



Overdependence on Short-term Wholesale Funding: A Historical Perspective

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During the Global Financial Crisis of 2007–2008, several banks, including Northern Rock, Bear Stearns and Lehman Brothers, suffered a liquidity crisis due to their overreliance on short-term wholesale funding from the interbank lending market. In partial response, regulators implemented the net stable funding ratio (NSFR) to encourage bank holding companies to diversify their funding sources and reduce their dependency on short-term wholesale markets. By implementing the NSFR, regulators hoped to ensure a stable funding structure for any bank holding company over the long term.

Policymakers faced similar challenges in the 1920s. Many state banks were reliant on borrowings from other banks because they did not have access to the discount window. Since nonmember state banks did not have access to the discount window, they had been indirectly borrowing through their national member correspondents. (See [this blog post](#) for more information on the banks’ indirect access to the discount window.) State regulators became concerned about an overreliance on loans from other banks, because excessive borrowings may be a sign of deteriorating bank health.

In this blog post, we examine Virginia state banks and study how overdependence on borrowing from other banks affected its banking system. Starting in 1922, Virginia state bank regulators implemented a “reluctance to borrow” approach and listed continuous borrowers as “habitual borrowers” in examination reports (hereafter, we refer to these banks here as “habitual borrowers”). We compare the balance sheet ratios, profitability and deposit compositions of these habitual borrowers with those of non-habitual borrowers and assess the financial stability implications of overreliance on short-term wholesale funding.

Historical Background

The Federal Reserve System was created by the passage of the Federal Reserve Act of 1913. While national banks were required to become members of their local Federal Reserve Bank, state-chartered banks were given a choice. Most banks chose not to join the system, because federal regulations and supervision tended to be stricter than their state counterparts. In addition, nonmember banks still enjoyed the benefit of the Federal Reserve’s discount window by establishing a correspondent relationship with a national bank. Despite efforts to limit the pass-through of discount window liquidity to nonmember banks, the Federal Reserve was not able to prevent correspondent banks from making advances to their respondents (Congressional Quarterly, 1923).

Virginia banks borrowed from their correspondents mostly in the form of “bills payable,” which resembles wholesale funding today. With this transaction, banks were required to post a loan or other security as collateral. An increase in borrowing by bills payable usually indicated a declining financial position because banks would raise funds by bills payable if they could not raise enough cash by rediscounting all their eligible commercial paper.¹

¹ Borrowings from other banks took place in the forms of bills payable and rediscounts. However, most banks borrowed using the bills-payable method. There is a distinction between rediscounts and bills payable, because a bank resorts to bills payable after it has rediscounted all of its commercial paper and is still in need of funding. Since bills payable are used as the last resort in attempting to borrow, this method usually indicates that the borrowing bank is weak (Gruchy, 1937).

Since bills payable served as the last resort to obtain cash reserves, their use was often seen as a sign of weakness (Gruchy, 1937). Moreover, interbank borrowing carried counterparty risk. It could pose a threat to nonmember banks if its member correspondent refused to roll over short-term funds. They could create problems for member banks as well if nonmember banks could not pay back their short-term loans (Anderson, Erol, and Ordoñez, 2022).

Discount window lending increased dramatically during the second half of 1917, when the Federal Reserve began assisting the Treasury in financing World War I. During that war, the Board allowed the Reserve Banks to discount for nonmember banks if government securities were used as collateral and were endorsed by a member bank. While this policy was withdrawn, nonmember banks continued to borrow from their member correspondents.² Bank regulators began monitoring their borrowing patterns due to concerns that borrowing had become habitual rather than seasonal (Virginia State Banking Division, 1920–1922a, b).

Banks had various reasons for sustained borrowing. First, banks borrowed from member correspondents and invested in higher-yielding Treasury securities and loans. Second, banks relied on borrowing to help their respondent banks and customers deal with the depressed economic conditions following the collapse in agricultural markets. Banks also borrowed to manage the withdrawal of deposits and bolster their cash positions.

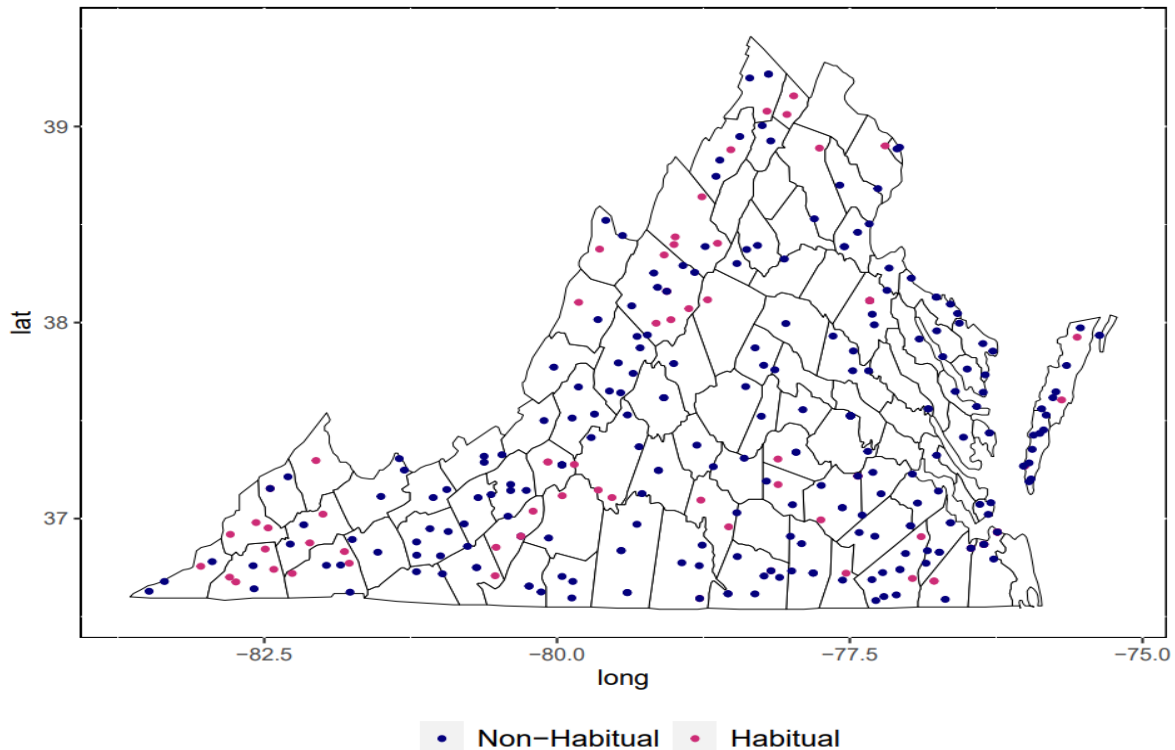
As more and more Virginia state banks relied on interbank borrowing, state regulators also became concerned about habitual borrowers. Continuous borrowing reduced competition for deposits within the banking sector, enabling inefficient banks to make loans and compete with efficient banks. Long-term borrowing also allowed banks with bad risk management to continue their operations, because they could offset withdrawals by depositors concerned about their solvency (Carlson, 2023). Continued reliance on borrowings from other institutions also indicated that the bank was financially weak. In particular, regulators were worried that too many banks were relying on borrowing using the bills-payable instrument. They developed guidelines on its use, which emphasized a greater “reluctance to borrow.” Starting in 1922, regulators reported in their examiners’ reports whether borrowing banks were habitual borrowers or not.

Comparing Habitual and Non-Habitual Borrowers in 1922 Virginia

Using information from Virginia state bank examiner reports, we identify 73 habitual borrowers and 234 non-habitual borrowers in 1922. Figure 1 maps habitual borrowers in red and non-habitual borrowers in blue. We then examine whether the behavior of habitual borrowers differed from that of non-habitual borrowers.

² In 1921, the Federal Reserve Board allowed member banks to discount on behalf of nonmember banks to prevent a banking crisis. This policy allowed a large amount of discount window liquidity to pass through to nonmember banks. This authority was withdrawn in 1923 when the recession was over. However, nonmember banks continued to borrow from member banks (Hackley, 1973).

Figure 1. Non-Habitual and Habitual Borrowers Among Virginia Banks in 1922



Source: Virginia State Banking Division, *State Bank Examination Report (1922a)*.

In Table 1, we compare balance sheet ratios of habitual and non-habitual borrowers. Both bank regulators and depositors paid close attention to three sets of ratios to assess the soundness of the banks: cash-to-deposit ratio, equity-to-deposit ratio and loan-to-deposit ratio (Gruchy, 1937). Cash reserves are composed of vault cash and reserves in other banks. Equity, or net worth, is measured as the sum of paid in capital plus cumulative retained earnings held as surplus or undivided profits. The loan-to-deposit ratio also measures liquidity, since banks could invest in bonds rather than loans to hold more liquid assets.

Table 1 shows that non-habitual borrowers were more liquid than habitual borrowers. Non-habitual borrowers held more interbank deposits and fewer loans than habitual borrowers. In addition, habitual borrowers relied more on borrowed money and less on deposits. These findings indicate that overreliance on borrowing from correspondent banks could contribute to the weakening of the banking sector. Because habitual borrowers were funded to a lower percentage by deposits, it is not surprising that the ratios to total deposits would be higher for habitual borrowers. However, these results are also robust when comparing them to ratios against total assets.

Table 1. Balance Sheet Ratios of Virginia Non-Habitual versus Habitual Borrowers in 1922

	(1)	(2)	(3)
	Non-Habitual	Habitual	Difference
Cash to total deposits	4.68 (4.17)	4.14 (2.14)	0.56 (0.51)
Interbank deposits to total deposits	13.67 (10.46)	8.60 (7.16)	5.06*** (1.31)
Bonds to total deposits	9.49 (15.18)	8.33 (22.19)	1.12 (2.29)
Loans to total deposits	99.62 (23.95)	125.1 (29.91)	-25.45*** (3.41)
Equity to total deposits	28.57 (15.63)	33.94 (19.38)	-5.32** (2.22)
Borrowings to total deposits	4.53 (9.07)	22.00 (15.65)	-17.49*** (1.47)
Borrowings to equity	16.29 (29.32)	72.12 (55.48)	-55.83*** (4.99)
Total deposits to total liabilities	75.65 (9.58)	65.35 (10.46)	10.28*** (1.31)
Borrowings to total liabilities	2.92 (5.20)	13.09 (7.64)	-10.18*** (0.79)
Age	14.48 (12.08)	15.60 (10.07)	-1.12 (1.56)
Population	12630.2 (39967.60)	12443.6 (28524.30)	140.6 (5029.5)
Obs.	234	73	

Note: Standard deviations are reported in parentheses in the first two columns. Standard errors are reported in parentheses in the third column, with * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

Source: Virginia State Banking Division, State Bank Examination Report (1922a, b).

In Table 2, we compare the profitability of non-habitual and habitual borrowers. We consider return on equity (ROE), return on assets (ROA) and net interest margin (NIM) and find that non-habitual borrowers were more profitable than habitual borrowers. These results are notable, given that habitual borrowers held more loans than non-habitual borrowers. They suggest that the quality of loans held by habitual borrowers may have been lower than that of non-habitual borrowers.

Table 2. Profitability of Virginia Non-Habitual and Habitual Borrowers in 1922

	(1)	(2)	(3)
	Non-Habitual	Habitual	Difference
Return on equity (ROE)	5.75 (9.83)	1.95 (6.61)	3.80*** (1.23)
Return on assets (ROA)	0.41 (0.84)	0.18 (0.93)	0.23* (0.12)
Net interest margin (NIM)	0.0169 (0.0141)	0.012 (0.0123)	0.0051*** (0.0018)
Obs.	234	73	

Note: Return on equity (ROE) is defined as net earnings divided by paid-in capital. Return on assets (ROA) is defined as net earnings divided by total assets. Net interest margin (NIM) is defined as net interest income (interest income – interest expense) divided by interest earning assets (bonds and loans). Standard deviations are reported in parentheses in the first two columns. Standard errors are reported in parentheses in the third column, with * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

Source: Virginia State Banking Division, State Bank Examination Report (1922a, b).

To determine whether state banks borrowing from other banks reduced the market discipline that banks normally experience from deposit funding, we compare the composition of deposits across habitual and non-habitual borrowers in Table 3 by looking at checking deposit accounts and time deposit accounts. Checking deposit accounts were the largest component of demand deposits and allowed depositors to withdraw funds easily but offered no interest. Time deposit accounts offered an interest rate of around 4 percent on average, but they required deposits to stay for a set period of time. As a result, banks funded with time deposits were less vulnerable to sudden deposit outflows. Although Table 1 indicates that non-habitual borrowers were more reliant on deposits than habitual borrowers, we do not find that the composition of deposits differed materially between the two types of banks.

Table 3. Deposit Composition Ratios of Virginia Non-Habitual versus Habitual Borrowers in 1922

	(1)	(2)	(3)
	Non-Habitual	Habitual	Difference
Checking deposits to total deposits	50.65 (22.39)	50.31 (23.30)	0.336 (3.030)
Time deposits to total deposits	39.47 (26.66)	39.22 (27.64)	0.246 (3.605)
Obs.	234	73	

Note: Demand deposits include overdrafts, individual deposits subject to check, demand certificates of deposits, official checks, certified checks and deposits of other banks. Time deposits include time certificates of deposits and savings deposits. Standard deviations are reported in parentheses in the first two columns. Standard errors are reported in parentheses in the third column, with * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

Source: Virginia State Banking Division, State Bank Examination Report (1922a, b).

Although the composition of funding for non-habitual and habitual borrowers was similar, funding costs may have differed. As a result, we next analyze the deposit rates for non-habitual and habitual borrowers in Table 4.

Specifically, we look at the rates on checking accounts, certificates of demand deposits, certificates of time deposits and savings deposits. We observe no difference in rates offered on checking accounts for the two types of banks. However, we do find some evidence that habitual borrowers offered higher rates on longer-term deposits accounts. Because banks at that time had 30 days to pay checks drawn on time deposits, they faced less pressure to raise cash quickly to meet withdrawals by time depositors. But depositors may have required higher rates from habitual borrowers to compensate for the observed risk in their portfolios.

Table 4. Deposit Rates of Virginia Non-Habitual versus Habitual Borrowers in 1920

	(1)	(2)	(3)
	Non-Habitual	Habitual	Difference
Demand certificate deposits	3.57 (0.79)	4.00 (0.00)	-0.23* (0.13)
Time certificate deposits	3.79 (0.39)	4.67 (1.15)	-0.15* (0.09)
Checking accounts	0.93 (1.59)	0.83 (1.44)	-0.12 (0.18)
Savings deposits	3.71 (0.49)	4.00 (0.00)	-0.14* (0.09)
Obs.	234	73	

Note: Standard deviations are reported in parentheses in the first two columns. Standard errors are reported in parentheses in the third column, with * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

Source: Virginia State Banking Division, State Bank Examination Report (1922a, b).

Conclusion

Following the Global Financial Crisis of 2007–2008, regulators introduced the NSFR to discourage banks from relying on wholesale funding from interbank markets and to ensure that they maintain a long-term stable funding structure. Virginia state bank regulators had similar concerns in the 1920s, because many banks became reliant on borrowings from other banks. This blog post has examined Virginia state banks in the early 1920s to address how overdependence on wholesale funding affected the banking system. In particular, we use data from 1922 to compare balance sheet characteristics and deposit rates of habitual borrowers and non-habitual borrowers. By focusing on a period in which banks became more reliant on borrowings from other banks, we have assessed the financial stability implications of bank funding structure.

Our analysis shows that habitual borrowers may have appeared riskier than non-habitual borrowers. Habitual borrowers relied more on borrowed money than non-habitual borrowers, while holding fewer liquid assets and more loans. Moreover, non-habitual borrowers displayed higher profitability than habitual borrowers. In terms of deposit composition, we see no difference between the two groups. However, we do find some evidence that habitual borrowers offered higher rates on time deposit accounts than non-habitual borrowers. Our study highlights the importance and challenges of ensuring a stable funding structure for all banks.

Guest Contributor

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