Equivalence of the 3 Methods of Estimating Bad Debts

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Abstract: When first learned, the three (3) methods of estimating bad debts appear distinct from one another. But upon closer examination, all three methods actually exhibit a common attribute that is at the same time unique for each business entity. Having known this shared feature led this researcher to establish equivalence and identify the formulas to convert experience rates compliant with the requirements of all three methods. Hence, a business entity may now effectively vary its approach in estimating doubtful accounts without having to be concerned that such new approach may either lead to a result that is far less accurate or compel it to veer away from existing policies and practices it uses to monitor overdue accounts.

Keywords: bad debts, accounts receivable, overdue accounts, doubtful accounts, experience rates.

1. Introduction

In current accounting literature, we usually find three (3) methods of estimating bad debts. These refer to (a) aging the accounts receivable approach, (b) percent-of-receivables approach and (c) percentage-of-sales approach. Since each of the foregoing methods comply with internationally accepted accounting standards, business entities tend to adopt such method that it deems best suited to its monitoring of overdue accounts.

Typically, business entities with limited resources and capabilities resort to either the percent-of-receivables approach or percentage-of-sales approach. This is because both approaches only require a single/composite rate when computing bad debts estimates. Thus, going by either approach will be fairly easy to apply.

On the other hand, business entities which prefer the aging the accounts receivable approach employ a more structured way in analyzing their bad debts. As its name implies, this approach entails more than one experience rate which are to be applied to each class of accounts receivable. The aging the accounts receivable approach is considered more accurate and scientific because the likelihood of non-payment is correlated with the length of time accounts receivable is reported as being overdue.

Be that as it may, all three methods do share one thing in common and that is, each one provides an approximate calculation of a business entity’s bad debts drawn from its historical account of receivables doubtful of collection. It is based on this premise that this researcher asserts equivalence of the three (3) methods of estimating bad debts.

This means to say that regardless of the approach implemented, any business entity required to present its accounts receivable at net realizable value will also be reasonably expected to report a bad debt estimate that will closely resemble its own historical account of receivables doubtful of collection. Merriam-Webster defines equivalence as the relation holding between two statements if they are either “both true” or “both false” so that to affirm one and to deny the other would result in a contradiction.

2. Methodology

To simplify the concept of estimating bad debts, this section will provide information as follows:

- Bad Debts Estimate – An Overview
- Accounting Equation of Allowance for Bad Debts
- Methods of Estimating Allowance for Bad Debts

The last part of this section (Methods of Estimating Allowance for Bad Debts) will focus on how business entities use their own experience rates to estimate bad debts. Please note further that definitions used in the section (Methods of Estimating Allowance for Bad Debts) were all lifted from either local or international literature to emphasize that such methods are regarded around the globe by Certified Public Accountants (CPAs) as different from one another.

The illustrations provided in the section (Methods of Estimating Allowance for Bad Debts) are alike in terms of results but varied in terms of the approach employed. This is so that the critical variables can be isolated, identified and analyzed.

3. Bad Debts Estimate – An Overview

To entice customers to buy their products and/or engage their services, most (if not, all) business entities offer credit terms. However, not all customers who buy on credit are treated equally. This is because customers are discriminated upon by business entities based on their credit scores.

Presented below is an approximate breakdown of how an individual’s credit score is determined:

1) Payment history 35%
2) Outstanding debt 30%
3) Length of time you’ve had credit 15%
4) Number of inquiries on your report 10%
5) Types of credit you currently have 10%
Total Credit Score 100%

Given the elements considered to arrive at an individual’s credit score, it becomes apparent as to why business entities would prefer to transact with customers with better-than-average credit ratings compared to those bearing poor credit scores. In contrast with those bearing poor credit scores, customers with above-average credit ratings are less likely to default or incur delay in the payment of their debts.

It is in this context that business entities are required by current accounting standards to estimate their Bad Debts Expense and to provide for an Allowance for Bad Debts in their financial statements.

The effect of recognizing an Allowance for Bad Debts is to reduce the face value (or original invoice amount) of Accounts Receivable at net realizable value. To illustrate,

Accounts Receivable
Less: Allowance for Bad Debts
Net Realizable Value of Accounts Receivable

4. Accounting Equation of Allowance for Bad Debts
Following is the accounting equation to determine the balance of Allowance for Bad Debts as of the end of the current year.

\[ ABD_{END} = ABD_{BEG} + BD_{CT} + REC_{CT} - WRT_{OFFS} \]

Where,

<table>
<thead>
<tr>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowance for Bad Debts, Beginning Balance</td>
<td>( ABD_{BEG} )</td>
</tr>
<tr>
<td>Bad Debts Expense, Current Year</td>
<td>( BD_{CT} )</td>
</tr>
<tr>
<td>Recoveries of Accounts Written Off, Current Year</td>
<td>( REC_{CT} )</td>
</tr>
<tr>
<td>Allowance for Bad Debts, Ending Balance</td>
<td>( ABD_{END} )</td>
</tr>
<tr>
<td>Write-Offs</td>
<td>( WRT_{OFFS} )</td>
</tr>
</tbody>
</table>

To facilitate analysis of the three (3) methods used to estimate Bad Debts Expense, we will assume moving forward that during the current year there will be zero recoveries such that,

\[ REC_{CT} = 0 \]

and zero write-offs such that,

\[ WRT_{OFFS} = 0 \]

Or,

\[ ABD_{BEG} + BD_{CT} = ABD_{END} \]

(Equation 1)

5. Methods of Estimating Allowance for Bad Debts
There are the three (3) methods of estimating Allowance for Bad Debts, namely:

1. Aging the accounts receivable (statement of financial position) approach

The aging of accounts receivable involves an analysis of the accounts where they are classified into not due or past due. Past due accounts are further classified in terms of the length of the period they are past due. The common classifications are:

- a. Not due
- b. 1 to 30 days past due
- c. 31 to 60 days past due
- d. 61 to 90 days past due
- e. 91 to 120 days past due
- f. 121 to 180 days past due
- g. 181 to 365 days past due
- h. More than 1 year past due
- i. Bankrupt or under litigation

The allowance is then determined by multiplying the total of each classification by the rate or percent of loss experienced by the entity for each category. The major argument for the use of this method is the more accurate and scientific computation of the Allowance for Bad Debts, and consequently, the accounts receivable are fairly presented in the statement of financial position at net realizable value.

Write-offs refer to accounts proved to be worthless or uncollectible.


3 Net realizable value is defined as the amount of cash expected to be collected or the estimated recoverable amount. Refer to the section “Accounts Receivable” on page 271, FINANCIAL ACCOUNTING Volume One 2012 Edition, Conrado T. Valix, Jose F. Peralta and Christian Aris M. Valix

4 The term “current year” may refer to either a calendar year (which ends December 31) or fiscal year (which ends on any other month-end except for December 31).
The objection to the aging method is that it violates the matching process. Moreover, this method could become prohibitively time consuming if a large number of accounts are involved.

**Illustration 1**

<table>
<thead>
<tr>
<th>Accounts Receivable</th>
<th>Experience Rate</th>
<th>Required Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not due</td>
<td>P 500,000</td>
<td>1% P 5,000</td>
</tr>
<tr>
<td>1-30 days past due</td>
<td>300,000</td>
<td>3% 9,000</td>
</tr>
<tr>
<td>31-60 days past due</td>
<td>200,000</td>
<td>5% 10,000</td>
</tr>
<tr>
<td>61-90 days past due</td>
<td>100,000</td>
<td>8% 8,000</td>
</tr>
<tr>
<td>91-180 days past due</td>
<td>50,000</td>
<td>15% 7,500</td>
</tr>
<tr>
<td>181-365 days past due</td>
<td>30,000</td>
<td>35% 10,500</td>
</tr>
<tr>
<td>More than one year</td>
<td>20,000</td>
<td>50% 10,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>P 1,200,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

The amount computed by aging of accounts receivable represents the required Allowance for Bad Debts at the end of the period. Thus, if the Allowance for Bad Debts has a beginning balance of P’10,000, the Bad Debts Expense is determined as follows:

\[
\text{Required Allowance} = \text{Accounts Receivable} \times \text{Experience Rate}
\]

\[
P = \text{Accounts Receivable} \times \text{Experience Rate}
\]

The amount computed using one composite rate represents the required Allowance for Bad Debts at the end of the period. Hence, if the Allowance for Bad Debts has a beginning balance of P’10,000, the Bad Debts Expense is determined as follows:

\[
\text{Equation 1}
\]

3. **Percentage-of-sales (income statement) approach**

In the percentage-of-sales approach, management estimates what percentage of credit sales will become uncollectible. This percentage is based on past experience and anticipated credit policy. The company applies this percentage to either total credit sales or net credit sales of the current year.

**Illustration 3**

Assume that Sabrina Mae Company elected to use the percentage-of-sales basis. Based on past experience, it was projected that 1% of net credit sales will become uncollectible. Net credit sales for 2011 totaled P’10,000,000.

\[
\text{Net Credit Sales} = \text{P } 10,000,000
\]

\[
x \times \text{Experience Rate} \times \text{Bad Debts Expense} = \text{P } 100,000
\]

The amount of bad debt expense and the related credit to the allowance account are unaffected by any balance currently existing in the allowance account. Because the Bad Debt Expense estimate is related to a nominal account (Sales), any balance in the allowance is ignored. Therefore, the percentage-of-sales method achieves a proper matching of cost and revenues.

Suppose further that the beginning balance of Allowance for Bad Debts is at P’10,000. Hence, the ending balance of Allowance for Bad Debts will be computed as follows:

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The main argument against this method is that the Accounts Receivable may not be shown at estimated realizable value because the allowance for bad debts may prove excessive or inadequate.9

Thus, it becomes necessary that from time to time the accounts should be “aged” to ascertain the probable loss and as a consequence of which the rate applied on sales should be revised accordingly.10

Suppose now that Sabrina Mae Company conducted an aging of its accounts receivables totaling P’1,200,000. Based on the schedule of aged accounts receivables, the required allowance for bad debts of P’60,000 was computed. Kindly refer to Illustration 1 on page 2.

As a consequence, an adjustment will need to be taken up by the company to address the excess allowance for bad debts earlier computed.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Balance</td>
<td>P 10,000</td>
</tr>
<tr>
<td>Bad Debts Expense</td>
<td>100,000</td>
</tr>
<tr>
<td>Unadjusted Balance</td>
<td>110,000</td>
</tr>
<tr>
<td>Required Allowance</td>
<td>(60,000)</td>
</tr>
<tr>
<td>Excess Allowance</td>
<td>P 50,000</td>
</tr>
</tbody>
</table>

6. Main Results

Equivalence of methods of estimating Allowance for Bad Debts

As was made evident from Illustrations 1 through 3, it is possible to arrive at a reasonable amount in Allowance for Bad Debts regardless of the method employed by a business entity.

This is because the rate used to estimate Bad Debts Expense is based on past performance (experience) of the business entity with regard to its efficiency to collect from its portfolio of overdue accounts.

To prove that equivalence exists among the three (3) methods of estimating Allowance for Bad Debts, this research output will identify and establish the factors used:

a) To convert the experience rates for each classification of aged receivables (used in Aging the Accounts Receivable approach) into one composite rate applied on outstanding receivables (shown in Percent-of-Receivables approach), and

b) To derive the composite rate applied on outstanding receivables (shown in Percent-of-Receivables approach) from the experience rate as a percentage of net credit sales (used in Percentage-of-Sales approach)

Conversion of experience rates for each classification of aged receivables into a single composite rate applied on outstanding receivables (from Aging the Accounts Receivable approach to Percent-of-Receivables approach)

To methodically do this, we will first express by way of a mathematical equation the manner by which the Allowance for Bad Debts, Ending Balance (ABDEND) is computed. Using Aging the Accounts Receivable approach, we find that

\[ ABD_{END} = (AR_{E1} \times ER_1) + (AR_{E2} \times ER_2) + (AR_{E3} \times ER_3) + (AR_{E4} \times ER_4) + (AR_{E5} \times ER_5) + (AR_{E6} \times ER_6) + (AR_{E7} \times ER_7) \]

(Equation 2)

Where,

<table>
<thead>
<tr>
<th>ABDEND</th>
<th>Allowance for Bad Debts, Ending Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR_{E1}</td>
<td>Outstanding Receivables Not Due</td>
</tr>
<tr>
<td>ER_1</td>
<td>Experience Rate applied to accounts Not Due</td>
</tr>
<tr>
<td>AR_{E2}</td>
<td>Outstanding Receivables 1-30 Days Past Due</td>
</tr>
<tr>
<td>ER_2</td>
<td>Experience Rate applied to accounts 1-30 Days Past Due</td>
</tr>
<tr>
<td>AR_{E3}</td>
<td>Outstanding Receivables 31-60 Days Past Due</td>
</tr>
<tr>
<td>ER_3</td>
<td>Experience Rate applied to accounts 31-60 Days Past Due</td>
</tr>
<tr>
<td>AR_{E4}</td>
<td>Outstanding Receivables 61-90 Days Past Due</td>
</tr>
<tr>
<td>ER_4</td>
<td>Experience Rate applied to accounts 61-90 Days Past Due</td>
</tr>
<tr>
<td>AR_{E5}</td>
<td>Outstanding Receivables 91-180 Days Past Due</td>
</tr>
<tr>
<td>ER_5</td>
<td>Experience Rate applied to accounts 91-180 Days Past Due</td>
</tr>
<tr>
<td>AR_{E6}</td>
<td>Outstanding Receivables 181-365 Days Past Due</td>
</tr>
<tr>
<td>ER_6</td>
<td>Experience Rate applied to accounts 181-365 Days Past Due</td>
</tr>
<tr>
<td>AR_{E7}</td>
<td>Outstanding Receivables More than One Year Past Due</td>
</tr>
<tr>
<td>ER_7</td>
<td>Experience Rate applied to accounts More than One Year Past Due</td>
</tr>
</tbody>
</table>


Next, we incorporate Equation 2 to Equation 1

\[ ABD_{	ext{beg}} + BD_{ct} = ABD_{	ext{end}} \]  \hspace{1cm} \text{(Equation 1)}

As a result, we arrive at

\[ (AR_{1} \times ER_{1}) + (AR_{2} \times ER_{2}) + (AR_{3} \times ER_{3}) + (AR_{4} \times ER_{4}) + (AR_{5} \times ER_{5}) + (AR_{6} \times ER_{6}) = ABD_{	ext{beg}} + BD_{ct} \]  \hspace{1cm} \text{(Equation 3)}

Since \( ABD_{	ext{end}} \) (from Equation 2) is equal to the required Allowance for Bad Debts applying the Aging the Accounts Receivable approach, we can readily assume that Equation 3 will require further adjustment for excessive Allowance for Bad Debts such that

\[ ABD_{	ext{beg}} = ADJ_{	ext{excess}} \]  \hspace{1cm} \text{(Assumption 1)}

Thus, we expand Equation 3 such that

\[ (AR_{1} \times ER_{1}) + (AR_{2} \times ER_{2}) + (AR_{3} \times ER_{3}) + (AR_{4} \times ER_{4}) + (AR_{5} \times ER_{5}) + (AR_{6} \times ER_{6}) = ABD_{	ext{beg}} + BD_{ct} - ADJ_{	ext{excess}} \]  \hspace{1cm} \text{(Equation 4)}

Going by Percent-of-Receivables approach, we find that

\[ ABD_{	ext{end}} = (AR_{6} \times ER) \]  \hspace{1cm} \text{(Equation 5)}

Where,

<table>
<thead>
<tr>
<th>( ABD_{	ext{beg}} )</th>
<th>Allowance for Bad Debts, Beginning Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>( ADJ_{	ext{excess}} )</td>
<td>Adjustment for Excessive Allowance for Bad Debts</td>
</tr>
</tbody>
</table>

Thus, we expand Equation 3 such that

\[ (AR_{1} \times ER_{1}) + (AR_{2} \times ER_{2}) + (AR_{3} \times ER_{3}) + (AR_{4} \times ER_{4}) + (AR_{5} \times ER_{5}) + (AR_{6} \times ER_{6}) = ABD_{	ext{beg}} + BD_{ct} - ADJ_{	ext{excess}} \]  \hspace{1cm} \text{(Equation 4)}

Going by Percent-of-Receivables approach, we find that

\[ ABD_{	ext{end}} = (AR_{6} \times ER) \]  \hspace{1cm} \text{(Equation 5)}

Where,

<table>
<thead>
<tr>
<th>( ABD_{	ext{end}} )</th>
<th>Allowance for Bad Debts, Ending Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>( AR_{6} )</td>
<td>Outstanding Receivables</td>
</tr>
<tr>
<td>( ER )</td>
<td>Experience Rate applied to Outstanding Receivables</td>
</tr>
</tbody>
</table>

Next, we incorporate Equation 5 to Equation 1

\[ ABD_{	ext{beg}} + BD_{ct} = ABD_{	ext{end}} \]  \hspace{1cm} \text{(Equation 1)}

As a result, we arrive at

\[ (AR_{6} \times ER) = ABD_{	ext{beg}} + BD_{ct} \]  \hspace{1cm} \text{(Equation 6)}

Given that \( ABD_{	ext{end}} \) (from Equation 5) should equal the required Allowance for Bad Debts when implementing the Percent-of-Receivables approach, it can already be expected that Equation 6 will result to an excessive Allowance for Bad Debts, Ending Balance. This is due to the inclusion of the Allowance for Bad Debts, Beginning Balance in Equation 6. Thus, there is need to adjust Equation 6 as follows

\[ ABD_{	ext{beg}} = ADJ_{	ext{excess}} \]  \hspace{1cm} \text{(Assumption 1)}

Thus, we expand Equation 6 such that

\[ (AR_{6} \times ER) = ABD_{	ext{beg}} + BD_{ct} - ADJ_{	ext{excess}} \]  \hspace{1cm} \text{(Equation 7)}

Because Sabrina Mae Company (or any other business entity for that matter) maintains a single set of books of account, we can conclude from Equations 4 and 7 that

\[ ABD_{	ext{end}} = AR_{1} + AR_{2} + AR_{3} + AR_{4} + AR_{5} + AR_{6} \]  \hspace{1cm} \text{(Equation 8)}

Re-writing Equation 8 in terms of percentages (%) of outstanding receivables, we derive

\[ 1 = W_{t_{1}} + W_{t_{2}} + W_{t_{3}} + W_{t_{4}} + W_{t_{5}} + W_{t_{6}} + W_{t_{7}} \]  \hspace{1cm} \text{(Equation 9)}

Where,

<table>
<thead>
<tr>
<th>( W_{t_{1}} )</th>
<th>Ratio of Outstanding Receivables Not Due to Total Outstanding Receivables</th>
</tr>
</thead>
<tbody>
<tr>
<td>( W_{t_{2}} )</td>
<td>Ratio of Outstanding Receivables 1-30 Days Past Due to Total Outstanding Receivables</td>
</tr>
<tr>
<td>( W_{t_{3}} )</td>
<td>Ratio of Outstanding Receivables 31-60 Days Past Due to Total Outstanding Receivables</td>
</tr>
<tr>
<td>( W_{t_{4}} )</td>
<td>Ratio of Outstanding Receivables 61-90 Days Past Due to Total Outstanding Receivables</td>
</tr>
<tr>
<td>( W_{t_{5}} )</td>
<td>Ratio of Outstanding Receivables 91-180 Days Past Due to Total Outstanding Receivables</td>
</tr>
<tr>
<td>( W_{t_{6}} )</td>
<td>Ratio of Outstanding Receivables 181-365 Days Past Due to Total Outstanding Receivables</td>
</tr>
<tr>
<td>( W_{t_{7}} )</td>
<td>Ratio of Outstanding Receivables More than One Year Past Due to Total Outstanding Receivables</td>
</tr>
</tbody>
</table>

Because this researcher claims equivalence between Equations 4 and 7, we set

\[ AR_{6} \times ER = (AR_{1} \times ER_{1}) + (AR_{2} \times ER_{2}) + (AR_{3} \times ER_{3}) + (AR_{4} \times ER_{4}) + (AR_{5} \times ER_{5}) + (AR_{6} \times ER_{6}) \]  \hspace{1cm} \text{(Equation 10)}

Substituting the percentages (%) of outstanding receivables from Equation 9 to Equation 10, we arrive at

\[ 1 \times ER = (W_{t_{1}} \times ER_{1}) + (W_{t_{2}} \times ER_{2}) + (W_{t_{3}} \times ER_{3}) + (W_{t_{4}} \times ER_{4}) + (W_{t_{5}} \times ER_{5}) + (W_{t_{6}} \times ER_{6}) + (W_{t_{7}} \times ER_{7}) \]  \hspace{1cm} \text{Or}

\[ ER = (W_{t_{1}} \times ER_{1}) + (W_{t_{2}} \times ER_{2}) + (W_{t_{3}} \times ER_{3}) + (W_{t_{4}} \times ER_{4}) + (W_{t_{5}} \times ER_{5}) + (W_{t_{6}} \times ER_{6}) + (W_{t_{7}} \times ER_{7}) \]  \hspace{1cm} \text{(Equation 11)}
Table 2. Inputting the data supplied from Illustration 1 on page 2 into Equation 11, we will be able to derive the composite rate of 5.0% used in Illustration 2 on page 3.

<table>
<thead>
<tr>
<th>Category</th>
<th>Accounts Receivable (% to Total)</th>
<th>Experience rate</th>
<th>(a x b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not due P 500,000</td>
<td></td>
<td>41.67%</td>
<td>1.00%</td>
</tr>
<tr>
<td>1-30 days past due P 300,000</td>
<td></td>
<td>25.00%</td>
<td>3.00%</td>
</tr>
<tr>
<td>31-60 days past due</td>
<td>200,000</td>
<td>16.67%</td>
<td>5.00%</td>
</tr>
<tr>
<td>61-90 days past due</td>
<td>100,000</td>
<td>8.33%</td>
<td>8.00%</td>
</tr>
<tr>
<td>91-180 days past due</td>
<td>50,000</td>
<td>4.17%</td>
<td>15.00%</td>
</tr>
<tr>
<td>181-365 days past due</td>
<td>30,000</td>
<td>2.50%</td>
<td>35.00%</td>
</tr>
<tr>
<td>More than one year</td>
<td>20,000</td>
<td>1.67%</td>
<td>50.00%</td>
</tr>
<tr>
<td>Total P 1,200,000</td>
<td>100.00%</td>
<td>5.00%</td>
<td></td>
</tr>
</tbody>
</table>

Derivation of one composite rate applied on outstanding receivables from the experience rate as a percentage of net credit sales (from Percent-of-Receivables approach to Percentage-of-Sales approach)

Recall the mathematical expression to derive the Allowance for Bad Debts using the Percent-of-Receivables approach which is

$$ ABD_{END} = (AR_x \times ER) $$  \hspace{2cm} (Equation 5)

Such that

$$ (AR_x \times ER) = ABD_{END} + BD_{CT} - ADJ_{EXCESS} $$ \hspace{2cm} (Equation 7)

Next up, we provide the equation to determine the Allowance for Bad Debts using the Percentage-of-Sales approach which is

$$ ABD_{END} = ABD_{BEG} + (CS_{NET} \times ER_{CSNET}) \pm ADJ $$ \hspace{2cm} (Equation 12)

Where,

<table>
<thead>
<tr>
<th>$$ ABD_{END} $$</th>
<th>Allowance for Bad Debts, Ending Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>$$ ABD_{BEG} $$</td>
<td>Allowance for Bad Debts, Beginning Balance</td>
</tr>
<tr>
<td>$$ CS_{NET} $$</td>
<td>Net Credit Sales</td>
</tr>
<tr>
<td>$$ ER_{CSNET} $$</td>
<td>Experience Rate based on Net Credit Sales</td>
</tr>
<tr>
<td>$$ ADJ $$</td>
<td>Adjustment for Excessive or Inadequate Allowance for Bad Debts</td>
</tr>
</tbody>
</table>

At this point, we will establish equivalence among experience rates used in Equations 4, 7 and 12 which are as follows:

- Aging the accounts receivable (statement of financial position) approach

$$ ER_n = \sum_{i=1}^{n} BD_{i,n} + AR_{i,n} $$ \hspace{2cm} (Equation 13)

Where,

<table>
<thead>
<tr>
<th>$$ ER_n $$</th>
<th>Experience Rate applied to accounts in Category n</th>
</tr>
</thead>
<tbody>
<tr>
<td>$$ BD_{i,n} $$</td>
<td>Total Historical Bad Debts experience from accounts in Category n</td>
</tr>
<tr>
<td>$$ AR_{i,n} $$</td>
<td>Total Historical Outstanding Receivables from accounts in Category n</td>
</tr>
</tbody>
</table>

Category n represents each and all account classifications in terms of the length of the period they are past due.

- Percent-of-receivables (statement of financial position) approach

$$ ER = BD_{H} + AR_{H} $$ \hspace{2cm} (Equation 14)

Where,

<table>
<thead>
<tr>
<th>$$ ER $$</th>
<th>Experience Rate applied to Outstanding Receivables</th>
</tr>
</thead>
<tbody>
<tr>
<td>$$ BD_{H} $$</td>
<td>Total Historical Bad Debts experience</td>
</tr>
<tr>
<td>$$ AR_{H} $$</td>
<td>Total Historical Outstanding Receivables</td>
</tr>
</tbody>
</table>

- Percentage-of-sales (income statement) approach

$$ ER_{CS} = BD_{H} + CS_{NET} $$ \hspace{2cm} (Equation 15)

Where,

<table>
<thead>
<tr>
<th>$$ ER_{CS} $$</th>
<th>Experience Rate applied to Net Credit Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>$$ BD_{H} $$</td>
<td>Total Historical Bad Debts experience</td>
</tr>
<tr>
<td>$$ CS_{NET} $$</td>
<td>Total Historical Net Credit Sales</td>
</tr>
</tbody>
</table>

Recall how we established equivalence between Aging the accounts receivable approach and Percent-of-receivables approach via

$$ ER = (W_{1,2} \times ER) + (W_{1,2} \times ER) + (W_{1,2} \times ER) + (W_{1,2} \times ER) + (W_{1,2} \times ER) + (W_{1,2} \times ER) + (W_{1,2} \times ER) + (W_{1,2} \times ER) + (W_{1,2} \times ER) $$ \hspace{2cm} (Equation 11)

Similarly, we can apply the same logic with Equations 13 and 14 such that

$$ \sum_{i=1}^{n} (BD_{i,n} \times AR_{i,n}) = BD_{H} + AR_{H} $$ \hspace{2cm} (Equation 16)
This section will next establish equivalence between Equations 14 and 15 such that

\[
\left( \frac{BD_{M}}{AR_{M}} \right)_{x_{1}} = \left( \frac{BD_{M}}{CS_{MNET}} \right)
\]

(Equation 17)

Because Equations 14 and 15 share the same numerator (BD_M) and their denominators (AR_M and CS_MNET) are related, we can therefore derive two (2) conversion factors (x_1 and x_2) as follows

1. Assign x_1 to the left side of Equation 17

\[
x_{1} = \left( \frac{BD_{M}}{AR_{M}} \right)_{x_{1}} + \left( \frac{BD_{M}}{CS_{MNET}} \right)
\]

\[
x_{1} = \left( \frac{BD_{M}}{CS_{MNET}} \right) \times \left( \frac{AR_{M}}{BD_{M}} \right)
\]

x_1 is used to convert experience rates from Percent of receivables approach to Percentage-of-sales approach.

x_1 is the ratio of total historical outstanding receivables to total historical net credit sales.

From Illustrations 2 and 3, we then use the 5% experience rate on outstanding accounts receivable, and 1% experience rate on net credit sales to derive x_1.

Thus,

\[
(5\%) (x_{1}) = 1\%
\]

\[
x_{1} = 1\% + 5\%
\]

\[
x_{1} = 20\%
\]

2. Assign x_2 to the left side of Equation 17

\[
x_{2} = \left( \frac{BD_{M}}{CS_{MNET}} \right)_{x_{2}} + \left( \frac{BD_{M}}{AR_{M}} \right)
\]

\[
x_{2} = \left( \frac{BD_{M}}{AR_{M}} \right) \times \left( \frac{CS_{MNET}}{BD_{M}} \right)
\]

x_2 is used to convert experience rates from Percentage-of-sales approach to Percent of receivables approach.

x_2 is the ratio of total historical net credit sales to total historical outstanding receivables.

From Illustrations 2 and 3, we then use the 5% experience rate on outstanding accounts receivable, and 1% experience rate on net credit sales to derive x_2.

Thus,

\[
(1\%) (x_{2}) = 5\%
\]

\[
x_{2} = 5\% + 1\%
\]

\[
x_{2} = 500\%
\]

Lastly, we derive ±ΔDJ from Equation 12 using percentage-of-receivables approach and percentage-of-sales approach to describe the variables.

\[
ABD_{END} = ABD_{BEGIN} + (CS_{MNET} \times ER_{CSNET}) \pm ADJ
\]

(Equation 12)

\[
±ADJ = (ABD_{BEGIN} - ABD_{END}) + (CS_{MNET} \times ER_{CSNET})
\]

(Equation 18)

To simplify Equation 18, we may re-write as

\[
±ADJ = \Delta ABD + (CS_{MNET} \times ER_{CSNET})
\]

(Equation 19)

Where, the variable (Δ ABD) represents the change in the balance of Allowance for Bad Debts.

To expound on the variable (Δ ABD), let us substitute Equation 5 to Equation 18

\[
±ADJ = (AR_{BEGIN} \times ER_{BEGIN}) - (AR_{END} \times ER_{END}) + (CS_{MNET} \times ER_{CSNET})
\]

The above equation is similar to

\[
±ADJ = (AR_{BEGIN} \times ER_{BEGIN}) - ((AR_{BEGIN} \times ΔAR) \times (ER_{BEGIN} + ΔER))
\]

Expanding the expression

“\(((AR_{BEGIN} + ΔAR) \times (ER_{BEGIN} + ΔER))\)”, we find that

\[
±ADJ = (AR_{BEGIN} \times ER_{BEGIN}) - (AR_{BEGIN} \times ΔER) + (ΔAR \times ER_{BEGIN}) + (ΔAR \times ΔER) + (CS_{MNET} \times ER_{CSNET})
\]
Where,

\[
\begin{align*}
\Delta AR & = (ARBEG \times ERBEG) - (ARBEG \times ER مهم) - (ARBEG \times ER مهم) + (CS مهم \times ER مهم) \\
\Delta ER & = (P100,000 \times P50,000) + (P100,000) \\
\Delta MT & = (P100,000) \\
\Delta MT & = (P40,000) - (P2,000) - (P6,000) + (P100,000) \\
\Delta MT & = (P50,000)
\end{align*}
\]

(Equation 20)

Inputting data from Illustrations 2 and 3, we then compute for the variable \(\pm ADJ\).

1. Using Equation 18,

\[
\begin{align*}
\pm ADJ & = (ARBEG \times ERBEG) - (ARBEG \times ER مهم) - (ARBEG \times ER مهم) + (CS مهم \times ER مهم) \\
\pm ADJ & = (P100,000 \times P50,000) + (P100,000) \\
\pm ADJ & = (P50,000)
\end{align*}
\]

Note that \(\pm ADJ\) of P50,000 is equal to the Excess Allowance computed in Illustration 3.

2. Using Equation 20 and assuming further that ARBEG is P’1,000,000 and that the experience rate on ARBEG or ERBEG is 1%.

\[
\begin{align*}
\pm ADJ & = (ARBEG \times ER مهم) - (ARBEG \times ER مهم) - (ARBEG \times ER مهم) + (CS مهم \times ER مهم) \\
\pm ADJ & = (P100,000 \times P50,000) \\
\pm ADJ & = (P50,000)
\end{align*}
\]

Note that \(\pm ADJ\) of P50,000 is equal to the Excess Allowance computed in Illustration 3.

7. Concluding Remarks

To summarize, the three different approaches will ultimately yield the same estimate of bad debts given that the business entity utilizes experience rates obtained from its historical account of receivables doubtful of collection.

More importantly, the article also showed that there exists ways to convert experience rates to and from the three different approaches. That is from Aging the Receivables approach to Percent-of-receivables approach to Percentage-of-sales approach and vice-versa. As a result, business entities may not necessarily need to gather historical data to determine its experience rates using the other approaches it has yet to apply.

Having the flexibility to convert experience rates or to use all three methods of estimating bad debts also allows the business entity to simplify its procedures when forecasting collections from credit sales – which is a critical component when analyzing cash flows.

References


Author Profile

Damito Magpantay earned his Master’s in Business Administration degree from De La Salle University in 2010 and received his B.S. in Accountancy from Colegio de San Juan de Letran in 1994. He is currently a freshman student of De La Salle University where he enrolled in the Doctor of Philosophy in Business (PhD) program. A Certified Public Accountant by profession, he is presently employed with SM Investments Corporation as an Assistant Vice President for Finance.