

What Economics Majors and Economists Should Know About the Supply and Demand Model: 8 The Default Model?

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FIRST DRAFT.
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I would value feedback on this draft.

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What Economics Majors and Economists Should Know About the Supply and Demand Model: 8 Conclusions

INTRODUCTION

This is the eighth of eight linked but largely independent papers in which I criticize the way that the supply and demand model is taught at the intermediate and advanced microeconomics levels.¹.

In the paper I discuss three issues. In Section 1 I discuss where should we teach the analytics of the supply and demand. In Section 2 I reiterate the argument made in Sleeman (2017g) that it is a very dangerous practice for economists to use the standard single-market supply and demand model as their default model to answer policy questions outside their own fields of expertise. In Section 3 I highlight the major results derived in the eight papers.

1 WHICH COURSE?

In the Sleeman (2017a) I argued that the supply and demand model should be presented in its analytical form in the intermediate microeconomics course. However, in recent years the mathematical skills that many majors bring to their course work have deteriorated.² If textbooks are a reliable guide to what takes place in the classroom, then economists have accommodated to this change by

¹ See Sleeman (2017a-g). Apart from a few diagrams economists have known most of the material in these papers for at least a half-century. But much of this material has still not made its way into the intermediate microeconomics texts and courses.

² Although introductory courses in so-called STEM subjects make concessions to the lack of preparation of their students a physics major, or a neuroscience major, has to bite the bullet and either learn the required mathematics or turn to a less demanding field. Many economics majors would benefit from studying Brown et al.'s (2014, especially 3-7 and chap. 8) excellent review of what neuroscientists have discovered about how humans learn in

augmenting the traditional verbal and graphical explanations with numerical examples.³ This is unfortunate because, although students enjoy the feeling of closure that they get when they obtain specific numerical values for the equilibrium values of the price and quantity transacted, they are simultaneously deluding themselves into believing that the qualitative models have quantitative content when they do not.⁴ Reliance on numerical examples also has the great disadvantage that it suggests to some majors that they are doing a general analysis when they are simply looking at special cases. Diagrams have at least a surface generality but arithmetic is spuriously precise and totally specific. Although the way we solve for the numerical equilibrium values is exactly the same as the way in which we solve for the algebraic values, many students in intermediate microeconomics classes cannot connect the abstract mathematical symbols with the supply and demand diagrams, and they are even less able to see the connection between the symbols and the economic concepts that they represent. I believe that the argument used in Sleeman (2017b, sec 4.1) provides a way to make the necessary connections.

There is a further problem. Intermediate microeconomics classes often include non-majors, and the sort of analysis proposed in this paper, especially the use of simple algebra, is probably not appropriate for this segment of our audience, which may explain why the treatment of supply and demand in many intermediate texts seldom strays much beyond what is taught at the principles level. Perhaps the material covered in these papers should be incorporated into courses specifically aimed at economics majors; an advanced microeconomics course might be a better choice than intermediate microeconomics course, but not every economics department teaches advanced theory courses.⁵

³ See Koopmans (1957, 174) discussion of the use of diagrams in economics. Trade theorists traditionally showed remarkable mental agility in devising elaborate diagrammatic models (some of which were notoriously difficult to understand and manipulate), but because diagrams live in a two-dimensional space they ultimately had to be supplanted by mathematical models that were not confined to two goods, two countries, etc. The three-good diagrams in Part 5 are also difficult to draw and cannot be manipulated.

⁴ One way of persuading students to learn a little algebra is to ask them to solve, say, a hundred supply and demand equations with very similar parameter values and then ask them what can they deduce from all of this useless labor. If they are then exposed to a simple algebraic supply and demand model, shown how to solve for P^e and Q^e , and then asked to calculate the equilibrium values using two or three of the parameter sets, they will rapidly learn that investing a little time to master very simple algebra generates a high return in undergraduate economics.

⁵ Among intermediate texts Nechyba has essentially bound two books between one set of covers, Part A using graphical analysis and Part B doing the analysis using mathematics; Gravelle and Rees (2004), Perloff (2011), and Snyder and Nicholson (2008) incorporate math into the body of their texts; Varian (2010) puts math into appendixes. Jehle and Reny (2011) is really a masters

Alternatively, the problems with the supply and demand model could be taught in mathematics for economists or mathematical economics classes, which are frequently available in top universities and liberal arts colleges (see Tremblay and Tremblay (2010)).

Some of the issues raised in this paper could also be incorporated in the first microeconomics course at the Ph.D. level where supply and demand is given scant attention, presumably because it is assumed that graduate students have already fully mastered the model.

Of course, with very good students at, say, the LSE or MIT, most of Paper 1 (Sleeman 2017a) and much of the other papers could be taught at the principles level.

However, I believe that most of the issues raised in this paper can and should be addressed at the intermediate level. These issues, as I have attempted to show in the sister papers, do not require a level of competence that would be beyond what we should expect of someone who will leave university with a major in economics. Every economics major ought to have a sound grasp of the strengths and limitations of the supply and demand model. And every economist, academic or otherwise, should also stress the limitations of the supply and demand model when they invoke it to answer questions by journalists, politicians, and media people, and when they present ideas about the efficacy of markets to non-economists.

2. THE DEFAULT MODEL?

The age of polymaths is long past. As our knowledge base expands exponentially, even the most brilliant and hard-working economist must specialize.⁶ In 1957 it was possible for an economist to read all of the major journals; sixty years later it is difficult to read everything that is written in one's own research field.⁷ Not only do we have to keep abreast of the current literature, but in order to remain at the frontier of research, we must know what our colleagues produce well before it is published.

level text. Muñoz-Garcia (2017) incorporates mathematics in his text that attempts to cover the needs of advanced undergraduate, masters, and Ph.D. students.

⁶ See the interview with Field medalist Cédric Villani in Bellos (2014 223)

⁷ Smith (1776) taught us the power of specialization. It is not only impossible, but also not desirable, for every economist to understand every other economist's research. The *Journal of Economic Literature*, the *Journal of Economic Surveys*, and especially the *Journal of Economic Perspectives* provide ways to stay abreast of current research in fields outside our own specialties.

When an economist is asked to pontificate upon some subject outside her research specialty, she should answer, "I don't know. You are asking my opinion about a subject that I do not work on and economics has become so specialized that it is impossible for me to keep abreast of the theoretical and empirical work outside of my own areas of interest." But all too often economists anxious not to look ignorant, uninformed, or ineffectual fall back on their "default" microeconomics model, the single-market supply and demand model when asked about microeconomic issues. This is especially true when the subject in question is something that they studied in their principles classes, such as the effects of an increase in the minimum wage.⁸

This is an extremely perilous road to take. The single-good model, despite its seemingly nice deterministic predictions is, as we have seen (Sleeman 2017a-g), a very poor guide to how the United States or any other real economy behaves.

Majors and non-economists should be warned against economists bearing strong priors and point predictions.⁹ Until research has been thoroughly replicated, which is seldom the case in economics¹⁰, or, at minimum, until there has been some scholarly discussion of the putative results, we should all stay mute.

3. CAVEAT EMPTOR

"The purpose of studying economics is not to acquire a set of ready-made answers to economic questions, but to learn how to avoid being deceived by economists." Joan Robinson.

I believe that these are the some of the features of the supply and demand model that should receive more emphasis in intermediate microeconomic theory courses.

1. The model is static; it is always in equilibrium. Statements about disequilibrium situations have no meaning. (Sleeman 2017a.)

⁸ See Kwak (2017, 204-205) for an excellent, but far from exhaustive, set of bibliographical notes on the recent minimum wage literature. However, Kwak fails to mention that the literature seems to have ignored the problem that the existing data on minimum wage changes in the United States does not have enough variation to allow within sample estimates of when an increase in the minimum wage will begin to bite.

⁹ Manski (2013) provides a masterful critique of the strong assumptions that economists must invoke in order to get tight point estimates to allow them to draw the policy conclusions they wish to draw from their data.

¹⁰ See Sleeman (2017e).

2. The model is qualitative. Statements about the directions of changes are meaningful; statements about the magnitude of changes are not meaningful. (Sleeman 2017a.)
3. The QCS analysis of the standard single-market model generates a significant number of semi-determinate or indeterminate results. The standard narrative exaggerates the predictive content of even the single- market supply and demand model. (Sleeman 2017a 13-14.)
4. Majors should be familiar with both the Walrasian and the Marshallian versions of the supply and demand model. (Sleeman 2017b sec 3)
5. There are two versions of the Walrasian model. Economists customarily think in terms of the Walrasian model but illustrate their thinking using the Inverse diagram. The Inverse model is isomorphic to the Walrasian model, but the Inverse model is useful only when there is a single market. (Sleeman 2017b sec 3)
6. The algebraic solutions of the models have a simple intuitive economic interpretation. (Sleeman 2017b 17-19.)
7. At least two and, preferably, three markets are needed when discussing how a price system works. (Sleeman 2017c sec 1.)
8. The algebra of the three-good supply and demand model is difficult to interpret. (Sleeman 2017c).
9. The QCS analysis of the two- and three-market models generate a very large number of possible results, most of which will be indeterminate. (Sleeman 2017c sec 3.3.)
10. The lessons that students should take away from the exercises is that real world markets must satisfy the stability conditions and that there is no reason that the supply and demand should be stable. (Sleeman 2017d.)
11. Normative economics does not exist. Students should simply be warned not to introduce their own value judgments into economic discussions. (Sleeman 2017g.)
12. The set of assumptions that underlie the supply and demand model are very like an implicit market ideology. (Sleeman 2017g.)
13. Pareto optimality and Pareto improvements play important roles in the standard narratives treatment of the welfare implications of the supply and demand models. I argue that both of these concepts are essentially irrelevant to most real economic problems. (Sleeman 2017g sec 3.)
14. The Theory of the Second Best suggests that piecemeal policies must be handled with extreme care. (Sleeman 2017 XXX.)
15. In economics demand only has meaning if the consumer has the ability to pay for the good or service. (Sleeman 2017g sec 5.)

16. Ability to pay depends not simply on the consumer's income, but also on her wealth, and her ability to obtain credit. (Sleeman 2017g sec 4.)
17. Changes in product prices cause changes in factor and asset prices, which in turn cause changes in demand, which in turn feed back into product prices. Resource allocation cannot be divorced from the distribution of income and wealth and access to credit. The efficiency-equity dichotomy is therefore misleading. (Sleeman 2017g.)
18. The simple horizontal summation of individual demands is incorrect because it does not take into account the distribution of income, the distribution of wealth, and access to credit.¹¹ (Sleeman 2017g sec 4.)
19. The SMD theorem proves that the market demand curve may not be a monotonic decreasing function of price and may not have the nice properties we associate with individual demand curves. (Sleeman 2017f sec 4.)
20. Consumer's surplus and consumers' surplus are different concepts. (Sleeman 2017g sec 2.)
21. If compensation is not paid at the time that the damage occurs, or before it occurs, the Hicks-Kaldor compensation approach involves value judgments. (Sleeman 2017g sec 2.)
22. The supply and demand model is often used to analyze policy issues, such as markets for children, sex and human organs, that many societies have regarded as repugnant. Economists often discount these forms of moral arguments. I argue that repugnance is a form of market failure. (Sleeman 2017g sec 5.)
23. The supply and demand model assumes that firms and household/individuals always behave both legally and morally. I argue that fraud is also a form of market failure. (Sleeman 2017g sec 6.)
24. The supply and demand model assumes that firms maximize profits. Even if real world firms attempt to maximize profits they may be incompetently managed, may make smaller profits than are possible, and may sustain losses without going out of business. (Sleeman 2017g sec 6.)
25. Markets, especially constrained ones and ones where asymmetric information is important, may be in equilibrium even if they do not clear. (Sleeman 2017g sec 7.)
26. Because economic agents' behaviors vary across space and time it is extremely unlikely that an empirically estimated supply and demand model will

¹¹ Nor does it take into account the distribution of preferences between different goods and services, differential tax rates, and other factors that lock the market demand curve into place.

continue to track well over time or that it can be applied to any geographical area other than the one for which it was estimated. (Sleeman 2017e sec 2.)

27. The supply and demand model is an *ex post* explanatory device not an *ex ante* predictive theory. (Sleeman 2017e sec 4.)

28. Given the number of free parameters in a qualitative supply and demand model, any actual set of prices and quantities can be explained by suitable parameter assignments. These explanations are unlikely to be unique. (Sleeman 2017e sec 5.)

29. Although the supply and demand model appears to be a powerful *ex post* explanatory tool, we do not know if those explanations are correct. (Sleeman 2017 sec 4.)

30. Theorems that have valid proofs for the AD model may not have any relevance for real world economies. (Sleeman 2017g.)

Professional economists have known about these problems with the standard exposition of the supply and demand model for at least twenty-five years, many for seventy years or more. In most disciplines a quarter of a century is usually sufficient time for problems with a model, especially if they are significant problems, to receive coverage in the undergraduate curriculum, although the analytical details may be too difficult to discuss. Economics majors should be taught that there are many problems that they should take into account when using the supply and demand model.

In economics, as in other disciplines, it takes a model to defeat a model. I do not have a model to replace the supply and demand model. While economists work on building the model that we need if we are ever to deal with the immensely important problems that beset real economies,¹² we will necessarily continue to teach the supply and demand model.¹³ But we should teach the model, "warts and all". We should have the courage to acknowledge the limitations of the model, and have the humility to admit to our students, and to policy makers who come to us for counsel, the existence of those limitations.

¹² This task may require the "rare combination of gifts" that Keynes (1924, 322) attributes to the master-economist and which perhaps only Keynes has ever possessed.

¹³ And we will also continue to teach consumer and producer surplus.

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