

## Content Articles in Economics

In this section, the *Journal of Economic Education* publishes articles concerned with substantive issues, new ideas, and research findings in economics that may influence or can be incorporated into the teaching of economics.

**HIRSCHEL KASPER**, Section Editor

# On the Treatment of Fixed and Sunk Costs in the Principles Textbooks

David Colander

*Abstract:* The author argues that, although the standard principles level treatment of fixed and sunk costs has problems, it is logically consistent as long as all fixed costs are assumed to be sunk costs. As long as the instructor makes that assumption clear to students, the costs of making the changes recently suggested by X. Henry Wang and Bill Z. Yang in the *Journal of Economic Education* are greater than the benefits.

Key words: fixed costs, sunk costs, teaching principles of economics

JEL code: A22

Recently, X. Henry Wang and Bill Z. Yang (2001) proposed an alternative textbook convention concerning the treatment of fixed, variable, and sunk costs. They argued that in the standard model, fixed costs should be divided into two components—sunk costs and avoidable fixed costs. They base their argument on the existence of inconsistencies in some textbooks.

As a principles textbook author who wants to provide as clear a presentation of costs as possible, I seriously considered adopting their usage but, in the end, decided not to do so. The reason I decided against using it was that it did not pass the KISS (Keep it simple, stupid) and CLAP (Change as little as possible [from the standard presentation]) criteria that are standard criteria for any textbook

---

*David Colander is the CAJ Professor of Economics at Middlebury College (e-mail: colander@middlebury.edu). The author thanks Henry Wang, Bill Yang, Brian Peterson, and Jenifer Gamber for helpful comments on an earlier draft.*

revision. Instead, I maintain that the current presentation in my book (which is the same as a convention that most other principles books currently use, although they may not always be consistent with that convention) is conventional. I argue that this current convention, correctly followed, does not have the logical difficulties to which Wang and Yang refer and allows instructors to maintain the proposition that “in the long run there are no fixed costs” and the other aspects of the model that are based on a single category of fixed costs.

Let me begin by saying that I am highly sympathetic with the point Wang and Yang (2001) are making. One of the reasons I wrote my principles text was a desire to present cost analysis clearly to students. Initially, I had grand hopes of clearing up the presentation and making it compatible with advances that were then being made in cost accounting and optimal control presentations of decision theory. When I wrote my first draft of the first edition, I tried to provide a new presentation of cost analysis. I presented costs in an optimal control framework in which there was a planning horizon (the long run) and an adjustment horizon (the short run). The short run was an adjustment decision to a long-run planning decision and any short-run adjustment would be characterized by its cost of adjustment. Adjustment cost, not fixed inputs or fixed costs, became the central concepts of short-run analysis. In this alternative model, there were no fixed or variable inputs; costs of adjustment, not marginal productivity, was the explanation for the shape of the short-run cost curve, and there was a range of inputs that varied by their costs of adjustment.

None of that presentation made it into the first edition. Reviewers universally panned it, and I quickly learned an important lesson in Textbook Writing 101: Once a model exists, one deviates from it at one’s peril. Thereafter, I struggled to fit my views into the existing framework and arrived at the convention that my principles textbook, and most other principles textbooks, currently use. It is compatible with that broader optimal control vision but deviates from the standard fixed/variable cost model as little as possible.

The key to the current convention is that *in the standard model, all fixed costs are assumed to be sunk costs*. This does not mean that in the real world all fixed costs must be sunk, in the same way that in the real world not all “fixed inputs” are fixed; it simply means that for purposes of the model that is the assumption that is being made. What Wang and Yang (2001) call avoidable fixed costs are thus excluded from the standard model, as are many other issues.

Because changing from the current convention involves significant coordination issues among different textbooks and among standardized tests such as the AP exam, to argue for a change from the current convention one must make a stronger argument than, “Had an alternative convention developed, it would be preferable.” One must argue that the current convention is logically wrong, or is hurting students’ understanding of the issue. The current convention does not suffer from those problems.<sup>1</sup>

Wang and Yang (2001) are right to point out the importance of a convention to textbook presentations of costs. Some convention is necessary because costs do not divide into neat fixed and variable categories; most costs are somewhere

inbetween the two; they are quasi-variable or quasi-fixed and can be adjusted at a cost. By pointing that out, and reminding teachers of economics that that is the case, Wang and Yang have made an important contribution to pedagogy.<sup>2</sup>

### PROBLEMS WITH THEIR CONVENTION

Their proposed convention would distinguish two types of fixed costs—one sunk and the other avoidable. I have two problems with this convention. The first is that it complicates the presentation and requires revising a number of standard propositions, including the “in the long run there are no fixed costs” and the “shut-down point” analyses. These are both deeply integrated into the teaching of the course, and switching from them will involve much confusion. For example, to use their conventions, one must add a new curve—average sunk costs—to analyze shut-down points, and the short-run supply curve must be redefined because it would no longer begin from the average variable costs. There would have to be significant expected gains from those changes to warrant introducing them into the texts. In my view that is not the case. By simply being clear that in the model fixed costs are assumed to be sunk, one can avoid those changes. Doing so maintains the logic of the current presentation, although it does not prevent discussion of the broader issues of quasi-fixed costs as an addition to the model.

A second, more serious, problem with their proposed convention is that their distinction of sunk and avoidable fixed costs is far too confining. It suggests to students that the problem of lumpiness and partial adjustability that underlies it exists only at the zero level of output. That is not true. The problem is much more general. Most costs are partially adjustable not only at zero output but at all output levels. To see this, consider the example they give of the existence of short-run, avoidable fixed costs. They write

A lawyer has signed a lease to rent an office from a landlord. Monthly rent is a short-run fixed cost for his or her business. Suppose that the lawyer decides to shut down the office for a couple of months or immediately get out of the business after the lease has been signed. In this case if he or she can sublet to someone else or pay the financial penalty for breaking the lease, at least some of the monthly rent can be avoided. Only that unavoidable part of the rent or penalty fee is sunk cost. (Wang and Yang 2001, 181)

This example is quite reasonable, but it does not go far enough. It is not only at zero output that costs can be avoided but at various levels of output. For example, if demand is lower than expected, the lawyer can rent one of the rooms of the office to someone else. Or he or she could share it with another lawyer, lowering his or her costs. In that case, what had been considered the fixed costs are partially avoidable not only at zero output but also at higher level of output. The reality is that many costs classified as fixed are partially avoidable, and there is no reason that they are avoidable only at zero output, as suggested by Wang and Yang.<sup>3</sup> The problem with the Wang and Yang convention is that it integrates this insight only into one place in the model and, in doing so, makes it harder to present it as a general limitation of the model.

## JUSTIFICATION FOR THE ALTERNATIVE CONVENTION

In their presentation, they agree that current convention of many books (and the one I am supporting here)—making fixed costs a synonym of sunk costs—provides a logically consistent convention. They argue against that convention for three reasons.

The first is that it can potentially confuse students and instructors into looking for a difference between fixed and sunk costs that does not exist. They argue that if sunk costs and fixed costs are the same, why have both terms? My answer is that the term “fixed” is associated with the term “fixed input” in the standard model. It is part of the current convention and might be described as a “sunk” term that we have to work around. The cost associated with the fixed input is the fixed cost; the input cannot be changed and has no other use, which makes it a sunk cost. The cost associated with the variable input is a variable cost, which, by assumption, can be varied costlessly.

Now, I am not arguing that, had one been starting the presentation from scratch, the fixed/flexible metaphor would have been the ideal one. It would not have been. Neither of these assumptions nicely fits many real-world production processes, but it is the standard model that textbooks use, and the terms reflect the model.

In making all fixed costs in the model sunk, the textbook authors are not making the terms synonyms as Wang and Yang (2001) suggest; they are simply assuming for simplicity in the model presented that the fixed costs of the model are sunk—and the money spent on them cannot be recovered.

A second argument Wang and Yang give for not assuming all fixed costs sunk is that it leads to logical inconsistencies in presentations. Although I have no doubt that logical inconsistencies exist in textbook presentations, I think they overstate the problem and a number of the logical inconsistencies in the texts that they point out are not, in my view, logical inconsistencies. They find logical inconsistencies because of a particular interpretation they give to the statement that “costs do not vary with the quantity of output produced.” Consider the following argument which they make:

Some textbook authors interpret *fixed costs* as the costs that are independent of the scale of production. This is false. This mistake is made in two steps. In the first step, an author correctly notes that there are no long-run sunk costs by stating that there are no long-run fixed costs. In the second step, forgetting that fixed costs meant sunk costs, the author re-interprets fixed costs inconsistently as costs that are independent of the level of output. Then the statement that “there are no long-run fixed costs” becomes false. It is the inconsistency in defining fixed costs that makes it a myth. (Wang and Yang 2001, 179)

They interpret “independent of the scale of output” to mean that costs do not vary for output *greater than zero*. An alternative interpretation is that it means that costs do not vary for output *greater than or equal to zero*. The latter interpretation makes it clear that in the model one is assuming that all fixed costs are sunk. Simply by interpreting the phrase “independent of output” as inclusive of zero, all fixed costs have to be sunk, and there is no inconsistency and there are no fixed costs in the long run. In my textbook (Colander 2004, 209), when I present the concept of fixed costs I explicitly point out that in my example the fixed

input cannot be modified or used for other purposes, which is why the costs are sunk. As long as one distinguishes a long-run planning period from a short-run adjustment period, this classification works nicely. In the long run nothing is fixed, but some costs are lumpy or indivisible, which means that they will be treated as fixed as soon as they are incurred. These indivisible set-up costs help account for the downward slope of the long-run cost curve. But they are still flexible in the long run. As soon as one signs a contract, they become fixed, and one is no longer in the long run; one is in the short run.

A third argument they provide against the current convention is that higher level books in managerial economics dedicate pages to clarifying the distinction between the two. This, for me, is not an argument for changing the presentation in the principles textbook. Authors of upper level books rightly expand on the models presented in principles in many ways. As long as the principles presentation is not inconsistent with what is presented in upper level textbooks, keeping it simple makes sense. Principles students have more than enough to learn already. To prepare students for upper level courses, in my textbook, I have a section using cost analysis in the real world. This section points out the major simplifications of the model and briefly describes the problems. In this discussion, the distinction between avoidable and unavoidable fixed costs is one of many real-world complications. Other complications include unmeasured costs, joint costs, economies of scope, asymmetries, and learning by doing.

## CONCLUSION

The models presented in introductory microeconomics have many failings. Wang and Yang (2001) have pointed out one of them. However, the fact that some authors of principles textbooks may have been sloppy in presenting the cost model does not mean that the basic cost model they use is not logically consistent and pedagogically supportable. Because that model is consistent with propositions that have become built into economic knowledge, and because it is simpler than the alternatives, it is highly desirable to maintain. The alternative convention Wang and Yang put forward complicates the model significantly and does not offer enough gains to warrant being used.

## REFERENCES

- Colander, D. 2004. *Economics*. 5th ed. New York: McGraw-Hill Irwin.  
Wang, X. H., and B. Z. Yang. 2001. Fixed and sunk costs revisited. *Journal of Economic Education* 32 (Spring): 178–85.

## NOTES

1. I want to make clear that the arguments presented in this article only concern principles textbooks, where simplicity and minimal change are more highly valued than at intermediate micro and field courses, and where students are expected to go into more complex issues.
2. One can tell the growing influence of the *Journal of Economic Education* by the number of reviewer comments I received telling me of the Wang and Yang argument.
3. The parallel to this proposition is that many of the costs specified as flexible have significant costs of adjustment. In fact, in many industries, it is more costly to change labor than to change machines.