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the then existing gold parity.<sup>45</sup> After the election, rumors spread that the new administration planned to devalue, that Roosevelt had been persuaded by George Warren to follow a policy of altering the gold content of the dollar as a means of "reflating" prices. The rumors became particularly widespread in early 1933 and gained credence when Roosevelt refused to deny them. The effect of the rumors and the failure to deny them was that, for the first time in the course of the contraction, the internal drain in part took the form of a demand for gold coin and certificates thereby reinforcing the external drain arising from speculative accumulation of foreign exchange.

The rumors about gold were only one part of the general uncertainty during the interregnum about future financial and economic policy. Under ordinary circumstances, it would have been doubtful that such rumors and such uncertainty could be a major factor accounting for so dramatic and widespread a financial panic. But these were not ordinary circumstances. The uncertainty came after more than three years of severe economic contraction and after more than two years of banking difficulties in which one wave of bank failures had followed another and had left the banking system in a peculiarly vulnerable position. The Federal Reserve itself participated in the general atmosphere of panic. Once the panic started, it fed on itself.

## 2. *Factors Accounting for Changes in the Stock of Money*

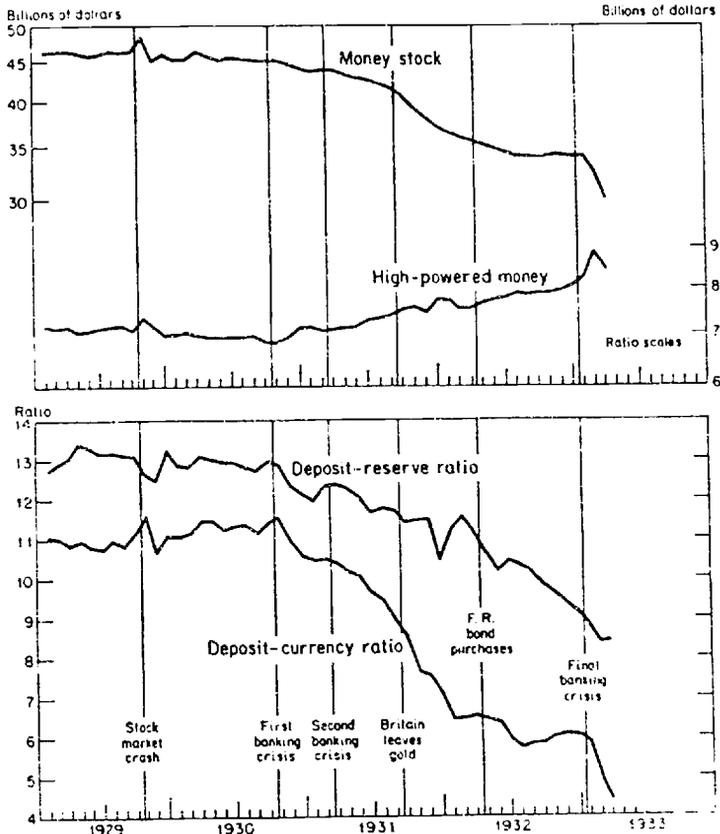
The factors accounting for changes in the stock of money during the four years from 1929 to 1933 are strikingly different from those in the other periods we have examined. Generally, the pattern for high-powered money has impressed itself most strongly on the total stock of money, the behavior of the two deposit ratios serving mainly to alter the tilt of the money stock relative to the tilt of high-powered money. That relation holds in Chart 31 only for the period up to October 1930, the onset of the first banking crisis. Thereafter, the two deposit ratios take command. High-powered money moves in a direction opposite to that of the total stock of money, and not even most of its short-term movements leave an impress on the stock of money.

From August 1929 to March 1933 as a whole, the change in high-powered money alone would have produced a rise of  $17\frac{1}{2}$  per cent in the stock of money. The change in the deposit-currency ratio alone would

<sup>45</sup> Frank B. Freidel, *Franklin Delano Roosevelt*, Vol. 3. *The Triumph*, Boston. Little, Brown, 1956, p. 351; Rixey Smith and Norman Beasley, *Carter Glass*, New York, Longmans, Green, 1939, pp. 321-323. When Roosevelt was authorized to reduce the gold content of the dollar under authority of the Thomas amendment to the Agricultural Adjustment Act of May 12, 1933, Glass, who had made an important speech on behalf of Roosevelt during the election campaign, made a vigorous attack on him in the Senate (Smith and Beasley, pp. 349-356).

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CHART 31  
The Stock of Money and Its Proximate Determinants, Monthly,  
1929-March 1933



SOURCE: Tables A-1 (col. 8) and B-3.

have produced a decline of 37 per cent; the change in the deposit-reserve ratio, a decline of 20 per cent; interaction between the two ratios, a rise of 10 per cent; these three converted the 17½ per cent rise that high-powered money would have produced into a 35 per cent decline in the stock of money.<sup>46</sup> For a more detailed examination of these changes, we

<sup>46</sup> The trough of the money stock was reached in April 1933. Although the percentage decline from Aug. 1929 to Apr. 1933 is only slightly larger than from Aug. 1929 to Mar. 1933 (35.7 rather than 35.2 per cent), the percentage changes in the money stock each determinant would have produced if it alone had changed over the longer period show larger differences: 13, -35, -19, and 9 per cent, in

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consider separately each of the periods distinguished in the preceding section and marked off on our charts.

### THE STOCK MARKET CRASH, OCTOBER 1929

Before the stock market crash, all three determinants of the money stock, and hence also the money stock itself, had been roughly constant. The constancy in high-powered money reflected a rough constancy in each of the categories into which we have divided the corresponding assets of the monetary authorities: the gold stock, Federal Reserve private claims, and other physical assets and fiat of the monetary authorities (see Chart 32B). However, the constancy of Federal Reserve private claims conceals a not uninteresting detail, brought out by Chart 33, which shows the components of Federal Reserve credit outstanding. The total was roughly constant because a decline in bills discounted was offset by a rise in bills bought. The reason for the divergent movements was the simultaneous rise in August 1929 of the New York Reserve Bank's discount rate from 5 to 6 per cent and the decline of its buying rate on bills (bankers' acceptances) from  $5\frac{1}{4}$  to  $5\frac{1}{8}$  per cent. We analyzed the reason for these apparently inconsistent movements in the preceding chapter (section 4). Their effect was to make it profitable for banks to get funds from the Reserve System by creating acceptances and selling them to the Reserve Banks rather than by increasing their own indebtedness.

When the crash came, there were widespread attempts by holders of securities to liquidate them and by banks and other lenders outside New York to reduce their loans. As in all such cases, the position of the collection of participants is different from that of any one participant. Long-term securities cannot, on net, be liquidated in a short interval but only

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the order shown in the text. The reason is that the return flow of currency after the banking holiday reduced high-powered money substantially and also raised the deposit-currency ratio from Mar. to Apr. 1933.

The numerical values of the contributions of the determinants during the contraction, dated as ending in Mar. and in Apr. 1933, follow.

<i>Proximate Determinant</i>	<i>Change in Money Stock That Would Have Been Produced by Indicated Determinant if It Alone Had Changed</i>			
	<i>Rate of Change Per Year</i>		<i>Fraction of Total Change</i>	
	<i>Aug. 1929- Mar. 1933</i>	<i>Aug. 1929- Apr. 1933</i>	<i>Aug. 1929- Mar. 1933</i>	<i>Aug. 1929- Apr. 1933</i>
High-powered money	4.6	3.2	-0.37	-0.28
Deposit-reserve ratio	-6.2	-5.9	0.52	0.49
Deposit-currency ratio	-13.0	-11.8	1.07	0.98
Interaction	2.6	2.3	-0.22	-0.19
All	-12.1	-12.0	1.00	1.00

Detail may not add to total because of rounding.

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transferred from one holder to another. The widespread attempts to liquidate simply reduced prices to a level at which intended purchases matched intended sales.

Loans on securities, especially call loans, are a somewhat more complex affair. In large measure, what is involved is also a transfer of debts from one lender to another, rather than a change in total. But, in addition, the total can be altered much more rapidly. Aside from default, one way is by a transfer of other assets, as most directly when a borrower transfers money to a creditor and reduces his own money balance, or more indirectly when a borrower acquires cash by selling the security serving as collateral to someone else who draws down a money balance to acquire it. Another way is by what is in effect mutual cancellation of reciprocal debts. The most obvious but clearly insignificant example involves the cancellation by two borrowers of loans they have made to one another. A less obvious but more important example involves a longer chain, say, a corporation lending on call in the stock market and simultaneously borrowing from a bank. If the bank takes over the call loan in discharge of its loan to the corporation, the total of the two kinds of debt outstanding is reduced. The total can also be altered by creation of debts; for example, if a corporation lending on call in the market is willing to accept a note from a bank or—more realistically—a deposit in that bank in return for the corporation's claim. In that case, the total of the two kinds of debt is increased.

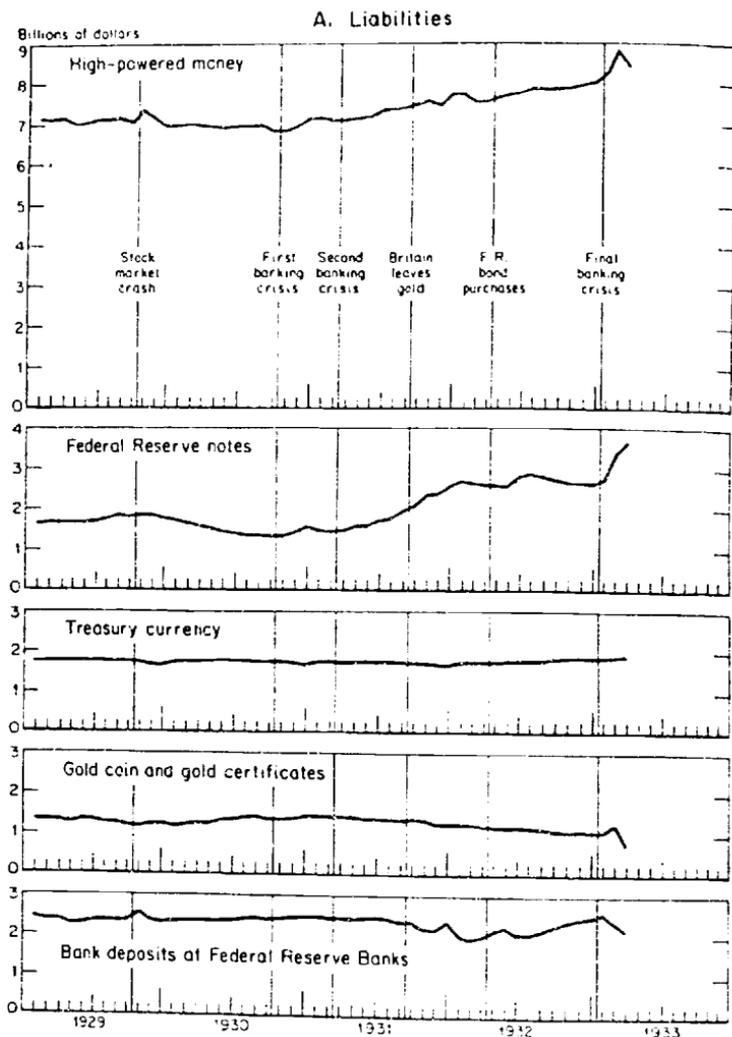
The essential point for our purpose is that the demand for liquidation of security loans involves one of three arrangements: (1) finding someone willing to take over the loans which, as for securities, can be done by a change of price, that is, a rise in interest rates; (2) finding someone willing to acquire assets for money to be used by the borrower to repay his loan, which can be done by lowering the price of the assets; or (3) arranging for more or less roundabout mutual cancellation or creation of debts, which involves changes in the relative prices of the various assets. The pressure on interest rates and on security prices can be eased by any measure that enhances the supply of funds in one of these forms to facilitate the liquidation of loans in one of these ways.

The situation was eased greatly at the time of the stock market crash by the willingness of New York banks to take over the loans. In the first week after the crash, those banks increased their loans to brokers and dealers by \$1 billion and the rest of their loans by \$300 million.<sup>47</sup> In large measure, this involved a creation of debts. The former lenders, the "others" for the accounts of whom the New York banks had been making loans, accepted deposits in New York banks as repaying their loans, and the New York banks in turn took over the claims on the bor-

<sup>47</sup>For sources, see footnote 5, above.

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CHART 32  
High-Powered Money, by Assets and Liabilities of the Treasury  
and Federal Reserve Banks, Monthly, 1929–March 1933

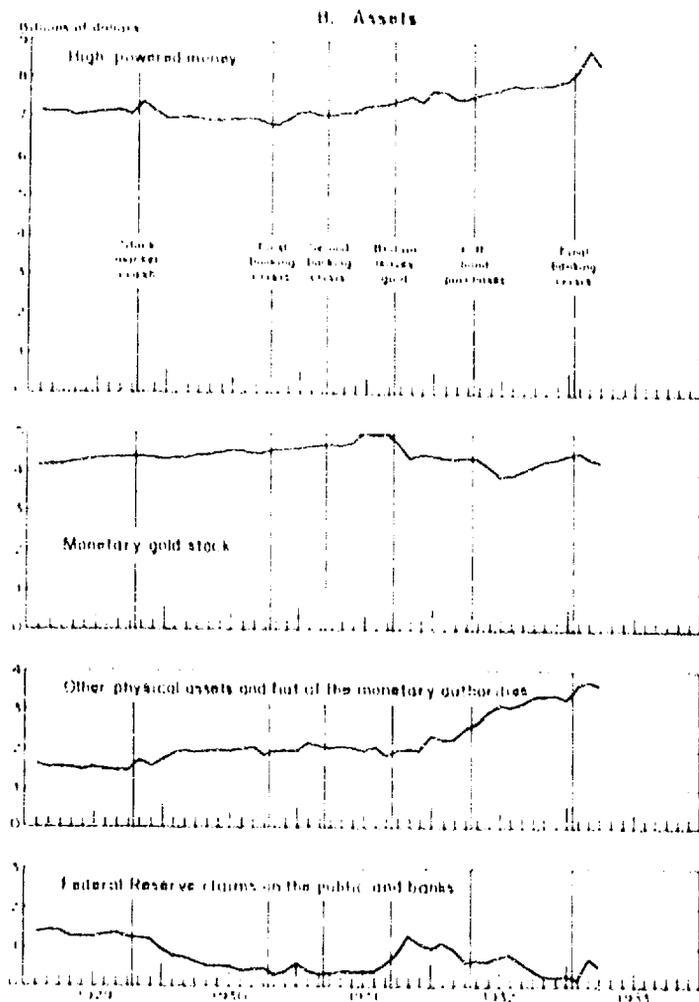


NOTE: Federal Reserve notes, Treasury currency, and gold coin and certificates are outside the Treasury and Federal Reserve Banks.

SOURCE: Same as for Chart 19.

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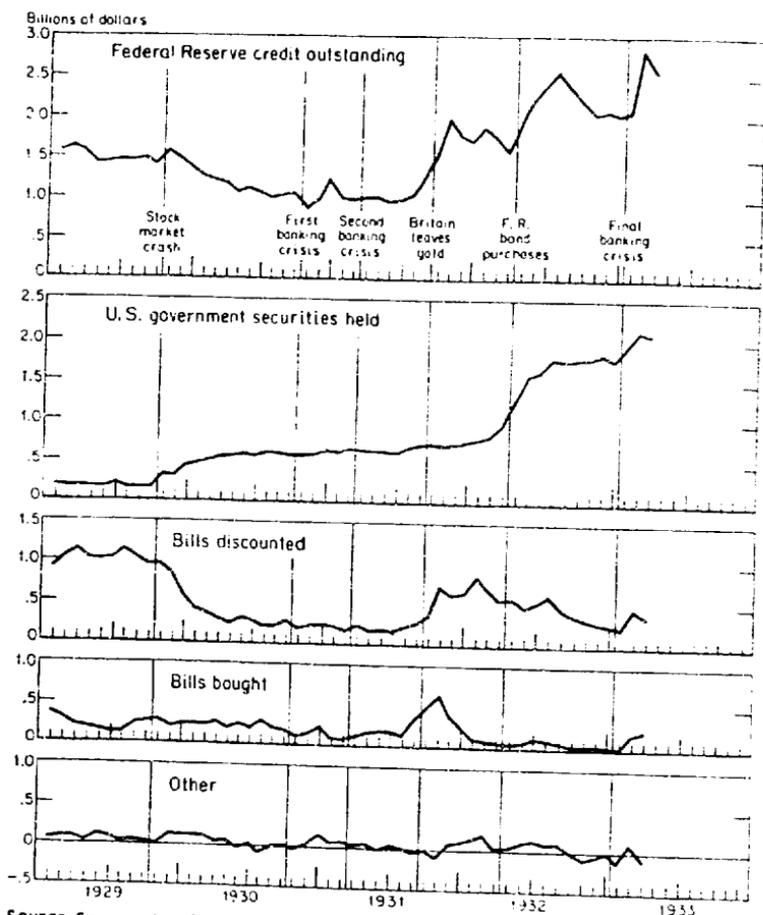
CHART 32 (Concluded)



rowers without pressing for their immediate payment. That is the reason the monetary effect of the crash shows up in our money stock series as a sharp increase in demand deposits and the reason the increase was in New York City. Indeed, the increase in our estimates understates the magnitude of the action of the New York banks. Some of the loans taken over

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CHART 33  
Federal Reserve Credit Outstanding, by Types, Monthly,  
1929-March 1933



SOURCE: Same as for Chart 22, except that all seasonal adjustments are by Shiskin-Eisenpreis method (reference given in source for Chart 21).

were for the accounts of out-of-town banks and were matched by an increase in interbank deposits of \$510 million in New York City weekly reporting member banks. But our money stock estimates exclude interbank deposits.

To be able to expand deposits, the New York banks had to be able either to raise the ratio of deposits to reserves or to acquire additional reserves. The first was impossible because New York banks had no excess

reserves. Indeed, the ratio of deposits to high-powered reserves was lower in New York than in the rest of the country because of the higher legal reserve requirements imposed on banks in central reserve cities. Therefore the increase in deposits in New York relative to deposits in the rest of the country in October 1929 produced a decline in the average deposit-reserve ratio for the country as a whole. Accordingly, the New York banks had to and did acquire additional reserves, as the bulge in high-powered money shows. They did so in the week of the crash partly by borrowing from the Federal Reserve Bank of New York, which, in Harrison's words, kept its "discount window wide open and let it be known that member banks might borrow freely to establish the reserves required against the large increase in deposits resulting from the taking over of loans called by others;"<sup>48</sup> and partly by virtue of the purchase by the New York Bank of about \$160 million of government securities. That purchase was far in excess of the amount the System's Open Market Investment Committee had been authorized to purchase for System account. It was made by the New York Bank on its own initiative for its own account without consulting either the Open Market Investment Committee or the Board. Though subsequently ratified, it was, as we shall see in more detail in section 5. below, the occasion for another battle in the struggle between the Bank and the Board, which had important effects on Federal Reserve policy during the rest of the contraction.

The actions taken by the New York Reserve Bank were timely and effective. Despite the stock market crash, there were no panic increases in money market rates such as those in past market crises, and no indirect effects on confidence in banks which might have arisen if there had been any sizable defaults on security loans. Harrison himself expressed the view that "it is not at all unlikely that had we not bought governments so freely, thus supplementing the reserves built up by large additional discounts, the stock exchange might have had to yield to the tremendous pressure brought to bear upon it to close on some one of those very bad days in the last part of October."<sup>49</sup> Harrison may have overstated the case—he was, after all, writing in defense of the actions the New York Bank had taken—but that is by no means certain.

In the month following the crash, there was a reversal. Deposits declined, as more lasting arrangements for the transfer and reduction of stock market loans replaced the temporary shift of many of those loans to New York banks. The changes in deposits produced a decline in the deposit-currency ratio, following the rise in October, and a decline in

<sup>48</sup> Harrison, *Miscellaneous*, Vol. I, letter, dated Nov. 27, 1929, Harrison to all governors. During the week ending Oct. 30, 1929, discounts increased \$200 million at all Reserve Banks, of which \$130 million was the increase in New York City weekly reporting member bank borrowings from the New York Reserve Bank.

<sup>49</sup> *Ibid.*, letter, dated Nov. 27, 1929, Harrison to all governors.

the deposit-reserve ratio milder than that in October. High-powered money also declined as a result of a reduction in bills discounted and in the gold stock, generally attributed to the withdrawal by foreigners of funds from the New York money market.<sup>50</sup> The net effect was to leave the stock of money after the crash at a lower level than before. At the end of November 1929, the stock of money was \$1.3 billion, or 3 per cent, less than it had been at the end of September. By the end of December, most of the loss had been made up; the stock of money was about \$0.5 billion, or 1 per cent, less than in September. These changes were concentrated in demand deposits. From December 1929 to October 1930, the stock of money fluctuated around a roughly constant level though with a mild downward trend. In October 1930, the stock of money was almost the same as it had been in November 1929 and nearly 2 per cent below its level at the end of December 1929.

For the period from August 1929 to October 1930 as a whole, the money stock declined by 2.6 per cent. High-powered money alone declined by 5 per cent. However, the deposit-currency ratio rose by about 7 per cent, enough to offset a minor decline in the deposit-reserve ratio as well as half the decline in high-powered money. In October 1930, the deposit-currency ratio stood at the highest level reached at any time in the 93 years covered by our data, except only for a fractionally higher peak reached in the month of the stock market crash (see Charts 31 and 64, and Table B-3). As we noted earlier, the public was clearly not greatly concerned at the time about the safety of bank deposits. But the high ratio made the System peculiarly vulnerable to the development of any such concern, as the following years were to demonstrate so tragically.

The decline in high-powered money occurred despite an increase of \$210 million in the gold stock and of \$470 million in the fiat of the monetary authorities. The latter increase reflected mostly a rise in government securities held by the System, i.e., the substitution of noninterest-bearing for interest-bearing government debt. Those expansionary factors were more than offset by a decline in Federal Reserve private claims of \$1,020 million—\$100 million in bills bought and \$920 million in bills discounted and other claims (see Chart 32B). Ultimately then, it was the failure of the Reserve System to replace the decline in discounts by other

<sup>50</sup> The return flow of foreign funds gave temporary relief to the foreign exchanges, which had been under pressure during the period of speculation. Foreign currencies had depreciated vis-à-vis the dollar, while foreigners were remitting funds to the security markets here. Before the peak in stock prices in 1929, the prices of those currencies had declined to the United States' gold import point. After the crash, the return flow of funds raised their prices to the gold export point. For example, the pound was as low as \$4.845857 in Sept. 1929 and in Dec. was as high as \$4.882010 (the figures are noon buying rates for cable transfers to New York, from *Commercial and Financial Chronicle*, Sept. 21, 1929, p. 1969; Dec. 27, 1929, p. 4017).

credit outstanding that was responsible for the decline in the stock of money.

The decline in discounts took place despite sharp reductions in discount rates—at the New York Bank, from 6 per cent to 2½ per cent in June 1930 (Chart 29). The successive declines in discount rates—the first of which came in November 1929, three months after the date set by the National Bureau as the reference cycle peak—though sharp and rapid by earlier standards, took place during a time when there was a sharp decline in the demand for loans and an increase in the demand for assets regarded as safe. Both made for a sharp decline in market interest rates. Though the discount rate fell absolutely, it probably rose relative to the relevant market interest rates, namely, those on short-term securities with essentially zero risk of default. Hence, discounting became less attractive. It is perhaps worth noting that this is not merely a retrospective judgment. The New York Reserve Bank favored more rapid reductions in the rate than those made. Harrison said in May 1931 that “if there had been no Federal Reserve System in October, 1929, money rates would probably have come down more rapidly than they had . . . .” In September 1930, Adolph Miller of the Federal Reserve Board said at a meeting with all the governors, “Money is not really cheap nor easy.” In mid-1930, Harold L. Reed, in the second of his two excellent books on the Federal Reserve System said: “In the writer’s opinion, however, there was much stronger ground for holding that the rate reductions had been too gradual and long delayed” than that they had been too rapid.<sup>51</sup>

As the near-constancy of the deposit-reserve ratio indicates, there was no tendency of banks to accumulate excess reserves. It has been contended with respect to later years (particularly during the period after 1934, when large excess reserves accumulated) that increases in high-powered money, through expansion of Federal Reserve credit or other means, would simply have been added to bank reserves and would not have been used to increase the money stock. In other words, a rise in high-powered money would have been offset by a decline in the deposit-reserve ratio. We shall argue later that the contention is invalid even for the later period. It is clearly not relevant to the period from August 1929 to October 1930. During that period, additional reserves would almost certainly have been put to use promptly. Hence, the decline in the stock

<sup>51</sup> See sect. 5 below for the New York Bank’s position. The quotation from Harrison is from Harrison, Notes, Vol. I, May 21, 1931; from Miller, Charles S. Hamlin, Hamlin Papers, Manuscript Division, Library of Congress, Diary, Vol. 18, Sept. 25, 1930, p. 86; from Reed, *Federal Reserve Policy, 1921-1930*, New York, McGraw-Hill, 1930, p. 191. This may not have been Miller’s view earlier in the year. In May, Hamlin reported, “Miller said the Federal Reserve Bank of New York was obsessed with the idea that easy money would help the business recession” (Hamlin, Diary, Vol. 17, May 9, 1930, p. 151).

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of money is not only arithmetically attributable to the decline in Federal Reserve credit outstanding; it is economically a direct result of that decline.

### ONSET OF FIRST BANKING CRISIS, OCTOBER 1930

The onset of the banking crisis is clearly marked in all three proximate determinants but particularly in the deposit ratios (Chart 31). From a peak of 11.5 in October 1930, the ratio of deposits to currency declined sharply—a decline that was to carry the ratio, with only minor interruptions along the way, to a low of 4.4 in March 1933. The deposit-reserve ratio likewise began a decline that was to carry it from a level of 12.9 in October 1930—the all-time high was 13.4 in April 1929—to a level of 8.4 in March 1933. These declines brought the deposit-currency ratio back to its level at the turn of the century and the deposit-reserve ratio to its level in 1912. They thus wiped out the whole of the much heralded spread in the use of deposits and “economy” in reserves achieved under the Reserve System.

The decline in the stock of money as a result of the banking crisis—a decline of slightly more than 3 per cent from October 1930 to January 1931, or more than in the preceding fourteen months—was clearly a result of the declines in the two deposit ratios, since high-powered money rose by 5 per cent. As Charts 32B and 33 show, the rise of \$340 million in high-powered money, seasonally adjusted, was produced partly by an inflow of \$84 million of gold<sup>52</sup>—the source that had always been the major reliance in pre-Federal Reserve crises—partly by an increase of \$117 million in Federal Reserve credit outstanding. The increase in Federal Reserve credit consisted partly of a rise of \$41 million in government securities, the balance of a rise in float. A rise in discounts just about offset a decline in bills bought. There was a brief spurt of roughly \$200 million in bills discounted in the two weeks after the failure of the Bank of United States, but it does not show up in the seasonally adjusted end-of-month figures plotted in Chart 33.

The rise in Federal Reserve credit certainly helped to offset some of the immediate effects of the banking crisis. But the movement was minor in magnitude. Many an earlier year-end shows rises of comparable magnitude and, even at its peak in December 1930, seasonally adjusted Federal Reserve credit was only 84 per cent of its level in the summer of 1929 when the System was seeking to curb speculation. The one other measure taken by the System in reaction to the banking crisis was a re-

<sup>52</sup> The gold inflows reflected partly the Hawley-Smoot Tariff Act passed in June 1930, which raised the tariff to the highest level up to that time in U.S. history; partly the reduction of U.S. lending abroad, and the continuance at a high level of interest and dividends on investments abroad and of war debt payments; partly the consequence of U.S. deflation on imports and exports. See sect. 4, below.

duction in late December 1930 in the New York Reserve Bank's discount rate to 2 per cent—to reassure the public.<sup>53</sup>

The rise in Federal Reserve Bank credit was temporary. After December 1930, discounts declined, bills bought were allowed to run off without replacement, while government security holdings increased by only a small fraction of the combined decline in discounts and bills bought. High-powered money rose in January 1931, only because a continued gold inflow offset the decline in Federal Reserve credit. It declined in February despite continued gold inflow, and rose slightly in March along with a minor rise in Federal Reserve credit and the gold stock. The decline in Federal Reserve credit from December 1930 to March 1931 was greater than the gold inflow. In effect, the System was not only sterilizing the gold inflow, but exerting a contractionary influence greater than the expansionary influence of the gold inflow.

Despite the reduction in high-powered money in February 1931, the money stock rose a bit because of a rise in both deposit ratios, as the wave of bank failures died down and confidence in banks was somewhat restored. As suggested earlier, if the rises in the deposit ratios had been reinforced by a vigorous expansion in high-powered money, instead of being offset by a reduction, the ground gained might have been consolidated and extended.

#### ONSET OF SECOND BANKING CRISIS, MARCH 1931

The onset of the second banking crisis is clearly marked in Chart 31 by the renewed decline in the deposit ratios and the beginning of a decline in the money stock at the fastest rate so far in the contraction. In the five months from March to August, to exclude wholly the effects of Britain's departure from gold in September, the stock of money fell by 5¼ per cent, or by almost exactly the same percentage as in all the preceding nineteen months of the contraction. This was at the phenomenal annual rate of 13 per cent, yet the rate was soon to rise still higher.

As after the first banking crisis, the decline in the stock of money was entirely a consequence of the fall in the deposit ratios. High-powered money rose, this time by 4 per cent from March to August, and so offset nearly half the contractionary effect of the declining deposit ratios. There were, however, two differences between the second banking crisis and the first one some six months earlier.

<sup>53</sup> Governor Harrison wrote, "he had been urged from many quarters to make a reassuring statement which might aid in quieting the banking situation. Such a statement was practically impossible because to be strong enough to do any good it would run the risk of being contradicted by any small bank failure which might thereafter occur. The rate reduction, apart from other reasons, served as a method of stating to the public that money was freely available" (Harrison, *Open Market*, Vol. II, Jan. 21, 1931).

(1) This time, the rise in high-powered money was produced almost entirely by the continued gold inflow, whereas earlier there had been at least a temporary increase in Federal Reserve credit, which helped to absorb some of the initial effects of the crisis. Federal Reserve credit remained almost perfectly stable, rising slightly only in July and August 1931. Despite the unprecedented liquidation of the commercial banking system, the books of the "lender of last resort" show a decline in bills discounted from the end of February to the end of April—a period when the usual seasonal movement is upward—and a rise from April to the end of August that made the whole increase from February to August less than the usual seasonal increase: they show irregular increases and decreases in bills bought, with the total at the end of August \$75 million higher than at the end of February, but still below its level at the turn of the year; and they show an increase of \$130 million in government securities purchased, the whole of the increase beginning late in June. Of this increase, \$50 million was a purely technical move rather than a reaction to domestic financial difficulties: it simply offset other reductions in credit outstanding. The remaining \$80 million represented a deliberate, if timid, move to contribute ease.<sup>54</sup>

(2) The second crisis lasted longer. In late 1930, there were signs of improvement after two or three months. On this occasion, as Chart 31 shows, the deposit-currency ratio—the most sensitive indicator of the public's attitude toward banks—not only continued to fall, but fell at an increasing rate. There was no sign that the crisis was drawing to an end when Britain's departure from gold intensified it.

Aside from the modest open market purchases in July and August, the only other domestic action of the System relevant to the money stock was a further reduction in the discount rate of the New York Reserve Bank to 1½ per cent in May—before the sharp June increase in bank failures. As we have seen, the reduction did not stimulate borrowing. On a different front, potentially of great consequence for the domestic money stock, the System participated in loans to foreign banks as part of an international effort to avert financial catastrophe abroad.<sup>55</sup>

<sup>54</sup> Federal Reserve Board, *Annual Report for 1931*, pp. 7–8. These figures are all as of Wednesdays. Of the \$130 million of government securities purchased, \$80 million was for System account and \$50 million for the New York Bank's own account (Harrison, *Open Market*, Vol. II, minutes of June 22 and Aug. 11, 1931. *Open Market Policy Conference meetings: Miscellaneous*, Vol. I, letter, dated July 9, 1931, Harrison to Seay; Notes, Vol. I, July 16, 1931, and Vol. II, Aug. 4, 1931). The latter purchase was made to offset the effect of the transfer of foreign-held balances from the acceptance market to Federal Reserve Banks.

<sup>55</sup> During the second and third quarters of 1931, the Federal Reserve Bank of New York in association with other Federal Reserve Banks purchased prime commercial bills with guaranteed repayment in gold from the Austrian National Bank, the National Bank of Hungary, the Reichsbank, and the Bank of England. The credit agreements with the Federal Reserve Banks at their separate maximums

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### BRITAIN'S DEPARTURE FROM GOLD, SEPTEMBER 1931

In the few months after the departure of Britain from the gold standard, the proximate determinants of the money stock plotted in Chart 31 continued the pattern of the preceding five months, but the pattern was even more emphatic. The stock of money fell still faster: in the five months from August 1931 to January 1932, it fell by 12 per cent—compared with 5 per cent in the preceding five months—or at the annual rate of 31 per cent—compared with 13 per cent. High-powered money again rose, this time by about  $4\frac{1}{2}$  per cent, and again offset only part, and this time a smaller part, of the effect of the declines in the deposit ratios, particularly the deposit-currency ratio. The banks were so hard pressed to meet the demands of their depositors that, try though they did, they were able to do little to lower the ratio of their deposit liabilities to their reserves. That had to wait for a more propitious time, which is why the most rapid decline in the deposit-reserve ratio came later when the decline in the deposit-currency ratio had tapered off, and the slowest decline came earlier when the deposit-currency ratio was declining fastest. As we shall see in later chapters, much of the adjustment on the part of the banks did not come until after the end of the business contraction and the beginning of recovery. The timing relations between changes in the two deposit ratios during the 1931-32 segment of the contraction repeated the tendencies we have observed in each earlier banking crisis.

The major difference, aside from scale, between the five-month period, August 1931-January 1932, and the preceding five months is the source of the rise in high-powered money, which does not show up in Chart 31 but does in Charts 32B and 33. Up to August 1931, high-powered money had risen chiefly as a result of gold inflows. As noted in section 1 above, the period after Britain's departure from gold saw a sharp outflow, particularly in September and October 1931, large enough to offset

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aggregated about \$156 million and were renewed several times. Reserve Bank holdings of bills payable in foreign currencies increased from \$1 million at the end of March to \$145 million in August (Federal Reserve Board, *Annual Report* for 1931, pp. 12-13).

See also Harrison, *Miscellaneous*, Vol. I, letter, dated July 9, 1931, Harrison to McDougal; *Open Market*, Vol. II, minutes of meeting, Aug. 11, 1931; and *Notes*, Vol. I, June 1, 15, 22; July 13, 16, 1931; Vol. II, July 28, 30; Aug. 4; Sept. 24, 28, 1931, for discussion of the foreign credits. One of the directors of the New York Reserve Bank, Charles E. Mitchell, was quoted as saying, "In all of these cases, he was concerned about the soundness of the operation to be undertaken by the Federal reserve banks which, in their domestic business, take as few chances as possible," and "the thing which bothered him with regard to these foreign credits was the risk involved when, at home, the Federal reserve banks take no risks" (Harrison, *Notes*, Vol. I, June 22, 1931).

the gold inflows during the earlier segments of the contraction. High-powered money rose because Federal Reserve credit outstanding rose. Federal Reserve credit rose primarily because of the sharp rise in discounts as banks, having no other recourse open to them, were driven to borrowing from the Reserve System, despite the unprecedentedly sharp rises in discount rates in October 1931. Bills bought increased substantially in September and October, but then were allowed to run off so that, by January 1932, they had fallen below their level at the end of August 1931. All told, from August 1931 to January 1932, the rise of \$330 million in high-powered money was accounted for by a rise of \$560 million in discounts, \$80 million in government securities, \$270 million in other assets of the monetary authorities, offset by a decline of \$580 million in the gold stock.

During those five months when high-powered money rose by \$330 million, currency held by the public increased by \$720 million. The extra \$390 million had to come from bank reserves. Since banks were unwilling and unable to draw down reserves relative to their deposits,<sup>56</sup> the \$390 million, amounting to 12 per cent of their total reserves in August 1931, could be freed for currency use only by a multiple contraction of deposits. The multiple worked out to roughly 14, so deposits fell by \$5,727 million or by 15 per cent of their level in August 1931. It was the necessity of reducing deposits by \$14 in order to make \$1 available for the public to hold as currency that made the loss of confidence in banks so cumulative and so disastrous. Here was the famous multiple expansion process of the banking system in vicious reverse. That phenomenon, too, explains how seemingly minor measures had such major effects. The provision of \$400 million of additional high-powered money to meet the currency drain without a decline in bank reserves could have prevented a decline of nearly \$6 billion in deposits.

In discussing the 1907 crisis, we showed how the rise in deposit ratios had made the banking system more vulnerable to an attempted conversion of deposits to currency. The situation in 1931 was even more extreme. At no time in 1907 did the public hold more than \$6 in deposits for every \$1 it held in currency; in March 1931, when the second banking crisis began, it held over \$10 in deposits for every \$1 of currency, an amount it succeeded in reducing to under \$7 by January 1932. In 1907, the banks owned less than \$9 in deposits for every \$1 of high-powered money they held as reserves; in March 1931, they owed more than \$12. The more extensive use of deposits—widely regarded during the twenties as a sign of the great progress and refinement of the American financial structure—and the higher ratio of deposits to reserves—widely regarded as a sign of the effectiveness of the new Reserve System in promoting

<sup>56</sup> At the end of Jan. 1932, their excess reserves totaled \$40 million.

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"economy" in the use of reserves—made the monetary system much more vulnerable to a widespread loss of confidence in banks. The defenses deliberately constructed against such an eventuality turned out in practice to be far less effective than those that had grown up in the earlier era.

When bank failures tapered off in February and March 1932, the deposit-currency ratio temporarily stopped falling. However, high-powered money declined by \$160 million in those two months, despite a dwindling of gold outflows, mainly as a result of changes in Reserve Bank credit: a decline of \$280 million in discounts, and a continued decline of \$50 million in bills bought, while government security holdings rose by about \$180 million. Discounts declined because banks took advantage of the pause in the demands on them to repay some of their borrowings. They followed that course despite a reduction in the New York Bank's discount rate to 3 per cent in February. The banks took advantage of the pause also to strengthen their reserve position somewhat, so the deposit-reserve ratio fell slightly from January to March 1932. The result was that the stock of money continued to decline though at a slower pace. In these two months it fell by another 2 per cent, an annual rate of 13 per cent, which can be described as moderate only by comparison with the preceding 31 per cent annual rate of decline.

### BEGINNING OF LARGE-SCALE OPEN MARKET PURCHASES, APRIL 1932

The beginning of the purchase of government securities on a large scale by the Federal Reserve System in April 1932, involving purchase of \$350 million during that month (see Chart 33 for seasonally adjusted end-of-the-month figures), had no immediate effect on the behavior of the stock of money. It declined another 4½ per cent for another four months, or at an annual rate of 14 per cent. The decline then slowed up sharply, the money stock falling one-half of 1 per cent in the two months from July to September 1932, or at the annual rate of 3 per cent. From September on, it rose mildly until January 1933, when the money stock was one-half of 1 per cent higher than in September 1932, implying an average rate of growth of about 1¾ per cent per year.

The reason the bond purchases had no greater effect to begin with is that they were offset in part by a renewed outflow of gold and the rest was more than offset by continued declines in the deposit ratios. From April to July 1932, when Reserve System holdings of government securities went up by roughly \$1 billion, the gold stock fell by about half that amount, most of the outflow going to France. At the same time, a renewed flurry of bank failures in June produced a further appreciable decline in the deposit-currency ratio, and the continued efforts of the banks to strengthen their position produced a further decline in the deposit-reserve ratio.

The gold drain ceased in mid-June and was replaced by an inflow.

Over the rest of the year, the gold stock rose by \$600 million, bringing the gold stock in January 1933 above its level a year earlier. Reserve System bond purchases ceased in August 1932. Discounts and bills bought fell from July on, so that total Federal Reserve credit outstanding reached a peak in that month and fell by \$500 million from then to January 1933. Nonetheless, high-powered money continued to rise at roughly a constant rate from April 1932 to January 1933 because of the reversal of the gold flow, plus an increase of \$140 million in national bank notes. The latter increase was due to an amendment attached to the Home Loan Bank Act of July 1932, which broadened the range of government bonds eligible as security for national bank notes.<sup>57</sup> Once the deposit-currency ratio reached its trough in July 1932, the rise in high-powered money plus the rise in the deposit-currency ratio were enough to offset the continued fall in the deposit-reserve ratio and produce the pattern of change in the money stock already described.

The form taken by the improvement in the banking position, recorded in the deposit-reserve ratio, is worth noting because it presaged a development that was to be important in the next few years. Banks began to accumulate substantial reserves in excess of legal requirements. Since the Reserve System regarded the so-called "excess reserves" as a sign of monetary ease, their accumulation contributed to adoption of the policy of keeping total government securities at the level reached in early August. Excess reserves were interpreted by many as a sign of lack of demand for bank funds, as meaning that monetary authorities could make "credit" available but could not guarantee its use, a position most succinctly conveyed by the saying, "monetary policy is like a string; you can pull on it but you can't push on it." In our view, this interpretation is wrong. The reserves were excess only in a strictly legal sense. The banks had discovered in the course of two traumatic years that neither legal reserves nor the presumed availability of a "lender of last resort" was of much avail in time of trouble, and this lesson was shortly to be driven home yet again. Little wonder that the reserves they found it prudent to hold exceeded substantially the reserves they were legally required to hold.<sup>58</sup> As noted above, their reaction was the same as in

<sup>57</sup> The amendment permitted use for a period of three years of all government bonds bearing interest at 3½ per cent or less, including future bond issues during the period. From August 1929 up to July 1932 there was a slight increase—\$60 million—in national bank notes in circulation, as national banks exercised somewhat more fully their right to issue on the security of three government bond issues bearing interest at 2 per cent, which had the circulation privilege.

<sup>58</sup> See Chap. 8, sect. 1, for evidence on this view. In Dec. 1932, Governor Meyer said that "if the banks knew that there was going to be a constant amount of excess reserves over a long period, that amount could be relatively small and still be more effective than a much larger but uncertain amount . . . . We have not obtained the full effect of recent large excess reserves because of uncertainty as to our future policy" (Harrison, Notes, Vol. III, Dec. 22, 1932).

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earlier crises, only greater in magnitude in response to the greater severity of the crisis.

### THE BANKING PANIC OF 1933

The final banking crisis, which terminated in the banking holiday early in March 1933, was in most essential respects a duplicate of the two preceding ones but still more drastic. The money stock fell 12 per cent in the two months from January to March 1933, or at an annual rate of decline of 78 per cent. For reasons we discuss in detail in the next chapter, our estimates overstate the decline in the stock of money, but hardly any reasonable allowance for error could cut the rate of decline to less than the 31 per cent rate of decline from August 1931 to January 1932. As in the earlier crises, high-powered money rose, primarily as a result of a rise in discounts and a lesser rise in bills bought. Chart 33 shows an appreciable rise in government securities. This rise is produced by the seasonal adjustment. There is no rise in the original figures. The early months of the years before 1933 were generally characterized by a decline in the Reserve portfolio of government securities in response to the return flow of currency from circulation usual at that season. In 1933, there was, of course, a drain of currency rather than a return flow: government securities were nevertheless reduced in January by \$90 million, but then raised in February by \$70 million, to a level at which they also stood at the end of March. Seasonal adjustment of the figures converted the decline in January and the modest rise in February to appreciable increases, and raised the original March figure only slightly less.

The banking holiday in March renders all the money figures non-comparable with earlier ones, so we consider the change from January to February alone, as an approximation of the decline up to the bank holiday. In that one month the money stock fell  $4\frac{1}{2}$  per cent, or at an annual rate of 56 per cent. Currency held by the public rose by over \$600 million, high-powered money by \$535 million—almost the same. But even the remaining \$65 million which had to be supplied from bank reserves, plus the scramble by banks for reserves, produced a decline in deposits of over \$2 billion in that one month, or nearly  $7\frac{1}{2}$  per cent of the already shrunken total. This time the multiplier was not 14 but 29.

The major monetary difference between the final banking crisis and the earlier ones was that for the first time the internal drain in part clearly took the form of a drain of gold coin and certificates. As Chart 32A shows, the volume of gold coin and certificates had risen mildly in 1930 but then had been constant or declining until the onset of the final crisis. In January 1933, the amount of gold coin and gold certificates outside the Treasury and Federal Reserve Banks was \$420 million less than at its peak in December 1930, \$340 million less than at its previous

January peak in 1931. The decline was apparently in some measure the result of a deliberate policy on the part of the Federal Reserve System of adding to its gold reserves by paying out Federal Reserve notes instead of gold certificates where feasible, a reversal of the policy adopted during the twenties to keep down the apparent reserve ratio (see Chapter 6, section 4).<sup>59</sup> Though the total of gold coin and gold certificates declined, the amount of gold coin alone increased by nearly \$120 million, from \$65 million in April 1931 to \$181 million in December 1932. That increase may have reflected a preference for gold coin in the earlier period, though to some extent it must reflect the growth of all forms of currency as opposed to deposits. But if it does reflect a preference for gold, that preference was not sufficiently widespread or dramatic to attract much attention. In February and March 1933, the situation was entirely different, as shown by the sharp spurt in gold coin and certificates in early 1933 in Chart 32A. Fears of devaluation were widespread and the public's preference for gold was unmistakable. On February 23, 1933, Harrison told the directors of the New York Reserve Bank, "there is little that foreigners can do to hurt our gold position, . . . the real danger comes from domestic sources."<sup>60</sup>

\* Gold certificates in circulation declined in all but three months in 1931 and 1932—when the certificates may have been paid out partly because of a shortage of other forms of currency, as in Feb. and Mar. 1933 before the bank holiday—for a net change of \$460 million. Although there is no acknowledgment in the *Annual Report for 1931 and 1932* that such a retirement policy was in effect, it is significant that the *Federal Reserve Bulletin* (Nov. 1931, p. 604) contains the following comment:

In considering the gold position of the country, it should be noted also that there are \$1,000,000,000 of gold certificates in circulation, a large part of which can be retired by the Federal reserve banks by substituting an equivalent amount of Federal [reserve] notes. The retirement of gold certificates would increase the gold holdings of the reserve banks, and of this increase 40 per cent would be required as reserves against the additional Federal reserve notes and 60 per cent would be added to the system's excess reserves.

\* He went on to say, "During the last ten days out-payments of gold coin at this bank, and, probably, at all of the Federal reserve banks have been heavier than in any recent similar period. This movement represents something more than the hoarding of currency, which reflects a distrust of banks; it represents in addition a distrust of the currency itself and it is inspired by talk of devaluation of the dollar and inflation of the currency" (Harrison, Notes, Vol. III).

Harrison made efforts to get banks to discourage hoarding. He suggested that they refuse to provide facilities for storage of gold and to grant loans against the collateral of an equivalent amount of gold. With respect to the first, he suggested that banks impose no obstacles to the acquisition of gold but make no offer of safe-keeping facilities; with respect to the second, he advised banks to decline a loan to buy gold on the ground that it was a loan for a capital purpose. He said, "I saw no occasion for a member bank, in these times particularly when so many people who needed credit for business purposes could not obtain the credit, to make loans to their customers for the purpose of buying gold to hoard. It was nothing but a speculative loan gambling on our going off the gold standard" (Conversations, Vol. II, Feb. 9, 1933). Direct pressure had come full circle.