

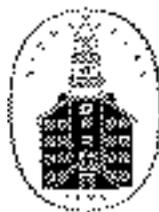
“On the Treatment of Fixed and Sunk Costs in Principles Texts”

by

David Colander

July, 2002

MIDDLEBURY COLLEGE ECONOMICS DISCUSSION PAPER NO. 02-33



DEPARTMENT OF ECONOMICS
MIDDLEBURY COLLEGE
MIDDLEBURY, VERMONT 05753

<http://www.middlebury.edu/~econ>

On the Treatment of Fixed and Sunk Costs in the Principles Texts

David Colander

CAJ Professor of Economics

Dept of Economic

Middlebury College

Middlebury, Vermont 05753

Phone 802-443-5302

Fax 802-443-2084

Colander@Middlebury.edu

On the Treatment of Fixed and Sunk Costs in the Principles Texts¹

Recently X Henry Wang and Bill Z. Yang (2001) propose an alternative textbook convention concerning the treatment of fixed, variable, and sunk costs. They argue 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 simply stupid) and CLAP (Change as Little as Possible (from the standard presentation)) criteria that are standard criteria for any textbook revision. Instead, I will maintain the current presentation in my book, which is based on a convention that most other principles books currently use, although they may not always be consistent with that convention. In this paper I argue that this current convention, correctly followed, does not have the logical difficulties to which Wang and Yang refer, and allows one 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 have highly sympathetic with the point the Wang and Yang are making. One of the reasons I wrote my principles text was a desire to

¹ I would like to thank Henry Wang, Bill Yang, Brian Peterson, and Jenifer Gamber for helpful comments on an earlier draft.

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 text, and most other principles texts, currently use. It is compatible with that broader optimal control vision, but deviates from the standard fixed/variable 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 call avoidable fixed costs are thus excluded from the standard model.

Subcategories of fixed costs are not included in the standard short-run principles level model, but are discussed later at the end of the chapter when discussing cost analysis in the real world.

The advantage of the current convention is that it meets both the KISS and CLAP criteria. Specifically, it maintains the proposition, in the long run there are no fixed costs, and it keeps the model simple. In addition it meets a third criterion in that it is compatible with many different presentations of the higher-level work.²

Wang and Yang are right to point out the importance of a convention to textbook presentations of costs. Some convention is necessary because costs do not divide up into neat fixed and variable categories; most costs are somewhere in-between 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.³ But I disagree with them about the implications of their paper for how the cost model should be presented, at least as it relates to principles texts.

² I want to make clear that the arguments presented in this paper only concern principles texts, where simplicity and minimal change are more highly valued than at intermediate micro and field courses, where students are expected to go into more complex issues.

³ 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 Zang argument.

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 problem 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 a new curve must be added--average sunk costs-- to analyze shut down points, and short-run supply curve must be redefined because it would no longer begin from the average variable costs. To warrant introducing such changes and complications would require significant gains from the new convention, and that is not the case. By simply being clear that in the model fixed costs are assumed sunk one can avoid those changes. Doing so maintains the logic of the current presentation, while not preventing discussion of the broader issues of quasi fixed costs as an addition to the model.

A second 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 costs 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 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. pg. 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 out one of the rooms of the office to someone else. Or he could share it with another lawyer, lowering his 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.⁴ The problem with the Wang and Zang 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 that for three reasons.

⁴ 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.

The first is that it can potentially confuse students and instructors into looking for a difference between fixed and sunk 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. 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. Neither of these assumptions nicely fits many real world production processes, but it is the standard model textbooks use, and the terms reflect the model. In making all fixed costs in the model sunk, the textbooks are not making the terms synonyms as Wang and Yang 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. While 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 pg. 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 text (XXXXXX) when I present the concept fixed costs I explicitly point out that in my example the fixed input can’t 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. But 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 text. 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 texts, keeping it simple makes sense. Principles students have more than enough to learn already. To prepare students for upper level courses, in my text 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 have pointed out one of them. However, the fact that some principles books 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 have become built into economic knowledge, and because it is simpler than the alternatives, it 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.

Bibliography

Wang, X Henry and Bill Z Yang “Fixed and Sunk Costs Revisited” Journal of Economic Education, Spring 2001 178-185.

XXXX