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CURRENCY HELD BY THE PUBLIC: CALL DATE AND MONTHLY ESTIMATES

CURRENCY HELD by the public is the difference between currency in circulation (i.e., outside the Treasury and, beginning November 1914, also outside Federal Reserve Banks) and bank vault cash.

The first section below describes our revisions of the published figures for currency outside the Treasury and Federal Reserve Banks. It covers the period 1867–1942. For 1867–1906 we deducted from the revised annual or semiannual currency-in-circulation series, vault cash estimates that other investigators had constructed (described in Chapter 11). For 1907–42 we deducted from the revised monthly or interpolated call date series of currency in circulation, vault cash estimates at call dates (section 2) and at dates nearest the end of month (section 3) that we had constructed. From 1943 on we shift to Federal Reserve estimates. Section 4 describes the residual series of currency held by the public and section 5 evaluates the reliability of the estimates.

1. Currency Outside Treasury and Federal Reserve Banks

The published figures for currency outside the Treasury and Federal Reserve Banks are themselves the difference between the amount of each kind of currency outstanding and the amount in the Treasury and, beginning November 1914, the amount in Federal Reserve Banks. The primary sources of those figures are the "Reports of the Treasurer" in

the Secretary of the Treasury's annual reports and the monthly *Circulation Statement of United States Money.* The kinds of currency included in the stock are:

1. Gold coin, gold bullion, and gold certificates issued by the Secretary of the Treasury in return for the deposit of gold
2. Standard silver dollars and silver certificates issued by the Secretary of the Treasury in return for the deposit of silver dollars
3. Fractional or subsidiary silver coin
4. Treasury notes of 1890; in process of retirement and cancellation after March 1900
5. United States notes ("greenbacks"); a permanent issue of $346.7 million
6. National bank notes, issued by national banks on the security of United States interest-bearing registered bonds until 1935; since then in process of retirement and cancellation
7. Federal Reserve notes, issued by Federal Reserve Banks since 1932 on the security of government bonds (earlier, secured by the pledge of collateral consisting of eligible paper, member bank promissory notes, gold and gold certificates)
8. Federal Reserve Bank notes, issued by Federal Reserve Banks in 1916–17, 1918–20, 1933, and 1942, against U.S. bonds (The Reserve Banks extinguished their liability while the notes were still in circulation by the deposit of lawful money with the United States Treasurer)
9. Minor coin.

Revisions of Basic Data

We made adjustments in the published data for selected kinds of currency either outstanding or outside the Treasury and Federal Reserve Banks.

1. GOLD COIN AND BULLION. January 1867–February 1878: Gold outside the Treasury was corrected for gold presumed lost as estimated by us, 1866–72, and by the Director of the Mint, 1873–78.[1] August 1878–May 1907: Gold outside the Treasury was obtained by subtracting the

[1] *Banking and Monetary Statistics,* Board of Governors of the Federal Reserve System, Washington, D.C., 1943, p. 408; Director of the Mint, *Annual Report,* 1887, p. 86; 1907, pp. 87 and 92.

amount in the Treasury from corrected figures for the stock.[2] Correction for the amount of gold presumed lost is an interpolation by Method L of the Director of the Mint's June estimates, 1878–79, and of his December estimates, 1879–1907.[3] June 1907–December 1913: The reported figures for the stock of gold minus the amount in the Treasury were used.[4] January 1914–December 1933: Since January 30, 1934, there has been no circulation of gold coin, and the monetary gold stock has included only gold held by the Treasury exclusive of relatively small amounts held since April 1934 in the active portion of the Gold Stabilization Fund. As of January 31, 1934, the estimated amount of gold outside the Treasury and Federal Reserve Banks was $287 million, even though all holders had been legally required to turn in any gold in their possession. The Federal Reserve concluded that in the course of time this amount of coin had been lost, destroyed, or exported without record and so not only excluded it from the monetary gold stock and from currency held by the public and all banks from then on, but also revised the figures prior to January 31, 1934, and subsequent to 1913 by subtracting this $287 million.[5] As a result of this revision, the published figures for the period before 1914 are not continuous with the revised figures beginning 1914. In *A Monetary History,* we concluded that the bulk of the $287 million recorded on January 1934 was retained illegally in private possession.[6] We therefore restored to the estimated gold stock and gold circulation the $287 million which the Federal Reserve subtracted for 1914–33. Since gold coin has not been a component of the money stock since January 31, 1934, we excluded the $287 million since that date.

2. FRACTIONAL CURRENCY. All fractional currency outstanding was to have been returned to the Treasury for retirement by the end of 1878. We assumed that all but $1 million recorded as still outstanding June 30, 1878, had been lost, and we distributed the loss by Method L over the period 1863–78, the amounts being deducted from the published

[2] The uncorrected gold stock is in "Report of the Treasurer," Secretary of the Treasury, *Annual Report,* 1898, pp. 109 ff.; 1903, pp. 205 ff.; 1909, pp. 190 ff. Gold in the Treasury is from *ibid.,* 1898, pp. 59 ff.; 1903, p. 173; 1909, pp. 190 ff.

[3] See footnote 1, above.

[4] "Report of the Treasurer," Secretary of the Treasury, *Annual Report,* 1909, pp. 190 ff.; 1915, pp. 339 ff.

[5] *Banking and Monetary Statistics,* pp. 409–412.

[6] Pages 463–464, note 45.

figures.[7] Fractional currency was assumed to have been $1 million in August 1878 and zero thereafter (it is not shown in the published monthly data beginning June 1878).

3. SUBSIDIARY SILVER COIN. In June 1910 the Director of the Mint deducted $9,700 thousand from the estimate of the stock of subsidiary silver coin at that date to adjust for an overestimate "for the fiscal years 1881–1910." [8] He made no attempt to apportion this amount over the years during which the error was accumulating. We assumed that the amount of the error was distributed over the months during the period 1881–1910 in a straight-line fashion, and accordingly we corrected by Method L the published figures for the stock and amount of subsidiary silver coin outside the Treasury.

4. NATIONAL BANK NOTES. In deriving currency outside the Treasury and Federal Reserve Banks, we tried to avoid inconsistencies between it and the vault cash data which constitute a component. On their balance sheets national banks reported bank notes of other national banks in their vaults as an asset; they did not report their own notes on hand (if shown as an asset this item would have been exactly offset as a liability). Published monthly figures for national bank notes outstanding and outside the Treasury and Federal Reserve Banks, however, include notes of issuing banks on hand.

Another component of national bank notes outstanding and in circulation not included in vault cash was national bank notes in transit. This item is equal to the difference between the amount of national bank notes issuers received from the Comptroller of the Currency—the amount shown on the banks' books—and the amount secured by the deposit of U.S. bonds—the amount shown on the Treasury's books.[9]

We therefore subtracted from published figures of national bank notes

[7] *Banking and Monetary Statistics,* p. 408.

[8] "Report of the Director of the Mint," in Secretary of the Treasury, *Annual Report,* 1910, p. 290.

[9] The Treasury's figures on national bank notes outstanding as liabilities of national banks were based on its record of "U.S. bonds deposited by national banks to secure the circulation of national bank notes." (The figures for national bank notes outstanding shown in the *Circulation Statement* were a sum of national bank notes secured by U.S. bonds—national bank liabilities—and national bank notes for which lawful money was on deposit with the U.S. Treasury—a Treasury liability. The latter, representing notes of closed banks and banks reducing their circulation, are not involved in the adjustment described in this paragraph.)

in circulation [10] estimates of national bank notes in vaults of issuing banks and in transit. Directly reported data on notes in vaults of issuing banks and in transit are available only for call dates, 1907–28.[11] For other periods we estimated the aggregate of the items by subtracting national bank figures of their note liability from Treasury figures of national bank note circulation secured by U.S. bonds. For 1866–69, when the record of national bank note circulation secured by U.S. bonds is lacking, we substituted for it the data on national bank notes outstanding.[12] After June 1935, when national bank notes were converted into a Treasury obligation and provisions were made for their retirement, no adjustment of the published figures of national bank notes in circulation is needed.

5. MINOR COIN. Figures for minor coin have been reported in the *Circulation Statement* since December 31, 1927. Monthly estimates back to 1914 were prepared by the Federal Reserve, and end-of-June figures beginning 1900 by the Secretary of Treasury.[13] We interpolated monthly

[10] Jan. 1867–Feb. 1878: Interpolation by Method L between June data, from *Banking and Monetary Statistics*, p. 408; Aug. 1878–Feb. 1887: Total outstanding monthly, from *Annual Report*, Comptroller of the Currency, 1891, p. 125, minus amount in Treasury, monthly, from "Report of the Treasurer," 1898, p. 44; Mar. 1887–Dec. 1913: Monthly *Circulation Statement of U.S. Money;* Jan. 1914–June 1935: *Banking and Monetary Statistics*, pp. 409–412.

[11] The banks supplied this information in a memorandum note accompanying their balance sheet returns. See the annual reports of the U.S. Comptroller of the Currency for a table on circulating notes of national banks received from the Comptroller, on hand, and outstanding.

[12] National bank notes in transit and in vaults of issuing banks were estimated as follows:

Jan. 1867–June 1906: For the call date nearest the end of each of the months in Table 1, national bank note liabilities from *Annual Report*, Comptroller of the Currency, 1916, Vol. II, pp. 329–355, were subtracted from (a) 1866–69: National bank notes outstanding from A. P. Andrew, *Statistics for the United States, 1867–1909* (National Monetary Commission, 1910, S. Doc. 570, 61st Cong., 2nd sess.), p. 43; and (b) 1870–1906: Circulation of national bank notes secured by U.S. bonds, from *Annual Report*, Comptroller of the Currency, 1891, Vol. I, p. 125; 1904, Vol. I, pp. 99–101; 1908, pp. 124–129.

May 1907–June 1928: Notes in vaults of issuing banks were interpolated monthly by Method L between call date figures for circulating notes of national banks received from the Comptroller and on hand. Notes in transit were interpolated monthly by Method L between mid- and end-of-year estimates obtained by deducting national bank call date figures of national bank notes received from the Comptroller from circulation of national bank notes secured by U.S. bonds (*ibid.*, 1918, Vol. II, pp. 19–21; 1924, pp. 158–160; 1928, pp. 222–223).

July 1928–June 1935: Notes in vaults of issuing banks and in transit were interpolated monthly by Method L between mid- and end-of-year estimates obtained by deducting national bank call date figures for national bank note liabilities from circulation of national bank notes secured by U.S. bonds (*ibid.*, 1931, pp. 178–179; 1935, pp. 183–184).

[13] *Banking and Monetary Statistics*, pp. 408–409 for June estimates; pp. 409–413 for monthly figures through 1941.

by Method L between the midyear figures from 1907 to 1914 and added the estimates of minor coin back to 1900 to the published figures of currency outside the Treasury. We did not extend the estimates of minor coin before 1900.

Seasonal Adjustments

Our series for currency outside the Treasury and Federal Reserve banks was seasonally adjusted in two stages. This series varies not only with the month of the year but also with the day of the week on which the last day of the month falls. We therefore estimated both daily and monthly seasonal factors by the method described in Chapter 10, section 4. We corrected the end-of-month data by the appropriate index.

We next computed percentage changes from one month to the next for this corrected series, which we then plotted. Repetitive movements appeared, May 1907–December 1913, June 1924–June 1932, and June 1935–June 1941, indicating that further seasonal correction was required. We eliminated residual seasonality by the method of ratios to moving averages. The final monthly series, whose dating was determined by the vault cash series (section 3, below), is given in Table 27, column 1.

Call Date Series

A call date series for 1907–42 was interpolated by Method L between the corrected end-of-month series of currency outside the Treasury and Federal Reserve Banks. It is given in Table 26, column 1.

2. All-Bank Vault Cash: Call Dates

The first step toward monthly estimates was the construction of a call date series for vault cash in all banks. For 1907–23 we summed estimates for national, nonnational, and mutual savings banks; for the overlapping period 1919–42 estimates for member, nonmember, and mutual savings banks.

The national bank estimates are from the reports of the Comptroller of the Currency, the member bank estimates from the reports of the Federal Reserve System. The nonnational, nonmember, and mutual savings bank estimates are based on data assembled by us from the re-

ports of state supervisory agencies in the forty-eight states, the District of Columbia, and the possessions. We collected whatever data on vault cash in all banks were available for each state in such reports, whether or not they were for dates identical with national and member bank call dates. We corrected these data, state by state, for daily and monthly seasonals and shifted nonidentically dated observations to the closest national and member bank call date by interpolating between two observations, using Method L. No observation had to be shifted more than two months. The remaining gaps at inter-June call dates were filled in, state by state, by interpolation Method R_3.

The final call date estimates are the sums for all states of the estimates for mutual savings and nonnational or nonmember banks plus the deseasonalized data for national or member banks.

Problems in Compilation of Nonnational and Mutual Savings Bank Data

In general we used as our basic source of nonnational and mutual savings bank data by states, the reports of the various state banking departments. In addition we used the annual (recently semiannual) returns published by the Comptroller of the Currency. The Comptroller's reports served both as a check on data in state reports and as a source for certain years when the latter were unavailable or unsatisfactory.

Vault cash is shown in various ways on consolidated balance sheets of the different states. It is broken down according to kinds of currency —distinguishing legal tender or currency eligible for reserve computation from other currency—or as a single item. When shown broken down, the components of vault cash were summed. Certain states, however, did not at all times report "cash on hand" separately from "cash items," "due from banks," or other asset categories. If vault cash represented the major component, rough estimates at call dates, excluding the extraneous component, were made on the basis of available information for the breakdown. If vault cash was the minor component, the call date figures were discarded.

For 1933–35, when certain states included unlicensed banks in their returns, estimates of vault cash in these institutions were deducted at call dates on the basis of the Comptroller of the Currency's June data which exclude unlicensed banks.

The reported figures in published sources, 1907–35, understated vault cash in all nonnational banks inasmuch as nonreporting banks, usually private banks, also held cash. Before 1919 the main nonreporting private banks were located in New York. We used annual Federal Reserve figures for vault cash in New York private banks—which include nonreporting banks [14]—to supplement the report date returns, 1907–19. For nonreporting banks in other states, 1907–42, and in New York, 1919–42, we added an aggregate estimate from the same source to our call date series for all reporting banks.

From 1919 on, for our member-nonmember bank estimates, we converted the nonnational estimates into nonmember estimates by subtracting state member bank figures, state by state.[15]

Report Dates

The dating of the reports of nonnational and mutual savings banks presents a problem. Most of the states require their banks to submit condition reports for several dates each year; the remaining states, once a year only. The states requiring more than one condition report annually generally designate the same call dates as those that are designated by the Comptroller of the Currency for national banks and by Federal Reserve authorities for state member banks. Some state banking departments, however, designate call dates that have no apparent relation to those designated by federal agencies. Even those states that usually use federal call dates have occasionally ignored one of them or, from time to time, have designated a call date of their own choosing. For any given national or member bank call date, therefore, there may be condition reports for nonnational and mutual savings banks that are differently dated by several days or by as much as several weeks; and there may be no reports from banks in some states.

Various classes of commercial banks, i.e., so-called "state" banks, loan and trust companies, stock savings banks, unincorporated banks, as well as mutual savings banks, were in operation in individual states. State supervision of these different types of institutions did not begin

[14] *All Bank Statistics, United States, 1896–1955*, p. 747.

[15] State member bank figures by states were compiled from the Federal Reserve Board, *Member Bank Call Report*, through March 1929; thereafter they were derived as residuals. Member bank figures are from the same source, minus national bank figures in the U.S. Comptroller of the Currency, *Abstract of Reports of Condition of National Banks.*

at the same time, and their respective operations were governed by different sections of the banking code. Consequently, the frequency of report dates for different classes of banks within a given state may vary, and the dates of call for the several classes of banks are not necessarily coincident.

As was shown in an earlier study of vault cash,[16] discrepancies in the dating of the components of all bank vault cash create difficulties because of the marked daily seasonal in the data. While information on the character of this intraweekly movement is at present limited, the movement unmistakably indicates that disregard of even small differences in dating between an interpolator and the universe or between components of an aggregate of vault cash will result in gross inaccuracies.[17] Experiments that we made along lines described in the next section showed that the daily seasonal was of about the same order of magnitude as the monthly seasonal. The solution adopted in Technical Paper No. 4 (see footnote 16) was to use only nonnational bank call date figures that were dated identically with national and member bank call dates in estimating all bank vault cash. Information from nonidentically dated call date figures was thereby sacrificed.

Our present approach to the problem of discrepant dating of vault cash figures represents an attempt (a) to correct for both the daily and the monthly seasonal movements characterizing the data, and (b) to use all call date figures of vault cash, whether or not dated identically with national and member bank call dates.

Seasonal Adjustment of Vault Cash Figures

Our preliminary tests convinced us that failure to estimate and eliminate the intraweekly seasonal would yield a poor monthly seasonal correction and make it appear that the monthly seasonal was changing when it was not. Accordingly, we used the method described in Chapter 10, section 4, to estimate simultaneously daily and monthly seasonal indexes for each of the following groups and periods. (1) National

[16] A. J. Schwartz and E. Oliver, *Currency Held by the Public, the Banks and the Treasury, Monthly, December 1917–December 1944.* National Bureau of Economic Research, Technical Paper 4, 1947 (hereafter referred to as Technical Paper 4).

[17] Technical Paper 4 (p. 17, note 6) mentions the intraweekly patterns of currency demands of all banks in the New York Reserve district (1926) and in the Minneapolis Reserve District (1927) and daily figures of vault cash holdings of all member banks by districts and reserve classes (June 1930).

banks, 1874–1917; (2) National banks, 1917–49; (3) State member banks, 1919–44; (4) New York State banks and trust companies, 1897–1917; (5) Nonnational and mutual savings banks outside New York, 1907–17; (6) Nonmember and mutual savings banks, 1919–44; (7) Nonnational and mutual savings banks, 1919–44—obtained by combining the indexes for (3) and (6). Computation of these indexes, which are given in Tables 29 and 30 in the appendix to this chapter, raised special problems for some of these groups.

National banks and state member banks (groups 1, 2, and 3). For these groups we had continuous series of vault cash at call dates and so could apply the general procedure directly. We divided the national bank series into two segments, before 1917 and 1917 and later, because vault cash changed its status in 1917. Prior to that date, vault cash satisfied legal reserve requirements; thereafter (until December 1, 1959), member banks could count only deposits at Federal Reserve Banks as meeting legal reserve requirements.

New York state banks (group 4). While New York state banks and loan and trust companies—the chief nonnational banks in the state—reported four times annually, 1907–17, the report dates seldom coincided with national bank call dates. Vault cash in these New York banks, moreover, averaged approximately two-fifths of vault cash in all nonnational banks during this period. Because of the unique dating pattern of the New York returns and the banks' special position in the reserve structure of the banking system, we computed separate daily and monthly seasonal indexes for New York for this period. For 1917–19 we used for New York the indexes for group 7.

Nonnational and nonmember banks (groups 5 and 6). For these banks, the available series were discontinuous. The number of states reporting vault cash varies from call date to call date and the call dates vary from state to state. One possibility would be to compute separate indexes for each of the forty-eight states, the District of Columbia, and the possessions, using all observations available for each unit. However, we rejected this procedure as too time-consuming and unnecessarily detailed. Instead we constructed hypothetical continuous nonnational (1907–17) and nonmember (1919–44) call date series of vault cash, using only identically dated observations. The sole purpose

of these series was to estimate daily and monthly seasonal indexes.[18] Only reported vault cash figures, no estimates, were used.[19]

In one respect the construction of the hypothetical call date series differed for 1907–17, when nonnational bank data were used, from that for 1919–44, when nonmember bank data were used. In the earlier period, for the purpose of economizing time, the series was constructed from identically dated figures for the sixteen states with the largest number of inter-June observations; in the later period, it was constructed from all identically dated observations for all states.[20]

The basic table giving all identically dated observations has many gaps for individual states, that is, dates without figures intermediate between dates with figures. If there was at least one inter-June observation for a given state for a given year, the gaps in that year for that state were filled in by interpolation Method R_1, using as the related series the sum of reported data for the largest common sample of states reporting for the date of the gap and for the closest dates preceding and following the gap at which there were observations for the state in question.

For each call date, the reported and filled in observations were summed, the sums being computed for two totals at dates at which the number of states changed. For example, Oregon was first included on August 22, 1907. The sum at this date was obtained excluding Oregon (to make the total comparable with the preceding call date) and in-

[18] The decision to proceed along these lines involved the assumption that the intra-weekly and monthly seasonals were approximately the same for the whole of the periods 1907–17 and 1919–44, and for all the states. Here we shall anticipate one of our findings: the assumption of a uniform seasonal for all the states is contrary to fact. We made an adjustment (described below) to correct for differential seasonal movements by regions. We have no direct evidence from our series to support or oppose the assumption of unchanging seasonal movements within the periods treated separately. See Technical Paper 4 (p. 17, note 6), however, for an indication of instability of intra-weekly indexes, 1921–27. There can be no doubt that a change in the seasonal behavior of vault cash resulted from the change in its status in June 1917, when the requirement went into effect that member banks carry all their legal reserves with Federal Reserve Banks.

[19] Thus, certain June data shown in the Comptroller's *Annual Report* were not used in estimating seasonal variations because footnotes indicated the figures were estimates. These data were, however, corrected by the seasonal indexes derived and used subsequently in obtaining vault cash totals at call dates.

[20] Table B-10 of Technical Paper 4 (p. 51) shows the basic data for nonnational banks for part of the period; lines 1, 3–15, 22, and 25 constituted our sample. Table B-4, *ibid.* (pp. 36–37), shows some of the basic data for nonmember banks. For the states shown additions were made of identically dated figures that were not included in the table because the method of interpolation used in Technical Paper 4 required reports for at least two consecutive call dates for a given state. In addition, available identically dated figures for the states not shown in the table were added.

cluding Oregon (to make the total comparable with the following call date). The resulting discontinuous series of segments was linked together, starting with the segment with the largest representation of states. The ratio of its value at an overlapping call date to the corresponding value for the preceding or succeeding segment was used to raise the level of the connecting segment. This linking was continued backward and forward to yield a continuous artificial series.

The interpolation of gaps and the linking procedure were simply devices to provide a continuous series that would facilitate computation of the daily and monthly seasonals. They affect our final results only insofar as they affect the daily and monthly seasonals that we used.

The hypothetical continuous series had no observations for several of the twelve months for nonmember banks, hence did not provide seasonal factors for those months. We interpolated seasonal factors by Method R_1, using as the related series the seasonal indexes for vault cash in weekly reporting member banks.

Nonnational and mutual savings banks, 1919–44 (group 7). We constructed the daily and monthly seasonal indexes for this period as a weighted average of the corresponding seasonals for nonmember and state member banks, weighting each by the estimated fraction of all nonnational bank vault cash held by the corresponding banks.

The state member bank and nonmember bank series did not yield a seasonal factor for every month, since there were three calendar months for which there were no reported figures. For nonnational banks, 1917–42, we needed seasonal factors for these months. We interpolated them by Method R_1, using the seasonal for vault cash in weekly reporting member banks as the related series.

Shifting Nonidentically Dated Observations to National and Member Bank Call Dates

The daily and monthly seasonal indexes derived as just described were applied to all observations, by classes of banks and by states. The resulting nonnational and nonmember observations were partly for dates identical with national and member bank call dates, partly for nonidentical dates. To get observations for all series at the same date, we shifted each nonidentically dated figure to the closest call date, which was never more than two months distant.

We shifted nonnational bank observations, 1907–19, by interpolat-

ing by Method L between the two nonidentically dated observations closest to the relevant call date, or between one nonidentically dated observation and a preceding or following identically dated observation.

For 1919–44, nonidentically dated nonnational bank observations had not only to be shifted to call dates, but also to be converted into estimates for nonmember banks. Had we estimated the identically dated figures for nonnational banks as we did for 1907–19 and then subtracted adjusted state member bank data at the call dates to get residual estimates for nonmember banks, we would have wasted the information provided by the call date state member bank data. Instead, for each state with nonidentically dated observations we (a) computed the ratio of nonmember to nonnational bank vault cash for whatever dates identically dated figures were available; (b) plotted the ratios as a time series and smoothed the points by a freehand curve; (c) read off from the chart an estimated ratio at the nonidentical date; (d) applied this ratio to the nonnational bank figure at the nonidentical date. We then shifted the resultant estimates for nonmember banks to the closest call date by the method described in the preceding paragraph for nonnational bank estimates.

Interpolation of Missing Call Date Figures, by States

Having seasonally adjusted all identically and nonidentically dated figures and shifted the latter to call dates, we had observations for fifty political units (the forty-eight states, the District of Columbia, and the possessions. Hereafter we use "states" to refer to these fifty units, including the D.C. and the possessions). For some states, moreover, we had separate observations for different classes of banks for different numbers of call dates (e.g., incorporated and unincorporated banks, or commercial and mutual savings banks, or combinations of subclasses). The major component with the most inter-June observations was usually the series for incorporated banks or one of its subclasses (e.g., loan and trust companies or so-called state banks). We proceeded to construct a single vault cash series for each state, interpolating by Method L for missing minor components only for those dates at which there was an observation for the major component. When the minor component was reported on a call date on which the major component was not, this observation was used, if needed, in interpolating the minor component

to the nearest date or dates for which the major component was available. No other use was made of it.

The missing call date observations were then interpolated state by state by Method R_3, using as the related series for each state, observations for selected other states. In order to use this method we had (a) to decide what "other" states should be used for each state and (b) to estimate the necessary parameters.

For both purposes we first converted all our available inter-June observations into relative deviations from inter-June trends—i.e., values of v as defined by equation 4 of Chapter 10—and then computed from these v's standard deviations and correlation coefficients separately for 1907–19 and 1919–44. We computed standard deviations for 1907–19 for all units that had at least eighteen observations during that period, and for 1919–44, for all that had at least twenty-three observations during that period. We also computed correlation coefficients for a limited number of states selected at random.[21]

Our initial hypothesis was that vault cash behavior would vary systematically with the size of the banking system within each state and hence that the best states to use to interpolate a given state would be states of roughly the same size. The results did not bear out this hypothesis. When we classified the states into three categories, small, medium, and large, the correlation coefficients between the v's for two states did not tend to be systematically higher when the states were in the same category than when the states were in different categories.

There did, on the other hand, appear to be systematic differences according to the geographical location of the states—partly, we conjecture, because of regional differences in seasonal patterns not corrected by the uniform countrywide seasonal we used, partly for other reasons. Accordingly, for 1919–44, we classified the states into the three groups shown in Table 22: Group I, states with mutual savings banks, which are mostly in the Midwest and the Northeast; Group II, other states not in the South and Southeast; Group III, other states in the South and Southeast. For 1907–19, we further subdivided Group I into Group Ia, New York State alone; Group Ib, the rest of the Group I states.

[21] We should note that this work was done about 1953, when the speed and availability of computers were not what they are at present. Were we doing this analysis today, we would no doubt routinely calculate correlations for all 1,225 possible pairs of states.

TABLE 22

Classification of States for Call Date Interpolation

States with Mutual Savings Banks	States with No Mutual Savings Banks	
	States Outside South and Southeast	States in South and Southeast
Group I	Group II	Group III
Connecticut	Arizona	Alabama
Delaware	California	Arkansas
Indiana	Colorado	District of Columbia
Maine	Idaho	Florida
Maryland	Illinois	Georgia
Massachusetts	Iowa	Kentucky
Minnesota	Kansas	Louisiana
New Hampshire	Michigan	Mississippi
New Jersey	Missouri	North Carolina
New York (1919–44)[a]	Montana	South Carolina
Ohio	Nebraska	Tennessee
Pennsylvania	Nevada	Texas
Rhode Island	New Mexico	Virginia
Vermont	North Dakota	West Virginia
Washington	Oklahoma	
	Oregon	
	U. S. Possessions	
	South Dakota	
	Utah	
	Wisconsin[b]	
	Wyoming	

[a]For 1907–19, New York by itself constituted a subgroup, Ia, and the rest of Group I states, a subgroup, Ib.

[b]Wisconsin was classified with states with no mutual savings banks because vault cash in its mutual savings banks was 1 per cent or less of the total in its nonnational or nonmember banks.

The differential seasonal is reflected in mean values of v that differ from zero, as shown by the following tabulation:

MEAN VALUE OF v TIMES 100

	1907–19	*1919–44*
Group I	+0.26 (excluding N.Y.)	+2.48 (including N.Y.)
Group II	−1.89	+0.87
Group III	−10.34	−10.55

To allow for this systematic effect, we modified Method R_3 by introducing a constant term, estimating u by

$$u^* = \bar{v} + b(v - \bar{v}),$$

where $\bar{v}$ is the mean value for the relevant group of states in the above tabulation.

Table 23 cross-classifies the pairs of states for which we computed correlation coefficients by the groups in which the states fall and gives the average correlation coefficient for each cell. These results and the individual correlation coefficients underlying them are roughly, but far from fully, consistent with the hypothesis that states in the same group are more like one another than states in different groups. Nonetheless, we proceeded on that basis, using for any state the other states in each group to interpolate missing observations.

For New York nonnational banks, 1907–19, we had reported observations, seasonally adjusted, either identically or nonidentically dated and shifted to national bank call dates, for every call date during the period except May 21, 1919. For this date we interpolated by Method L between the preceding and following seasonally adjusted call-date observations.

To apply Method R_3 we needed to estimate not only the correlation coefficient, for which we used the averages in Table 23, but also the standard deviations for individual states or at least the ratios among them. The computed standard deviations of the v's for individual states are subject to such large sampling variability that we hesitated to use them separately as estimates for the "true" standard deviations. We experimented therefore with relating the size of the standard deviations

TABLE 23

Pairs of States Correlated by Groups; Average Coefficients of Correlation, 1907–44

1907–19			1919–44		
Both Group I	Groups I, II	Groups I, III	Both Group I	Groups I, II	Groups I, III
Wash./Mass.	Wis./Wash.	Wash./D.C.	Wash./Mass.	Wis./Wash.	Md./Ga.
N.J./Wash.	Nev./Ind.	Conn./La.	Conn./Del.	Wis./Del.	N.Y./Tenn.
Md./N.J.	Nev./Conn.	N.J./Va.	N.J./Wash.	Calif./Del.	Wash./D.C.
	N.D./Ind.	Ind./Miss.	Del./Ohio	Nev./N.Y.	
				Ill./Del.	
				Utah/Del.	
Av. r +.558	+.490	+.540	+.154	+.199	+.119
	Both Group II	Groups II, III		Both Group II	Groups II, III
	Calif./Wis.	Wis./La.		Calif./Wis.	Wis./La.
	Ill./Wis.	Calif./La.		Ill./Wis.	Calif./La.
	Utah/Wis.	Utah/La.		Utah/Wis.	Utah/La.
	Ill./Calif.	Colo./D.C.		Ill./Calif.	Calif./D.C.
	Utah/Calif.	N.D./Va.		Utah/Calif.	N.D./Va.
	Utah/Ill.	Ill./S.C.		Ill./Utah	Ill./Ala.
Av. r	+.265	+.017		+.352	+.087
		Both Group III			Both Group III
		N.C./La.			La./N.C.
		Va./Miss.			Miss./Va.
		N.C./Miss.			N.C./Ala.
		S.C./Ala.			S.C./Ala.
Av. r		+.440			+.441

to the average size of vault cash, on the hypothesis that the larger the size of vault cash, the greater the cancellation of independent errors, and hence the smaller the relative variability that might be expected in the observations (the standard deviation of the v's is analogous to the coefficient of variation of the original observations, hence is a measure of relative variability). The relation is generally in the correct direction, but it is so small and loose that with all groups, 1907–19, and with Groups I and III, 1919–44, we treated the standard deviations for different states in each group as equal to one another. For Group II, 1919–44, we used estimates derived from the relation between the standard deviations and the average size of vault cash.[22]

Final Call Date Estimates

This interpolation procedure meant that for each call date we had either an original or an estimated seasonally adjusted observation on vault cash in reporting nonnational or nonmember banks for each of the fifty states. The entries were summed to get vault cash in all reporting nonnational and mutual savings banks at national bank call dates, 1907–19, and in all reporting nonmember and mutual savings banks at

[22] For 1919–44, the standard deviations for Group I showed the highest correlation with the vault cash figures. However, the negative slope was so slight that it did not lead to widely different estimates of the standard deviation for different sizes of vault cash. For the state with the smallest vault cash the standard deviation was less than twice that for the state with the very largest.

For Group II, there was no significant relation between the size of vault cash and the standard deviation for average vault cash larger than $2,000; there was, however, a significant negative slope for average vault cash of $2,000 and under. A freehand line was drawn to fit this relation. We read off from the chart a value for the standard deviation corresponding to the size of vault cash beginning at $300, and rising by steps of $100 to $2,000 (all dollar figures in thousands). For average vault cash above this amount we used an unchanging standard deviation. The standard deviations used for states in this group are:

.933	.990	1.034	1.273	1.697	2.042	3.589
Wisconsin	South Dakota	North Dakota	Montana	Idaho	Wyoming	New Mexico
Illinois		Arizona		Nevada	Utah	
Michigan						
Iowa						
Nebraska						
Colorado						
Oregon						
California						
Missouri						
Kansas						
Oklahoma						
Possessions						

For Group III there was not enough variation among states in average vault cash to determine its effect on the size of the standard deviation.

national and member bank call dates, 1919–42. Table 24 shows the summations (column 1), estimates for nonreporting banks (column 2), for national or member banks (column 3), and the totals for all banks (column 4).

Member bank figures, mostly available directly in seasonally unadjusted form in the published sources, are a sum of seasonally adjusted national and state member bank data. The only special problem was that for 1919–22 observations were not available for state member banks at national bank call dates that were not also state member bank call dates. For these dates we interpolated estimates by Method L between the deseasonalized state member bank figures.

3. All-Bank Vault Cash: Monthly Estimates

The monthly vault cash series, 1907–17, is a sum of deseasonalized monthly data for clearinghouse banks in seven cities accounting for from one-third to one-half of all bank vault cash; the residual data for reporting banks—clearinghouse banks not included and nonclearinghouse banks—interpolated by Method L between the call date figures; and estimates for nonreporting banks interpolated by Method L between June dates. For 1917–42 the all-bank series is a total of deseasonalized monthly data for weekly reporting member banks; the residual data for nonweekly reporting member banks and the estimates for reporting nonmember and mutual savings banks, both interpolated by Method L between call dates; and estimates for nonreporting nonmember banks interpolated by Method L between June dates. Beginning 1943 we present monthly estimates derived as the difference between currency outside Treasury and Federal Reserve Banks and estimates of currency outside all banks published in the *Federal Reserve Bulletin.* We seasonally adjusted this residual series.

1907–17. During this period vault cash data are available weekly from clearinghouses in selected cities including Chicago, New Orleans, St. Louis, and San Francisco, 1907–08; Philadelphia, 1907–14; Boston, 1907–16; and New York, 1907–17.[23] For New York, the clearinghouse

[23] The sources are as follows: A. P. Andrew, "Statistics of Banks and Banking in the United States," *Statistics for the United States, 1867–1909,* pp. 149–150 (Chicago); E. W. Kemmerer, *Seasonal Variation in the Relative Demand for Money and Capital in the United States,* pp. 269, 274, 275 (St. Louis, New Orleans, San Francisco); *The American Banker,* monthly issues (Philadelphia); Boston Clearing House Association, *Statement*

TABLE 24

Vault Cash at All Banks, at Call Dates, 1907–42
(seasonally adjusted, in millions of dollars)

Part I. Nonnational, Mutual Savings, and National Banks, National Bank Call Dates, 1907–1919

National Bank Call Date	Vault Cash			
	All Nonnational and Mutual Savings Banks		All National Banks	All Banks
	Reporting (1)	Nonreporting (2)	(3)	(4)
1907				
May 20	412	11	698	1121
Aug. 22	416	11	736	1163
Dec. 3	471	10	736	1216
1908				
Feb. 14	454	10	795	1259
May 14	483	9	894	1386
July 15	490	9	855	1354
Sept. 23	510	9	926	1445
Nov. 27	492	9	923	1424
1909				
Feb. 5	535	8	866	1409
Apr. 28	519	8	902	1429
June 23	551	8	896	1455
Sept. 1	551	8	881	1440
Nov. 16	560	9	886	1454
1910				
Jan. 31	557	9	843	1409
Mar. 29	563	10	896	1469
June 30	595	10	848	1453
Sept. 1	568	10	897	1476
Nov. 10	561	10	851	1422
1911				
Jan. 17	571	10	924	1504
Mar. 7	561	10	956	1527
June 7	573	10	941	1524
Sept. 1	558	10	946	1514
Dec. 5	588	9	953	1551
1912				
Feb. 20	586	9	1002	1597
Apr. 18	573	8	976	1556
June 14	558	8	959	1524

(continued)

TABLE 24 (continued)

National Bank Call Date	Vault Cash			
	All Nonnational and Mutual Savings Banks		All National Banks	All Banks
	Reporting (1)	Nonreporting (2)	(3)	(4)
1912				
Sept. 4	575	8	931	1514
Nov. 26	584	9	949	1542
1913				
Feb. 4	597	9	948	1554
Apr. 4	566	10	953	1529
June 4	588	10	913	1511
Aug. 9	586	9	973	1568
Oct. 21	603	9	933	1545
1914				
Jan. 13	611	8	1052	1671
Mar. 4	593	7	995	1595
June 30	639	7	1006	1652
Sept. 12	646	7	1005	1658
Oct. 31	607	7	1025	1639
Dec. 31	599	8	741	1348
1915				
Mar. 4	583	8	779	1370
May 1	579	8	801	1388
June 23	613	8	825	1446
Sept. 2	631	8	908	1547
Nov. 10	637	8	891	1536
Dec. 31	639	8	893	1540
1916				
Mar. 7	675	7	904	1585
May 1	659	7	844	1510
June 30	655	7	805	1467
Sept. 12	721	7	851	1579
Nov. 17	686	7	895	1588
Dec. 27	730	7	873	1610
1917				
Mar. 5	764	6	895	1666
May 1	774	6	842	1622
June 30	752	6	724	1482
Sept. 11	641	6	477	1124
Nov. 20	624	6	483	1113
Dec. 31	596	6	490	1092

(continued)

TABLE 24 (continued)

National Bank Call Date	Vault Cash: All Nonnational and Mutual Savings Banks, Reporting (1)	Vault Cash: All Nonnational and Mutual Savings Banks, Nonreporting (2)	Vault Cash: All National Banks (3)	Vault Cash: All Banks (4)
1918				
Mar. 4	589	6	468	1064
May 10	583	6	479	1068
June 29	536	6	430	972
Aug. 31	494	6	405	904
Nov. 1	533	5	472	1010
Dec. 31	542	5	465	1012
1919				
Mar. 4	530	5	437	971
May 12	570	4	443	1016
June 30	556	4	432	992

Part II. Nonmember, Mutual Savings, and Member Banks, Member Bank Call Dates, 1919–42

Member Bank Call Date	Vault Cash: All Nonmember and Mutual Savings Banks, Reporting (1)	Vault Cash: All Nonmember and Mutual Savings Banks, Nonreporting (2)	Vault Cash: All Member Banks (3)	Vault Cash: All Banks (4)
1919				
June 30	418	6	567	992
Sept. 12	402	6	624	1032
Nov. 17	451	6	609	1066
Dec. 31	424	7	610	1040
1920				
Feb. 28	426	7	599	1032
May 4	445	7	588	1040
June 30	431	7	601	1039
Sept. 8	404	6	616	1026
Nov. 15	378	6	611	995
Dec. 29	408	5	604	1016
1921				
Feb. 21	392	5	578	975
Apr. 28	383	5	553	941
June 30	370	4	532	907
Sept. 6	334	4	493	831
Dec. 31	358	4	483	845

(continued)

TABLE 24 (continued)

Member Bank Call Date	Vault Cash			
	All Nonmember and Mutual Savings Banks		All Member Banks	All Banks
	Reporting (1)	Nonreporting (2)	(3)	(4)
1922				
Mar. 10	362	4	516	882
May 5	364	4	490	858
June 30	366	4	498	868
Sept. 15	353	4	508	866
Dec. 29	389	4	547	940
1923				
Apr. 3	386	4	502	892
June 30	378	4	478	860
Sept. 14	382	4	541	927
Dec. 31	405	4	518	927
1924				
Mar. 31	400	4	499	903
June 30	398	4	508	910
Oct. 10	406	4	550	960
Dec. 31	404	4	531	939
1925				
Apr. 6	406	4	528	939
June 30	407	4	508	919
Sept. 28	418	4	516	938
Dec. 31	431	4	528	963
1926				
Apr. 12	430	4	546	979
June 30	422	4	517	942
Dec. 31	407	3	509	919
1927				
Mar. 23	401	3	521	925
June 30	414	3	540	958
Oct. 10	411	3	530	944
Dec. 31	411	3	529	943
1928				
Feb. 28	406	3	522	931
June 30	395	3	501	899
Oct. 3	404	3	490	896
Dec. 31	414	3	521	938
1929				
Mar. 27	393	3	500	896
June 29	383	3	484	869
Oct. 4	392	3	520	916
Dec. 31	374	2	498	874

(continued)

TABLE 24 (continued)

Member Bank Call Date	Vault Cash			
	All Nonmember and Mutual Savings Banks		All Member Banks	All Banks
	Reporting (1)	Nonreporting (2)	(3)	(4)
1930				
Mar. 27	364	2	501	867
June 30	355	2	490	848
Sept. 24	348	2	445	795
Dec. 31	353	2	528	883
1931				
Mar. 25	338	2	448	788
June 30	340	2	504	846
Sept. 29	336	2	525	863
Dec. 31	334	1	482	816
1932				
June 30	303	1	482	786
Sept. 30	273	1	426	700
Dec. 31	283	1	429	712
1933				
June 30	266	1	435	702
Oct. 25	246	1	430	677
Dec. 30	261	1	477	739
1934				
Mar. 5	255	1	504	760
June 30	251	0	530	780
Oct. 17	251	0	529	780
Dec. 31	260	0	563	823
1935				
Mar. 4	261	0	554	816
June 29	260	0	602	862
Nov. 1	266	1	577	844
Dec. 31	276	1	593	870
1936				
Mar. 4	284	1	619	905
June 30	298	1	694	993
Dec. 31	304	1	644	948
1937				
Mar. 31	325	1	643	969
June 30	323	1	611	935
Dec. 31	308	1	577	886
1938				
Mar. 7	321	1	627	949
June 30	335	1	719	1055
Sept. 28	336	1	733	1070
Dec. 31	332	1	756	1089

(continued)

TABLE 24 (concluded)

Member Bank Call Date	Vault Cash			
	All Nonmember and Mutual Savings Banks		All Member Banks	All Banks
	Reporting (1)	Nonreporting (2)	(3)	(4)
1939				
Mar. 29	338	1	754	1093
June 30	339	1	767	1106
Oct. 2	339	1	763	1103
Dec. 30	341	1	853	1195
1940				
Mar. 26	362	1	838	1201
June 29	372	1	886	1259
Dec. 31	370	1	886	1257
1941				
Apr. 4	397	1	902	1300
June 30	408	1	1014	1423
Sept. 24	404	1	1007	1413
Dec. 31	394	1	969	1364
1942				
Apr. 4	400	1	994	1395
June 30	410	1	1002	1413
Dec. 31	408	1	946	1356

Source, by Column

Part I

1. The original data were obtained at report dates from the reports of state banking departments and at midyear dates from *Annual Report* of the Comptroller of the Currency. For New York State, June data for vault cash in New York private banks – which include nonreporting banks – from *All-Bank Statistics*, p. 747, were used. For seasonal adjustment and interpolation, see text, Chap. 12, section 2.

2. Vault cash in nonreporting private banks in Mass., N.J., Penna., Md., Va., Ga., Tex., Ohio, Ill., Mich., Minn., Iowa, Mont., and Wash. was obtained at June dates from *All-Bank Statistics* and interpolated by Method L to national bank call dates.

3. Vault cash in national banks, from Comptroller of the Currency, *Annual Report,* was adjusted simultaneously for the daily and for the monthly seasonal in two periods, 1874–1917, 1917–49.

4. Sum of cols. 1, 2, and 3.

reported data not only for banks that were members of the clearinghouse, but also, from May 1907 to September 1907, for nonmember banks using it and from February 1908 to December 1917, for all New York City banks not in the clearinghouse.[24]

These data are described variously as the sum of specie and legal tender, or cash reserves, or total money holdings, or lawful money. All these data are presented in the form of weekly averages. We dated them as of Wednesday, the midpoint of the week, selecting the Wednesday date nearest the end of the month. Because they were weekly averages, the data did not require correction for the daily seasonal present in vault cash dated as of a given day, but they did require correction for the monthly seasonal. New York we corrected by itself, the data for the remaining six cities, as a group.

Neither the data for New York nor for the other six cities were continuous, 1907–17. For New York we made a continuous hypothetical series of the three segments by raising the level of the less inclusive segment to that of the more inclusive segments. This hypothetical series was used to estimate seasonal factors that were applied to the discontinuous data. Similarly, for the six-city series a hypothetical total was constructed to compute seasonal factors to apply to the data for individual cities.

of the Associated Banks of Boston, as Returned to the Clearing House, weekly issues (Boston); *Commercial and Financial Chronicle,* weekly issues (New York, Boston, and Philadelphia).

[24] For the distinction between nonmembers using the clearinghouse and banks not in the clearinghouse, see J. G. Cannon, *Clearing Houses,* pp. 150–156.

Notes to Table 24 (concluded)

Part II

1. See text, Chap. 12, section 2.
2. Same as for Part I, col. 2.
3. Sum of vault cash in national banks from Comptroller of the of the Currency, *Annual Report,* adjusted simultaneously for the daily and for the monthly seasonal, 1917–49, and in state member banks, from *Member Bank Call Report* through Mar. 1929; thereafter obtained as a residual by subtracting national bank figures from member bank figures from *ibid.*, also adjusted simultaneously for daily and monthly seasonal. At national bank call dates that were not also state member bank call dates, 1919–22, state member bank figures are interpolations by Method L between closest deseasonalized state member bank figures.
4. Sum of cols. 1, 2, and 3.

At each Wednesday date nearest the end of month we summed the deseasonalized figures for New York and for those of the six cities for which data were available. We did not view this discontinuous monthly series as a potential monthly interpolator of the call date figures. Instead we accepted the monthly data as a component of the total and estimated the residual from call date estimates by interpolation using Method L.

In order to obtain a call date series to be interpolated in this way, it was first necessary to compile the seven-city summation at call dates. For call dates that did not fall on a Wednesday, an estimate was interpolated by Method L between the deseasonalized Wednesday figures for those of the seven cities for which data were available for weeks immediately preceding and following the call date. This estimate was then subtracted from the call date figure for all reporting banks. If the composition of the seven-city total changed from one call date to the next, the totals were put on the same basis in order to obtain comparable residuals. For example, on August 22, 1907, data are available for New York City nonmembers of the clearinghouse as well as members. On the next call date, December 3, 1907, data are available for members only. The seven-city total at both call dates was therefore obtained with nonmembers excluded and was subtracted from our call date series. The residual was then interpolated to obtain monthly estimates. However, our monthly seven-city totals for August and September 1907 included New York City nonmembers, consequently the residuals in these two months were too large by the amount of vault cash in these banks. At end of August and September we therefore deducted vault cash in New York City clearinghouse nonmembers.

The final monthly estimates of vault cash, 1907–17, are given in column 4 of Table 25, Part I.

1917–42. Weekly reporting member bank figures are available beginning December 1917. These are Friday figures through April 1921, Wednesday figures thereafter. We compiled Friday and Wednesday figures nearest the end of month and adjusted them for the day of the week, on the basis of the daily seasonal indexes we had computed for national and state member bank data.[25] We then made a correction for monthly seasonal in the conventional way.

[25] These daily seasonals were weighted by the percentage of the total constituted by vault cash in the component classes of banks and then averaged.
This procedure of course assumes that the distribution of weekly reporting member

We tested vault cash in weekly reporting member banks as a possible interpolator of vault cash in nonweekly reporting member banks and in nonmember banks. The test was made on the call date level, that is, the weekly reporting data were obtained in call date form and deviations from intercall trends correlated with corresponding deviations for the other series. All test correlations were low. When seasonal and movements between alternate call dates have been taken out, apparently only random movements are left in the figures. We also tested currency outside Treasury and Reserve Banks minus vault cash in weekly reporting member banks as a possible interpolator of nonweekly reporting member and nonmember bank data. Again the correlations were low.

We therefore interpolated monthly figures by Method L between the call date figures for nonweekly reporting banks and added these estimates to the weekly reporting member bank figures and to monthly estimates for nonreporting banks to obtain all bank vault cash, monthly. Table 25, Part II, presents the breakdowns and the totals for Friday nearest the end of the month, 1918–19; Part III, for Friday nearest the end of the month, 1919–21, and for Wednesday nearest the end of the month, 1921–42. Beginning August 1, 1919, separate figures are shown for nonweekly reporting member and nonmember banks.

Federal Reserve Estimates, 1943 to Date

It is possible to derive all-bank estimates for 1943–46 by subtracting Federal Reserve published estimates of currency outside all banks [26] from Treasury figures of currency outside the Treasury and Federal Reserve Banks. The estimates of currency outside all banks for these four years are end-of-month figures, so we used data for currency outside the Treasury and Federal Reserve Banks that were similarly dated in order to derive the residual vault cash.

The Federal Reserve System has published monthly estimates of commercial bank vault cash for the period 1947–60,[27] and has made available to us unpublished estimates for 1960–68. For the period since 1947 the Federal Reserve figures are monthly averages of daily figures.

banks between national and state member banks is the same as that of all member banks. If the data on weekly reporting members were broken down by supervisory jurisdiction, the weights for the indexes would more properly be the percentage of vault cash in weekly reporting member banks contributed by national banks and the percentage contributed by state member banks.

[26] *Federal Reserve Bulletin*, monthly issues beginning Feb. 1944.

[27] *Ibid.*, Oct. 1960, pp. 1116–1121. Semimonthly estimates are given.

TABLE 25

Vault Cash at All Banks, at End of Month, 1907–42
(seasonally adjusted, in millions of dollars)

Part I. Clearinghouse Banks of Selected Cities and Other Banks
Wednesdays, 1907–17

Wednesday Nearest End of Month	Clearing-house Banks of Selected Cities (1)	All Other Reporting Banks (2)	All Nonreporting Banks (3)	All Banks (4)
1907				
May 29	493	622	11	1126
July 3	462	645	11	1118
July 31	486	664	11	1161
Sept. 28	469	685	11	1164
Oct. 2	459	715	10	1184
Oct. 30	394	751	10	1155
Nov. 27	420	775	10	1205
1908				
Jan. 1	436	762	10	1208
Jan. 29	446	743	10	1200
Feb. 26	584	687	10	1281
Apr. 1	618	700	9	1328
Apr. 29	645	711	9	1365
June 3	650	694	9	1353
July 1	691	662	9	1362
July 29	723	654	9	1385
Sept. 2	745	675	9	1429
Sept. 30	732	681	9	1423
Oct. 28	742	656	9	1406
Dec. 2	782	629	9	1420
Dec. 30	602	781	8	1391
1909				
Feb. 3	610	795	8	1413
Mar. 3	598	803	8	1409
Mar. 31	600	810	8	1419
Apr. 28	603	818	8	1429
June 2	617	818	8	1443
June 30	628	819	8	1456
July 28	635	819	8	1463
Sept. 1	613	820	9	1442
Sept. 29	601	834	9	1444
Nov. 3	571	852	9	1432

(continued)

TABLE 25 (continued)

Wednesday Nearest End of Month	Clearing-house Banks of Selected Cities (1)	All Other Reporting Banks (2)	All Nonreporting Banks (3)	All Banks (4)
1909				
Dec. 1	575	853	9	1437
Dec. 28	575	844	9	1429
1910				
Feb. 2	566	836	9	1410
Mar. 2	565	864	9	1438
Mar. 30	566	892	10	1469
Apr. 27	538	894	10	1442
June 1	548	896	10	1453
June 29	548	897	10	1455
Aug. 3	582	884	10	1476
Aug. 31	594	874	10	1478
Sept. 28	576	867	10	1453
Nov. 2	555	858	10	1423
Nov. 30	592	871	10	1473
Dec. 28	583	891	10	1484
1911				
Feb. 1	596	901	10	1506
Mar. 1	617	904	10	1530
Mar. 29	614	899	10	1523
May 3	600	890	10	1500
May 31	628	884	10	1522
June 28	645	885	10	1539
Aug. 2	610	889	10	1509
Aug. 30	614	893	10	1517
Sept. 27	616	902	9	1527
Nov. 1	612	914	9	1536
Nov. 29	628	924	9	1561
1912				
Jan. 3	665	927	9	1600
Jan. 31	675	927	9	1610
Feb. 28	658	926	9	1592
Apr. 3	635	921	8	1564
May 1	632	907	8	1547
May 29	640	883	8	1531
July 3	619	874	8	1501
July 31	636	882	8	1525
Aug. 28	626	889	8	1523
Oct. 2	604	900	9	1514

(continued)

TABLE 25 (continued)

Wednesday Nearest End of Month	Clearing-house Banks of Selected Cities (1)	All Other Reporting Banks (2)	All Nonreporting Banks (3)	All Banks (4)
1912				
Oct. 30	600	910	9	1518
Nov. 27	612	919	9	1540
1913				
Jan. 1	627	930	9	1566
Jan. 29	615	939	9	1562
Feb. 26	602	935	9	1546
Apr. 2	593	926	10	1528
Apr. 30	598	913	10	1522
May 28	604	900	10	1514
July 2	603	921	10	1534
July 30	612	945	10	1567
Sept. 3	599	944	9	1552
Oct. 1	611	933	9	1553
Oct. 29	604	930	9	1544
Dec. 3	619	949	9	1576
Dec. 31	634	964	8	1606
1914				
Jan. 28	660	956	8	1624
Feb. 25	676	930	8	1613
Apr. 1	679	943	8	1630
Apr. 29	694	963	7	1664
June 3	690	989	7	1686
June 30	637	1008	7	1652
July 29	610	1037	7	1654
Sept. 2	522	1101	7	1630
Sept. 30	577	1078	7	1662
Oct. 28	608	1027	7	1642
Dec. 2	545	900	7	1452
Dec. 30	439	904	8	1351
1915				
Jan. 27	430	911	8	1349
Mar. 3	438	924	8	1370
Mar. 31	468	910	8	1385
Apr. 28	487	894	8	1390
June 2	511	907	8	1426
June 30	512	921	8	1441
July 28	514	942	8	1464
Sept. 1	569	967	8	1544

(continued)

TABLE 25 (continued)

Wednesday Nearest End of Month	Clearing-house Banks of Selected Cities (1)	All Other Reporting Banks (2)	All Nonreporting Banks (3)	All Banks (4)
1915				
Sept. 29	599	944	8	1551
Nov. 3	624	912	8	1544
Dec. 1	656	907	8	1572
Dec. 28	619	910	7	1536
1916				
Feb. 2	594	953	7	1554
Mar. 1	582	990	7	1579
Mar. 29	563	988	7	1558
May 3	529	972	7	1507
May 31	494	960	7	1461
June 28	525	949	7	1482
Aug. 2	505	1005	7	1518
Aug. 30	531	1053	7	1591
Sept. 27	535	1066	7	1608
Nov. 1	567	1045	7	1619
Nov. 29	498	1063	7	1567
1917				
Jan. 3	575	1065	6	1646
Jan. 31	586	1069	6	1661
Feb. 28	607	1073	6	1686
Mar. 28	563	1092	6	1660
May 2	493	1119	6	1618
May 30	514	1112	6	1632
June 27	332	1087	6	1425
Aug. 1	288	987	6	1281
Aug. 29	262	907	6	1175
Oct. 3	236	873	6	1115
Oct. 31	222	878	6	1106
Nov. 28	227	878	6	1111
1918				
Jan. 2	220	867	6	1093

(continued)

TABLE 25 (continued)

Part II. Weekly Reporting Member Banks and All Other Banks, Fridays, 1918–19

Friday Nearest End of Month	Weekly Reporting Member Banks (1)	All Other Reporting Banks (2)	All Nonreporting Banks (3)	All Banks (4)
1918				
Feb. 1	390	689	6	1085
Mar. 1	389	669	6	1064
Mar. 29	400	661	6	1067
May 3	406	654	6	1066
May 31	381	626	6	1013
June 28	374	592	6	972
Aug. 2	380	549	6	935
Aug. 30	384	515	6	905
Sept. 27	381	561	5	947
Nov. 1	383	622	5	1010
Nov. 29	389	621	5	1015
1919				
Jan. 3	385	618	5	1008
Jan. 31	384	608	5	997
Feb. 28	365	597	4	966
Mar. 28	382	606	4	992
May 2	376	621	4	1001
May 29	366	623	4	993
June 27	373	619	4	996

(continued)

TABLE 25 (continued)

Part IIIA. Weekly and Nonweekly Reporting Member and Nonmember Banks, Fridays, 1919–21

Friday Nearest End of Month	Weekly Reporting Member Banks (1)	Nonweekly Reporting Member Banks (2)	Nonmember and Mutual Savings Banks		All Banks (5)
			Reporting (3)	Nonreporting (4)	
1919					
Aug. 1	371	208	412	6	997
Aug. 29	378	217	405	6	1006
Oct. 3	380	221	418	6	1025
Oct. 31	370	221	438	6	1035
Nov. 28	381	222	444	6	1053
1920					
Jan. 2	387	223	424	7	1041
Jan. 30	387	211	425	7	1030
Feb. 27	401	198	426	7	1032
Apr. 2	394	195	436	7	1032
Apr. 30	385	192	444	7	1028
May 28	385	204	439	7	1035
July 2	380	221	430	7	1038
July 30	388	218	419	7	1032
Sept. 3	382	215	406	6	1009
Oct. 1	377	218	396	6	997
Oct. 29	377	222	385	6	990
Dec. 3	373	250	390	6	1019
Dec. 31	318	283	407	5	1013
1921					
Jan. 28	365	252	399	5	1021
Feb. 25	355	224	391	5	975
Apr. 1	328	211	387	5	931
Apr. 29	357	201	383	4	945

(continued)

TABLE 25 (continued)

Part IIIB. Weekly and Nonweekly Reporting Member and Nonmember Banks, Wednesdays, 1921–42

Wednesday Nearest End of Month	Weekly Reporting Member Banks (1)	Nonweekly Reporting Member Banks (2)	Nonmember and Mutual Savings Banks		All Banks (5)
			Reporting (3)	Nonreporting (4)	
1921					
June 1	305	209	376	4	894
June 29	314	216	371	4	905
Aug. 3	301	204	352	4	861
Aug. 31	286	194	337	4	821
Sept. 28	295	196	338	4	833
Nov. 2	270	202	346	4	822
Nov. 30	265	207	352	4	828
Dec. 28	275	211	357	4	847
1922					
Feb. 1	261	229	360	4	854
Mar. 1	258	243	362	4	867
Mar. 29	273	238	363	4	878
May 3	271	219	364	4	858
May 31	269	222	365	4	860
June 28	267	226	366	4	863
Aug. 2	268	225	361	4	858
Aug. 30	271	224	356	4	855
Sept. 27	272	228	357	4	861
Nov. 1	259	241	369	4	873
Nov. 29	257	252	379	4	892
1923					
Jan. 3	265	261	389	4	919
Jan. 31	269	249	388	4	910
Feb. 28	271	237	387	4	899
Mar. 28	279	225	386	4	894
May 2	270	217	383	4	874
May 29	271	212	381	4	868
June 27	271	207	378	4	860
Aug. 1	269	226	380	4	879
Aug. 29	279	244	381	4	908
Oct. 3	278	253	386	4	921
Oct. 31	264	252	392	4	912
Nov. 28	265	251	398	4	918
1924					
Jan. 2	262	249	405	4	920
Jan. 30	267	243	403	4	917

(continued)

TABLE 25 (continued)

Wednesday Nearest End of Month	Weekly Reporting Member Banks (1)	Nonweekly Reporting Member Banks (2)	Nonmember and Mutual Savings Banks		All Banks (5)
			Reporting (3)	Nonreporting (4)	
1924					
Feb. 27	274	237	402	4	917
Apr. 2	266	230	400	4	900
Apr. 30	263	231	399	4	897
May 28	275	231	399	4	909
July 2	280	233	398	4	915
July 30	281	242	401	4	928
Sept. 3	277	254	404	4	939
Oct. 1	264	264	406	4	938
Oct. 29	273	267	406	4	950
Dec. 3	278	268	405	4	955
Dec. 31	262	269	404	4	939
1925					
Jan. 28	273	263	405	4	945
Feb. 25	288	257	405	4	954
Apr. 1	266	249	406	4	925
Apr. 29	276	246	407	4	933
June 3	266	243	407	4	920
July 1	267	241	407	4	919
July 29	270	241	411	4	926
Sept. 2	264	241	415	4	924
Sept. 30	276	241	418	4	939
Oct. 28	265	246	422	4	937
Dec. 2	263	251	427	4	945
Dec. 30	274	256	431	4	965
1926					
Feb. 3	268	259	431	4	962
Mar. 3	272	261	430	4	967
Mar. 31	270	263	430	4	967
Apr. 28	270	261	428	4	963
June 2	271	256	424	4	955
June 30	266	251	422	4	943
July 28	273	251	419	4	947
Sept. 1	265	251	417	4	937
Sept. 29	277	251	414	4	946
Nov. 3	280	251	411	4	946
Dec. 1	257	251	409	4	921
Dec. 29	261	251	407	3	922

(continued)

TABLE 25 (continued)

Wednesday Nearest End of Month	Weekly Reporting Member Banks (1)	Nonweekly Reporting Member Banks (2)	Nonmember and Mutual Savings Banks		All Banks (5)
			Reporting (3)	Nonreporting (4)	
1927					
Feb. 2	252	256	404	3	915
Mar. 2	249	261	402	3	915
Mar. 30	259	265	402	3	929
Apr. 27	258	270	406	3	937
June 1	248	276	411	3	938
June 29	258	281	414	3	956
Aug. 3	249	278	413	3	943
Aig. 31	249	276	412	3	940
Sept. 28	251	274	411	3	939
Nov. 2	239	275	411	3	928
Nov. 30	247	278	411	3	939
Dec. 28	256	281	411	3	951
1928					
Feb. 1	233	283	408	3	927
Feb. 29	237	285	406	3	931
Mar. 28	240	280	404	3	927
May 2	235	274	400	3	912
May 29	235	269	398	3	905
June 27	238	264	395	3	900
Aug. 1	231	258	398	3	890
Aug. 29	243	254	401	3	901
Oct. 3	241	249	404	3	897
Oct. 31	231	257	407	3	898
Nov. 28	240	266	410	3	919
1929					
Jan. 2	237	276	414	3	930
Jan. 30	239	270	407	3	919
Feb. 27	240	265	400	3	908
Apr. 3	238	259	393	3	893
May 1	219	258	389	3	869
May 29	232	258	386	3	879
June 26	222	257	383	3	865
July 31	233	269	386	3	891
Aug. 28	235	279	389	3	906
Oct. 2	222	292	392	3	909
Oct. 30	250	291	387	3	931
Nov. 27	237	288	381	3	909
Dec. 31	213	285	374	2	874

(continued)

TABLE 25 (continued)

Wednesday Nearest End of Month	Weekly Reporting Member Banks (1)	Nonweekly Reporting Member Banks (2)	Nonmember and Mutual Savings Banks		All Banks (5)
			Reporting (3)	Nonreporting (4)	
1930					
Jan. 29	227	288	371	2	888
Feb. 26	216	290	367	2	875
Apr. 2	204	292	363	2	861
Apr. 30	209	286	361	2	858
May 28	225	281	358	2	866
July 2	220	273	355	2	850
July 30	212	264	353	2	831
Sept. 3	204	251	350	2	807
Oct. 1	195	248	348	2	793
Oct. 29	201	263	350	2	816
Dec. 3	206	281	352	2	841
Dec. 31	232	296	353	2	883
1931					
Jan. 28	223	279	348	2	852
Feb. 25	220	262	343	2	827
Apr. 1	201	248	338	2	789
Apr. 29	218	258	339	2	817
June 3	206	271	340	2	819
July 1	223	281	340	2	846
July 29	218	280	339	2	839
Sept. 2	224	278	337	2	841
Sept. 30	247	277	336	2	862
Oct. 28	246	273	335	2	856
Dec. 2	211	268	334	2	815
Dec. 30	220	264	334	1	819
1932					
Feb. 3	215	262	328	1	806
Mar. 2	202	261	323	1	787
Mar. 30	212	259	319	1	791
Apr. 27	202	258	314	1	775
June 1	194	256	308	1	759
June 29	230	254	303	1	788
Aug. 3	200	245	292	1	738
Aug. 31	202	237	283	1	723
Sept. 28	200	230	274	1	705
Nov. 2	175	234	276	1	686
Nov. 30	187	239	279	1	706
Dec. 28	189	244	282	1	716

(continued)

TABLE 25 (continued)

Wednesday Nearest End of Month	Weekly Reporting Member Banks (1)	Nonweekly Reporting Member Banks (2)	Nonmember and Mutual Savings Banks		All Banks (5)
			Reporting (3)	Nonreporting (4)	
1933					
Feb. 1	189	241	280	1	711
Mar. 1	380	239	277	1	897
Mar. 29	275	237	274	1	787
May 3	223	234	271	1	729
May 31	212	231	268	1	712
June 28	203	229	266	1	699
Aug. 2	193	226	260	1	680
Aug. 30	217	224	256	1	698
Sept. 27	217	222	251	1	691
Nov. 1	203	223	248	1	675
Nov. 29	223	237	254	1	715
1934					
Jan. 3	218	253	260	0	731
Jan. 31	231	256	258	0	745
Feb. 28	238	260	255	0	753
Mar. 28	264	265	254	0	783
May 2	244	270	253	0	767
May 30	257	275	252	0	784
June 27	256	280	251	0	787
Aug. 1	238	275	251	0	764
Aug. 29	259	271	251	0	781
Oct. 3	263	266	251	0	780
Oct. 31	268	267	253	0	788
Nov. 28	280	274	256	0	810
1935					
Jan. 2	272	281	260	0	813
Jan. 30	297	271	261	0	829
Feb. 27	304	261	261	0	826
Apr. 3	296	268	261	0	825
May 1	278	276	261	0	815
May 29	301	285	260	0	846
July 3	305	293	260	0	858
July 31	315	283	261	0	859
Aug. 28	326	274	263	0	863
Oct. 2	308	262	265	0	835
Oct. 30	325	253	266	0	844
Nov. 27	327	265	270	0	862
Dec. 31	312	281	276	1	870

(continued)

TABLE 25 (continued)

Wednesday Nearest End of Month	Weekly Reporting Member Banks (1)	Nonweekly Reporting Member Banks (2)	Nonmember and Mutual Savings Banks		All Banks (5)
			Reporting (3)	Nonreporting (4)	
1936					
Jan. 29	345	276	280	1	902
Feb. 26	359	272	283	1	915
Apr. 1	356	283	288	1	928
Apr. 29	370	296	291	1	958
June 3	354	313	295	1	963
July 1	368	324	298	1	991
July 29	376	317	298	1	992
Sept. 2	363	309	300	1	973
Sept. 30	359	302	301	1	963
Oct. 28	376	295	301	1	973
Dec. 2	366	285	303	1	955
Dec. 30	367	280	304	1	952
1937					
Feb. 3	367	287	312	1	967
Mar. 3	362	292	318	1	973
Mar. 31	345	298	325	1	969
Apr. 28	343	306	324	1	974
June 2	315	315	323	1	954
June 30	288	323	323	1	935
July 28	304	317	320	1	942
Sept. 1	275	310	317	1	903
Sept. 29	307	304	315	1	927
Nov. 3	296	296	312	1	905
Dec. 1	278	290	310	1	879
Dec. 29	301	284	308	1	894
1938					
Feb. 2	271	312	314	1	898
Mar. 2	270	335	320	1	926
Mar. 30	329	336	324	1	990
Apr. 27	360	333	327	1	1021
June 1	374	329	331	1	1035
June 29	396	325	335	1	1057
Aug. 3	370	327	335	1	1033
Aug. 31	377	328	335	1	1041
Sept. 28	404	329	336	1	1070
Nov. 2	390	339	334	1	1064
Nov. 30	404	346	333	1	1084
Dec. 28	414	354	332	1	1101

(continued)

TABLE 25 (continued)

Wednesday Nearest End of Month	Weekly Reporting Member Banks (1)	Nonweekly Reporting Member Banks (2)	Nonmember and Mutual Savings Banks		All Banks (5)
			Reporting (3)	Nonreporting (4)	
1939					
Feb. 1	386	346	334	1	1067
Mar. 1	377	339	336	1	1053
Mar. 29	423	331	338	1	1093
May 3	397	334	338	1	1070
May 31	409	336	338	1	1084
June 28	432	339	339	1	1111
Aug. 2	414	330	339	1	1084
Aug. 30	455	321	339	1	1116
Sept. 27	461	313	339	1	1114
Nov. 1	426	344	340	1	1111
Nov. 29	460	374	341	1	1176
Dec. 27	461	404	341	1	1207
1940					
Jan. 31	448	390	349	1	1188
Feb. 28	465	376	355	1	1197
Apr. 3	452	367	363	1	1183
May 1	433	383	366	1	1183
May 29	468	399	368	1	1236
July 3	454	417	372	1	1244
July 31	468	420	371	1	1260
Aug. 28	497	422	371	1	1291
Oct. 2	460	425	371	1	1257
Oct. 30	489	427	371	1	1288
Nov. 27	492	429	371	1	1293
Dec. 31	454	432	370	1	1257
1941					
Jan. 29	515	423	379	1	1318
Feb. 26	513	414	387	1	1315
Apr. 2	491	404	397	1	1293
Apr. 30	500	422	400	1	1323
May 28	539	442	404	1	1386
July 2	541	466	408	1	1416
July 30	548	469	407	1	1425
Sept. 3	531	474	405	1	1411
Oct. 1	510	478	404	1	1393
Oct. 29	528	484	401	1	1414
Dec. 3	506	492	397	1	1396
Dec. 31	471	498	394	1	1364

(continued)

TABLE 25 (concluded)

Wednesday Nearest End of Month	Weekly Reporting Member Banks (1)	Nonweekly Reporting Member Banks (2)	Nonmember and Mutual Savings Banks		All Banks (5)
			Reporting (3)	Nonreporting (4)	
1942					
Jan. 28	540	496	396	1	1433
Feb. 25	530	494	398	1	1423
Apr. 1	491	491	400	1	1383
Apr. 29	518	507	403	1	1429
June 3	468	528	407	1	1404
July 1	451	545	410	1	1407
July 29	498	534	410	1	1443
Sept. 2	463	521	410	1	1395
Sept. 30	471	510	409	1	1391
Oct. 28	487	499	409	1	1396
Dec. 2	471	486	409	1	1367
Dec. 30	474	475	409	1	1359

Notes to Table 25

Source, by Column

Part I

1. These are seasonally adjusted sums of vault cash in clearing-house banks of selected cities for the periods shown below. The series is discontinuous. The data come from the following sources:
   a. *Chicago, 1907–08,* from A. P. Andrew, *Statistics for the United States, 1867–1909,* pp. 149–150.
   b. *St. Louis, New Orleans, San Francisco, 1907–08,* from E. W. Kemmerer, *Seasonal Variation in the Relative Demand for Money and Capital in the United States,* pp. 269, 274, 275.
   c. *Philadelphia, 1907–17,* from *The American Banker,* monthly issues.
   d. *Boston, 1907–16;* from Boston Clearing House Association, *Statement of the Associated Banks of Boston, as Returned to the Clearing House,* weekly issues.
   e. *New York, 1907–17,* from *Commercial and Financial Chronicle,* weekly issues. This source also shows data for Boston and Philadelphia.

For coverage of series, dating and seasonal adjustment, see text, Chap. 12, section 3.

Notes To Table 25 (concluded)

2. These are residual figures for reporting banks not in the clearinghouse data of col. 1, See text, Chap. 12, section 3 for derivation.

3. Vault cash in nonreporting private banks in Mass., Penna., Md., Va., Ga., Tex., Ohio, Mich., Iowa, Mont., and Wash. was obtained at June dates from *All-Bank Statistics,* and interpolated by Method L to Wednesday nearest the end of the month.

4. Sum of cols. 1, 2, and 3.

Part II

1. These are seasonally adjusted figures for vault cash in weekly reporting member banks. The original figures come from the *Federal Reserve Bulletin,* monthly issues.

2. From the call date figures for all reporting banks, Table 24, cols. 1 plus 3, call date figures for weekly reporting member banks were deducted. For call dates that fell on a Friday, the deseasonalized Friday figure for weekly reporting member banks was used; for call dates that fell on another day of the week, a figure was interpolated by Method L to the call date between deseasonalized Friday figures for the week immediately preceding and for the week immediately following the call date. We interpolated by Method L to Friday nearest the end of the month between the call date residuals.

3. June figures, same as Part I, col. 3 were interpolated by Method L to Friday nearest the end of the month.

4. Sum of cols. 1, 2, and 3.

Part III

1. Same as Part II, col. 1, except that beginning May 1921, the figures are Wednesday data and were corrected by the Wednesday daily index. The source for the original figures, through 1941, is *Banking and Monetary Statistics,* pp. 134–162; thereafter, *Federal Reserve Bulletin,* monthly issues.

2. From the call date figures for all member banks, Table 24, Part II, col. 3, call date figures for weekly reporting member banks were deducted, as described above, for Part II, col. 2, and the residuals were interpolated by Method L to Friday nearest the end of the month, Aug. 1, 1919–Apr. 29, 1921, to Wednesday thereafter.

3. Interpolations by Method L between call date figures of Table 24, Part II, col. 1, to Friday nearest the end of the month, Aug. 1, 1919–Apr. 29, 1921, to Wednesday thereafter

4. June figures, same as Part I, col. 3, were interpolated by Method L to Friday nearest the end of the month, Aug. 1, 1919–Apr. 29, 1921, to Wednesday thereafter.

5. Sum of cols. 1, 2, 3, and 4.

We corrected the vault cash estimates for monthly seasonal movements for 1943–46 and 1947–60. The seasonally corrected Federal Reserve figures, 1943–60, are given in *A Monetary History;* [28] in this volume we do not reproduce them and do not show them for years after 1960.

4. Currency Held by the Public: at Call Dates and Monthly

Table 26 brings together the call date series for currency in circulation described in section 1 and the vault cash series described in section 2. The difference between them is the call date series of currency held by the public.

Table 27 brings together the corresponding monthly series described in sections 1 and 3.

Beginning 1943, we present seasonally adjusted Federal Reserve estimates of currency held by the public. For 1943–46 the data are for end of month. Because the period is brief, it has not been possible to correct for daily as well as monthly seasonals. Our seasonal correction is limited to the elimination of the monthly component of the seasonal variation insofar as it is distinguishable. Beginning 1947 the data are Federal Reserve seasonally adjusted monthly averages of daily figures.[29]

5. Reliability of the Estimates

The trustworthiness of our residual series cannot be measured directly. Any errors in our estimates of vault cash as well as our revisions of currency outside Treasury and Federal Reserve Banks, if not offsetting, are transmitted directly to the estimates of the currency holdings of the public. For currency in circulation we have no additional information on errors of reporting. One hypothetical source of error is the inclusion, in the reported figures, of currency which has been lost or destroyed. However, various studies of the rate of loss of currency suggest that this source of error is negligible.[30]

[28] Table A-2, col. 1, pp. 741–744.

[29] *Federal Reserve Bulletin,* monthly issues beginning Feb. 1944, for end-of-month original estimates, 1943–46; Oct. 1969, pp. 790–793, for seasonally adjusted monthly averages of daily figures, 1947–68.

[30] See *A Monetary History,* pp. 442–443, footnote 20; Robert Laurent, "Currency Transfers by Denomination," Ph.D. thesis in process, University of Chicago.

TABLE 26

Currency in Circulation Outside Treasury and Federal Reserve Banks, All Bank Vault Cash, and Currency Held by the Public, National and Member Bank Call Dates, 1907–42

(seasonally adjusted, in millions of dollars)

Call Date[a]	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1907			
May 20	2834	1121	1713
Aug. 22	2819	1163	1656
Dec. 3	3007	1216	1791
1908			
Feb. 14	3095	1259	1836
May 14	3087	1386	1701
July 15	3089	1354	1735
Sept. 23	3099	1445	1654
Nov. 27	3104	1424	1680
1909			
Feb. 5	3091	1409	1682
Apr. 23	3112	1429	1683
June 23	3137	1455	1682
Sept. 1	3129	1440	1689
Nov. 16	3138	1454	1684
1910			
Jan. 31	3128	1409	1719
Mar. 29	3163	1469	1694
June 30	3172	1453	1719
Sept. 1	3206	1476	1730
Nov. 10	3203	1422	1781
1911			
Jan. 7	3223	1504	1719
Mar. 7	3261	1527	1734
June 7	3300	1524	1776
Sept. 1	3293	1514	1779
Dec. 5	3305	1551	1754
1912			
Feb. 20	3326	1597	1729
Apr. 18	3325	1556	1769
June 14	3346	1524	1822
Sept. 4	3352	1514	1838
Nov. 26	3366	1542	1824

(continued)

TABLE 26 (continued)

Call Date[a]	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1913			
Feb. 4	3393	1554	1839
Apr. 4	3363	1529	1834
June 4	3404	1511	1893
Aug. 9	3432	1568	1864
Oct. 21	3452	1545	1907
1914			
Jan. 13	3473	1671	1802
Mar. 4	3486	1595	1891
June 30	3482	1652	1830
Sept. 12	3607	1658	1949
Oct. 31	3721	1639	2082
Dec. 31	3221	1348	1873
1915			
Mar. 4	3226	1370	1856
May 1	3298	1388	1910
June 23	3329	1446	1883
Sept. 2	3420	1547	1873
Nov. 10	3487	1536	1951
Dec. 31	3514	1540	1974
1916			
Mar. 7	3599	1585	2014
May 1	3632	1510	2122
June 30	3665	1467	2198
Sept. 12	3778	1579	2199
Nov. 17	3828	1588	2240
Dec. 27	3867	1610	2257
1917			
Mar. 5	4119	1666	2453
May 1	4198	1622	2576
June 20	4148	1482	2666
Sept. 11	4014	1124	2890
Nov. 20	4148	1113	3035
Dec. 31	4257	1092	3165
1918			
Mar. 4	4330	1064	3266
May 10	4447	1068	3379
June 29	4497	972	3525
Aug. 31	4798	904	3894

(continued)

TABLE 26 (continued)

Call Date[a]	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1918			
Nov. 1	5116	1010	4106
Dec. 31	5120	1012	4108
1919			
Mar. 4	4922	971	3951
May 12	4951	1016	3935
June 30	4879	992	3887
Sept. 12	4990	1032	3958
Nov. 17	5140	1066	4074
Dec. 31	5257	1040	4217
1920			
Feb. 28	5346	1032	4314
May 4	5446	1040	4406
June 30	5499	1039	4460
Sept. 8	5590	1026	4564
Nov. 15	5604	995	4609
Dec. 29	5504	1016	4488
1921			
Feb. 21	5264	975	4289
Apr. 28	5106	941	4165
June 30	4949	907	4042
Sept. 6	4755	831	3924
Dec. 31	4583	845	3738
1922			
Mar. 10	4490	882	3608
May 5	4483	858	3625
June 30	4490	868	3622
Sept. 15	4550	866	3684
Dec. 29	4699	940	3759
1923			
Apr. 3	4755	892	3863
June 30	4850	860	3990
Sept. 14	4917	927	3990
Dec. 31	4904	927	3977
1924			
Mar. 31	4879	903	3976
June 30	4860	910	3950
Oct. 10	4813	960	3853
Dec. 31	4854	939	3915

(continued)

TABLE 26 (continued)

Call Date[a]	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1925			
Apr. 6	4866	939	3927
June 30	4844	919	3925
Sept. 28	4847	938	3909
Dec. 31	4931	963	3968
1926			
Apr. 12	4945	979	3966
June 30	4921	942	3979
Dec. 31	4907	919	3988
1927			
Mar. 23	4931	925	4006
June 30	4907	958	3949
Oct. 10	4868	944	3924
Dec. 31	4812	943	3869
1928			
Feb. 28	4734	931	3803
June 30	4830	899	3931
Oct. 3	4766	896	3870
Dec. 31	4765	938	3827
1929			
Mar. 27	4796	896	3900
June 29	4778	869	3909
Oct. 4	4734	916	3818
Dec. 31	4674	874	3800
1930			
Mar. 27	4587	867	3720
June 30	4533	848	3685
Sept. 24	4446	795	3651
Dec. 31	4692	883	3809
1931			
Mar. 25	4648	788	3860
June 30	4839	846	3993
Sept. 29	5146	863	4283
Dec. 31	5427	816	4611
1932			
June 30	5756	786	4970
Sept. 30	5641	700	4941
Dec. 31	5546	712	4834

(continued)

TABLE 26 (continued)

Call Date[a]	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1933			
June 30	5642	702	4940
Oct. 25	5483	677	4806
Dec. 30	5575	739	4836
1934			
Mar. 5	5278	760	4518
June 30	5373	780	4593
Oct. 17	5392	780	4612
Dec. 31	5366	823	4543
1935			
Mar. 4	5531	816	4715
June 29	5568	862	4706
Nov. 1	5686	844	4842
Dec. 31	5749	870	4879
1936			
Mar. 4	5910	905	5005
June 30	6242	993	5249
Dec. 31	6421	948	5473
1937			
Mar. 31	6449	969	5480
June 30	6447	935	5512
Dec. 31	6416	886	5530
1938			
Mar. 1	6390	949	5441
June 30	6485	1055	5430
Sept. 28	6601	1070	5531
Dec. 31	6702	1089	5613
1939			
Mar. 29	6900	1093	5807
June 30	7062	1106	5956
Oct. 2	7257	1103	6154
Dec. 30	7426	1195	6231
1940			
Mar. 26	7589	1201	6388
June 29	7847	1259	6588
Dec. 31	8535	1257	7278
1941			
Apr. 4	9009	1300	7709
June 30	9574	1423	8151

(continued)

TABLE 26 (concluded)

Call Date[a]	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1941			
Sept. 24	10094	1413	8681
Dec. 31	10908	1364	9544
1942			
Apr. 4	11638	1395	10243
June 30	12457	1413	11044
Dec. 31	15123	1356	13767
1943			
June 30	17527	1564	15963
Oct. 18	18992	1608	17384
Dec. 31	20029	1563	18466
1944			
Apr. 13	21428	1772	19656
June 30	22685	1722	20963
Dec. 30	24738	1804	22934

[a]National bank call dates through 1922; national and member bank call dates thereafter.

Source by Column

1. Interpolated by Method L between the seasonally adjusted end-of-month series, given in Table 27, col. 1.
2. Table 24, Part I, col. 4, Part II, col. 4.
3. Col. 1 minus col. 2.

For bank vault cash, Table 28 shows by classes of banks the proportion of our total estimates based on reported and estimated figures. The proportion shown as reported at call dates includes nonidentically dated figures that were seasonally adjusted by us and shifted to call dates. Thus viewed, 9 per cent of our final call date results, 1907–19, and 14 per cent, 1919–42, represent interpolated values. Even a large error in our interpolation procedure will not seriously affect the reliability of our call date totals.

Thirty-six per cent of the monthly estimates represent reported figures, the remainder, interpolations by Method L between call date figures.

TABLE 27

Currency in Circulation Outside Treasury and Federal Reserve Banks, All Bank Vault Cash, and Currency Held by the Public, Wednesday [a]Nearest End of Month, 1907–42

(seasonally adjusted, in millions of dollars)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1907			
May 29	2841	1126	1715
July 3	2815	1118	1697
July 31	2823	1161	1662
Aug. 28	2818	1164	1654
Oct. 2	2815	1184	1631
Oct. 30	2885	1155	1730
Nov. 27	2989	1205	1784
1908			
Jan. 1	3069	1208	1861
Jan. 29	3093	1200	1893
Feb. 26	3095	1281	1814
Apr. 1	3085	1328	1757
Apr. 29	3109	1365	1744
June 3	3060	1353	1707
July 1	3081	1362	1719
July 29	3097	1385	1712
Sept. 2	3097	1429	1668
Sept. 30	3099	1423	1676
Oct. 28	3104	1406	1698
Dec. 2	3104	1420	1684
Dec. 30	3105	1391	1714
1909			
Feb. 3	3091	1413	1678
Mar. 3	3091	1409	1682
Mar. 31	3091	1419	1672
Apr. 28	3112	1429	1683
June 2	3120	1443	1677
June 30	3143	1456	1687
July 28	3135	1463	1672
Sept. 1	3129	1442	1687
Sept. 29	3152	1444	1708
Nov. 3	3136	1432	1704
Dec. 1	3140	1437	1703
Dec. 28	3138	1429	1709

(continued)

TABLE 27 (continued)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1910			
Feb. 2	3129	1410	1719
Mar. 2	3142	1438	1704
Mar. 30	3164	1469	1695
Apr. 27	3132	1442	1690
June 1	3155	1453	1702
June 29	3171	1455	1716
Aug. 3	3186	1476	1710
Aug. 31	3206	1478	1728
Sept. 28	3211	1453	1758
Nov. 2	3197	1423	1774
Nov. 30	3216	1473	1743
Dec. 28	3218	1484	1734
1911			
Feb. 1	3241	1506	1735
Mar. 1	3260	1530	1730
Mar. 29	3266	1523	1743
May 3	3276	1500	1776
May 31	3303	1522	1781
June 28	3282	1539	1743
Aug. 2	3260	1509	1751
Aug. 30	3292	1517	1775
Sept. 27	3283	1527	1756
Nov. 1	3286	1536	1750
Nov. 29	3306	1561	1745
1912			
Jan. 3	3298	1600	1698
Jan. 31	3316	1610	1706
Feb. 28	3330	1592	1738
Apr. 3	3314	1564	1750
May 1	3334	1547	1787
May 29	3358	1531	1827
July 3	3332	1501	1831
July 31	3352	1525	1827
Aug. 28	3353	1523	1830
Oct. 2	3345	1514	1831
Oct. 30	3375	1518	1857
Nov. 27	3365	1540	1825

(continued)

TABLE 27 (continued)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1913			
Jan. 1	3383	1566	1817
Jan. 29	3393	1562	1831
Feb. 26	3388	1546	1842
Apr. 2	3361	1528	1833
Apr. 30	3392	1522	1870
May 28	3402	1514	1888
July 2	3415	1534	1881
July 30	3436	1567	1869
Sept. 3	3424	1552	1872
Oct. 1	3449	1553	1896
Oct. 29	3453	1544	1909
Dec. 3	3462	1576	1886
Dec. 31	3476	1606	1870
1914			
Jan. 28	3471	1624	1847
Feb. 25	3484	1613	1871
Apr. 1	3484	1630	1854
Apr. 29	3428	1664	1764
June 3	3529	1686	1843
June 30	3482	1652	1830
July 29	3473	1654	1819
Sept. 2	3539	1630	1909
Sept. 30	3728	1662	2066
Oct. 28	3722	1642	2080
Dec. 2	3343	1452	1891
Dec. 30	3225	1351	1874
1915			
Jan. 27	3250	1349	1901
Mar. 3	3225	1370	1855
Mar. 31	3260	1385	1875
Apr. 28	3295	1390	1905
June 2	3313	1426	1887
June 30	3335	1441	1894
July 28	3361	1464	1897
Sept. 1	3418	1544	1874
Sept. 29	3454	1551	1903
Nov. 3	3486	1544	1942
Dec. 1	3489	1572	1917
Dec. 28	3511	1536	1975

(continued)

TABLE 27 (continued)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1916			
Feb. 2	3599	1554	2045
Mar. 1	3593	1579	2014
Mar. 29	3619	1558	2061
May 3	3629	1507	2122
May 31	3589	1461	2128
June 28	3660	1482	2178
Aug. 2	3692	1518	2174
Aug. 30	3760	1591	2169
Sept. 27	3798	1608	2190
Nov. 1	3835	1619	2216
Nov. 29	3822	1567	2255
1917			
Jan. 3	3887	1646	2241
Jan. 31	4012	1661	2351
Feb. 28	4108	1686	2422
Mar. 28	4169	1660	2509
May 2	4200	1618	2582
May 30	4272	1632	2640
June 27	4103	1425	2678
Aug. 1	4025	1281	2744
Aug. 29	4004	1175	2829
Oct. 3	4037	1115	2922
Oct. 31	4065	1106	2959
Nov. 28	4181	1111	3070
1918			
Jan. 2	4252	1093	3159
Feb. 1	4177	1085	3092
Mar. 1	4322	1064	3258
Mar. 29	4398	1067	3331
May 3	4451	1066	3385
May 31	4435	1013	3422
June 28	4495	972	3523
Aug. 2	4634	935	3699
Aug. 30	4792	905	3887
Sept. 27	4974	947	4027
Nov. 1	5116	1010	4106
Nov. 29	5106	1015	4091

(continued)

TABLE 27 (continued)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1919			
Jan. 3	5104	1008	4096
Jan. 31	4959	997	3962
Feb. 28	4920	966	3954
Mar. 28	4936	992	3944
May 2	4963	1001	3962
May 29	4929	993	3936
June 27	4884	996	3888
Aug. 1	4955	997	3958
Aug. 29	4969	1006	3963
Oct. 3	5027	1025	4002
Oct. 31	5088	1035	4053
Nov. 28	5174	1053	4121
1920			
Jan. 2	5254	1041	4213
Jan. 30	5209	1030	4179
Feb. 27	5341	1032	4309
Apr. 2	5404	1032	4372
Apr. 30	5446	1028	4418
May 28	5449	1035	4414
July 2	5501	1038	4463
July 30	5532	1032	4500
Sept. 3	5583	1009	4574
Oct. 1	5621	997	4624
Oct. 29	5647	990	4657
Dec. 3	5553	1019	4534
Dec. 31	5500	1013	4487
1921			
Jan. 28	5338	1021	4317
Feb. 25	5253	975	4278
Apr. 1	5151	931	4220
Apr. 29	5105	945	4160
June 1	5023	894	4129
June 29	4952	905	4047
Aug. 3	4848	861	3987
Aug. 31	4759	821	3938
Sept. 28	4738	833	3905
Nov. 2	4627	822	3805
Nov. 30	4572	828	3744
Dec. 28	4582	847	3735

(continued)

TABLE 27 (continued)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1922			
Feb. 1	4468	854	3614
Mar. 1	4481	867	3614
Mar. 29	4510	878	3632
May 3	4484	858	3626
May 31	4466	860	3606
June 28	4488	863	3625
Aug. 2	4466	858	3608
Aug. 30	4512	855	3657
Sept. 27	4578	861	3717
Nov. 1	4598	873	3725
Nov. 29	4634	892	3742
1923			
Jan. 3	4697	919	3778
Jan. 31	4640	910	3730
Feb. 28	4692	899	3793
Mar. 28	4748	894	3854
May 2	4768	874	3894
May 29	4824	868	3956
June 27	4848	860	3988
Aug. 1	4861	879	3982
Aug. 29	4907	908	3999
Oct. 3	4920	921	3999
Oct. 31	4878	912	3966
Nov. 28	4936	918	4018
1924			
Jan. 2	4898	920	3978
Jan. 30	4814	917	3897
Feb. 27	4872	917	3955
Apr. 2	4878	900	3978
Apr. 30	4866	897	3969
May 28	4900	909	3991
July 2	4859	915	3944
July 30	4839	928	3911
Sept. 3	4843	939	3904
Oct. 1	4792	938	3854
Oct. 29	4855	950	3905
Dec. 3	4882	955	3927
Dec. 31	4854	939	3915

(continued)

TABLE 27 (continued)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1925			
Jan. 28	4875	945	3930
Feb. 25	4890	954	3936
Apr. 1	4868	925	3943
Apr. 29	4859	933	3926
June 3	4851	920	3931
July 1	4845	919	3926
July 29	4869	926	3943
Sept. 2	4841	924	3917
Sept. 30	4847	939	3908
Oct. 28	4875	937	3938
Dec. 2	4866	945	3921
Dec. 30	4929	965	3964
1926			
Feb. 3	4922	962	3960
Mar. 3	4947	967	3980
Mar. 31	4921	967	3954
Apr. 28	4977	963	4014
June 2	4927	955	3972
June 30	4921	943	3978
July 28	4971	947	4024
Sept. 1	4924	937	3987
Sept. 29	4920	946	3974
Nov. 3	4922	946	3976
Dec. 1	4876	921	3955
Dec. 29	4905	922	3983
1927			
Feb. 2	4906	915	3991
Mar. 2	4911	915	3996
Mar. 30	4937	929	4008
Apr. 27	4952	937	4015
June 1	4918	938	3980
June 29	4907	956	3951
Aug. 3	4907	943	3964
Aug. 31	4846	940	3906
Sept. 28	4881	939	3942
Nov. 2	4833	928	3905
Nov. 30	4789	939	3850
Dec. 28	4810	951	3859

(continued)

TABLE 27 (continued)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1928			
Feb. 1	4752	927	3825
Feb. 29	4733	931	3802
Mar. 28	4798	927	3871
May 2	4790	912	3878
May 29	4780	905	3875
June 27	4825	900	3925
Aug. 1	4771	890	3881
Aug. 29	4804	901	3903
Oct. 3	4767	897	3870
Oct. 31	4717	898	3819
Nov. 28	4832	919	3913
1929			
Jan. 2	4764	930	3834
Jan. 30	4747	919	3828
Feb. 27	4757	908	3849
Apr. 3	4795	893	3902
May 1	4735	869	3866
May 29	4762	879	3883
June 26	4776	865	3911
July 31	4778	891	3887
Aug. 28	4825	906	3919
Oct. 2	4731	909	3822
Oct. 30	4763	931	3832
Nov. 27	4761	909	3852
Dec. 31	4674	874	3800
1930			
Jan. 29	4640	888	3752
Feb. 26	4623	875	3748
Apr. 2	4578	861	3717
Apr. 30	4528	858	3670
May 28	4560	866	3694
July 2	4531	850	3681
July 30	4500	831	3669
Sept. 3	4511	807	3704
Oct. 1	4427	793	3634
Oct. 29	4410	816	3594
Dec. 3	4515	841	3674
Dec. 31	4692	883	3809

(continued)

TABLE 27 (continued)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1931			
Jan. 28	4670	852	3818
Feb. 25	4650	827	3823
Apr. 1	4650	789	3861
Apr. 29	4714	817	3897
June 3	4716	819	3897
July 1	4841	846	3995
July 29	4897	839	4058
Sept. 2	5018	841	4177
Sept. 30	5151	862	4289
Oct. 28	5393	856	4537
Dec. 2	5318	815	4503
Dec. 30	5423	819	4604
1932			
Feb. 3	5702	806	4896
Mar. 2	5611	787	4824
Mar. 30	5534	791	4743
Apr. 27	5526	775	4751
June 1	5505	759	4746
June 29	5747	788	4959
Aug. 3	5786	738	5048
Aug. 31	5711	723	4988
Sept. 28	5646	705	4941
Nov. 2	5549	686	4863
Nov. 30	5548	706	4842
Dec. 28	5546	716	4830
1933			
Feb. 1	5690	711	4979
Mar. 1	6485	897	5588
Mar. 29	6296	787	5509
May 3	5931	729	5202
May 31	5731	712	5019
June 28	5648	699	4949
Aug. 2	5566	680	4886
Aug. 30	5548	698	4850
Sept. 27	5521	691	4830
Nov. 1	5478	675	4803
Nov. 29	5559	715	4844

(continued)

TABLE 27 (continued)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1934			
Jan. 3	5570	731	4839
Jan. 31	5236	745	4491
Feb. 28	5266	753	4513
Mar. 28	5333	783	4550
May 2	5323	767	4556
May 30	5350	784	4566
June 27	5371	787	4584
Aug. 1	5373	764	4609
Aug. 29	5409	781	4628
Oct. 3	5407	780	4627
Oct. 31	5378	788	4590
Nov. 28	5441	810	4631
1935			
Jan. 2	5372	813	4559
Jan. 30	5450	829	4621
Feb. 27	5526	826	4700
Apr. 3	5539	825	4714
May 1	5523	815	4708
May 29	5561	846	4715
July 3	5566	858	4708
July 31	5546	859	4687
Aug. 28	5615	863	4752
Oct. 2	5640	835	4805
Oct. 30	5682	844	4838
Nov. 27	5737	862	4875
Dec. 31	5749	870	4879
1936			
Jan. 29	5826	902	4924
Feb. 26	5897	915	4982
Apr. 1	5944	928	5016
Apr. 29	5963	958	5005
June 3	5993	963	5030
July 1	6241	991	5250
July 29	6214	992	5222
Sept. 2	6198	973	5225
Sept. 30	6241	963	5278
Oct. 28	6289	973	5316
Dec. 2	6333	955	5378
Dec. 30	6418	952	5466

(continued)

TABLE 27 (continued)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F. R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1937			
Feb. 3	6436	967	5469
Mar. 3	6463	973	5490
Mar. 31	6449	969	5480
Apr. 28	6495	974	5521
June 2	6455	954	5501
June 30	6447	935	5512
July 28	6489	942	5547
Sept. 1	6519	903	5616
Sept. 29	6535	927	5608
Nov. 3	6494	905	5589
Dec. 1	6452	879	5573
Dec. 29	6418	894	5524
1938			
Feb. 2	6383	898	5485
Mar. 2	6377	926	5451
Mar. 30	6450	990	5460
Apr. 27	6454	1021	5433
June 1	6486	1035	5451
June 29	6485	1057	5428
Aug. 3	6486	1033	5453
Aug. 31	6496	1041	5455
Sept. 28	6601	1070	5531
Nov. 2	6617	1064	5553
Nov. 30	6666	1084	5582
Dec. 28	6699	1101	5598
1939			
Feb. 1	6749	1067	5682
Mar. 1	6802	1053	5749
Mar. 29	6900	1093	5807
May 3	6970	1070	5900
May 31	6988	1084	5904
June 28	7057	1111	5946
Aug. 2	7064	1084	5980
Aug. 30	7189	1116	6073
Sept. 27	7250	1114	6136
Nov. 1	7280	1111	6169
Nov. 29	7377	1176	6201
Dec. 27	7421	1207	6214

(continued)

TABLE 27 (concluded)

Wednesday Nearest End of Month	Currency in Circulation Outside Treasury & F.R. Banks (1)	Vault Cash, All Banks (2)	Currency Held by the Public (3)
1940			
Jan. 31	7479	1188	6291
Feb. 28	7556	1197	6359
Apr. 3	7597	1183	6414
May 1	7632	1183	6449
May 29	7741	1236	6505
July 3	7854	1244	6610
July 31	7924	1260	6664
Aug. 28	8039	1291	6748
Oct. 2	8098	1257	6841
Oct. 30	8254	1288	6966
Nov. 27	8362	1293	7069
Dec. 31	8535	1257	7278
1941			
Jan. 29	8719	1318	7401
Feb. 26	8876	1315	7561
Apr. 2	8998	1293	7705
Apr. 30	9153	1323	7830
May 28	9354	1386	7968
July 2	9590	1416	8174
July 30	9814	1425	8389
Sept. 3	9997	1411	8586
Oct. 1	10127	1393	8734
Oct. 29	10281	1414	8867
Dec. 3	10497	1396	9101
Dec. 31	10908	1364	9544
1942			
Jan. 28	11220	1433	9787
Feb. 25	11449	1423	10026
Apr. 1	11610	1383	10227
Apr. 29	11876	1429	10447
June 3	12146	1404	10742
July 1	12474	1407	11067
July 29	12938	1443	11495
Sept. 2	13255	1395	11860
Sept. 30	13676	1391	12285
Oct. 28	14045	1396	12649
Dec. 2	14540	1367	13173
Dec. 30	15103	1359	13744

Notes to Table 27

[a]The dating is the same as that of the monthly vault cash estimates. Though described here as "Wednesday dates," Feb. 1, 1918, to Apr. 29, 1921, dates were, in fact, Friday dates. (See Table 25, Parts IIIA and B.)

Source, by Column

1. Published figures for end-of-month dates for the components of currency outside the Treasury and Federal Reserve Banks were corrected by us for discontinuities, summed, seasonally adjusted and shifted between the end-of-month totals by Method L to dates shown in this table. Before 1914, amounts outside the Treasury were obtained either directly, or if the stock of a component required correction, indirectly, by subtracting the amount in the Treasury from corrected figures of the stock. The components, their sources, and the corrections made were as follows.
   A. Gold coin: *May 1907,* stock of gold, from "Report of the Treasurer," in *Annual Report* of the Secretary of the Treasury, 1909, p. 190, *minus* amount of gold reported lost in June 1907, from *Annual Report* of the Director of the Mint, 1907, pp. 92 and 87, *minus* gold in Treasury, from "Report of the Treasurer," *loc. cit.,* 1909, p. 190; *June 1907–Dec. 1913,* stock of gold, from *ibid.,* 1909, pp. 190 ff.; 1915, pp. 339 ff., *minus* gold in Treasury from "Report of the Treasurer," *loc. cit.,* 1909, pp. 190 ff.; 1915, pp. 339 ff; *Jan. 1914–Dec. 1933,* gold outside Treasury and Federal Reserve Banks, from *Banking and Monetary Statistics,* pp. 409–412, *plus* $287 million deducted by Federal Reserve but restored by us, as described in text; *Jan. 1934–Dec. 1942, ibid.,* pp. 412–413 and *Circulation Statement of U.S. Money.*
   B. (a) Gold certificates, (b) silver certificates, (c) silver dollars, (d) U.S. notes and currency certificates, and (e) Treasury notes of 1890: *May 1907–Dec. 1913, Circulation Statement of U.S. Money; Jan. 1914–Dec. 1942, Banking and Monetary Statistics,* pp. 409–413 and *Circulation Statement of U.S. Money.*
   C. (a) Federal Reserve notes and (b) Federal Reserve Bank notes: *Nov. 1914–Dec. 1942, Banking and Monetary Statistics,* pp. 409–413 and *Circulation Statement of U.S. Money.*
   D. Subsidiary silver: *May 1907–May 1910,* stock, from "Report of the Treasurer," *loc. cit.,* 1909, p. 195; 1915, p. 343, *minus* the error (interpolated monthly by Method L) reported to have cumulated to $9.7 million over the period, June 1881–June 1910, in "Report of the Director of the Mint," *ibid.,* 1910, p. 290, *minus* amount in Treasury, from "Report of the Treasurer," *loc. cit.,* 1909, p. 194; 1915, p. 343.

Notes to Table 27 (concluded)

June 1910–Dec. 1913, Circulation Statement of U.S. Money; Jan. 1914–Dec. 1942, Banking and Monetary Statistics, pp. 409–413 and *Circulation Statement of U.S. Money.*

E. National bank notes: Same sources as for B. above, *minus* estimates of national bank notes in vaults of issuing banks and in transit, May 1907–June 1935. The estimates were derived as follows: *May 1907–June 1928, notes in vaults of issuing banks* are monthly interpolations by Method L between call date figures on circulating notes of national banks received from the Comptroller and on hand, from *Annual Report* of the Comptroller of the Currency; *notes in transit* are monthly interpolations by Method L between mid-and end-of-year estimates of the transit item, obtained by deducting national bank call date figures of national bank notes received from the Comptroller, *ibid.*, from figures on the "circulation of national bank notes secured by U.S. bonds," *ibid.*, 1918, vol. II, pp. 19–21; 1924, pp. 158–160, 1928, pp. 222–223. *July 1928–June 1935, notes in vaults of issuing banks and in transit* are monthly interpolations by Method L between mid-and end-of-year estimates, obtained by deducting national bank call date figures of national bank note liabilities, *ibid.*, annual volumes, from figures on the "circulation of national bank notes secured by U.S. bonds," *ibid.*, 1931, pp. 178–179; 1935, pp. 183–184.

F. Minor coin: *May 1907–Dec. 1913,* monthly interpolations by Method L between June figures, *Banking and Monetary Statistics,* pp. 408–409; *Jan. 1914–Dec. 1942, ibid.,* pp. 409–413 and *Circulation Statement of U.S. Money.*

The various kinds of currency itemized above were added together. This series was adjusted for seasonal in two stages: (a) Each end-of-month day was corrected by a combined daily and monthly seasonal factor; (b) Repetitive movements that still remained, May 1907–Dec. 1913, June 1924–June 1932, and June 1935–June 1941, were corrected by factors derived by the method of ratios to moving averages.

2. Table 25, Parts I and II, col. 4 (through June 1919); thereafter, Part III, col. 5.
3. Col. 1 minus col. 2.

Through 1922 call date information was available for five or six call dates annually. On the average, then, only every other monthly figure required interpolation during this period. After 1922, there were three or four member bank call dates per year, so that between two-thirds and three-fourths of the monthly figures required interpolation.

In addition to these estimation errors our estimates of currency held by the public are subject to an error of coverage during periods of panic

TABLE 28

Reported and Interpolated Vault Cash in Various Classes of Banks at Call Dates and End of Month as Percentages of Total Vault Cash, 1907–42

Class of Banks and Period Covered	Per Cent of Total Vault Cash			
		Interpolated		Total
	Reported (1)	By Method L (2)	By Method R (3)	Cols. 1+2+3 (4)
Call Dates				
1907–19:				
National banks	56.0	–	–	56.0
Nonnational and mutual savings banks	35.0	[a]	9.0	44.0
Total	91.0	–	9.0	100.0
1919–42:				
Member banks	62.0	–	–	62.0
Nonmember and mutual savings banks	24.0	–	14.0	38.0
Total	86.0	–	14.0	100.0
Monthly				
1907–19:				
Clearinghouse banks in seven cities	36.0	–	–	36.0
All other banks	–	64.0	–	64.0
Total	36.0	64.0	–	100.0
1919–42:				
Weekly reporting member banks	32.0	–	–	32.0
Nonweekly reporting member banks	2.0	28.0	–	30.0
Nonmember and mutual savings banks	2.0	36.0	–	38.0
Total	36.0	64.0	–	100.0

[a]Interpolation of New York data by Method L averaged less than 0.5 per cent of total vault cash.

that have occurred at least three times since 1907: October 1907–February 1908; August–December 1914; and February–March 1933. In each of these periods actual or threatened suspension of payments by banks increased the demand for currency by the public as well as the banks. The inelasticity of the supply of legal kinds of currency led to the creation and circulation of substitutes. In 1907 and 1914, banks resorted to a familiar substitute for currency in settling interbank balances—the clearinghouse loan certificate. Since these clearinghouse loan certificates did not circulate outside banks, they did not constitute an addition to currency held by the public. Only for 1907 do we have a detailed estimate of substitutes created for public use.[31] These substitutes included: clearinghouse loan certificates in currency denominations to be used by banks in paying their customers; clearinghouse checks in currency denominations; cashiers' checks in convenient denominations; cashiers' checks drawn on New York or drafts upon reserve city banks; negotiable certificates of deposit; pay-checks payable to bearer—a liability of the firm or corporation for whose benefit they were issued by banks; issues of railroads, mining companies, manufacturers, and storekeepers. Andrew estimates that in total $250 million of these substitutes were in public circulation from the end of October 1907 until the spring of 1908. In 1914 it is possible that addition of Aldrich-Vreeland currency to the national bank note issue eliminated the need for extralegal currency substitutes. During the period of bank holidays in February–March 1933 it has been estimated that probably as much as $1 billion in substitute forms of currency were in use.[32]

Appendix to Chapter 12

DAILY AND MONTHLY SEASONAL FACTORS FOR VAULT CASH

This appendix presents the daily and monthly seasonal factors used to correct reported national and nonnational, member and nonmember, bank vault cash call date figures.

Table 29 lists the daily and monthly seasonal factors derived from vault cash figures for various classes of banks for the periods shown.

[31] A. P. Andrew, "Substitutes for Cash in the Panic of 1907," *Quarterly Journal of Economics*, Aug. 1908, pp. 497–515.

[32] H. P. Willis and J. M. Chapman, *The Banking Situation*, p. 15.

TABLE 29

Intraweekly and Monthly Seasonal Indexes, Vault Cash, Call Date Series

	Hypothetical Series					
	Non-national Banks 1907–17	All Non-member Banks 1919–44	State Member Banks 1919–44	All National Banks, 1917–49	All National Banks, Aug. 1874–June 1917	State Banks and Trust Companies, New York State, 1897–1917
			Daily Indexes			
Mon.	100.0	100.8	100.7	101.2	99.6	100.7
Tues.	95.1	102.7	105.6	105.0	99.8	100.2
Wed.	103.7	102.6	103.8	106.0	102.2	99.2
Thurs.	96.4	99.9	102.0	101.3	100.3	101.7
Fri.	111.6	98.2	95.7	95.1	100.0	101.3
Sat.	93.1	95.8	92.2	91.5	98.1	97.0
			Monthly Indexes			
Jan.–Feb.	100.2	(99.2)[a]	(101.2)[a]		104.3	
Feb.–Mar.	103.5	96.9	98.4	94.8	100.3	100.1
Mar.–Apr.	99.0	96.7	97.6	98.5	98.6	98.2
Apr.–May	103.2	98.3	97.9	101.7	100.6	103.4
May–June	93.8	(98.0)[a]	(98.8)[a]		103.9	106.6
June–July	97.4	97.8	99.7	97.6	101.8	98.0
July–Aug.	102.8	(101.2)[a]	(103.8)[a]		99.1	106.5
Aug.–Sept.	98.6	106.2	109.5	98.5	99.6	101.7
Sept.–Oct.	89.7	97.7	100.9	100.8	96.0	99.5
Oct.–Nov.	102.6	105.9	99.7	98.9	101.1	97.3
Nov.–Dec.	103.8	95.1	88.4	101.8	95.9	96.1
Dec.–Jan.	105.3	105.5	107.9	107.4	98.8	92.6

[a]Interpolated on basis of weekly reporting member bank data.

The months of the year run from the sixteenth of a calendar month to the fifteenth of the next. Nonmember and state member bank monthly indexes for months without call dates were interpolated by Method R_1, using the monthly seasonal indexes of weekly reporting member banks as the related series.

Table 30 presents the combined monthly and daily seasonal factors for vault cash in the following classes of banks:

a. Nonnational banks, 1907–17—hypothetical series
b. National banks, 1874–1917
c. State banks and trust companies in New York State, 1897–1917
d. Nonmember banks, 1919–44—hypothetical series
e. State member banks, 1919–44
f. Nonnational banks, 1919–44
g. National banks, 1917–49.

The hypothetical series for nonnational banks, 1907–17, and for nonmember banks, 1919–44, were constructed, for the sole purpose of providing estimates of seasonals, from observations dated identically with national and member bank call dates.

Weighted averages of the seasonal factors computed for vault cash in state member and nonmember banks (average vault cash over the period in each class constituting the weights), were used as the seasonal factors for vault cash in nonnational banks, 1919–44. The latter seasonals were used to adjust nonidentically dated nonnational bank figures.

No member bank seasonal indexes, as such, were computed. Adjusted state member bank data added to adjusted national bank data yielded adjusted member bank data.

TABLE 30

Combined Intraweekly and Monthly Seasonal Indexes, Vault Cash, Call Date Series

	Jan. Feb.	Feb. March	March April	April May	May June	June July	July Aug.	Aug. Sept.	Sept. Oct.	Oct. Nov.	Nov. Dec.	Dec. Jan.
Nonnational Banks, National Bank Call Dates, 1907–17 – Hypothetical												
Mon.	100.2	103.5	99.0	103.2	93.8	97.4	102.8	98.6	89.7	102.6	103.8	105.3
Tues.	95.3	98.6	94.2	98.3	88.9	92.6	97.9	93.7	84.8	97.7	98.9	100.5
Wed.	103.9	107.2	102.8	106.9	97.5	101.1	106.5	102.3	93.4	106.3	107.5	109.0
Thurs.	96.6	99.9	95.5	99.6	90.2	93.8	99.2	95.0	86.1	99.0	100.2	101.7
Fri.	111.8	115.1	110.7	114.8	105.4	109.0	114.4	110.2	101.3	114.2	115.4	116.9
Sat.	93.3	96.6	92.2	96.3	86.9	90.5	95.9	91.7	82.8	95.7	96.9	98.4
All National Banks, National Bank Call Dates, August 1874–June 1917												
Mon.	104.0	99.9	98.3	100.2	103.5	101.4	98.7	99.2	95.7	100.7	95.5	98.5
Tues.	104.1	100.1	98.4	100.3	103.7	101.6	98.9	99.3	95.8	100.9	95.7	98.6
Wed.	106.5	102.5	100.8	102.8	106.1	104.0	101.3	101.8	98.2	103.3	98.1	101.0
Thurs.	104.7	100.6	99.0	100.9	104.2	102.1	99.4	99.9	96.4	101.4	96.2	99.2
Fri.	104.3	100.2	98.6	100.5	103.9	101.8	99.1	99.5	96.0	101.1	95.9	98.8
Sat.	102.4	98.3	96.7	98.6	102.0	99.9	97.2	97.6	94.1	99.2	94.0	96.9

State Banks and Trust Companies, New York State, Report Dates, 1897–1917

Mon.	100.8	98.9	104.1	107.3	98.7	107.2	102.4	100.1	98.0	96.8	93.3
Tues.	100.3	98.4	103.6	106.8	98.2	106.7	101.9	99.6	97.5	96.3	92.8
Wed.	99.3	97.4	102.6	105.8	97.2	105.6	100.9	98.6	96.5	95.3	91.8
Thurs.	101.8	99.9	105.1	108.3	99.7	108.2	103.4	101.2	99.0	97.8	94.3
Fri.	101.4	99.5	104.7	107.9	99.3	107.8	103.0	100.8	98.6	97.4	93.9
Sat.	97.1	95.2	100.4	103.6	95.0	103.4	98.7	96.4	94.3	93.1	89.6

Nonmember Banks, Member Bank Call Dates, 1919–44 – Hypothetical

Mon.	97.6	97.4	99.0	98.5	106.9	98.5	106.7	95.9	106.3
Tues.	99.6	99.4	101.0	100.5	108.9	100.4	108.6	97.9	108.2
Wed.	99.5	99.3	100.9	100.4	108.8	100.4	108.5	97.8	108.1
Thurs.	96.7	96.5	98.1	97.6	106.0	97.6	105.8	95.0	105.4
Fri.	95.1	94.9	96.5	96.0	104.4	96.0	104.1	93.4	103.8
Sat.	92.7	92.4	94.0	93.5	101.9	93.5	101.7	90.9	101.3

State Member Banks, Member Bank Call Dates, 1919–44

Mon.	99.1	98.3	98.7	100.5	110.2	101.7	100.4	89.1	108.7
Tues.	104.0	103.2	103.5	105.4	115.1	106.5	105.3	94.0	113.5
Wed.	102.2	101.3	101.7	103.5	113.2	104.7	103.5	92.2	111.7
Thurs.	100.3	99.5	99.9	101.7	111.4	102.9	101.6	90.4	109.9
Fri.	94.0	93.2	93.6	95.4	105.1	96.6	95.3	84.1	103.6
Sat.	90.6	89.8	90.1	92.0	101.7	93.2	91.9	80.6	100.2

(continued)

TABLE 30 (concluded)

	Jan. Feb.	Feb. March	March April	April May	May June	June July	July Aug.	Aug. Sept.	Sept. Oct.	Oct. Nov.	Nov. Dec.	Dec. Jan.
Nonnational Banks, 1919–44 (Weighted average of seasonal factors for state member and nonmember banks)												
Mon.	100.6	98.2	97.8	98.9	99.0	99.2	102.8	108.1	99.6	104.5	93.6	107.1
Tues.	103.6	101.2	100.7	101.9	102.0	102.2	105.9	111.1	102.5	107.4	96.5	110.1
Wed.	102.9	100.4	100.0	101.2	101.3	101.5	105.1	110.4	101.8	106.8	95.7	109.4
Thurs.	100.5	98.0	97.6	98.8	98.9	99.1	102.7	108.0	99.5	104.4	93.4	106.9
Fri.	97.2	94.7	94.3	95.5	95.6	95.8	99.4	104.6	96.2	101.0	90.1	103.6
Sat.	94.5	92.0	91.6	92.7	92.8	93.0	96.7	101.9	93.4	98.2	87.3	100.9
All National Banks, National Bank Call Dates, 1917–49												
Mon.		96.0	99.7	102.9		98.8		99.7	102.0	100.1	103.0	108.6
Tues.		99.8	103.5	106.7		102.6		103.5	105.8	103.9	106.8	112.4
Wed.		100.9	104.5	107.8		103.6		104.5	106.9	105.0	107.8	113.4
Thurs.		96.1	99.8	103.0		98.9		99.8	102.1	100.2	103.1	108.7
Fri.		89.9	93.6	96.8		92.7		93.6	95.9	94.0	96.9	102.5
Sat.		86.3	90.0	93.2		89.1		90.0	92.3	90.4	93.3	108.9

Source: See Chap. 12, Appendix.