Imagine spending an entire class period taking your students through an economics article. You carefully motivate and explain the model, and then relax the model assumptions one by one to demonstrate the sensitivity of the policy conclusions to a variety of factors. You sit back, satisfied that you have given your students a thorough understanding of the problem. Then one of them raises a hand and asks “Why did you make us read this if it’s wrong?”

The story illustrates a basic tension between demand for business education (students want practical knowledge) and supply (professors are trained to provide abstract theory). This tension is found throughout academia, but it is perhaps most acute in a business school. Business professors have academic training and publish in the same journals as their colleagues in Arts and Sciences. They value methodology above application, but their students have more immediate concerns. They expect a return on a fairly sizable investment and consequently don’t want to learn material that doesn’t have tangible and obvious value.

One implication of this mismatch is that teaching economics in the usual way – with models and public policy applications – is not likely to satisfy student demand. Business students have difficulty learning abstract theory, and even those who understand it have difficulty applying its lessons to real-world problems. In addition, they have little interest in the public policy applications used to motivate and illustrate economic theory.

In this chapter, we propose a problem-solving pedagogy as a better way to teach economics to business students. The pedagogy begins with a business problem, like the fixed-cost fallacy, and then gives students just enough analytic structure to compute the costs and benefits of various solutions. Teaching students to solve problems, rather than learn models, satisfies student demand in a straightforward way because it allows students to “see” the value of the education they are receiving. It also allows students to absorb the lessons of economics without as much of the analytical “overhead” as a model-based pedagogy. This is an advantage, especially in a terminal or stand-alone economics course, like those typically taught in a business school. To see this, ask yourself which of the following ideas is more likely to stay with a business student after the class is over: the fixed-cost fallacy or that the partial derivative of profit with respect to price is independent of fixed costs.

The sections that follow describe student demand for business education and then show how the elements of a problem-solving pedagogy satisfy this demand.
WHY ECONOMISTS SHOULDN'T TEACH ECONOMICS IN THE SAME WAY AS THEY LEARNED IT

This section characterizes student demand, focusing on the peculiar features of business education that make teaching economics with a model-based pedagogy so unsuccessful.

Business Education is an Investment, and Students Want to ‘See’ a Return

Most professors are attracted to academia by a love of learning. For them, knowledge is its own reward. But business students, both those seeking MBA degrees and those taking undergraduate business courses, have a different goal in mind. They are making a very big investment, and expect that a business education will help them perform better in a business setting, further their careers, and make more money. In fact, business schools tout the starting salaries of their graduates as an indicator of the school’s ability to help students achieve these goals. Most business students have calculated the cost of each class that they take – about $130/hour for a top ranked program – and if they don’t receive obvious value from each class, they are not shy about letting the dean know.

Students Want Practical Knowledge Not Abstract Theory

The decision to pursue a professional education instead of – or after – a traditional liberal arts education reveals a preference for specialized over general knowledge and a preference for application over theory. But most importantly, business students want to be able to apply the lessons they learn to help them realize their goals of furthering their careers and making more money.

This is a pretty high bar for any class, but especially daunting for those teaching using a model-based pedagogy. Even the economics majors who take these classes have trouble applying its lessons to real-world situations. Ferraro and Taylor (2005, p. 3 and pp. 7–8) illustrate the difficulty with a simple quiz about “opportunity cost,” one of the most useful ideas in economics.

Select the Best Answers to the Following Questions:

1. You won a free ticket to see an Eric Clapton concert (which has no resale value). Bob Dylan is performing on the same night and is your next-best alternative activity. Tickets to see Dylan cost $40. On any given day, you would be willing to pay up to $50 to see Dylan. Assume there are no other costs of seeing either performer. Based on this information, what is the opportunity cost of seeing Eric Clapton?

   A. $0
   B. $10
   C. $40
   D. $50

2. You won a free ticket to see an Eric Clapton concert (which has no resale value). Bob Dylan is performing on the same night and is your next-best alternative activity. Tickets to see Dylan cost $40. On any given day, you would be willing to pay up to $50 to see Dylan. Assume there are no other costs of seeing either performer. Based on this information, what
is the minimum amount (in dollars) you would have to value seeing Eric Clapton for you to choose his concert?

A. $0  
B. $10  
C. $40  
D. $50

Of course, the right answer to both questions is B – the cost of something is what you give up to pursue it. But Ferraro and Taylor (2005) found that only 22 percent of students answered the first question correctly, and only 40 percent answered the second one correctly. Year of degree, quality of school, and other educational inputs were unrelated to a student’s ability to answer these simple questions. The only significant finding was that micro theorists were better than all other groups, but macroeconomists were indistinguishable from undergraduates who never took an economics course.

Ferraro and Taylor (2005) reach the obvious conclusion (p. 11):

If we are unable to instill in our students a deep and intuitive understanding of one of the most fundamental ideas that the discipline has to offer and the idea whose frequent application could do the most good in people’s private and public lives, then we wonder what we can claim as our value-added to the college curriculum.

For business students, who are less able to realize the value of abstract theory, the problem is even worse.

**Business Students Learn Concretely, Not Abstractly**

Psychological research (Schroeder, 1993) suggests that students, on average, are less comfortable than their professors with abstract ideas and have less tolerance for ambiguity. Rather, students are more dependent on immediate gratification and crave structure and clarity. For them, a successful educational path is usually from practice to theory, not the more traditional route from theory to practice. For these learners, Schroder (1993) calls for a “concrete-active” pedagogy as opposed to the more traditional “abstract-reflective” one (p. 25):

Concrete active learners come to class seeking direct, concrete experience, moderate-to-high degrees of structure, and a linear approach. They value the practical and the immediate, and the focus of their perception is primarily on the physical world. Their instructors, on the other hand, prefer the global to the particular, [and] are stimulated by the realm of concepts, ideas, and abstractions.

The traditional model-based pedagogy falls into the abstract-reflective category, while a problem-based pedagogy is designed to fit into the concrete-active category.

**Public Policy vs. Business Applications**

The application of economics to public policy is often the focus of economics and is often the subject of the professor’s academic research. It is natural, therefore, to use public policy applications to illustrate, motivate, and validate the usefulness of econom-
ics. However, making the link between the public policy examples taught in class and the business applications of interest to students is difficult because it requires students to move from the particular (public policy example) to the abstract (economic theory) and then back again to the particular (business decision). It is easy for students to get lost along the way. For example, suppose a student is interested in analyzing a problem with transfer prices that are set above marginal cost. If a student has not seen the link between the application (transfer pricing) and the appropriate model (successive monopoly), it might never occur to him. Making these links explicit helps business students learn which analytic tools to apply to a particular business decision, which also makes it easier for business students to see and appreciate the value of economic theory.

**Students of Differing Backgrounds**

Students seeking a business education come to class with a variety of educational backgrounds: some are English majors, some are engineers, and some are economics majors. Teaching economics using a traditional model-based pedagogy raises the problem of how to pitch the class: aim too low and you will bore the economics majors; aim too high and you will lose the English majors; aim at the median student and you will satisfy no one. Using a problem-solving pedagogy mitigates this problem because the business applications are new to all. In addition, with less analytical overhead, it is easier for the English majors to keep up, or to learn the material outside of class using online tools.3 Allowing students to learn the analytics at their own pace allows the less analytically inclined students to spend more time on the tools, while the more analytical students can focus on the business applications.

**Economics is Taught as a Stand-alone Course**

Most professors learned economics from a traditional model-based pedagogy as part of a sequence of classes in a curriculum. Each course in the curriculum builds on the ones before it, and students often realize the value of a class only after taking the next class in the sequence. In a business curriculum, however, economics is taught as a stand-alone subject, typically in a terminal class. In this setting, professors must design courses that stand on their own. Building a course around solving business problems is one way to do this.

**ELEMENTS OF A PROBLEM-SOLVING PEDAGOGY**

This section outlines the elements of a problem-solving pedagogy and shows how they satisfy student demand. Much of this material is taken from Froeb and McCann (2010), but elements of the approach can be found in many managerial economics texts.

**Begin with a Business Problem**

Beginning with a real-world business problem puts the particular ahead of the abstract and motivates the material in a straightforward way. For teaching principles in a functional area like economics, avoid ill-defined and open-ended problems (see, for
example, Lamym, 2007), because there are many potential ways of looking at an open-ended problem, and many potential analytical tools that could be used to fix it. Instead, use narrower problems whose solution requires students to use the analytical tools of interest; or, at least, tightly manage the class discussion so that you can “steer” it towards the tools of interest.

**Inefficiency Implies Opportunity**

The first element of a problem-solving pedagogy is to show students how to use the traditional tools of economic analysis to identify problems. To do this, turn the traditional focus of economics on its head. Instead of trying to fix inefficiencies by changing public policy, teach students to view inefficiency as an opportunity for business to make money.

Economics is valuable to business students because it gives them the tools to spot inefficiency, in other words, an asset in a lower-valued use. Business views each under-employed asset as a potential wealth-creating transaction, and the art of business is to identify these transactions and find ways to profitably consummate them. Making money is simple in principle, find an under-employed asset, buy it, and then sell it to someone who places a higher value on it.

In practice, it is rarely that simple, particularly when the inefficiency occurs within a larger organization. Companies can be thought of as collections of transactions, from buying raw materials like capital and labor to selling finished goods and services. In a successful company, these transactions move assets to higher-valued uses and thus make money for the company. But this is not always the case. Some organizational designs encourage profitable decision-making; but others do not. A poorly designed company will consummate unprofitable transactions or fail to consummate profitable ones. The next section takes up the problem of goal alignment within an organization: how to make sure that employees have enough information to make good decisions, and the incentive to do so.

**Organizational Design**

To solve business problems in a simple, linear way, distill each problem down to a bad decision, and then proceed in two steps: show students how to figure out what is wrong (why was the bad decision made?); and then show them how to fix it. Both steps require that you understand how people are likely to behave in different circumstances, and this motivates the use of economics. The rational actor paradigm not only helps students figure out why people behave the way they do, but also shows them how to motivate them to change.

If you assume that people act rationally, optimally and self-interestedly, then mistakes have only one of two causes: either people lack the *information* necessary to make good decisions; or they lack the *incentive* to do so. This immediately suggests a problem-solving algorithm: start by asking three questions to diagnose the cause of the problem.

1. Who is making the bad decision?;
2. Do they have enough information to make a good decision?; and
3. Do they have the incentive to do so?
Note that incentives have two pieces, a performance evaluation metric and a scheme to reward good performance.

Answers to these three questions should allow students to identify the source of the problem. If an employee is acting in a way contrary to the goals of the organization, answers to these three questions should also suggest ways to fix the problem:

1. Let someone else make the decision – someone with better information or incentives;
2. Give more information to the current decision-maker; or
3. Change the current decision-maker’s incentives.

Students use benefit-cost analysis to choose from among the viable solutions.

Those of you familiar with the so-called Rochester approach to Organizational Design should recognize the similarity of this problem-solving algorithm to the “three legs” of Organizational Architecture – decision rights, performance evaluation, and reward structures – developed by Jensen and Meckling (2000) and later refined by Brickley, Smith, and Zimmerman (1997). It differs in that they decompose incentives into two pieces, performance evaluation and reward schemes, rather than lump them together, and don’t consider information flows separately from the incentives. The justification for this difference is that decision makers with appropriately designed performance evaluation metrics and reward schemes already have an incentive to gather the information necessary to make a good decision. The substance is similar, but it is often useful to consider the problem of information acquisition separately from incentives.

EXAMPLES

High Transportation Costs at a Coal-burning Utility

A power-generating utility owns a large coal-burning power plant on a river and each week a dozen barges arrive loaded with coal to feed the power plant. The transportation division of the parent company is responsible for transporting coal to the power plant, and it pays a barge company to pick up the coal at a railhead and transport it down river.

Once a barge arrives at the docks, the power plant is very slow to unload the coal because they have just one crew of dockworkers and they rarely work overtime or on weekends. The barge company gives its customers three days to unload the coal, but if it takes longer, it charges late fees of $500 per day. Because very few barges are unloaded within three days, the transportation division pays very high late fees.

The immediate problem is that the late fees paid by the transportation division are bigger than the overtime fees that would cause them to disappear, but the unloaded barges also represent inefficiency, in other words, the barges have a higher valued use in transporting coal to other customers.

Imagine that you are brought in to fix the problem. Start by using our problem-solving algorithm:
1. **Who is making the bad decision?** The power plant is unloading the barges too slowly, which leads to big late fees.

2. **Does the power plant have enough information to make a good decision?** Yes. The power plant knows that leaving barges at the dock beyond three days results in extra charges.

3. **Does the power plant have the incentive to make a good decision?** No. Promptly unloading the barges would require overtime pay to the dockworkers. Since dockworkers’ overtime wages are twice the normal wages, the power plant saves money by waiting until the barges can be unloaded during normal work hours.

The cause of the problem should now be obvious: the power plant division increases its own division profit by keeping the barges at the dock until they can be unloaded during regular work hours, requiring no overtime pay. The delay results in late fees falling on the transportation division.

There are two obvious solutions to this problem. The first is to change the performance evaluation metric of the power plant to include late fees. If the costs of paying overtime are less than late fees, this change will give the power plant an incentive to unload the barges within three days. If not, it won’t. Either way, this change would better align the incentives of the power plant with the profitability goals of the parent company.

The other obvious solution is to move the decision rights about when to unload the coal to the division that is already paying the late fees (the transportation division). Although this solution achieves the same goal alignment, it would likely create coordination problems because the dockworkers have other responsibilities within the power plant. It is never easy for employees to serve two bosses.

**Outsourcing a Washing Machine Agitator**

In 1996, GE operated a washing machine plant that was trying to decide whether to outsource its plastic agitator. The firm received a bid of $0.70 per unit from a trusted supplier and compared it to internal production costs. Put yourself in the role of plant manager and make your decision on the basis of Table 59.1.

The relevant comparison should neglect the costs of depreciation and overhead because GE incurs these costs regardless of whether it decides to outsource. The relevant cost of internal production is $0.80, and the relevant cost of outsourcing is $0.70. Outsourcing is cheaper.

In this example, however, identifying the right decision was easier than implementing it for the plant manager. Six years earlier, the plant had incurred $1 million in tooling costs to make molds for the agitators. Following Generally Accepted Accounting Principles (GAAP), they were charging themselves $100,000/year, over ten years, for the tooling cost. This is called straight-line depreciation. Since it had been six years since the tooling costs were incurred, there was still $400,000 worth of undepreciated capital on the company’s balance sheet. Accountants at his firm told the plant manager that if he decided to outsource the agitator, these “assets” would “become worthless,” and the manager would be forced to take a charge against his division’s profitability. The $400,000 charge would prevent him from reaching his performance goal, and he would
have to forgo his bonus. The manager rationally decided not to outsource even though outsourcing would have been a profitable move for the company.

Run this problem through our problem-solving framework to identify the source of the problem, and try to find a way to fix it.

1. **Who is making the bad decision?** The plant manager decided not to outsource, even though outsourcing would have been a profitable move for the company.

2. **Does the plant manager have enough information to make a good decision?** Yes. In fact, he is the one who identified the profitable decision.

3. **Does the plant manager have the incentive to make a good decision?** No. Outsourcing reduces accounting profit, and because the manager's bonus is tied to plant income, he rationally decided not to outsource.

Although the problem seems simple, the solution is not. The first reaction of most students is to suggest a change in the performance evaluation metric of the plant manager so that his incentives are not tied to accounting profit, which includes the sunk-cost depreciation. Instead they would change the performance evaluation metric to a measure of accounting profit without the sunk costs.

But this solution raises another, more subtle problem. What if the same plant manager made the initial decision to incur the $1 million tooling cost? If you allow the plant manager to walk away from every investment decision that doesn’t work out, you create an incentive to over-invest in capital equipment.

Once they recognize this additional problem, students often suggest moving the decision rights for investment decisions to another business unit, with incentives to increase the net present value of the capital investments that they make. Although moving decision rights to an investment center might sound like a good idea, how would the new decision-maker get the information necessary to make good investment decisions? Ultimately, they would have to rely on information from the plant manager, which leads us back to the very first problem. The plant manager has an incentive to manipulate the decisions of the business unit by selectively feeding them information about the profitability of capital investment projects.

This is a rich problem in that a professor can use it to illustrate a lot of important

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<tr>
<td>Other overhead</td>
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*Notes:* Annual unit volume is 1,000,000. Depreciation refers to straight-line depreciation of the $1,000,000 initial tooling cost, equal to $100,000 per year for ten years ($0.10 = $100,000/1,000,000).

*Source:* Froeb and McCann (2010, p. 29).
principles: that accounting costs do not necessarily correspond to economic costs; that there are no perfect solutions, only tradeoffs; and that sometimes the best solution is to do nothing. It never occurs to most students that their solution is perhaps more costly than the problem it is designed to solve. This example can also be used to talk about ethics. What differentiates the behavior of our plant manager from the managers at Enron, who enriched themselves at the expense of shareholders? Isn’t the GE plant manager doing the same thing?

CONCLUSION

Using the traditional tools of microeconomics in tandem with the tools of organizational design shows students how to solve problems in a simple, linear way. Economics teaches students to identify profitable decisions, while organizational design shows students how to implement them. Teaching one without the other may explain why students have difficulty seeing the relevance of economics to business. Identifying profitable decisions without being able to implement them, or implementing decisions without knowing whether they are profitable, are both fruitless exercises.

A problem-solving pedagogy is but one way to teach microeconomic principles to business students. Hybrid approaches use some of the same elements to teach business students (see, for example, Baye, 2007). In addition there are different pedagogies, like Bergstrom and Miller’s (1999) classroom experiments and Maital (1994)’s “executive” approach that satisfy Schroeder’s call for “concrete-active” teaching. However, for the reasons outlined above, we think a problem-solving pedagogy is the best way to teach microeconomic principles to business students on a managerial economics course.

NOTES

1. We wish to acknowledge useful comments from Brian McCann.
2. The discussion in this chapter is primarily focused on business education at the MBA level, given that this course is primarily taught in such programs. However, these concepts apply to undergraduate business courses as well.
3. See, for example, the Managerial Economics module of Southwestern’s Mbaprimer.com, accessed 25 May 2011.

REFERENCES


