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**Student constructed learning and the potential for cognitive dissonance in
the teaching of perfect competition**

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Student constructed learning and the potential for cognitive dissonance in the teaching of perfect competition

Abstract

This paper uses basic ideas from cognitive learning theory to assess the model of perfect competition from the perspective of an active learner. The story told about the competitive process is shown to be problematic when students try to reconstruct it for themselves. In particular it has the potential to generate cognitive dissonance. An alternative approach to teaching competition as process is outlined which is based on ontological foundations and inductive learning rather than deductive analysis from core axioms. This approach may be more suitable for business students in particular.

JEL codes: A22, D41, L11, L26, M21

1. Introduction

This paper explores how a more complete understanding of the economic process can be fostered in students. In particular we focus on the standard story of the model of perfect competition, since this forms the cornerstone of every student's education about the competitive process and represents the 'competitive ideal'. We draw upon cognitive learning theory and attempt to simulate the thought processes of an 'active learner' as they deconstruct the story they are told in their classes and their textbooks and then attempt to reconstruct it for themselves. We suggest that there is ample scope for cognitive dissonance (Festinger, 1957) to arise in this process and outline some of its consequences. Finally we suggest a different approach to teaching students about competition which has an ontological foundation in contrast to the axiomatic foundation of perfect competition.

The arguments presented here have practical implications for administrators of economics groups or departments who find themselves the subjects of financial pressure because of low student numbers post first year, and who are puzzled by the low conversion rates of students to subsequent optional economics courses from a large first year pool.¹

2. Perfect Competition: a Persuasive Story?

As McCloskey (1994: 121) notes, '...the economists arguing formally in their journals in the role of Scientists are literary artists, using words to tell a

¹ See Guest and Duhs (2002), Alauddin and Valadkhani (2003) for more on this issue. In addition, the authors' own experiences reflect this fact and discussions with numerous colleagues across the world lead us to believe that the problem is widespread.

persuasive story.’ Storytelling is also an important part of teaching economics. If students find the stories they are told persuasive they are likely to develop an affinity for economics. But what makes a story persuasive?

At their simplest, stories are constructed from two fundamental elements: characters (or in the rare extreme a single character) and settings. The characters in a story display particular traits (e.g. their physiologies, personalities, knowledge and skills) and they interact with each other in particular settings (e.g. New York City - ‘Taxi Driver’, the Sahara - ‘Ice Cold in Alex’, a galaxy far, far away - ‘Star Wars’ etc...) to play out a sequence of events which constitute the plot of the story. So, the plot which unfolds is a product of *both* the setting and the traits of the characters.

Stories are based on premises about their characters and an audience has to buy into these premises in order to understand and potentially enjoy the story. For many stories in the realm of popular entertainment this will require the ‘suspension of disbelief’, which means accepting the story’s premises even if they are unrealistic. For example, to enjoy a Superman movie it is necessary to accept (among other things) that the main character can fly, that he is bullet proof and that a pair of spectacles are a good enough disguise to conceal his alter-ego. Once the audience has bought into these premises the storyteller has to ensure that the plot unfolds in a manner that is consistent with the initial premises; in other words, the story has to have logical internal coherence.

This means there are two potential problems for the storyteller: (1) the audience may not buy into the story's premises, or (2) the internal logic of the story may not be consistent with its premises. Either of these problems can constitute a 'deal breaker' in the implicit contract between storyteller and audience. It is important to note also that later stories (e.g. sequels) involving the same characters must also be true to the initial premises (unless a good reason for changing them has been given) and be consistent with the details of previous stories.

Like the stories that are primarily created to entertain, the stories of economics are subject to the same potential problems with regard to their premises and internal consistency and, if only by virtue of the pervasive influence of television, the student of economics can be thought of as a relatively skilled critic in this regard. The stories of economics are, of course, not designed to entertain students.² They are primarily designed to educate them, which is to say that they are there to provide them with insights into the economic aspects of the world around them and develop their understanding in this regard - this is the claim made by economic science in general and principles textbooks in particular.

The fact that economic stories claim to provide insights into the real world means that they have the potential to be judged somewhat more harshly than stories whose primary purpose is to entertain. We should therefore expect

² Even so, good teaching is in part a performance and, in some measure, a good performer interprets the content in such a way that it becomes, if not entertaining, at least interesting. Perhaps we should speak of 'edutainment'? (cf: Colander, 2004, where he suggests that content is by far the most important thing).

the willingness of the audience to suspend disbelief to be diminished when they judge these kinds of stories.

The economic stories told to first year students are encapsulated in simplified models. At the outset every nascent economist is taught about the value of simplified models as a way of capturing essential elements of the more complex real world. Few students have a problem with the arguments made by teachers justifying this general approach to developing insights. Rather, the problems begin when the particular nature of the key models which constitute a common basic training in theoretical economics are revealed. Arguably, none is more problematic for the beginning student than the model of perfect competition.

The model of perfect competition dominates principles textbooks in terms of the relative number of pages dedicated to it (see Hill and Myatt, 2007). It tells a story about how competition between firms leads to a long-run equilibrium outcome where all firms remaining in the industry charge a price equal to the opportunity costs of production and therefore allocate scarce resources efficiently. Two sets of key players are explicitly noted in this story; consumers and entrepreneurs. Consumers are economic decision makers who choose rationally between options based upon their exogenously given and stable preferences which aggregate as a market demand curve. On the other hand, entrepreneurs run firms, defined as a collection of factors of production, and on observing markets where other firms are making above-normal profits, enter these markets and in so doing drive the price down towards opportunity

costs for everyone. On the surface this story seems quite plausible; but as is so often the case, the devil is in the detail. When students are being taught the model they *do* insist, quite rightly, on hearing this detail, since without it they are not able first to deconstruct the story and then to reconstruct it for themselves and internalise it as a part of their own knowledge set (see the discussion of cognitive learning in Reynolds, Caley and Mason, 2002).

As noted above, a story can be found wanting in respect of two fundamental criteria; premises about its characters, and the coherence of the plot as it unfolds. If we assess the model of perfect competition against these two criteria we can identify the weak points in the story and focus on the existence of potential deal breakers *from a student's perspective*. When a student is exposed to the various aspects of the model she may face the problem of cognitive dissonance: there may be an inconsistency between what the teacher is telling her and with what she believes to be true about the world and/or what is true within the logic of the model.

Herbert Simon (1957) pointed out a half century ago that the characters who populate neoclassical models, *homo economicus*, do not look much like real human beings in terms of both the information they have access to and their ability to process it effectively. The story of perfect competition states *explicitly* that entrepreneurs have access to complete information about their own costs of production at all levels of potential output and that these costs arise from using best practice technology, they know what the demand curve for their product looks like (indeed they know that there is pre-existing

demand for their product) and, when confronted with all this information, they do not face cognitive limits in terms of their capacity to calculate answers to questions they have; in fact they only have one substantive question which is, how much should the firm produce in order to maximise its profits? Similarly, consumers are fully informed about all alternatives open to them and can readily and costlessly identify the lowest priced seller of the homogeneous product. From a student's perspective these assumptions may seem quite reasonable as a first pass and thus not generate cognitive dissonance; after all, one might expect that an entrepreneur would have formulated expectations about the firm's costs and potential revenues when they constructed their business plan, and obviously consumers will buy the product from the cheapest supplier they are aware of. So, these explicit assumptions about the agent probably do not comprise a deal breaker when the student is first introduced to them.

It is one thing to suggest that entrepreneurs might reasonably have knowledge of their costs and demand curves, but actually the fundamental assumption underlying the model is that agents are homogeneous. The logical consequence of populating the model with homogeneous entrepreneurs is that any given entrepreneur must know exactly the same things as any other given entrepreneur with respect to how to run a successful business (e.g. technical knowledge and organisational knowledge) and have the requisite skills to operationalise this knowledge efficiently and effectively. Given that all firms have equal access to factors of production, the implication of homogeneity is

that all firms will be identical in terms of their costs of production. If the teacher can slip this point past students unnoticed the story of the dynamics of entry and exit becomes easier to tell, since ‘high cost firms’ will be driven out of the market by low cost firms, but this pedagogic sleight of hand cannot be relied upon and in order to answer the (inevitable) question,³ ‘*why do some firms have higher costs than others?*’ the teacher has to resort to finesse by stepping outside the confines of the formal model and introduce the possibility that different firms have different capabilities. Alfred Marshall’s (1920) original analysis did not face this problem because his notion of the ‘representative firm’ was a theoretical device with *average* characteristics of all firms in the industry, where all *actual* firms had the potential to differ from each other in respect to their costs (Moss, 1984; Earl, 1995; Hart, 2002). In terms of generating cognitive dissonance for the student this issue may or may not matter; for some students the claim that high cost firms will be driven from the industry is commonsensical, even though such firms cannot logically exist within the confines of the model, but for others the logical impossibility of their existence in the first place may be problematic. Arguably, students who fall into the first camp display an appreciation of the ‘art’ of economic theorising in that they intuitively grasp the distinction between *formal* and *appreciative* theorizing,

‘When economists are doing or teaching theory *per se*...the theoretical style is stark, logical, formalized. In contrast, when economists are undertaking applied work that is

³ This question only needs to be asked by one alert student in a class; it does not take long for the idea to diffuse through the rest of the class.

of interest for policy reasons or are explaining to an audience that is interested in that question *per se*, why certain economic events happened, theoretical ideas tend to be used less formally and more as a means of organizing analysis. These two different styles of theorizing we shall call *formal* and *appreciative*.' (Nelson and Winter, 1982, p. 46).

The challenge for the teacher is to recognise that there may be quite a few students who are residing in the second camp and they need to be guided carefully towards the (rather imprecise) technique of appreciative theorizing. This means developing skills in striking a workable balance between judgement, intuition and common sense about real world phenomena and formal theoretical models. Making the distinction between appreciative and formal theory explicit to students may help some or even most of those with dissonance issues find reconciliation regarding this question. So, to the extent that this point constitutes a deal breaker it may simply be nothing more than a minor contributory factor rather than a major cause for concern, in the sense that some students may be less than happy with any claims of rigour in economics and begin to doubt its veracity but are willing to keep an open mind.

Nothing discussed so far (assumptions about agents' cognitive abilities, availability of information, and identical firms) needs to constitute a major deal breaker, but there remains a big question to be fielded by the teacher, and it may prove to be the theory's Achilles heel from the learner's perspective. The question is this, '*if all firms are identical (or even if they are not, but a large number of low cost firms actually and potentially exists) what*

mechanism stops too many new firms entering the market simultaneously and driving the market price down below costs for everyone? In other words, by what process does the long-run equilibrium become established? The problem was pointed out 70 years ago by Hayek (1937) and later elaborated on and explored by Richardson (1960/1990). It arises from the need for all firms to coordinate their investment plans with each other and this requires the addition of an extra (strong) assumption, either that all entrepreneurs are omniscient and somehow capable of thinking *as one* and agreeing on a solution (e.g. sequential entry), or that an external coordinating body exists. As contributions to a persuasive story each of these ‘solutions’ is unsatisfactory. Assuming omniscient actors is an implausible premise, but even if it were not the problem of coordination does not go away, since the puzzle of which specific firms from the oversubscribed pool of identical potential entrants should proceed with entry⁴ remains unresolved, and may well stymie actual entry by all of them (see Dasgupta and Stiglitz, 1980). Alternatively the introduction of a central coordinating body at this point (the most infamous of which is the Walrasian auctioneer) would constitute *the* big deal breaker since, from an audience perspective, the *deus ex machina* is perhaps the most unsatisfying and derided of solution concepts for any story, and from the perspective of a theory which purports to show the superiority of perfect competition between atomistic firms it is highly problematic because it reduces the theory to one of central planning. So, the honest answer to the student’s

⁴ Likewise, if too many firms have already entered the market the problem of which ones should exit again has no obvious solution.

question is that there is no process that will guarantee long-run equilibrium; instead the student will just have to accept that a core axiom of neoclassical economic methodology is that equilibrium is presumed but not derived (Arnsperger and Varoufakis, 2006). In essence this amounts to revealing another premise of the story and it has the potential to generate irreconcilable cognitive dissonance for many students.

3. Responses to Cognitive Dissonance in the Economics Classroom

Festinger's theory of cognitive dissonance provides insights on what we should expect to see in such a situation. He suggests that, rather than being prepared to allow inconsistent cognitions to persist, people will try to find a way of reconciling them even if it means twisting one, in a Procrustean manner, so that it is consistent with the other. If there is no way of doing this, then the only way out is to abandon one of the cognitions, in the way that, say, a consumer with a debt problem hides credit card statements without looking at them and carries on spending without facing up to the fact that there is a debt problem at all.

A common problem for people who are trying to remove cognitive dissonance is that adjusting or re-framing one cognition in order to match the other one will result in conflicts with other parts of their view of the world. Which cognitive adjustments are made will depend on what is cognitively the easiest way out. Normally, then, the cognitions that are adjusted or avoided altogether in order to remove dissonance will be those that are relatively

peripheral ones in the person's way of looking at the world; people will avoid making adjustments to core constructs, the ones they use as a basis for forming many other constructs (see Earl, 1992; Earl and Wicklund, 1999). However, which constructs/cognitions are core and relatively immutable will depend on a person's history, for that will affect the kind of world view they have had a chance to build up for themselves. Here, we may expect major differences between lecturers and students, and within both of these groups in their willingness to embrace or remain attached to the model of perfect competition.

For many professors, who have built up a web of theories based on the notion of general equilibrium, perfect competition will be part of their analytical hard core (Latsis, 1976) so abandoning it would be very painful in terms of retooling costs. Hence it is to be expected that there will be justifications for continuing to use it along the lines offered by Hicks (1939, p. 84) when he found that increasing returns resulted in indeterminacy:

'It is, I think, only possible to save anything from this wreck - and it must be remembered that the threatened wreckage is that of the greater part of general equilibrium theory - if we can assume that the markets confronting most of the firms with which we shall be dealing do not differ very greatly from perfectly competitive markets.'

By contrast, new students of economics have yet to make the investment of their professors in creating a theoretical world based on perfect competition. Hence if they find it hard to accept the premises of the model when they look at the world around them it is cognitively much easier for them to abandon it

than it would have been for Hicks, even if this required them to abandon the study of economics altogether. Such students may well switch into politics or marketing as fields which keep them in touch with economic issues but where the models and reality seem to fit together more readily. The exception, clearly, is the kind of student who has, so to speak, 'set their heart' on getting an economics degree/becoming an economist and who would find it difficult to imagine switching to a different degree programme. In the latter case, if they have no other economic world view in sight (i.e. if they are not being taught in a pluralistic manner), they will find a way to justify to themselves the premises of the model and the story told by the model.

Whenever the coordination problem comes up in class, it thus has the potential to split students into two broad groups; those students who become thenceforth highly suspicious of anything further that the teacher says (and, by association, of economics), and those who are reserved in their judgement because they have pre-committed to studying economics as a long term proposition (possibly as a result of doing well in economics at high school) and may view the anomaly as a temporary problem, or they may simply find the formal technical analysis as fascinating as any real world issues it claims to shed light on. For members of the first group, any latent plans for studying economics may begin to wane and the rest of their economics course may well become an exercise in instrumental grade attainment in order to be allowed to proceed on to other subjects. After all, what incentive do they have to go to

the trouble of learning difficult formal analysis (be it algebraically or diagrammatically rendered) if the outcome of its showpiece model is ‘a fix’?

Now, the usual caveat that goes with the model of perfect competition is that it is not intended to describe real world markets, but it is instead a yardstick against which real markets can be judged. For the doubting student this argument may seem like compounding an error. How can a theoretical model which is incapable of explaining adequately the process by which an allocatively efficient outcome could evolve *in the first place* be a sensible measuring rod for real markets which operate in *real time*? Indeed, the subsequent comparative analysis of the relative welfare effects of perfect competition and monopoly might now seem little more than an academic exercise in the worst sense of this phrase. In particular, there is no satisfactory answer to the question about why we should assume a monopoly industry has costs which are identical to those of perfect competition. The problems for the student do not end here however.

Although they are new to the ‘economic way of thinking’ students of introductory economics are not *tabulae rasae*; each student brings some world experience to class which consists of observations they have made about the world and the facts they have absorbed. They may have turned these observations and facts into theories about how things work and a subset of these homespun theories, derived perhaps from a blend of shopping experiences and news items on the TV, may well be about business competition. One striking thing they must notice is the fact that firms who

manufacture the products they buy, or at least aspire to buy, do not stand still. For example, perhaps the most ubiquitous product owned by students is a mobile phone.⁵ Over the course of any 12 month period the manufacturers of mobile phones revamp their products considerably - new features are added, their size is diminished, their weight is reduced, improved battery technology is adopted etc... It is not a great intellectual leap for a student who is aware of these changes to have developed the notion that competition is a process of continuous struggle in which producers continuously attempt to outdo each other by improving one or more of their products' features while keeping prices attractive. Seen in this light the model of perfect competition does not seem to provide a very useful frame of reference at all because it positively extols the virtues of a stationary structural state that results from all firms passively accepting the conditions they are confronted with. Hayek (1948: 92) emphasised the apparent perversity of the economist's position when he stated that what economists '...have been discussing under the name of "competition" is not the same as what is thus called in ordinary language'. The scope for further cognitive dissonance on the part of the student here is clear.

The approach in this section and the previous one was based on insights from cognitive learning theory and the contention that economics teaching is a form of storytelling. The results of the analysis suggest that the story of perfect competition encapsulated in the formal model is problematic from an

⁵ The Australian Government (2006) reports the percentage of population 16 years old and above using mobile phones in 2002 was 70% in the UK, 69% in Hong Kong, 65% in Australia, 61% in Canada and 54% in the US, while the UK's Office for National Statistics estimates that nearly 90% of people between 15 to 34 years old owned or used a mobile phone in February 2003.

active learner's perspective due to issues with both internal coherence and external reference points. To the extent that the analysis has managed to simulate the process of deconstruction in the mind of an active student learner, and therefore identified critical questions to which there is a paucity of persuasive answers, it suggests that unconvincing stories may be an important explanatory variable in theories of why a significant proportion of the students who take introductory economics courses do not pursue the subject beyond this level (Hansen et al., 2002; Alauddin and Valadkhani, 2003). It follows that a possible solution here is to heed Colander's (2000) advice (originally directed at macroeconomics teaching) to 'tell better stories'.

4. A Strategy for Telling Better Stories about Competition

Rather than approaching the teaching of competition by beginning with the standard axioms and then deducing their logical consequences (in so far as this is actually possible) in an equilibrium framework, which means ignoring how particular industry structures came to exist in the first place, it would be far more illuminating to begin by looking at some of the general patterns of entry and exit found in the literature on business history and ask both where new industries come from and how their respective structures have evolved through time. As Baumol (1991: 5) asserted in a discussion about the future curriculum of economics, 'history is apt to prove a very good source of ideas and is apt to contribute considerably to a general understanding.' Once historical patterns have been revealed to students the process of theory

building can begin and the nature and consequences of competition as a process can be explored and debated from a sound platform of empirical observation. So, now students would be encouraged to move inductively from observation to theory, which means moving from specific examples towards general observations. In other words the approach rests on ontological foundations rather than axioms and because of this the theoretical stories constructed during this process should be much more convincing.

The process of capturing essential elements of a complicated reality by observing recurring patterns has been given the name *inductive leveraging* by Stodder (2000: 148-9), who points out that ‘the ability to generalize on the basis of repeated patterns is, according to psychologists, a basic part of the human repertoire’. Arthur (2000: 60), in a discussion about cognition and student learning, in which he points out that cognitive psychology has revealed the human brain is not designed to think deductively but instead thinks associatively, advocates the inductive approach also, ‘...students need experience - details as well as theory ... they need economic history, not as an adjunct to theory, but as a supplier of cognitive understanding in its own right’.

By introducing the real world from day one, teachers can help students develop their skills as appreciative theorists (Nelson and Winter, 1982) and de-emphasize the formalism which currently prevails and makes the stories unconvincing to many. Ultimately, the aim is to produce students who have a cache of stories from the real world which can be combined with theory so that

they do not feel compelled to fit inappropriately a limited number of simple formal models to a complicated reality.

The complicated reality itself can be presented in two steps. First, a number of specific histories about certain industries can be presented. Second, the stories can be compared in order to identify common features that lead to the distillation of a number of stylized facts. Thanks to the initial work of Gort and Klepper (1982) and Klepper and Graddy (1990) along with a number of other subsequent contributions to the literature on industry evolution (including Jovanovic and MacDonald, 1994; Geroski, 1995; Klepper, 1997; Klepper and Simons, 1997; Klepper and Simons, 2000; Geroski and Mazzucato, 2001; Horvath et al., 2001; Geroski, 2003; Klepper and Simons, 2005) the raw materials necessary for this approach are readily available.

While Gort and Klepper (1982) examined 46 industries in their original analysis the most popular for later analysis (because of the availability of detailed data) include automobiles, tyres, beer brewing, penicillin, television sets, and semi-conductors. Each of these individual industries has associated with it a detailed story in its own right, but when one abstracts from the detail common features emerge. In particular the pattern of entry and exit into these industries from their inception is remarkably similar. The stylized pattern of net entry is shown in figure 1 and the stylized evolution of firm numbers is illustrated in figure 2. Here it can be seen that at the very beginning of a new industry and its associated market only a few firms are present, but this is followed by a rapid explosion of net entry which reaches a

peak and then diminishes such that there is massive exit and reduction in firm numbers - the industry enters a period of 'shakeout'.

<<INSERT FIGURE 1 HERE PLEASE>>

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Analysis of the individual stories behind particular industries exposes some interesting issues. One which has particular relevance for the predictions of perfect competition theory is the stimulus to entry. Under perfect competition the stimulus to new entry is the prospect of large profits from entering a large and established market and the long term result of this is to reduce market concentration. Yet history reveals that the majority of entry into new markets occurs *before* the market has become established and that once it has become established, and sales have taken off, the industry typically experiences a shakeout of producers (beginning in 1909 for automobiles and 1951 for TV sets) which leaves it more concentrated, '...it is often the case that entry and both market size and market growth are negatively correlated over time,' Geroski (2003: 75). Clearly there is great scope for theory building to explain the patterns observed, and Klepper and Simons (2005) identify three popular alternatives from the literature: (1) 'radical innovation theory' - shakeouts are determined by technological change where firms' respective speeds of response in turning an invention into an innovation give early

innovators the opportunity to expand to a new more efficient production scale and drive prices lower causing exit by non-innovators; (2) 'dominant design theory' - initially new firms enter the industry offering a multitude of variations on the product until eventually a de facto product standard emerges and opportunities for new entry based on novel versions of the product diminish. Further success for incumbents then relies upon developing process improvements (e.g. Ford's famous Model T production line) which implies a race down a learning curve which leads to slower rivals exiting; (3) 'competitive advantage theory' - market structure and innovation co-evolve such that more capable incumbents enjoy higher returns which in turn enables them to pursue more R&D and dominate the industry at the expense of less capable rivals and a virtuous circle for these more capable firms ensues as the less capable rivals exit.

Each of the three alternatives is plausible and from a teaching perspective each can be synthesised into an overarching abstract framework based upon the general principles of evolutionary theory. Although most often associated with biological interpretations of economics, the evolutionary algorithm (variety - selection - retention) is actually 'substrate neutral' (Dennet, 1995) and the specific details provided by evolutionary economists (e.g. Boulding, 1981; Nelson and Winter, 1982; Hodgson, 1999; Loasby, 1999; Potts, 2000) have created a corpus of work which emphasises heterogeneity of decision makers and organisations (such as firms) with respect to knowledge and capabilities and provides the tools to enable the analysis of real time

processes of competition. Because the framework emphasises that competition is a process which takes place between heterogeneous entities it is able to embrace the role of the entrepreneur in a way that neoclassical equilibrium theory and the theory of perfect competition in particular cannot (see Kent and Rushing, 1999).

5. Conclusions

The analysis above suggests that the model of perfect competition tells a story that has several inconsistencies which might comprise deal breakers for students. The problem stems from the model's potential to generate cognitive dissonance in the minds of students and this means they will have to struggle to reconcile the model with both their own external experiences of the nature of competition as an active process and the model's own internal lack of coherence. If introductory economics is the recruiting ground for future generations of economists this may partly explain why the subsequent uptake of economics is poor; people cope with cognitive dissonance either by changing their attitudes or changing their behaviour and psychology tells us that they will often follow the line of least resistance. For many doubting students it will be easier to change behaviour, which is to say wait out the course and drop economics at the earliest opportunity because the model simply does not resonate with them. As Bernstein (2004: 33) put it, 'The everyday appearance of social life provides little in the way of verification for the student of basic economic ideas'. But what of those who do not drop economics?

The student who passes through Economics 101 without worrying too much about the logic of the formal model, or the fact that it does not tally with experience, is likely to have coped with cognitive dissonance by changing her attitude. Evidence suggests that the continuing student is likely to be technically able and capable of coping comfortably with formal modelling. It is likely that this type of student will be predisposed towards dissonance reduction based on the pragmatic grounds that the model of perfect competition is 'just a model'. In addition there will be a reinforcement effect because they get rewarded well for their technical virtuosity in assignments and examinations. This attitude is illustrated by the following vignette,

'[As an undergraduate student in economics] I had done well in my studies and my department chairman said to me: "It's time to start getting those applications in to graduate school." I looked at him rather astonished, and said, "You don't think I'm going to graduate school do you?" And he said, "Well, of course - you got all As." I replied "I'm interested in economics, I can do it, but I don't believe it."'

(Rothschild, 2000: 285).

For a teacher looking to de-emphasise the static model of perfect competition evolutionary economics, broadly defined, offers a viable alternative. Furthermore it has the virtue of keeping many of the basic building blocks of standard microeconomics intact and therefore does not require a massive cull of material. For example, the lectures on the costs of the firm can be retained, but modified slightly by pointing out that different firms have different costs, not just because of possibly unique access to raw material inputs, but also because different entrepreneurs possess different

skills and the organisations they create will possess different capabilities and evolve these capabilities idiosyncratically as time passes and learning takes place. Also the models of imperfect competition and oligopoly can be reinterpreted against the dynamic backdrop of the empirical evidence on industry evolution.

Lazonick (1991) has roundly criticised economists for their adherence to the belief that 'perfect markets and the passive firm' are the 'institutional foundations of ideal economic outcomes' (p.168). His criticism stems from deep research into the forces which have shaped business history and the demonstration that innovation in all its forms is a critical explanatory variable in this process. By adopting the approach suggested here Lazonick's criticisms can be addressed because students will be introduced to both innovation-based competition (Schumpeterian competition) and price-based competition and can be encouraged to think of them as complements from the outset.

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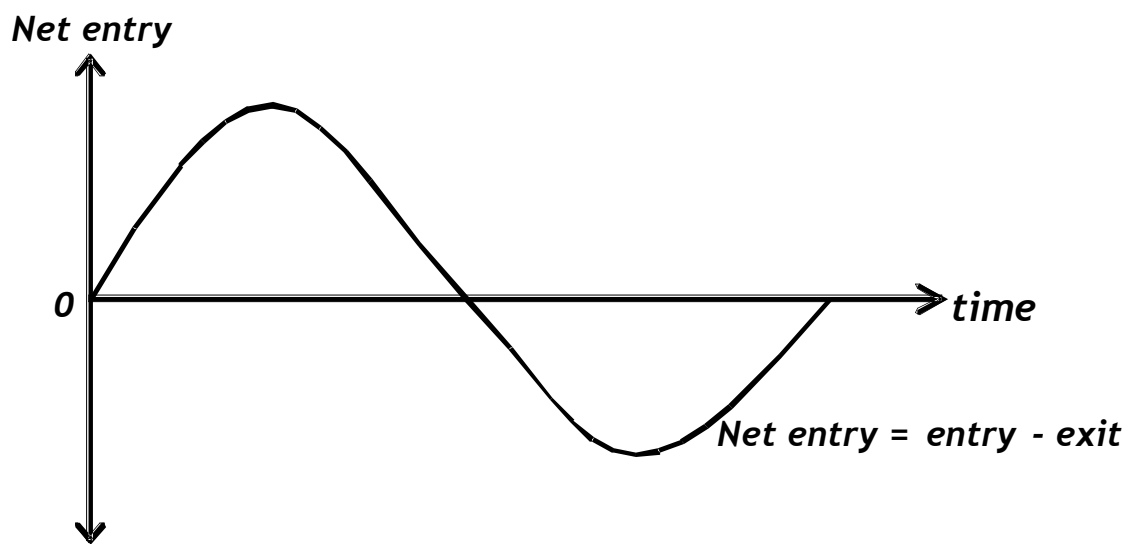


Figure 1. Stylized pattern of net entry over an industry life cycle.
(Based on Geroski, 2003)

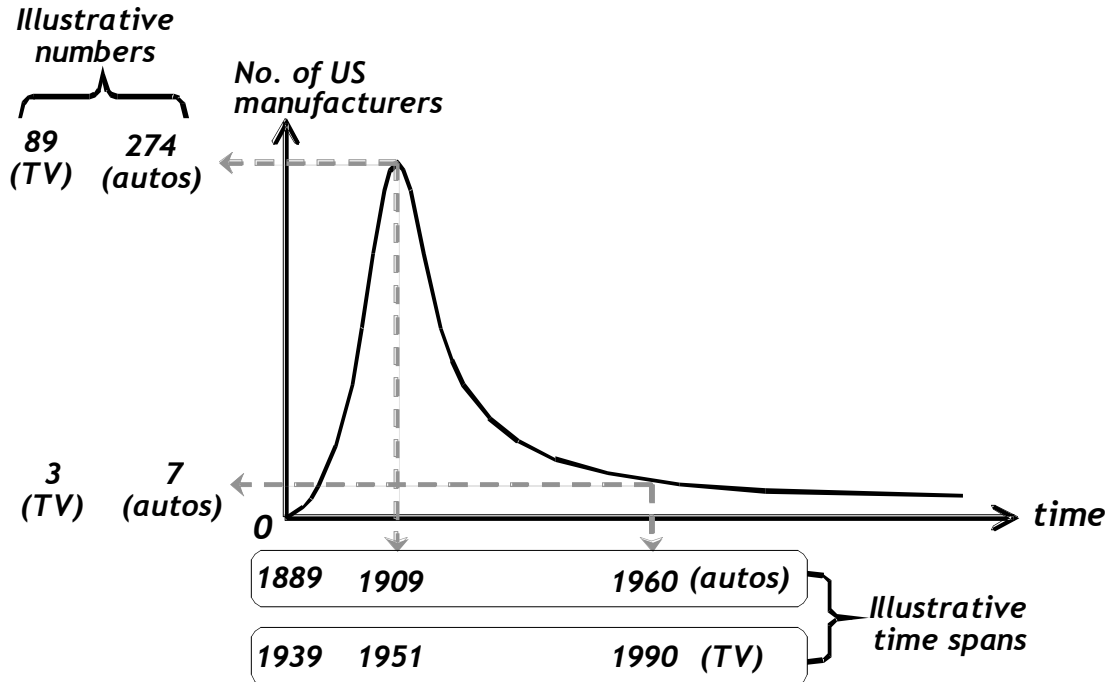


Figure 2. Stylized pattern of industry evolution (firm numbers).
 (Based on data from Klepper and Simons, 1997)