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Volume Title: The Volume of Consumer Instalment Credit, 1929-38

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Volume Publisher: NBER

Volume URL: <http://www.nber.org/books/holt40-2>

metadata, citation and similar papers at core.ac.uk

Chapter Title: Appendix D, Methods of Estimate and Limitations of the Data

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Chapter URL: <http://www.nber.org/chapters/c9306>

Chapter pages in book: (p. 97 - 118)

APPENDIX D

Methods of Estimate and Limitations of the Data

Methods of Estimate and Limitations of the Data

IN DEVELOPING the quantitative measures of consumer instalment credit which have been presented in this study we employed one general method for the retail group estimates and another for the cash loan estimates. It was necessary, however, because of the diversity of the source material within each of the two major categories, to deviate from these general methods in compiling certain individual series. The following exposition sets forth the principal procedures used for the two major fields of instalment credit, and the modifications used in special cases to adjust them to the peculiarities and limitations of the data at hand.

RETAIL INSTALMENT CREDIT

General Procedure

The following procedure was used to construct the estimates for the five principal types of establishments comprising the retail group: dealers in new and used passenger automobiles, and department, furniture, household appliance, and jewelry stores.

1. Annual total retail sales series were obtained for each of the five principal types of retail establishments.
2. The percent of total sales made on an instalment basis by each type of establishment was calculated for each year.
3. The annual retail sales series were multiplied by the percent of retail sales made on instalment to produce annual

series of instalment sales. These sales were considered to represent the amount of instalment credit granted.

4. The instalment sales, or amounts of credit granted, were then distributed on a monthly basis for each year covered.
5. The average duration of indebtedness in months was computed for each retail field.
6. The size of monthly payment for each amount of credit granted was derived through division of the amount of credit granted in each month of a particular year by the average duration of customer indebtedness (in months) for that year.
7. The amount of repayments made in each month was calculated by addition of the monthly payments due in a given month on all unliquidated credit grants of previous months.
8. Outstandings were estimated by subtraction of total repayments from total credit granted.

Characteristics and Limitations of the Data

This method was not applied rigidly to all classifications in the retail group, since differences in the character of source materials necessitated certain additional steps in procedure, as follows.

Annual retail sales series of four types of retail establishments—department, furniture, household appliance, and jewelry stores—were obtained from the *Census of Business*¹ for the censal years 1929, 1933 and 1935, and from Department of Commerce estimates² for intercensal years. These sales figures are presented in Table D-1. Using the 1935 Census instalment sales percentages as bases, series on instalment sales as a percentage of total sales for these four groups were then derived from the trend shown in the annual *Retail*

¹ *Census of Business*, Bureau of the Census, United States Department of Commerce.

² Market Data Section, Marketing Research Division, Bureau of Foreign and Domestic Commerce, United States Department of Commerce.

TABLE D-1

RETAIL SALES OF DEPARTMENT STORES (1925-38),
FURNITURE STORES (1924-38), HOUSEHOLD APPLIANCE
STORES (1928-38), AND JEWELRY STORES (1928-38)
(thousands of dollars)*

Year	Department Stores	Furniture Stores	Household Appliance Stores	Jewelry Stores
1924	...	\$ 1,544,125
1925	\$ 4,262,840	1,621,980
1926	4,394,010	1,694,859
1927	4,426,800	1,724,170
1928	4,492,380	1,717,301	\$ 771,499	\$ 508,518
1929	4,607,150	1,803,888	950,832	536,281
1930	4,230,050	1,451,718	747,854	380,585
1931	3,803,770	1,067,439	549,893	300,662
1932	2,852,830	590,398	304,144	187,914
1933	2,787,240	646,219	312,561	173,299
1934	3,115,160	716,097	368,899	203,077
1935	3,279,110	845,803	435,184	232,689
1936	3,639,810	1,065,712	539,628	279,227
1937	3,803,770	1,118,998	572,006	308,825
1938	3,541,440	939,958	429,005	276,090

* Based on *Census of Business*, 1929, 1933 and 1935, Bureau of the Census, United States Department of Commerce; and on Department of Commerce estimates for intercensal years.

*Credit Survey*³ for 1925-27 and 1929-38. The total instalment sales of each of these four types of retail establishments were computed by multiplying their retail sales estimates by the percent of their total sales made on instalment in each year.

Monthly instalment sales series were constructed as fol-

³ *Retail Credit Survey*, Credit Analysis Unit, Bureau of Foreign and Domestic Commerce, United States Department of Commerce. Each *Retail Credit Survey* reports the operation of an identical number of stores over a two-year period. Stores are separated according to type of business, i.e., furniture, jewelry, household appliance, etc. Using the figures relating to the percent sold on instalment, we calculated the increase or decrease in these percentage figures over a two-year period for identical stores, then worked backward and forward to apply the calculated results to the 1935 *Census of Business* instalment sales percentages as a base (*Census of Business: 1935*, vol. VI, p. 11). Thus the magnitude of the series is governed by the 1935 *Census of Business* figure for each of the trades mentioned, and the trend of the series is that exhibited by the *Retail Credit Survey* reports.

lows. The estimated annual total instalment sales series were distributed monthly according to the monthly instalment sales of similar trade samples reporting under the *Retail Credit Survey* for most recent years; additional compilations were obtained through the use of rough seasonals, calculated from Federal Reserve Board data, retail association data, and other sources. These sample data employed for the calculation of monthly estimates of instalment sales varied in sales coverage and in geographic representativeness, and some of them are subject to the errors inherent in any sampling process.

These estimates of instalment sales were considered to represent the actual amount of credit granted by each of the four types of retail establishments. There was little accurate information on average down payments and finance charges for the instalment sales of these four retail groups; and since amounts of instalment sales and amounts of credit granted are approximately equal for these groups, it was decided that the instalment sale might be regarded as the actual amount of credit granted.⁴

The average duration of instalment indebtedness was then estimated for each year and each type of establishment. These estimates were computed from yearly collection ratios⁵ reported to the *Retail Credit Survey*; the 1937 and 1938 collection ratios, excluding down payments taken from

⁴ Where average down payments are 10 percent or less, and average lengths of contract 18 months or more with typical financing charges, the cash selling price of an article sold on instalment (i.e. before deduction of down payment) would very likely be equal to or less than the amount of credit granted. This observation is particularly applicable to instalment sales by furniture and household appliance stores. For department and jewelry stores, however, the average contract duration is shorter: in such cases the cash price of the instalment sale is greater than the amount of credit granted. Thus the estimates for department and jewelry stores are biased upward to some extent, and those for furniture and household appliance stores downward. The bias is not likely to be more than 4 percent either way for any individual series. When totals are made of the four groups, these biases are largely offset. For further discussion of this point, see National Bureau of Economic Research (Financial Research Program), *Government Agencies of Consumer Instalment Credit*, by Joseph D. Coppock (ms. 1940), Chapter 6.

⁵ The yearly collection ratio is the sum of the instalment collections during each month of the year divided by the sum of the instalment amounts outstanding as of the first of each month in that year.

the 1938 *Retail Credit Survey*, were used as bases. Working backward, and using link relatives calculated from collection ratios of surveys of the years preceding, we estimated collection ratios for 1929 through 1936 in each of these four retail classifications. Use of the formula $n = \frac{2}{cr} - 1$ then enabled us to compute figures on duration of indebtedness.⁶ Corresponding figures for 1925, 1926, 1927 and 1928 for all retail outlets were extrapolations based upon available data. For furniture stores and household appliance stores, a two-year moving average was applied to the durations of indebtedness estimated by the regular formula, since collection ratios indicating contracts extending for 18 months or longer are attributable predominantly to contracts granted in the previous year. In these estimates for department stores, furniture stores, household appliance stores, and jewelry stores, the actual duration of indebtedness, or "paying-out" time, was accounted for largely by computation from annual collection ratios. Such ratios showed in statistical terms the annual effects of prepayments, delinquencies, renewals, and repossessions upon the volume of repayments and outstandings. The series did not reflect, however, fortuitous monthly occurrences affecting the repayments and outstandings columns. Having computed the durations of indebtedness for these four retail groups, we then applied these figures to the monthly amounts of credit granted in corresponding years to calculate outstandings, repayments and net credit change.⁷

To simplify the explanation of the method used for calculating outstandings, let us assume a "paying-out" period of

⁶ n = duration of indebtedness in months; cr = collection ratio.

Figures on duration of indebtedness computed from collection ratios by this formula constitute the best available indicators of the actual time covered by the paying out of instalment accounts in these four retail classifications. However, the use of collection percentages in such computation has its limitations as well. If we assume no change in collection conditions or length of indebtedness, we may conclude that a sharp rise in sales will cause a drop in the collection ratio, while a sharp drop in sales will produce a rise in the collection ratio. This limitation has been largely offset through the use of annual collection ratios.

⁷ The procedure employed in this calculation was developed at the National Bureau.

12 months for a given number of credit grants. Each monthly credit grant would then be divided by 12 to produce the monthly payment due for the 12 months following the extension of that particular amount of credit. In order to compute outstandings as of the end of the first year, for example, we totaled the credit grants for the 12-month period and deducted from that sum the amount of payments made during the last eleven months on credit extensions of that year. After the first outstandings estimate was made, we calculated successive month-end outstandings as follows: we obtained the difference between credit granted and repayments made in a given month; if this difference was positive, we added the amount of grants in excess of repayments to the outstandings for the preceding month; but if it was negative, we subtracted the decrease from the outstandings of the preceding month.

In order to take account in our estimates of the short and long maturities which go to make up the average, we used a breakdown of the average durations of indebtedness, splitting them into 12- and 24-month series for some groups, and into 12- and 30-month series for others. If an average duration of indebtedness were 18 months under the 12- and 24-month series, 50 percent of the credit grants in that year would run for 12 months, and 50 percent for 24 months. Under a 12- and 30-month series, 67 percent of the credit extensions would run for 12 months, and 33 for 30 months. Outstandings, repayments, and net credit change were calculated in the same manner as that described in the preceding paragraph, except that the 12- and 24-month series or 12- and 30-month series for these items were summed up for each month.⁸

For automobile dealers, the estimates of retail sales were

⁸ The department store and jewelry store series, in which the duration of indebtedness varied between 12 and 18 months, were worked up on the basis of 12- and 24-month distributions; 12- and 30-month distributions were used for the household appliance and furniture store series, in which the duration of indebtedness varied between 12 and 26 months. Experimentation indicated that further breakdowns of the figures on average duration of indebtedness made no substantial change in the results.

those supplied by the Automobile Manufacturers' Association,⁹ covering the number of new passenger cars sold each year. The ratio "used cars sold as a percent of new cars sold" was also obtained from the Association's figures¹⁰ and then employed for a calculation of the number of used cars sold (see Table D-2). The next step was to multiply the number of new cars and the number of used cars sold each year by the percent of each type sold on an instalment basis,¹¹ a process which yielded the number of new and used cars sold on instalment. Series on the number of new and used cars sold on instalment *each month* were then computed as follows: the number of each type financed during a year was distributed by months to conform to the number of new and used cars financed monthly during the same year by approximately 456 companies reporting to the Bureau of the Census, United States Department of Commerce.¹² The total numbers of new and used cars financed each month were then multiplied by the average amount of note¹³ in corresponding months for both new and used cars as reported by the same sales finance companies. The sum of these two products for each month produced the total amounts of actual credit granted per month on new and used automobiles.

⁹ *Automobile Facts and Figures* (1939), Automobile Manufacturers' Association. The Association's estimates of new cars sold are based upon reports collected monthly on new-car sales of the dealers connected with each automobile manufacturing company.

¹⁰ Published in the *Composite Experience of Sales Finance Companies and Automobile Dealers* (1938). National Association of Sales Finance Companies.

¹¹ *Ibid.* These instalment percentages were taken from annual surveys made by the National Automobile Dealers Association, and agree closely with those reported by General Motors Acceptance Corporation.

¹² *Automobile Financing*, Bureau of the Census, United States Department of Commerce. From 1928 through 1931, 356 companies reported, in 1932, 313 companies, and approximately 456 companies from 1933-38 inclusive.

¹³ Amount of note is the instalment sale price minus down payment plus financing and insurance charges. In the case of used automobiles, the average amounts of note were reduced 10 percent at the suggestion of several persons with long experience in the sales finance field. It is the practice of most sales finance companies to buy only the better used-car paper, so that an average figure from their used-car records would not be altogether typical. In the opinion of some observers, however, this allowance of 10 percent is somewhat high.

TABLE D-2

NUMBER OF NEW AND USED PASSENGER CARS SOLD,
1925-38

<i>Year</i>	<i>New Automobiles</i>	<i>Used Automobiles</i>
1925	3,132,028	3,094,443
1926	3,399,506	3,039,158
1927	2,762,585	3,273,663
1928	3,258,883	3,812,893
1929	3,996,612	5,139,643
1930	2,651,875	4,773,375
1931	1,903,342	3,464,082
1932	1,095,720	2,454,413
1933	1,525,595	2,669,791
1934	1,927,847	3,161,669
1935	2,866,782	4,357,509
1936	3,513,858	5,762,727
1937	3,507,781	6,173,695
1938	1,957,350	4,619,346

Maturities in the automobile group were calculated from the figures referring to the actual length of contract granted by three large sales finance companies. For outstandings and repayments the average length of contract for cars bought on instalment was applied to the monthly amounts of credit granted. From this point the procedure was the same as that described above with reference to repayments and outstandings of the other four types of retail establishments.

Since length of contract in automobile transactions refers to the number of months specified at the time of the sale, the actual time consumed in the paying off of instalment obligations was not accounted for in the automobile dealer series. The statistical effects of prepayments of instalment accounts, renewals of notes, delinquencies and repossessions are therefore not reflected in the repayments and outstandings columns of the automobile dealer series. Presumably there would be a tendency for the estimated outstandings to acquire a downward bias when actual delinquencies and renewals exceeded prepayments, and an upward bias when prepayments exceeded delinquencies and renewals. Delin-

quencies and renewals probably exceed prepayments, as a rule, resulting in a consistent underestimate in this series. However, these outstanding estimates were checked wherever possible against the actual automobile receivables of three large sales finance companies, and were found to agree closely, both in seasonal and cyclical movements, with the sales finance company figures.

Since the source data for the series covering all types of retail establishments made no allowances for purchases of instalment paper from retailers by sales finance companies or other agencies, the estimated outstandings must be regarded as the total amount of consumer instalment debt arising from instalment sales by retailers. The total outstandings are not to be considered the instalment receivables of these retailers alone; they are also the receivables of sales finance companies, industrial banking companies, commercial banks, and any other agencies which purchase retail instalment paper.

The foregoing description covers the basic data and procedures used to calculate the quantitative estimates of retail instalment credit for the five principal groups of establishments. Divergences in sources of data and method are described for the separate types of establishments comprising the entire retail group.

Dealers in New and Used Automobiles

With few exceptions these estimates (which cover passenger cars only), were calculated according to the above procedure. Unit new-car sales data for 1925 through 1929 were taken from the new-car registration figures prepared by R. L. Polk and Company, and adjusted according to estimates made by the Automobile Manufacturers' Association. For the period 1925-27, the numbers of new and used cars financed yearly were distributed according to the Polk figures. The average amounts of note in this period were assumed to be the same during each month of a year. Since no monthly average amount-of-note calculations were available for these three

years, annual estimates prepared by Milan V. Ayres, Secretary, National Association of Sales Finance Companies, were employed.¹⁴

Department Stores

Total department store retail sales were taken from the Census for 1929, 1933 and 1935. For non-census years the Federal Reserve Board index of department store retail sales was used for estimates of yearly sales. The instalment sales percentage for 1928 was an extrapolation, and the percentages for 1925 through 1927 were based on the *National Retail Credit Survey* published in 1930.¹⁵ For the periods 1929-33 and 1936-38 yearly instalment sales were distributed by months according to the monthly instalment experience of department store samples reporting to the *Retail Credit Survey* for these same years. The monthly retail sales of the *Retail Credit Survey* samples conformed closely to the monthly pattern of retail sales exhibited by the Federal Reserve Board's monthly department store index, indicating that these samples may be considered representative of total department store sales for these years. For the periods 1934-35 and 1925-28 we took monthly instalment sales indices for 1929, 1930, 1931, 1932 and 1933 from the *Retail Credit Survey*, covering 33 department stores, and computed them as a percent of the monthly retail sales indices for these 33 stores during the same years.

The ratios between these instalment sales indices and the retail sales indices were computed for each month over the 5-year period, and averaged. These averages were then multiplied by the monthly Federal Reserve retail sales indices in 1925, 1926, 1927, 1928, 1934 and 1935, to produce instalment sales indices for these same years. In computing these indices, the average month in each year was treated as a base (i.e., average month = 100).

¹⁴ *Composite Experience of Sales Finance Companies and Automobile Dealers* (1938), National Association of Sales Finance Companies.

¹⁵ After 1930 the *National Retail Credit Survey* was entitled the *Retail Credit Survey*.

Furniture Stores

For non-census years, yearly estimates of retail sales by furniture stores were derived from a number of sources. For 1936 through 1938 the figures used were supplied by the Market Data Section of the Bureau of Foreign and Domestic Commerce. For annual sales for 1934, and for 1929 through 1932, it was assumed that 57 percent¹⁶ of the furniture-household appliance group sales estimated by the Market Data Section for these years were furniture store sales. For 1924, 1927 and 1928, retail furniture sales were estimated from Federal Reserve Board data on furniture sales of department stores.¹⁷ The 1925 and 1926 estimates were based upon *Retail Credit Survey* data.

Instalment sales for 1936 through 1938 were distributed monthly according to indices computed from *Retail Credit Survey* samples for those years. For 1934 and 1935 indices, a procedure similar to that used in the department store series was employed. In this case average ratios of monthly instalment sales indices to retail sales indices were derived from a sample of 15 stores reporting retail and instalment sales to the *Retail Credit Survey* for 1929 through 1933.¹⁸ These ratios for each month were multiplied by the retail indices (average month in each year = 100) taken from National Retail Furniture Association reports¹⁹ for 1934 and 1935; the result was instalment sales indices for these two years. For 1932 and 1933, ratios were computed which showed the average monthly relationship between retail sales indices,

¹⁶ Fifty-seven percent represents the proportion of total furniture and household appliance store sales attributed to furniture stores alone in the 1929, 1933 and 1935 Censuses.

¹⁷ In 1924, department stores of 7 Federal Reserve districts reported departmental sales to their respective Federal Reserve banks. The 7 districts were: Boston, Chicago, Cleveland, Dallas, New York, Philadelphia, and San Francisco. For 1927 and 1928, 6 of these districts reported (Philadelphia was the exception) along with the St. Louis and Richmond districts.

¹⁸ For purposes of convenience, these ratios are termed the average monthly variations between instalment and retail sales indices. Indices were based on the average month in each year.

¹⁹ *Retail Furniture Store Operating Experiences*, Comptrollers' Division, National Retail Furniture Association, annual reports for 1934 and 1935.

1934-38 (average month in each year = 100), of furniture stores reporting to the National Retail Furniture Association²⁰ and retail sales indices of department store furniture sales, 1934-38 (average month of each year = 100), calculated from sales data reported to Federal Reserve banks.²¹ The Federal Reserve banks' department store furniture sales indices for 1932 and 1933 were multiplied by these ratios to produce retail sales indices for these years. The retail indices so obtained were then adjusted in the light of the monthly variation between instalment and retail sales indices for furniture stores.

For the instalment sales indices for 1924 through 1931, we first calculated a rough seasonal index of furniture store retail sales from monthly indices (1934 through 1938) of stores reporting to the National Retail Furniture Association. The procedure was as follows: the percentage change in total retail sales of these stores for each year over the previous year was worked out and a two-year forward moving average was applied to these percentages; dividing the results for each year by 12, we computed what was termed the average monthly change in sales for each year; these monthly change percentages we proceeded to multiply by $5\frac{1}{2}$, $4\frac{1}{2}$, $3\frac{1}{2}$, $2\frac{1}{2}$, $1\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$, $1\frac{1}{2}$, $2\frac{1}{2}$, $3\frac{1}{2}$, $4\frac{1}{2}$, and $5\frac{1}{2}$ for January through December respectively. Where the monthly change for a year was a decrease, the results were subtracted from the first half-year figures of the monthly retail sales index for that year (computed from the above-mentioned National Retail Furniture Association data by using the average month in that year as equal to 100), and added to the last half-year figures.

The indices thus estimated for each year from 1934 through 1938 were averaged for each month to yield the seasonal in-

²⁰ *Ibid.*, annual reports for 1934-38 inclusive. Approximately 250 to 300 retail stores were represented in these annual reports. Indices of retail sales for 1936, 1937 and 1938 agreed closely with furniture retail sales indices for similar years reported by the Market Data Section.

²¹ Approximately 200 department stores from 6 Federal Reserve districts (Boston, Chicago, Cleveland, New York, Richmond, and San Francisco) reported departmental sales data to Reserve banks. These data were obtained through the International Statistical Bureau.

dex. To this seasonal index were added and subtracted the average amounts of monthly change in retail sales for the years 1924 through 1931 multiplied by 5%, 4%, etc. These average monthly changes were again calculated by a two-year forward moving average of the percentage change in sales over the previous year. In this case, however, where the monthly change for a year was an increase, the results after multiplication were subtracted from the seasonal index for the first half-year and added to the seasonal index for the last half-year.²² Thus retail furniture sales indices were compiled for each year of the 1924-31 period. These indices were then adjusted for variation between instalment and retail sales indices to yield instalment sales indices.

Because the basic data for the early years of this series were fragmentary, the methods used to distribute monthly instalment sales over these years were necessarily rough. As a result, our figures for these years may tend to overestimate sales in certain months and underestimate them in other months, but the extent of such bias cannot be determined with the data now available.

Household Appliance Stores

Retail sales were obtained from Census data for 1929, 1933 and 1935. Market Data Section estimates of household appliance store sales were used for the years following 1935, while for intercensal years 43 percent of the Market Data Section estimates of the furniture-household appliance group sales were employed.²³ The 1928 retail sales figure was an extrapolation, as was also the instalment sales percentage for the same year. Instalment sales in 1936, 1937 and 1938 were distributed according to the instalment sales of stores reporting to the Retail Credit Survey in the same years. For the years 1932 through 1935, average monthly ratios of the *Retail Credit Survey* instalment indices (1936-38) to the Federal Reserve banks' indices of department store household appli-

²² The procedure was reversed where the monthly change was a decrease.

²³ See footnote 16, p. 115.

ance sales (1936-38)²⁴ were computed. The monthly indices of department store household appliance sales (1932, 1933, 1934 and 1935) were then multiplied by these ratios to produce instalment indices for these years. Instalment indices for 1928, 1929, 1930 and 1931 were based upon a seasonal index of instalment sales computed from instalment indices of the years 1932 through 1938.²⁵ The seasonal index was adjusted on the basis of the monthly change in sales during each of the four years (1928-31) to yield the instalment indices for these years.

As a check against the monthly pattern of household appliance store sales developed through the above method, sales data were available, for the later years covered by our estimates, from several large corporations in the household appliance business. These figures showed a close resemblance to our estimated series. For earlier years, however, no figures exist with which to compare our results, so that it is impossible to judge how much our estimates tend to distort the monthly sales pattern.

The 1938 collection percentage reported for household appliance stores was adjusted on the basis of collection ratio movements for other outlets in order to offset the artificial rise in the collection ratio caused by a very rapid decline in household appliance sales.

Jewelry Stores

Census figures were used for retail sales in 1929, 1933 and 1935, and Market Data Section estimates for the other years. The 1928 figure was an extrapolation, as was the instalment sales percentage for that year.

Since no reliable sample data were available for jewelry store instalment sales, it was necessary to use monthly retail sales indices to distribute instalment sales on a monthly basis. Basic to such a distribution was the assumption that

²⁴ See footnote 21, p. 116.

²⁵ The seasonal index was calculated in the same way as was the furniture retail sales seasonal index.

the percentage of retail instalment sales remained constant throughout the 12 months of each year. This is, of course, not strictly true; as noted in our discussion of the other retail series, there is some variation between the monthly distribution of total retail sales and of retail instalment sales. It is, however, impossible to judge how closely these jewelry store estimates conform to the actual sales pattern, since no material is available with which to compare our figures.

The retail sales indices employed were the calculations of the Marketing Research Division, Department of Commerce, for the years 1936, 1937 and 1938, and those of the International Statistical Bureau for the years 1929 through 1935. The 1928 index was arrived at after a computation of a seasonal index of retail sales from the indices of 1929 through 1938 and adjustment of the seasonal index on the basis of the average monthly change in sales during 1938.

"All Other Stores"

This group includes all types of retail establishments which are not covered by the preceding five classifications, but whose instalment sales are made largely to consumers.²⁶

In developing these estimates, we used the retail sales estimates (1929-38) of the Market Data Section for retail groups which included our "all other stores." A figure on instalment sales of our "all other stores" category (reported in the 1935 Census) as a percent of total retail sales in 1935 of the Market Data Section estimates was calculated. With this 1935 figure as a base, we calculated similar percentage figures for 1929-34 and 1936-38 by applying the percentage change from 1935 exhibited by the combined instalment sales percentages for the 5 principal types of retail establishments. The percentages thus calculated were multiplied by the Market Data

²⁶ These establishments are as follows: country general stores, drygoods and general merchandise stores, gasoline filling stations, garages, automobile tire and accessory stores and other automotive stores, the entire apparel group, hardware stores, bookstores, sporting goods stores, florists, secondhand stores, drugstores, bicycle shops, fuel and ice dealers, gift, novelty and souvenir shops, and luggage stores.

Section sales estimates to produce estimates of instalment sales for the "all other stores" group. End-of-year outstandings (1929-38) were then estimated as follows: the total of instalment sales of "all other stores" in each year was multiplied by the average ratios for the same year's outstandings (end-of-year) to instalment sales for the 5 principal types of retail establishments.

CASH LOAN INSTALMENT CREDIT

General Procedure

The four principal cash-lending agencies are commercial banks (personal loan departments), credit unions, industrial banking companies, and personal finance companies. The general procedure employed in preparing the estimates for these agencies may be summarized as follows:

1. Outstandings totals as of the end of each year were obtained.
2. Monthly outstandings were calculated by interpolation of the year-end outstandings totals on the basis of sample data.
3. Ratios of monthly loans extended to outstandings as of the end of each month were calculated from sample data.
4. The computed monthly outstandings totals (2) were multiplied by the ratios computed (3) to yield total monthly loans.
5. Net credit change was calculated by subtraction of the outstandings of one month from the outstandings of previous months.
6. For the computation of repayments, net credit change was subtracted from loans extended (if an increase) or (if a decrease) added to loans made.

Characteristics and Limitations of the Data

Outstandings constituted in all cases the starting point for our calculations except the estimates of loans insured by the Federal Housing Administration.²⁷ Year-end complete coverage outstandings estimates compiled by the Russell Sage

²⁷ See pp. 124-25.

Foundation²⁸ for each type of cash-lending agency were used for our December estimates and for basing points from which we interpolated monthly outstandings figures on the basis of sample data. To estimate outstandings monthly for a certain agency in 1930, for example, we would divide the Russell Sage Foundation's 1929 year-end outstandings estimate by our sample 1929 year-end outstandings estimate and multiply the quotient by the sample's outstandings totals for January through December 1930. The computed December 1930 figure would then be subtracted from the Russell Sage Foundation's December 1930 estimate, and the difference adjusted so that the calculated estimates would accord with the Russell Sage Foundation's year-end figure. Thus, if the Russell Sage Foundation's December 1930 estimate were \$1,200,000 larger than our computed figure, \$1,200,000 would be added to our December 1930 figure, \$1,100,000 to the November figure, \$1,000,000 to the October figure, and so forth, on a pro rata scale over the entire year. If, on the other hand, our estimated figure were \$1,200,000 larger than that of the Russell Sage Foundation, these amounts would be subtracted instead.

In calculating monthly estimates of loans made, we multiplied the estimated total outstandings figures by the ratios of loans made to outstandings for the sample. These figures on loans made include renewals, which represent not new loans but merely the refinancing of old notes. Figures on payments due also include payments on renewals.²⁹

We calculated net credit change for each month by subtracting one month's outstandings from the previous month's outstandings (the net credit change applying to the former month). If the credit change were positive, it would be subtracted from loans made of the same month to show repayments for that month; if it were negative, it would be added to loans made to produce repayments.

²⁸ See Russell Sage Foundation, *Consumer Credit and Economic Stability*, by Rolf Nugent (1939).

²⁹ If an outstanding loan for \$50 is renewed, \$50 is added to the payments due in that month and \$50 to the loans made. The result is a rise in both loans made and payments due; outstandings, however, remain the same.

There follows a discussion of the sample data used in each cash loan series (1) to interpolate the Russell Sage Foundation's year-end outstandings, and (2) to calculate our totals of loans made and repayments. In conclusion, we describe the procedure employed in the estimates of Title I insured loans made by all types of lending institutions combined.

Commercial Banks (Personal Loan Departments)

Commercial bank samples, varying in coverage, were employed as a basis for estimates of month-end outstandings from 1934 through 1938. Our monthly figures for 1929-34 we estimated by assuming a straight-line movement in outstandings between year-end totals. Since month-end outstandings of commercial banks show but slight seasonal variance, the degree of error within these monthly estimates for 1934-38 should be slight. Eleven banks, accounting for almost 20 percent of the total volume of cash loans extended by commercial banks, provided the data needed for an interpolation of the Russell Sage Foundation's outstandings figures for 1934 and 1935, and for calculating the volume of loans made. Because one bank in this sample was too heavily represented, however, only 10 percent of its figures were included in the calculations.

For 1936, 4 additional banks were added to the initial sample of 11; these 15 banks made up 25 percent of total volume of cash loans in that year. For 1937, 7 more banks were added, making 22 in the sample; for 2 of these 7 banks only 10 percent and 50 percent respectively of total loan volume was used. The 1937 sample also accounted for approximately 25 percent of the volume of all cash loans made by personal loan departments of commercial banks in that year. In 1938, the figures of 8 more banks were included, resulting in a sample of 30 banks. This sample contributed 25 percent of the total volume of cash loans by commercial banks for 1938.

For the years prior to 1934, we calculated annual estimates of loans made by applying to the ratio of loans to receivables

(for 1934) the percentage change in loans to receivable ratios for the previous years as estimated from year-end data supplied by various banks.

Credit Unions

Monthly reports from a group of credit unions to the Russell Sage Foundation served as a basis for the interpolation of the Russell Sage Foundation year-end outstandings totals. Loans extended annually were calculated according to ratios of loans made to outstandings as computed from state banking reports.³⁰

Industrial Banking Companies

Monthly estimates of outstandings for industrial banking companies were compiled from the figures of a sample of 20 Morris Plan banks which were used for interpolating the Russell Sage Foundation's year-end estimates. This sample covered approximately 30 percent by volume of total industrial banking company outstandings. Loans made monthly were also reported for this sample, so that it was possible to compute ratios of loans made to outstandings. Total loans made monthly were derived by multiplying total estimated monthly outstandings by these ratios.

Personal Finance Companies

Data from 18 personal finance companies reporting their month-end outstandings from 1929 through 1938 supplied the basis for interpolation of the Russell Sage Foundation's

³⁰ Cf. The Commonwealth of Massachusetts, *Annual Reports of the Commissioner of Banks Relating to Credit Unions, 1929-38*; Wisconsin State Banking Commission, *Annual Report of Wisconsin Credit Unions, 1934-38*. Ratios computed from Massachusetts reports were used for 1929 through 1933; for the years 1934 through 1938 we used means of the ratios calculated from both state reports.

Some credit unions make their charge each month on the unpaid balance of the loan and do not include the charge as a part of the amount of the loan or as a part of the loan balance outstanding. About three-fourths of all credit unions use this lending method, and to that extent the credit union series exclude interest charges.

year-end estimates of total outstandings for all personal finance companies³¹ on a monthly basis. This sample covered about 30 percent by volume of total personal finance company outstandings, but it was too heavily weighted by the figures of two individual companies. In order to counteract this bias in the sample, we used in the summation only 10 percent of one company's outstandings totals and 50 percent of the totals for the other company. For our estimates of loans made, we multiplied our computed outstandings totals by the ratios of monthly loans made to month-end outstandings calculated from the figures of two large companies which together account for approximately 35 percent by volume of all personal finance company outstandings.

Unregulated Lenders

The year-end outstandings totals are those of the Russell Sage Foundation. In this instance we calculated average outstandings by averaging year-end figures, since there were no monthly estimates by which we might measure average outstandings.

Title I Loans Insured by the Federal Housing Administration

Loans insured under FHA Title I may be held by commercial banks, by credit unions, and by industrial banking companies (personal finance company loans and loans made by unregulated lenders are not insurable under Title I). In-

³¹ It is possible to estimate the amount of interest due and to become due on outstandings totals of personal finance companies through use of the formula $\frac{oi(d+2)}{3}$, in which o = outstandings, i = monthly interest rate, and d =

duration of loan. See National Bureau of Economic Research (Financial Research Program), *Personal Finance Companies and Their Credit Practices*, by Ralph A. Young and Associates (1940) Chapter 1, p. 23.

If we substitute 2.8 for i , and 13 for d , interest due and to become due amounts to approximately 14 percent of estimated outstandings. In 1938, for example, when average outstandings of personal finance companies totaled \$347,600,000, interest due and to become due amounted to approximately \$48,700,000. When these two figures are added together, it is found that total average outstandings of personal finance companies for 1938 (including interest due and to become due) came to about \$396,300,000.

insured FHA loans were specifically excluded from our estimates for personal loan departments of commercial banks, so that there is no duplication between this series and the FHA series. In the case of the credit union estimates, insured FHA loans were not specifically excluded, but such duplication as exists is negligible. Insured FHA loans could not be excluded, however, from the estimates for industrial banking companies, and a small amount of duplication therefore exists between this series and that for FHA loans. The two series probably do not overlap by more than a small percentage. Retail instalment contracts sold to sales finance companies are also included in the FHA series; the amount of duplication with the retail series is negligible.

The procedure used for estimating outstandings of notes insured by the Federal Housing Administration was very similar to that employed for the estimates of outstandings of retail establishments. Figures covering the actual length of contract granted on Title I FHA loans were applied to a monthly series of loans extended (1934-38),³² and outstandings were estimated according to the method described on pages 109-10. Basic data for estimates of loans made monthly and of actual length of contract granted were taken from Federal Housing Administration Annual Reports (1934, 1935, 1936, 1937 and 1938). For all years, approximately 80 percent of the insured Title I loans of \$2,000 or less were considered to have been consumer loans; this percentage accounted for all notes for single-family residences, all notes for farm dwellings, one-half the notes for multiple residences, and one-half "all other property" notes.

³²No Title I notes were insured by FHA during the period from May 1937 through January 1938.