

SNAKE-OIL WITH MATHEMATICS IS STILL SNAKE-OIL: WHY RECENT TRENDS IN THE APPLICATION OF SO-CALLED “SOPHISTICATED” ECONOMICS IS HINDERING GOOD COMPETITION POLICY ENFORCEMENT

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A. INTRODUCTION: WHY ECONOMICS IS GOOD FOR COMPETITION POLICY

Since, to many readers, it will appear rather strange that an economist active in the world of competition policy for over 20 years would seek to argue that the use of “sophisticated” economics is not helping good competition policy enforcement,¹ I need to begin this paper by making the following clear statement: economics is central to any sensible implementation of competition law and the explicit use of economic reasoning has had numerous beneficial effects on the implementation of competition law.² The development of the application of competition law in Europe over the last 20 years has been characterised by two trends: first, the explicit use of economic principles; and secondly, the testing of hypotheses derived from the application of those principles with reference to observed market behaviour, i.e. the facts.

1. Making Economic Arguments Explicit

Economics is central to the sensible application of competition law. That is surely obvious once one recognises that many of the key concepts of competition law—for example, the concepts of “competition”, “monopoly”, “oligopoly”

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¹ Throughout this paper I place sophisticated in inverted commas since, as hopefully this paper makes clear, many of the recent developments in the application of economics to competition policy represents an unhelpful simplification, albeit one that is dressed up in equations.

² I should caveat that the views expressed in this paper primarily reflect my experiences of European (EU and that of Member States) competition policy over the last 20 or so years.

and “barriers to entry”—are concepts derived not from law, nor from sociology or political science, but from economics. The application of competition law cannot therefore properly take place without regard to economic considerations.³

The implementation of competition law therefore, almost by definition, involves the use of economics; the only question is whether economics is applied implicitly or explicitly. In the 1970s and 1980s, the decisions of the European Commission and European Court of Justice, to the extent that they gave due regard to economic reasoning, tended to apply economic principles in an imprecise and ad hoc manner. However, particularly following the introduction of the Merger Regulation, the explicit use of economic arguments in both submissions to the Commission and the Commission’s subsequent decisions has increased significantly. The increasing reliance on economic reasoning can also be seen in the number of guidelines and notices that have been issued in the last decade.⁴

As a result, enforcement of competition rules became both more robust and predictable.

2. Beyond Theory: Using Observed Market Evidence to Assess Economic Arguments

The second important development relates to the use of observed market evidence against which to test various economic hypotheses—so-called empirical evidence—to support economic arguments.⁵ Let me make an obvious but often forgotten observation: economics is a social science; it is not a hard science. In contrast to physics, say, economics is unable to conduct proper replicable controlled experiments. Furthermore, physics has the advantage of dealing with laws of nature whereas economics has to deal with human behaviour.

³ To quote Professor Schmalensee: “Unless economic efficiency is held to be of no importance, one can no more avoid the use of economic models in [the application of competition policy] than one can avoid speaking prose”: R Schmalensee, “On the Use of Economics Models in Antitrust: the ReaLemon Case” (1979) 127 *University of Pennsylvania Law Review* 994.

⁴ These include: EU Commission (1997) Commission Notice on the definition of the relevant market for the purposes of Community competition law OJ C372/03; EU Commission (2000) Notice: Guidelines on Vertical Restraints OJ C291/01; EU Commission (2004) Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings OJ C31/03; EU Commission (2008) Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings OJ C265/07; and EU Commission (2009) Guidance on the Commission’s enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings OJ C45/02. The importance of economics in EU competition law was further confirmed by the appointment of a Chief Economist in 2003. The Chief Economist reports directly to the Director General of DG Competition and is supported by a team of economists.

⁵ It is a common fallacy to equate the use of empirical evidence with the use of econometric analysis. Econometric analysis represents only one method for analysing observed data.

Therefore to pretend that economics can provide the same reliable predictions as physics is to demonstrate a distinct lack of understanding of our discipline.

We therefore need to remember that there are few robust economic presumptions that can be drawn from the available literature, ie there are few or no “universal economic truths”. At a theoretical level, these differences are often not resolvable. Those familiar with economic theory will know that a large number of results can often be reversed by making an alternative assumption. This is particularly true of modern economic analysis which employs game theoretic methodology.

This feature of economic models implies that we need to have recourse to observed market evidence, ie the facts: theory alone is never sufficient. Empirical analysis offers the chance to test conflicting hypotheses. While recourse to empirical evidence is not always definitively conclusive, it is usually more supportive of one hypothesis than another. Put simply, looking at what is actually happening in the industry under consideration is essential to any proper competitive assessment.

These two developments—making economic arguments explicit and testing the resulting theories against observed market evidence—have resulted in a more transparent application of economic principles, and hence in better informed and more predictable outcomes.

But if economics is central to the sensible application of competition policy and the explicit use of economics has resulted in marked benefits, why is it the contention of this paper that recent trends in the application of economics are impairing rather than improving the substantive competitive assessment? Surely “sophisticated” means better? As this paper argues, the answer is no. To see why, we need to consider by what criteria one should judge whether the practical application of economics constitutes good economics. Having done that, we are then able to highlight why the application of so-called “sophisticated” economics often fails to meet the criteria of good economics.

B. CRITERIA FOR GOOD PRACTICAL ECONOMICS

There are three criteria that the practical application of economics should meet if it is to be considered good economics for policy purposes.

1. The economic model being used to inform the competitive assessment should reflect the key features of competition in the industry under investigation.

Although we know that any economic model will represent a simplification of the world, this is not an excuse for making assumptions that have a significant impact on the model’s predictions that are at odds with reality. For example, consider an industry where firms compete via a tender process and that tender

process is a first-price auction. Then it ought to be clear that to model competition in that market assuming that the tender process is a second-price auction is likely to give rise to incorrect predictions.⁶

2. Good practical economics presents hypotheses that can be tested using observed market evidence.

As noted above, one of the beneficial developments of competition law in Europe over the last 20 years has been the use of observed market data to test the validity of economic models/arguments presented. A model that is not capable of being tested empirically should be discarded. This key principle is embodied in the EU Commission’s best practices guidelines on economic evidence, which state that “whenever feasible, an economic model should be accompanied by an appropriate empirical model—ie a model which is capable of testing the relevant hypotheses given the data available”.⁷

3. Good economics requires that the models/arguments being presented are able to explain observed competitive behaviour.

The models being used should also be able to provide predictions that are consistent with observed market behaviour. If that is not the case, then there is a problem with the model; it simply does not provide a good lens through which to assess competition in that instance. For example, a model that predicts that prices should be 20% higher than actually observed provides a poor explanation of the observed competitive process in that industry and is therefore unlikely to provide a solid basis on which to make predictions of how competition would be affected by either a change in market structure or via a change in commercial conduct.⁸

In summary, economists would do well to bear in mind the following wise advice of one of the fathers of modern economics, Alfred Marshall:⁹

“[I had] a growing feeling in the later years of my work at the subject that a good mathematical theorem dealing with economic hypotheses was very unlikely to be good economics: and I went more and more on the rules—(1) Use mathematics as

⁶ This example draws on an actual case where one expert claimed to have proved that a new entrant would never be able to outbid the incumbent using a model that assumed a form of auction not actually used in practice. Somewhat embarrassingly, midway through the case, a new entrant did what that economic expert had ruled out as being impossible; namely, it outbid the incumbent.

⁷ EU Commission, DG Competition, “Best Practices for the Submission of Economic Evidence and Data Collection in Cases Concerning the Application of Articles 101 and 102 TFEU and in Merger Cases”, Staff Working Paper (2010).

⁸ Again, this example draws on an actual case in which the economists at a competition authority used a model to predict/estimate post-merger price increases despite the fact that that model gave pre-merger predictions that were demonstrably inconsistent with observed price levels.

⁹ Alfred Marshall, like so many of the great economists, started life as a mathematician, so no one can accuse him of being afraid of mathematics.

a short-hand language, rather than as an engine of inquiry. (2) Keep to them till you have done. (3) Translate into English. (4) Then illustrate by examples that are important in real life. (5) Burn the mathematics. (6) If you can't succeed in 4, burn 3. This last I did often."

In short, what Marshall says is mathematics can be useful in helping you to understand the issue at hand, but do not believe what the mathematics tells you unless (i) you can give an intuitive, sensible explanation of that mathematical result and (ii) you can provide some real world examples to provide evidentiary support for it.

This is good, practical advice that is too often forgotten in current applications of competition policy economics.

C. THE INCREASED USE OF "SOPHISTICATED ECONOMICS" DOES NOT MEET THE CRITERIA FOR GOOD PRACTICAL ECONOMICS

What do we mean by sophisticated economics? I trust that it is clear that if we mean applying well-established economic principles and conducting a detailed assessment of how competition actually works in an industry with reference to the facts, then I too am in favour of their use!

So that is clearly not what I mean by sophisticated economics. By sophisticated economics, I am referring to the increasing reliance on theoretical economic models to make inferences about real world outcomes, whether in the merger context or for pursuing allegations of consumer harm in an antitrust context. The problem with many of these theoretical models is that, while highlighting potential competition problems, they provide little or no guide to the circumstances in which such concerns would arise in practice. Such techniques have helped to give rise to two detrimental developments in the practical application of economics in competition policy.

- First, there has been an increased reliance on theoretical possibilities with less and less regard being given to observed behaviour and facts.
- Secondly, the use of superficially more complex models and techniques has detracted attention and effort away from the central issue of understanding how competition really works.

Furthermore, a corollary of these two developments has been to reduce, not increase, the understanding of the economists' target audience, ie lawyers, judges and competition officials who are not economists. In so doing, it can be argued that economics is having less, not more, influence on the substantive analysis.

Let me expand on each of these three points.

1. Over-reliance on Theoretical Possibilities

As noted above, economics is a social science, not a hard science, and that fact has a number of implications for how economics should be used in practice.

First, we need to understand the benefits and the limitations of economic models. Much of what we term economic theory is not theory in a strict sense as would be understood by a scientist (eg a physicist) but rather a series of models. As Derman eloquently states: “Economics is replete with models but with very few theories! We mustn’t confuse the two”.¹⁰ It is worth spending a little more time on this point because this is such an important distinction.

Models are metaphors that compare the object of their attention to something else that resembles it. But resemblance is always partial, so models necessarily simplify things and reduce the dimensions of the world. By simplifying real-world complexity, models can provide useful insights into the drivers of how firms compete in a given industry. Models are not, however, descriptions of reality and we should never confuse the two. For example, the Cournot and Bertrand models of competition provide economists with tools for thinking about how a small number of firms compete. But neither of these theoretical models actually captures how firms actually compete and, indeed, both omit many important features of competition, including dynamic competitive responses. We know that dynamic responses are an important dimension of competition in the real world—often more important than static competition.¹¹ The fact that it is difficult to incorporate dynamic responses of firms into our models does not mean that we should ignore them.

By ignoring dynamic responses, many economists make the unsubstantiated claim that all horizontal mergers give rise to a price increase absent marginal cost efficiencies.¹² Such claims are based on taking too literally the predictions of basic static economic models. Certainly, as far as I am aware, there is no empirical support for such claims.

It is therefore important to test the predictions of any economic model against the observed facts; simply positing a theoretical possibility can lead to disaster—as is well illustrated by a case brought by the UK Office of Fair Trading (OFT) in relation to certain sales practices of tobacco companies.¹³

¹⁰ E Derman, *Models.Behaving.Badly: Why Confusing Illusion with Reality Can Lead to Disaster, on Wall Street and in Life* (John Wiley & Sons, 2011).

¹¹ For good illustrations of dynamic responses observed in markets, see National Economic Research Associates, “Merger Appraisal in Oligopolistic Markets”, Office of Fair Trading Research Paper 19 (November 1999). See also RBB, “Do Efficiencies Ever Deliver? Lessons from the UPS/TNT Case”, Brief 41 (March 2013).

¹² See inter alia J Farrell and C Shapiro, “Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition” (2010) 10(1) *The BE Journal of Theoretical Economics* 9. It should also be noted that competition authorities tend to be highly sceptical of efficiency arguments presented by the parties. See RBB, *ibid.*

¹³ Competition Appeals Tribunal Judgment, *Imperial Tobacco Group plc and others v OFT*, 12 December 2011, [2011] CAT 41.

That case centred on so-called Parity & Differential agreements, whereby a manufacturer paid incentives to encourage certain retailers to set the retail price of its individual brands at a level “no higher than” the retail price of a rival’s directly competing product. The OFT advanced a theory of vertical collusion whereby certain agreements were alleged to result in effects akin to horizontal price fixing and therefore constituted an infringement by object.¹⁴ An academic economist was hired by the OFT to develop a theoretical model to support that view.

The OFT decision to pursue the case was based almost entirely on the possibility raised in a theoretical model with little regard given to the actual facts. Indeed, a range of empirical analyses showed no evidence to support the OFT’s theory of harm, and those factual deficiencies in the OFT’s arguments quickly became apparent in front of the UK Competition Appeal Tribunal. After an embarrassing attempt by the OFT to retro-fit a new theory to the established facts in front of the Tribunal, the case, after more than seven years, was thrown out.

This case demonstrates the dangers of relying on economic theory alone without reference to the empirical evidence. The OFT chose to advance a theory of harm on the basis of an abstract theoretical model that made no attempt to connect to the extensive industry evidence that the OFT had itself collected. Indeed, its approach of hiring one economic expert to examine solely theoretical issues and another economic expert to focus on empirical evidence appears to have made it more, not less, likely that there was a divergence between theory and market reality.

Nor should it be thought that the tobacco case represents an isolated event. Far too often competition authorities engage too deeply in the realms of theoretical economic possibilities without seeking to identify the conditions in which such theoretical possibilities become a genuine competition concern. It is one thing to devise a theoretical economic model that produces a particular prediction and quite another to understand whether that same model has any practical relevance for the actual case in hand.¹⁵

In summary, we must not become convinced that theoretical possibilities represent likely competitive outcomes, especially when the economic models upon which such predictions rely are relatively new and untested. We would do well to remember the words of JM Keynes:

“Too large a proportion of recent ‘mathematical’ economics are mere concoctions, as imprecise as the initial assumptions they rest on, which allow the author to lose sight of the complexities and interdependencies of the real world in a maze of pretentious and unhelpful symbols.”

¹⁴ For more details, see RBB, “The OFT Tobacco Investigation: A Case of Smoke without Fire”, Brief 38 (January 2012).

¹⁵ One is reminded of the many jokes concerning the ability of economists to argue any outcome.

Put simply, looking at what is actually happening in the industry under consideration is essential to any proper competitive assessment. This brings me to my next point.

2. Ignoring Real-world Complexities

One would have thought that more sophisticated economics would mean taking into account more features of real-world competition. In practice, however, the use of so-called sophisticated economics appears to be having the opposite effect.

Let me illustrate with reference to upward pricing pressure (UPP) and other so-called pricing tests for assessing horizontal mergers. These tests have been presented as providing a better filter than the approach of defining the relevant market, which then allows market shares to be calculated. Furthermore, it is argued by their proponents that such pricing tests are simple to apply since they require the measurement of just two parameters, diversion ratios and margins.¹⁶

Unfortunately, there are a number of problems with this approach. First, measuring diversion ratios between individual firms (something that is not needed for market definition) is not straightforward and is often imprecise. Secondly, defining and measuring the appropriate margin to use is also not straightforward and often the subject of intense debate. It has been argued that margins are routinely calculated in predatory pricing cases. True, but those cases take several years and there is still often disagreement at the end of the case. So we layer imprecision on top of imprecision.

Third, and of critical importance, the UPP model fails to adequately capture the richness of real-world competition. In particular, the UPP model ignores dynamic aspects of competition which are as if not more important aspects of the competitive process. Although it is also the case that market definition as a first stage in the competitive assessment also does not capture all factors relevant to the overall competitive assessment (including these dynamic responses), a key difference in how these two approaches have been conducted in practice is that this limitation of market definition has come to be well understood, and that market shares are seen as just providing a staging post on the way to a merger assessment.¹⁷

In contrast, the practical implementation of UPP and other pricing tests effectively sees them as the first and often critical step in competitive assessment of

¹⁶ Many advocates of UPP and other pricing pressure tests argue that the same information is required for defining the relevant market. However, that is simply incorrect: diversion ratios between firms are not required under the Hypothetical Monopolist Test (the clue is the name), and knowing the margin with precision is also not required.

¹⁷ In addition, the market definition approach permits the calculation of market shares in a properly defined relevant market. That is not true of the UPP-type pricing tests.

the merger.¹⁸ By pretending that the competitive effects of a horizontal merger can be adequately captured in just two (imprecisely) measured parameters, we divert attention and resources from considering how competition actually works in an industry.

It also gives the impression—and an incorrect one—that good competition economics can be done at one’s desk, without the need to get one’s hands dirty by engaging with the real world. The blind use of many theoretical models does not even require the analyst to have knowledge of the products or even the industry that they are being asked to investigate! Such an approach will almost always lead to an incomplete characterisation of how firms actually compete in the market of interest. In so doing, it is likely that important features of real-world competition are ignored.

Since a number of commentators have consistently misunderstood these points, let me be clear that the objections to the UPP and other pricing tests are not that these pricing pressure tests are new or difficult to understand—they are neither so new nor difficult to understand. Rather, the criticisms relate to the fact that such analyses give a false and dangerous sense of precision. In practically all cases, the parameters required for such analyses cannot be measured with any degree of precision. Although it could be argued the same is true of more traditional approaches, such as market definition, that argument ignores the fact that those more traditional analyses typically accommodate a more wide-ranging view of the available evidence and do not fixate on two ill-defined and poorly measured parameters.

Furthermore, these tests provide competition authorities with a significant degree of discretion. For example, in applying the UPP test, there is an absence of clear guidance (to which the authorities ought to adhere themselves) as to (i) what margins are relevant to the assessment, (ii) the standards of proof appropriate to measuring diversion ratios and, most importantly, (iii) what the benchmark is in applying these tests. As a result, practical experience shows that the goalposts can move from case to case.¹⁹ Similarly, in implementing illustrative price rise tests, large differences arise depending on whether one assumes the demand curve to be linear or to have constant elasticity. In the absence of clear *ex ante* guidance about when the authorities will assume that the demand curve is linear and when it exhibits constant elasticity, it is extremely difficult for practitioners to provide sound advice. Who would want to give a client the following advice: “You will be fine if the competition authority assumes that demand is linear but not if the competition authority assumes it has constant

¹⁸ Proponents of these tests suggest that they raise the presumption of competitive harm if the (undefined) threshold is exceeded.

¹⁹ For example, in the five years since they have started to implement pricing tests, the UK competition authorities have failed to provide guidance on what “efficiency credit” will be assumed in applying such tests.

elasticity (but unfortunately we are unable to estimate the slope of the demand curve for your product robustly, let alone assess the rate of change in that slope that would be required to determine the answer to the linear/constant elasticity question)”?)

Since, in practical terms, there is often no effective external scrutiny of the substantive analysis undertaken by European competition authorities, particularly in relation to mergers, increasing the discretion of competition authorities is an unjustified and potentially dangerous development.²⁰

3. Driving a Gap between Economists and Non-economists

Just as non-economists do well to remember the core role of economics in the application of the principles of competition law, economists do well to remember that they are operating within a legal framework. It cannot be good news when the economic debates/arguments leave the non-economist both cold and perplexed. There is an unjustified arrogance amongst some economists who respond to the concerns/criticisms of “sophisticated” economics voiced by lawyers and officials with the dismissive (and unjustified) statement that “lawyers simply don’t understand economics”.

But even if that were true, the fault would lie as much with the economists as it would with the lawyer. Moreover, it does not bode well for the good application of economics. Indeed, I would argue that the recent developments of over-reliance on theoretical possibilities and placing less focus on the real world have led to economics becoming less influential in the outcome of the substantive analysis, not more so. If economists cannot explain and demonstrate the relevance of their results, and show how their predictions about economic effects are drawn from a body of work that is consistent with observed industry facts, it is not clear why they should be taken seriously by the ultimate decision-makers. We cannot expect non-economists to become expert in deciding over technical statistical debates: is it reasonable to expect a judge to be able to make an informed decision as to whether cross-sectional econometric analysis trumps a time series analysis?

As a result, there is a widening gap between economists and non-economists, and, at least in some instances, the role of economics in a number of cases has been marginalised. It has led to statements such as “but that is the economic argument and economics is only part of the argument”. Such statements indicate a reversal of the positive developments that we have

²⁰ One problem facing the practical application of economics in European competition policy relates to a fundamental difference in the economic analysis of the parties and that conducted by the competition authority; namely, effective scrutiny. Whereas economic submissions made by the parties are subject to full scrutiny, that conducted by the authority is subject effectively to none since appeals to courts does not usually involve a detailed substantive assessment of the competition authorities’ economic analysis.

observed in European competition law since the mid-1990s. Since the substantive questions raised by competition law are economic in nature, the correct use of economic analysis is to ensure it is integral to the argument, and that it does not occupy some isolated component that might or might not be influential in decision-making.

What economists, or at least those interested in the practical realities of the real world, should be aiming for is not complexity for complexity's sake but, rather, clarity in the application of sound, well-established economic principles, firmly rooted in and tested against observed market evidence. Keynes again provides the appropriate quotation: "If economists could manage to get themselves thought of as humble, competent people on a level with dentists, that would be splendid".

Unfortunately, we appear to be a long way from reaching that goal and it certainly has not been aided by the recent ascendancy of "sophisticated" economics.