An Alternative Method to Debits and Credits in Accounting: The Trial Balance Approach

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ABSTRACT

Making accounting more accessible for business professionals is a worthy mission to improve stakeholders' grasp of financial information. Improving the understanding of building financial statements betters the shared common language across departments, employees, and management who are pursuing the joint goals of the organization. This paper reviews the literature available on the traditional approach of recording transactions and suggests an alternative to 'Debits' and 'Credits' in accounting using the normal form of the expanded equation. The methodology relies on the sequence of mathematical equations and the reliability of balancing the equations when recording transactions. The modified approach records increase- and decrease-transactions to normal accounts, as found in the left and right location in the columns of trial balance. The trial balance is the foundation for the method. The equations underlying the trial balance are used for balancing. The accounts of the trial balance are allowed to move up and down via increases and decreases while remaining in their left or right position. This approach unmasks the economic events presently hidden with the debits and credits approach.

Keywords: expanded accounting equation; expanded normal equation; financial accounting; single-direction t-account; debits and credits

INTRODUCTION

Ever since Pacioli, Father of Accounting, authored his book '*The rules of double-entry bookkeeping: Particularis de computis et scripturis* in 1494,[1]' there has not been much advancement to the mechanics of this approach. After all, Pacioli was a mathematician and he designed a fail-safe method for all accounting transactions.

Pacioli relied on the use of the normal balance of the accounts based on the type of category such as assets, liabilities, owners' equity, revenues, and expenses. He fixed the location of the normal balance either on the right or the left side of the account depending on the category location in the trial balance. This approach facilitated the transfer of the ending balances from the T-account to the correct location in the trial balance. The detriment of this method was the confusion caused by reversing the signs in the accounts and the veiling of the economic events by using the traditional nomenclature (i.e., 'debits' and 'credits').

This paper delves into the accounting literature to further understand the mechanics of recording transactions and then uses the flow of the accounting equations to result in a normal form of the expanded equation. Then, the fixed normal form of the expanded equation can be used to record accounting transactions. The method proposed in this paper contributes to accounting and accounting and business education in two ways. First, the Expanded Normal Equation (ENE) provides a method to record transactions that avoids the use of traditional nomenclature (i.e., 'debits' and 'credits'). Second, the ENE and the use of this alternative recordation technique makes the ongoing effect of transactions on all elements of the ENE more transparent to a broader audience of students and end-users.

LITERATURE REVIEW

The present approach for first courses in accounting is in a continuous state of change fueled by educators seeking to improve upon a history of pedagogy (Phillips & Heiser, 2011; Stice & Stice, 2013). Pincus (1997), Vangermeersch (1997), Ingram (1998), Geiger and Ogilby (2000), and Bryne and Flood (2005) find that despite the proliferation of instructional resources available for accounting education, students continue to have measurable struggles within the discipline. Byrne and Flood (2005) also suggest that early negative experiences can lead to increases in attrition and negative affect towards the subject matter and field of accounting. Pierre et al. (2009) stated that accounting educators can benefit from improved pedagogy, particularly when training business professionals in introductory accounting courses.

Financial users experience the most difficulties when deciding whether to debit or credit specific accounts. Depending on the type of account, debits and credits can result in increases or decreases; this *prima facia* lack of consistency in the meaning of debits and credits is confusing and perplexing for beginners (Briloff, 2010; Ellerman, 2007). Ingram (1998) and Phillips and Heiser (2011) illustrate the counterintuitive nature of credits and debits through examples; while asset and expense accounts increase with debits and decrease with credits, the other categories of liability, equity, and revenue accounts increase and decrease in the opposite fashion. Though the preparers of financial statements possess a deep understanding of these methods and their meanings, the business professionals who need to understand transactions, the process remains challenging and confusing (Apostolou et al., 2013; Ellerman, 1985).

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[1] The first mention of double-entry accounting and journal entries was in Benedetto Cotrulgi's manuscript *Libro de l'Arte de la Mercatura.* However, Pacioli regularly receives credit as the father of accounting.

Although Pacioli, Father of Accounting, foresaw many technological developments during his life, not even he could imagine automated systems for real-time recording of revenues and expenses when authoring the '*The rules of double-entry bookkeeping: Particularis de computis et scripturis* in 1494.' During Pacioli and his predecessor's time, accountants used a manual structure for accounts with fixed locations of a normal balance (increase, decrease) or (decrease, increase) depending on the type of account. The intent of fixing the locations in the T-accounts, using the normal balances of these accounts, is to aid accounting clerks in ending up with the correct locations on the trial balance.

Pacioli (1494/2012) postulates that the design of the double-entry system provides some assurance that the accounting equation maintains its balance and account balances automatically post to the correct left or right location in the trial balance. The method proposed in this article sets the relationships between all accounts, allowing for all the financial elements of a business to appear in a single expanded equation. The expanded equation transcends beyond the normal balance in the account to the normal balance of all categories, such as assets, liabilities, owners' equity, revenues, and expenses. The normal balance of these categories corresponds to their location in the trial balance with assets and expenses on the left side and liabilities, equity, and revenues on the right side. The normal location of a category is where the side is positive or increasing. All transactions are recorded using simple increases and decreases to these categories, which have a fixed location in the trial balance.

Undergraduate accounting texts often start with an explanation of financial reporting and then continue with a discussion of the accounting cycle, the introduction of the accounting equations, and then the preparation of journal entries. Most introductory chapters start by defining the different elements of the accounting equations. Ordinarily, accounting texts classify all accounts into five basic categories: assets, liabilities, owners' equity, revenues, and expenses.

The trial balance is a compilation of account balances displayed in the same order as the categories listed above (LeBow, 2002; Loughran, 2011; Porter, 2019). The trial balance displays assets and expenses on the left-side with a balancing right-side that includes the other main categories (Eq 5). Accountants compile the trial balance after recording all the transactions using the two accounting equations. The first traditional accounting equation (Eq 1) is the starting point for introducing the topic of accounting. Accountants refer to the following accounts as permanent, since these accounts are open for more than one accounting period (LeBow, 2002; Loughran, 2011; Porter, 2019). This equation contains the main components of the balance sheet which reflects the value of assets, liabilities, and owners' equity of an entity at a point in time; therefore, it is static. Typically, this equation is presented in its normal form as follows:

Assets = Liabilities + Owners' Equity   (1)

The income statement basic equation (Eq 2) reflects the company's financial performance over one period, typically a month or a year. The accountant computes the difference between monthly income and expenses to derive a net income or loss amount. Unlike assets, liabilities, and the owners' equity accounts, revenues and expenses are temporary accounts; following the closeout at the end of each month, the accountant transfers the resulting net income amount to the owners' equity.

Revenues – Expenses = Net Income   (2)

Combining the two equations (Eq 1 and Eq 2) result in the expanded equation. The expanded equation is not new. Needles et al. (2013), Warren et al. (2015), Weygandt et al. (2018), Williams et al. (2005), Harrison and Horngren (2008), Libby et al. (2017), and other textbooks begin showing the expanded equation of accounting (Eq 3) in some form:

Assets = Liabilities + ((Owners' Equity + (Revenues – Expenses) – Distributions to Stockholders))   (3)

The expanded equation contains all categories and that is the reason for its importance. As the entity continues its day-to-day operations, the business activities such as revenues and expenses affect their assets and liabilities throughout the accounting period and not just at the end of the month during closing. Therefore, keeping all the categories in one equation, rather than splitting them into two (Eq 1 and Eq 2) is beneficial throughout the month.

METHODOLOGY FOR THE ALTERNATIVE METHOD[2]

The methodology relies on the logical sequence of mathematical equations. The trial balance is a compilation of monthly transactions that results in posting asset and expense balances on the left side and liability, owners' equity, and revenue on the right side (Eq 5). Increasing and decreasing the accounts on the left and right side of the trial balance is the foundation of this approach. The fixed locations of the categories in the trial balance are assumed for this method.

Using the scaffolding theory, accounting instructors can assist learners in connecting gaps of problem-solving (Simons & Klein, 2007; Phillips & Heiser, 2011). Wood et al. (1976) used the term to describe using a support system to construct an object, one level at a time, like an engineering process. What the scaffolding theory offers in this application is to start beginners with a ready equation based on using normal balances of all the accounts and the use of the trial balance as a starting point to explain the accounting equation. When using scaffolding in the classroom, typically the learners must be attempting to solve a multi-step challenging problem. The instructor and the learners understand the end goal of following the steps, which in this case is compiling transactions into the trial balance but only the instructor knows the precise sequence leading to the result.

Therefore, the instructor can start with the expanded equation (Eq 4), assuming no distributions at this point since they will be addressed later as a contra-equity category. The mathematical expression is simplified to the following, taking the parentheticals out:

Assets = Liabilities + Owners' Equity + Revenues – Expenses   (4)

The expanded equation is the basis for the 'single equation' suggested in this modified approach to record transactions. The equation is rewritten in the trial balance format. The trial balance is the foundation of this alternative approach. The instructor may start with the expanded equation presented earlier (Eq 4) and then rearrange it in its normal form (Eq 5) without contra-

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3. The author has presented the methodology at the 2020 AAA SPARK conference, receiving feedback and comments which have been implemented in this version of the paper. Additionally, the author solicited comments from various accounting faculty who added value to the methodology.

accounts, which will be addressed later in the paper.

   Assets + Expenses = Liabilities + Owners' Equity + Revenues   (5)

       After introducing this ready equation to accounting users, they can start recording transactions that result in increases and decreases to the different accounts, keeping the equation in balance and the elements in their fixed normal location. The instructor can explain the difference between temporary and permanent accounts and how the temporary accounts are represented in the permanent accounts, one period at a time. The temporary accounts are opened for monthly tracking and closed into the permanent accounts at month-end.

       This alternative trial balance approach uses the expanded equation previously discussed in its normal form, same as presented in the traditional accounting equation (Eq 1) for permanent accounts (Pacioli, 1494/2012). The positioning applies to revenues and expenses as well. For example, the expense category is listed on the left since the normal balance of each expense account is on the left. Ingram (1998) showed this rearrangement of the expanded formula in brief article students understanding. Ingram (1998) stated that debits and credits may not be needed and an alternative approach exist, although in his article he did not show a methodology or the sequence of the full accounting cycle. In this presentation (Eq 5), all transactions to the accounts would then reflect increases or decreases without having to switch the position (left or right) in the T-account. Because the equation and the location of all the categories such as assets, expenses, and liabilities are fixed, thus the position of the normal balance (e.g., left, right) for all the accounts is automatically satisfied.

       Explaining the ENE requires pedagogical intuition, as well. The new equation contains both permanent and temporary accounts at all times. In this proposed method, all accounts need to be presented according to their normal balances. The location of these categories is fixed in the equation in order to avoid the reversing of the signs as in Pacioli's method. Every transaction should still have balanced sides to keep the expanded equation in balance.

       It is helpful to start beginners with the trial balance for an initial understanding of the ENE. This technique is consistent with the scaffolding theory approach starting with a ready solution and then explaining the supporting elements. With the use of the trial balance, it is visually apparent why assets and expenses are listed on the left of the trial balance, while liabilities, equity, and revenues are listed on the right. All transactions must have corresponding increases and decreases while keeping the ENE in balance. For example, a company receiving cash must increase the account, and a company selling inventory must decrease the account. There are logical explanations using increases and decreases to every single account after posting transactions.

       Another benefit to our proposed approach is the natural explanation of the relationship between permanent and temporary accounts. For example, if equation four (see Eq 4) is rewritten in equation 6 format (see Eq 6), then assets and liabilities or the permanent accounts would be shown on the left and the other categories on the right. This would illustrate how a change in net assets (assets - liabilities) results in changes in owners' equity (See Eq 6). For example, an increase or a decrease in net assets is associated with an increase or a decrease in owners' equity—either the permanent equity or the temporary equity reflected in the revenues and expenses. This is consistent with the original equation (See Eq 1) only to include the temporary components as well.

Assets - Liabilities = Owners' Equity + Revenues – Expenses   (6)

The method proposed in this paper assumes the use of automated software[3] systems designed to record transactions and balances in the correct location of the accounting equation. Our proposed method also allows the accountant to focus on logical increases and decreases of the relevant accounts instead of the multiple meanings of debit and credit combined with the left or right position for each specific account. Presently, the only time the accountant combines these equations is during the closing process and transfer for net income/loss into retained earnings within owners' equity. However, the underlying reality is that those income statement transactions have an automatic effect on the balance sheet and the separation of these two accounting equations is unnecessary.

The separation of revenues and expenses in a distinct equation helped business owners focus on performance in the current period. In an automated system, this can be derived using a date-range formula separating the activity for the relevant period. Therefore, the two equations above can be combined into one to reflect the dynamic relationship between all accounts. The single equation makes the relationship between all accounts more transparent to users. For example, using one equation during a single period facilitates the understanding of all the accounts affected by a transaction, such as expenses affecting assets and liabilities. Understanding the relationship between temporary and permanent accounts clarifies the monthly financial dynamics of an entity. Except for reporting and the creation of financial statements, the use of the single equation eliminates the need to separate the equations and better illustrates the dynamically-linked relationship between accounts.

The ENE with Contra-accounts

Adding the contra-accounts to the equation allows users to address all types of accounts, along with their normal balances. Every contra-account should appear on the opposite side of the equation of the original category. The contra-account mathematically reduces the original category that it is associate with, therefore its normal balance should appear on the opposite side of it. For example, while assets normally appear on the left side of the equation, contra-assets – which are offsets to the original account – appear on the right side of the equation. Again, contra-accounts should be presented in their normal position in the equation.

Including contra-accounts in the basic expanded equation (Eq 5) facilitates a more comprehensive range of transactions. In fact, once all the contra-accounts are added, all accounts should fall within an element of the equation below (Eq 7a). In this approach, distributions to stockholders, or dividends, is a contra-account to equity, which explains its usual location on the left side of the equation since the normal balance of that account is on the left. Another example is the accumulated-depreciation account, which is a contra-asset. This account should be placed on the right side of the equation since it carries an offset balance to an asset account. This expanded equation can handle any account, including accruals (liabilities), cost of goods sold (expenses), treasury stock (contra-equity), sales discounts (contra-revenues), or bond discount (contra-liability). Keeping the equation in its normal format allows for the natural use of

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4.   In addition to the flow of mathematical equations, the author has tested this alternative approach via a software program in 2019/2020.

recording transactions while keeping the equation in balance (Exhibit 2). To prove the equation even further, one can take any published trial balance and plug it into the equation. Additionally, taking a trial balance and separating the left and right-side categories further proves the ENE.

Assets (A) + Expenses (E) + Contra-Liability (CON-L) + Contra-Equity (CON-EQ.) + Contra-Revenue (CON-R) = Liabilities (L) + Owners' Equity (EQ.) + Revenues (R) + Contra-Asset (CON-A) + Contra-Expense (CON-E)   (7a)

or

A + E + CON-L + CON-EQ. + CON-R = L + EQ. + R + CON-A + CON-E   (7b)

Accounting users can record all transactions using the left and right sides of the equation with the inclusion of contra-accounts in the ENE. The first five categories of accounts (assets, liabilities, owners' equity, revenues, and expenses) have corresponding contra-accounts. Understanding the relationship between accounts and contra-accounts clarifies the monthly financial dynamics between all the accounts for an entity. The method systematically emphasizes the increase or decrease as a first step, and then records the location in the equation as a second step. The benefit of this approach stems from the accountant's ability to focus on the common-sense increases and decreases without the confusion over the position of the transaction in the account. Since the location of the account is factored in the ENE equation, the use of a single direction T-account is made possible, and there is no need to switch the signs in the T-accounts.

Supporting the ENE Using Single direction T-accounts

The ENE supports the use of a single-direction T-account (+, -) for all subsidiary accounts. This method does not require sign reversal within the accounts to record transactions according to the normal balance in the account. Instead, the method using the ENE assumes that all transactions are increases or decreases and the balance of the transactions can be posted to the correct location either on the left or right side of the ENE. After every transaction, the posting is recorded in the subsidiary account and in the equation; both manual and electronic posting are possible with the proposed method. In the following paragraphs, a full example is shown using the steps of the accounting cycle.

RESULTS USING THE ACCOUNTING CYCLE

The results of using the alternative method are shown in this section using selected steps of the accounting cycle as shown in Warren et al. (2015). An example using the ENE in the accounting cycle is shown, as follows: (1) analyze and record transactions; (2) post transactions to the ledger; (3) prepare an unadjusted trial balance; (4) prepare adjusting entries and adjusted trial balance; (5) prepare financial statements (6) closing entries and post-closing trial balance. Since step 4, prepare adjusting entries and adjusted trial balance, is similar to step 2 and 3 in the ENE, this step is not shown here.

Analyze and Record Journal Entries Using the ENE

Following is a summary list of journal entries. The account-increases do not have an added notation, but decreases are noted with parentheses. Also, increases and decreases influencing one side of the equation, such as 'left' or 'right,' are noted as such. See the example of journal entry in Table 1 (Appendix) and (3b, 3h, and 3i). The following entries modify the use of debits and credits in a journal entry to increases and decreases. This method allows for a visual representation of how the ENE remains in balance. It also allows for journal entries to be presented in T-accounts by increases and decreases rather than debits and credits. Once the accounting user understands the logical reasons for increases and decreases underlying the events, they can perform the transactions in the accounts. Table 1 (Appendix) provides an example of journal entries using the ENE methods proposed in this paper.

Post Transactions to the Ledger Using the ENE

In most of the accounting texts, the authors start explaining transactions using increases and decreases then switch to using debits and credits, emphasizing the location in the account (left, right) rather than the relationship to increasing or decreasing the balance of the account. This alternative method separates the position (dr., left, cr., right) from the increases and decreases. Figure 1a through Figure 1j (Appendix) provide examples illustrating the use of single direction T-accounts in the proposed method; as a reminder, the balances of the T-accounts are recorded on the left or right according to the category and location in the ENE. This visual notation presented in Figure 1a – Figure 1j (Appendix) allows for easy reference to why the accounting equations stay in balance after every transaction.

All T-accounts should have increases and decreases on the same sides showing (+, -) for assets, liabilities, equity, revenue, expenses, and all contra-accounts. After each transaction, the accountant posts the balance to the left or right of the ENE according to the normal balance of each category. So, a net positive or negative balance of an asset account would be posted on the left-side of the ENE. Moreover, a net positive or negative balance of a liability account would be posted on the right-side of the ENE. In all the transactions, the increases and decreases in the T-accounts should be recorded in a single-direction T-account, on the left and right sides of the account. The second step is to transfer the balance of the two transacting accounts into the ENE. Following are the cumulative account balances for the previous transactions. This is illustrated in Figure 2 (Appendix).

Prepare an Unadjusted Trial Balance

Following is the compiled unadjusted trial balance using the prior transactions shown in Table 2 (Appendix). Notice the titles for balances in the accounts 'Left' and 'Right' instead of 'Debit' and 'Credit.' Displaying the account balances in the trial balance by corresponding to the left and right side of the equation allows for a more precise explanation of account positions. If an account falls on the left side of the equation, then it is listed on the left side of the trial balance, and the same is for the right side. Also, note that the ENE allows negative account balances to appear if some arise. For example, if there is a negative balance in the accounts receivable account, then it is stated as such in the trial balance. This presentation should not impact the balancing of the equation since summation is defined for all real numbers.

Prepare Adjusting Entries and Adjusted Trial Balance

Given that under this alternative method, adjustments can be recorded in the same manner as transactions, they were not shown along with the adjusted trial balance.

Prepare Financial Statements

Given that the trial balance is the same as in the traditional method of accounting, there should be no difference in preparing financial statements. Therefore, the statements were not presented for the example above.

It is foreseeable that the statement of cash flows may be easier to generate from the ENE, given that all accounts are included in one equation. Ingram (1998) stated the importance of using the ENE to the indirect method of the cash flow statement. The ENE explicitly shows the effect of an increasing liability or decreasing asset on the cash account.

It is noteworthy to mention that the ENE assumes that categories such as 'current assets,' 'current liabilities,' 'other income,' and 'other expenses' are subcategories of the main revenues and expense categories. The balancing of the ENE remains the same while including the subcategories. The location of these subcategories on the financial statement is handled the same way as in the traditional method using numerical ranges (e.g., 5000-6000, 6000-7000) in the chart of accounts. Most accounting software captures data at the account level using debits and credits (increases, decreases). This method proposes a graphical user interface (GUI) that captures accountants' input in a single T-account approach (+, -), and then posts to the ENE.

Month-end Closing Using the ENE

The closing process can occur in the equation by offsetting the accounts on each side of the ENE to the owners' equity category and, more specifically, retained earnings. Also, dividends are offset to retained earnings in owners' equity as a contra-equity account. The expenses and contra-equity accounts need offsets to move them to the other side of the equation, but the revenues category is merely collapsed into owners' equity or added to it. This is similar to the traditional method. The closing process is illustrated using equation seven (Eq 7a) as a foundation in the steps outlined below.

Step 1: 48,000(A) + 8,500 (E) + 4,500 (CON-EQ.) = 10,500(L) + 30,000 (EQ.) + 18,500 (R) + 2,000 (CON-A)

Step 2: 48,000(A) + 8,500 (E) -8,500 (Closing) + 4,500 (CEQ) - 4,500 (Closing) = 10,500(L) + ((30,000 (EQ) + 18,500 (R) Closing) -8,500 (E) Closing) -4,500 (CON-EQ.) Closing)) + 2,000 (CON-A)

Step 3**:** 48,000(A) = 10,500(L) + 35,500(EQ.) + 2,000 (CA)

Table 3 (Appendix) illustrates how the closing process is possible through the use of journal entries. The post-closing trial balance is presented in Table 4 (Appendix).

TESTING, VALIDITY, AND LIMITATIONS

The validity of this paper is based on the mathematical flow of the equations and the continuous balancing of the effecting transactions. This paper is presented as theoretical piece. The next step would be to develop documentation and textbook examples to use in the accounting curriculum. At which point, the statistical effectiveness of the alternative method could be tested. As of now, the author lists this as a limitation of this paper.

CONCLUSIONS AND IMPLICATIONS

Pincus (1997), Vangermeersch (2000), Ingram (1998), Porter (2019) and many other scholars have called on accounting education to transition out of the use of debits and credits in order to assist the millions of users in understanding the accounting discipline. The reluctance to make this step was due to many reasons. Firstly, parting from this tradition, which has provided a sound foundation for hundreds of years, is rather difficult, and secondly the lack of a secondary method that would be able to handle all kinds of transactions.

The trial balance approach is a simplified approach to the recordation of all types of transactions. This approach does not change double-entry accounting, which is still the basis for this method. It merely simplifies transactions to increases and decreases posted in a fixed equation. The ENE builds on the current expanded equation taught in the first accounting course and underlies any resulting trial balance. The ENE brings all the categories of accounting to a single dynamic equation. Therefore, new accounting users are learning the same equation as before and only presenting it in its normal format. For already accountants, this is the same equation implied in the trial balance.

Contra-accounts can be thought of as derivatives of the ENE, so knowing that assets are on the left of the ENE means that a contra-asset will be on the right side of the ENE, etc. The increases and decreases to the individual accounts are more intuitive to the recorder of the transactions than 'debits' and 'credits,' hence the reason for most accounting texts starting with this approach. Figure 3 (Appendix) illustrates the derivation of the ENE and the usage of the single-direction T-account.

The subject of debits and credits has perplexed accounting users for centuries. This nomenclature has blinded users to the mere increases and decreases of the accounts, which facilitates comprehension of the transactions. Accountants may have mastered this technique, yet a non-ignorable number of beginners and consumers of financial statements may benefit from this simplified approach. Finally, the more significant benefit to this approach is the users' understanding of the underlying effect of every transaction on all the temporary and permanent accounts in a business. Being able to view every transaction with its full effect on assets, liabilities, and owner's equity generates a deeper understanding of accounting events.

The previous pages showed that basic accounting can be taught without the use of debits and credits. Both the traditional and this proposed method capture the essence of double-entry accounting, yet one focuses more on the underlying economic change in the accounts. Understanding activities in any business is predicated on understanding the transactions within it. This alternative method allows users to record all events with plain increases and decreases, thus unmasking the actual economic events recorded by the transactions.

Implications for Instructors

Dropping debits and credits may and will take time. Before then, instructors may benefit from using the ENE or Eq 5 as an organizing tool of the accounts on the left and the ones on the right. This aids the students to memorize and consistently apply transactions using a single equation with fixed locations. The T-accounts can be opened corresponding to the sides of the equation, yet the reversing of the signs would still be necessary, as done in the traditional method in order to be consistent with present accounting textbooks. At the end, transferring account balances to the trial balance is almost automatic which directly connects to the location in the trial balance.

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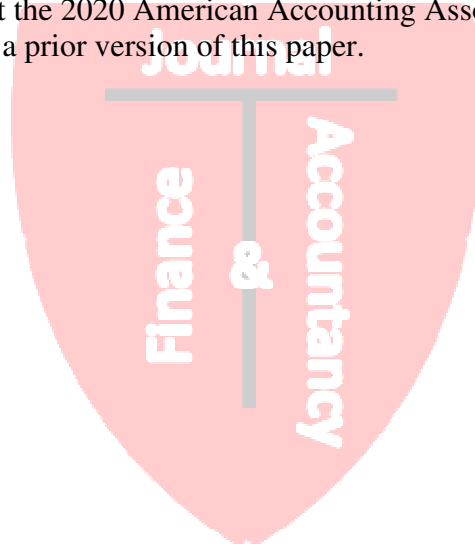
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APPENDICES

Table 1: Examples of Journal Entries Using the ENE

		ENE Left	ENE Right
a)	Cash	10,000.00	
	Loan Payable		10,000.00
	The business received a loan for $10,000		
b)	Cash	(1,500.00)	
	Utilities Expense	1,500.00	
	The business paid a utility bill of $1,500		
c)	Accounts Receivable	15,000.00	
	Fees Earned		15,000.00
	The business accrued for invoices not billed $15,000		
d)	Cash	30,000.00	
	Common Stock		30,000.00
	The business received $30,000 cash investment in exchange for common stock		
e)	Cash	(4,500.00)	
	Accounts Payable		(4,500.00)
	The business paid $4,500 for office supplies on account		
f)	Repairs Expense	5,000.00	
	Accounts Payable		5,000.00
	The business received a repair bill of $5,000 on account		
g)	Accounts Receivable	3,500.00	
	Fees Earned		3,500.00
	The business completed a service on account for $3,500		
h)	Cash	(4,500.00)	
	Dividends	4,500.00	
	The business paid dividends to shareholders of $4,500		
i)	Cash	(8,500.00)	
	Equipment	8,500.00	
	The business bought new equipment for cash of $8,500		
j)	Depreciation Expense	2,000.00	
	Accumulated Depreciation		2,000.00
	The business recorded monthly depreciation expense for equipment		
	Totals	61,000.00	61,000.00

Table 2: Example of the Trial Balance Compiled Using the Proposed ENE-based Method

	ENE Left	ENE Right
Cash	21,000	
Accounts Receivable	18,500	
Equipment	8,500	
Accumulated Depreciation		2,000
Accounts Payable		500
Loan Payable		10,000
Common Stock		30,000
Dividends	4,500	
Fees Earned		18,500
Utilities Expense	1,500	
Repairs Expense	5,000	
Depreciation Expense	2,000	
	61,000	**61,000**

Table 3: Month-end Closing Using Journal Entries

	ENE Left	ENE Right
Fees Earned		-18,500
Retained Earnings		18,500
Close out Revenues		
Utilities Expense	-1,500	
Repairs Expense	-5,000	
Depreciation Expense	-2,000	
Retained Earnings		-8,500
Close out Expenses		
Dividends	-4,500	
Retained Earnings		-4,500
Close out Dividends		

Table 4: Post-Closing Trial Balance for Month-end Closing

	ENE Left	ENE Right
Cash	21,000	
Accounts Receivable	18,500	
Equipment	8,500	
Accumulated Depreciation		2,000
Accounts Payable		500
Loan Payable		10,000
Common Stock		30,000
Retained Earnings		5,500
	48,000	**48,000**

Figure 1a: Single-direction T-Account: Liability and Asset Transactions

Transaction	Single-direction T-Accounts	
The business obtains a loan for $10,000. In this transaction, cash increases by 10,000 (+10,000, 0), and loan payable increases by 10,000 (+10,000, 0).	**ENE LEFT ↑** Cash + / - 10000	**ENE RIGHT↑** Loan Payable + / - 10000
ENE: Assets + Expenses = Liabilities + Owners' Equity + Revenues Ex. (Assets [Cash] + 10,000) + Expenses = (Liabilities [Loan Payable] + 10,000) + Owners' Equity + Revenue		

Figure 1b: Single-direction T-Account: Asset and Expense Transactions

Transaction	Single-direction T-Accounts

The business pays a utility bill for $1,500. In this transaction, cash decreases by 1,500 (+, -1,500), and utilities expense increases by (+1500, -) for the purpose of tracking.	**ENE LEFT↓↑**
	
	Cash
	  + | -
	      | 1,500
	
	Utilities Expense
	  + | -
	1,500 |

ENE: Assets + Expenses = Liabilities + Equity + Revenues Ex. (Assets [Cash] – 1,500) + (Expenses [Utilities Expense] + 1,500) = Liabilities + Equity + Revenues	

Figure 1c: Single-direction T-Account: Asset and Revenue Transactions

Transaction	Single-direction T-Accounts	

The business accrues for services not billed $15,000. In this transaction, accounts receivable increases by $15,000 (+15,000, -), and fees earned increases by $15,000 (+15,000, -) for the purpose of tracking.	**ENE LEFT ↑**
	Accounts Receivable
	  + | -
	15,000 |
		ENE RIGHT ↑
		Fees Earned
		  + | -
		15,000 |

ENE: Assets + Expenses = Liabilities + Equity + Revenues Ex. (Assets [Accounts Receivable] + 15,000) + Expenses = Liabilities + Equity + (Revenues [Fees Earned] + 15,000)		

Figure 1d: Single-direction T-Account: Asset and Equity Transactions

Transaction	Single-direction T-Accounts
The business receives $30,000 cash investment in exchange for common stock. In this transaction, cash increases by $30,000 (+30,000, -), and common stock increases by $30,000 (30,000+, -) for the purpose of tracking.	**ENE LEFT** ↑ **ENE RIGHT** ↑ Cash Common Stock + | - + | - 30,000 | 30,000 |
ENE: Assets + Expenses = Liabilities + Owners' Equity + Revenues Ex. (Assets [Cash] + 30,000) + Expenses = Liabilities + (Owners' Equity [Common Stock] + 30,000) + Revenues	

Figure 1e: Single-direction T-Account: Asset and Liability Transactions

Transaction	Single-direction T-Accounts
The business pays off an office supplies bill on account for $4,500. In this transaction, the cash decreases by $4,500 (+, -4,500), and accounts payable decreases by $4,500 (+, -4,500).	**ENE LEFT** ↓ **ENE RIGHT** ↓ Cash Accounts Payable + | - + | - | 4,500 | 4,500
ENE: Assets + Expenses = Liabilities + Equity + Revenues Ex. (Assets [Cash] - 4,500) + Expenses = (Liabilities [Account Payable] - 4,500) + Equity + Revenue	

Figure 1f: Single-direction T-Account: Expense and Liability Transactions

Transaction	Single-direction T-Accounts	
The business receives a bill for a repair of $5,000 on account. In this transaction, repairs expense increases by $5,000 (+5,000, -) for the purpose of tracking, and accounts payable increases by $5,000 (+5,000, -).	**ENE LEFT↑** Repairs Expense + | - 5,000 |	**ENE RIGHT↑** Accounts Payable + | - 5,000 |
ENE: Assets + Expenses = Liabilities + Equity + Revenues Ex. Assets + (Expenses [Repairs Expense] + 5,000) = (Liabilities [Accounts Payable] + 5,000) + Equity + Revenues		

Figure 1g: Single-direction T-Account: Asset and Revenue Transactions

Transaction	Single-direction T-Accounts	
The business completes a service on account for $3,500. In this transaction, accounts receivable increases by $3,500 (+3,500, -), and revenues increase by $3,500 (+3,500, -) for the purpose of tracking.	**ENE LEFT↑** Accounts Receivable + | - 3,500 |	**ENE RIGHT↑** Fees Earned + | - 3,500 |
ENE: Assets + Expenses = Liabilities + Equity + Revenues Ex. (Assets [Accounts Receivable] + 3,500) + Expenses = Liabilities + Equity + (Revenues + 3,500)		

Figure 1h: Single-direction T-Account: Asset and Contra-Equity Transactions

Transaction	Single-direction T-Accounts
The business pays dividends of $4,500 to shareholders. In this transaction, cash decreases by $4,500, and dividends, which is a contra-equity account, increases by $4,500 for the purposes of tracking.	**ENE LEFT ↓↓** Cash + | - | 4,500 Dividends (CE) + | - 4,500 |
ENE: Assets (A) + Expenses (E) + Contra-Liability (CL) + Contra-Equity (CEQ.) + Contra-Revenue (CR) = Liabilities (L) + Owners' Equity (EQ.) + Revenues (R) + Contra-Asset (CA)+ Contra-Expense (CE) Ex. (Assets [Cash] - 4,500) + (Contra Equity [Dividends] + 4,500) = Net Change to left side of ENE equals is zero	

Figure 1i: Single-direction T-Account: Multiple Asset Transactions

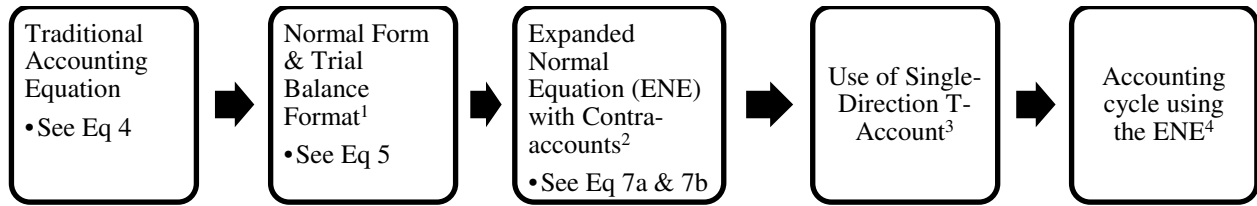| Transaction	Single-direction T-Accounts
The business buys new equipment for cash of $8,500. In this transaction, cash decreases by $8,500 (+, -8,500), and equipment increases by $8,500 (+8,500, -).	**ENE LEFT ↓↑** Cash $\quad$ + $\quad\mid\quad$ - $\qquad\qquad$ 8,500 Equipment $\quad$ + $\quad\mid\quad$ - $\quad$ 8,500
ENE: Assets + Expenses = Liabilities + Equity + Revenues Ex. (Assets [Cash] - 8,500) + (Assets [Equipment] + 8,500) + Expenses = Liabilities + Owners' Equity + Revenues	

Figure 1j: Single-direction T-Account: Expense and Contra-Asset Transactions

Transaction	Single-direction T-Accounts
Record depreciation expense for the month of $2,000. In this transaction, depreciation expense increases by $2,000 (+2,000, -), and accumulated-depreciation increases by $2,000.	**ENE LEFT↑** $\qquad\qquad$ **ENE RIGHT↑** Depreciation Expense $\qquad$ Accum. Depreciation $\quad$ + $\quad\mid\quad$ - $\qquad\qquad$ + $\quad\mid\quad$ - $\quad$ 2,000 $\qquad\qquad\qquad$ 2,000
ENE: Assets (A) + Expenses (E) + Contra-Liability (CON-L) + Contra-Equity (CON-EQ.) + Contra-Revenue (CON-R) = Liabilities (L) + Owners' Equity (Eq.) + Revenues (R) + Contra-Asset (CON-A) + Contra-Expense (CON-E) Ex. (Expenses [Depreciation Expense] + 2,000, -) = (Contra-Asset [Accumulated-Depreciation] + 2000, -)	

Figure 2: Single-Direction T-Accounts Cumulative Balances

Left Side of the ENE		**Right Side of the ENE**	

Left Side of the ENE

Cash

+	-
10,000	1,500
30,000	4,500
	4,500
	8,500
Bal. 21,000	

Accounts Receivable

+	-
15,000	
3,500	
Bal. 18,500	

Equipment

+	-
8,500	
Bal. 8,500	

Dividends

+	-
4,500	
Bal. 4,500	

Utilities Expense

+	-
1,500	
Bal. 1,500	

Repairs Expense

+	-
5,000	
Bal. 5,000	

Depreciation Expense

+	-
2,000	
Bal. 2,000	

Right Side of the ENE

Accumulated Depreciation

+	-
2,000	
Bal. 2,000	

Accounts Payable

+	-
5,000	4,500
Bal. 500	

Loan Payable

+	-
10,000	
Bal. 10,000	

Common Stock

+	-
30,000	
Bal. 30,000	

Fees Earned

+	-
15,000	
3,500	
Bal. 18,500	

Figure 3: Sequence of Steps - Traditional Equation to an Expanded Normal Equation

| Traditional Accounting Equation •See Eq 4 | → | Normal Form & Trial Balance Format[1] •See Eq 5 | → | Expanded Normal Equation (ENE) with Contra-accounts[2] •See Eq 7a & 7b | → | Use of Single-Direction T-Account[3] | → | Accounting cycle using the ENE[4] |

[1] Normal form allows categories to be placed in the normal form for the category. This is similar to the normal location of accounts. An account's assigned normal balance is on the side where increases are placed because the increases in any account are usually greater than the decreases. Accounts on the left side of equation increase on the left side. Accounts on the right side of the equation increase on the right side. Notice that this equation is organized like any trial balance with Assets and Expenses on the left and Liabilities, Owner's Equity and Revenues on the right.
[2] Contra-accounts are placed in the opposite location of the original category. For example, Contra-Asset such as the accumulated depreciation account is placed on the right side of the ENE while Assets are on the left. Contra-accounts are opposite to the original category and mathematically have to be placed as such in the ENE. The mathematical end-result of the contra-account is deducted from the original category, thus the opposite placement in the ENE.
[3] Single-direction T-accounts are (+, -) for assets, liabilities, equity, revenue, expenses, and all contra-accounts. Therefore, increases are posted on the left and decreases are posted on the right. After all transaction are posted, the balance of the t-account should be posted to the left or right of the equation above, according to the normal balance of each category.
[4] All t-accounts are single direction (+, -) account. At the end, the balance of the T-account is placed in the corresponding location of the ENE. All transactions, whether applying the traditional accounting equation or ENE, affect a right and left side (or more than one right and left sides), but always keep the right and left sides in balance. The ENE corresponds to the final trial balance. Below is the flow of equations described:

Assets = Liabilities + Owners' Equity + Revenues – Expenses   (4)
Assets + Expenses = Liabilities + Owners' Equity + Revenues   (5)
Assets (A) + Expenses (E) + Contra-Liability (CON-L) + Contra-Equity (CON-EQ.) + Contra-Revenue (CON-R) = Liabilities (L) + Owners' Equity (EQ.) + Revenues (R) + Contra-Asset (CON-A) + Contra-Expense (CON-E) (7a)

or

A + E + CON-L + CON-EQ. + CON-R = L + EQ. + R + CON-A + CON-E   (7b)