The Effects of Changes in Loan Demand and Deposits on Changes in Bankers' Deposits Maintained for a Country National Bank, 1920–1929

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One characteristic of the United States national banking era, 1863-1914, was the concentration of country national bank funds in the cities. Country banks maintained bankers' deposits with their city bank correspondents for which they received interest and services. Policy makers expected that these deposits would diminish as the Federal Reserve banks began to provide correspondent services after 1914; however, bankers' deposits continued to increase [Watkins, 1929, pp. 8-9, 43, 50-1, 62]. Bankers' deposits were viewed as a destabilizing factor of the financial system. Policy makers believed that bankers' deposits financed stock market loans and were therefore the basis of speculation. Since currency moved to the interior from the cities in the fall and stock market crashes occurred frequently in October, bankers' balances were accused of precipitating the decline [Watkins, 1929, pp. 7, 220, 362].

This paper utilizes the account records of a single but representative country bank, the First National Bank of Bloomington, Illinois to determine some sources of fluctuations in the changes of its bankers' balances. A simple portfolio selection model, as presented by Gendreau, is used to examine the behavior of the changes in bankers' deposits maintained [Gendreau, 1979, pp. 508-9]. In shorter time intervals, by either controlling for the currency withdrawal effects in September or adjusting the data seasonally, the evidence suggests that the bank's portfolio choice decisions were based on evaluating the return and risk characteristics of the relevant assets. These results are consistent with the principles of portfolio management and confirm that correspondent services were useful in an environment of unit banking.

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Bankers' Balances and the Correspondent Banking System

Bankers' balances were either deposits held or deposits maintained by banks. A bank accepting bankers' deposits held deposits while a bank placing deposits at another bank maintained deposits. Deposits maintained were a source of secondary reserves since they could be withdrawn on demand. The bank holding bankers' deposits provided correspondent services such as collections, bankers' loans, currency shipments, investments, and advice as well as access to organized city financial markets [Watkins, 1929, pp. 3-7, 205-290]. Access to financial markets through correspondents permitted interregional capital transfer, diversified asset portfolios, and contributed to the integration of the United States capital market [James, 1978].[1]

Correspondent banking services were necessary in the legally imposed unit banking environment. Interior banks needed city correspondents as reserve agents and for their services, rural bank customers, locally obtainable city payment services. City banks needed rural collection agents due to increased payments by check.

The Bankers' Balances Controversy

Prior to 1933, bankers' balances were a source of controversy in the banking system. The controversy centered on the principles of antitrust and extended to the notion that bankers' balances caused an unstable financial system structure. The concentration of reserves in the cities resulted in the accusation that city banks controlled lending and impaired country credit. City banks attracted bankers' deposits from the interior by paying interest on balances maintained.[2] Bankers' deposits, loans, United States bonds, and other securities were all potential investments for country bank asset portfolios. If bankers' deposits and loans were substitutes, increased deposits reduced local lending. Thus, bankers' deposits were accused of denying local communities of credit [Watkins, 1929; Gendreau, 1979, pp. 506-7].

Also, bankers' deposits were believed to be a source of instability in the financial system. Bankers' deposits allegedly financed security market loans that, in turn, encouraged stock market speculation.[3] In harvest months, deposits were withdrawn and these loans were either called or not renewed. The reduction in credit was associated with rising short-term interest rates.

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[1] Additional contributory factors of national capital market integration include the removal of legal restrictions and the expansion of the commercial paper market [Sylla, 1969; Davis, 1965].

[2] From the 1890s to about 1914, New York City banks paid 2 percent on bankers' deposits while banks in other cities paid interest in the range of 1.5 to 3 percent. The level of interest paid depended on local market characteristics and the condition of the money market [James, 1976, pp. 200-1].

[3] The Comptroller of the Currency suggested this in 1900 [Office of Comptroller of the Currency, 1900, pp. *xxv-xxvi*].

When tightness in the money markets led to stock market crashes, interbank deposits were viewed as a destabilizing factor in the financial markets. Stock market crashes revealed the loss of confidence in the financial system and when banks restricted the ability to convert deposits into cash the loss of confidence in the payments system risked a general economic meltdown [Watkins, 1929].

A policy goal of the Federal Reserve acts was to reduce the extent of the correspondent banking system.[4] Following 1914, legal reserves were to be deposited in the Federal Reserve district banks that were to perform services such as collections and rediscounting; however, correspondent banking persisted as an important institutional feature [White, 1983, pp.149-55; Watkins, 1929, p. 245]. Bankers' deposits continued to increase at correspondent banks after the Federal Reserve banks began operation as individual banks maintained deposits greater than the required legal reserves [Watkins, 1929, pp. 8-9, 43, 50-63, 159, 236, 272].

Implicit Value of Bankers' Balances

One contemporary suggestion why the correspondent banking persisted was that city banks continued to provide valuable services in competition with and in addition to those services provided by the Federal Reserve banks. City banks held inventories of potential investments for country bank asset portfolios and they provided advice on investment, business, and economic conditions. Dealers and brokers of other assets required payment in city funds, which necessitated the maintenance of bankers' deposits [Watkins, 1929, pp. 205-8, 257-60]. Thus, city banks provided the means for country banks to diversify their asset portfolios. Alternatively, the Federal Reserve banks provided extremely limited investment services.

In country bank asset portfolios, bankers' deposits were both a secondary reserve asset and an investment asset. Bankers' deposits were liquid because they were paid upon demand. These deposits earned a return over funds held in the vault or deposited at a Federal Reserve district bank. Because the cities had financial markets, country banks could accumulate bankers' deposits there for eventual investments [Watkins, 1929, pp. 208-12, 262-65, 361, 370].

While Watkins emphasizes the investment services characteristic for the continued importance of bankers' balances, Gendreau urges that the investment asset characteristic was important as well before 1933. A substitute investment for deposits were higher-yielding and liquid United States bonds. Because bankers' deposits also paid interest and were liquid, surplus funds

[4] Before 1913, the Comptroller of the Currency proposed recommendations with similar aims. For example, legal reserves on deposit with reserve agents were recommended to be reduced to 20% from 60% [Office of Comptroller of the Currency, 1900, p. *xxvii*]. Additional currency issues were proposed in amounts up to 50% of the face value of deposited bonds [Office of Comptroller of the Currency, 1902, pp. 58-9, 1906, pp. 55-6].

could be deposited to diversify a country bank's portfolio instead of incurring the transaction costs of a securities transaction. Country banks are believed to have largely met the local short-term demands for credit, then deposited surplus funds with city correspondents [Gendreau, 1979].

Demands of country bank funds exhibited seasonal behavior. In agricultural districts, demand for loans grew in the spring to finance planting, fertilizer, seeds, equipment, etc. Later, in the late summer and early fall, demand for loans increased again for the harvesting and marketing of the crops. These loans were repaid from the early fall to the spring. In the winter and summer, a short-term, rural investment or commercial loan demand did not exist to offset the decline in demand for agricultural related credits. As a result, in the later fall and winter months as well as the summer months, country banks accumulated surplus funds that needed temporary placement. Investments in bankers' deposits were one option [Watkins, 1929, pp. 151-52].

Given that short-term, local demand for credit at country banks was driven by the seasonal agricultural cycle, bankers' deposits played an important role in country bank asset portfolios. If future loan demand was uncertain, then bankers' deposits would be an option for surplus funds of country banks. As a low risk, interest-earning, and highly liquid asset, bankers' deposits was one attractive investment option available to country national banks for their asset portfolios. Rural bankers can be viewed as constructing asset portfolios with minimum risk levels given returns on all available investments. Therefore, country banks maintaining bankers' deposits in their asset portfolios behaved rationally in their portfolio management decisions.

A Simple Model of Bankers' Deposits Maintained by Country National Banks

Gendreau's model of portfolio selection provides an explanation of the behavior of bankers' deposits. Country banks first meet their local demands for agricultural credit, and then make decisions with respect to their surplus funds. Country national bankers could hold surplus funds, invest them in United States bonds, invest them in other bonds, or deposit them in interest earning bankers' balances. The relationship of bankers' deposits is presumed to take the linear form of

$$\Delta \text{BALM} = \beta_0 + \beta_1 \text{FLOW} + \beta_2 \Delta \text{QUAL} + \varepsilon.$$

The variable BALM is the amount of bankers' deposits maintained by the bank at all correspondents. FLOW is the flow of funds variable, the difference between the change in the present and previous period's deposits and the change in the present and previous period's loans. QUAL is the proportion of government bonds to loans and other securities, and ε is an error term. The variable GOV, United States bonds, is an alternative measure for QUAL [Gendreau, 1979, pp. 508-9].

Country bank business was influenced by the seasonal and agricultural cycles. In the spring during planting and the fall during harvesting, bank customers demanded agricultural loans and withdrew their deposits. Country banks recalled deposits from city correspondents and increased loans. In the spring and the fall, the flow of funds should be negative as well as the change in bankers' deposits; the association of the pair is positive. When agricultural loans were repaid in the winter, deposits should increase and loans should decrease, so the flow of funds should be positive and bankers' deposits are expected to increase; again, the slope is positive. In linear regression, the expected direction of dependency is

$$\partial \Delta \text{BALM} / \partial \text{FLOW} > 0.$$

A bank with a well diversified portfolio will not have to maintain as many bankers' deposits since its exposure to insolvency risk is reduced. Thus, the greater the proportion of government bonds held to loans and other investment securities, the fewer bankers' deposits necessary to diversify the portfolio with a safe liquid asset such as bankers' deposits. Alternatively, a country national bank with a declining portfolio of government bonds will have to increase its bankers' deposits maintained to improve the level of diversification in its portfolio. In linear regression, the relationship expected is

$$\partial \Delta \text{BALM} / \partial \Delta \text{QUAL} < 0.$$

Similarly, if government bonds are substitutes for bankers' deposits, then the greater the levels of government bonds held in the portfolio, the fewer the level of bankers' deposits necessary to achieve liquidity, safety, and diversification. If the bank has a greater proportion of its assets invested in government bonds to loans and other securities, then it is expected to maintain fewer bankers' deposits. Thus, as the bank liquidates its government investment holdings, the bank is expected to increase its bankers' deposits maintained. The following relationship is expected in linear regression

$$\partial \Delta \text{BALM} / \partial \Delta \text{GOV} < 0$$

[Gendreau, 1979, pp. 508-9].

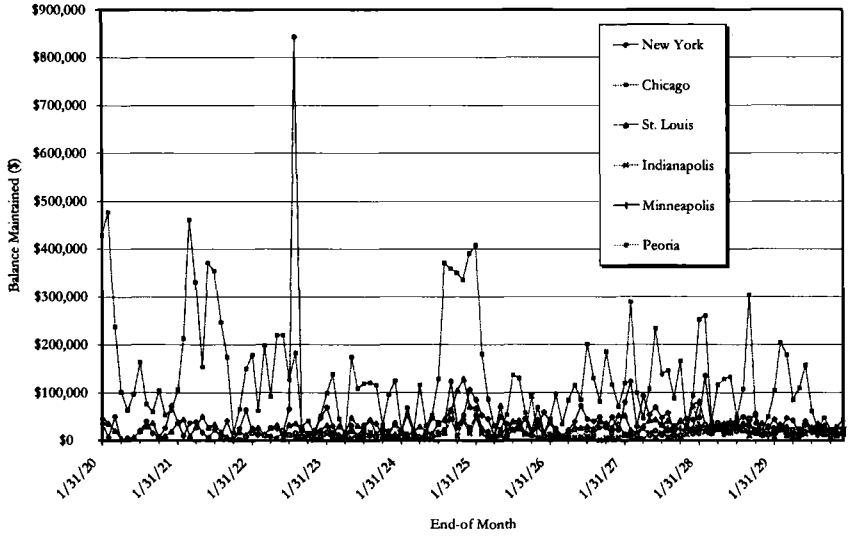
Data and Data Manipulation for a Country National Bank

Data for a single country national bank, the First National Bank of Bloomington, Illinois, were collected to test the hypothesized relationships of bankers' balances with loans, deposits, and investments.[5] The focus of this

[5] The University of Illinois Archives has many account books in their business records group. The Bloomington Bank Records contains account books for several Bloomington, Illinois national, state, and private banks for the years 1857 to 1932. The First National Bank of Bloomington was chosen for this study because its records contained the only complete

study is the behavior of the bankers' deposits maintained by a single, but representative, country bank. The bank began its operations in 1858 when it organized as a state bank, the Bank of Bloomington.[6] In 1865, the bank reorganized as a national bank. Over the years, many other private, state, and national banks operated in Bloomington and McLean County. During March 1911, the First National bank of Bloomington consolidated with the Third National Bank of Bloomington. In July 1921, the bank merged with the other national bank in Bloomington, the State National Bank.[7] The bank reorganized as the First National Bank and Trust Company in November 1930 and failed to reopen following the national bank holiday in 1933. The failure was apparently the result of an asset portfolio heavily weighted in agricultural loans and mortgages. This portfolio suffered from the lingering effects of the first Fed engineered deflation in late 1920 and early 1921 from which the bank was unable to recover [Wedding, 1942, pp. 25-32].

Figure 1: *Deposits Maintained at Correspondent Cities, 1920-1929*



Source: First National Bank of Bloomington

series for the decade of the 1920s. Data were collected on a monthly basis and the final day of the month was chosen for recording.

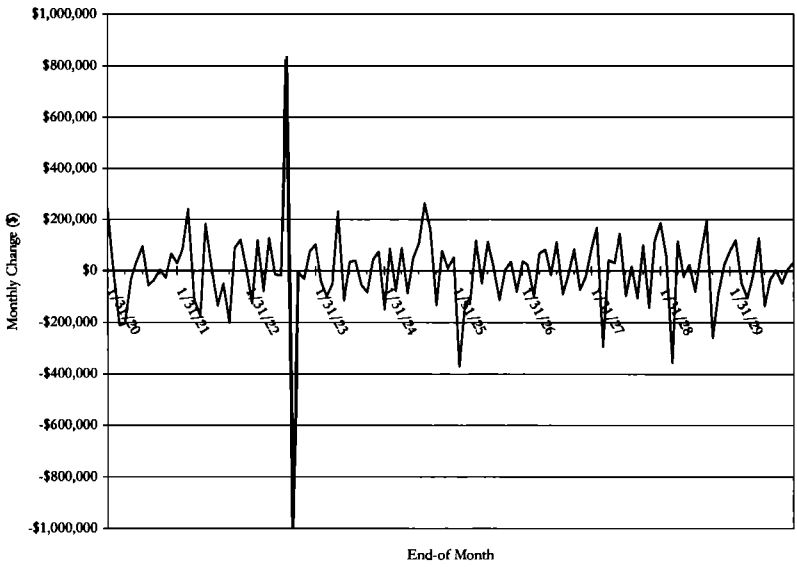
[6] Bloomington is located in McLean County, Illinois' largest county in terms of land area. The county was and remains an agricultural district. Bloomington served as the county seat, a market town, and a regional distribution center. Bloomington had some light manufacturing, food processing industry (Beer Nuts, etc.) and the Chicago and Alton Railroad shops.

[7] A dummy variable to capture the effects of the merger was not statistically significant and was omitted.

Once collected, the data were aggregated. Bankers' deposits include any funds in the hands of a city correspondent except for the Federal Reserve Bank at Chicago.[8] Loans consist of bills receivable. Deposits held includes individual deposits, petty deposits, due to banks, demand and time certificates of deposits, certified checks, cashiers' checks, savings accounts, postal savings accounts, United States deposits, dividend accounts and library loan payments. Government bonds include United States bonds held for investment and United States bonds in transit. Other securities include stocks and bonds and other bonds; however, Federal Reserve Bank Stock is not included. After the data were aggregated into accounts, the data were seasonally adjusted by the seasonal index method as described by Newbold [Newbold, 1995, pp. 699-703]. Figure 1 shows the balances maintained at each correspondent bank.

This paper examines the changes in the aggregated bankers' balances shown in Figure 2.

Figure 2: *Monthly Changes in Bankers' Deposits Maintained, 1920-1929*

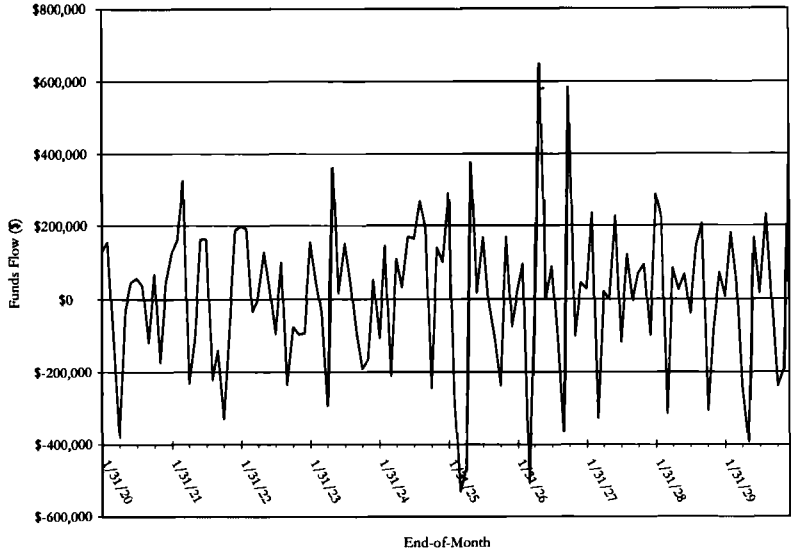


Source: First National Bank of Bloomington.

Historical movements can be observed: balances generally increased in the winter and summer and decreased in the spring and fall. The flow of funds is presented in Figure 3. The fund flows conform to the standard interpretation for a country bank. The flows are typically positive in January, negative in March, positive in the summer, and negative in the late summer and early fall.

[8] The bank maintained deposits at several banks in cities including New York, Chicago and St. Louis, 1920-1929; Peoria, Illinois, 1921-1929; Indianapolis, 1922-1929, and Minneapolis, 1927-1929.

Figure 3: *Monthly Funds Flow, 1920-1929*



Source: First National Bank of Bloomington.

Estimation of the Model

The ordinary least squares estimated regression results with t-statistics in parentheses are presented in Table 1 where * indicates statistical significance at the ten percent level and ** at the five percent level. Estimations were performed for different data manipulations including monthly, quarterly, and semi-annual time intervals, and data were also seasonally adjusted in an attempt to control for months of likely currency withdrawal.

The signs on the regression coefficients are as expected for the monthly data and the seasonally adjusted monthly data. The flow of funds variable is significant at one percent.[9] In addition, the change in asset quality and change in government bonds variables are significant at the five percent level only when the monthly data is seasonally adjusted.[10]

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[9] Causality tests performed by the method described by Pyndyck and Rubinfeld failed to infer causation between balances maintained and flow of funds using the unadjusted data [Pindyck and Rubinfeld, 1991, pp. 215-16].

[10] A variable to account for the time trend was not significant for the regressions estimated and was omitted. Since the seasonal index method extracts a constant proportional seasonal term and smoothes the irregular term of the time series, this statistical result suggests cyclical effects were an important determinant in the observation of the expected relationships with the deposits maintained.

Table 1: *Estimated Least Squares Linear Regressions of Bankers' Deposits at the First National Bank of Bloomington, Illinois.*

Dependent variable: Change in bankers' deposits maintained.

Interval	n	FLOW	ΔQUAL	ΔGOV	Adjusted R^2	F	D-W
Monthly, Seasonally Adjusted	120	0.49** (7.27)	-2268782** (-2.10)		0.30	26.80	2.77
Monthly, Seasonally Adjusted	120	0.49** (7.29)		-0.76** (-2.24)	0.31	27.20	2.76
Quarterly, Seasonally Adjusted	40	0.38** (5.00)	162283.7 (0.08)		0.37	12.51	2.83
Quarterly, Seasonally Adjusted	40	0.38** (5.03)		0.38 (0.42)	0.37	12.65	2.84
Monthly	120	0.45** (7.23)	-1755745 (-1.61)		0.30	26.36	2.73
Monthly	120	0.46** (7.34)		-0.64* (-1.89)	0.30	27.10	2.71
Quarterly	40	0.36** (5.32)	-1143616 (-0.53)		0.41	8.60	2.78
Quarterly	40	0.37** (5.40)		0.46 (0.72)	0.44	14.71	2.75
Semi-Annual	20	0.41** (3.86)	-121737 (-0.05)		0.40	7.45	2.66
Semi-Annual	20	0.41** (4.05)		0.96 (1.23)	0.45	8.87	2.90

With the quarterly data, the signs on the regression coefficients are as expected and statistically significant at the one percent level of significance on the flow of funds variable. The sign on the estimated coefficients for the change of asset quality and the change in government bonds held as an investment is not as expected for three of the four regressions and the variables are found to be not statistically significant at five percent.

The results of the regressions with the unadjusted semi-annual data are similar to that of the unadjusted quarterly data. The sign on the regression coefficients of the flow of funds variable was as expected and the variable was statistically significant at five percent. The sign on the coefficient of the change in asset quality variable is as expected, but neither of the quality proxies are statistically significant.

The regression results of this one bank compare favorably to the regression results obtained by Gendreau using the aggregate unadjusted country national bank semi-annual data. One difference that Gendreau found for the aggregated national unadjusted data is the signs on the coefficients of the change in asset quality proxies were negative as expected and the quality

proxies were statistically significant at the five percent level of significance as well [Gendreau, 1979, Table 1, p. 511].

Under the seasonally adjusted monthly account data, bankers' deposits behave as expected for this bank. Deposits maintained at city correspondents are directly dependent on interperiod flow of funds. Further, month-by-month fluctuations in the quality of the asset portfolio inversely affect the maintenance of bankers' deposits as a liquid secondary reserve asset, as expected. In shorter time periods, the bank, as expected, actively changes the composition of its high quality loans as if they were substitutes for bankers' deposits maintained.

Regressions were estimated with dummy variables representing a month or groups of months using the unadjusted data. The month of September between 1920 and 1929 is found to be statistically significant at the ten percent significance level for many estimated regressions. In addition, the change in government bonds held as an investment becomes significant at five percent. As usual, the change in the flow of funds is significant. The estimated model with standard errors in parentheses is

$$\Delta \text{BALM} = \underset{(13129.58)}{1050.06} + \underset{(0.06)}{0.45}\,\Delta \text{FLOW} - \underset{(0.34)}{0.67}\,\Delta \text{GOV} - \underset{(45675.26)}{78036}\,\text{SEPT}$$

SEPT is a dummy variable that takes the value of 1 in the month of September and 0 otherwise. The regression estimates that the expected difference in deposits maintained at correspondents between September and any other month is a withdrawal of $78,036 for this bank. September is undoubtedly a harvest month in any year and currency would be needed to pay seasonal workers. Uncertainty about currency demand in October may have led the bank to accumulate currency during September as financial panics were likely to occur in October. Financial center banks should have expected this demand for currency in September since short-term interest rates increased in September and continued to increase in October whether or not stock market crashes occurred. These drains affected the stock market through in increase in the call loan rate increases beginning in late August, but currency drains are only significant at this bank in September, not October. The statistical result above suggests that the blame for these market declines attributed to currency movements to the country must lie elsewhere if they are systematic.

Once the data time intervals increase, the regression results do not provide as strong a confirmation of the expected relationships. Although the quality proxies are not statistically significant, the positive signs for their estimated coefficients suggest that in longer time periods, high quality liquid investments are complements for bankers' deposits maintained at this bank.[11]

[11] The intention to hold more United States bonds could result in the positive sign observed in the longer estimated regressions instead of the expected negative relationship. Contemporaneously, funds could be accumulated with correspondents as well as bonds purchased. Similarly, when currency is issued, the bonds are no longer recorded as

Conversely, the positive association also corresponds with the view that bankers needed to manage their asset portfolios for short run unexpected withdrawals, since their liabilities were characteristically short term. Since changes in amounts are evaluated, short-run economic conditions might require immediate adjustment that is otherwise smoothed out when changes are viewed over a longer time horizon. This suggestion is also consistent with contemporary bank behavior prior to the 1960s: banks actively managed their asset portfolios while behaving as if their liabilities were given.

Overall, the flow of funds variable is statistically significant at one percent and it has the expected positive effect on the change in the bank's bankers' deposits. Furthermore, for the estimations using the seasonally adjusted monthly accounts, the coefficients on the quality proxies are significant at five percent with the expected negative direction. Finally, controlling for the month of September, the monthly data confirm that this bank rationally maintained bankers' deposits in a model of simple portfolio selection.

Conclusion

The controversy surrounding bankers' balances in country bank asset portfolios was perhaps the result of a misunderstanding by policy makers over the importance of bankers' deposits in asset portfolio management. The regression results confirm that a country national bank constructed asset portfolios analyzing the return and risk characteristics of relevant investments. Bankers' deposits maintained at correspondents were an important investment in the asset portfolio. Because bankers' deposits continued to be maintained, these deposits must have had other valuable attributes.[12] Policy makers would continue to be confounded by the supposed problem unless either bankers' deposits were prohibited or national branch banking was allowed [Watkins, 1929].

The 1920s were a period of activism for the Office of the Comptroller of the Currency. In principle, the Comptroller's office opposed branch banking as it was supposed to centralize reserves, concentrate bank capital and limit the need for a source of coordination and reserves to the national banks. An ongoing shift in bank charters toward the state systems, some of which allowed branch banking, led the Comptroller to reason that branches in the place of organization would not reduce local control of bank capital [Office of Comptroller of the Currency, 1924, pp. 5-11].

From 1920-21, the Comptroller recommended legislation that permitted branch banking in the place of organization. In 1924, the Comptroller presented written legislation that was the basis for the Act of February 25,

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investments and deposits no longer need to be accumulated for bond purchases. In fact, this bank increased its circulation $100,000 in the late 1920s.

[12] Gendreau estimates that bankers' deposits maintained in 1929 by 82 state Federal Reserve member banks had implicit returns in excess of the 2 percent typically received on those deposits [Gendreau, 1983].

1927. The act allowed national banks to open branches in their place of organization if their state of organization allowed branch banking. Further, state bank members of the Federal Reserve system would have to dispose of their branches located outside of their place of organization [Office of Comptroller of the Currency, 1928, pp. 1-10]. While some state banks reorganized with national bank charters and some national banks opened branches, by 1929, the Comptroller declared the Act of February 25, 1927 a failure and advocated nothing less than Federal Reserve district-wide branching for national banks [Office of Comptroller of the Currency, 1930, pp. 1-10]. Prior to 1929, the policy opposed to statewide branch banking reinforced the need for correspondent services; the promotion of district-wide branch banking practically eliminated the necessity for correspondents. Ironically, a long-time policy goal would have been brought about as a result of a sacrifice of a fundamental principle!

Even after payment of interest on bankers' deposits was prohibited by New Deal banking reforms, bankers' deposits continued to be an asset held by country national banks. Country banks valued both the liquidity of deposits in the environment of the Great Depression and the services city correspondents provided [Gendreau, 1983, pp. 422-23].

The movement of currency to the interior in harvest months was supposed to drain reserves from financial centers and promote an environment of instability. Yet currency movements were an annual event and should have been expected by city banks holding bankers' deposits. While it is likely the annual movement of currency in the fall produced tightness in the money markets, there is evidence that financial center banks prepared for this drain by maturity-matching their short-term assets with the expected demand for currency [Watkins, 1929]. Unforeseen events such as asset shocks and unexpected city demand for cash would seem to be more likely explanations for financial instability. Those sources place blame for payments restrictions on financial center banks and their unseen asset portfolios. Shocks to the financial system are shocks precisely because they are unexpected. An attempt to restrict the ability of banks to maintain bankers' deposits could have unexpected consequences such as banks holding riskier asset portfolios that would increase the instability of the financial system.

This country national bank, at least, was economically rational when maintaining its bankers' deposits with its city correspondents. The First National Bank of Bloomington, Illinois perceived implicit value in maintaining these deposits even though the interest received on them was below that of alternative investments.

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