
38 Less is more: the perils of trying to cover too much in microeconomic principles

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As taught in American colleges and universities, introductory economics courses leave almost no measurable trace on students. When they are given tests that probe their knowledge of basic economic principles six months after taking these courses, they perform no better than others who never took an introductory course at all (Hansen, Salemi, and Siegfried, 2002).

In many professions, clearly substandard performance provokes malpractice lawsuits against. But the instructors of introductory economics courses have never, to my knowledge, been confronted with such lawsuits. Perhaps that is because few people outside of academic economics departments have any appreciable working knowledge of basic economic principles, so almost no one can tell how poorly we train our students. But that does not make our performance any less scandalous. How can a university justify charging thousands of dollars for courses that add no measurable value?

STUDENTS FAIL TO MASTER EVEN BASIC CONCEPTS

Even the most basic economic concepts, such as opportunity cost, do not seem to be getting across. Everyone who ever took an economics course has at least heard of the concept. There is not unanimous agreement on how it should be defined, but for present purposes, we can work with the definition I personally prefer, which is that the opportunity cost of engaging in an activity is the value of everything you must give up to pursue it.

Suppose, for example, that you have won a free ticket to see an Eric Clapton concert tonight, which has no resale value. Bob Dylan is also performing tonight, and his concert is the only other option you are considering. A Dylan ticket would cost you \$40, and on any given day you would be willing to pay as much as \$50 to see him perform. (In other words, if Dylan tickets were priced above \$50, you would pass on his event, even if you had nothing else to do.) For simplicity, assume there is no other cost of seeing either performer. What is your opportunity cost of attending the Clapton concert?

The only thing of value that you must sacrifice to attend the Clapton concert is seeing Dylan. You would miss out on a performance that would have been worth \$50 to you, but you would also avoid having to spend \$40 for a ticket to the event. The value of what you give up by not seeing Dylan is thus $\$50 - \$40 = \$10$. In this example, if seeing Clapton is worth at least \$10 to you, you should attend his concert. Otherwise you should see Dylan.

Opportunity cost is, by consensus, one of the two or three most important ideas in

introductory economics. Yet we now have persuasive evidence that most students do not master this concept in any fundamental way. The economists Paul Ferraro and Laura Taylor recently posed the Clapton/Dylan question to groups of students to see whether they could answer it (Ferraro and Taylor, 2005). They gave their respondents only four choices:

- a. \$0
- b. \$10
- c. \$40
- d. \$50

As noted, the unambiguously correct answer is \$10, the value of what you sacrifice by not attending the Dylan concert. Yet when Ferraro and Taylor posed this question to 270 undergraduates who had previously taken a course in economics, only 7.4 percent of them answered it correctly. Since there were only four choices, students who picked at random would have had a correct response rate of 25 percent. A little bit of knowledge seems to be a dangerous thing here.

When Ferraro and Taylor posed the same question to 88 students who had never taken an economics course, 17.2 percent answered it correctly – more than twice the correct response rate as for former economics students, but still less than chance.

Why did the economics students perform so poorly? The main reason, I suspect, is that because opportunity cost is only one of several hundred concepts that professors throw at them during the typical introductory course, it simply goes by in a blur. Students do not spend much time on it, nor do they use it repeatedly in different contexts. So it never really sinks in.

The evolved human brain apparently relies on a simple rule of thumb to help it cope with what would otherwise be an overwhelming onslaught of information: Unless the same piece of information comes up repeatedly, the best bet is to ignore it. Trying to assimilate and react to the terabytes of information that bombard our senses each day is simply not a feasible option. When a piece of information recurs, however, it is much more likely to be worthy of attention, and the brain begins laying down new circuits to deal with it. So it is not reasonable to expect students to learn basic economic concepts if they are exposed to each one only fleetingly.

But Ferraro and Taylor suggest a different explanation for why introductory courses are so ineffective: the instructors who teach them may not have mastered the basic concepts themselves. After all, they first heard about opportunity cost when it was one of hundreds of concepts that went by in a blur when they took their own first course in microeconomics.

When Ferraro and Taylor examined the leading introductory economics textbooks, they discovered that most did not devote sufficient attention to the opportunity cost concept to enable students to answer the Dylan/Clapton question. When they examined intermediate microeconomics texts, they discovered that the opportunity cost concept received only cursory mention, possibly because authors assumed it had been adequately covered in the introductory course. And when they examined graduate microeconomics texts, they found that the term did not even appear in the indexes of many of them.

To test their hypothesis that instructor knowledge gaps were a contributing factor to poor student performance, Ferraro and Taylor posed the same Clapton/Dylan question to a sample of 199 professional economists at the annual American Economic Association meetings in 2005. Only 21.6 percent chose the correct answer; 25.1 percent thought the opportunity cost of attending the Clapton concert was \$0, 25.6 percent thought it was \$40, and 27.6 percent thought it was \$50.

The opportunity cost concept is undeniably important. It helps explain a host of interesting behavior patterns. Consider, for example, the widely remarked cultural differences between large coastal cities in the United States and smaller cities in the Midwest. Why do residents of Manhattan tend to be rude and impatient, whereas residents of Topeka are more likely to be friendly and courteous?

You could dispute the premise, of course, but most people seem to find it roughly descriptive. If you ask for directions in Topeka, people seem eager to stop and help you; in Manhattan, they may not even make eye contact. Because Manhattan has the highest wage rate and the richest menu of things to do of any city on the planet, the opportunity cost of people's time is very high there. So perhaps it is only to be expected that New Yorkers would be a little quicker to show impatience.

LIMIT TOPIC COVERAGE

The best way to teach introductory microeconomics – or any other subject, for that matter – is to expose students to repeated applications of a short list of the core ideas of the discipline. But whose short list? If we asked a thousand economists to provide their own versions, we would get a thousand different lists. Yet to dwell on their differences would be to miss their essential similarities. Indeed, almost all would contain variants of propositions like these:

- *The Scarcity Principle:* Having more of one good thing usually means having less of another.
- *The Cost-Benefit Principle:* Take no action unless its marginal benefit is at least as great as its marginal cost.
- *The Principle of Comparative Advantage:* Everyone does best when each concentrates on the activity for which he or she is relatively most productive.
- *The Principle of Increasing Opportunity Cost:* Use the resources with the lowest opportunity cost before turning to those with higher opportunity costs.
- *The Equilibrium Principle:* A market in equilibrium leaves no unexploited opportunities for individuals, but may not exploit all gains achievable through collective action.
- *The Efficiency Principle:* Efficiency is an important social goal, because when the economic pie grows larger, everyone can have a larger slice.

My point is not that this is the best short list, but that the introductory micro course will be taught most effectively if it begins with a well-articulated short list of some sort, and then doggedly hammers away at it, illustrating and applying each principle in context after context.

Many introductory economics textbooks, of course, do nothing of the sort. To be sure, versions of the core principles are found in these books, but so is virtually every other economic principle that has surfaced over the last 200 years. The mind-boggling detail of these books – thousand-plus page encyclopedic reference tomes, many of them – could not have been purposely designed to camouflage more effectively the handful of principles that really matter.

Why did this happen? An important factor may have been that adoption decisions are often made by committee. When five busy faculty members meet to consider textbooks, broad philosophical and methodological discussions quickly give way to detailed comparisons of topic coverage. Each committee member, of course, has his or her own favorite set of topics. And from the individual faculty member's perspective, one of the most costly mistakes is to choose a text that omits several of her favorite topics. Choosing such a book means that she will either have to abandon those topics when she teaches the course, or else have to prepare supplementary readings or special handouts in order to cover it. Time is short, and for many, the tenure clock is ticking.

Thus it is no surprise that, given two otherwise equally attractive texts, the one with broader topic coverage has a clear edge. Book publishers know this, of course, and have become understandably reluctant to invest in texts with limited topic coverage. So despite their occasional promises of new, leaner versions, almost all of today's introductory texts follow the encyclopedic format.

At one level, this might seem the most sensible compromise since, after all, professors can always pick and choose from the topics available in the text. Yet, as a practical matter, few of us attempt to fine-tune our assignments in this way. ("In chapter 4, read sections 4.1, 4.3, 4.4–4.6, 4.8, pages 231–33 of section 4.9, pages 245–47 of section 4.11, and sections 4.14–4.16.") In most cases, professors either assign the entire text, or else attempt to cover, in sequence, as many chapters as time permits. On the rare occasion when a professor does take the trouble to assign only excerpts from one of the encyclopedic texts, students invariably complain about having been forced to spend so much for a book that was used so sparingly.

When the dust settles, most students leave the introductory course never having fully grasped the essence of economic fundamentals. Opportunity cost and other basic concepts are more important than, say, the idea that the short-run average cost curve is tangent to the long-run average cost curve at the output level for which capacity is at the optimal level. But students would never realize that from the relative emphasis these topics receive in many of our introductory textbooks.

Intelligent instructors with Ph.D.s in economics may wonder whether so much repetition is really necessary, fearing that they will bore their students by exposing them to yet another application of the opportunity cost concept, or to yet another application showing why sunk costs should not matter. To many, it will seem that the same time would be better spent discussing why the average fixed cost curve is asymptotic to the quantity axis. At some point, it surely is better to move on to the technical properties of the average fixed cost curve. But that point almost surely does not come during the micro principles course. For decades, I have had the privilege of teaching some of the most capable undergraduates in the world. That experience has persuaded me that by attempting less, I end up teaching more.

THE ECONOMIC NATURALIST WRITING ASSIGNMENT

It is important for students not just to be able to apply core economic principles, but also to have an inclination to do so. The most effective strategy I have discovered for achieving that goal is to encourage them to become “economic naturalists.” Studying biology enables people to observe and marvel at many details of life that would otherwise have escaped notice. For the naturalist, a walk in a quiet wood is an adventure. In much the same way, studying economics can enable students to see the mundane details of ordinary existence in a sharp new light.

I require my students to submit two short papers (500 words maximum), one due at mid-term, the other at term’s end. The title of each paper is supposed to be an interesting question prompted by something they have experienced and observed personally. I call this assignment “the economic naturalist” because it was inspired by the kinds of questions an introductory course in biology enables students to answer. If you know a little evolutionary theory, you can see things you did not notice before. The theory identifies texture and pattern in the world that is stimulating to recognize and think about.

For example, here is a standard Darwinian question: Why are males much bigger than females in most vertebrate species? Bull elephant seals, for instance, can exceed 20 feet long in length and weigh 6000 pounds – as much as a Lincoln Navigator – whereas female elephant seals weigh only 800 to 1200 pounds.

Similar sexual dimorphism is observed in most vertebrate species. The Darwinian explanation is that most vertebrates are polygynous (meaning that males take more than one mate – if they can), and so males must compete for females. Bull elephant seals pummel one another on the beach for hours at a time, until one finally retreats, bloodied and exhausted.

The winners of these battles command nearly exclusive sexual access to harems of as many as one hundred females. This is a Darwinian prize of the first order, and it explains why males are so much bigger. A male with a mutant gene for larger size would be more likely to prevail in fights with other males, which means that this gene would appear with higher frequency in the next generation. In short, the reason males are so large is that small males seldom gain access to females.

A similar explanation accounts for the large tail displays in peacocks. Experiments have demonstrated that peahens prefer peacocks with longer tail feathers, which are thought to be a signal of robust health, since parasite-ridden males cannot maintain a bright, long tail.

For both the large bull elephant seal and the peacock with a long tail display, what is advantageous to males individually is disadvantageous to them as a group. A 6000-pound seal, for example, finds it harder to escape from the great white shark, its principal predator. If bulls could all cut their weight by half, each would be better off. The outcome of each fight would be the same as before, yet all would be better able to escape from predators. Similarly, if peacocks’ tail displays were all reduced by half, females would still choose the same males as before, yet all peacocks would be better able to escape from predators. But bull elephant seals are stuck with their massive size and peacocks are stuck with their long tail feathers.

Of course, such evolutionary arms races do not continue indefinitely. At some point, the added vulnerability inherent in larger size or longer tail displays begins to outweigh

the benefit of increased access to females. It is that balance of costs and benefits that is reflected in the characteristics of surviving males.

The biologist's narrative is interesting. It coheres. And it seems to be right. Thus if you look at monogamous species, ones in which males and females pair off for life, you do not see sexual dimorphism. This is "the exception that proves the rule" in the old-fashioned sense of the verb "to prove": it tests the rule. Polygyny led to the prediction that males would be bigger. And in its absence, males are not bigger. For example, because the albatross is monogamous, theory predicts that males and females will be roughly the same size, which in fact they are.

THE IMPORTANCE OF NARRATIVE

The biologist's narrative regarding sexual dimorphism has legs. It is easy to remember and satisfying to recount to others. If you can tell such stories and understand why they make sense, you have a far better grasp of biology than if you have simply memorized that birds belong to Class Aves. It is the same with narrative explanations based on principles of economics.

Most introductory microeconomics courses (and my own was no exception in the early days) make little use of narrative. Instead, they inundate students with equations and graphs. Mathematical formalism has been an enormously important source of intellectual progress in economics, but it has not proved an effective vehicle for introducing newcomers to our subject. Except for engineering students and a handful of others with extensive prior training in math, most students who attempt to learn economics primarily through equations and graphs never really grasp that distinctive mind-set known as "thinking like an economist." Most of them spend so much effort trying to make sense of the mathematical details that the intuition behind economic ideas escapes them.

The human brain is a remarkably flexible organ with the capacity to absorb new information in myriad different forms. But information gets into most brains more easily in some forms than others. In most cases, students grasp equations and graphs only with difficulty. But because our species evolved as storytellers, virtually everyone finds it easy to absorb the corresponding ideas in narrative form.

I stumbled onto this insight by chance some twenty years ago when participating in the writing across the disciplines program at Cornell, which was inspired by research showing that one of the best ways to learn about something is to write about it. As Walter Doyle and Kathy Carter, two proponents of the narrative theory of learning, have written, "At its core, the narrative perspective holds that human beings have a universal predisposition to 'story' their experience, that is, to impose a narrative interpretation on information and experience" (2003). Psychologist Jerome Bruner, another narrative learning theorist, observes that children "turn things into stories, and when they try to make sense of their life they use the storied version of their experience as the basis for further reflection. . . . If they don't catch something in a narrative structure, it doesn't get remembered very well, and it doesn't seem to be accessible for further kinds of mulling over" (quoted by Doyle and Carter, 2003).

In short, the human brain's specialty seems to be absorbing information in narrative form. My economic naturalist writing assignment plays directly to this strength. It calls

for the title of each student's paper to be a question. For three reasons, I have found it useful to insist that students pose the most interesting questions they can. First, to come up with an interesting question, they must usually consider numerous preliminary questions, and this itself is a useful exercise. Second, students who come up with interesting questions have more fun with the assignment and devote more energy to it. And third, the student who poses an interesting question is more likely to tell others about it. If you cannot actually take an idea outside the classroom and use it, you do not really get it. But once you use it on your own, it is yours forever.

To illustrate, an economic naturalist is someone like Bill Tjoa, a former student who wanted to know, "Why do the keypad buttons on drive-up automatic teller machines have Braille dots?" A plausible answer, he reasoned, is that once the keypad molds have been manufactured, the cost of producing buttons with Braille dots is no higher than the cost of producing smooth ones. Making both types would require separate sets of molds and separate batches of inventory. If the patrons of drive-up machines found buttons with Braille dots harder to use, these extra costs might be worth incurring. But since the dots pose no difficulty for sighted users, the best and cheapest solution is to produce only keypads with dots.

Another of my favorite submissions was by Greg Balet, who asked, "Why do regulators require toddlers to be strapped into safety seats for even a two-block drive to the grocery store, yet permit them to sit untethered on our lap during cross-country airline flights?" Many students, on first hearing this question, respond that it is because if a plane crashes, you are going to die anyway, even if you are strapped in. But Mr. Balet reasoned that the primary rationale for seatbelts in planes was never to enable people to survive a crash, but rather to prevent injury during severe air turbulence. And since severe air turbulence occurs far more frequently than auto accidents, regulators were quicker to require seatbelts in airplanes than in cars.

Mr. Balet concluded that the real explanation for the asymmetry he was trying to explain had to lie on the cost side of the cost-benefit test, rather than the benefit side. If you already have a safety seat set up in the back seat of your car, it is essentially costless to strap your child in. But if you are on a full flight from New York to Los Angeles, you would have to buy an extra seat, which might cost you \$1000. That cost, he argued, explains why safety seats are not required on airplanes.

In response to my challenge to employ economic principles to cast light on their own experiences, my students have tackled a host of other fascinating questions. Some examples:

Why do brides spend so much money on wedding dresses, while grooms often rent cheap tuxedos, even though grooms could potentially wear their tuxedos on many other occasions and brides will never wear their dresses again? (Jennifer Dulski)

Why do top female models earn so much more than top male models? (Fran Adams)

Why do fast food restaurants often post signs saying, "If you do not receive a receipt, your meal is free?" (Sam Tingleff)

Why does a \$500 tuxedo rent for \$100 a day, while a \$20,000 car rents for \$50 a day? (Jon Gotti)

Why do airline tickets purchased at the last minute sell for premium prices, while Broadway tickets sold at the last minute sell at deep discounts? (Gerasimos Efthimiatis)

Students often struggle to come up with an interesting question in the weeks leading up to their first paper's due date. But as the due date for the second paper approaches, it is quite common for students to ask whether they can do a medley. They have three great questions, they will say, and want permission to write about each one.

Once students realize that they can pose and answer interesting questions on their own, they are hooked. A lifetime trajectory begins in which their mastery of economic principles not only does not decay with each year since completion of the course, but actually grows stronger.

If one of our important goals in the course is to train economic naturalists, it becomes much easier to decide which topics to cover and which to leave out. Other things equal, the more a topic enables students to make sense of their observations and experience, the stronger the case for including it. I find it astonishing that many people receive college degrees without ever once having been exposed to ideas like the prisoner's dilemma or the tragedy of the commons. These and other simple applications of game theory are not only ideal vehicles for illustrating several of the core ideas of economics, but they also have enormous power to explain events in the world.

Some instructors ask how a less-is-more version of the introductory microeconomics course can find time to include such topics, which, after all, do not even make it into some of the encyclopedic texts. The answer is that there is plenty of time, provided we abandon topics like the largely futile attempt to explain why the long-run average cost curve is tangent to the firm's demand curve in the Chamberlain model of monopolistic competition. Abandoning those topics is a small price to pay for the opportunity to learn a general principle that explains, among other things, why urban freeways are too crowded, why whales have been hunted to near extinction, why North Atlantic fisheries are near collapse, why the ozone layer is in danger, why many fail to vote, and why the National Hockey League has a helmet rule.

In addition to focusing on a short list of core principles, it is also useful to focus extra attention on those important concepts that students find most difficult to master. Here we may take useful cues from behavioral economics research showing that people often systematically violate the prescriptions of the rational choice model. For example, the model says that rational persons will ignore sunk costs when making decisions, yet many people are in fact strongly influenced by them. Someone who has purchased a basketball ticket for \$50 is more likely to drive through a snowstorm to get to the game than is an equally avid fan who won her ticket in a raffle. A rational ticket holder should weigh the benefit of attending the game against the cost of driving through the storm when deciding whether to make the trip. If the former is larger, she should go, no matter how she came to acquire the ticket.

It is common for people to ignore implicit costs, and they are also likely to focus on average costs and benefits, rather than marginal costs and benefits. And because these tendencies often lead to bad decisions, topics like these merit extra emphasis. Student resources are limited, which underscores the importance of focusing on precisely those issues for which knowing economic theory is most likely to be helpful.

It may seem natural to wonder whether discussing examples of irrational choices might confuse students who are struggling to master the details of the rational choice model. Ironically, however, my experience has been exactly to the contrary. Such examples actually underscore the normative message of the traditional theory. Students who are exposed to them invariably gain a deeper understanding of the basic theoretical principles at issue. Indeed, they often seem to take an almost conspiratorial pride in being able to see through their friends' errors of judgment.

CONCLUDING REMARKS

The world is a more competitive place now than it was when I started teaching in the 1970s. In arena after arena, business as usual is no longer good enough. Baseball players used to drink beer and go fishing during the off season, but they now lift weights and ride exercise bicycles. Assistant professors used to work on their houses on weekends, but the current crop can now be found most weekends at the office. The competition for student attention has grown similarly more intense. There are many tempting courses in the typical college curriculum, and even more tempting diversions outside the classroom. Students are freer than ever to pick and choose.

Yet many of us seem to operate under the illusion that most freshmen arrive with a burning desire to become economics majors. And many of us seem not yet to have recognized that students' cognitive abilities and powers of concentration are scarce resources. To hold our ground we must become not only more selective in what we teach, but also more effective as advocates for our discipline. We must persuade students that we offer something of value.

A well-conceived and well-executed introductory microeconomics course can teach students more about society and human behavior in a single term than virtually any other course in the university. This course can and should be an intellectual adventure of the first order. Not all students who take the kind of course I am advocating will go on to become economics majors. But many will, and even those who do not will leave with a sense of admiration for the power of economic ideas.

Some economists fret that a course like the one I have described would leave students unprepared to tackle the rigorous demands of higher-level courses in the economics major. But that has not been the experience at Cornell. Here and elsewhere, the intermediate microeconomics course essentially starts from scratch, as if students had never taken an introductory course. (In the light of evidence that students learn nothing in typical introductory courses, this should hardly be surprising.) Students who enter the major with a firm intuitive grasp of the most important economic principles are not only well-equipped to meet the demands of upper-level economics courses, they are much more likely to want to take those courses in the first place.

A salesman knows that he gets only one chance to make a good first impression on a potential customer. The principles course is our discipline's one shot at making a good impression on students. By trying to teach them everything we know, we often squander this opportunity.

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