Annual Percentage Rate And Annual Effective Rate: Resolving Confusion In Intermediate Accounting Textbooks

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ABSTRACT

Evidence of confusion in intermediate accounting textbooks regarding the annual percentage rate (APR) and annual effective rate (AER) is presented. The APR and AER are briefly discussed in the context of a note payable and correct formulas for computing each is provided. Representative examples of the types of confusion that we found is presented and evaluated.

Keywords: Annual Percentage Rate; APR, Annual Effective Rate; AER; Nominal Rate; Effective Rate; Annual Rate; Periodic Rate; Usable Funds

INTRODUCTION

Interest rate concepts such as the annual percentage rate (APR) and annual effective rate (AER) are pervasive in both business and personal finance.[1] Unfortunately for accounting students the interest rate concepts covered correctly by their introductory finance textbooks[2] may be taught incorrectly by their intermediate accounting textbooks forcing knowledgeable instructors to devote valuable class time to identifying, explaining, and correcting the deficiencies in the texts they use. Less knowledgeable instructors may unknowingly perpetuate the confusion, passing it on to yet another generation of accountants.

This paper is divided into four sections. In the first section, we briefly discuss the paper's methodology. We then define the APR and AER, both conceptually and mathematically, drawing on Rich and Rose (1996) and Chandrasekaran et al (1997) using a note payable for context. Following that, we present and analyze examples drawn from the three textbooks which represent the type of deficiencies we found. Finally, the paper ends concluding comments and recommendations for textbook authors and faculty.

METHODOLOGY

We identified the most recent editions of the following three intermediate accounting textbooks: Nikolai et al (2010), Keiso et al (2012) and Spiceland et al (2013). These textbooks were selected because they are mature, with a collective longevity totaling more than fifty years, they are in widespread use,[3] and boast an extensive base of reviewers. For example, for their sixth and seventh editions, Spiceland et al acknowledge over 260 faculty reviewers teaching at community colleges, colleges, and universities across the continental United States. Together the examined editions of the three textbooks have been reviewed in total or in part by approximately 280 faculty, including the authors themselves.

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[1] The APR is defined in Regulation Z (Truth in Lending, 12 CFR 226). An AER equivalent, called the annual percentage yield (APY), is found in Regulation Z (Truth in Saving, 12 CFR 230). The authors use the more common term AER throughout this paper.

[2] As recently as the late 1990's, this was not the case. For example, Chandrasekaran et al (1996) and Rich and Rose (1997) document widespread confusion between the APR and AER in introductory finance textbooks. There is a distinct possibility that the deficiencies in intermediate accounting textbooks are a vestige of this confusion.

[3] Due to the proliferation of custom and electronic books it is increasingly difficult to precisely measure the size of a textbook's market shares, however the combined market share of these three textbooks is thought to represent not less than fifty percent.

Specifically, we examined each textbook's index for the following basic or similar terms: nominal rate, annual rate, effective rate, annual percentage rate or APR, periodic rate, usable funds. We also examined each textbook's chapter on time value of money as well as individual topics such cash discounts, bonds payable, investments in held-to maturity securities, leases, short-term notes, and troubled-debt restructuring. Significantly, in each instance where the narrative or an accompanying illustration purports to calculate the AER in the context of more than one payment per year or a term of less than one year we found ambiguous or imprecise terminology and/or computational errors.

APR AND AER DEFINED

In the context of a loan, the nominal (or stated) rate represents the cost of borrowing over a interest period as a function of the loan's face amount (or face value). In contrast, the effective rate represents the cost of borrowing over an interest period as a function of the borrower's usable funds, that is, the funds the borrower actually gets to use (Rich and Rose, 114). Several common loan provisions reduce usable funds below face amount including, closing costs, discount interest, and a compensating balance requirement.[4] For example, assume the following loan with closing costs:

> A business issues a one year note with a face amount of $10,000 to a lender. The note carries an annual rate of 14%, compounded semiannually, and requires two payments of $5,530.92 with the first beginning six months after closing. The borrower agrees to make a single payment of $300 to the lender at closing to cover loan related costs such as document preparation and processing, notary services, and a credit report.

According to its legal form, the note provides the lender with a semiannual rate of return of 7% (14%/2) on the unpaid face amount.[5] The lender treats the $300 of closing costs as a separate flow of revenue on which it earns a separate profit or loss. In contrast, from the borrower's perspective, the $300 payment of closing costs reduces the usable funds below the face amount to $9,700 ($10,000 - $300) and so raises the periodic effective cost of borrowing above 7%. Although the periodic nominal rate can be easily inferred from the loan documents (14% stated rate) and payment pattern (2 payments per year), the periodic effective rate must be imputed. The periodic effective rate is the rate that equates the two payments of $5,530.92 with the usable funds of $9,700. Mathematically, the periodic effective rate can be expressed as an internal rate of return, where r is the periodic effective rate:

$$0 = \$9{,}700 - \$5{,}530.92 \times (1+r)^{-1} - \$5{,}530.92 \times (1+r)^{-2} \qquad (1)$$

Equation (1) can be solved correctly using one of several available functions found in basic financial calculators or in Microsoft Excel. For example, using RATE in Microsoft Excel, the periodic (six month) effective rate on the note payable is =RATE(2,-5530.92,9700), or approximately 9.22417%. Observe that the periodic effective rate fully amortizes the usable funds of $9,700 over the two payments of $5,530.92: (($9,700 × (1+9.22417%) - $5,530.92) × (1 +9.22417%) - $5,530.92) = $0.00.

The periodic effective rate is the common building block of the APR and AER. The difference between the APR and AER resides in how the effective periodic rate is annualized: the APR annualizes the periodic effective rate without recognizing the effect of intraperiod compounding, whereas, the AER annualizes the periodic effective rate by incorporating intraperiod compounding (Rich and Rose, 115). Stated differently, the APR is the result of applying a linear annualization process to the periodic effective rate, while the corresponding AER is the result of applying a geometric annualization process to the same rate. Although the descriptions of the APR and AER may seem abstract, their mathematical expressions, including their relation to each other and to the effective periodic

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[4] Discount interest occurs when interest, generally on a simple interest basis, is deducted from the face value. The borrower receives the net amount (face value less discount) and repays the face value. A compensating balance refers to a portion of the face amount that must remain on deposit, generally in a noninterest-bearing account, over the term of the loan. Spiceland (362) briefly describe the effect of a compensating balance requirement on the effective annual rate for a loan with a single compounding period per year (m=1).

[5] The periodic nominal rate was used to determine the level payments: =PMT(7%,2,10000) returns -$5,530.92. Thus, the semiannual stated (nominal) rate fully amortizes the loan's face value of $10,000 over the two payments of $5,530.92: (($10,000 × (1+7%) -$5,530.92)×(1+7%/2)-$5,530.92)=$0.00.

rate, are actually relatively straightforward, where r is defined as before and m is the number of compounding periods in a year: [6]

$$APR = r\times m \tag{2}$$

$$AER = (1+r)^m - 1 \tag{3}$$

$$AER = \left(1+\frac{APR}{m}\right)^m - 1 \tag{4}$$

$$APR = [(1+AER)^{\frac{1}{m}} - 1]\times m \tag{5}$$

$$r = APR/m \tag{6}$$

$$r = (1+AER)^{\frac{1}{m}}\text{ -1} \tag{7}$$

Substituting for r and m in equation (2) and (3) the APR and AER on the note payable are 18.4483% [9.22417%×2] and 19.29919% [$(1+9.22417\%)^2$-1], respectively. Correspondingly, we can use equation (4) to convert a semiannually compounded (m=2) APR of 18.44834% into the corresponding AER of 19.29919% [$(1+18.44834/2)^2$-1] and equation (5) to convert an AER of 19.29919% into the corresponding semiannually compounded (m=2) APR of 18.44834% [($(1+19.29919\%)^{1/2}$-1)×2]. Finally, the common periodic effective annual rate for a semiannually compounded APR of 18.44834% and its corresponding AER of 19.29919% is 9.22417% [18.244834%/2] per equation (6) or equation (7) [$(1+19.29919\%)^{1/2}$-1].

TEXTBOOK EXAMPLES

The following section analyzes representative examples drawn from the discussion of cash discounts, noninterest-bearing loans and bonds payable in the three intermediate textbooks examined. In addition to confusion between the APR and AER, these examples may also reflect confusion over more fundamental concepts which are crucial to a correct understanding of these terms such as usable funds and the distinction between nominal and effective rates.

Time Value of Money

All three textbooks establish the foundation for a basic understanding of the AER. For example, each textbook demonstrates the effect of compounding frequency on the effective annual rate of return on the future value of a single deposit (Keiso: 315; Nikolai: M5; and Spiceland: 323). Spiceland et al (324, ftn 1) and Keiso et al (315, ftn 5) go on to define the relation between an annual nominal (or stated) rate and the corresponding annual effective rate as $(1+i/m)^m$-1, where i is the annual nominal (stated) rate and m is defined as above. However, neither textbook distinguishes between the periodic effective rate r and the periodic nominal rate i/m, which may lead students to mistakenly conclude that r and i/m are equivalent concepts.[7]

The failure to distinguish i/m and r may lead students to further conclude that the annual nominal rate i and the APR are also equivalent concepts. For example, Keiso et al (331) elsewhere impute a 2% periodic (monthly)

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[6] Equation (2) describes the theoretical APR. When payment periods are uniform the theoretical APR per equation (2) and per Regulation Z (Truth in Lending) are identical. Vicknair (2004) describes a fundamental actuarial error in the way Truth in Lending computes the effective periodic rate when one or more non uniform (odd) payment periods exists. In such cases, the theoretical and Truth in Lending APRs differ.

[7] Observe that i/m= r is true when usable funds equal face amount. Moreover, the three annual rates (i, APR and AER) converge when i/m=r and m=1. Thus, the failure to distinguish between i/m and r can lead to the mistaken conclusion that i=APR is true and to confusion over the AER (see, for example, footnote 16). This is apparently also common in introductory finance textbooks. For example, Ross et al (2014: 144-145) define the relation between the APR and corresponding AER using equation (4), but equate the quoted rate and APR. However, they note in a footnote to the discussion that in practice the APR may be higher than the quoted rate "if the lender charges substantial fees that must be included in the federally mandated APR calculation." We would add that the non-federally mandated AER is higher also. We conclude that the failure to distinguish between i/m and r stems from an editorial decision to avoid discussion of usable funds.

interest rate that equates an amount borrowed (using a credit card) with 12 monthly payments in the form of an ordinary annuity. Because there are no transaction costs, the imputed periodic rate is also an effective rate r. Keiso et al correctly use equation (3) to calculate the corresponding AER of 26.82% [$(1+2\%)^{12}-1$]; however, they loosely refer to the corresponding APR of 24% (12% × 2) as the "annual nominal rate." Because the annual nominal rate focuses on legal form, while the APR focuses on economic substance, we prefer that the periodic nominal and effective rates be clearly distinguished.

Cash Discounts

Cash discounts are commonly offered by sellers to encourage prompt payment.[8] The periodic effective rate on cash discounts is c/(1-c), where c is the stated cash discount rate.[9] For example, assume the terms 2%/10, net 30. The periodic effective rate on these terms is 2.04% [2%/(1-2%)] and represents the cost of financing the net invoice for 20 days (30-10). There are 18.25 (365/20) 20-day periods in a 365-day year and so m = 18.25. Substituting into equation (2) and (3) yields the following APR and AER:

$$APR = 2.04\% \times 18.25 = 37.23\% \tag{8}$$

$$AER = (1 + 2.04\%)^{18.25} - 1 = 44.56\% \tag{9}$$

In contrast, Spiceland et al (366) calculate the following annualized rate which they identify as the "effective rate": 2.04% × 18.25 = 37.23%. Correspondingly, Nikolai et al (323) and Keiso et al (371)[10] calculate the following annualized rate, but identify it more ambiguously as "approximately equal to an annual effective interest rate…"[11] and as "effectively earning [the calculated rate]", respectively: 2.00% × 18.25 = 36.50%.

Although Spiceland et al annualize the effective periodic rate of 2.04%, which is correct,[12] they mistakenly use equation (2) rather than equation (3) and so inadvertently calculate the APR rather than the AER. Nikolai et al and Keiso et al, also mistakenly use equation (1). In addition, they also erroneously annualize the nominal discount rate of 2% rather than the effective periodic rate of 2.04%.[13] Thus, were they to use equation (3), the calculated AER would still be in error.

Short Term Notes

Both Spiceland et al and Nicholai et al calculate the annual effective rate on a short term, noninterest-bearing note (notes with discount interest).[14] Spiceland et al (376) provide the following analysis of a six-month, "$700,000 noninterest-bearing note receivable, with a 12% discount rate" exchanged for merchandise with a sales value of $658,000:[15]

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[8] For a detailed analysis of cash (sales) discounts, including an examination of their treatment in seven intermediate textbooks, see Vicknair (2000). Interestingly, the three textbooks we examine here were included in his study and, except for a partial improvement in Spiceland et al (see ftn 9), continue making the same errors.

[9] Vicknair (2000: 58, ftn 3)

[10] Keiso et al (371) use the same 2%/10, net 30 terms as a general frame of reference, but instead calculate the annual cost of credit on 1%/10, net 30 terms as 18.25% [1%/(20/365)].

[11] Nikolai et al assume a 360-day year. It is unclear to us whether by "approximately equal to" they mean to say that the result of the formula has been rounded, or whether the formula itself represents an approximate method of calculating the AER.

[12] According to Vicknair (2000: 56, Table 1) Spiceland et al (2001) annualize the discount rate (rather than the periodic effective rate) using equation (1). The change from annualizing the discount rate to annualizing the effective periodic rate represents an improvement. According to the same table, Keiso et al and Nikolai et al here repeat the errors.

[13] According to Vicknair (2000: 56, Table 1) Keiso et al and Nikolai et al repeat the same error made in earlier editions.

[14] Keiso et al (379-380) include an example of a "three-year note bearing interest at 10 percent annually." Because their example is constructed around annual payments (m=1) and face value equals usable funds, the stated rate of 10% is an APR as well as an AER. However, this is not mentioned.

[15] Spiceland (742) later repeat the same scenario in the form a short-term note payable.

The sales revenue under this arrangement is only $658,000, but the interest is calculated as the discount rate times the $700,000 face amount. This causes the effective interest rate to be higher than the 12% stated rate.

$ 42,000	Interest for 6 months
÷ $658,000	Sales price
= 6.38%	Rate for 6 months
× 2*	To annualize the rate
= 12.76%	Effective interest rate

*Two 6-month periods

Similarly, Nickolai et al (606) provide the following analysis of a three month, noninterest-bearing note payable with a maturity amount of $10,000 and a bank discount rate of 12% [usable funds of $10,000 × (1-12% × 3/12) = $9,700)]:

> In borrowing money, a manager must be aware of the *effective interest rate, referred to as the annual percentage rate (or APR)* [emphasis added], for each source of credit. In the preceding case, the *approximate effective annual interest* [emphasis added] on the cash actually borrowed is higher than the discount rate of 12%. It is 12.37% [($300/$9,700) × 4 quarters]. Federal laws require lenders to disclose the APR to borrowers.

Both Spiceland et al and Nikolai et al correctly calculate the periodic effective rate r on their respective notes. However, as with cash discounts, both these authors mistakenly use equation (1) [12.38%=6.38%×2 and 12.37%=$300/$9700×4] and so calculate the APR.[16] Using equation (2), the correct AER on the two notes payable is approximately 13.17% [$(1+ 6.38\%)^2 - 1$] and 12.96% [$(1+300/9700)^4 - 1$], respectively.

Nikolai et al add further confusion by observing that the "effective interest rate, [is] referred to as the annual percentage rate (or APR)…" This is the only instance in the three textbooks where the APR and AER are explicitly equated. Moreover, they describe their calculated annual rate as the "approximate effective annual interest rate" which seems to imply that the calculated annual rate is not the effective annual rate, but rather only an approximation.

Finally, Nicolai et al oversimplify when they assert that "Federal laws require lenders to disclose the APR to borrowers." The provisions of Federal Truth in Lending laws apply to virtually all consumer credit transactions. However, in their example the borrower is a corporation (Trollingwood Corporation). Lenders are under no federal statutory obligation to disclose either the APR or the AER to corporate or other business and not-for-profit borrowers.[17]

Bonds Payable

All three textbooks include the valuation of semiannual payment bonds. The following example from Keiso et al (791) is representative of the type of confusion we found in each textbook:[18]

[16] These notes involve discount interest and so i/m=r is false. Both notes carry an annual (nominal) discount rate of 12%, which implies a periodic discount rate of 6% (12%/2) and 3% (12%/4), respectively. However, the corresponding periodic effective rate r is 6.38% ($42,000/$658,000) and 3.09% ($300/$9,700), respectively.

[17] Keiso et al (331, ftn 2) reveal similar confusion over the scope of Truth in Lending law. Moreover, they assert that according to Federal law "… instead of stating the rate as '1% per month,' contracts must state the rate as '12% per year' if it is simple interest or '12.568%' if it is compounded monthly." This statement is confusing in its terminology and incorrect in what it suggests about the requirements of Truth in Lending law. Suffice it to say that "1% per month" can be expressed as an APR of 12% or as an AER of 12.568% and that Truth in Lending law requires that covered contracts disclose the former of the two rates.

[18] Keiso et al (809) value semiannual payment bonds yielding an "effective rate" of 14%, but use a discount rate of 7% (14%/2) to the bonds cash flows. Similarly, Nikola et al (659-660) illustrate effective interest amortization of semiannual payment bonds whose aggregate price "yields an effective interest rate of 14%." However, they also use a 7% (14%/2) discount rate to amortize the bonds under the effective interest method.

> To illustrate amortization of a discount under the effective-interest method, Evermaster Corporation issued \$100,000 of 8 percent term bonds on January 1, 2007, due on January 1, 2012 with interest payable each July 1 and January 1. Because the investors required an *effective-interest rate* [emphasis added] of 10 percent, they paid \$92,278 for the \$100,000 of bonds, creating a \$7,722 discount. Evermaster computes the \$7,722 discount as follows.[6]

Maturity value of bonds payable		\$100,000
Present value of \$100,000 due in 5 years at 10%, interest payable semiannually (Table 6-2): FV($PVF_{10,5\%}$); (\$100,000 × .61391)	\$61,391	
Present value of \$4,000 interest payable semiannually for 5 years at 10% annually (Table 6-4): R($PVF\text{-}OA_{10,5\%}$); (\$4,000 × 7.71273)	30,887	
Proceeds from sale of bonds		92,278
Discount on bonds payable		\$ 7,722

> [6] Because companies pay interest semiannually, the interest rate used is 5% (10% × 6/12). The number of periods is 10 (5 years × 2).

The above example's terminology and valuation are inconsistent. For example, if we take "effective rate of 10 percent" at face value, then the resulting bond value is erroneous. Per equation (7) the effective semiannual rate corresponding to an AER of 10% is 4.8809% [$(1 + 10\%)^{1/2} - 1$] and not 5% (10%/2). Therefore, the correct bond value is \$93,158.41 [=PV(4.8809%,10,-4000,-100000)] and not \$92,278. On the other hand, if the bond value is correct, then the required rate of return is expressed as an APR rather than an AER.[19]

In order to identify which of these two errors is most likely it helps to recognize that the yield to maturity as conventionally computed in finance, used in practice by bond traders, and reported by investment services such as Moody's Bond Record is an APR and not an AER.[20] Thus, it appears that Keiso et al (as well Nikolai et al and Spiceland et al), assume that bond yields are reported as AERs. However this does not explain their use of equation (6) rather than equation (7) to derive the corresponding periodic effective rate.

There are several relatively straight forward alternatives for correcting this misunderstanding and the resulting valuation error. For example, the Keiso et al example could be revised so as to be consistent with practice by equating the market rate and yield to maturity. This alternative would require nothing more than a minor change in terminology and an expanded footnote explanation:

> To illustrate amortization of a discount under the effective-interest method, Evermaster Corporation issued \$100,000 of 8 percent term bonds on January 1, 2007, due on January 1, 2012 with interest payable each July 1 and January 1. Because the investors required a market rate, or *yield to maturity* [emphasis added], of 10 percent, they paid \$92,278 for the \$100,000 of bonds, creating a \$7,722 discount. Evermaster computes the \$7,722 discount as follows.[6]

[19] The dollar error is relatively small (\$93,158.41-\$92,278=\$880.41 or .9450% of the correct value); however, the valuation insight is critical to a correct understanding of how bond values behave under changing interest rates: holding a bond's yield to maturity constant, the value of bonds sold between interest payment dates follows a classical compound interest curve and not a straight line.

[20] See for example, Ross et al (2014: 170) or Jeng and McLeod (1995:19). For an example from practice, see Rusarsky and Vicknair (1999: 250). Consistent with equation (2), in Exhibit 2, the discount rate of 2.87% they use in verifying the current price of an AT&T Corp. semiannual payment bond reported in Moody's Bond Record is equal to the reported yield to maturity of 5.74% divided by 2.

Maturity value of bonds payable		$100,000
Present value of $100,000 due in 5 years at 10%, interest Payable semiannually (Table 6-2):		
$FV(PVF_{10,5\%})$; ($100,000 × .61391)	$61,391	
Present value of $4,000 interest payable semiannually for 5 years at 10% annually (Table 6-4):		
$R(PVF\text{-}OA_{10,5\%})$; ($4,000 × 7.71273)	30,887	
Proceeds from sale of bonds		92,278
Discount on bonds payable		$ 7,722

[6] In practice, the market rate of interest on a bond, referred to as the yield to maturity, is reported as annual percentage rate. The relation between the reported yield to maturity and the semiannual discount rate is yield to maturity divided by number of interest payments per year. Therefore, the correct discount rate for the Evermaster bonds is 5% (10%/2). By way of contrast, the Wall Street Journal reports the "current yield" which is the ratio of the bond's annual interest payment divided by the bond's current market price, or 8.67% ($8,000/$92,278×2) for the Evermaster bonds. The number of periods is 10 (5 years × 2).

Alternately, the example could be revised to focus on the AER. This alternative would require a minor change in market rate from 10% to 10.25% $[(1+5\%)^2-1]$ in addition to a similarly expanded explanatory footnote:

To illustrate amortization of a discount under the effective-interest method, Evermaster Corporation issued $100,000 of 8 percent term bonds on January 1, 2007, due on January 1, 2012 with interest payable each July 1 and January 1. Because the investors required an effective market rate of *10.25 percent* [emphasis added], they paid $92,278 for the $100,000 of bonds, creating a $7,722 discount. Evermaster computes the $7,722 discount as follows.[6]

Maturity value of bonds payable		$100,000
Present value of $100,000 due in 5 years at 10.25%, interest Payable semiannually (Table 6-2):		
$FV(PVF_{10,5\%})$; ($100,000 × .61391)	$61,391	
Present value of $4,000 interest payable semiannually for 5 years at 10.25% annually (Table 6-4):		
$R(PVF\text{-}OA_{10,5\%})$; ($4,000 × 7.71273)	30,887	
Proceeds from sale of bonds		92,278
Discount on bonds payable		$ 7,722

[6] The effective periodic (discount) rate is $(1+10.25\%)^{1/2}-1$, or 5%. By convention, the market rate, or yield to maturity, on bonds is reported as an annual percentage rate. The corresponding annual percentage rate is 5% × 2, or 10%. In contrast, the Wall Street Journal reports the bond's "current yield" which is the ratio of the bond's annual interest payment divided by the bond's current market price, (2×$4,000)/$92,278, or 8.67%. The number of periods is 10 (5 years × 2).

Observe that regardless of which alternative one prefers, the calculation and terminology are consistent. Moreover, the footnote clearly points out that by convention bond yields are reported as APRs and then distinguishes between the periodic market rate expressed as an APR and as an AER. Students who recall the difference between the APR and AER from finance should have little difficulty with either presentation. Although, the later presentation which focuses on the AER is arguably preferable on conceptual grounds, we prefer to focus on the yield to maturity for several reasons: (1) it is easier to derive the effective periodic rate used in discount bond cash flows from an APR-type rate than from an AER; (2) the yield to maturity conforms to long established practice conventions; (3) and, the yield to maturity as an APR is taught in introductory finance.[21]

[21] For example, see Ross et al (2014: 170).

CONCLUSIONS & RECOMMENDATIONS FOR AUTHORS & FACULTY

The source of the errors we found in our examination of texts seems to be rooted in confusion between the periodic nominal and effective rates i/m and r and between the annualized periodic rates APR and AER. There also appears to be some confusion concerning the requirements of Federal Truth in Lending law. Significantly, these errors should not be particularly difficult to correct individually or in the aggregate. However, we strongly recommend that intermediate textbook authors consider adding a short section to their time value of money materials to review basic interest rate concepts, perhaps as an appendix. In particular, these materials should carefully distinguish between nominal and effective rates and between the APR and AER.

With space in intermediate accounting textbooks increasingly at a premium, textbook authors could respond by structuring their bonds and short-term notes-related materials around annual payments (as they do, for example, for leases and troubled-debt restructuring) and by ignoring the high cost of discounts lost. We sincerely hope that this does not happen. Because many business and accounting students find interest rate concepts difficult, encountering these concepts from differing perspectives (accounting versus finance) is a goal worth pursuing. Students ask only that these concepts be presented correctly across disciplines.

Until these issues are resolved by textbook authors, we suggest that intermediate accounting instructors carefully check their textbook materials for the presence of the types of errors identified in this paper. In particular, instructors should pay special attention to the materials on time value of money, cash discounts, short-term notes, and bonds payable.

This recommendation extends to new and mature faculty alike. We anticipate that new faculty may have studied from post Chandrasekaran et al (1996) and Rich and Rose (1997) era finance textbooks which correctly define and distinguish between the APR and AER and so may have already identified and corrected some or all of the errors identified in this paper.

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NOTES