BANK DEBITS AND DEPOSIT TURNOVER IN JAPAN*

By MASAKICHI ITO

Assistant Professor, Institute of Economic Research

The Statistics Department of the Bank of Japan has been making public the monthly figures on debits to current deposits and deposit turnover for all banks in Japan. However, such figures are available only for the period of and after August 1948. It is true, also, in the pre-war period that there were some attempts made to estimate the velocity of deposits.[1] However, those attempts were all based on clearings. Whereas certain intricate procedures are absolutely necessary in estimating debits to current deposits based on clearings, it was not possible to obtain those figures required for such procedures. Therefore, the turnover rate of current deposits calculated on a basis of clearings was not always so reliable.

If *Ginkōkyoku Nenpō* (the Annual Report of the Banking Bureau, the Ministry of Finance) were made available to us, however, there would be a way open for us to estimate the debits to current deposits directly without even relying on clearings for the pre-war period. The figures thus estimated would be available for each half-year and, in addition, as illustrated below, they would prove highly correlated to national income figures. We believe, therefore, they would be an extremely important indicator in the analysis of Japanese business cycles. And the turnover rate of current deposits which could be estimated from debits to current deposits would also be important in clarifying the movement of the velocity of money in Japan. Figures of this kind, in any long-run series, have not yet been made public in Japan. Hence, the results of our estimate are given with the understanding that only annual figures are shown while half-year figures must be given up in order to save space. As to the figures for the post-war period, they are the same as those made public by the Statistics Department of the Bank of Japan.

I. *Debits to, and Turnover Rate of, Current Deposits in National Banks*

Debits to current deposits in national banks are obtained through a simple calculation[2] for the years 1880 to 1898. The figures thus obtained have been divided by the average of current deposits at the end of the first half and the second half of the year concerned, thereby giving the turnover rate. As to "Furidashi Tegata" (drawn bills)[3] which are of the same character as current deposits, an estimate was made in the same way for the same period, and both results are shown together in Table 1. Although the figures for current deposits of national banks will presumably involve some amount of "Koguchi Tōza Yokin" (petty-sum

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[1] Minoru Nakatani and Eiichirō Ohno, *Yokintsūka no Kenkyū* (A Study on Deposit Currency), 1933; Tokyo Clearing House, *Yokintsūka no Sūryō to Sono Kaitensokudo* (Quantity of Deposit Currency and its Velocity), 1937.

current deposits),[4] no adjustment has been made since there is no suitable method to remove the latter.

II. *Debits to, and Turnover Rate of, Current Deposits in Ordinary Banks*

In the case of ordinary banks, it is possible to estimate debits to, and the turnover rate of, current deposits for the years 1894 to 1940. However, for both periods from the first half of 1894 to the second half of 1897 and from the first half of 1904 to the first half of 1907, only the figures summing up current deposits and "petty-sum current deposits" are available. In view of the above, the latter has been removed by applying the following method.

1. From the first half of 1904 to the first half of 1907:

(1) Current deposits at the end of each half-year are estimated by applying the following regression equation:

$$Y=0.573X+25{,}491 \quad \text{(Unit: ¥1,000)}$$

where Y indicates current deposits and X indicates current deposits plus "petty-sum current deposit." This equation has been calculated through the method of least squares by using 24 samples which were derived from the figures for current deposits (henceforth referred to as Y) for both periods from the first half of 1898 to the second half of 1903 and from the second half of 1907 to the first half of 1913 and also from the figures for current deposits plus "petty-sum current deposits" (henceforth referred to as X) for the same two periods.

[2] The reference figures which are necessary in calculating debits both to current deposits and to total deposits are shown in the Annual Report of the Banking Bureau, the Ministry of Finance. Those figures are in the following respective forms either for the period up to 1916 inclusive or for the period after 1917 inclusive.

For the period after 1917:

First half-year	Balance brought over from the previous period	(A_1)
	Deposits during the current period	(B_1)
	Balance	(C_1)
Second half-year	Deposits during the current period	(B_2)
	Balance	(C_2)

For the period up to 1916:

First half-year	Aggregated deposits	(D_1)
	Balance	(C_1)
Second half-year	Aggregated deposits	(D_2)
	Balance	(C_2)

$D_1=A_1+B_1$ $\qquad$ $D_2=C_1+B_2$

The debits to deposits for the first half-year $E_1=A_1+B_1-C_1$ or $E_1=D_1-C_1$.
The debits to deposits for the second half-year $E_2=C_1+B_2-C_2$ or $E_2=D_2-C_2$.
Therefore, the debits to deposits for the year $E=E_1+E_2=A_1+B_1+B_2-C_2$ or $E=D_1+D_2-C_1-C_2$.

[3] "Furidashi Tegata" account is a demand deposit account to be drawn by a banker's note named "Furidashi Tegata" or "Yokin Tegata."

[4] "Koguchi Tōza Yokin" (a petty-sum current deposit) is the old name of "Tokubetsu Tōza Yokin" (a special current deposit), which is a demand deposit to be drawn by a deposit passbook, not by a check.

TABLE 1. DEBITS TO, AND TURNOVER RATES OF, CURRENT DEPOSITS AND "DRAWN BILLS" IN NATIONAL BANKS, 1880–1898

Unit: ¥1,000

Item / Year	Debits to current deposits (1)	Average of current deposits at the end of 1st half and 2nd half of the year (2)	Annual rate of turnover of current deposits (3)=(1)/(2)	Debits to "drawn bills" (4)	Average of "drawn bills" at the end of 1st half and 2nd half of the year (5)	Annual rate of turnover of "drawn bills" (6)=(4)/(5)
1880	142,893	4,039	35.37	17,120	577	29.67
1881	195,302	5,571	35.06	13,109	454	28.88
1882	210,788	6,978	30.21	16,579	411	40.30
1883	178,490	8,131	21.95	12,417	484	25.64
1884	166,881	7,410	22.52	12,748	510	24.99
1885	148,108	9,852	15.03	10,286	435	23.63
1886	185,465	11,375	16.30	10,343	496	20.86
1887	222,156	12,317	18.04	13,233	545	24.26
1888	243,750	12,607	19.33	14,733	509	28.96
1889	293,554	12,786	22.96	17,343	595	29.15
1890	302,469	14,017	21.58	20,592	558	36.92
1891	334,705	17,210	19.45	20,241	654	30.97
1892	426,989	22,337	19.12	21,452	557	38.49
1893	555,645	30,150	18.43	27,171	884	30.72
1894	649,123	34,878	18.61	30,267	950	31.85
1895	797,825	40,948	19.48	39,348	1333	29.52
1896	716,082	40,815	17.54	33,172	1097	30.25
1897	445,899	20,942	21.29	18,049	583	30.96
1898	133,219	4,619	28.84	2,623	203	12.91

(2) Debits to current deposits are estimated by applying the following regression equation:

$$Y'=0.898X'+29{,}187 \quad \text{(Unit: ¥1,000)}$$

where Y' indicates debits to current deposits and X' indicates debits to current deposits plus debits to "petty-sum current deposits." This equation has been calculated by using 24 samples which were derived from the figures for debits to current deposits (henceforth referred to as Y') for both periods from the first half to 1898 to the second half of 1903 and from the first half of 1908 to the second half of 1913 and also from the figures for debits to current deposits plus debits to "petty-sum deposits" (henceforth referred to as X') for the same two periods.

2. From the second half of 1893 to the second half of 1897:

(1) Current deposits at the end of the first half and the second half of 1897 are estimated by applying the following regression equation:

$$Y=0.674X+5{,}471 \quad \text{(Unit: ¥1,000)}$$

which has been calculated by using 6 samples of current deposits (Y) and current deposits plus "petty-sum current deposits" (X) for the period from the first half of 1898 to the second half of 1900. In the case of 1896 and before, however, the value of X itself was extremely small as compared with later periods and, if this equation is applied, would function so as to

make its constant term exaggerate the results. Instead of applying this equation, an average ratio of Y to X was calculated, respectively, for the first half and for the second half throughout the periods from 1897 to 1899 (resulting in 71.1% for the first half and 71.2% for the second half), and by multiplying X with this ratio, respectively, the value of Y was estimated.

(2) Debits to current deposits are estimated as follows: An average ratio of Y' to X' was calculated, respectively, for the first half and for the second half throughout the period from 1898 to 1900 (resulting in 91.8% for the first half and 92.2% for the second half), and by multiplying X' with this ratio, respectively, the value of Y' was estimated.

As a result of the above calculations, we obtained consecutive figures for the debits to, and the outstanding amount of, current deposits. As a primary approach, by dividing debits to current deposits during the year by the average of current deposits at the end of the first half and the second half of the year, we obtained the deposit turnover for the year. The rate of turnover thus obtained, however, is considerably underestimated, because there is a systematic tendency for current deposits at the end of the first half and the second half to be always higher as compared with those at the end of the remaining months. The principal reason for this is to be found in the existence of "window-dressing" deposits. In fact, our investigation covering the period where the figures at the end of each month are available reveals that the figures at the half-year end are obviously by about 10% higher than the former figures. Therefore, if the average of current deposits at the end of the first half and the second half are applied to the calculation of the turnover rate, the results would be underestimated by about 10%. Moreover, this being only a general trend and not always constant at 10%, the results may be inaccurate to some extent. In view of the above, by multiplying the half-year end average of current deposits with the following adjustment coefficient, we obtained the estimated month-end average of current deposits for the year. The adjustment coefficient is the ratio of the half-year end average of current deposits to the month-end average of the same and this was calculated for the period where the figures at the end of each month are available, that is, the period 1910 to 1940 (excluding 1923 only). As for the period where the adjustment coefficient is not obtainable, that is, the period 1894 to 1909, and the year 1923 where the same is true, the average of the adjustment coefficients for the four years from 1910 to 1913, amounting to 97.2%, was applied to the former and the average of adjustment coefficients for the four years of 1921, 1922, 1924 and 1925, amounting to 92.9%, was applied to the latter. The estimated month-end average of current deposits thus obtained for each year was applied as the denominator to the debits to current deposits as numerator in order to calculate the turnover rate of current deposits.

In the case of the total deposits (including current deposits and other various kinds of deposits) of ordinary banks, too, the debits thereto can be calculated as based on the Annual Report of the Banking Bureau for each half-year during the period from the second half of 1893 to 1940. Therefore, the month-end average of total deposits for each year was estimated by applying the same adjustment as in the case of current deposits and the results were applied as the denominator to the annual debits to total deposits as numerator in order to obtain the turnover rate of total deposits. The results are shown in Table 2 together with the turnover rate of current deposits. The figures in brackets in the table are those for "drawn bills" and the turnover rate of such bills has been based on half-year end figures. The same is true for the turnover rate of current deposits shown in Table 1.

TABLE 2. DEBITS TO CURRENT AND TOTAL DEPOSITS AND TURNOVER RATES OF BOTH DEPOSITS IN ORDINARY BANKS, 1894–1940

Unit: ¥ 1,000

Item / Year	Debits to current deposits (1)	Average outstanding amount of current deposits (2)	Annual rate of turnover of current deposits (3)=(1)/(2)	Debits to total deposits (4)	Average outstanding amount of total deposits (5)	Annual rate of turnover of total deposits (6)=(4)/(5)
*	(17,608)	(731)	(24.08)			
1894	288,438	15,506	18.60	500,557	46,005	10.88
*	(26,324)	(1,095)	(24.03)			
1895	490,372	27,371	17.92	758,323	70,508	10.76
1896	980,285	46,728	20.98	1,416,808	123,787	11.45
1897	1,544,827	82,330	18.76	2,177,562	203,545	10.70
1898	2,143,812	100,376	21.36	3,105,999	261,398	11.88
1899	3,022,593	146,500	20.63	4,100,679	359,213	11.42
1900	3,203,708	162,857	23.97	5,233,732	417,641	12.53
1901	3,578,875	160,667	22.28	4,907,362	430,391	11.40
1902	4,119,726	192,020	21.45	5,533,729	507,098	10.91
1903	4,740,848	200,076	23.70	6,320,329	545,096	11.59
1904	5,419,456	223,745	24.22	7,310,965	578,935	12.63
1905	6,507,873	244,877	26.58	8,758,955	662,727	13.22
1906	9,190,188	327,031	28.10	12,629,751	906,768	13.93
1907	9,678,629	309,475	31.27	13,052,851	930,507	14.03
1908	7,636,952	270,935	28.19	10,591,017	891,236	11.88
1909	8,196,504	318,585	25.73	11,415,127	1,011,381	11.29
1910	9,575,651	360,841	26.54	13,259,992	1,138,538	11.65
1911	10,415,358	385,033	27.05	14,430,253	1,226,206	11.77
1912	11,841,981	384,695	30.78	16,118,574	1,334,523	12.08
1913	12,450,555	373,028	33.38	16,980,944	1,394,096	12.18
1914	11,970,381	373,352	32.06	16,648,165	1,473,298	11.30
1915	13,425,620	416,079	32.27	18,132,344	1,533,229	11.83
1916	21,434,229	533,447	40.18	28,749,329	1,972,483	14.58
1917	32,317,181	693,806	46.58	41,755,360	2,619,330	15.94
1918	52,126,432	970,480	53.71	66,298,393	3,867,957	17.14
1919	71,397,287	1,095,863	65.15	91,649,183	5,113,900	17.92
1920	66,156,589	1,140,974	57.98	90,372,846	5,733,988	15.76
1921	56,897,261	1,102,233	51.62	79,873,651	6,127,844	13.03
1922	59,156,392	1,277,728	46.30	86,393,089	7,708,512	11.21
1923	56,127,553	1,366,952	41.06	83,033,914	7,628,868	10.88
1924	60,534,011	1,298,044	46.63	88,898,181	7,773,916	11.44
1925	69,204,985	1,282,970	53.94	99,603,639	8,245,899	12.08
1926	76,407,391	1,304,919	58.55	109,577,982	8,827,731	12.41
1927	64,128,910	1,286,884	49.83	98,396,694	8,938,510	11.01
1928	73,177,372	1,261,482	58.01	106,747,651	9,056,697	11.79
1929	67,919,672	1,162,990	58.40	98,513,881	9,226,744	10.68
1930	55,064,989	1,057,127	52.09	83,249,468	8,835,194	9.42
1931	52,123,826	924,733	56.37	79,290,149	8,460,105	9.37
1932	54,037,578	875,310	61.74	81,227,906	7,922,979	10.25
1933	64,124,230	1,000,839	64.07	94,448,373	8,464,713	11.16
1934	75,157,038	1,076,149	69.84	107,924,934	9,080,899	11.88
1935	76,338,211	1,096,787	69.60	109,789,286	9,536,809	11.51
1936	85,573,762	1,150,691	74.37	122,935,531	10,156,265	12.10
1937	105,629,148	1,477,438	71.49	149,626,634	11,381,022	13.15
1938	117,237,642	1,898,219	61.76	166,587,059	13,768,209	12.10
1939	153,854,211	2,506,155	61.39	218,826,492	16,820,815	13.01
1940	186,537,935	3,218,657	57.96	272,873,856	21,319,233	12.80

* The figures in brackets are those for the "drawn bills".

Fig. 1 illustrates the changes in the turnover rate of current deposits for both national and ordinary banks as well as that of total deposits for ordinary banks. While the turnover rate of current deposits in ordinary banks fluctuates heavily due to business fluctuations, its steep rise as a long-run trend is noticeable. Namely, the turnover rate rose from about 20 in the nineties to more than three times in the late thirties. On the contrary, the turnover rate of total deposits which was recorded as 10 in the nineties reached 17 in the late 1910's and thereafter has remained relatively stable up to the forties at 10 to 13, indicating no such remarkable rising trend as in the case of current deposits. The reason for this is to be found in the fact that time deposits and similar saving deposits whose turnover rate is lower as compared with current deposits have increased their share of total deposits.

In the post-war period, the Statistics Department of the Bank of Japan has made public the figures for debits to, and the turnover of, current deposits of all banks for the period from August 1948 to the present. Here the annual figures only are given for 1949 and thereafter in Table 3. The formula which the Bank of Japan developed to calculate the monthly figures for the turnover of private current deposits is as follows:

$$T'=\frac{D}{A}$$

where T' indicates the turnover of private current deposits, D the monthly total debits to private current deposits, and A the arithmetic average of the previous and current month-end

FIG. 1. TURNOVER OF CURRENT AND TOTAL DEPOSITS, 1880–1940

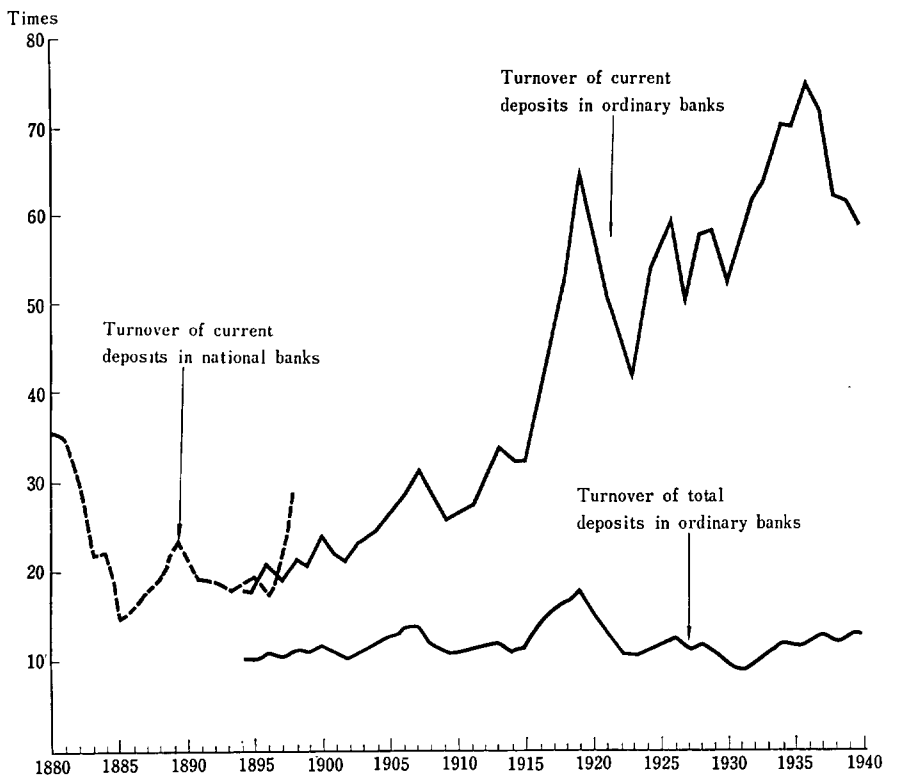


TABLE 3. DEBITS TO, AND TURNOVER RATE OF, PRIVATE CURRENT DEPOSITS IN ALL BANKS, 1949–1963

Unit: billion yen

Year	Debits to private current deposits	Monthly rate of turnover of private current deposits
1949	11,201.6	12.62
1950	15,206.6	14.29
1951	23,681.7	14.59
1952	29,617.4	13.81
1953	36,902.0	14.42
1954	41,386.9	18.84
1955	47,310.6	19.56
1956	57,931.8	18.53
1957	73,161.3	28.86
1958	80,001.2	31.12
1959	84,165.8	25.52
1960	99,089.4	28.51
1961	128,425.3	34.33
1962	145,103.3	80.90
1963	166,474.7	23.98

Source: Statistics Department of the Bank of Japan, *Economic Statistics of Japan, 1963*, 1964, pp. 79–80.

values of [(outstanding amounts of private current deposits) minus (outstanding amounts of checks and bills drawn by private individuals and institutions)].

As can be seen from the above formula, the Statistics Department deducts the outstanding amount of checks and bills drawn by the public from the balance of current deposits in calculating the turnover of current deposits, whereas in the case of the pre-war figures no such deduction was made in our calculation. Hence, the figures in both series cannot be simply compared with each other. Attention should be given to the fact that the turnover rate for the pre-war period is shown as an annual rate while that in Table 3 is shown as a monthly rate.

III. *Debits to Current Deposits and National Income*

Now let us compare debits to current deposits with the national income in the pre-war and post-war periods separately.

1. In the pre-war period:

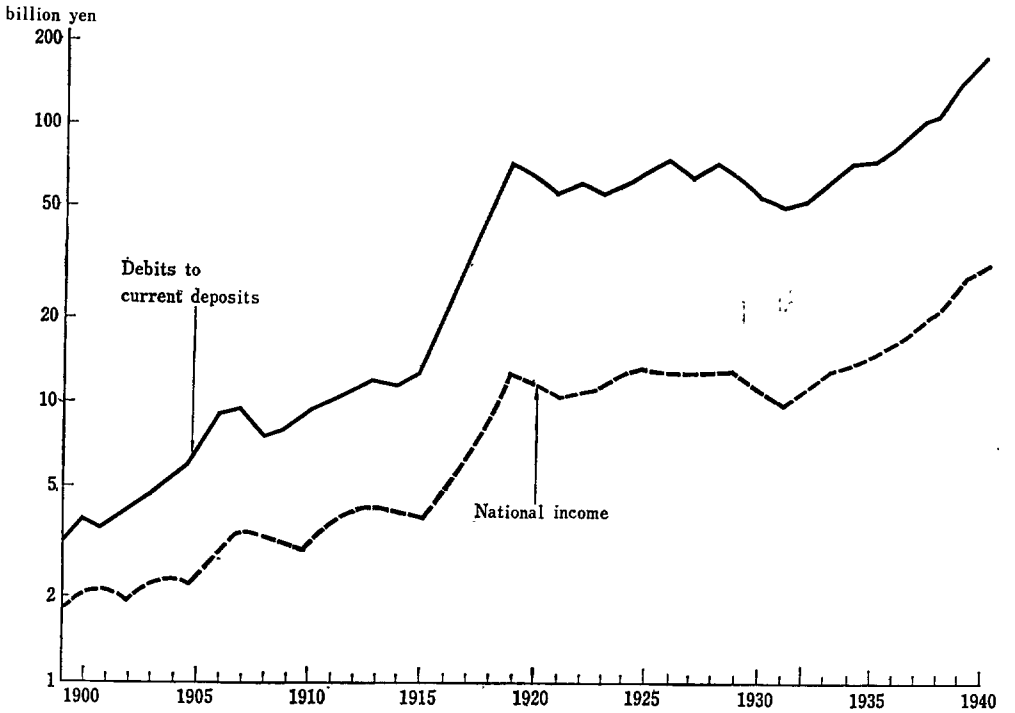
Figures for debits to current deposits in the pre-war period are available, as mentioned already, for the years 1880 and thereafter in the case of national banks and for the years 1894 and thereafter in the case of ordinary banks. Here, we will take up the period of 42 years beginning with 1899 when national banks disappeared and all banks were consolidated into a single system of ordinary banks and ending in 1940. In this period, debits to current deposits of ordinary banks and the national income closely paralleled each other as seen from

Fig. 2. The relationship between these figures can be represented in the following regression equation using the method of least squares:

$$Y=5.493X-6{,}583 \quad \text{(Unit: ¥1,000)}$$

where Y represents debits to current deposits and X the national income. The coefficient of

FIG. 2. DEBITS TO CURRENT DEPOSITS AND NATIONAL INCOME, 1899–1940



correlation is+0.996, a high value even exceeding our expectation. The figures for the national income were derived from the national income produced in current prices which had been calculated by the Institute of Economic Research, Hitotsubashi University.[5]

The relationship between debits to current deposits in ordinary banks and the national income for the period in and after 1916 when the former rapidly increased is illustrated in Fig. 3. For the period from 1916 to 1940, the regression equation is

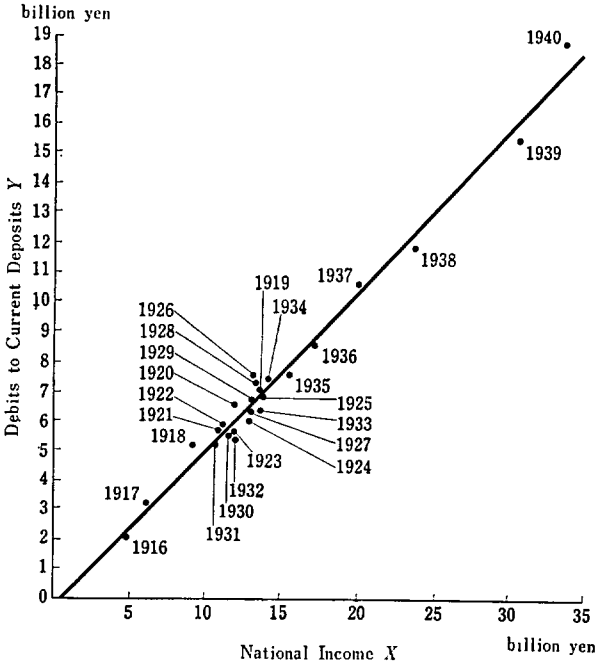
$$Y=5.251X-2{,}133 \quad \text{(Unit: ¥1,000)}$$

and the coefficient of correlation is+0.994.

A high degree of correlation between both will prove true only when two prerequisites exist: That debits to current deposits represent the amount of transactions in satisfactory way and that the latter is proportional to the national income. The first prerequisite means that, in Fisher's equation of exchange: $MV+M'V'=PT$, either (1) the term $M'V'$ (that is, the product of current deposits M' and the velocity V', which is equal to debits to current deposits mentioned here) would constitute an overwhelming portion of the transaction PT, or (2) the term MV (that is, the product of cash currency M and its velocity V) would show

[5] Kazushi Ohkawa and others, *The Growth Rate of the Japanese Economy since 1878*, 1957, p. 247.

FIG. 3. RELATIONSHIP BETWEEN DEBITS TO CURRENT DEPOSITS AND NATIONAL INCOME, 1916-1940



a tendency to move proportionally to $M'V'$.

In case of the years where either of these prerequisites, (1) or (2), does not exist, there would naturally appear a divergence between debits to current deposits and the national income. In the pre-war period, this divergence would have become wider as we go back through the years. The reasons for this are, (1) that the share of $M'V'$ in PT is expected to have become smaller and (2) that the share of the non-pecuniary food consumption by farmers in the national income would have become greater with the necessary consequence of disturbing the relationship between the amount of transactions and the national income.

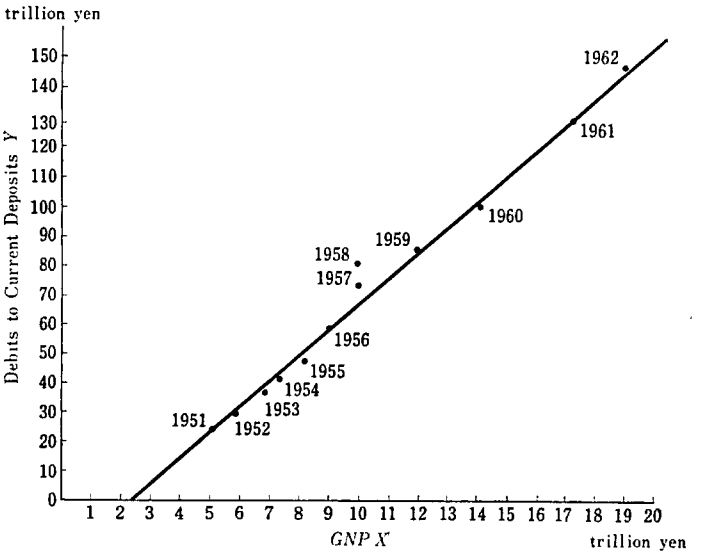
2. In the post-war period:

In this period, a comparison will be made between debits to current deposits in all banks (Table 3) as published by the Statistics Department of the Bank of Japan, and the *GNP* as estimated by the Economic Planning Agency. As for debits to current deposits of all banks, figures for each calendar year are available in 1949 and thereafter. As for the *GNP*, however, the figures for each calendar year are available only in 1951 and thereafter and prior to it the figures only cover the fiscal years. In view of the above, we used the period 1951 to 1962 and a regression equation using the method of least squares was developed to clarify the relationship between debits to current deposits and the *GNP*:

$$Y=8.7382X'-20{,}304 \quad \text{(Unit: billion yen)}$$

and the coefficient of correlation is+0.993 (Fig. 4). As can be seen from Fig. 4, all years with the exception of 1957 and 1958, which were affected by a depression, lie in the neighbourhood of the regression line. When national income (X) is adopted instead of *GNP*(X'),

FIG. 4. DEBITS TO CURRENT DEPOSITS AND *GNP*, 1951-1962



an almost similar relationship holds true as follows:

$$Y=11.008X-22{,}824 \quad \text{(Unit: billion yen)}$$

and the coefficient of correlation is+0.994.

It is noteworthy that, both in the pre-war period and in the post-war period, debits to current deposits and the national income or *GNP* are highly correlated with each other. Half-year figures for debits to current deposits are available in Japan as far back as 1880 and they would prove highly useful in the analysis of Japanese business cycles.