

# Increasing Student Interest in Accounting Principles using the DuPont Model

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## Abstract

The ‘Introduction to Business’ course often plays a central role in undergraduate business programs; designed in part to increase beginning students’ levels of awareness, knowledge, and interest in the concepts and principles associated with each functional area (e.g., accounting, economics, information systems, human resources, finance, operations, and marketing). The accounting principles, in particular, are often viewed by students in these introductory courses as “a foreign language” [1]; and fear [2] and anxiety [3] are common reactions by students to information about financial statements and financial ratios. The DuPont Model is a useful tool for visually connecting the information in the income statement and the balance sheet to five common financial ratios (i.e., total asset turnover, net profit margin, leverage multiplier, return on assets, and return on equity). This article describes a DuPont Model activity used in an introduction to business course designed to stimulate interest in and basic understanding of these fundamental accounting principles.

## Introduction

An undergraduate business course that introduces students to the array of business principles highlights the importance of the subsequent principles courses. The course can also help increase students’ levels of interest in their chosen fields of study where each of the principles apply. In this context introducing accounting principles to beginning business students is particularly challenging. Many students in an introductory course are not accounting majors and often perceive the value of accounting principles simply as a ‘check a box’ with respect to graduation requirements [4]. In addition, accounting principles are often viewed by students in introductory courses as a ‘foreign language’ [1] with fear [2] and anxiety [3] as common student reactions to information about financial statements and financial ratios. One explanation for these reactions is that students have a hard time personifying the accounting concepts or relating them to principles that they understand or to previous experiences [5] [2].

This article describes an in-class activity designed to stimulate interest in, and basic understanding of, fundamental accounting principles introduced in an introductory business course. The activity capitalizes on the integrative nature of the DuPont Model to: 1) Visually display how the financial ratios are a product of the information on the financial statements, and 2) Draw connections between the information on the financial statements to other business concepts to which students might be better able to relate. Further, the activity uses an active-

learning [6] or involvement-oriented [7] approach by building the model piece by piece on a whiteboard using student input.

### **DuPont Model**

The DuPont Model is a well-known tool for analyzing a firm's performance. The model provides a method for visually and quantitatively 'decomposing' indicators of firm performance (i.e., return on assets, return on equity) into key drivers of firm performance (i.e., net profit margin, total asset turnover, leverage multiplier), and to connect these drivers to information on the firm's income statement and balance sheet (See Figure 1). Because of its simplicity, the model is helpful for displaying the connection between day-to-day management practices to the more distal concept of company performance. For example, a common decision in financial management is about how much cash to hold and in operations management the decision about how much inventory to hold is a similarly common issue of discussion. The outcomes of both of those decisions can be seen on the balance sheet; and with the help of the DuPont Model the connection between these decisions (i.e., the amount of cash and inventory held) and firm performance is clear.

The effects of financial incentives used to motive sales representatives, for example, can be seen on the income statement in the revenue and the selling, general, and administration boxes. Similarly, the outcomes of incentives used to motive accounts-receivable staff to collect receivables in a timely fashion can be made to the selling, general, and administration expense on the income statement and to the quantity of accounts receivable on the balance sheet. And with the help of the DuPont Model the connection between the outcomes of these motivation practices and firm performance is clear. In short, connections between many of the functional-area (i.e., accounting, finance, information systems, management, marketing, and operations) principles and practices are discussed in an introductory business course can be linked to the income statement and the balance sheet, and therefore connections between these functional-area principles and practices and firm-level performance can be made via the DuPont Model. It is for this reason that the DuPont Model provides a useful tool for helping introduction-level business students' increase their awareness of and interest in the accounting concepts. The model can therefore serve as an integrative tool to connect key financial ratios to financial statements, which in turn can be connected to practices and principles in each of the other functional areas discussed in an introductory course.

### **The Activity**

#### **Preparation**

Prior to the activity students read the textbook chapter on accounting and completed a graded quiz. We allowed students to take the quiz online using notes and the textbook if needed. The only limitation was that the quiz would end after 15 minutes. The objective of using a graded, but time-limited, open-notes quiz was for every student to have reviewed the chapter prior to the in-class activity.

#### **The Activity**

At the beginning of the class immediately following the quiz, the session started by asking students to imagine during a school break, when they were young, they decided to start a small

business outside their home, selling lemonade drinks to passing neighbors. Students were encouraged to ask questions and discuss in order that every student had a clear picture of the imaginary scenario.

We then asked the class: “What supplies would you need before you could start selling lemonade?” As students called out items (e.g., cups, lemonade mix, a container, a table, a sign, sugar) we would write them on the whiteboard, toward the left-side. Occasionally we would have to probe further by asking questions such as “What if a customer only has a \$10 dollar bill and the price of the lemonade is \$1 dollar?” to get additional items that might be important (e.g., a box containing cash and smaller denominations so that they could give change to a customer).

Once we have a comprehensive list of the items that they would need to start their business, we tell them to imagine that all of these items total \$100, but that they only have \$50 in their ‘piggy bank’; and then ask them “What could you do to get another \$50”. The most common response is to borrow money from their parents or a sibling. Subsequently, on the whiteboard, below the list of items they need to start the business, we write “Your money: \$50” and “Loan from your Mom: \$50”.

At this point we ask students to reflect upon the information they studied in the accounting chapter; calling particular attention to the section that described various financial statement. We then ask them to tell us which of the statements we would use to record the information that is written on the whiteboard (i.e., the balance sheet). This gives us an opportunity to talk about the idea of ‘balance’ between the value of the items that they needed to produce and sell lemonade and how they ‘paid for those items’ using money from their savings (i.e., equity) and money that they had borrowed from their mother (i.e., debt).

Next, we ask students to imagine that they ran their business for one month, and to describe all the activities they would need to do during that month to keep the business running successfully. Responses from the students typically includes discussions about selling cups of lemonade, collecting money from customers, hiring a sibling to help promote the business, replenishing inventory when they run low on lemonade or cups. With some probing we can get them to think about such activities as paying interest to their mother for the initial loan. At this point we ask them to put a dollar figure to each of these activities and then we write the dollar figures with the associated activities on the whiteboard, above the balance sheet information. The results are the following categories with imaginary dollar amounts: Revenue, Cost of Goods Sold, Selling, General and Administration costs, and Interest Expense. As with the discussion about the balance sheet we ask students to tell us which of the statements we would use to record the information on the whiteboard (i.e., the income statement).

Next, students are asked to recall the various types of financial ratios listed in the textbook (i.e., profitability ratios, efficiency ratios, and leverage ratios). As part of this, and any other aspects of the activity, we invite them to look in their textbooks or on the internet to help answer the discussion questions, if needed. Once the students identify the types of ratios that were discussed in the textbook we identify one ratio for each type (i.e., net profit margin, total asset turnover, leverage multiplier) and write them on the whiteboard to the right of the income statement and balance sheet information. At this point it is relatively easy to connect the

information on the income statement and balance sheet to these three ratios; and on the whiteboard we write in the calculations, thereby filling in the information between the statements on the left and the ratios on the right. Students then calculate values for each of the ratios (e.g.,  $NPM = 0.15$ ;  $TAT = 1.53$ ;  $Leverage\ Multiplier = 2.00$ ) and then have the class practice explaining each number. Because students can see how each ratio was calculated it is relatively easy to give them a simple rule of thumb for interpreting the numbers (i.e., “Start at the bottom of the ratio and move to the top”). With some practice they get to a point of interpreting a ratio using simple, lemonade-stand-oriented language (e.g., “For every dollar I got from customers I got to keep 15 cents; 85 cents went to my expenses”). Rather than talking about inventory, cash, plant, property, and equipment, interest expense, selling, general, and administration costs, etc. we keep the discussion about cups, money in a box used for making change, tables and chairs, money they own their mother for borrowing \$50, and salary that they pay their sibling.

At this point we extend the model further. Writing the Return on Assets and the Return on Equity to the right of the three other ratios, and talk about the fact that, as owners of the organization it is useful to notice how these more distal ratios are connected to the financial statements. The three types of ratios are important because investors often look to these ratios as indicators of the firm’s performance.

The final aspect of the activity is to have students imagine what they would like the financial ratio results to be at the end of the second month of their business (e.g., “Would it be better if  $NPM$  is 0.14 or 0.16?); and then we ask them to think about actions that they could take to improve the numbers during the second month. The key at this point is to have them think about actions that could affect the numbers in the income statement (e.g., offer a loyalty card that rewards customers for buying more drinks) or the balance sheet (e.g., hold less cups in inventory); and then to reflect upon how those actions would affect the ratios displayed to the right of the financial statements.

### **After the activity**

During the subsequent class session, we give a more traditional lecture on the accounting material, building upon the concepts mentioned during the activity and adding in concepts and principles that were not directly related to the lemonade stand activity (e.g., cash flow statements).

### **Effectiveness**

As in previous accounting-pedagogy studies (e.g., Grimm & Blazovich, 2016; Matherly & Burney, 2013), students were surveyed after the activity to understand their attitudes towards the activity. Ninety-two students of the 138 enrolled in the course completed the post-activity survey. To assess students’ attitudes towards the activity we asked them seven items anchored by strongly disagree (1) and strongly agree (5) – e.g., ‘The activity held my attention’; ‘The activity excited my curiosity’ ( $M = 3.85$ ,  $SD = 0.76$ ,  $\alpha = .92$ ). In addition, students were asked their level of confidence with respect to the upcoming exam (i.e., ‘I feel certain about my ability to use basic accounting principles on the exam’;  $M = 3.72$ ,  $SD = 0.96$ ). The Pearson correlation between the two variables was

0.33 ( $t = 1.71$ ,  $p = 0.04$ ), suggesting that students who reported more positive attitudes toward the activity were more confident about their ability to perform well on the exam.

## Conclusion

In many business programs the 'Introduction to Business' course is designed to increase students' levels of awareness, knowledge, and interest in the concepts and principles associated with each functional area. Unfortunately, for many students the accounting-component of the course can be challenging; in part, because students have a hard time relating the concepts to their existing knowledge and experiences. Applying the DuPont Model to a simple example (e.g., starting and running a lemonade stand) is one way to help students understand the basic accounting principles and to connect the financial statement concepts to the financial ratio concepts. Because the model is integrative in nature students can visually see the connection between the financial statements at one end of the model and the financial ratios at the other, thereby seeing information represented differently (i.e., as a single set of related concepts) from how it is presented in the textbook (i.e., as separate sections in a chapter).

From our experience working with students in the introductory course who have limited experience with financial information, we have found it useful to start with something they know (e.g., how to run a lemonade stand) and then build the model on the whiteboard from left (i.e., the financial statements) to right (i.e., financial ratios). On the other hand, when using this model with Executive MBA students we have found that it is useful to start on the right side of the model with the more distal indicators of firm performance (e.g., ROE) and then working toward the left, 'decomposing' ROE and ROA into financial information (e.g., revenue, inventory) that is more proximal to the students' current functional areas. EMBA students often report to us that while they are aware of ROE and ROA concepts and know that their managers and investors value these indicators, the connection between the performance of their department or team and the firm's performance is not clear to them. Starting on the right side of the model and working to the left helps the EMBA students realize that one way to understand the connection between any indicator of performance (e.g., customer satisfaction) and more proximal measures of performance is to 'decompose' the indicator into factors that affect it.

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Figure 1  
Du Pont Model

