

## **Why do mainstream economists lie to students?**

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Shakespeare was one of the world's all-time greatest writers of comedies for the theatre.

This paper analyses his entire dramatic output in terms of his sense of humour.

Well, the paper is not about Shakespeare. It is about a widespread assertion that mainstream economists make, which has a structural similarity to the opening paragraph. It is central to the neoclassical theory of the firm: that as the scale of production rises, beyond a certain point the average total costs begin to increase. This forms the basis for the classic diagram of the U-shaped average cost curve, ubiquitous in textbooks, intersected at its minimum by the marginal cost curve, which is alleged to form the basis of firms' decisions. The role in decision making means that strictly speaking the theory concerns firms' *perceptions* of the cost curve, rather than objective reality, but the implication must also be that the true cost structure is closely related, if one takes into account the standard neoclassical assumption of perfect information.

Textbooks differ in how they present the U shape, in particular whether they attempt to justify it. Many just present it without any rationale, perhaps with the word "typical" attached, presumably to deflect any risk of students' attempts at critical thinking. The better ones give examples, e.g. referring to agriculture with limited land, or mining in which the best seams are exploited first; another class of examples includes manufacturing, where a factory's

limited space or a fixed number of machines is taken as the limiting factor. Clearly it is this fixed factor that justifies the allegation that costs start to increase at some point.

An occasional textbook also includes empirical information along with the standard theory. For example Begg, Fischer and Dornbusch present evidence that most manufacturing industry either has increasing returns to scale or a horizontal curve. However, its theoretical presentation is along the normal lines, with a U-shaped curve [1]. The given justifications are that (a) the standard analysis may apply more readily to services; and (b) as the operating scale increases, managerial diseconomies of scale set in, with coordination problems, and “average costs *may* begin to rise” [their emphasis]. However, even this more careful exposition of the issues is presented without any supporting evidence for these latter suggestions.

### *The evidence*

The problem is that the classic U shape appears to be wrong, at least for a large proportion of firms. Empirical work, based on taking a sample of firms and asking the appropriate person within each of them about their perceived cost structure, indicates that it applies to rather a small proportion, variously estimated at between 5 and 11 percent [2-4]. So although the textbook description may sometimes apply, its presentation as a general description is false.

The empirical literature goes back many decades. The first paper was by WJ Eiteman and GE Guthrie, published in 1952 [2]. This followed an earlier theoretical paper by Eiteman in 1947, that framed the question in terms of whether or not orthodox economic theory needed to be modified [5], and the theoretical argument was criticised by Bishop [6] and by Haines [7]. When Eiteman produced his empirical paper with Guthrie five years later, it was still

posed in these terms, and concluded, “If the beliefs of businessmen in general coincide with those included in this sample, it is obvious that short-run marginal price theory should be revised in the light of reality”. This drew another riposte, this time by Ritter [8], still focusing entirely on the implications for marginal theory. As he said, “Marginalism is a deductive principle of the end-result to be expected from profit-maximizing behaviour, merely claiming that the entrepreneur will, if possible, produce additional output if the added receipts expected exceed the added costs which it is thought will be incurred”.

In the 1990s Blinder *et al* carried out a similar study, with similar findings; their estimate of the proportion of firms believing that they had the textbook cost curve was 11 percent [3]. These survey-based studies are admittedly fallible, but as Blinder *et al* point out, possibly no more so than national accounts, which are based on questionnaire data. In any case, other evidence is available showing that in US manufacturing, costs tend either to be stable or to fall with scale of production [4].

### *The implications*

There are at least two possible reactions to this literature. The one that has predominated is that if the empirical findings are true, then the neoclassical theory of the firm has serious problems. The other is simply that an apparent falsehood has persisted for several decades. Let us consider this second one, before returning to the first issue.

In any academic discipline, it is possible to make false statements of “fact” – we are all fallible. Normally this is quickly discovered and the mistake is rectified, if not by the original author then at least in subsequent work. It is particularly important that this correction be done in textbooks that are widely used by students of the subject, as they are highly influential.

The situation here is different. The same falsehood has been repeated by numerous authors, to the extent that it must be considered part of an orthodoxy, and this has continued for more than half a century. This is not mere fallibility; if we discount the possibility of ignorance of the literature, it is a deliberate falsehood. It is important to get the facts right, and this would be true even if no crucial theoretical constructs were at stake.

What would be expected in other academic disciplines? A situation of this kind would not be tolerated in any of the natural sciences. Scientists are extremely careful about statements of apparent empirical fact, and correct any such statement when it is found to be false or of limited generality. Such an error could not be repeated in a subsequent edition of the same book. A scientist who published it in a textbook would face ridicule rather than imitation.

Not everyone agrees that natural sciences are a good model for economics. What would happen in the humanities? Let us return to our analysis of Shakespeare's comedies. If we were to try and analyse *Hamlet* [9] in terms of humour, we might try and establish that the following comic exchange sets the tone for the whole play:

Hamlet: Whose grave's this, sirrah?

Gravedigger: Mine, sir.

It is possible that this has been attempted, but as far as I am aware the idea has not been perpetuated in standard teaching texts for decades.

### *Possible justification*

In what ways is it possible to defend the textbook account? First, there are a number of ways of fudging the issue. One is that it is just a thought experiment. In the case of traditional agriculture or in mining the reasoning likely applies quite well, but in manufacturing it implies

a notion of decision making that may or may not be appropriate. This is testable in principle and ought to be tested, because if it is seriously inappropriate then the thought experiment would not apply to an important sector of a modern economy. The bottom line is that a thought experiment that produces a demonstrably false result merely shows that the thought processes are faulty.

A second is that it is just a model, and that “all models are fiction”. It is true that models are designed to simplify reality, sometimes to such an extent that the term “fiction” seems to be not far from the mark. But the aim of a model is to capture an essential feature of the situation or system that it represents, not to distort or falsify it.

A third is that it creates “good intuitions”. If such an argument is made, it is difficult to know what “good” means in this context. It seems likely that the U-shaped cost curve, together with the theoretical context within which it is embedded, does create intuitions that make students begin to think like neoclassical economists. Whether or not this is regarded as “good” is contestable, as it depends on one’s attitude to neoclassical theory – except that in the case where it leads to the repetition of a deliberate falsehood, there is a strong *prima facie* case that something has gone seriously wrong.

If these fudges are rejected on the basis that thought experiments, models and intuitions are all supposed to lead towards the truth, rather than away from it, what other possibilities are there? There are logically only three:

1. **the evidence is wrong**: this would require showing that the evidence of a U shape is true in a sufficient majority of cases to justify its being presented as the typical case, contrary to the evidence we already have;
2. **an inadvertent error has been made**: the U shape is a convention, that unfortunately has been inadvertently repeated for over 50 years, but as it doesn’t really have any important implications the mistake will be rectified forthwith;

3. **it is essential:** a necessary part of theory, e.g. a deduction from the assumption of rational optimising behaviour, or essential to the overall account of the firm and/or to its role in wider neoclassical theory.

For #1, it is possible that new evidence could be adduced that would justify this position, contradicting what currently appears to be the case. For example, studies of the cost structure in industry could be augmented to include managerial costs, and this might possibly alter the conclusions. Admittedly the literature on the topic is somewhat thin. This is strange in itself: for such an important assertion as the U-shaped cost curve, a sound empirical basis would be expected. Response #2 would at least hold out the promise of rectifying the situation, albeit without explaining why it has occurred – but if this were the position would the rectification not have already happened?

This leaves #3. It is not essential for critics of neoclassical theory to show in exactly what way the false U-shaped curve is essential to its proponents. The original literature in the 1950s failed to resolve the situation, because Eiteman was not content just to show that the U shape was wrong as a generalisation, he attempted to state why it showed that the theory needed to be rethought. As we have seen, this was contested – and the dispute muddied the waters.

Even if Eiteman was wrong in some of his analysis of the implications of his findings for neoclassical theory, this would be irrelevant: its proponents have a serious problem because they continue to insist on a theoretical structure that requires a deliberate falsehood. As a general principle, the burden of proof is on the proponents of a theory to show that its component parts are sound, and if evidence is produced that appears to cast serious doubt on this, then it is up to them to put their own house in order. To enter into the discourse using their conceptual apparatus is to concede that it may have some validity, and therefore to be

in reactive mode – a stronger position is just to say “this appears to be empirically wrong – what are you going to do about it?”.

*Why do mainstream economists persist with the error?*

A less central point is to try and understand the strange persistence of the falsehood. A U-shaped cost curve is clearly important as the basis for much of the standard theory, in deriving the upward-sloping supply curve and explaining firms’ decision making processes. It is understandable that supporters of a theory may be reluctant to abandon one of their foundation stones merely because it is wrong.

Perhaps more interesting is the relationship between rising marginal costs and the underlying philosophy of neoclassical theory. A U-shaped cost curve leads to a convergent solution, thus fitting into the dominant paradigm of neoclassical theory: convergence towards a stable equilibrium. In some cases, although not necessarily, this could be for ideological reasons – a Panglossian tendency to regard the competitive, free-trade economy as “the best of all possible worlds”.

Convergence may be an excellent model of the price system when it works well. As an account of the wider economy, however, it has the fundamental problem that its only endogenous causal process is towards stable equilibrium, which logically implies that everything else must be conceived of as a “shock”. However, the evidence shows that capitalist economies tend to have a number of properties, including sustained *per capita* growth [10]. This observation is so robust that it must indicate an endogenous growth-promoting process within the capitalist system. But convergence is unable to explain growth, and requires a “shock” that is also sustained. Hence the need for an exogenous source of

growth in neoclassical growth theory, e.g. technological change (Solow), or introduction of the idea of spillovers (endogenous growth theory).

In contrast, the observed sustained growth tendency can readily be explained in terms of a self-perpetuating cycle [11]. This is seen with the assumption of constant returns to scale, and is amplified when economies of scale are present – only a U-shaped cost curve converts a growing system into a static (convergent) one. Similar amplification can be seen if spillovers are added, suggesting that these have been introduced into endogenous growth theory so as to counteract the convergent tendency of standard theory. It is odd to find a theory that is philosophically committed to static and convergent properties, in which a U-shaped cost curve plays a key part, and then has to introduce an exogenous process or an externality in order to reverse the effects of the shape of the curve – especially when the evidence is that it in practice that shape rarely occurs.

Up till now, we have seen that mainstream economics repeats a deliberate falsehood. Is this the same as a lie? Some definitions of lying also contain an additional element, the intention to deceive. Is that present? It appears that we are dealing with an intention to self-deceive, if theorists believe their models, rather than a deliberate attempt to mislead others. In the context of teaching and textbooks, however, the self-deception is continually passed on to a new audience, and that could qualify as deception, even if the message is believed by those who are preaching it.

### *Contestability*

It is not new to say that neoclassical theory has serious problems; there are several critiques [12,13], many of which are quite old, and have never received a satisfactory reply. This is not the place to discuss them. Some are highly technical, for example the argument that the

“horizontal demand curve” that is essential to the model of the firm in a perfectly competitive market is mathematically incompatible with a downward-sloping market demand curve [14]. But the more serious problem is that they are contestable, because this means that the disputes never resolve, they remain as continuing contests.

These criticisms vary in their effectiveness: not all are justified, and some of those that are may still be contestable. A stronger position is that some key elements are not just fiction, but are demonstrably false. If we are to challenge the hegemonic control that mainstream economics exerts over university teaching in the UK, to an extent unmatched in any other academic discipline, one way would be to identify and publicise aspects of the theory that are indefensible – i.e. not merely a matter of personal orientation and preference, as such differences are acceptable within a pluralist framework, but factually wrong. This would have the advantage that alliances can be made even with non-economists, who may not have any interest in or understanding of neoclassical theory, but know the difference between fact and falsehood.

### *Conclusion*

I have focused on the neoclassical theory of the firm, where the conventional view conflicts with empirical reality, yet is ubiquitous in textbooks and basic courses. Perhaps it is not news to anyone that neoclassical theory does not correspond to how the actual economy works, and in fact many theorists do not make any claim that it does. For example the above quote from Ritter is framed entirely in terms of a deductive principle, not correspondence with any real phenomena, and it is this tautological quality that he uses to defend it. Probably the same defence could be used against *any* possible inconvenient empirical finding.

At the same time it is this type of unreality that leaves the neoclassical perspective open to attack. Often this is done in abstract or general terms, but this seems merely to result in contests that have no decisive outcome. It may be better to oppose the theoretical structure on the grounds that it gives rise to something that is demonstrably false – or if the evidence base on which that claim is made is alleged to be weak, the defenders of the theory need to produce evidence that they have sound factual foundations.

An interesting aspect of the U-shaped cost curve is that it plays an important role in the systematic neglect of growth by neoclassical theory. The distinctive property of the capitalist economy, relentless *per capita* growth, can be understood as long as the cost curve is either horizontal or shows economies of scale; only the U shape destroys the dynamism. Thus as well as being wrong as a general representation of reality, the U-shaped curve omits an essential underlying force, thereby creating a bad intuition of how the economy works.

This paper has focused on the “destructive” task of trying to show a fatal weakness in existing mainstream theory. Complementary to this is a need for construction of better theory that has the potential to replace the neoclassical account with something better. An important focus is likely to be the explanation of capitalist growth, where existing mainstream theoretical accounts are so unconvincing. This is not a minor matter: as Lucas wrote, “Once one starts to think about [growth] it is hard to think about anything else” [15]. We can agree with Baumol [10]: if growth theory cannot account for the specific dynamism of capitalism, it is like a performance of *Hamlet* without the Prince of Denmark.

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