the banks issuing more notes with bank capital required more specie reserve. The higher the equity capital, the higher was note issue, and therefore, the greater was need for specie reserve. This is shown by CPTL. The sign is consistent and significant at a zero percent significance level. This is supported by the very low p-value of 0.008.

The sign for the coefficient of loans to total assets, LOTA is negative and consistent. However, the low t-value indicates that the coefficient is not statistically significant. The higher p-value confirms this fact.

## CONCLUSIONS

The regression results of this paper suggest that the major factors determining the liquidity reserve of the US free banks were banknotes, deposits, and capital. This result is consistent with the standard norm of rational and sound banking practices. In the language of Hinfelder and Rockoff, it was the “product of a careful decision-making process” (1972, p. 50).

Rational banking behavior warranted that banks must keep higher cash reserve when they issued more liabilities - whether the liabilities were bank-notes or deposits. A sound and a rational liquidity management practice required that a prudent bank must keep a higher proportion of specie reserve against its liabilities. The liquidity management data of the free banking period contained in the model of this paper does supports this view. The positive association between specie reserve and bank-note as well as deposits suggests that the liquidity reserve management of the banks during the free banking was consistence with prudent banking practices. When banks had issued huge note liabilities, cash reserve of the banks were found to have increased. Similar relationship was found between cash reserve and banks deposits.

The negative relationship between liquidity reserve and the proportion of loans found in this paper is also consistent with sound banking practices. The higher the amount of call and short term loans in absence of capital market, the greater the opportunity of converting them into cash, and the lower was the need for holding vault cash reserve.

Although the predictive powder of model is high and significant, readers should take the results of this regression very cautiously due to small sample period. The robustness of results could not be verified because of small sample.

### *Notes*

1. Most of the states introduced free banking during 1850s although the Free Banking Era began with the expiration of the federal charter of the Second Bank of the United States in 1836. Michigan and New York were the first two states that introduced the Free Banking Act in 1836 and 1837 respectively.
2. It should be clear that banks operating in New England and Pennsylvania during the antebellum period were not free banks.
3. Since aggregate data of other banks notes are found, NROBKTA is omitted from equation 1

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