

What Economics Majors and Economists Should Know About the Supply and Demand Model: 7 Welfare 1/2/18

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FIRST DRAFT.
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I would value feedback on this draft.

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INTRODUCTION

This is the seventh 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 this paper I discuss the welfare implications of the supply and demand model. I examine seven issues. In Section 1 I argue that normative economics is an empty economic box, and that the assumptions used in the standard supply and demand narrative border on an implicit ideology. In Section 2 I discuss some of the problems that must be faced when using consumer surplus in policy analysis. In Section 3 I argue that Pareto optimality and potential Pareto improvements are vacuous concepts. In Section 4 I discuss the role of the distribution of income and wealth in welfare analysis. I argue that majors must fully internalize the fact that in economics demand is always predicated on the consumer's ability to pay. In Section 5 I argue that we should recognize that "repugnance" is a form of market failure. In Section 6 I point out that fraud is also a type of market failure. These two market failures seldom receive attention in the standard narrative. In Section 7 I briefly review the implications of asymmetric information for the First welfare Theorem.

¹ See Sleeman (2017a-f,h). 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 and advanced microeconomics texts and courses.

Economics, unlike physics, is an important subject.² No one outside of the physics community gives a fig whether some newly discovered elementary particle “spins” clockwise or counterclockwise, but mistaken economic theories have led to policies that cause misery to millions of people.

1. VALUE JUDGMENTS AND IDEOLOGY

Most majors and most economics professors are attracted to Economics because of its potential relevance for analyzing economic policy. Economists claim that the policy conclusions they draw from the supply and demand model are independent of their personal value judgments. This dictum is ingrained in majors from their first economics course, usually the microeconomic principles course, and usually in the first lecture of that course. Unfortunately the lesson that we wish to teach is presented in terms of the dichotomy between positive and normative economics.³ But this dichotomy misleads students because normative economics is not a type of economics, nor is it a field of economics such as labor economics or environmental economics. There are no courses in normative economics; there are no normative economics majors; no degrees in normative economics; no graduate fields in normative economics; no Ph.Ds. in normative economics; no textbooks of normative economics; and no journals of normative economics.⁴

Instead of inventing a straw-subject, economists should simply tell students that we, and they, should not inject our personal value judgments into economic analysis without clearly stating that these are just our personal views;⁵ that

² Atkinson (2011) argues that economists should do more welfare economics, and notes that economics is one of the few social science disciplines that does not have a code of ethics. The American Economic Association at its 2012 meetings adopted a code of conduct that required its members to disclose conflicts of interest. DeMartino and McCloskey (2016) is devoted to the role of ethics in the economics profession. Falk and Tirole (2016) construct a model of moral behavior using standard economic techniques.

³ See Putnam (2002, especially chap. 3). Su and Collander (2013) provide an interesting review of the debate between Putnam and Walsh on the one side, and DasGupta on the other, over the issue of whether economics can be separated from value statements.

⁴ E. J. Mishan (1981) wrote a book on normative economics but it is out of print and does not appear to be widely read or cited.

⁵ “[T]he ability to distinguish what one thinks is true from what one would like to be true is critical in all science.” Lipsey (2008, n.7)

policy statements that purport to improve social wellbeing always involve value judgments, that are not, and cannot be, derived from economic analysis *per se*.⁶

Although economists have been largely successful in removing overt value judgments from the academic journals, students should be warned that we have been less successful in removing from our courses and textbooks a set of assumptions that, taken together, look suspiciously like an implicit ideology. Assumptions such as (1) households have given preferences, (2) households know their preferences, (3) households are fully informed about the goods and services that they can purchase, (4) households and firms are constrained maximizers, (5) markets are in equilibrium and therefore households and firms are at their maxima,⁷ (6) markets rapidly and smoothly return to equilibrium if disturbed, and (7) interference with the existing distribution of income and wealth have harmful effects on incentives and involve value laden inter-personal comparisons of utility.⁸

Assumptions 1 through 6 are the building blocks with which economists construct the verbal and graphical formulations of the supply and demand model; these assumptions leave little room for the government to intervene to increase consumer welfare. All we are left with is the usual cases of “market failure” – external effects and public goods (if (3) holds then there are no information problems). Economists are often seen as apologists for capitalism, having strong preferences for market solutions, suspicious of government intervention in markets,⁹ and hostile to attempts to interfere with the existing allocations of income and wealth (assumption 7). Assumptions 1 to 7 provide ammunition for such views. Taken as a whole the assumptions seem very like what George Soros (2015, 13) has called “market fundamentalism”, a reification of “the market” that does not always fit well with what we know about real-world markets.¹⁰

⁶ If economists never commit the sin of making value judgments, then the positive/normative distinction is otiose; economics is just positive economics. After defining normative economics undergraduate economics courses proceed to ignore it.

⁷ Boland (2017 8-9) observes that the assumption that all agents simultaneously maximize is equivalent to the statement that the model is in equilibrium.

⁸ The most famous overt statement of these assumptions is Becker’s claim (1976, 6-7) that “The combined assumptions of maximizing behavior, market equilibrium and stable preferences, used relentlessly and unflinchingly, form the heart of the economic approach as I see it.”

⁹ For a discussion of “government failures” see Schuck’s (2014), disheartening taxonomic analysis and Levy and Peart’s (2015) review of Schuck’s book.

¹⁰ Consider the terminology which economists routinely use to describe the effects of indirect taxation: the taxes “impose a burden” that must be borne by consumers, producers or both; the taxes “drive a wedge” between consumers and producers; the taxes inflicts a “deadweight loss”

Most economists are not ideologues, but it is easy to slip unconsciously from statements that are true of our theoretical markets, to statements about real markets where those statements may not hold.¹¹

The situation is much worse when academic economists write editorials and letters to the editor, appear as pundits in the media, write popular books on economics, and give policy advice. Conclusions drawn from the single market supply and demand model, slanted by the personal opinions of the commentators, can be presented as though they were readings from some economic bible.

This does not mean that welfare economics and welfare conclusions drawn from the supply and demand model are necessarily special pleading. An important part of welfare economics is what is best described as prescriptive economics.¹² Prescriptive economics takes other people's value judgments or policy proposals and first determines whether the problem has been diagnosed properly, considers alternative ways to solve the problem, and then brings to bear on the alternative solutions the powerful extremization techniques that economists have borrowed from mathematics, classical constrained extremization, quadratic and non-linear programming, the calculus of variations, Pontryagin's maximum principle, Bellman's dynamic programming, and stochastic calculus, to determine the pros and cons of the alternatives. Policy makers and voters can then, in principle, decide which alternative they favor.¹³

One of the strengths of the prescriptive approach to economic policy is an open-mindedness that is willing to discuss issues such as statistical life extension

on society; the taxes "reduces the gains from trade"; the taxes are "inefficient"; the taxes do not constitute a Pareto improvement. This dismal litany is seldom balanced by a discussion of the possible benefits that may flow from the government's use of its tax revenue to provide schools and infrastructure, police and fire fighters. Of course, indirect taxes are regressive and they may not be the most efficient way to provide public goods and services.

¹¹ However, Rodrik (2015, 7) writes that "economics is, in fact, a collection of diverse models that do not have a particular ideological bent ..."

¹² J. N. Keynes (1924) who is usually regarded as the progenitor of the Positive/Normative distinction in economics also had a separate category, "the art of economics" that seems to correspond to what I refer to as prescriptive economics. Harrod (1938) makes a similar point. Simon Wren-Lewis and others have also drawn an analogy between economics and medicine.

¹³ On the basis of conversations with economists who have actual experience of economic policy making, and after reading Schuck (2014), this is undoubtedly an extremely naïve view of how real economic policy is made. Clearly, economic policy is another of those topics, like sausage making, that one should not observe too closely.

dispassionately, issues that non-economists sometimes refuse to grapple with even though they are important elements of policy decisions.¹⁴

2. CONSUMER SURPLUS¹⁵

Intermediate Microeconomics texts are replete with policy analyses using consumer and producer surpluses. Supply curves are converted into marginal cost or WTA curves, and demand curves into marginal benefit or WTP curves. These curves are then used to discuss consumer and producer surpluses.¹⁶ In turn the consumer and producer surpluses are used to analyze policy issues: Rent controls, minimum wages, sales taxation, agricultural subsidies, environmental and resource issues, and protection are just the most common examples.

In this paper I have implicitly assumed that the individual demand curves were derived from a consumer's maximization decision. Consumer surplus is an attempt to use the demand curve to provide an objective dollar measure of the change in the consumer's subjective, unobservable, utility when the price of the good or service changes. As is so often the case in microeconomics the income effects that are associated with price changes cause problems. Hick's (1943) attempted to circumvent the problematic income effects by developing four indifference curve based measures to provide a theoretical link to the consumer surplus welfare measure. Willig's seminal paper appeared to put the Hicksian measures on a firm theoretical and empirical footing.¹⁷ Hicks also introduced the concept of a compensated demand curve, which removes the troubling income effect. These solutions based on unobservable indifference curves have no operational significance. An equivalent strategy is to assume that all

¹⁴ However, this dispassionate approach can sometimes lead you down strange paths; see Landsburg's blog post of March 20th, 2013 titled "Censorship, Environmentalism and Steubenville". Landsburg has since clarified his position.

¹⁵ McFadden (2017) is an excellent recent survey of the problems discussed in this section. McFadden is more sanguine than I am about our ability to deal operationally with subjective preferences.

¹⁶ With affine functions consumer surplus will always be finite but if the demand curve is non-linear than consumer surplus may be unbounded.

¹⁷ Just *et al.* (1982 especially chaps. 1-6 and app. B) provides an excellent guide to the problems associated with the consumer surplus idea and provide extensive references to the literature. See also Blaug (1978, 356-383), Lipsey (2001, 192), Morey (1984), Ng (2010), and Stiglitz (1987). Samuelson's disdain for consumer surplus is well known (Samuelson 1947, 195-197).

consumers have quasi-linear utility functions.¹⁸ This approach is also unsatisfactory: Are all households' preferences captured by quasi-linear utility functions?

The problems become worse if we attempt to aggregate individual consumer's surpluses into an aggregate consumers' surplus. (In recent years economists have either carelessly, or perhaps carefully, mislaid the annoying apostrophes in consumer's surplus and consumers' surplus.)¹⁹ Economists routinely finesse these aggregation problems by appealing to the unlikely fiction that all households have identical preferences and factor endowments, which is equivalent to assuming that there is a single "representative" individual and so the consumer's surplus is also the consumers' surplus; the "representative agent" approach adds a certain gravitas to the discussion that "a single consumer" lacks.

In real world situations if the market demand curve is a dollar measure of aggregate welfare then economists have assumed that individual welfares can be added, which is equivalent to making an interpersonal comparison of utility; your welfare can only be added to mine if our utilities are commensurable.

The standard narrative still has problems. Consider Figure 1. On the left we have a single consumer trading with a single producer. Consumer and producer

[Figure 1 goes about here.]

surpluses arise because the equilibrium price is determined at the margin (the unit with the lowest MB and the highest MC), and each unit sells for the same price (linear pricing). Panel (a) of Figure 1 is essentially correct in the sense that consumer and producer surplus are maximized.²⁰

Figure 1(b) is likely to mislead students for two reasons. First, the market demand curve is drawn as a straight line, which is correct only if we have a set of economically identical consumers, otherwise there will be kinks in the curve each time a new consumer is attracted into the market by a lower price.²¹ Second,

¹⁸ Majors should be aware that economists frequently use nicely behaved functional forms for utility and production functions without providing a scrap of evidence that these are forms that actually capture the behavior of households or firms.

¹⁹ Marshall (1890) was careless in his use of apostrophes. Varian (2010) does distinguish between the two types of surplus, but resorts to a quasi-linear utility function to derive the consumers' surplus.

²⁰ Nechyba (2010, 467-8) has a nice diagram that illustrates the individual maximization that underlies Figure 37(a).

²¹ If there are an infinite number of individual consumers as in Aumann's (1964,1966) atomistic models then the market demand curve will appear to be smooth although convex from below.

while the standard exposition shows that varying the slopes of the supply and demand curves changes the size of the aggregate consumer and producer surpluses, it can easily lead students to believe that all consumers receive equal shares of the surplus, even though this case is completely unrealistic.

Figure 2 provides a better illustration of the relation between the aggregate consumers' surplus (CS) and the individual consumer's surpluses (cs). The figure shows a market with two individuals, A and B. First, note that the market demand curve has a kink where the price drops below B's choke point. Also

[Figure 2 goes about here.]

note that the figure shows that at the initial equilibrium price P^e consumer A has a larger consumer surplus than does consumer B. Finally, note that the figure indicates that if the price rises above consumer B's choke point (in this case because the market supply curve shifts to the left from S to S_1), then the market demand curve becomes the demand curve of consumer A and consumer B ceases to have a surplus because she drops out of the market.

Aggregate consumer and producer surpluses are the staple of cost benefit analysis (CBA) and widely used in policy applications of the supply and demand model. Pragmatism prevails, economists asked for policy advice usually present a CBA that assumes that the demand and supply curves do measure aggregate welfare. Unfortunately, these analyses are not only theoretically and empirically suspect,²² but they almost always involve gains to some members of society and losses to others, and therefore violate the rule for a Pareto improvement.

²² Marshall (1890), and Dupuit (1844/1969), were aware that their measures of consumer surplus required that the marginal utility of income (which Marshall, confusingly, referred to the marginal utility of money) be constant. Marshall was driven to grasping at the straw that his welfare measure applied only to "inessential" goods. Much of the subsequent consumer surplus literature was concerned with this assumption. Layard *et al.* (2008) provide evidence that the marginal utility of income is declining.

Commonsense would suggest that a WTP measure of consumer surplus should equal a WTA one. Willig's paper (1976) was an attempt to provide support for this equality. But there is ample evidence in the Behavioral Economics literature that WTA's are larger than WTP's (Isoni *et al.* (2011) provides a good point of entry to the literature.) Hanemann (1991), and Amiran and Hagen (2003) provide examples of situations in which WTA may be infinite. See Schuck (2014, 45-51) on CBA.

3. PARETO OPTIMA²³

The standard discussions of economic welfare and economic policy in the context of the supply and demand model are based on the ideas of Pareto optimality and Pareto improvements. This is because economists reject value judgments,²⁴ which forces them to choose the “neutrality” of Pareto optimality as their criterion for a socially optimal allocation of resources. The attempt to make economics *wertfrei* means that from an economist’s point of view only policies that correspond to a strict Pareto improvement improve social welfare. However, both Pareto optima and Pareto improvements are essentially vacuous concepts in any real economic situation.²⁵

When introducing supply and demand, most intermediate narratives emphasize that the market equilibrium, established at the output where the quantity supplied equals the quantity demanded and corresponding to the output below the point where the supply (MC) curve intersects the demand (MB) curve, has two nice properties: At the equilibrium the market has generated an efficient output, and that output corresponds to a Pareto optimum (the FWT), see Figure 1(b).²⁶ Since MB is the value that the marginal consumer receives from consuming the marginal unit of the good, and since MC is the opportunity cost to the marginal firm of producing the marginal unit of the good (what society has given up in terms of other goods and services that could have been potentially produced in its place), then the market output is efficient. Efficient in two senses, the Pareto efficient sense that no one can be made better off without making at least one person worse off. And efficient in the common usage of the term that the value of the marginal unit is maximized, given the cost of the inputs used to produce it; or, equivalently, efficient in the sense that given the value of the marginal unit, its social cost has been minimized.

However, the standard exposition can easily lead students into believing that economic efficiency and Pareto optimality are synonymous. But, although efficiency is a sufficient condition for Pareto optimality, Pareto optimality does not imply economic efficiency. AD equilibria are efficient and Pareto optimal, but almost any inefficient resource allocation must also be a Pareto optimum. Economic problems are usually problems because all obvious Pareto

²³ See Lloyd (2010), Blaug (1978) and Niehans (1990 265).

²⁴ See Putnam (2002 56). Putnam makes the important point that there are different types of value judgments, some of which are open to empirical argument.

²⁵ Harrod (1938) makes essentially the same point. See Robbins’ (1938) reply.

²⁶ I am ignoring external effects, public goods problems, and information asymmetries among other market failures.

improvements have been exhausted, which leaves only situations in which there are conflicting interests; those conflicting interests emasculate Pareto optimality.²⁷ Panel (a) of Figure 3 illustrates the standard treatment where Pareto optima are synonymous with an AD-type efficient allocation of resources,

[Figure 3 goes about here.]

whereas panel (b) shows that in reality Pareto optima are the norm rather than the exception. What is rare is the set of efficient allocations, which, in reality, may be close to empty. If in practice the set of Pareto optima is essentially identical to the set of all actual allocation of resources, what is the point of the Pareto optimality concept?²⁸ And what, apart from academic interest, is the point of discussing Pareto improvements if they are unlikely to exist?

The standard defense of the Pareto optimum idea, and of the time spent studying efficient first best allocations, is that they provide us with a benchmark against which we can measure real inefficient resource allocations. However, the Pareto optimum concept is a very weak reed upon which to base such evaluations.²⁹ Pareto optimality, an ordinal concept, does not provide a metric to tell us how far any non-Pareto optimal allocation is from the “nearest” Pareto optimum, only that we are not there.³⁰ Say that we have two allocations, X and Y. The X allocation fails to meet 10 of the first-order criteria, while the Y allocation fails to meet 11 of them. Can we conclude that X is socially more desirable than Y? What if the failed criteria are different or if they only partially overlap? Then we would need to know how society evaluates the different criteria, how large the deviations are, and how to aggregate the information into a single measure – knowledge that is never available to us.

Economists’ defense of the Pareto improvement criterion argues that the winners from a policy choice can often compensate the losers.³¹ However, any

²⁷ I grant that it is possible that there are situations where the economic actors have overlooked some solution to their conflict that might be teased out by an ingenious economist.

Optimality arguments couched in terms of the “Core” stress the fact that mutually beneficial (although not necessarily equally beneficial) voluntary trades, in the limit, move the economy to the Pareto frontier. They do not stress that such trades seldom exist in real-world situations.

²⁸ I suspect that the idea that Pareto optimal allocations are rare derives from looking at those short, one-dimensional, contract curves in Edgeworth exchange boxes.

²⁹ See Putnam (2002 56).

³⁰ It also provides no guide as to choosing between Pareto optima and non-Pareto optima many of which would be deemed to be preferred if income distribution was taken into account.

³¹ This is the so-called Hicks/Kaldor criterion; see Hotelling (1938), Hicks (1939), and Kaldor (1939). Scitovsky (1941-42) pointed out that there are situations in which the Hicks/Kaldor criterion leads to ambiguous outcomes; see Gorman (1955) and Lipsey (2010).

exposition of compensation needs to carefully set out exactly how the compensation is to be determined, who will pay how much and to whom, and how the compensation scheme is to be administered and paid for. In most cases this will not be an easy task, as the standard narrative admits. Further, compensation needs to be paid before the injury occurs, not after the fact. We must bite the bullet and finally tell our students that economists faced with these difficulties have simply ignored their own strictures about abjuring value judgments and have resorted to the value judgment of potential compensation: The brutally utilitarian argument that as long as the winners gain more than the losers lose (measured by different consumer surpluses), then that fact alone is sufficient to justify the policy, even though no compensation is paid.³²

Say you are told that in order for other people to get to work more quickly, a new bypass will be built and the home you have lived in for three years must be demolished. The bypass will be built because economists have determined that the gains to the commuters are larger than your loss, sufficiently large that the commuters could, in principle, compensate you for the lost monetary and psychic value of your home. However, no compensation will be paid to you when your home is demolished. Would you regard this as a satisfactory policy?³³

Or consider how the standard narrative analyzes rent controls using Figure 4.³⁴ Assume that the market is initially in equilibrium at (Q^e, R^e) . It is clear that the unregulated market solution represents a Pareto optimum, maximizing the

[Figure 4 goes about here.]

gains from trade triangle AEB, and is also efficient in the economic sense since $MC=MB$. Now assume that demand increases to D_1 causing the equilibrium rent to rise to R_{e1} . Although the new equilibrium is a Pareto optimum and economically efficient, some tenants may not be able to afford the higher rents

³² As the euphemism “collateral damage” is more acceptable than “civilians killed and maimed as part of the military operation”, so “potential compensation” has a more friendly ring than “just suck it up”.

³³ Such calculations might not bode well for humanity; see Adams (2002).

³⁴ Microeconomists like to point out that surveys of economists often show strong agreement about microeconomic issues among microeconomists, whereas macroeconomists fight like cats and dogs over macroeconomic issues. See for example, the IGM Forum poll published on February 7, 2012, which asked for responses to the statement: “Local ordinances that limit rent increases for some rental housing units, such as in New York and San Francisco, have had a positive impact over the last three decades on the amount and quality of broadly affordable rental housing in cities that have used them.” I think that the degree of unanimity among microeconomists shown in this poll, and on other equally complex issues, is evidence that many economists rely on the single-market supply and demand model as their “default” model.

and so a rent ceiling (R_C) equal to the original equilibrium rent, R^e , is established as a temporary measure.

If rents do not change, then the market will continue to supply the original number of apartments, Q^e , because apartment owners have no incentives to change their investments if there is no increase in their rates of return. There will be a new, vertical, supply curve above Q^e .³⁵ (Pooh-Bah would point out that in the “long-run”, when inflation is likely to cause costs to increase faster than hotly contested rent increases, the supply of apartments may increase more slowly than if rent control were not in place. It is likely that the rate of return on capital will decrease in the “long-run”. Of course, this result cannot be derived from a static model.) Although the new equilibrium is inefficient because there are unexploited gains from trade (the large triangle GE_1E), it is important to reiterate that the rent controlled equilibrium is a Pareto optimum; once the rent ceiling has been introduced removing it will make those who gain from rent control worse off. Removal of rent control will increase efficiency, but it cannot be a Pareto improvement.³⁶ The economists’ policy criteria, efficiency and Pareto optimality, will often be at variance with one another.

Majors should be aware that in situations in which there is government intervention to control market prices, for example, rent controls, minimum wages, protection, and various subsidies, the market ends in equilibrium (the “short” end of the market determines the equilibrium transactions), even though the market does not clear.³⁷

The standard intermediate narrative then dwells on the various ways in which the scarce resource (the number of apartments Q^e) is allocated by non-price means. This again is Pooh-Bah economics. None of those propositions can be derived from the standard model. Indeed we should re-work the supply and demand model when introducing price constraints. For example, in the rent control case we have a new model of the form:

³⁵ The market “clears” in these constrained situations even though there is excess demand at the equilibrium. Market “clearing”, which is often associated with market equilibrium, is not necessary for a market to be in equilibrium.

³⁶ Colander *et al.* (2010) has an interesting analysis of welfare costs of market restrictions.

³⁷ Rock concerts, sports events and similar occasions where there are physical capacity limits may also have equilibria despite there being excess demand.

$$(93) \quad f, g: R_{++} \rightarrow R_{++}$$

$$(94) \quad Q^d = f(R) = d_1 + d_{11}R \quad d_1 > 0, d_{22} < 0$$

$$(98) \quad Q^s = f(R) = s_1 + s_{11}R \quad s_1 > 0, s_{11} > 0$$

$$(99) \quad R = R^c \quad d_1 > s_1 \quad d_1 s_{11} - d_{11} s_1 > 0$$

$$(100) \quad Q^d = f(R) = d_1 + d_{11}R \quad d_1 > 0, d_{22} < 0$$

All that this model allows an economist to say is that there will be excess demand at the controlled rent and that the controls do not meet the economic efficiency standard.³⁸ Further, most policy makers and voters have no interest in the deadweight loss triangles that economists use to measure the inefficiency of the controls. Instead these groups, whom economists often regard as economic illiterates, are concerned with who gains and who loses, usually assuming that gains to renters are more important than losses to landlords. Economists are reduced to emphasizing that policies such as rent control are poorly targeted since controlling a price, with little attention to who pays that price, is a clumsy way of dealing with a distributional issue.³⁹

Almost all of the standard policies that economists have opposed because they are inefficient and cause deadweight losses (rent control, minimum wages, protection, agricultural and other subsidies, etc.) are subject to the same problem; once an inefficiency has been created removing it may increase economic efficiency but only at the expense of those who gained from the inefficient policy.

³⁸ Lind (2007 and 2010) examines more sophisticated rent control models.

I do not dispute the fact that rent control has almost always been a poorly targeted policy, especially if the controls are extended over long periods of time. However, much of the standard literature appears to be testing hypotheses about rent control that are based on informal observation and anecdote rather than being derived from the standard model; indeed, these results cannot be derived even from the modified model laid out in the text, because it does not address these issues. For example, the model has nothing to say about the quality of the apartments, which, as is the rule in supply and demand analysis, is assumed to be constant, although the standard treatment of rent control usually assumes that apartment quality will decline.

Arnott (1995), in an early revisionist appraisal of the rent control literature, makes the important distinction between first- and second-generation rent control. The standard analysis relates to first generation rent control. Turner and Malpezzi (2003) provide a wide-ranging survey of rent controls in many countries. Jenkins' paper (2009) contains a history of rent control in the United States and an interesting review of the United States empirical work on rent control.

4. DISTRIBUTION

The most egregious omission from the standard supply and demand narrative is its failure to connect resource allocation with the distribution of income. In Part 7 we saw that the distinction between individual and market demand curves is often fudged at the intermediate level. Intermediate Microeconomics textbooks usually refer to something called “income” when specifying the determinants of market demand. Whether this refers to aggregate income, or average income, instead of each individual consumer’s income is usually left moot, thus ignoring the possible effects of price changes on the distribution of income and hence on market demands and resource allocation.

Of course, every economist knows that the Pareto optimum criterion ignores the distribution of income and wealth.⁴⁰ Textbook authors and economics professors justify ignoring income and wealth distributions on the grounds that they cannot discuss distributional issues without making value judgments and invoking interpersonal comparisons of utility. Consequently economists must remain mute with respect to the desirability of changes in the distributions of income and wealth. However, we should make it clear to our majors that the existing distributions of income and wealth do not have privileged positions in economic theory; although economics cannot determine what is a desirable distribution of income and wealth, this does not mean that economics provides support for the existing distributions of income and wealth.

The traditional marginal productivity explanation of factor price determination, based on the supply and demand for factors, and where the demands are derived demands generated by profit maximization, leaves much to be desired. Although its logic is impeccable, its implementation is problematic. Labor markets are a prime example of principal-agent problems. And the marginal productivity theory smells of “just desserts”, something that Hamlet warns Polonius against. Economists have stressed the division of labor and its implicit message that no man is an island, while free market pundits seem to believe that we are all Davy Crocketts out in the wild frontier (Crockett did not make his own knife, rifle, powder and ball). In 2010 the hedge fund manager John

⁴⁰ It is generally agreed that the Second Welfare theorem, even ignoring its strong convexity assumptions, is merely a theoretical curiosum. In practice no government is going to use lump sum transfers to move to a “more desirable” distribution of income and wealth. Even if such a policy was contemplated there is no possibility that the government would possess the information necessary for the policy to be implemented.

Paulson received compensation of \$5 billion dollars,⁴¹ but he probably did not make his own bread or his own suits.⁴²

The facts about income and wealth distributions are well known because of the work of Piketty and Saez (2003) that was available to economists in the 1990s.⁴³ A discussion of the facts of distribution does not require us to parade our prejudices before our students as if they were economic theorems. But it provides an opportunity to discuss the assumptions and methods used to derive those facts, and the different interpretations that can be placed on those facts.

5. ABILITY TO PAY

Economics majors must continually remind themselves that in economics, demand has meaning only if it is backed by the ability to pay (ATP), where the ATP encompasses not simply the consumer's income but also her wealth, and her ability to obtain credit. The demand curve is routinely depicted as a willingness to pay (WTP) curve, but there is seldom any mention of, still less a proper emphasis on, the fact that WTP is irrelevant if not backed up with the requisite ATP.⁴⁴ The market reflects only those desires that can potentially be consummated by an actual purchase.

⁴¹ Paulson received (approximately) \$3.5b in 2007, \$2b in 2008, \$2.2b in 2009, and \$5b in 2010. He did less well in 2011 and 2012 but received about \$1.3b in 2013. See also Rodrick (2015 121-125).

⁴² <https://www.youtube.com/watch?v=URvWSsAgtJE> and <https://www.youtube.com/watch?v=r4Wn0DZ6czo>

⁴³ See the (JEP 2013) Symposium, Piketty *et al.* (2016), Lansing and Markiewicz (2016), and Guvenen and Kaplan (2017) for more recent research. On wealth mobility see Carroll and Hoffman (2017). Income and wealth are inextricably intertwined because high incomes are difficult to spend and because the returns to large portfolios are likely to be higher than more modest ones because high risk, and potentially, high return assets are likely to be a greater proportion of large portfolios, see Bach *et al* (2017).

⁴⁴ It is interesting that economists define the consumer's budget constraint only in terms of her income. In reality she most likely has access to assets that are either liquid or that may be used as collateral. Most consumers make extensive use of loans in the form of credit card transactions. I presume that this concentration on income arose because Jevons, Marshall, and Walras were academics whose principal source of purchasing power was their salaries. Keynes (1924, 367) notes that Marshall "belonged to the period of small salaries and no pensions ... he ... managed out of his professorial stipend (of £700, including his fellowship)." I was lived comfortably when I receive a stipend of £750 a year (plus free tuition) when I was a student at the LSE in 1957. Keynes was probably thinking of his own circumstances. Skidelsky (2015, xix) estimates that Keynes was worth £400,000 when he died in 1946, a sum approximately equal to £14 million, or \$22million in 2015.)

I have no demand for million dollar sports cars, for one hundred million dollar private planes, one hundred and seventy million dollar penthouses in London, or three hundred million dollar luxury yachts, because I do not have the requisite ATP. The homeless have no demand for housing, although they may have great need of it; the many US households who suffer from what is euphemistically called “food insecurity” have no demand for food even though they may have hungry children to feed; many older persons have no demand for electricity although they may freeze in the winter and die of heatstroke in the summer; people suffering from rare diseases such as motor neuron disease have no demand for the pharmaceutical research that might develop drugs to cure or alleviate their suffering. The poor have no demand for the best schools, the most nutritious meals, the safest cars, or the best shoes for their children, or generally for amenities taken for granted by the more affluent. For different reasons the rich have no demand for services that may be vital to the poor, such as transit systems and affordable housing and health services, and no conception of how important a car is (no matter how old, poorly maintained, and unsafe) to people working three jobs, and transporting children to daycare, and needing access to distant social services. What gets produced, in what quantities and qualities, is determined by a set of relative prices that are the outcomes of choices that depend on ATP.⁴⁵

Ignoring the effect of income and wealth distributions may seem reasonable when we consider the market for peanuts. Because peanuts are in no sense a vital component of most people’s expenditures, it does not bother us that some people can buy as many as they like, while others can afford far fewer of them. But access to the best medical treatment, legal representation and education are also scarce, and most people, probably most economists, do worry that some people, because of their superior financial resources, have much greater access to these amenities than other people do. There is a general acceptance that the rich will live in the most desirable city locations and possess the most glamorous clothes and cars, but less agreement that they should have privileged access to the things that enable people to maximize their capabilities.⁴⁶

⁴⁵ Students should also be aware that high income and wealth individuals, and large corporations, are able to use their financial strength to obtain economic rents from legislators at the expense of the general public.

⁴⁶ See Sen (1985, 2001). Sen’s approach would have been received with approval by Marshall who wrote in his Inaugural Lecture, quoted in Keynes (1924, 367), of his desire to produce economists “with cool heads but warm hearts, willing to give some at least of their best powers to grappling with the social suffering around them; resolved not to rest content till they have done what in them lies to discover how far it is possible to open up to all the material means of a refined and noble life.”

Because economists are unwilling to introduce their own value judgments into discussions of economic policy, they have resorted to trying to divorce resource allocation (efficiency) from issues of income and wealth distributions (equity). But the set of equilibrium prices generated by a price mechanism must reflect the distribution of income and wealth, because individual demand curves are functions of individual consumer's incomes, wealth, and access to credit. Conventional supply and demand analysis is based on market demand curves, which depend on an aggregate income variable. As we have seen there is no legitimate way in which we can combine those individual incomes into an aggregate income term. We should at least acknowledge that this is a major problem even if we cannot solve it.⁴⁷

Here are two examples that illustrate can be used to illustrate to majors the influence of the distribution of income on resource allocation:

Example 1: Location, we are told, is the major factor in determining house prices. The supply of desirable places to live, such as those with beautiful views (Benson et al.), those located in fashionable neighborhoods, and those that have easy access to a city's amenities, are obviously in very inelastic supply. In fact the supply curve may be essentially vertical, especially when the existing residents use their political influence to zone where they live to restrict expansion of accommodation that may reduce the value of their property or their access to an attractive view or recreational space.

People whose incomes and wealth are sufficient to buy into the fashionable areas of the city, but are unable to obtain one of the desirable residences, must now look further afield, seeking areas that are contiguous with, or close to, and with similar conveniences to, the most desirable parts of the city; they start to move into and gentrify those neighborhoods.

Consider an economy in which there are only two types of households, A's, (whose incomes come from IT-related employment) and B's (all other workers). The A's incomes continually rise because of a technologically induced increase in the demand for their skills, whereas the B's incomes stagnate because of global competition.

In Figure 5 the horizontal axis represents the amount of housing available in the soon to be newly fashionable neighborhood.⁴⁸ Initially only B's wish to live in the area and their demand curve d_b determines the price of housing, P_1 . Now

[Figure 5 goes about here.]

⁴⁷ The market demand function for rice in China should have 1.33 million income parameters.

⁴⁸ Lady Bracknell: "The unfashionable side. ... However, that could easily be altered." (Wilde (1895/1965 46)).

A's start to buy houses in the area and refurbish them to the standards they are accustomed to. Initially the price rises to P_2 and the B's share of the housing market contracts. From this point on, as the incomes and wealth of the A's continue to increase, and the incomes of the B's continue to stagnate, the price of housing will be bid up from P_2 to P_3 , and finally to P_5 , which is the choke point for the B's.⁴⁹ Now only A's live in the newly gentrified neighborhood. The price of housing in the newly desirable parts of the city will continue to bubble upwards until something happens to reduce the purchasing power of the A's.

Example 2: Consider a version of the augmented three-good supply and demand model. There are two classes of consumers: those who have high incomes and net worths (A's) and those with low incomes and net worths (B's). Assume that there are three goods: (1) bread, (2) cake, and (3) IT applications. Assume that the A's obtain their incomes by producing IT applications and that the B's incomes come from producing bread and cake. The A's and B's initially consume all three goods. Assume that there is a sudden fad for bread.⁵⁰ Finally, assume that the A's incomes are rising because of an increased demand for IT products, while the incomes of the B's stagnate even as the A's switch their purchases from cake to bread. Bread and cake are rival in production and so the increased demand for bread will drive up its price relative to cake, causing bakers to produce more bread and less cake. Ultimately the B's may be forced to consume cake instead of bread even though cake has become more expensive.

6. REPUGNANCE

Economists have a tendency to apply the supply and demand model promiscuously not only to any microeconomic problem that comes their way,

⁴⁹ I am assuming that some of the B's will leave as they receive more and more attractive offers for their houses. Freeman and Braconi (2004) argue that gentrification did not cause displacement in New York City in the 1990's because it also caused neighborhoods to improve. However, although existing residents may not be enticed to sell their homes, when homes do become available it will be higher income families who purchase them. See also http://www.nybooks.com/articles/2017/08/17/tenants-under-siege-inside-new-york-city-housing-crisis/?utm_medium=email&utm_campaign=NYR_Housing_crisis_North_Korea_Henry_James&utm_content=NYR_Housing_crisis_North_Korea_Henry_James+CID

⁵⁰ Gwendolen: "Bread and butter, please. Cake is seldom seen at the best houses nowadays." (Wilde (1895/1965, 83)).

but also to problems that have traditionally been the purview of other social science disciplines: problems such as crime, marriage, murder, and abortion.⁵¹

But if everything is within the scope of the supply and demand model then everything should be for sale, as it would be in the AD model with, presumably, the exception of military-grade heavy weapons that would come within the scope of defense and anything that would stop the police from enforcing property rights. However, societies have traditionally placed restrictions on the scope of market transactions, especially Abrahamic societies where, for example, there are prohibitions on the sale of sex.⁵² Most governments also limit economic activities such as the sale of kidneys, the sale of certain drugs, and the sale of children.⁵³ These prohibitions are examples of societies perceiving a “market failure” that is seldom discussed in the intermediate textbooks’ coverage of the supply and demand model.

7. ASYMMETRIC INFORMATION

The supply and demand model applies to a good or service that is perfectly homogenous. In such a world there are no information asymmetries and the markets for used cars and medical insurance function smoothly and efficiently. In the real-world asymmetric information is a serious problem.

Adam Smith’s world was very different from ours. In the mid-eighteenth century you knew your butcher, your baker, your candlestick maker; they had to be careful about their reputations. In the twenty-first century many transactions are made anonymously at many hands removed. No one believes that all business owners are frauds and cheats, but it is surely naive to assume, as the standard narrative does, that none of them are.⁵⁴

⁵¹ Economists forays into our sister social sciences do not seem to have unearthed startling new discoveries, or to have caused our fellow social science practitioners to revise their ideas: Perhaps because although we may beat the same coverts we may be after different game.

⁵² A discussion of the economics of prostitution may be found at <https://static1.squarespace.com/static/5164d71ae4b0ce432330c861/t/56d54c9ec2ea510f175bc932/1456819359350/CM26+PROHBTN+2-29-16.pdf>

⁵³ An interesting early discussion of the issues is Solow’s review (1971) of Titmus’ monograph (1971) on the supply of whole blood in the United Kingdom and the United States. See also Arrow (1997), Besley (2013), Bruni and Sugden (2013), Healy and Krawiec (2017), Krawiec (2009), Pinker (2008), Roth (2010), and Sandel (2010, 2013). The issues raised in these books and articles make excellent class discussion topics.

⁵⁴ Smith (1776/1937) famously observed that: “People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices.” However, although Smith’s statement was directed at incorporated towns, a remnant of the old guild system, I doubt that he would be less scathing

It is difficult to find the words “fraud” or “negligence” in economics textbooks. Even discussions of the so-called “Lemons” model do not often mention that asymmetric information is usually the result of one party deliberately withholding information from the other, a morally questionable decision even if not strictly illegal. The standard account of the supply and demand model, which assumes a set of perfectly informed market participants, cannot address fraudulent behavior; for example, there can be no false advertising in a world of complete information. However in the real world manufacturers of automobiles, airbags, cell-phones, breast implants, meat products, cigarettes, dietary products, hair restoratives, treatments for sexual dysfunction, and pharmaceuticals such as opioids and thalidomide, produce and actively market products that they know are of poor quality, or addictive, or even fatal until they are eventually caught. In the service sector physicians may overprescribe diagnostic tests and invasive procedures; investment advisors may charge exorbitant fees and may not acknowledge a fiduciary obligation to provide sound advice to those they advise; financial institutions may sell asset types that they know to be excessively risky, and may manipulate financial markets such as LIBOR, and the markets for foreign exchange and gold. The standard narrative argues that market systems are self-correcting because no fully rational firm would ever produce thalidomide or faulty ignition switches or fail to replace vital parts on an oilrig, because such firms fear the wrath of the stock market. But while the wrath is *ex post*, the economic damage, including loss of lives and livelihoods, occurs *ex ante*.

Figure 41 shows a market in which the suppliers are better informed than the buyers. The buyers believe that they are purchasing a good product and their perceived marginal benefit (PMB) is larger than the actual marginal benefit (AMB) they receive from consuming what is actually a poor quality good. Their demand curve is therefore $D=PMB$. The market is in equilibrium at (Q_M, P_M) . The solution is Pareto optimal because moving to the social optimum at (Q_{SO}, P_{SO}) will make producers worse off. But the equilibrium is economically inefficient because $MC > AMB$. If consumers discover that the product is useless or harmful, then demand may drop to $D=AMB$; if the product is found to be deadly then the vertical AMB' replaces AMB , and the demand curve would become the vertical axis.

In the 1980's Stiglitz and his associates⁵⁵ showed that constrained Pareto improvements are likely to exist in any AD-style competitive system where there

about the practices of large corporations that use their combined political influence to obtain significant economic rents from politicians.

⁵⁵ See Stiglitz (1987, 1991, 1994), Hoff (2008), and McFadden (2017).

is asymmetric information. Stiglitz (1991) argues that this literature demolishes the exaggerated claims made in the name of Smith's "invisible hand".⁵⁶ This literature provides another example of how the supply and demand model can be in equilibrium even though the market does not clear (see Section 7.3). Employers often have reason to believe that "efficiency" wages motivate employees and reduce supervision costs, and improve the pool of potential job applicants. They are therefore willing to pay a wage higher than the competitive equilibrium, and will be unwilling to decrease wages and benefits in the face of obvious excess labor supply. The labor market is in equilibrium although there are unemployed workers.⁵⁷

Consider Figure 6 which shows the United States labor market(s) before and after 2008, the beginning of the Great Recession. Either large sections of the labor force simultaneously decided to consume more leisure, S to S' , or there was a demand shock, D to D' . In the first case the labor market is in equilibrium although a large section of the labor force stubbornly insists that it is unemployed and entitled to unemployment benefits even though it has voluntarily decided to work less.⁵⁸

[Figure 6 goes about here.]

Alternatively there was a massive demand shock to the labor market. Employers would not employ the unemployed workers because they perceived that it would not be profitable to continue to hire them at the efficiency wage W_E . And, according to this theory, employers would not hire workers who are willing to work for W_e because they believe that these workers are lower productivity workers and that hiring them would raise supervision costs.

Determining which scenario is a better explanation of the behavior of the labor market in the early years of the Great Recession would require a more elaborate model. That model would have to incorporate such factors as voluntary quits, layoffs, early retirements, delayed entry into the labor market, the possible mismatching of workers and jobs, and discouraged workers.

All competition in the standard supply and demand model is via legitimate strategies and does not include real world practices such as industrial espionage, reverse engineering, and poaching vital employees from

⁵⁶ Stiglitz (1991 40).

⁵⁷ Employers may claim that there is a shortage of nurses or engineers or IT workers when, in fact, they are paying wages and benefits that are "too low".

⁵⁸ This would make more sense in the standard labor economics models where it is often assumed that workers can bargain over their hours of work, whereas in the Great Recession case the workers would have to suddenly have a preference for being outside of the labor force.

competitors. In the standard exposition there are no inefficient firms because all perfectly competitive firms are by definition producing efficiently.⁵⁹

Government incompetence is taken for granted by some economists, while private sector incompetence is assumed away. But government incompetence is usually attributed to its bureaucratic structure, a bureaucratic structure that is shared with most Fortune 500 companies, although those companies operate under different incentive systems than government agencies.

Of course, all of the above is Pooh-Bah economics.

Friedman/Realist/Instrumentalist.

⁵⁹ In 2017 General Motors (GM) announced that it was considering leaving the European car market. GM had not made a profit in Europe since 1998. See also Bloom and Van Reenan (2007). There are Pooh-Bah (Gilbert (1885) and Sleeman (2017a)) discussions of inefficient firms being driven out of business under perfect competition, but these discussions violate the static nature of the supply and demand model.

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FIGURES

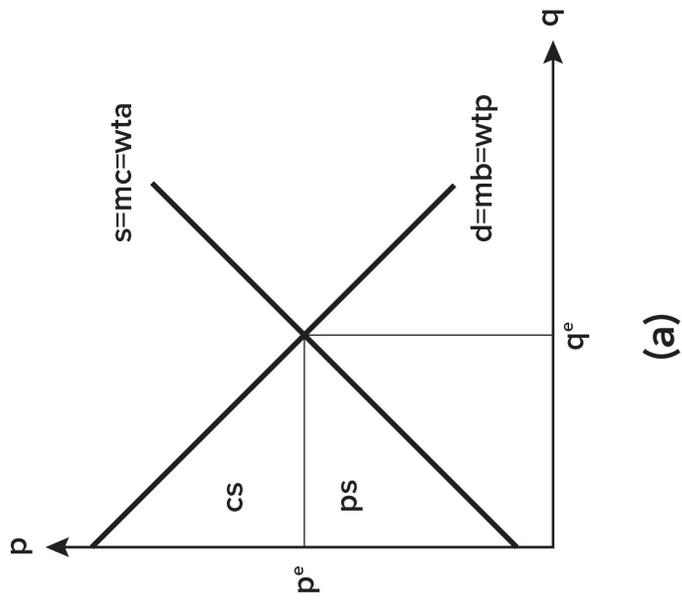
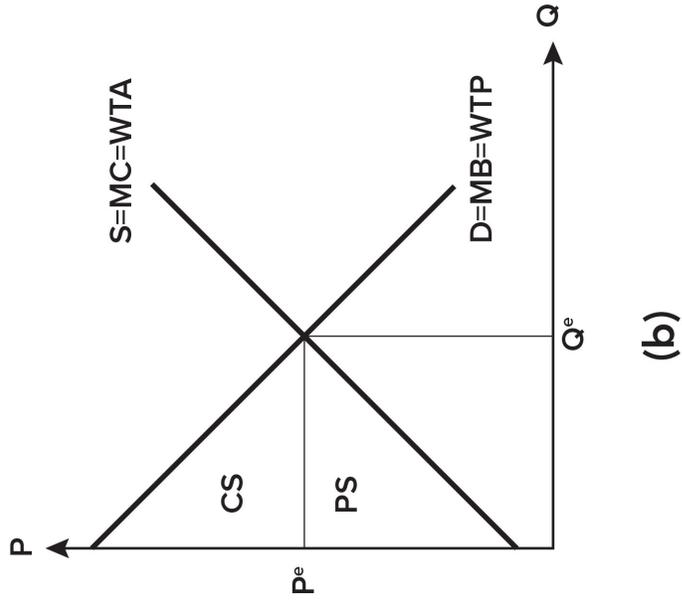


Figure 1

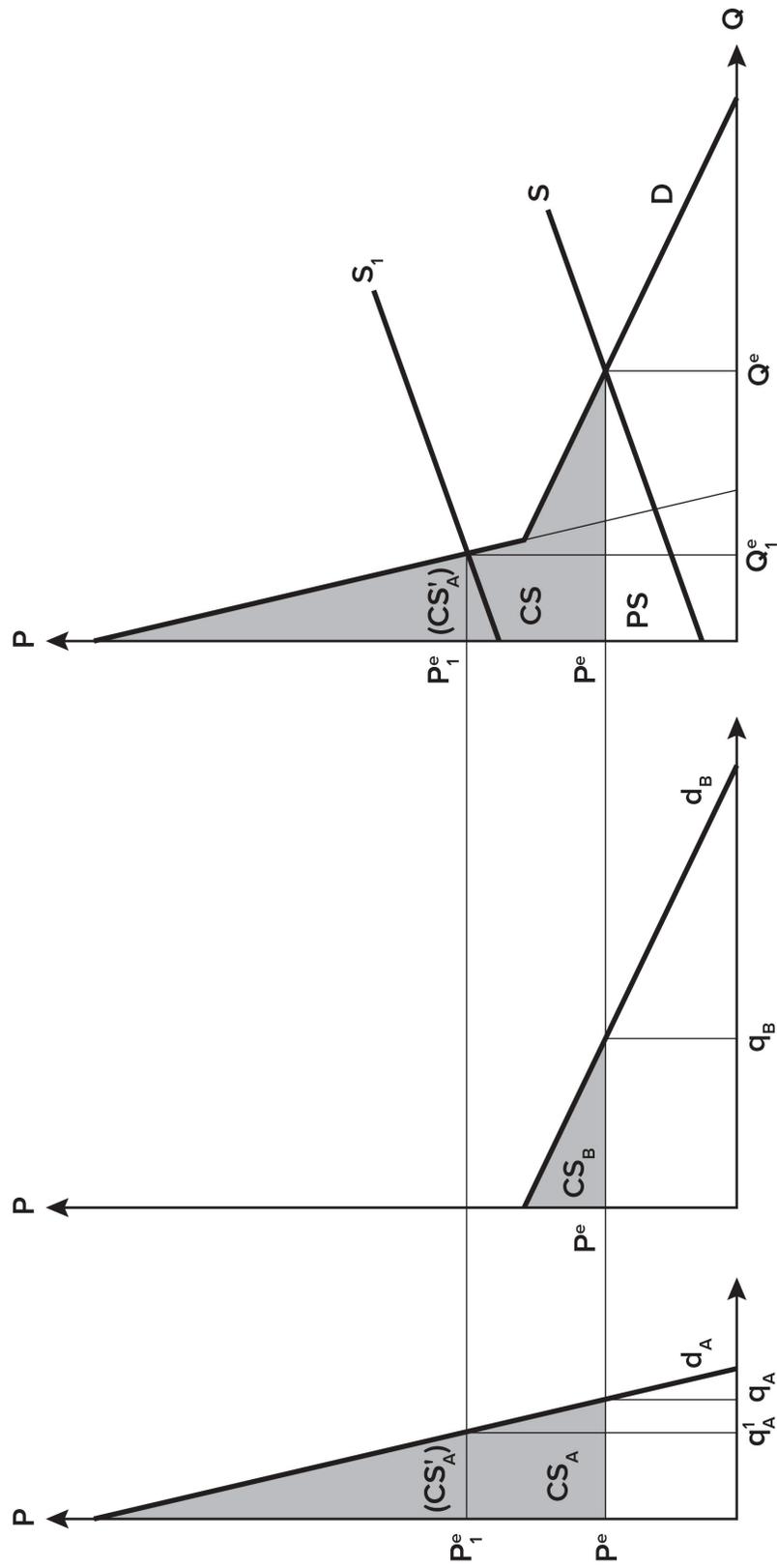
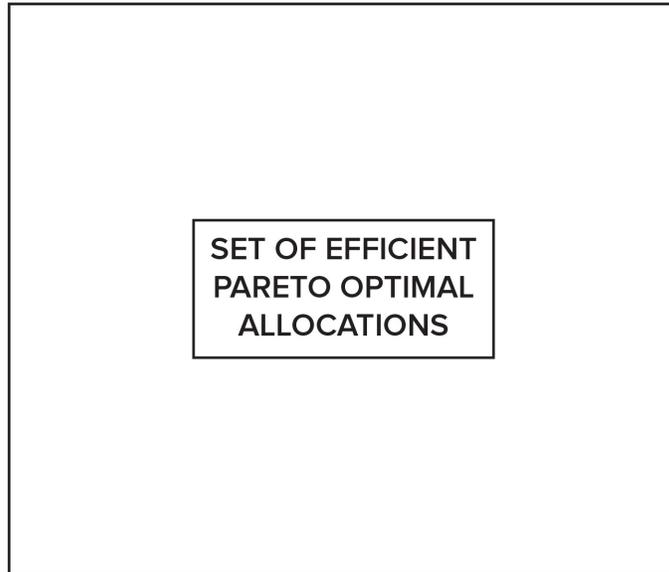


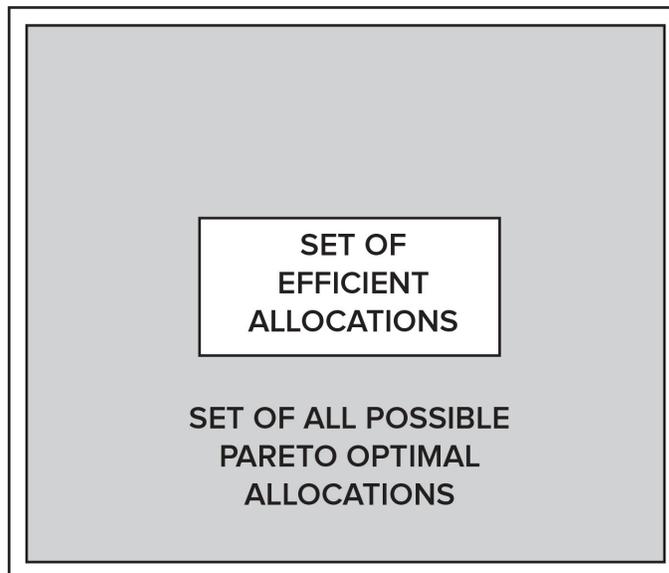
Figure 2

SET OF ALL POSSIBLE ALLOCATIONS



(a)

SET OF ALL POSSIBLE ALLOCATIONS



(b)

Figure 3

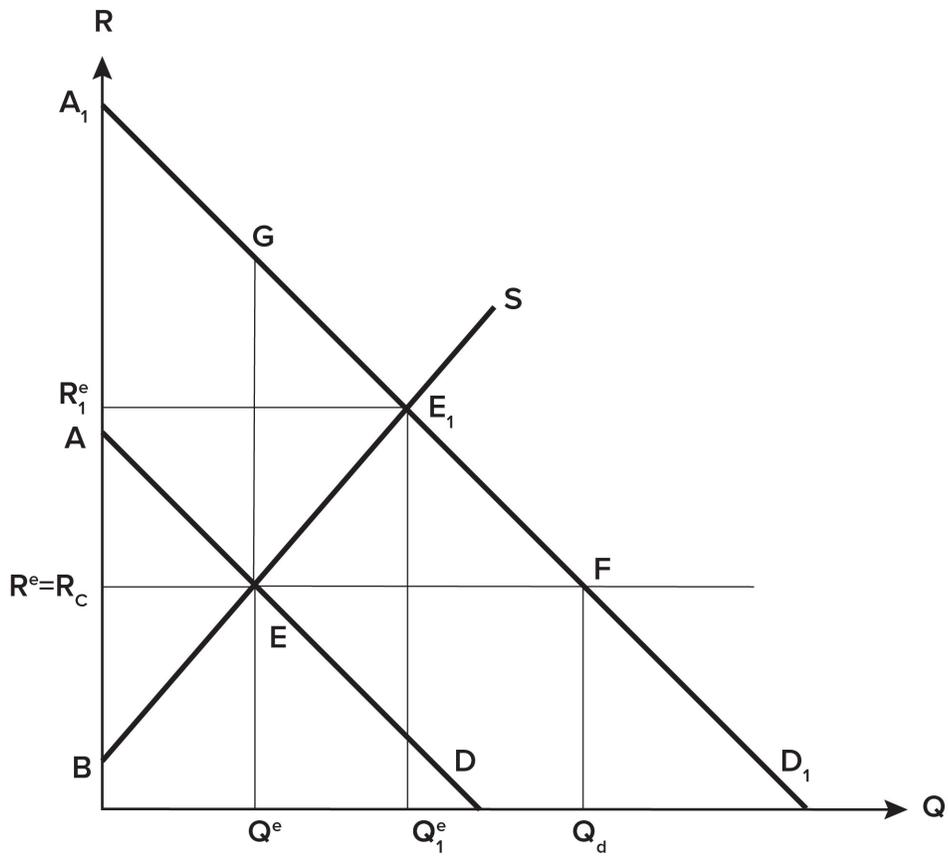


Figure 4

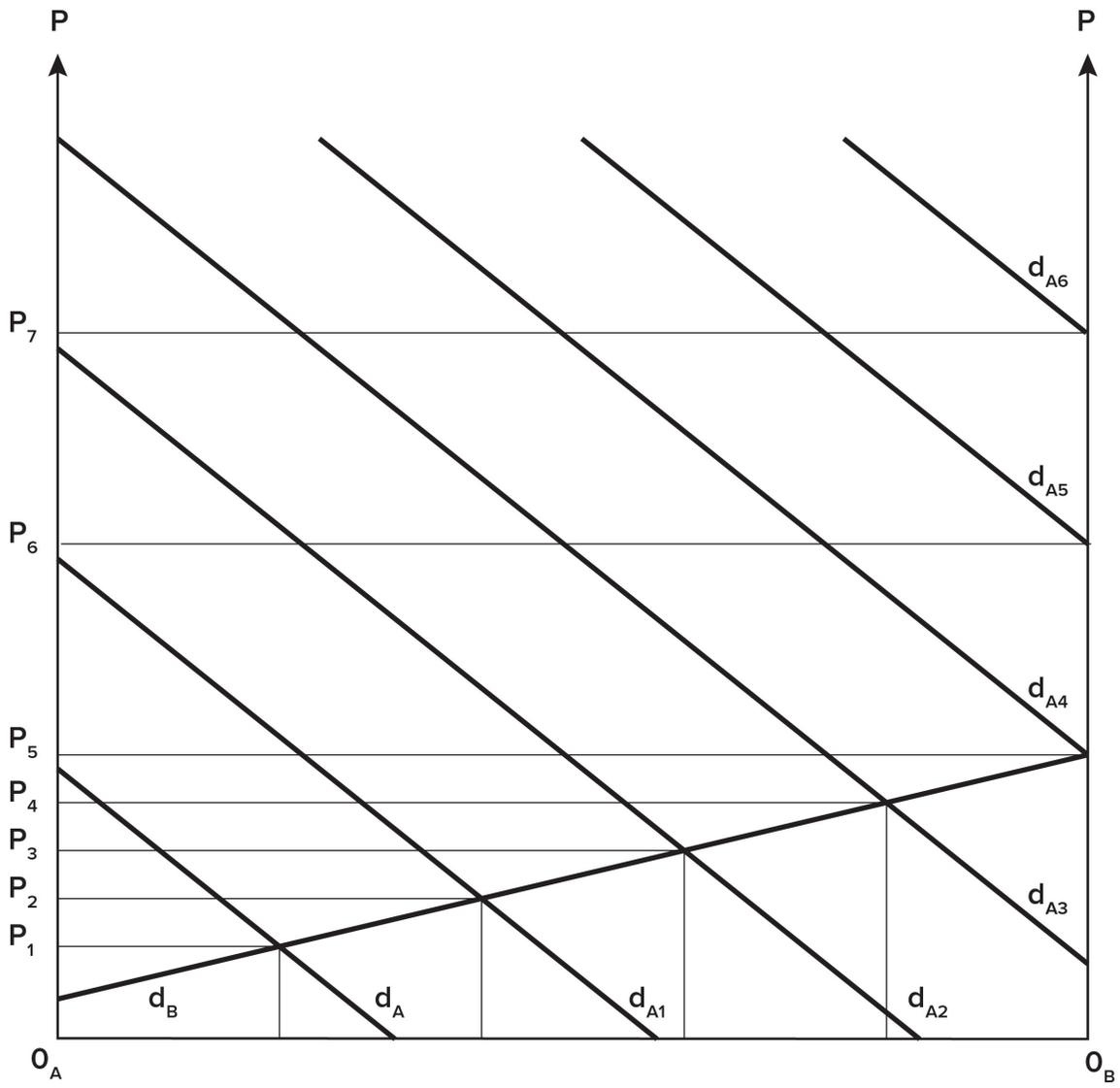


Figure 5

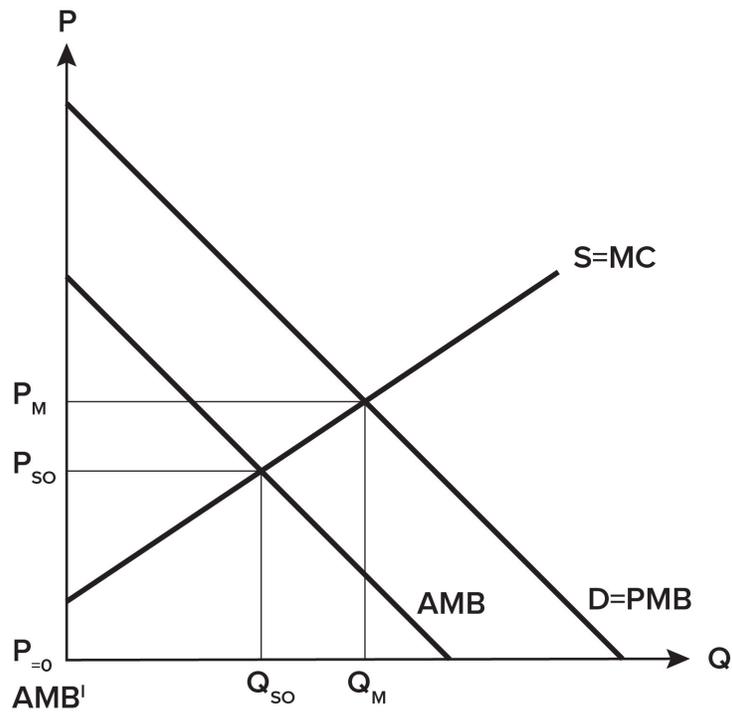


Figure 6

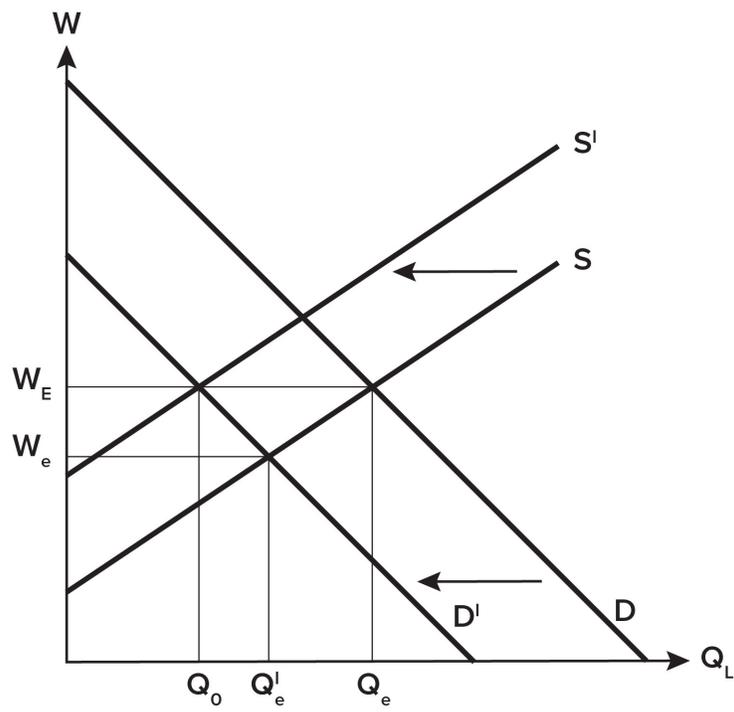


Figure 7