FEDERAL RESERVE BANK
OF NEW YORK

[Circular No. 306]
[October 6, 1920]

Ratio of Bank Capital to Deposits

To all Banks and Trust Companies
in the Second Federal Reserve District:

In the belief that they will find it of interest we take pleasure in sending herewith to the banks and trust companies in this Federal Reserve District a reprint of a recently published article on "The Ratio of Bank Capital to Deposits" by E. W. Kemmerer, Professor of Economics and Finance in Princeton University.

It is contended in this article that capital funds should stand in some reasonable proportion to deposits because the capital funds of a bank provide its customers with a limited guaranty fund against the loss of their deposits and are an assurance to the public of the owners' faith in the institution. It is also pointed out that the marked decline during the past forty years in the ratio of capital to deposits for national banks, state banks and trust companies has been accelerated by the war and the desirability of a new ratio is suggested.

Mention is made of "10 to 1" as a fair ratio between deposits and capital and the paper indicates that a capital fund (capital, surplus and undivided profits) equal to at least 10 per cent. of the deposits is now quite generally considered as the minimum contribution which the stockholders should maintain. In fact, some of the western states have a legal requirement that this ratio shall be maintained.

Professor Kemmerer concludes his discussion with the statement that

> "The present is a particularly opportune time for bankers to carefully examine their positions in this regard and, where needed, to set their houses in order."

The large number of banks in this district which have increased their capital during the past year is an indication of the fact that the bankers of New York, New Jersey and Connecticut are awake to the desirability of maintaining an appropriate ratio between capital and deposits, and it is in view of this tendency that we have thought it would be of interest to all the banks in this district to receive a copy of this article, which we believe is the most comprehensive recent analysis and discussion of the subject.

Yours very truly,

J. H. Case,

Acting Governor

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Bankers Statistics Corporation
NEW YORK, N. Y.

THE RATIO OF BANK CAPITAL TO DEPOSITS

By EDWIN WALTER KEMMERER

Professor of Economics and Finance in Princeton University

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Meaning of Terms.

Deposit currency inflation has resulted in a great decline since 1913 in the ratio of "Capital Funds"[1] (or of "net worth") to deposits in our American banks. This ratio had been declining almost uninterruptedly for 36 years prior to 1913; and, as far back as the early '90's the decline became a matter of concern to many economists and bankers. It is the object of this paper to show the extent of the decline and to consider its significance and the need of remedial measures.

The Deposit Guaranty Function of Capital Funds.

The public is concerned with the amount of capital funds banks shall have because the investment of money in a bank by its proprietors is an assurance to the public of the owners' faith in the enterprise and provides the customers with a limited guaranty fund against the loss of their deposits. In case of insolvency the stockholders must lose their entire investment and usually more under double liability of capital, before depositors lose a dollar.

It is for the purpose of affording the public this sort of protection that our banking laws both national and state require a certain amount of initial capital of all commercial banks[2] before they can begin business and that the laws make provisions to insure the maintenance of this capital and the accumulation of a surplus. It is also for this purpose that the national banking law and the banking laws of two-thirds of our states impose double liability on bank stock.

Capital Funds Should Stand in Some Reasonable Proportion to Deposits.

From this protective or guaranty function of bank capital funds it follows that the amount of such funds banks should have ought to stand in some reasonable proportion to the load they have to carry, in other words, to the deposits they must protect. Despite the fact that the national bank act and the laws of 33 of our commonwealths make the legal minimum capital requirement of commercial banks a function of the number of the inhabitants of the city in which the bank is located, most people recognize that the question of the adequacy or inadequacy of a bank's capital as a protection to deposits is fundamentally a question of the ratio of capital funds to deposits.

The Movement of the Ratio of Capital Funds to Deposits for National Banks Has Been Downward Since 1874.

Let us therefore turn to the facts as regards this capital funds ratio. For national banks, the only kind of commercial banks for which complete figures are available, the developments from 1864 to the present time are shown in the following chart[3].

Ratio of Capital Funds and of Capital to Deposits for all National Banks, Annually, 1864 to 1919.

The ratio increased rapidly during the first ten years of the national banking system until it reached its maximum of 106 per cent. in 1874. From 1877 to 1881 it dropped from 101 per cent. to 61 per cent., the drop being due chiefly to an increase in deposits during those four years—an increase of 62 per cent., or from $649 millions to $1,050 millions, while the capital funds decreased 2.3 per cent. From 1881 to 1895 the ratio fluctuated from year to year with a slight downward tendency reaching 56 per cent. in the latter year; both capital funds and deposits having increased substantially during this period, the former 54 per cent. and the latter 67 per cent. Then came another pronounced drop in the ratio, this time from 58 per cent. in 1896 to 36 per cent. in 1899, which was due to the fact that deposits increased for that period from $1,752 millions to $2,606 millions, while capital declined from $1,050 millions to $947 millions.

The act of 1900 authorizing the establishment of national banks in towns of 3,000 population or less with a capital of $25,000 and permitting the issue of national bank notes up to 100 per cent. of the bonds deposited (instead of up to only 90 per cent.) led to the formation of many new small banks and was largely responsible for the doubling of the number of national banks during the next 13 years. During this period both capital funds and deposits increased rapidly, the former from $1,013 millions to $2,046 millions and the latter from $2,559 millions to $6,023 millions, bringing the ratio down from 40 per cent. to 34 per cent. Then came the war with its great inflation of bank deposits, raising the deposit figures from $6,023 millions in 1913 to $13,827 millions on November 17, 1919, an increase of 130 per cent., while capital funds increased only from $2,046 millions to $2,494 millions, or 22 per cent. This reduced the capital funds ratio from 34 per cent. to 18 per cent., or almost cut it in half.

Comparatively Small Proportion of War Time Profits of National Banks Turned Into Capital Funds.

The war period brought national banks large profits, each of the last three years having yielded larger percentage profits than any previous year in the history of the national banking

[1]In this paper I shall use the term "capital funds," for lack of a better term, to cover the assets represented by the liability items, capital, surplus, and undivided profits; and the word "capital" to represent that portion of the capital funds represented by the paid-up capital stock.

[2]Section 5138 of the U. S. Revised statutes provides that "No association shall be organized with a less capital than one hundred thousand dollars, except that banks with a capital of not less than fifty thousand dollars may, with the approval of the Secretary of the Treasury, be organized in any place the population of which does not exceed six thousand inhabitants, and except that banks with a capital of not less than twenty-five thousand dollars may, with the sanction of the Secretary of the Treasury, be organized in any place the population of which does not exceed three thousand inhabitants. No association shall be organized in a city the population of which exceeds fifty thousand persons with a capital of less than two hundred thousand dollars."
Of the 48 states the banking laws of 42 provide minimum capital requirements for commercial banks under state charters; in three states the minimum is $50,000; in 11 states it is $25,000; in 3 states it is $20,000; in 8 states it is $15,000; in 16 states it is $10,000; in 1 state, $7,500; and in 1 state, $5,000. In nearly all of the states the minimum capital required varies with the population of the city or town in which the bank is located.

[3]The figures for each year refer to the Comptroller's call coming nearest July 1st. Figures for 1919 are given for the last date available at this writing, namely, November 17, 1919, as well as for June 30, 1919. Deposits cover all deposits exclusive of bankers' balances.

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system since 1869[1]; but a comparatively small part of these profits were retained in the capital, surplus, and profits accounts.

If Measured in a Dollar of the Same Purchasing Power as the Dollar of 1913, National Bank Deposits Would Have Been the Same on November 17, 1919 as they Were on June 4, 1913, While the Capital Funds of National Banks Would Have Been 47 Per Cent. Lower.

Of course this great increase in bank deposits since 1913 is largely merely an expression of currency depreciation. From June, 1913 to November, 1919 the wholesale price index number of the Bureau of Labor Statistics rose from 100 to 230, an increase of 130 per cent. (representing a depreciation of 56.5 in the purchasing power of the dollar). National bank deposits during these six years increased by exactly the same percentage, namely 130 per cent., so that if we express the volume of deposits in November, 1919 in terms of the June, 1913 dollar (namely, a dollar of the same purchasing power as that of June, 1913) we find that there was no increase whatever. As a matter of fact this increase in bank deposits was the chief cause of the rise in the price level[2].

Expressed in terms of a dollar of the same purchasing power as that of June, 1913 the item of capital funds for national banks would have been on November 17, 1919 $1,085 millions, instead of the actual figure $2,046 millions; or in other words, would have been 47 per cent. lower than it was in June, 1913.

Decline of Capital Funds Ratio in State Banks and Trust Companies.

Similar declines in the capital funds ratio have taken place in state banks and in trust companies. The facts by five-year intervals for the state institutions reporting to the Comptroller of the Currency are shown in the following table:

RATIOS OF CAPITAL FUNDS AND OF CAPITAL FOR STATE BANKS, AND TRUST COMPANIES.

Five Year Intervals.

Year. June 30.	Ratio of Capital Funds to Deposits. State Banks.	Ratio of Capital Funds to Deposits. Trust Companies.	Ratio of Capital to Deposits. State Banks.	Ratio of Capital to Deposits. Trust Companies.
1874	54.1		43.0	
1879	75.5		62.1	
1884	47.3		33.8	
1889	45.6		32.8	
1894	52.6	36.6	37.1	20.6
1899	29.7	25.1	20.0	12.5
1904	27.5	35.5	16.8	14.9
1909	26.7	30.2	16.9	12.8
1914	21.8	25.9	15.5	11.7
1919	15.4	18.2	8.7	7.9

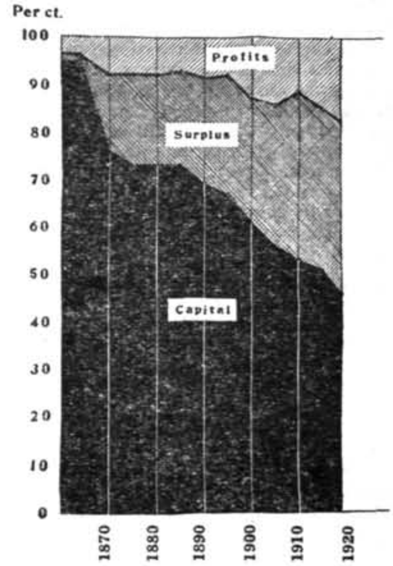
For state banks the average ratio of capital funds to deposits is less than a third as high today as it was twenty-five years ago, and for trust companies it is slightly less than half as high. For both classes of banks the ratio showed a striking decline during the war period, 1914 to 1919.

Decline in Capital Ratio and in Percentage of Capital to Total Capital Funds in National Banks Since 1864.

Let us now turn from the capital funds ratio to the capital ratio, namely, the ratio of capital to deposits (exclusive of bankers' balances). From the standpoint of the protection of the public a dollar of capital is usually much more important than a dollar of surplus or undivided profits, for the reason that for national banks and for state banks and trust companies in two-thirds of our states (including most of the more important ones) the law imposes a double liability on the capital stock. Of the three capital fund items, therefore, the capital item is qualitatively superior to the other two and, to the extent that the double liability can be enforced, a dollar of capital is twice as much protection to depositors, where double liability exists, as a dollar of surplus or of undivided profits.

The following chart shows for all national banks by years the percentage of the total capital funds, represented respectively by capital, surplus, and undivided profits.

Percentage of the Capital Funds of National Banks, Consisting Respectively of Capital, Surplus, and Undivided Profits, Annually, 1864-1919.



The striking fact brought out by the chart is the large and almost continuous decline in the proportion of capital. This movement divides itself into four periods: (1) A period of rapid decline from 1864 to 1870, during which the percentage of capital to capital funds fell from 95 to 76; (2) a period of comparative stability from 1871 to 1885, during which the percentage fell only slightly, namely, from 76 to 73; (3) a period from 1886 to 1915, which witnessed a continuous decline in the percentage of capital from 71 to 51; and finally, (4) a period from 1916 to the present time, during which the decline has become more pronounced, having been from 51 per cent. in 1916 to 46 per cent. in November, 1919.[3]

The average ratios of capital to deposits for national banks are shown for the period 1864 to 1919 on the chart on page 2. From 1864 to 1878 the average ratio varied between 63 per cent. (1864) and 77 per cent. (1870). Then came a drop to a new level which was reached about 1881. From 1881 to 1896 the average ratio varied from 53 per cent. (1884) to 38 per cent. (1895). During this last period bankers talked of a "2 to 1" or a "2½ to 1" ratio as a proper one. From 1896 to 1899 there was another drop and the average ratio between 1899 and 1915 varied from 40 per cent. to 32 per cent. At this time "4 to 1" was commonly looked upon as a fair ratio. Then came the war-

[1]Annual reports of the Comptroller of the Currency 1918, v. 1, p. 7; and 1919, v. 1, pp. 25-26.

[2]See E. W. Kemmerer, Inflation, Bankers Statistics Corporation Service, December 4, 1919.

[3]The reasons for the decline in the percentage of capital to capital funds are many, and a discussion of them does not fall within the province of this paper. Among the more important are: (1) The growth of existing banks. When increased banking power is being obtained by the formation of many new banks whose capital funds at the beginning naturally consist either entirely or almost entirely of capital, the proportion of capital to capital funds in the banks of the country tends to increase, or at least to decrease more slowly. When, on the other hand, increased banking power is being obtained largely by the growth of existing banks, the proportion of capital tends to decline. (2) The desire to escape the double liability which applies to capital and does not apply to surplus and profits. (3) Until the passage of the Federal Reserve Act, the desire to avoid the investment of additional funds in United States bonds. (4) The fact that surplus and undivided profits often escape taxes that fall on capital. (5) The fact that surplus can be increased or decreased with less formality and expense than can capital, and can be decreased with less unfavorable criticism on the part of the public. (6) The fact that subscriptions to Federal Reserve Bank stock need not be increased with an increase in undivided profits, as they must be with an increase in capital or surplus. On June 4, 1913, before the Federal Reserve Act was passed, undivided profits represented 13.1 per cent. of the total capital funds of national banks, and on June 30, 1919 they represented 17.5 per cent.

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time decline which gave an average ratio at the end of 1919 of only 8 per cent., and now we hear talk of "10 to 1" as a fair ratio.

Decline in Capital Ratio for State Banks and Trust Companies.

The table on page 3 shows a like decline in the average capital ratio for state banks and for trust companies. For state banks the ratio dropped from 43.0 per cent. in 1874 to 15.5 per cent. in 1914, and to 8.7 per cent. in 1919. For trust companies there was a drop from 20.6 per cent. in 1894 to 11.7 per cent. in 1914, and to 7.9 per cent. in 1919.

These pronounced declines in the average capital funds ratios and in the average capital ratios for national banks, state banks, and trust companies are of themselves of great significance; but the *average* figures cover up the most serious phase of the situation, namely, the many extremely low individual ratios that enter into the average. Large numbers of our banks, both national and state, are carrying adequate capital funds. The chief danger comes from a comparatively small minority of the banks in each class that, in their zeal for large dividends, are running their ratios to figures far below those of the more conservative banks. In support of this statement a few illustrations may be given.

Figures recently compiled by the banking department of one of our leading states show the average ratio of capital funds to deposits as of December 31, 1919, for all state banks to have been 12.79, and for all trust companies 11.76. But of the twenty-five state banks covered by the report the ratios for eleven were below the average for all; those for four were below 8 per cent., and that of one was below 6 per cent. For the one hundred and twenty-one trust companies covered by the report the range was from 45.30 per cent. to 3.63 per cent. Fifty-four of the trust companies had ratios below the average of all; eighteen had ratios below 7.5 per cent., and five had ratios below 6 per cent.

A similar situation exists among national banks. On three consecutive pages of the 1918 annual report of the Comptroller of the Currency giving the figures for 148 national banks I find capital fund ratios varying from 30.7 to 6.26, and capital ratios varying from 20.6 to 3.09.

Legal Minimum Ratios of Capital Funds to Deposits Should be Fixed by Law.

Ratios as low as some of these above cited do not afford reasonable protection to the depositing public nor are the banks which have them fair competitors with more conservative banks. For our banking laws, national and state, to permit banks to conduct business with such small ratios of capital funds to deposits, as some of these banks have, is unduly to encourage the development of unsafe banks.

Our laws require legal minimum reserves; they usually require minimum amounts of capital in relation to the population of the cities in which banks are located, why should they not also fix a minimum ratio somewhere of capital funds to deposits, and say to the banks, "This limit is one of the rules of the game, so far you may go but no farther"? Many bankers who oppose such a rigid minimum, themselves insist upon an equally rigid one in requiring of customers a margin of at least 20 per cent. on loans collateraled by stocks. They ask their customers to offer at least a 20 per cent. margin as a protection to the bank. Why should not the bank be required, likewise, by the public, to make a minimum capital funds guaranty as a protection to its depositors?

Other Methods of Inducing Banks With Inadequate Capital Funds to Increase These Funds to a Reasonable Ratio to Deposits.

In an administrative way, and until statutory minima are imposed the Comptroller of the Currency and the various state banking departments could probably accomplish much in the direction of inducing the weaker banks to raise their capital funds ratios to reasonable figures. The Federal Reserve Banks, moreover, in granting applications to member banks for loans and rediscounts, and in applying the graduated scale of discount rates authorized by the Phelan act, could improve the situation by showing preference to banks with reasonable capital funds ratios.

Great Improvements During Recent Years in Our Bank Examinations Have Justified Some Reductions in Capital Funds Ratios.

Of course it is recognized that the great improvements made in recent years in our bank examinations, both national and state, and in the examinations of our clearing house associations, together with the increasing supervision over member banks exercised by the Federal Reserve System are forces favorable to safer banking. They justify smaller capital funds ratios than were needed a generation ago.

The great decline in bank failures during recent years may be a good omen although its favorable significance at this time is likely to be exaggerated because our banks as well as our business houses have been enjoying a period of war-stimulated prosperity and of artificial protection. The strikingly small number of bank failures and of commercial failures since the year 1914 may have its dangerous side for it may signify, in part, that for some years little dead wood has been cut out. With a trying period of deflation and readjustment ahead the present is an opportune time for banks to set their houses in order, if they have not already done so.

The average capital funds ratio has been declining almost continually for two generations. For many banks it has now reached the danger point. There should be a limit somewhere.

CONCLUSIONS.

The conclusions of this paper may be summarized in a few words.

The capital funds of banks, namely capital, surplus and undivided profits, are of interest to the public because they are an assurance of the owners' faith in the enterprise and because they serve as a limited guaranty fund to depositors against the loss of their deposits. If this guaranty-fund function is to be of any importance the amount of capital funds a bank maintains must stand in some reasonable proportion to the amount of deposits they are to protect.

For the last two generations there has been for national banks, state banks and trust companies a pronounced and almost continual decline in the ratios of capital funds to deposits and that decline was accentuated by the war.

Of the capital funds the part consisting of capital is subject to double liability in national banks and in the state banks and trust companies of two-thirds of our states. The proportion of the total capital funds represented by capital has declined almost steadily during the last half century both for national banks and for state institutions. It has dropped sharply since the outbreak of the war.

The capital funds of many individual banks are today dangerously low in proportion to the deposits. In the interest of adequate protection to depositors and of rules for the game of bank competition that are fair to conservative bankers, our banking laws, both national and state, should fix minimum limits for the ratio of capital funds to deposits, limits which all banks of a given class should be prevented from passing.

Until such legislation is enacted much could be accomplished administratively by the Comptroller of the Currency, the Federal Reserve Banks, and the state banking departments, in the direction of bringing up to a reasonable standard the capital funds ratios of those banks whose present positions are the most unfavorable.

The present is a particularly opportune time for bankers to carefully examine their positions in this regard and, where needed, to set their houses in order.

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