

TABLE 1
BALANCES OUTSTANDING, BY MONTHS, AND ANNUAL RATE EQUIVALENTS OF THE CARRYING CHARGE¹

Month	Balance outstanding at beginning of month						
	Accounting approach				Present-value approach		
	Priority plan	Constant-ratio plan ²	Direct-ratio plan	Residuary plan	Simple-discount plan ³	Simple-interest plan	Small-loan and present-value plans ⁴
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
1	150	150.00	150.00	150	160	150.00	150.00
2	140 ⁵	131.25	132.22 ⁶	130	140	130.30	132.19
3	120	112.50	114.16	110	120	110.88	114.12
4	100	93.75	95.83	90	100	91.74	95.78
5	80	75.00	77.22	70	80	72.88	77.18
6	60	56.25	58.33	50	60	54.28	58.30
7	40	37.50	39.16	30	40	35.94	39.15
8	20	18.75	19.72	10 ⁷	20	17.85	19.72
Total	710	675.00	686.64	640	720	663.87	686.44
Equivalent annual rate ⁸	.169	.178	.175	.1875	.167	.181	.175 ⁹

¹ Cash price of article \$200. On time, it may be bought for \$50 down and \$20 a month for 8 months. Carrying charge is equal to \$10 or $\$50 + (8 \times \$20) - \$200$.

² Finance charge distributed over the 8 months at rate of \$1.25 per month; therefore principal is reduced by only \$18.75 per month.

³ The finance charge of \$10 is added to cash price (\$200) less the down payment (\$50), making the beginning balance \$160. The latter figure is also $8 \times \$20$. This plan is also known as the "Series-of-payments" plan.

⁴ Monthly rate of 1.457 per cent applied to outstanding balance. Interest for first month is \$2.19 (or $0.01457 \times \$150$), leaving \$17.81 for reduction of principal.

⁵ Finance charge of \$10 is deducted from first payment of \$20, leaving \$10 for reduction of principal; therefore the balance at beginning of second month is $\$150 - \10 or \$140.

⁶ The sum of the digits from 1 to 8 (the number of payments) is 36; therefore $8/36$ of the finance charge, or \$2.22, is taken from first payment, leaving only \$17.78 to be applied toward principal. During the second month, $7/36$ of the \$10 or \$1.94 is earned, leaving \$18.06 for reduction of principal.

⁷ All the finance charge (\$10) is taken out of last payment, leaving only \$10 for reduction of principal.

⁸ Finance charge (of \$10) divided by one-twelfth of total shown just above annual rate, except for present-value plan (see footnote 9). For example, one-twelfth of \$710 = \$59.17 and $\$10 \div \$59.17 = 0.169$ or 16.9 per cent for the Priority Plan.

⁹ This rate (0.175) is for the small-loan plan. It is 12×0.01457 . It may also be obtained by dividing \$10 by one-twelfth of \$686.44. The rate for the present-value plan is 0.190. The only difference between the small-loan and present-value plans is that under the latter the monthly rate (0.01457) is converted to an effective annual rate, that is, $(1.01457)^{12} - 1 = 0.1896$ or approximately 19 per cent. As shown, the monthly balances are the same under both plans.

THE ACCOUNTING APPROACH

The group of methods described by the heading "Accounting Approach" includes the following:

The *priority*, or yield-minimum, plan, under which the finance charge is considered to be deducted from the first payment. If this charge is more than the periodic payment, the excess is deducted from the second payment before the remainder is applied toward reduction of principal.

The *constant-ratio*, or uniform, plan, under which the finance charge is considered as being

divided equally over the installment period; that is, the seller or lender credits his income account with an equal part of each installment.⁴

The *direct-ratio*, or 12/78, plan, under which the finance charge is considered as being apportioned over the installment term in decreasing amounts; that is, the seller or lender credits a decreasing proportion of the periodic payment to his income account.

The *residuary*, yield-maximum, or Merchant's, plan, under which the finance charge is considered

⁴ Snyder's *Essential Business Mathematics* (1947 edition), pp. 182-183; also Cassidy and Robusto's *Business Mathematics* (1952 edition), p. 98.