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## **TEACHING BASIC TRANSFER PRICING INDUCTIVELY USING A STUDENT PRICE-NEGOTIATION CASE**

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### **ABSTRACT**

*Students in an introductory management accounting course are given a brief introduction to the concept of transfer pricing and presented with a transfer pricing problem without any guidance on how to solve the problem. The problem requires groups of students to play the role of a selling(buying) division and determine an acceptable minimum(maximum) price for their group before negotiating with other groups. Students learn transfer pricing inductively as they work through the details of the case and arrive at a profit maximizing price for the product they are selling(buying).*

### **INTRODUCTION**

Most of what we teach in undergraduate accounting classes involves the use of a deductive teaching approach, whereby we move “downward” from general concepts to specific examples. That is, we introduce a topic or procedure (e.g., LIFO inventory flow assumptions), show an example problem or two, assign similar homework problems, and then test students’ abilities to reproduce representative examples on exams. Lather, rinse, repeat. Whether this is because of the sheer volume of information that needs to be transferred to students in Accounting classes, or just a by-product of tradition is unclear. In either case it is possible that some areas of accounting education might lend themselves better to alternative teaching approaches. In this paper, the concept of Inductive Teaching and Learning Methods is introduced and illustrated through an example in-class price-negotiation exercise created to teach the basics of Transfer Pricing within an introductory Managerial Accounting class.

Inductive teaching and learning has its basis in the study of how people learn (Bransford et al., 2000) and is described as an, “umbrella term that encompasses a range of instructional methods, including inquiry learning, problem-based learning, case-based teaching, discovery learning, and just-in-time teaching.” (Prince and Felder 2007, 14). What makes an approach inductive is the movement “upward” from specific to general, imposing more responsibility on the student to discover the general concept than a traditional lecture-based method does. In this sense, the approach is more *student-centered* or *constructivist* (i.e., students construct their own perceptions of reality rather than absorbing what is presented by professors) (Prince and Felder 2006, 123). The approach usually involves cooperative (i.e., group) learning through in-class discussion and some form of directed problem-solving.

Substantial cognitive research (see Bransford et al 2000 for a summary) supports an inductive approach when the student's prospective real-world careers involve significant problem solving activities, as is the case for accounting graduates. By starting with details and working toward general principles, the approach helps train students to generate alternative solutions, assess their progress toward a solution, and derive over-riding principles from their experiences. Traditional deductive teaching does little to let students challenge their perceptions and misperceptions of a topic on the fly. This promises a deeper (meaning-oriented) learning, rather than a surface (memorization-based) understanding (Prince & Felder 2006, 135). It is often the intellectual struggle that provides the cement for the resulting knowledge foundation. When we have guest speakers on our campus, one of the attending professors usually will ask the speaker what skill(s) he or she finds most often missing from current graduates. A banking executive recently provided an especially intriguing response, "intellectual patience."

## **BACKGROUND**

Inductive methods have several different approaches. These are commonly referred to as 1) Discovery Learning, 2) Inquiry-based learning, 3) Project (or Case)-based Learning, and 4) Just-in-Time Teaching. Prince and Felder (2006) examine these approaches in depth as they apply to engineering education. A brief description of each follows, including how each might be used in an accounting setting.

Discovery Learning involves confronting students with a general challenge or goal (e.g., identify pricing strategies for year-end inventory quantities in a situation where prices have increased over time). The instructor may answer student questions, but provides very little guidance on mechanics. Trial and error provide the basis for learning under this technique. The Transfer-pricing exercise described in this paper falls under a variant of this category known as Guided Discovery, whereby the instructor provides some structure and support (Spencer and Jordan 1996).

Inquiry-based Learning presents students with a question to be answered, a data set, and a hypothesis to be tested. Colburn (2000) notes that this approach most commonly is applicable when students are somewhat familiar with the setting and the question requires experimental investigation. Examples of such settings would be common in teaching an auditing class such as testing workpapers to determine whether a given account balance is materially accurate.

Project (Case)-based Learning involves team assignments using an unstructured, practical problem to solve. Students are asked to define the problem, determine what information they need to solve it, formulate alternative solutions, and select the best solution. Instructor involvement under this method is confined to answering questions and directing groups to potential information sources. Much of the case-based curriculum commonly used in MBA programs would fit this category. Also, case-based tax research assignments might be structured accordingly.

Just-in-Time Teaching uses online lessons performed by students who then blog their questions and concerns with other students and the professor. In class time is then devoted only to those topics deemed by the professor to need more explanation. Since the materials have not yet been formally discussed in class prior to student involvement, the method is considered inductive and could be feasibly applied to just about any routine accounting topic. It has been used primarily in Physics classes and involves extensive instructor time and involvement.

Examples of the use of inductive learning appear in other business-related disciplines as well. For example, Leung (2009) uses a learning feedback technique to improve the accuracy of assigning customers with certain profiles to their appropriate market segments in order to implement an effective marketing strategy. Whitford/join , et al. (2002) model bankruptcy prediction decisions using an automated inductive approach, whereby the model teaches itself in the process of making the predictions. In accounting, the use of inductive learning through case-based teaching is well-established at the graduate level (e.g., Harvard cases or Deloitte's Trueblood Seminar case series). However, few examples of a departure from a traditional deductive teaching method exist at the introductory accounting level. What this paper is hoping to accomplish is to illustrate an instance where the inductive approach can be utilized for a traditional topic in an introductory managerial accounting class and to stimulate thought for other topics as well. The remainder of the paper is organized as follows. The next section discusses the context for the case- transfer pricing, followed by a description of the methodology used in the inductive learning case utilized and the resulting price-negotiation results. The final section provides a summary and discussion, including future areas where a similar technique might be employed.

## TRANSFER PRICING

Transfer pricing, as taught at the introductory level, involves setting inter-department sales prices for products sold between divisions of the same organization. The issue becomes especially important when the managers of each division are evaluated based on their respective profit measures, usually under a Return on Investment (ROI) approach. Under these conditions, prevailing theory (Garrison, et al., 2012) recommends that the managers be allowed to negotiate a mutually-agreeable price subject to certain parameters imposed by corporate management. The parameters are designed to protect both the buyer and the seller and insure that they arrive at a solution that is beneficial to overall company profit goals.

The imposed parameters usually take the form of:

1. **Maximum Price**= the price available to the buyer division from a supplier outside of the company.
2. **Minimum Price**= seller's variable costs to produce the product, plus the opportunity cost of any lost sales to external customers (i.e., contribution margin or selling price less variable costs foregone).

The opportunity cost to the seller for the contribution margin foregone on a lost sale is dependent on whether the seller has sufficient capacity to accommodate the inside sale without interrupting its normal sales to outside customers. If there is excess production capacity, the opportunity cost is zero and the seller need only recover its variable product costs to make the internal sale incrementally profitable. If no excess capacity exists, the seller must normally charge its full outside-customer selling price to remain whole. When partial excess capacity is present, the calculation of minimum prices becomes complicated beyond the scope of an introductory course.

## INDUCTIVE LEARNING CASE

The pricing model explained above is not discussed by the professor prior to doing the price negotiation case. As such, the case tests whether students will inductively discover how the parameters of the model have influenced their pricing behaviors. After the price negotiations, the professor will explain the pricing model in the context of the prices negotiated by the students.

The described case involves one division's sale of a "Bonfire" car stereo to a second in-house division that manufactures automobiles. The case states that the company president purchased the stereo division in order to keep the stereo profits "in house." The auto manufacturer previously had purchased the stereos externally. Implementing the case requires eight student groups, representing two groups each of four case conditions as follows:

**Case 1** (two groups): Seller of stereos, selling price to outside customers \$100, no excess production capacity to accommodate inside sale. The per unit costs are: direct materials \$10, direct labor \$30, variable overhead \$5, allocated fixed overhead \$10.

**Case 2** (two groups): Seller of Stereos, same as Case 1 but seller *has* enough excess capacity to accommodate inside sale to automobile division without interrupting outside customer sales.

**Case 3** (two groups): Buyer of 5,000 stereos, currently pays \$95 for each stereo from outside supplier, Somy. Buyer knows the manufacturing costs of seller.

**Case 4** (two groups): Buyer of Stereos, same as Group 3 except it currently pays \$105 for each stereo from the outside supplier, Somy.

After the groups read their respective cases (see attached copies), they are asked to spend approximately five minutes developing a price they would be willing to accept (if a seller) or pay (if a buyer). After reading the case, and discussing an acceptable maximum or minimum price, the students case groups are brought together to negotiate a price for a transfer of product between the buying and selling group based on the information given to them in the case. Each seller group is paired (only once) with a buyer group (instructor should have one of the matched whole groups move to the location of other group-or, breakout rooms are ideal if available) to create the appropriate combinations. As shown above, the major manipulated variables are:

- 1) the presence/ absence of seller excess production capacity, designed to manipulate the presence/ absence of an opportunity cost to the seller in the minimum price construct, and

- 2) the price paid by the buyer (\$100 or \$95) that is either more than or less than the seller's normal sales price- designed to invoke the maximum price parameter noted above.

The exercise produces four mutually-negotiated transfer prices (Cases 1 vs. 4, Cases 2 vs. 3, Cases 2 vs. 4 and Cases 1 vs. 3). Three of the four combinations should produce a logical pricing result between the defined maximum and minimum parameters (although the students don't know the parameters up front) as follows:

	<u>Minimum Price</u>	<u>Maximum Price</u>
Cases 1 vs. 4	\$100	\$105
Cases 2 vs. 3	\$45	\$95
Cases 2 vs. 4	\$45	\$105
Cases 1 vs. 3	\$100	\$95

Note that the Case 1 vs. 3 condition is designed so that an optimal pricing solution should not be possible. That is, the lack of excess capacity induces a full opportunity cost, making the seller's logical minimum asking price (\$100) more than the buyer's logical maximum offer price (\$95). As such, both would be better off by not executing the internal sale transaction. This case often produces a stalemate and makes for a lively discussion when debriefing the students. If the students behave rationally, the instructor must decide whether to require the groups to decide on a price or just let them remain undecided in this condition.

As mentioned previously, the exercise described here would best fit under the category of a "guided inquiry" approach whereby the instructor plays an important role in directing the student's discovery process. That is, most of the inductive learning comes through the debriefing process following the actual price negotiations. The professor should carefully coax from the students what information was instrumental in their negotiating strategies (especially the groups that should not agree on a price) and blend this into a discussion of the transfer pricing model. This produces dialogue such as, "If I sell to them internally, I have to cancel a sale to one of my present customers-they will have to pay me for doing this." (i.e., the minimum price parameter), or "Why in the world would I ever buy the product internally for more than I can pay my existing outside supplier (the maximum price parameter)? We also often hear comments like "I'm evaluated on my ability to maximize *my* profits, not the company's." and "Why don't we split the difference in our prices and keep the profit in house?" The case provides a lively and popular in-class alternative to the usual deductive teaching approach and seeks to address student learning outcomes of group cooperation, persuasive communication, and self insight.

## **Results**

Figures 1-4 present the student-group negotiated prices over a five-year period by case condition as compared to maximum and minimum pricing parameters. For the first three case combinations, results show that prices generally fell between the defined limits providing evidence that students were able to recognize the implications of the provided cues and "discover" the appropriate pricing strategies. Despite only receiving a brief introduction, students were able to apply their prior knowledge of product costing and relevant costing to a new setting remarkably well in a manner that makes sense for both the buying and selling group (i.e., the price ends up higher than the minimum price the selling group should be willing to accept and lower than the maximum price the selling group should be willing to pay).

Figure 5 provides this information in terms of the percentages of groups falling within the pricing parameters or refusing to reach agreement in one case. For the combinations with a relative "wide" range between minimum and maximum prices, groups were able to arrive at price that fell between the minimum and maximum in most of the negotiations. For the case

2/case 4 combination with a range of \$60 between minimum and maximum prices, (minimum of \$45, maximum of \$105), twelve out of the fifteen groups arrived at a price between the minimum and maximum, two arrived at a price outside the range, and one was unable to reach agreement on a price (figure 1). For the group 2/group 3 combination with a \$50 range between the minimum and maximum prices (minimum of \$45, maximum of \$95), fifteen out of fifteen groups were able to reach agreement on a price that fell between the minimum and maximum (figure 2).

For the combination of group 1/group 4 where the range of acceptable prices was only \$5 “wide” (minimum of \$100, maximum of \$105), seven groups were able to reach a mutually beneficial price, five reached a price outside the range, and three were unable to reach agreement (figure 3) For the group 1/group 3 combination where no mutually beneficial price is possible (minimum of \$100, maximum of \$95), and one of the groups (group 1) has the most difficult set of facts to interpret due a lack of excess production capacity, six of the groups stood their ground and did not reach agreement on a price despite encouragement from the instructor to “find a way to keep the sales in-house if at all possible.” (figure 4) Nine of the groups in that combination reached agreement on price, which was a price that was too high(low) to maximize income of the buying(selling) group. In all but one of the cases, the price was “too low” which probably reflects the difficulty of the scenario presented to group 1, involving opportunity costs associated with a lack of production capacity in addition to the more obvious product costs. In speaking to group 1 students after the case, many students realized that opportunity costs were present and needed to be considered in setting a minimum price, but they were not sure how to quantify them and incorporate them into a minimum selling price for their product.

Overall the students did a remarkably good job of applying the concept of relevant costing and product costing to a transfer pricing problem. They were able to take their prior knowledge, and apply it to a new environment with only a brief introduction to the topic of transfer pricing from the instructor.

Figure 1:

Figure 2:

Figure 3:

Figure 4:



Figure 5:

## SUMMARY AND DISCUSSION

In this paper we describe the concept of Inductive Teaching and Learning and provide an example of an in-class exercise designed to let students “discover” the concepts of transfer pricing in an introductory Managerial Accounting class. We have been using this exercise in our managerial accounting classes for over five years and find it to be an excellent means to present the material in a way that is both informative and fun for the students (and the professor). Students enjoy the interaction with other students while negotiating prices, and the exercise often evolves into a competitive atmosphere with each group trying to get the “best deal” for themselves, consistent with the behavior of real world managers. The exercise provides an excellent opportunity for students to integrate their knowledge of topics they have previously covered such as product costing, relevant costing, and segment profitability in a new setting and learn the “rules” of transfer pricing inductively. Results show that students are quite adept at incorporating case cues in a manner consistent with the pricing parameters espoused by traditional transfer-pricing theory. Prior research (Douchy et al, 2003) suggests that students using inductive learning techniques are more likely to retain knowledge for longer periods of time. A logical extension of this study would be to test this proposition in a longitudinal setting.

Other topics in Managerial Accounting that would appear to be fertile candidates for an inductive approach would include:

1. *Cost-Volume-Profit Analysis*, whereby students might be coaxed to discover the concept of generating “contribution margin” sufficient to pay fixed costs (i.e., breakeven).
2. *Job Order Costing*, whereby students might discover logical ways to attach overhead costs to a product using a surrogate “cost driver.”
3. *Relevant Costs*, whereby students can be allowed to sort relevant and irrelevant cues to infer the concepts of “future costs that differ between decision alternatives.”
4. *Budgeting and Standard costing*, whereby a case might be used to let students produce

their own budgets under a participative budgeting environment and to decide how to build normal inefficiencies into standards to implement the idea of “practical standards”

5. *Segment Reporting*, whereby students discover the motivational implications of assigning common fixed costs to divisional managers.

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