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INTEREST RATES CHARGED ON  
INSTALLMENT PURCHASES<sup>1</sup>

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**R**ETAIL SELLING on the installment plan is a widely accepted practice. Yet few buyers know the interest-rate equivalent of the carrying charges they pay for installment credit. That it is usually relatively high no one denies. This situation has led to suggestions from some quarters that sellers be required to specify on their sales contracts the interest-rate equivalent of their service charges, so that buyers will be better able to determine whether they are paying "too much" for the privilege of using installment credit.

By the end of 1950, 12 states had passed laws to control installment financing in various ways; but no state requires that the finance charge be stated as an annual interest rate.<sup>2</sup> Perhaps one reason why state laws have not required the posting of equivalent annual interest rates is that several methods of computing rates are in use and all are apparently recognized as valid. This creates a confusing situation. It is desirable, therefore, to review some of the more commonly used methods of computing equivalent rates and try to determine whether certain of them should be favored over others.

The following problem is taken as a basis for discussion:

An article advertised for \$200 cash may be bought on time for \$50 down and \$20 a month for 8 months. What

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<sup>2</sup> For further discussion, see articles by W. P. Mors, in the January and April issues, 1943, and in the October, 1950, and January, 1951 issues of the *Journal of Business*. Also see article by Johnson and Gregory, in the April, 1953 issue of the same *Journal*.

equivalent annual rate is charged if it is bought on time? The symbols described below are used. Their values for the illustrative problem are shown in the column on the right.

| Sym-<br>bol | Description                                                             | Exam-<br>ple |
|-------------|-------------------------------------------------------------------------|--------------|
| $i$ or $d$  | Equivalent annual interest or discount rate                             | ?            |
| $n$         | Number of payments                                                      | 8            |
| $p$         | Periodic (monthly) payment                                              | \$20         |
| $m$         | Payment periods in one year                                             | 12           |
| $C$         | Cash price . . . also equal to the cash received when money is borrowed | \$200        |
| $D$         | Down payment . . . always equals zero when money is borrowed            | \$50         |
| $pn$        | Sum of future installments = $C - D + I$                                | \$160        |
| $I$         | Interest and service, or carrying charge . . . equals $pn + D - C$      | \$10         |

$^1$  8 months  $\times$  \$20 =  $pn$

Down payment =  $D$

Cash price =  $C$

Carrying charge =  $I$

\$160

50

210

200

10

Eight methods of computing the rate equivalent of the service charge in the illustrative problem may be considered. These methods may be grouped into two broad categories, as shown in table 1. First is a group of four methods which apparently were developed from various practices of sellers or lenders in crediting the service charge on installment contracts to income.<sup>3</sup> These are shown under the heading "Accounting Approach." Second is another group of four methods, all of which are derived by methods of computing the present value of future payments. They appear under the heading "Present-Value Approach."

<sup>3</sup> For further discussion, see the *Installment Mathematics Handbook*, M. V. Ayres (Ronald Press, New York, 1946).