

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Corporate Cash Balances, 1914-43: Manufacturing and Trade

Volume Author/Editor: Friedrich A. Lutz

Volume Publisher: NBER

Volume ISBN: 0-870-14136-8

Volume URL: <http://www.nber.org/books/lutz45-1>

Publication Date: 1945

Chapter Title: Cash and the Volume of Transactions

Chapter Author: Friedrich A. Lutz

Chapter URL: <http://www.nber.org/chapters/c4820>

Chapter pages in book: (p. 37 - 50)

CASH AND THE VOLUME OF TRANSACTIONS, 1919-39

AS INDICATED IN CHAPTER 2, a second line of approach in an analysis of corporate cash balances is to relate cash balances to the work which they have to do, i.e., to payments. Before the movement of the ratio of cash to payments can be investigated, however, it is first necessary to consider the main factors determining the size of cash holdings.

CASH REQUIREMENTS AND CASH HOLDINGS

Manufacturing corporations hold cash balances primarily to provide for future payments, but it cannot be assumed a priori that the money held for this purpose is necessarily a fixed percentage of expected future payments. The determinants of the ratio are manifold, and it is possible that both they and the ratio may vary over a period of time. Five factors deserve particularly to be mentioned in this connection.

(1) *Coincidence of receipts and expenditures.* A company which has reason to expect that, in the near future, it will have to make cash payments that are not matched by an inflow of money will have to hold more cash than if it expects that receipts will come in at the same time that expenditures are being made. For instance, receipts from sales may be subject to seasonal fluctuations whereas production expenditures are not. It is clear then that during the months when sales are low the company needs a large cash balance on which to draw for its expenditures. The cash balance itself will show seasonal fluctuations; it will rise when sales increase and fall when they decrease. For this reason the ratio of average cash¹ to payments during any one unit period (such as a month) will increase when sales increase and fall when sales fall. Such a ratio is an index of the work the cash balance does. If the ratio rises,

¹ By "average cash" we mean the average of the cash balances which existed at successive moments of time during the unit period, e.g., the average of the cash balances at the end of every business day during a month.

it means that the cash is being turned over more slowly than before (that is, the velocity of circulation of the cash balance is decreasing), and vice versa.

In addition to current receipts and expenditures there are non-recurrent receipts and disbursements. A company may, for instance, plan to add to its equipment. If it finances this addition out of profits (i.e., neither through outside funds nor through the sale of marketable securities or other assets), the cash balance will increase before the disbursement is made. Therefore, in the period before the accumulated funds are spent, the ratio of cash to payments will rise, whereas it will fall in the period when the disbursement takes place. The situation will be similar in the case of tax payments—in fact, in the case of all large concentrated disbursements.

If the lack of coincidence of receipts and expenditures were the only factor determining the size of cash balances, both cash balances and the ratio of cash to payments would fluctuate rather widely, because of seasonal and cyclical influences. However, such fluctuations are largely avoided if the company takes advantage of the existence of a credit market in one or the other of the forms described under (2) and (3) below.

(2) *Opportunities for investments.* Even if a concern expects large disbursements—for instance, on fixed property in the near future—it may not have to hold a particularly large cash balance if it can invest on short term the money required for this purpose. In the late twenties, when concerns could lend on call to members of the stock exchange at an attractive interest rate, they would have been foolish to hold funds in the form of actual cash even if these funds were to be needed shortly for plant expansion. Or, to take a different example, if a company is preparing to meet tax payments, it is not obliged to hold a large cash balance for this purpose if it has the alternative of investing in tax notes or other government securities. Through short-term investment, a company can also eliminate an increase in its cash balances which is due to seasonal influences.

If an enterprise has short-term debts (see 3 below) it may, of course, prefer to use a temporary surplus of cash for reduction of the debts rather than for investment.

(3) *Opportunities for borrowing.* A concern which has access

to credit need not hold the same amount of cash as a firm which finds it difficult to borrow. Seasonal expenditures do not require a previous accumulation of cash if the firm can finance them by bank credit. In addition, expenditures on equipment do not require a gradual accumulation of cash over an extended period if the concern can arrange the issue of securities shortly before the disbursements are to be made.

(4) *Uncertainty.* Cash is held for precautionary reasons to meet special contingencies that may affect the conduct of industrial operations, e.g., a strike that stops receipts while payments continue in substantial volume, or a sudden price decline that lowers receipts without lowering payments to the same extent. Furthermore, special buying opportunities may arise which can be taken advantage of only by cash purchases at the moment. In general it is true that the greater the feeling of uncertainty about the future, the greater the ratio of cash to payments. In this case, also, part of the liquid reserves held for special contingencies may be invested in marketable securities.

Thus the possibility of giving or taking credit tends to iron out fluctuations in the cash balance and in the ratio of cash to payments which would otherwise occur. Since either borrowing or lending has a stabilizing influence on cash balances, it is not unreasonable to expect that cash may comprise a fairly stable percentage of total payments, i.e., that the ratio of cash to total payments may remain relatively constant. However, as indicated under (5), there is a situation conceivable in which the ratio may rise considerably above the "normal" ratio, i.e., the ratio determined by the volume of transactions and the precautionary motive.

(5) *Unfavorable business prospects.* A company may find itself in a situation where it holds more cash than it considers necessary. Excess cash may accumulate if business conditions are such that investment in assets of the company does not pay; if, in addition, the company has no debts to pay back, and investment in marketable securities is unattractive because the yield is low or prices are expected to fall; and if, finally, the company is reluctant to pay out cash by way of dividends. Such a situation can occur only in a period of business contraction. In a period of business expansion, the company is not likely to hold more cash than is required for the transaction purpose and the precautionary motive.

STATISTICAL PROCEDURE

A correct measure of the relation of cash holdings to total payments would require that the average of daily cash balances during the year be related to total payments. The data available, however, permit calculation of only the ratio of the average of two year-end cash balance figures to estimated payments during the year. This measure has certain drawbacks, two of which may be mentioned specifically.

First, because of seasonal influences the year-end cash balances may be exceptionally high or exceptionally low, compared with the average for the year; this is true at least if it is assumed that a company does not or cannot make use of the opportunities for lending and borrowing. This deficiency is not of great importance in the present study, however, since interest is centered not so much on the absolute level of the ratio as on its movements over time.

Second, nonrecurrent expenditures made during the year, such as disbursements for fixed property, are included in our payments figures. Before such expenditures are made, the cash balance during some period within the year is likely to be higher than during the rest of the time, including the year end. In this case, the ratio of cash to payments as used in this study would be too low compared with a correctly calculated ratio. On the other hand, if the year end falls in a period when preparations for nonrecurrent expenditures are being made, the ratio may be too high. This deficiency cannot be overcome. Although, as shown in the preceding chapter, nonrecurrent expenditures may be separated from total payments, in order to show their importance in relation to total disbursements, cash balances cannot be divided correspondingly into two parts—one held to provide for operating expenditures, the other for nonrecurrent disbursements. The influence of this factor on our ratio of cash to payments will be less important, the more the companies take advantage of the credit market by lending and borrowing.

In our analysis the average ratio of cash to payments during the twenties (1922-29) is used as a sort of "normal" ratio, that is, a measurement of the amount of cash normally required for the transaction purpose. This use is justified on two grounds: first, because it is reasonable to assume that in this boom period the

corporations did not hold "idle" cash, but made use of the credit market to invest any temporary surplus of cash which they might have possessed; second, because the ratio of cash to payments was remarkably stable during those years. With the aid of the "normal" ratio, the amount of cash which the corporations held in the thirties, over and above what was necessary for the transaction purpose, can be calculated: The payments figure for each year is multiplied by this "normal" ratio; the result obtained represents the "transaction" cash for each year. The difference between the transaction cash figure and the actual cash figure is called, for lack of a better name, "free" cash. This "free" cash then includes all cash held to provide against the uncertainty of the future (case 4 above) in so far as the amount of cash held for this purpose was greater in the thirties than in the twenties. A part or all of this "free" cash may therefore perform the important function of a reserve for unforeseen contingencies. In addition, "free" cash includes what might truly be called "excess" cash, i.e., cash which is held for the reason described under (5) in the preceding section.²

It is important to emphasize that "free" cash is not "idle" cash in the sense that it does not circulate at all. It is an estimate of the amount of cash which is not needed for the transaction purpose, based on the assumption that the ratio of cash to payments which prevailed on the average through the years 1922-29 indicates the volume of money in relation to payments which is required for the transaction purpose. If corporations adhered to a "normal" turnover ratio, they could dispose of an amount of money equal to the amount of "free" cash. The appearance of "free" cash indicates that the turnover of total cash of the companies is less than "normal."

It is, of course, possible that after a period in which cash holdings are large in relation to payments, corporations become accustomed to a high ratio of cash to payments, just as banks have become used to excess reserves. If so, our "free" cash includes a part which represents the additional margin that business now considers necessary.

² Mr. A. Kisselgoff of the Financial Research Staff of the National Bureau of Economic Research devised the methods of estimate used here and was in charge of their preparation. The author is indebted to Mr. Kisselgoff for ideas developed in the process.

Slight exaggerations in the movement of "free" cash from year to year may result from the method of calculation adopted, since the ratio of cash to payments which is required for the transaction purpose may vary because of the influences of nonrecurrent "bulky" payments. Therefore, for the purpose of drawing conclusions these minor fluctuations must be disregarded, and only the broad changes in the ratio taken into account.

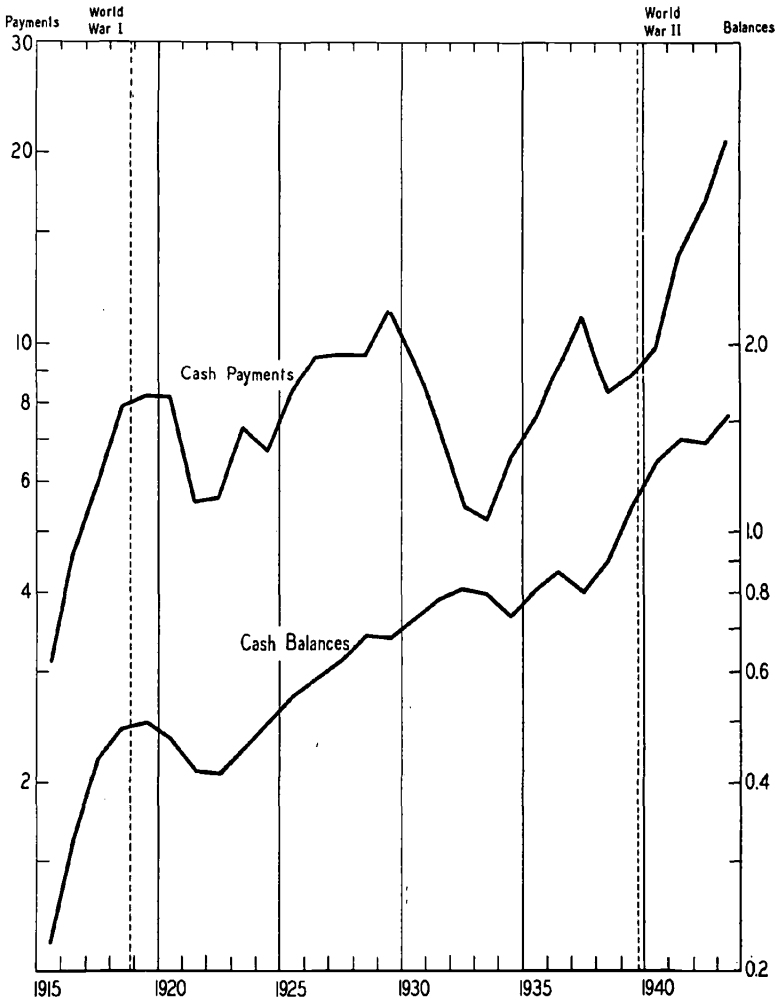
Among the "bulky" payments those for taxes deserve particular attention. If the assumption is made that a company holds 100 percent cash against its tax liabilities, it is clear that if tax liabilities increase the ratio of cash to payments will rise from year to year. In this case, therefore, it would seem to be more reasonable to exclude cash held against tax liabilities from our cash figure and tax payments from our payments figure. But for the period between the two wars, which is considered in this chapter, such exclusion is not possible since the balance sheets of the corporations, as a rule, do not show tax liabilities separately. Fortunately, they do not play a very important role in these years. Moreover, it should be remembered that the liquid funds which are held against tax liabilities may be in the form not of cash but of marketable securities. In a later discussion of developments during the present war period, special attention will be given to this point.

RELATION BETWEEN CASH BALANCES AND PAYMENTS

Cash balances (moving averages of year-end data for two successive years) and annual cash payments of our sample of large manufacturing corporations are presented in Chart 10. While cash payments follow a cyclical pattern, cash balances reflect the influence of business cycles less well. The minor recessions that occurred in the years 1924 and 1927 did not leave any imprint on the movement of cash balances and no cyclical movement is visible after 1929.

If average cash is expressed as a percentage of total payments, a rough index of the velocity of circulation of cash balances is obtained. When this index rises, it means that the velocity is declining, and vice versa. The upper curve in Chart 11 shows the movement of this ratio for large manufacturing corporations. In

Chart 10—ESTIMATED ANNUAL CASH PAYMENTS AND AVERAGE CASH BALANCES OF SAMPLE OF LARGE MANUFACTURING CORPORATIONS (SAMPLE B)



In the depression of the early thirties average cash balances of large manufacturing corporations, unlike cash payments, rose somewhat above the level attained in the late twenties.

the twenties only minor fluctuations occur, indicating a relatively constant velocity of circulation. In the thirties, the ratio rises (velocity falls) sharply up to 1933, declines (velocity rises) dur-

ing the period of business expansion until 1937, and rises (velocity falls) in the recession of 1938.³

Chart 12 separates cash balances into the two components, "transaction" and "free" cash, discussed in the preceding section. For reasons already indicated, minor fluctuations of "free" cash around the zero level are neglected. But the appearance of "free" cash after 1929, its fall from 1933 onward, and its rise after 1937 are unmistakable. "Free" cash in the thirties has a definite (inverse) cyclical pattern. It appears that the relative stability of the absolute level of cash balances of large manufacturing corporations over most of the thirties can be considered as consisting of a decrease in "transaction" cash counterbalanced by an increase in "free" cash, and vice versa.

The sample of medium-sized and small manufacturing companies reveals a somewhat different picture. First, as shown by Chart 11, the ratio of cash to payments is lower at all times for the medium and small corporations than for the large concerns. The explanation may be that the medium-sized and small companies are, on the whole, less profitable than the large concerns, and, therefore, that they are driven to holding smaller cash balances in relation to payments.⁴

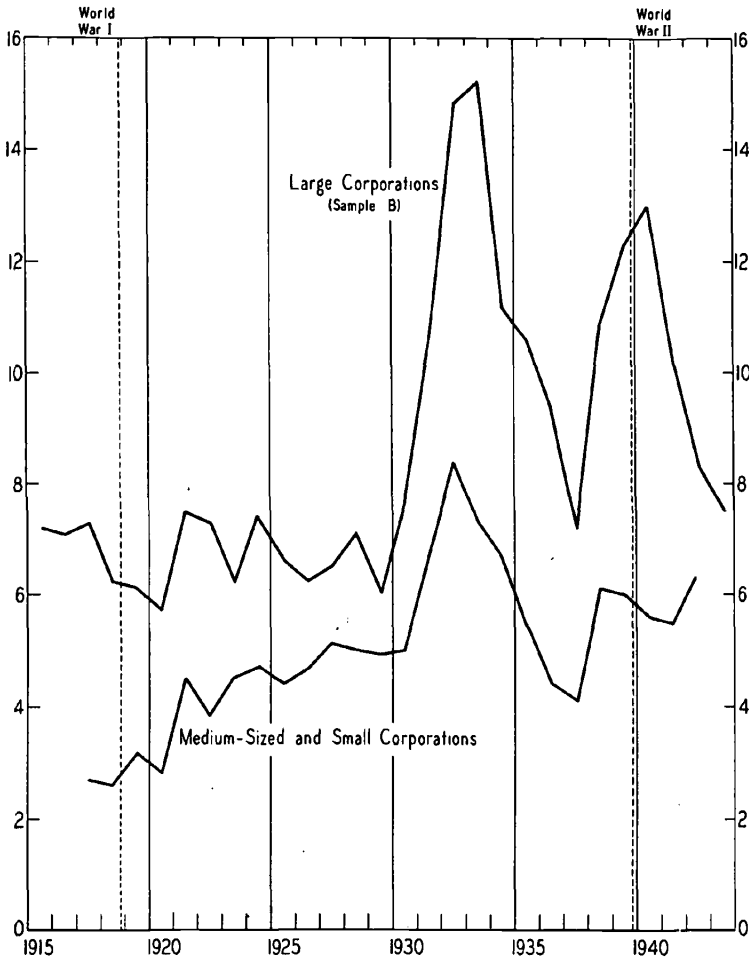
Second, after 1920 the ratio shows a definite tendency to increase. Apparently, the experience of the depression which began in 1920 induced this group of corporations to shift to a more comfortable liquidity position, and higher profits enabled them to do so. Third, although the ratio rises sharply in the depression years 1931 and 1932, the rise is not so great as that of the corresponding ratio for large corporations.

Changes in holdings of "free" cash by medium-sized and small corporations are much more difficult to interpret than are changes in "free" cash of large manufacturing corporations. All that can be ventured on the basis of Chart 13 is that in the early years of the period under consideration there appears to have been a short-

³ The ratio of demand and time deposits to bank debits of commercial banks in 100 leading cities excluding New York shows between 1929 and 1938 the same movements as those of the ratio of cash balances of large manufacturing corporations to payments, i.e., a rise until 1933, a fall from then onward until 1937, and a rise again in 1938.

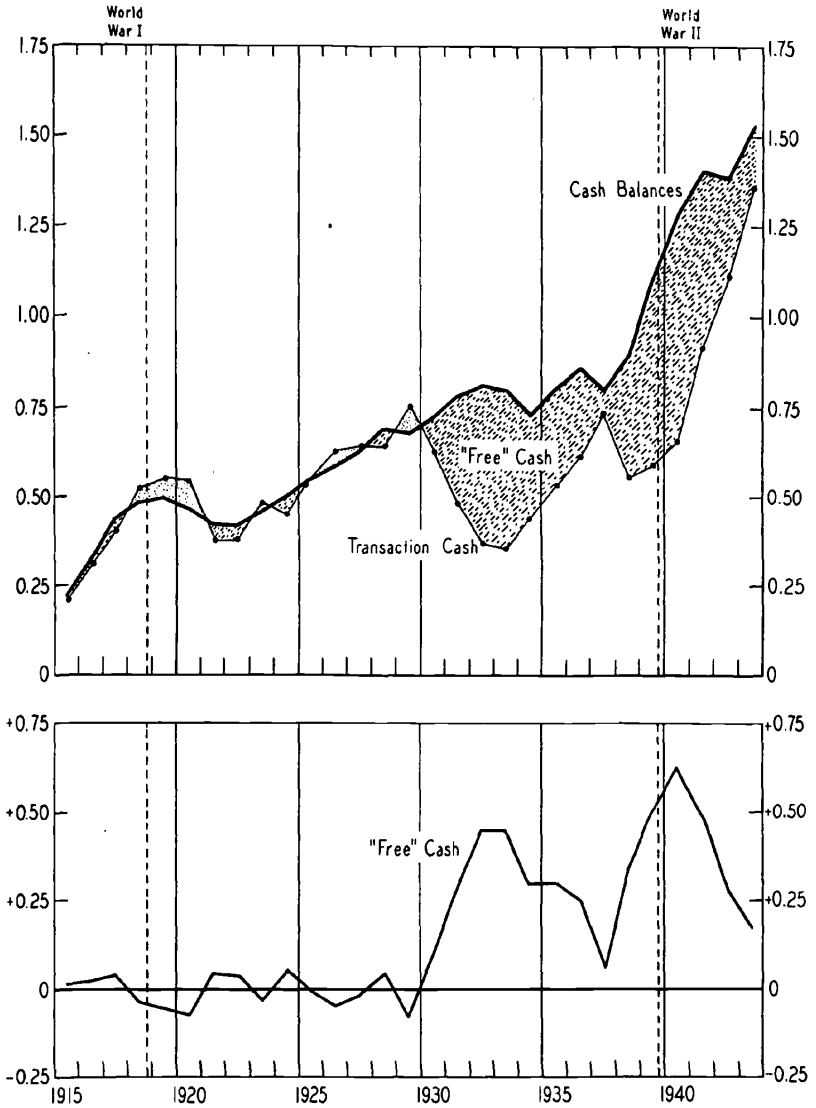
⁴ How much cash to hold for the "precautionary motive," for instance, is subject to managerial discretion within rather wide limits.

Chart 11—RATIO OF AVERAGE CASH BALANCES TO ESTIMATED ANNUAL CASH PAYMENTS OF SAMPLES OF MANUFACTURING CORPORATIONS



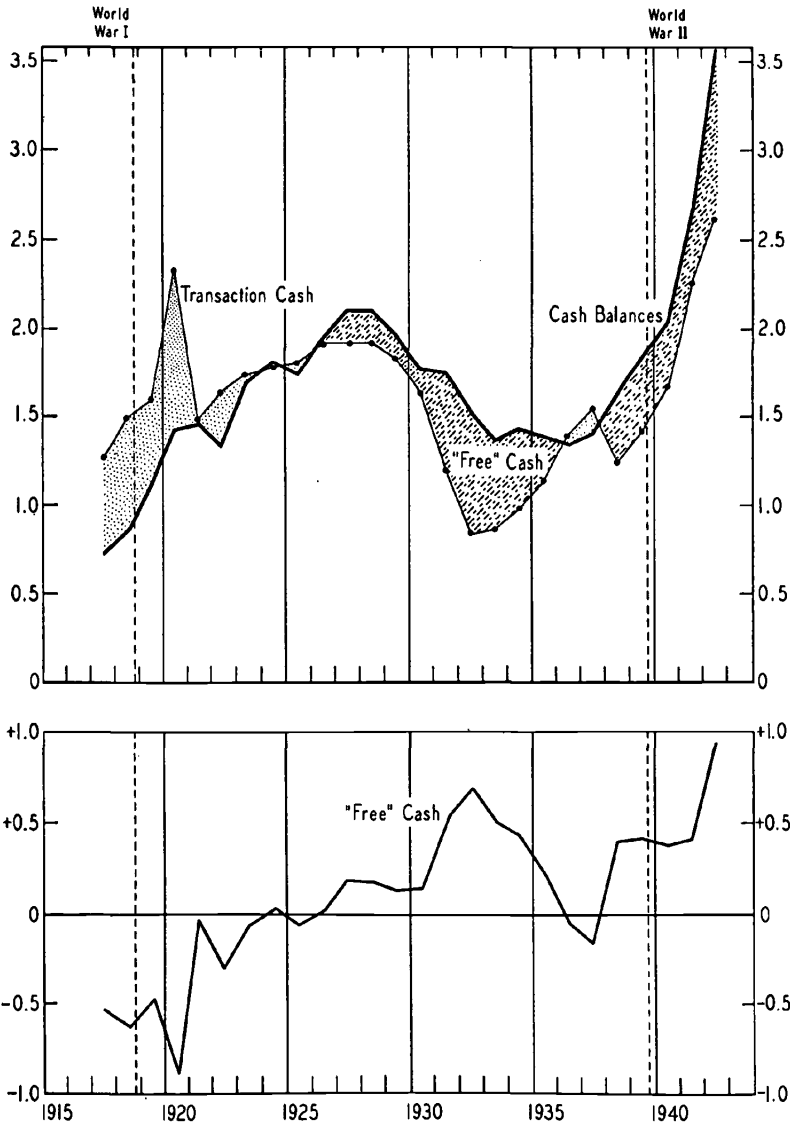
For large, and also for medium-sized and small, manufacturing corporations a relatively constant velocity of circulation of cash balances during most of the twenties is indicated by the minor fluctuations of the ratio of cash balances to payments; sharp changes in velocity occurred in the thirties.

Chart 12—AVERAGE CASH BALANCES, ESTIMATED TRANSACTION CASH, AND ESTIMATED "FREE" CASH OF SAMPLE OF LARGE MANUFACTURING CORPORATIONS (SAMPLE B)



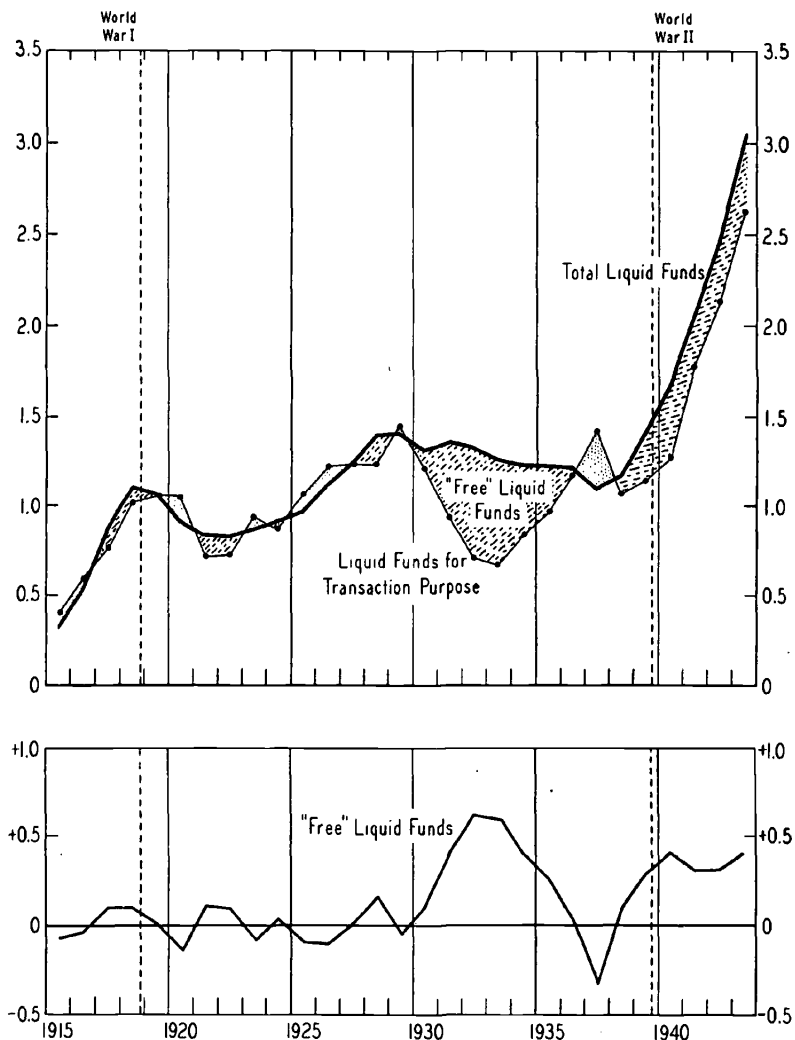
In the twenties transaction needs seem to have determined the level of cash balances of large manufacturing corporations; in the thirties "free" cash comprised a substantial part of the balances.

Chart 13—AVERAGE CASH BALANCES, ESTIMATED TRANSACTION CASH, AND ESTIMATED "FREE" CASH OF SAMPLE OF MEDIUM-SIZED AND SMALL MANUFACTURING CORPORATIONS



For medium-sized and small manufacturing corporations, "free" cash in relation to transaction cash in the thirties was not so great as in the case of large manufacturing corporations.

Chart 14—ESTIMATED TOTAL LIQUID FUNDS, LIQUID FUNDS FOR TRANSACTION PURPOSE, AND "FREE" LIQUID FUNDS OF SAMPLE OF LARGE MANUFACTURING CORPORATIONS (SAMPLE B)



On the whole the movement of "free" liquid funds is similar to that of "free" cash for large manufacturing corporations. The main difference between the two series is that in 1937 there were no "free" liquid funds whereas there was a slight "surplus" of cash alone.

age of money, and that after the crisis of 1929 some "free" cash was held. But in the thirties the ratio of "free" cash to transaction cash was never so high as in the case of large corporations.

Corporation management considers marketable securities as part of liquid funds and, as far as their liquidity is concerned, just as good as cash. In order to complete the picture, "free" liquid funds (i.e., funds which are not necessary for the transaction purpose) of our sample of large manufacturing corporations are shown in Chart 14. The method of computation is the same as that for "free" money.⁵ Between the two wars the movements of "free" liquid funds are similar to those of "free" cash. (Compare Charts 12 and 14.) The main difference between the two series is that the fluctuations of "free" liquid funds are not so wide as those of "free" cash, and that the year 1937 exhibits a "shortage" of liquid funds⁶ whereas cash alone still shows a slight surplus compared with the average of the twenties. The movements during each of the two war periods will be analyzed later.

The reader must be warned against a careless interpretation of this second measure of liquidity. If all companies, or even an important number of them, should begin to liquidate their security portfolios at the same time, interest rates would rise and security prices fall. The securities then would not provide so much cash as their prices would indicate before the liquidation started. As far as an individual company is concerned, however, there is no objection to treating its marketable securities as equivalent to cash, since a partial liquidation of securities by one company is not likely to affect interest rates or security prices.

⁵ That is, the average ratio of cash plus marketable securities to payments during 1922-29 is used as a basis for calculating "free" liquid funds.

⁶ For reasons that are explained in Chapter 5, holdings of marketable securities in the late twenties appear to have been exceptionally high. Therefore, the average ratio of cash plus marketable securities to payments for 1922-29 is perhaps too high to be used as a base for calculating "free" liquid funds. The year-to-year movement of "free" liquid funds, however, is not affected by the use of this base; neither can the absolute level of "free" liquid funds be greatly distorted by it. But for the year 1937 the "shortage" of liquid funds revealed by this method of computation becomes doubtful.

SUMMARY

- (1) In the twenties transaction needs appear to have determined the level of the cash balances of large manufacturing corporations, if year-to-year fluctuations are neglected. The increase in cash balances that took place in that period is primarily a reflection of the increase in payments.
- (2) In the thirties a large part of the cash balances of large manufacturing corporations was "free" cash—an increasing part in recession and a decreasing part in expansion.
- (3) For medium-sized and small manufacturing corporations, "free" cash increased after 1929, but in relation to transaction cash it was not so great as in the case of large manufacturing corporations.