assets. The Investment Manager concept permits one bank to be sole trustee of a pension plan ("Master Trustee"), rendering to the plan sponsor uniform accounting reports including cash statements and valuation statements, while accepting investment direction as to specified parts of the pension plan assets from Investment Managers (another bank, an insurance company, or a registered investment advisor).

In the case of a Master Trust the requirements of the regulation will be served if either the Master Trustee or the Investment Manager maintains the specified records and gives prescribed statements and confirmations in accordance with the requirements of Part 12. Any national bank serving either as Master Trustee or Investment manager should ensure that the requirements of the regulation are being met, either through performing the functions required by the regulation itself or contracting with another party that that party should do so.

DRAFTING INFORMATION: The principal drafter of this ruling is Ralph Janvey, Staff Attorney, Office of the Comptroller of the Currency, Washington, D.C. 20219.

Authority: 12 U.S.C. 24 and 12 U.S.C. 92a.

Adoption of Amendment. Accordingly, the Comptroller amends 12 CFR Part 12 as set forth below.

PART 12—RECORDKEEPING AND CONFIRMATION REQUIREMENTS FOR SECURITIES TRANSACTIONS

1. Section 12.5 is amended by revising paragraphs (a) and (c) to read as follows:

* * * * *

§ 12.5 Time of notification.

The time for mailing or otherwise furnishing the written notification described in 12 CFR 12.4 shall be five business days from the date of the transaction, or if a broker/dealer is utilized, within five business days from the receipt by the bank of the broker/dealer's confirmation, but the bank may elect to use the following alternative procedures if the transaction is effected for:

(a) Accounts (except periodic plans) where the bank does not exercise investment discretion and the bank and the customer agree in writing to a different arrangement as to the time and content of the notification; provided, however, that such agreement makes clear the customer's right to receive the written notification within the prescribed time period at no additional cost to the customer;

* * * * *

(c) Accounts where the bank exercises investment discretion in an agency capacity, in which instance (1) the bank shall mail or otherwise furnish to each customer not less frequently than once every three months an itemized statement which shall specify the funds and securities in the custody or possession of the bank at the end of such period and all debits, credits and transactions in the customer's account during such period, and (2) if requested by the customer, the bank shall mail or otherwise furnish to each such customer within a reasonable time the written notification described in 12 CFR 12.4. The bank may charge a reasonable fee for providing the information described in 12 CFR 12.4;

* * * * *

2. Paragraph (d) of § 12.6 is revised.

§ 12.6 Securities trading policies and procedures.

Every national bank effecting securities transactions for customers shall establish written policies and procedures providing:

* * * * *

(d) That bank officers and employees who make investment recommendations or decisions for the accounts of customers, who participate in the determination of such recommendations or decisions, or who, in connection with their duties, obtain information concerning which securities are being purchased or sold or recommended for such action, must report to the bank, within ten days after the end of the calendar quarter, all transactions in securities made by them or on their behalf, either at the bank or elsewhere in which they have a beneficial interest. The report shall identify the securities purchased or sold and indicate the dates of the transactions and whether the transactions were purchases or sales. Excluded from this requirement are transactions for the benefit of the officer or employee over which the officer or employee has no direct or indirect influence or control, transactions in mutual fund shares or U.S. government or federal agency obligations, and all transactions involving in the aggregate $10,000 or less during the calendar quarter.

3. Paragraph (a) of § 12.7 is revised.

§ 12.7 Exceptions.

The following exceptions to this Part shall apply:

(a) The requirements of 12 CFR 12.3(b) through 12 CFR 12.3(d) and 12 CFR 12.6(a) through 12 CFR 12.6(c) shall not apply to banks having an average of less than 200 securities transactions per year for customers over the prior three calendar year period, exclusive of transactions in U.S. government and federal agency obligations.

* * * * *

Dated: December 21, 1979.

John G. Heimann,

Comptroller of the Currency.

[FR Doc. 79-39849 Filed 12-28-79; 8:45 am]

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FEDERAL RESERVE SYSTEM

12 CFR Part 226

[Reg. Z; Docket No. R-0239]

Truth in Lending; Calculation and Disclosure of Annual Percentage Rates

AGENCY: Board of Governors of the Federal Reserve System.

ACTION: Final rule.

SUMMARY: The Board is adopting revisions in the requirements of Regulation Z, Truth in Lending, with regard to the calculation and disclosure of the annual percentage rate and other credit terms. The most important changes are: (1) adoption of a tolerance of ⅛ of 1 percentage point in either direction from the exact annual percentage rate, in place of the existing rounding rule; (2) adoption of simplified rules for treating minor payment schedule variations; and (3) expansion of the protection available to creditors who have relied in good faith on faulty calculation tools. The revisions, which are set forth below, include amendments to §§ 226.5 and 226.8 of the regulation, deletion of several Board Interpretations, and expansion of Supplement I to Regulation Z. The issues addressed were the subject of a prior proposal published by the Board (44 FR 45141, August 1, 1979).

EFFECTIVE DATE: January 10, 1980, but compliance optional until October 1, 1980.

FOR FURTHER INFORMATION CONTACT: Regarding the regulation: Dolores S. Smith, Section Chief (202-452-2412), Ellen Maland, Attorney (202-452-3867), or Margaret Stewart, Attorney (202-452-2412), Division of Consumer and Community Affairs, Board of Governors of the Federal Reserve System, Washington, D.C. 20551. Regarding the economic impact analysis: Thomas A. Durkin, Economist (202-452-2503), Division of Research and Statistics, Board of Governors of the Federal Reserve System, Washington, D.C. 20551.

SUPPLEMENTARY INFORMATION: (1) Introduction. In January 1979, the

Board's staff undertook an extensive review of the provisions of Regulation Z relating to calculation and disclosure of the annual percentage rate. This rate expresses in percentage terms the cost of a consumer credit transaction. Because of its usefulness as a tool for comparing various credit sources, this term is considered to be the most important disclosure required by the Truth in Lending Act. The Act directs the Board, as part of its rulemaking responsibilities, to prescribe rules for calculating and disclosing this rate.

The review focused primarily on the variety of special rules in the regulation regarding annual percentage rate determination and the absence of specific guidance in certain areas. The study was prompted by adoption in January 1979 of uniform guidelines for the enforcement of Regulation Z (44 FR 1222, January 4, 1979), efforts by Congress and the Board to simplify the requirements of the Act and Regulation Z, and the Board's Regulatory Improvement Project.

The proposal published by the Board last January (44 FR 1116, January 4, 1979) described five areas in which the Board believed clarification or further guidance was necessary, together with alternative ways of dealing with the issues raised. Based on the more than 300 comments received in response to this publication, the Board in August 1979 (44 FR 45141, August 1, 1979), published specific regulatory changes which it proposed to make regarding these issues. The August publication proposed amendments to §§ 226.5 and 226.8 of the regulation, revision of the Board's Supplement I (the rules for determination of the annual percentage rate), and revision of Volume I of the Board's Annual Percentage Rate Tables.

Approximately 235 commenters responded to the August proposal. The great majority of comments were from banks and other financial institutions. Based on these comments and the Board staff's analysis, the Board now adopts amendments to §§ 226.5 and 226.8, together with revisions to Supplement I to Regulation Z. These changes are discussed below. The Board has decided not to make the proposed changes to Volume I of the Board's Annual Percentage Rate Tables.

In order to assist creditors in adapting to the requirements of the regulation as amended, the Board will not require them to comply with the revised regulation until October 1, 1980. However, the Board notes that many of the revisions, such as the ⅛ of 1 percentage point tolerance, provide creditors with greater protection than is available to them under the existing regulation. Therefore, the Board has determined that the revised provisions should be effective concurrently with the existing regulation until October 1, 1980. Creditors who have the capability and who wish to comply with the revisions before that time may do so, while creditors who require a longer period of adjustment may continue to operate under the existing rules in the interim. After October 1, 1980, all creditors will be required to comply with the new rules.

Set forth below is a discussion of the changes to be made and the economic impact of the changes, followed by the text of the amendments to §§ 226.5 and 226.8, and the revised Supplement I to Regulation Z.

(2) Regulatory Provisions. *Tolerance.* Section 226.5(b)(1) sets forth the general standard of accuracy for calculation and disclosure of the annual percentage rate in closed end credit transactions. An annual percentage rate will be considered accurate, subject to the exceptions discussed below, if it is within ⅛ of 1 percentage point above or below the exact annual percentage rate. Currently, the annual percentage rate must be disclosed either as an exact rate or rounded to the nearest ¼ of 1 percentage point.

The Board notes that the ⅛ of 1 percentage point tolerance is in accord with the Truth in Lending amendments now being considered by Congress and that a large majority of the commenters addressing this issue supported such a tolerance. The comments indicated no basis for applying different tolerance rules depending on such factors as length of the transaction or type of credit extended. Therefore, the tolerance will be available, as a general rule, without regard to any distinguishing factors.

The regulation continues to recognize both the actuarial method and the United States Rule method in calculation of the annual percentage rate. Under the actuarial method, the unpaid balance of the obligation is increased by the finance charge earned during each unit-period (or fractional unit-period), and decreased by any payments made at the end of that period. Under the United States Rule method, which is used by many credit unions, any earned, unpaid finance charge is not added to the unpaid balance of the obligation, but is accumulated separately until such time as payments are sufficient to pay the earned unpaid finance charge. A second characteristic distinguishing this method from the actuarial method is that no interest calculation is made until a payment is received.

In application of the ⅛ of 1 percentage point tolerance, the accuracy of the disclosed annual percentage rate will be judged in accordance with whichever of these two methods was used in calculating the disclosed rate. In transactions involving equal payments and equal periods, either method will produce the same annual percentage rate. In irregular transactions, however, there may be slight variations in the annual percentage rate.

Supplement I. Supplement I to Regulation Z, which was first adopted 10 years ago, sets forth equations and instructions for determining the exact annual percentage rate. This material, which is incorporated by reference in the regulation, is not intended for day-to-day use by creditors in their lending operations. Rather, it is used by manufacturers of calculation tools in producing and verifying their products. These products are in turn used by a great majority of creditors; in this sense, the supplement provides a standard of accuracy for the credit industry.

In its August proposal, the Board suggested revising Supplement I to expand the number and variety of examples, to include explanations and equations for determining the annual percentage rate in accordance with the United States Rule as well as the actuarial method, and to provide further guidance on determination of unit-periods and fractional unit-periods.

With the exception of the material relating to the United States Rule, the revisions proposed in Supplement I have been adopted by the Board. The material relating to the United States Rule has not been adopted because the comments and other information available to the Board indicated that there is no compelling need for this material. In view of the apparent lack of necessity for such an expansion, the Board has determined that Supplement I should continue to be based solely on the actuarial method. As indicated above, however, the supplement has been expanded to provide further examples and more specificity regarding the determination of unit-periods and fractional unit-periods. The existing Supplement I permits fractional unit-periods in the denominator for the actuarial method equation to be expressed in either a linear or an exponential form. In order to provide a more uniform standard, the new supplement requires the use of the linear form, which is widely used in the credit industry.

Board tables and other tools. Section 226.5(b)(2)(i) describes Volumes I and II of the Annual Percentage Rate Tables. This material provides creditors with a readily-usable calculation tool applying the technical information contained in Supplement I. An annual percentage rate computed in accordance with the instructions in the tables is deemed to comply with the regulation, even in those cases where its use may produce an annual percentage rate that falls outside the general rule on accuracy. Volume I, the more commonly-used of the tables, applies to credit transactions involving equal payment amounts and periods, as well as to transactions with an odd first payment, odd first period, or odd final payment.

In its August proposal, the Board had suggested revising Volume I by expanding the explanatory material regarding its use, amending the adjustments needed to accommodate certain irregularities, and reprinting the factor tables in ⅛ of 1 percentage point rather than ¼ of 1 percentage point increments. The Board has now determined that the proposed changes are not warranted. In making this decision, the Board was particularly mindful of the possible difficulties creditors would experience in adjusting to the new material, as compared to the relatively slight increase in accuracy produced by the revisions. The Board also notes that this volume has been widely distributed throughout the credit industry in the last 10 years, compounding the difficulty of disseminating new material.

Section 226.5(b)(2)(ii) authorizes the use of any other computation tool, including charts, tables, computers and calculators, which produces the same degree of accuracy as called for by § 226.5(b)(1).

Single add-on rate. Section 226.5(b)(3) permits creditors assessing finance charges in a certain manner to disclose an annual percentage rate which may not meet the general accuracy requirements of the regulation. Where a single add-on rate is applied to all transactions up to 60 months in length, the creditor may disclose for all those transactions the single highest annual percentage rate. For example, an add-on rate of $10 per $100 per year would produce the following annual percentage rates at various maturities: at 3 months, 14.9%; at 21 months, 18.18%; and at 60 months, 17.27%. Under this provision, the creditor may disclose for all transactions up to 60 months an annual percentage rate of 18.18% (the highest annual percentage rate). This provision reflects the current Board Interpretation § 226.502. In its August proposal, the Board had suggested limiting this special rule to transactions with maturities greater than 9 months since short-term transactions produce the greatest degree of overstatement. As an alternative, the Board also requested comment on whether the rule could be eliminated entirely.

The available evidence indicates that the present rule may still be necessary for certain creditors, for short-term transactions as well as those over 9 months in length. Therefore, the Board is retaining the current rule enunciated in Interpretation § 226.502. For organizational purposes, however, the Board is eliminating the interpretation and placing this special rule in the body of the regulation itself, as reflected in § 226.5(b)(3). The Board emphasizes that this provision continues to be available only in transactions which are payable in equal installments at equal intervals.

Range of balances. Section 226.5(b)(4), like the preceding paragraph, represents an exception to the general rule on accuracy of disclosed rates, for creditors assessing finance charges by a certain method. This special rule is currently reflected in § 226.5(c)(2)(iv). Under this rule, creditors applying a single finance charge to all balances within a specified range may understate the annual percentage rate by up to 8% of the actual rate for the lowest balance, by disclosing for all balances within that range the annual percentage rate computed on the median balance. That is, if a finance charge of $9 applies to all balances between $91 and $100, an annual percentage rate of 10% (the rate on the median balance) may be disclosed as the annual percentage rate for all balances, even though a $9 finance charge applied to the lowest balance ($91) would actually produce an annual percentage rate of 10.7%.

In its August publication, the Board had proposed two alternatives: (1) limit the special rule to transactions involving orders by mail or telephone, or (2) eliminate the special provision entirely. The available evidence indicates that a need may continue to exist for this provision, but only with respect to the preliminary disclosures made on series of sales agreements and orders by mail or telephone. Therefore, the Board is limiting § 226.5(b)(4) to annual percentage rates disclosed pursuant to §§ 226.8(g) (1) and (2) and 226.8(h)(1).

Minor irregularities—annual percentage rate.—The Board is adopting two provisions, §§ 226.5(b)(5) and 226.8(r), that deal with the impact of minor payment schedule irregularities on the annual percentage rate, finance charge and other disclosures. A common irregularity is an initial payment period that is longer or shorter than the other periods; another involves one payment that differs in amount from the other payments.

The new § 226.5(b)(5) states that, for purposes of computing an annual percentage rate, the irregularity of an initial payment period may be disregarded if it is within a specified number of days longer or shorter than a regular period. Since first period irregularities have a greater impact on the rate in short-term than in long-term transactions, the provision makes distinctions based on the length of the term. The degree of first period irregularity that may be ignored under the new provision is shown in the following table:

For a term of the transaction of.	Up to 1 yr......	At least 1 yr. Less than 10 yrs.	10 yrs. and over.
The first period may be treated as regular if it differs from regular by up to this many days.	6 shorter, 13 longer.	11 shorter, 21 longer.	Any number shorter, 32 longer.

In addition, any payment irregularity that results from an irregularity in the first period within these specified ranges could also be disregarded.

This new provision replaces the minor irregularities provisions in the existing § 226.5(d) of the regulation and Board Interpretation § 226.503. It provides a similar approach in defining which irregularities in the first period may be disregarded by comparing the number of days in the irregular period to the number of days in a regular period. The new rules are simpler to apply, however, since they make no distinctions based on the length of the unit-period. Elimination of that distinction appears justified since the effect of first period variations on the annual percentage rate is more closely related to the term of the transaction than to the unit-period's length; furthermore, dropping the distinction permits a simpler and more understandable rule for determining which irregularities may be disregarded. The ranges of irregularities specified are basically those that have been applicable to transactions payable monthly under the existing rules. This choice was made because a month is the most common unit-period and because those ranges are the most generous.

The new provision also differs from the existing version in its treatment of variations in payment amounts. The existing rule requires that the irregular payment be measured against the regular payment to see if it falls within 25% or 50% (depending on the transaction's term) of the regular payment. If it met that test, it could be disregarded. The new rule simply states that any payment irregularity that *results from* a first period irregularity within the specified ranges may be ignored. By describing the variation in payment amount in terms of its cause, the most common minor irregularity will be taken care of, while the need to independently measure the irregular payment is eliminated.

In its August proposal, the Board had offered three alternative ways of dealing with the effect on the annual percentage rate of payment schedule irregularities. The most stringest of the alternatives was to eliminate the minor irregularities provisions and require all creditors to disclose a rate meeting the general standard of accuracy of ⅛ of 1 percentage point. There was relatively little support for this approach among the commenters. The second alternative suggested was to continue the approach currently taken and simply improve the regulatory language. This alternative received the greatest support from the commenters. The third option was to replace the existing provision with one permitting a larger degree of overstatement (but a smaller degree of understatement) where an initial payment or payment period is irregular.

The board has chosen the second of the three alternatives by adopting a provision that provides essentially the same protections now available to creditors computing an annual percentage rate, while simplifying the determination of which irregularities fall within the specified ranges.

Minor irregularities—finance charge. The new § 226.8(r) provides a similar minor irregularities provision for purposes of computing and disclosing the finance charge and the schedule of payments. It is parallel to the annual percentage rate provision discussed above, new § 226.5(b)(5), in that it defines in the same way the first period irregularities that may be disregarded. It differs from both Board Interpretation § 226.505 (which it replaces) and the new § 226.5(b)(5), however, in that it permits disregarding only variations in the *final* payment that result from first period irregularities. The Board believes that this limitation is warranted, on the grounds that adjustments made in other ways do not require this special treatment. If an adjustment is made to the first payment to account for an irregular first period (for example, where a first payment due January 1 on a mortgage loan made on November 20 is increased to pay the extra 10 days' interest) or where the charge for the odd first period is spread out among all the payments, it is a simple matter to reflect the adjustments when disclosing the finance charge and the payment schedule.

The minor irregularities protection is needed, however, when the adjustment for an irregular first period is made at the end of the transaction. For example, a credit union making a loan on November 20 with the first payment due January 1 will frequently collect payments that are determined as if there were a regular first period, but will accrue interest based on the actual time the principal is outstanding and will adjust the final payment to account for the effect of the long first period. The new § 226.8(r) permits the credit union to disregard the effect of such a practice in disclosing the finance charge and payment schedule.

This provision differs from the one proposed in August in several ways. Its applicability is not limited to certain so-called simple interest obligations. Furthermore, it permits less overstatement (resulting from long first periods), while countenancing some degree of understatement (resulting from short first periods). The comments suggested that long first periods are far more common than short ones and that the minor irregularities provision should be expanded to cover them. In addition, the provision adopted has the advantage of providing parallel rules for defining period irregularities for purposes of both annual percentage rate and finance charge computation.

It should be noted in connection with both of the minor irregularities provisions that creditors are always free to arrange payment schedules with irregularities that fall outside the categories defined in those provisions. In such cases, a creditor has two choices: it can take specific account of the effect such irregularities have on the disclosures; alternatively, in the case of the annual percentage rate, it can ignore the irregularity provided the disclosed rate is not more than ⅛ of 1 percentage point from the true rate.

Certain creditor practices. The new § 226.8(s) states that, when making calculations and disclosures, creditors may ignore the effect of certain facts or practices, namely, collecting of payments in whole cents, changing dates of payments and advances when the scheduled date falls on a weekend or holiday, and the fact that months have different numbers of days. These things have very slight effects on disclosures and the Board believes the negligible benefit to consumers of taking account of such matters does not justify the burden of doing so.

This provision differs from the August proposal in that the authorization to treat all months as equal is not restricted to simple interest creditors, and the requirement to mark as an estimate the finance charge disclosed in reliance on such a provision has been deleted.

Faulty calculation tools. Section 226.5(c) represents an extension of the existing § 226.5(c)(3). Under the latter provision, an annual percentage rate or finance charge error that results from an error in the chart or table used by the creditor does not violate Regulation Z. The Board proposed in its August publication to extend this provision to errors resulting from the use of faulty calculators and computers, or, in the alternative, to eliminate the provision entirely. The first alternative—extension of the protection to all types of calculation tools—would not have extended to the software or programming elements of electronic calculation tools. This proposal was suggested in an effort to limit the protection of the rule to errors beyond the creditor's control and to alleviate possible enforcement difficulties in confirming errors in software.

The comments received by the Board on this issue clearly supported the extension of the provision to all calculation tools, including software elements of calculators and computers. The Board believes that this protection should be made available for all calculation tools, without regard to type, and new § 226.5(c), set forth below, reflects this decision. In the Board's view, the vast majority of creditors do not possess the specialized technical knowledge necessary to evaluate calculation tools internally and must continue to rely on the producers of those tools to provide that knowledge.

The inaccuracies which may be countenanced by this provision will, in the Board's view, be offset by the restrictions imposed on the availability of the protection. First, the creditor's reliance on the tool must be in good faith. This imposes on the creditor a reasonable degree of responsibility for assuring that the tool in question provides the degree of accuracy required by the regulation. For example, the creditor might verify the results obtained by use of the tool by comparing those results to the figures obtained by use of another calculation tool. The creditor might also reasonably rely on the expertise of the enforcement agency in making such a determination.

Second, any creditor with reason to believe that the tool is in fact inaccurate must promptly discontinue use of that tool and notify the Federal Reserve Board of the error. That is, a creditor who was aware of the error and continued to use the tool for disclosure purposes would no longer have the protection of § 226.5(c) as to inaccurate disclosures made after that time. The Board imposes no specific requirement on creditors with regard to the information contained in the notification to the Board. However, the description of the tool in question must be specific enough to identify the tool. The Board envisions that the notification would normally include the name of the manufacturer or producer of the tool, a trade name, or a model name or number. In describing the error, the creditor need not identify the specific source of the error, as for example by determining the steps in a calculator program which produced the inaccurate results. While the creditor is encouraged to include its opinion regarding the source of the error, a description of the erroneous results and the transactions to which they relate would be sufficient for purposes of this requirement.

Open end credit. Section 226.5(a), relating to the determination of the annual percentage rate in open end credit, has been retained in its present form except for the addition of the ⅛ of 1 percentage point tolerance. Thus, an annual percentage rate calculated and disclosed pursuant to § 226.5(a) would be subject to the same standard of accuracy as that set forth for closed end credit transactions. The Board staff's analysis, together with the comments, indicates no basis for making any other changes in the provisions of § 226.5(a) at this time.

Effective date. In accordance with 5 U.S.C. 553(d)(1) and (3), the Board has determined that the effective date of these amendments need not be delayed 30 days, but may be issued effective immediately since these amendments for the most part are less restrictive than the provisions that they replace. In addition, compliance with the amendments is not required until 9 months have elapsed, thus providing persons subject to these provisions sufficient time to analyze their procedures and tools in light of the changes made and adjust to the new requirements. Although mandatory compliance is not immediately required, the Board has determined that both the new and existing provisions shall be in effect concurrently during the 9-month interim period so that creditors wishing and able to take advantage of the new provisions at this time may do so.

(3) Economic Impact Analysis. According to § 102 of the Act, Truth in Lending was intended "to assure a meaningful disclosure of credit terms so that the consumer will be able to compare more readily the various credit terms available to him and avoid the uninformed use of credit. . . ." However, in the 10 years since the effective date of the Act, the complexity of the Act and its implementing regulation has presented serious compliance difficulties. Despite indications that most financial institutions have made good-faith attempts to comply with Regulation Z, technical violations are common. In its *Annual Report on Truth in Lending for the Year 1978*, the Board reported that more than four-fifths of the banks and almost three-fifths of the credit unions examined that year by the Federal regulatory agencies were found not to be in complete compliance with Regulation Z. This *Annual Report* indicated, though, that "for both kinds of institutions most violations were nonsubstantive." (See p. 11, *Annual Report for 1978*.) Nonsubstantive violations include such things as errors that might arise on account of misunderstanding the regulation, clerical errors, carelessness, and oversights that do not materially affect the accuracy of the most important disclosures. The difficulties of complying in good faith with a complex law and regulation, along with indications that not all current provisions of Truth in Lending are helpful to consumers in shopping for credit, have prompted Congressional calls for Truth in Lending simplification.

Earlier this year, as part of its own efforts to simplify its regulations, the Board requested public comment on certain relatively technical issues concerning methods of calculating and disclosing annual percentage rates and finance charges under Regulation Z (44 FR 1116, January 4, 1979, and 44 FR 45141, August 1, 1979). Each of the changes resulting from this review appears to be consistent with the goal of simplifying the regulation. In general, the amendments should increase somewhat the levels of technical compliance with the regulation without requiring creditors to make costly adjustments in their operations. Also, although technical compliance is made somewhat easier, it is done without sacrificing important consumer protections.

The first major amendment concerns the degree of tolerance allowed in disclosures of annual percentage rates which would comply with Regulation Z. Existing § 226.5(b) of Regulation Z requires, as a general rule, that the annual percentage rate disclosed be either the precise rate or the precise rate rounded to the nearest ¼ of 1 percentage point. Apparently some creditors have interpreted this provision to be a true tolerance, which it is not. The amendment will permit a fixed tolerance of ± ⅛ of 1 percentage point on all transactions, which is the tolerance proposed in the Truth in Lending Simplification Act that has passed the Senate. The amendment will have the effect of bringing into compliance some transactions which are, technically, not in compliance because of misconceptions about or errors in using the rounding rule. Consumer protections should not be sacrificed because the tolerance allowed to aid compliance is relatively narrow. At present, there is no available evidence that consumers make credit decisions on the basis of variations in annual percentage rates as small as ⅛ of 1 percentage point. In terms of dollars and cents, a tolerance of ⅛ of 1 percentage point is about 7 cents per $100 financed on 12-month loans and about 22 cents per $100 on 36-month loans. On larger, longer-term loans like mortgages where ⅛ of 1 percentage point may be more significant in absolute dollar terms, it is still a small proportion of the annual percentage rate at current market levels.

The second major amendment concerns the part of Regulation Z known as the minor irregularities rule. A relatively narrow tolerance, such as the tolerance resulting from either the ⅛ of 1 percentage point rule or the rule of rounding to the nearest ¼ of 1 percentage point, may not be sufficient to ease certain compliance problems in cases involving irregular payments. Creditors often arrange, mostly for the convenience of their customers, payment patterns which allow minor irregularities in the schedule of payments. A common example is an abnormally long first period so that monthly payments can be due on the customer's payday. The problem is that on loans with relatively short maturities a long (or short) first payment or other irregularity may cause the true annual percentage rate to deviate from the disclosed rate by more than the allowed tolerance. The result is an added burden for creditors attempting to comply with the regulation in good faith but also trying to satisfy the payment period desires of their customers. For this reason Regulation Z allows, in effect, wider tolerances for certain variations in payment amounts and patterns that fall within the minor irregularities provisions.

The existing minor irregularities rule is complex. It allows a payment to be classified as regular for purposes of computing an annual percentage rate if it varies in size from regular payments by no more than a certain percentage. It also permits a first payment period to be treated as regular if it varies from the other periods by no more than a certain number of days. The number of days in first periods that may be counted as regular depends upon the frequency of payment and upon the original maturity of the loan contract. All other payments must be equal in size and be scheduled at equal intervals.

The new minor irregularities provisions appear to be a useful simplification because they achieve the basic purpose of the minor irregularities rule—reducing the compliance burden for creditors attempting to accommodate customers—and it makes the present rule clearer and easier to understand. This approach, together with the tolerance rule, should aid good-faith compliance efforts somewhat, especially for newer or smaller creditors not as familiar with the technicalities of Regulation Z but attempting to comply without the aid of expensive legal advice or calculating equipment. For two reasons it does not seem that understatement or overstatement of the annual percentage rate disclosed as a result of the minor irregularities rule is harmful to consumers. First, if a long first period or a smaller first payment is counted as regular under the minor irregularities rule, to the extent that the disclosed rate varies from the exact annual percentage rate, the exact rate will be lower. Since a long first period is probably the most frequent minor irregularity, consumers generally will not be burdened with annual percentage rates higher than those disclosed. Second, minor irregularities in the first period are often arranged for the convenience of consumers *after* the essentials of the credit offer are accepted. As a result, variations in annual percentage rates resulting from minor irregularities in such cases are not likely to be very useful in credit shopping.

The third major provision concerns extending to users of calculating equipment the existing protection from liability provided to creditors relying in good faith on faulty charts or tables. In many cases the sophistication of the technical skills needed to evaluate the performance of these tools requires creditors to rely on the assurances of manufacturers. On occasion, minor errors beyond their control could subject creditors to major litigation costs and civil penalties. Although the ⅛ of 1 percentage point tolerance may obviate the need for protection from some minor errors, protection for a creditor using calculating devices and computers in good faith appears reasonable. Consumer's interests should be protected by the fact that conscious errors or continued use of devices known to produce erroneous results would subject creditors to the penalties of Truth in Lending, as with any other violation. Furthermore, protection for creditors using calculating devices and computers in good faith should facilitate the adoption of improved calculating equipment.

(4) Text of Amendments. In consideration of the foregoing and pursuant to the authority granted in § 105 of the Truth in Lending Act (15 U.S.C. 1604 (1970)), the Board amends Regulation Z (12 C.F.R. Part 226) as follows:

§ 226.5. [Amended]

1. Effective October 1, 1980, existing § 226.5(a) is amended by deleting both the title "General rule—open end credit accounts" and the first sentence beginning "The annual percentage rates for open end credit" and ending "nearest quarter of 1 percent."; §§ 226.5 (b) through (e), Interpretations §§ 226.500, 226.503, and 226.505, and Supplement I to Regulation Z are rescinded.

2. Effective January 10, 1980 § 226.5 is amended by amending paragraph (a) and revising paragraphs (b) and (c) in their entirety. Section 226.8 is amended by adding paragraphs (r) and (s) and Supplement I to Regulation Z, to read as follows:

§ 226.5. Determination of annual percentage rate.

(a) *Open end credit—general rule.* The annual percentage rate is a measure of the cost of credit, expressed as a yearly rate. An annual percentage rate shall be considered accurate if it is not more than ⅛ of 1 percentage point above or below the annual percentage rate determined in accordance with this section.

* * * * *

(b) *Credit other than open end.* (1) *General rule.* The annual percentage rate is a measure of the cost of credit, expressed as a yearly rate, which relates the amount and timing of value received by the consumer to the amount and timing of payments made. The annual percentage rate shall be determined in accordance with either the actuarial method or the United States Rule method and shall be considered accurate if it is not more than ⅛ of 1 percentage point above or below the annual percentage rate determined in accordance with whichever method is used. Explanations, equations and instructions for determining the annual percentage rate is accordance with the actuarial method are set forth in Supplement I, which is incorporated in this Part by reference.

(2) *Computation tools.* (i) The Regulation Z Annual Percentage Rate Tables produced by the Board may be used to determine the annual percentage rate, and any such rate determined from these tables in accordance with the instructions contained therein will comply with the requirements of this section. Volume I of the tables applies to single advance transactions involving up to 480 monthly payments or 104 weekly payments. It may be used for regular transactions, and for transactions with any of the following irregularities: an odd first period, an odd first payment, and an odd final payment. Volume II applies to transactions involving multiple advances and any type of payment or period irregularity.

(ii) Creditors may use any other computation tool in determining the annual percentage rate so long as the annual percentage rate so determined equals the annual percentage rate determined in accordance with Supplemental I, within the degree of accuracy set forth in paragraph (b)(1) of this section.

(iii) Supplement I and Volumes I and II may be obtained from any Federal Reserve Bank or from the Board in Washington, D.C. 20551.

(3) *Single add-on rate transactions.* If a single add-on rate is applied to all transactions with maturities up to 60 months and if all payments are equal in amount and period, a single annual percentage rate may be disclosed for all such transactions, provided that it is the highest annual percentage rate for any such transaction.

(4) *Certain transactions involving ranges of balances.* For purposes of disclosing the annual percentage rate referred to in §§ 226.8(g) (1) and (2) (Orders by mail or telephone) and 226.8(h)(1) (Series of sales), if the same finance charge is imposed on all balances within a specified range of balances, the annual percentage rate computed for the median balance may be disclosed for all of the balances. However, if the annual percentage rate computed for the median balance understates the annual percentage rate computed for the lowest balance by more than 8% of the latter rate, the annual percentage rate shall be computed on whatever lower balance will produce an annual percentage rate which does not result in an understatement of more than 8% of the rate determined on the lowest balance.

(5) *Payment schedule irregularities.* In determining and disclosing the annual

percentage rate, a creditor may disregard an irregularity in the first period [5c] that falls within the limits described below and any payment schedule irregularity that results from the irregular first period:

(i) For transactions in which the term [5c] is less than 1 year: a first period not more than 6 days shorter or 13 days longer than a regular period;

(ii) For transactions in which the term is at least 1 year and less than 10 years: a first period not more than 11 days shorter or 21 days longer than a regular period; or

(iii) For transactions in which the term is at least 10 years: a first period shorter than or not more than 32 days longer than a regular period.

(c) *Errors in calculation tools.* An error in disclosure of the annual percentage rate or finance charge shall not, in itself, be considered a violation of this Part if:

(1) The error resulted from a corresponding error in any calculation tool, such as a chart, table, calculator or computer, used in good faith by the creditor, and

(2) Upon discovery of the error, the creditor promptly

(i) Discontinues use of that calculation tool for disclosure purposes, and

(ii) Notifies the Board in writing of the error in the calculation tool. The notification shall include an identification of the tool and a description of the error, and shall be addressed to the Division of Consumer and Community Affairs, Board of Governors of the Federal Reserve System, Washington, D.C. 20551.

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§ 226.8 Credit other than open end—specific disclosure.

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(r) *Payment schedule irregularities.* In determining and disclosing the finance charge and the payment schedule under paragraph (b)(3) of this section, a creditor may disregard an irregular final payment or portion of a final payment that results from an irregular first period [13a] within the limits described below and may treat the irregular first period as if it were regular:

(i) For transactions in which the term [13a] is less than 1 year: a first period not more than 6 days shorter or 13 days longer than a regular period;

(ii) For transactions in which the term is at least 1 year and less than 10 years: a first period not more than 11 days shorter or 21 days longer than a regular period; or

(iii) For transactions in which the term is at least 10 years: a first period shorter than or not more than 32 days longer than a regular period.

(s) *Disregarding certain practices.* In making calculations and disclosures, a creditor need not take into account the effects of the following:

(1) The fact that payments are collected in whole cents;

(2) The fact that the dates of payments and advances are changed because the scheduled date falls on a Saturday, Sunday, or holiday; and

(3) The fact that months have different numbers of days.

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Supplement I to Regulation Z

Rules for Determining the Annual Percentage Rate for Other than Open End Credit Transactions Pursuant to § 226.5(b) of Regulation Z

I. Introduction

Section 226.5(b) of Regulation Z provides that the annual percentage rate for other than open end credit transactions shall be determined in accordance with either the actuarial method or the United States Rule method. This supplement contains an explanation of the actuarial method as well as equations, instructions and examples of how this method applies to single advance and multiple advance transactions and transactions involving required deposit balances (as defined in § 226.8(e) of the regulation).

Under the actuarial method, at the end of each unit-period (or fractional unit-period) the unpaid balance of the amount financed is increased by the finance charge earned during that period and is decreased by the total payment (if any) made at the end of that period. The determination of unit-periods and fractional unit-periods shall be consistent with the definitions and rules in Sections II (C), (D) and (E) and the general equation in Section II (H).

In contrast, under the United States Rule method, at the end of each payment period, the unpaid balance of the amount financed is increased by the finance charge earned during that payment period and is decreased by the payment made at the end of that payment period. If the payment is less than the finance charge earned, the adjustment of the unpaid balance of the amount financed is postponed until the end of the next payment period. If at that time the sum of the two payments is still less than the total accrued finance charge for the two payment periods, the adjustment of the unpaid balance of the amount financed is postponed still another payment period, and so forth.

II. Instructions and Equations for the Actuarial Method

(A) *General rule.* The annual percentage rate shall be the nominal annual percentage rate determined by multiplying the unit-period rate by the number of unit-periods in a year.

(B) *Term of the transaction.* The term of the transaction begins on the date of its consummation, except that if the finance charge or any portion of it is earned beginning on some other date, the term begins on that other date. The term ends on the date the last payment is due, except that if an advance is scheduled after that date, the term ends on the later date. For computation purposes, the length of the term shall be equal to the time interval between any point in time on the beginning date to the same point in time on the ending date.

(C) *Definitions of time intervals.* (1) A period is the interval of time between advances or between payments and includes the interval of time between the date the finance charge begins to be earned and the date of the first advance thereafter or the date of the first payment thereafter, as applicable.

(2) A common period is any period that occurs more than once in a transaction.

(3) A standard interval of time is a day, week, semimonth, month, or a multiple of a week or a month up to, but not exceeding, 1 year.

(4) All months shall be considered equal. Full months shall be measured from any point in time on a given date of a given month to the same point in time on the same date of another month. If a series of payments (or advances) is scheduled for the last day of each month, months shall be measured from the last day of the given month to the last day of another month. If payments (or advances) are scheduled for the 29th or 30th of each month, the last day of February shall be used when applicable.

(D) *Unit-period.* (1) In all transactions other than a single advance, single payment transaction, the unit-period shall be that common period, not to exceed 1 year, that occurs most frequently in the transaction, except that

(a) If 2 or more common periods occur with equal frequency, the smaller of such common periods shall be the unit-period; or

(b) If there is no common period in the transaction, the unit-period shall be that period which is the average of all periods rounded to the nearest whole standard interval of time. If the average is equally near 2 standard intervals of time, the lower shall be the unit-period.

(2) In a single advance, single payment transaction, the unit-period shall be the term of the transaction, but shall not exceed 1 year.

(E) *Number of unit-periods between 2 given dates.* (1) The number of days between 2 dates shall be the number of 24-hour intervals between any point in time on the first date to the same point in time on the second date.

(2) If the unit-period is a month, the number of full unit-periods between 2 dates shall be the number of months measured back from the later date. The remaining fraction of a unit-period shall be the number of days

[5c] For purposes of this paragraph, the "first period" is the period from the date on which the finance charge begins to be earned to the date of the first payment, and the "term" is the period from the date on which the finance charge begins to be earned to the date of the final payment.

[13a] For purposes of this paragraph, the "first period" is the period from the date on which the finance charge begins to be earned to the date of the first payment, and the "term" is the period from the date on which the finance charge begins to be earned to the date of the final payment.

measured forward from the earlier date to the beginning of the first full unit-period, divided by 30. If the unit-period is a month, there are 12 unit-periods per year.

(3) If the unit-period is a semimonth or a multiple of a month not exceeding 11 months, the number of days between 2 dates shall be 30 times the number of full months measured back from the later date, plus the number of remaining days. The number of full unit-periods and the remaining fraction of a unit-period shall be determined by dividing such number of days by 15 in the case of a semimonthly unit-period or by the appropriate multiple of 30 in the case of a multimonthly unit-period. If the unit-period is a semimonth, the number of unit-periods per year shall be 24. If the number of unit-periods is a multiple of a month, the number of unit-periods per year shall be 12 divided by the number of months per unit-period.

(4) If the unit-period is a day, a week, or a multiple of a week, the number of full unit-periods and the remaining fraction of a unit-period shall be determined by dividing the number of days between the 2 given dates by the number of days per unit-period. If the unit-period is a day, the number of unit-periods per year shall be 365. If the unit-period is a week or a multiple of a week, the number of unit-periods per year shall be 52 divided by the number of weeks per unit-period.

(5) If the unit-period is a year, the number of full unit-periods between 2 dates shall be the number of full years (each equal to 12 months) measured back from the later date. The remaining fraction of a unit-period shall be:

(a) The remaining number of months divided by 12 if the remaining interval is equal to a whole number of months, or

(b) The remaining number of days divided by 365 if the remaining interval is *not* equal to a whole number of months.

(6) In a single advance, single payment transaction in which the term is less than a year and is equal to a whole number of months, the number of unit-periods in the term shall be 1, and the number of unit-periods per year shall be 12 divided by the number of months in the term.

(7) In a single advance, single payment transaction in which the term is less than a year and is *not* equal to a whole number of months, the number of unit-periods in the term shall be 1, and the number of unit-periods per year shall be 365 divided by the number of days in the term.

(F) *Percentage rate for a fraction of a unit-period.* The percentage rate of finance charge for a fraction (less than 1) of a unit-period shall be equal to such fraction multiplied by the percentage rate of finance charge per unit-period.

(G) *Symbols.* The symbols used to express the terms of a transaction in the equation set forth in Section II (H) are defined as follows:

A_k=The amount of the kth advance.

q_k=The number of full unit-periods from the beginning of the term of the transaction to the kth advance.

e_k=The fraction of a unit-period in the time interval from the beginning of the term of the transaction to the kth advance.

m=The number of advances.

P_j=The amount of the jth payment.

t_j=The number of full unit-periods from the beginning of the term of the transaction to the jth payment.

f_j=The fraction of a unit-period in the time interval from the beginning of the term of the transaction to the jth payment.

n=The number of payments.

i=The percentage rate of finance charge per unit-period, expressed as a decimal equivalent.

Symbols used in the examples shown in this supplement are defined as follows:

$\ddot{a}_{\overline{x}|}$ = The present value of 1 per unit-period for x unit-periods, first payment due immediately.

$$= 1 + \frac{1}{(1+i)} + \frac{1}{(1+i)^2} + \cdots\cdots + \frac{1}{(1+i)^{x-1}}$$

w = The number of unit-periods per year.

I = wi x 100 = The nominal annual percentage rate.

(H) *General equation.* The following equation sets forth the relationship among the terms of a transaction:

$$\frac{A_1}{(1+e_1 i)(1+i)^{q_1}} + \frac{A_2}{(1+e_2 i)(1+i)^{q_2}} + \cdots + \frac{A_m}{(1+e_m i)(1+i)^{q_m}} = \frac{P_1}{(1+f_1 i)(1+i)^{t_1}} + \frac{P_2}{(1+f_2 i)(1+i)^{t_2}} + \cdots + \frac{P_n}{(1+f_n i)(1+i)^{t_n}}$$

(I) *Solution of general equation by iteration process.* The general equation in Section II(H), when applied to a simple transaction in which a loan of $1000 is repaid by 36 monthly payments of $33.61 each, takes the special form:

$$A = \frac{33.61\,\ddot{a}_{\overline{36}|}}{(1+i)}$$

Step 1:
Let I_1=estimated annual percentage rate=12.50%
Evaluate expression for A, letting $i=I_1/(100w)$=.010416667
Result (referred to as A')=1004.674391

Step 2:
Let $I_2=I_1+.1$=12.60%
Evaluate expression for A, letting $i=I_2/(100w)$=.010500000
Result (referred to as A'')=1003.235366

Step 3:
Interpolate for I (annual percentage rate):

$$I = I_1 + .1\left[\frac{(A - A')}{(A''-A')}\right]$$

$$= 12.50 + .1\left[\frac{(1000.000000 - 1004.674391)}{(1003.235366 - 1004.674391)}\right] = 12.82483042\ \%$$

Step 4:
First iteration, let I_1=12.82483042% and repeat Steps 1, 2, and 3 obtaining a new I=12.82557859%
Second iteration, let I_1=12.82557859% and repeat Steps 1, 2, and 3 obtaining a new I=12.82557529%
In this case, no further iterations are required to obtain the annual percentage rate correct to two decimal places, 12.83%.

When the iteration approach is used, it is expected that calculators or computers will be programmed to carry all available decimals throughout the calculation and that enough iterations will be performed to make virtually certain that the annual percentage rate obtained, when rounded to two decimals, is correct.

Annual percentage rates in the examples below were obtained by using a 10 digit programmable calculator and the iteration procedure described above.

III. Examples for the Actuarial Method

(A) *Single advance transaction, with or without an odd first period, and otherwise regular.* The general equation in Section II (H) can be put in the following special form for this type of transaction:

$$A = \frac{1}{(1+fi)(1+i)^t}\left(P\,\ddot{a}_{\overline{n}|}\right)$$

Example (A)(1): Monthly payments (regular first period)
Amount advanced (A)=$5000. Payment (P)=$230.
Number of payments (n)=24.
Unit-period=1 month. Unit-periods per year (w)=12.
Advance, 1-10-78. First payment, 2-10-78.
From 1-10-78 through 2-10-78=1 unit-period. (t=1; f=0)
Annual percentage rate (I)=wi=.0969=9.69%

Example (A)(2): Monthly payments (long first period)

Amount advanced (A)=$6000. Payment (P)=$200.
Number of payments (n)=36.
Unit-period=1 month. Unit-periods per year (w)=12.
Advance, 2-10-78. First payment, 4-1-78.
From 3-1-78 through 4-1-78=1 unit-period. (t=1)
From 2-10-78 through 3-1-78=19 days. (f=19/30)
Annual percentage rate
(I)=wi=.1182=11.82%

Example (A)(3): Semimonthly payments (short first period)
Amount advanced (A)=$5000. Payment (P)=$219.17.
Number of payments (n)=24.
Unit-period=½ month. Unit-periods per year (w)=24.
Advance, 2-23-78. First payment, 3-1-78. Payments made on 1st and 16th of each month.
From 2-23-78 through 3-1-78=6 days. (t=0; f=6/15)
Annual percentage rate
(I)=wi=.1034=10.34%

Example (A)(4): Quarterly payments (long first period)
Amount advanced (A)=$10,000. Payment (P)=$385.
Number of payments (n)=40.
Unit-period=3 months. Unit-periods per year (w)=4.
Advance, 5-23-78. First payment, 10-1-78.
From 7-1-78 through 10-1-78=1 unit-period. (t=1)
From 6-1-78 through 7-1-78=1 month=30 days. From 5-23-78 through 6-1-78=9 days. (f=39/90)
Annual percentage rate
(I)=wi=.0897=8.97%

Example (A)(5): Weekly payments (long first period)
Amount advanced (A)=$500. Payment (P)=$17.60.
Number of payments (n)=30.
Unit-period=1 week. Unit-periods per year (w)=52.
Advance, 3-20-78. First payment, 4-21-78.
From 3-24-78 through 4-21-78=4 unit-periods. (t=4)
From 3-20-78 through 3-24-78=4 days. (f=4/7)
Annual percentage rate
(I)=wi=.1496=14.96%

(B) *Single advance transaction, with an odd first payment, with or without an odd first period, and otherwise regular.* The general equation in Section II(H) can be put in the following special form for this type of transaction:

$$A = \frac{1}{(1+fi)(1+i)^t}\left[P_1 + \frac{P\,\ddot{a}_{\overline{n-1}|}}{(1+i)}\right]$$

Example (B)(1): Monthly payments (regular first period and irregular first payment)
Amount advanced (A)=$5000. First payment ($P_1$)=$250.
Regular payment (P)=230. Number of payments (n)=24.
Unit-period=1 month. Unit-periods per year (w)=12.
Advance, 1-10-78. First payment, 2-10-78.
From 1-10-78 through 2-10-78=1 unit-period. (t=1; f=0)
Annual percentage rate
(I)=wi=.1008=10.08%

Example (B)(2): Payments every 4 weeks (long first period and irregular first payment)
Amount advanced (A)=$400. First payment ($P_1$)=$39.50.
Regular payment (P)=$38.31. Number of payments (n)=12.
Unit-period=4 weeks. Unit-periods per year (w)=52/4=13.
Advance, 3-18-78. First payment, 4-20-78.
From 3-23-78 through 4-20-78=1 unit-period. (t=1)
From 3-18-78 through 3-23-78=5 days. (f=5/28)
Annual percentage rate
(I)=wi=.2850=28.50%

(C) *Single advance transaction, with an odd final payment, with or without an odd first period, and otherwise regular.* The general equation in Section II(H) can be put in the following special form for this type of transaction:

$$A = \frac{1}{(1+fi)(1+i)^t}\left[P\,\ddot{a}_{\overline{n-1}|} + \frac{P_n}{(1+i)^{n-1}}\right]$$

Example (C)(1): Monthly payments (regular first period and irregular final payment).
Amount advanced (A)=$5000. Regular payment (P)=$230.
Final payment (P_n)=$280. Number of payments (n)=24.
Unit-period=1 month. Unit-periods per year (w)=12.
Advance, 1-10-78. First payment, 2-10-78.
From 1-10-78 through 2-10-78=1 unit-period. (t=1; f=0)
Annual percentage rate
(I)=wi=.1050=10.50%

Example (C)(2): Payments every 2 weeks (short first period and irregular final payment)
Amount advanced (A)=$200. Regular payment (P)=$9.50.
Final payment (P_n)=$30. Number of payments (n)=20.
Unit-period=2 weeks. Unit-periods per year (w)=52/2=26.
Advance, 4-3-78. First payment, 4-11-78.
From 4-3-78 through 4-11-78=8 days. (t=0; f=8/14)
Annual percentage rate
(I)=wi=.1222=12.22%

(D) *Single advance transaction, with an odd first payment, odd final payment, with or without an odd first period, and otherwise regular.* The general equation in Section II (H) can be put in the following special form for this type of transaction:

$$A = \frac{1}{(1+fi)(1+i)^t}\left[P_1 + \frac{P\,\ddot{a}_{\overline{n-2}|}}{(1+i)} + \frac{P_n}{(1+i)^{n-1}}\right]$$

Example (D)(1): Monthly payments (regular first period, irregular first payment, and irregular final payment)
Amount advanced (A)=$5000. First payment ($P_1$)=$250.
Regular payment (P)=$230. Final payment ($P_n$)=$280.
Number of payments (n)=24. Unit-period=1 month.
Unit-periods per year (w)=12.
Advance, 1-10-78. First payment, 2-10-78.
From 1-10-78 through 2-10-78=1 unit-period. (t=1; f=0)
Annual percentage rate
(I)=wi=.1090=10.90%

Example (D)(2): Payments every two months (short first period, irregular first payment, and irregular final payment)
Amount advanced (A)=$8000. First payment ($P_1$)=$449.36.
Regular payment (P)=$465. Final payment ($P_n$)=$200.
Number of payments (n)=20. Unit-period=2 months.
Unit-periods per year (w)=12/2=6.
Advance, 1-10-78. First payment, 3-1-78.
From 2-1-78 through 3-1-78=1 month.
From 1-10-78 through 2-1-78=22 days. (t=0; f=52/60)
Annual percentage rate
(I)=wi=.0730=7.30%

(E) *Single advance, single payment transaction.* The general equation in Section II (H) can be put in the special forms below for single advance, single payment transactions. Forms 1 through 3 are for the direct determination of the annual percentage rate under special conditions. Form 4 requires the use of the iteration procedure of Section II (I) and can be used for all single advance, single payment transactions regardless of term.

Form 1 - Term less than 1 year:

$$I = 100w\left(\frac{P}{A} - 1\right)$$

Form 2 - Term more than 1 year but less than 2 years:

$$I = \frac{50}{f}\left\{\left[(1+f)^2 + 4f\left(\frac{P}{A} - 1\right)\right]^{1/2} - (1+f)\right\}$$

Form 3 - Term equal to exactly a year or exact multiple of a year.

$$I = 100\left[\left(\frac{P}{A}\right)^{1/t} - 1\right]$$

Form 4 - Special form for iteration procedure (no restriction on term)

$$A = \frac{P}{(1+fi)(1+i)^t}$$

Example (E)(1): Single advance, single payment (term of less than 1 year, measured in days)
Amount advanced (A)=$1000. Payment (P)=$1080.
Unit-period=255 days. Unit-period per year (w)=365/255.
Advance, 1-3-78. Payment, 9-15-78.
From 1-3-78 through 9-15-78=255 days. (t=0; f=0)

Annual percentage rate
(I)=wi=.1145=11.45%. (Use Form 1 or 4.)

Example (E)(2): Single advance, single payment (term of less than 1 year, measured in exact calendar months)

Amount advanced (A)=$1000. Payment (P)=$1044.

Unit-period=6 months. Unit-periods per year (w)=2.

Advance, 7-15-78. Payment, 1-15-79.

From 7-15-78 through 1-15-79=6 mos. (t=1; f=0)

Annual percentage rate
(I)=wi=.0880=8.80%. (Use Form 1 or 4.)

Example (E)(3): Single advance, single payment (term of more than 1 year but less than 2 years, fraction measured in exact months)

Amount advanced (A)=$1000. Payment (P)=$1135.19.

Unit-period=1 year. Unit-periods per year (w)=1.

Advance, 7-17-78. Payment, 1-17-80.

From 1-17-79 through 1-17-80=1 unit period. (t=1)

From 7-17-78 through 1-17-79=6 mos. (f=6/12)

Annual percentage rate
(I)=wi=.0876=8.76%. (Use Form 2 or 4.)

Example (E)(4): Single advance, single payment (term of exactly 2 years)

Amount advanced (A)=$1000. Payment (P)=$1240.

Unit-period=1 year. Unit-periods per year (w)=1.

Advance, 1-3-78. Payment, 1-3-80.

From 1-3-78 through 1-3-79=1 unit-period. (t=2, f=0)

Annual percentage rate
(I)=wi=.1136=11.36%. (Use Form 3 or 4.)

(F) *Complex single advance transaction.*

Example (F)(1): Skipped payment loan (payments every 4 weeks)

A loan of $2135 is advanced on 1-25-78. It is to be repaid by 24 payments of $100 each. Payments are due every 4 weeks beginning 2-20-78. However, in those months in which 2 payments would be due, only the first of the two payments is made and the following payment is delayed by 2 weeks to place it in the next month.

Unit-period=4 weeks. Unit periods per year (w)=52/4=13.

First series of payments (single payment) occurs 26 days after 1-25-78. (t_1=0; f_1=26/28)

Second series of payments begins 9 unit-periods plus 2 weeks after 2-20-78. (t_2=10; f_2=12/28)

Third series of payments begins 6 unit-periods plus 2 weeks after start of second series. (t_3=16; f_3=26/28)

Last series of payments begins 6 unit-periods plus 2 weeks after start of third series. (t_4=23; f_4=12/28)

The general equation in Section II (H) can be written in the special form:

$$2135 = \frac{100\,\ddot{a}_{\overline{9}|}}{(1+(26/28)i} + \frac{100\,\ddot{a}_{\overline{6}|}}{(1+(12/28)i)(1+i)^{10}} + \frac{100\,\ddot{a}_{\overline{6}|}}{(1+(26/28)i)(1+i)^{16}} + \frac{100\,\ddot{a}_{\overline{3}|}}{(1+(12/28)i)(1+i)^{23}}$$

Annual percentage rate
(I)=wi=.1200=12.00%

Example (F)(2): Skipped payment loan plus single payments

A loan of $7350 on 3-3-78 is to be repaid by three monthly payments of $1000 each beginning 9-15-78, plus a single payment of $2000 on 3-15-79, plus 3 more monthly payments of $750 each beginning 9-15-79, plus a final payment of $1000 on 2-1-80.

Unit-period=1 month. Unit-periods per year (w)=12.

First series of payments begins 6 unit-periods plus 12 days after 3-3-78. (t_1=6; f_1=12/30)

Second series of payments (single payment) occurs 12 unit-periods plus 12 days after 3-3-78. (t_2=12; f_2=12/30)

Third series of payments begins 18 unit-periods plus 12 days after 3-3-78. (t_3=18; f_3=12/30)

Final payment occurs 22 unit-periods plus 29 days after 3-3-78. (t_4=22; f_4=29/30)

The general equation in Section II (H) can be written in the special form:

$$7350 = \frac{1000\,\ddot{a}_{\overline{3}|}}{(1+(12/30)i)(1+i)^{6}} + \frac{2000}{(1+(12/30)i)(1+i)^{12}} + \frac{750\,\ddot{a}_{\overline{3}|}}{(1+(12/30)i)(1+i)^{18}} + \frac{1000}{(1+(29/30)i)(1+i)^{22}}$$

Annual percentage rate (I) = wi = .1022 = 10.22%

Example (F)(3): Mortgage with varying payments

A loan of $39,688.56 (net) on 4-10-78 is to be repaid by 360 monthly payments beginning 6-1-78. Payments are the same for 12 months at a time as follows:

Year	Monthly payment
1	$291.81
2	300.18
3	308.78
4	317.61
5	326.65
6	335.92
7	345.42
8	355.15
9	365.12
10	375.33
11	385.76
12	385.42
13	385.03
14	384.62
15	384.17
16	383.67
17	383.13
18	382.54
19	381.90
20	381.20
21	380.43
22	379.60
23	378.68
24	377.69
25	376.60
26	375.42
27	374.13
28	372.72
29	371.18
30	369.50

Unit-period = 1 month. Unit-periods per year (w) = 12.

From 5-1-78 through 6-1-78 = 1 unit-period. (t = 1)

From 4-10-78 through 5-1-78 = 21 days. (f = 21/30)

The general equation in Section II (H) can be written in the special form:

$$39{,}688.56 = \frac{\ddot{a}_{\overline{12}|}}{(1+(21/30)i)(1+i)} \left[291.81 + \frac{300.18}{(1+i)^{12}} + \frac{308.78}{(1+i)^{24}} + \cdots + \frac{369.50}{(1+i)^{348}} \right]$$

Annual percentage rate (I) = wi = .0980 = 9.80%

(G) *Multiple advance transactions.*

Example (G)(1): Construction loan

Three advances of $20,000 each are made on 4-10-79, 6-12-79, and 9-18-79. Repayment is by 240 monthly payments of $612.36 each beginning 12-10-79.

Unit-period = 1 month. Unit-periods per year (w) = 12.

From 4-10-79 through 6-12-79 = (2 + 2/30) unit-periods.

From 4-10-79 through 9-18-79 = (5 + 8/30) unit-periods.

From 4-10-79 through 12-10-79 = (8) unit-periods.

The general equation in Section II (H) is changed to the single advance mode by treating the 2nd and 3rd advances as negative payments:

$$20{,}000 = \frac{612.36\,\ddot{a}_{\overline{240}|}}{(1+i)^{8}} - \frac{20{,}000}{(1+(2/30)i)(1+i)^{2}} - \frac{20{,}000}{(1+(8/30)i)(1+i)^{5}}$$

Annual percentage rate (I) = wi = .1025 = 10.25%

Example (G)(2): Student loan

A student loan consists of 8 advances: $1800 on 9-5-78, 9-5-79, 9-5-80, and 9-5-81; plus $1000 on 1-5-79, 1-5-80, 1-5-81, and 1-5-82. The borrower is to make 50 monthly payments of $240 each beginning 7-1-78 (prior to first advance).

Unit-period = 1 month. Unit-periods per year (w) = 12.
Zero point is date of first payment since it precedes first advance.
From 7-1-78 to 9-5-78 = (2 + 4/30) unit-periods.
From 7-1-78 to 9-5-79 = (14 + 4/30) unit-periods.
From 7-1-78 to 9-5-80 = (26 + 4/30) unit-periods.
From 7-1-78 to 9-5-81 = (38 + 4/30) unit-periods.
From 7-1-78 to 1-5-79 = (6 + 4/30) unit-periods.
From 7-1-78 to 1-5-80 = (18 + 4/30) unit-periods.
From 7-1-78 to 1-5-81 = (30 + 4/30) unit-periods.
From 7-1-78 to 1-5-82 = (42 = 4/30) unit-periods.

Since the zero point is date of first payment, the general equation in Section II (H) is written in the single advance form below by treating the first payment as a negative advance and the 8 advances as negative payments:

$$-240 = \frac{240\,\ddot{a}_{\overline{49}|}}{(1+i)} - \frac{1800}{1+(4/30)i}\left[\frac{1}{(1+i)^{2}} + \frac{1}{(1+i)^{14}} + \frac{1}{(1+i)^{26}} + \frac{1}{(1+i)^{38}}\right] - \frac{1000}{1+(4/30)i}\left[\frac{1}{(1+i)^{6}} + \frac{1}{(1+i)^{18}} + \frac{1}{(1+i)^{30}} + \frac{1}{(1+i)^{42}}\right]$$

Annual percentage rate (I) = wi = .3204 = 32.04%

(H) *Transaction involving required deposit balance.*

Example (H)(1): Required constant deposit balance

Creditor advances $1000 on 4-12-79 and requires borrower to maintain a deposit balance of $200 throughout the 12 month loan. The loan is to be repaid by 12 equal monthly payments of $90 each beginning 5-12-79. The deposit balance will be released on 4-12-80.

Unit-period = 1 month. Unit-periods per year (w) = 12.
From 4-12-79 through 5-12-79 = 1 unit-period.
From 4-12-79 through 4-12-80 = 12 unit-periods.

The general equation in Section II (H) can be written as:

$$800 + \frac{200}{(1+i)^{12}} = \frac{90\,\ddot{a}_{\overline{12}|}}{(1+i)}$$

or for iteration solution as:

$$800 = \frac{90\,\ddot{a}_{\overline{12}|}}{(1+i)} - \frac{200}{(1+i)^{12}}$$

Annual percentage rate (I) = wi = .2223 = 22.23%

Example (H)(2): Required periodic deposits into a restricted account

Creditor advances $1000 on 6-15-79. Borrower is required to make 12 monthly payments of $110 each beginning 7-15-79, of which $20 is to be deposited into an account. The account will be released to the borrower at time of final payment on 6-15-80.

Unit-period = 1 month. Unit-periods per year (w) = 12.
From 6-15-79 through 7-15-79 = 1 unit-period.

The general equation in Section II (H) can be written as:

$$1000 + \frac{240}{(1+i)^{12}} = \frac{110\,\ddot{a}_{\overline{12}|}}{(1+i)}$$

or for iteration solution as:

$$1000 = \frac{110\,\ddot{a}_{\overline{12}|}}{(1+i)} - \frac{240}{(1+i)^{12}}$$

Annual percentage rate (I) = wi = .1779 = 17.79%.

By order of the Board of Governors, December 21, 1979.

Theodore E. Allison,

Secretary of the Board.

[FR Doc. 79-39811 Filed 12-28-79; 8:45 am]

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FEDERAL TRADE COMMISSION

16 CFR Part 13

[Docket C-3000]

RR International, Inc., et al.; Prohibited Trade Practices and Affirmative Corrective Actions

AGENCY: Federal Trade Commission.

ACTION: Final order.

SUMMARY: In settlement of alleged violations of federal law prohibiting unfair acts and practices and unfair methods of competition, this consent order, among other things, requires a Wilmington, Del. firm and two corporate officers engaged in the advertising, sale and distribution of a product known, among other names, as the G. R. Valve, to cease representing, without reliable substantiation, that installing the G. R. Valve or any substantially similar automobile retrofit device in a motor vehicle will result in fuel economy improvement. They are also barred from using any endorsement or testimonial which has not been properly authorized; and prohibited from misrepresenting a product endorser's expertise in a field of knowledge, and the conclusions of tests or surveys pertaining to energy consumption or energy saving characteristics of automobile retrofit devices. Additionally, the order requires that product advertising disclose any material connection that may exist between endorser and the firm or its corporate officers.

DATES: Complaint and order issued Nov. 28, 1979.[1]

FOR FURTHER INFORMATION CONTACT: FTC/PE, Linda C. Dorian, Washington, D.C. 20580. (202) 724-1524.

SUPPLEMENTARY INFORMATION: On Monday, July 16, 1979, there was published in the Federal Register, 44 FR 41218, a proposed consent agreement with analysis In the Matter of RR International, Inc., a corporation; Eduard A. Hamala, Cary Bunin, individually and as officers of the corporation, for the purpose of soliciting public comment. Interested parties were given sixty (60) days in which to submit comments, suggestions or objections regarding the proposed form of order.

No comments having been received, the Commission has ordered the issuance of the complaint in the form contemplated by the agreement, made its jurisdictional findings and entered its order to cease and desist, as set forth in the proposed consent agreement, in disposition of this proceeding.

The prohibited trade practices and/or corrective actions, as codified under 16 CFR Part 13, are as follows: Subpart-Advertising Falsely or Misleadingly: § 13.110 Endorsements, approval and testimonials; § 13.135 Nature of product or service; § 13.170 Qualities or properties of product or service; 13.170-34 Economizing or saving; § 13.190 Results; § 13.205 Scientific or other relevant facts; § 13.210 Scientific tests; § 13.255 Surveys. Subpart-Claiming or Using Endorsements or Testimonials Falsely or Misleadingly: § 13.330 Claiming or using endorsements or testimonials falsely or misleadingly. Subpart-Corrective Actions and/or Requirements: § 13.533-20 Disclosures; 13.533-45 Maintain records. Subpart-Misrepresenting Oneself and Goods—Goods: § 13.1665 Endorsements; § 13.1710 Qualities or properties; § 13.1730 Results; § 13.1740 Scientific or other relevant facts; § 13.1757 Surveys.

[1] Copies of the Complaint and Decision and Order filed with the original document.