Market Failures and Efficiency in the Principles Course

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Many policy debates revolve around the appropriate extent and form of government intervention in specific markets, or, more accurately, government alteration of the incentives or institutional rules in those markets, including the provision of certain goods.¹ To make sense of these debates, economics students must understand what “free” markets do well and, in particular, where they fail, and how governments may be able to improve their behavior. Toward this end, authors of principles textbooks generally discuss concepts including gains from trade, efficiency, the invisible hand, and various causes of market failures such as market power, externalities, and public goods.

The current pedagogy fails to emphasize fully the common principles underlying the various categories of market failure. The examination of principles textbooks below demonstrates that each category of market failure is typically discussed separately. Furthermore, the textbooks do not always clearly show how an economist identifies the alternative, preferred outcome, nor do they emphasize that economists often apply an efficiency criterion in considering alternatives.

I argue instead for a unified consideration of how markets fail, based on how an efficiency rule is violated. All market transactions can be characterized as “efficient” or “inefficient,” according to whether they satisfy the efficiency rule that marginal benefits to society equal or exceed marginal costs to society. Then, all explanations of individual market failures can refer to this rule and show how private-decision rules may sometimes deviate from it. Finally, one can show how government, by making alterations to individual markets (by changing rules or incentives or by providing goods directly), may be able to improve the efficiency of the economy. This unified consideration does not require rearrangement of topics within the course, other than introduction of the efficiency rule at some point before the first type of market failure is taught.

A unified treatment of market failures and efficiency has two key benefits. First, consolidation enables reinforcement of the basic concepts through repetition of the same analytical constructions and may also lessen the class time required to cover market failures. Second, consolidation conveys to students that economists often reference a common normative foundation, based on the con-

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A unified treatment of market failures and efficiency has two key benefits. First, consolidation enables reinforcement of the basic concepts through repetition of the same analytical constructions and may also lessen the class time required to cover market failures. Second, consolidation conveys to students that economists often reference a common normative foundation, based on the con-
cept of efficiency, in making arguments for alterations to market institutions and incentives. Thus, students more accurately learn when current institutional structures or free-market outcomes are desirable as well as when market alterations are preferable.

My argument focuses on teaching the government’s role in correcting for market power, externalities, and public goods problems. I ignore other forms of government involvement, especially the definition and enforcement of property rights and the regulation of decreasing costs industries. I also ignore three other issues framing the government’s role. First, governments have many policy objectives other than efficiency, including the distribution of gains and losses from a policy. Second, market alterations are desirable, on efficiency grounds, only where private decision rules are actually improved. A government may fail to adopt an efficiency enhancing policy because of political constraints (e.g., capture by special interests), bureaucratic constraints (e.g., limited information), or distortions from taxation necessary to support the policy. Third, the extent to which market failures occur may be viewed primarily as determined by the existence of transaction costs. Existing markets cannot make all otherwise efficient trades because of transaction costs barriers. The government’s role may be interpreted as the application of a unique power, coercion, to overcome transaction-costs barriers through the alternation of market institutions and incentives. Furthermore, such transaction costs, along with those arising from policy mechanisms such as regulations and taxes, may be another reason why the government cannot act to improve market outcomes. These issues should be included in a broader discussion of the role of government in the economy or of the bases on which one can make policy choices.

**TEXTBOOK TREATMENT OF EFFICIENCY**

In this section, I examine the presentation of efficiency and of market failure in seven microeconomics or general principles textbooks: Baumol and Blinder (1994), Edgmand, Moomaw, and Olson (1996), Heyne (1997), Mankiw (1997), Parkin (1996), Stiglitz (1997), and Taylor (1995). These textbooks serve as a good sample of the textbook market. Baumol and Blinder is a leading seller, and Parkin is also in the top 10 (Choi 1996). Stiglitz is trying to establish a reputation as being on the leading edge of the genre. Mankiw and Taylor are first editions and so have the benefit of working from a clean slate. Edgmand, Moomaw, and Olson is an example of the social issues genre of textbook, with most chapters devoted to particular economic issues (agriculture, crime and drugs, education, health care) rather than components of economic theory (consumer behavior, perfect competition, monopoly, oligopoly, etc.). Finally, Heyne stresses economic thinking and so might be expected to place ideas related to efficiency in a larger context.

Most of the authors introduce the concept of efficiency by using the production possibilities frontier to examine productive efficiency. Taylor (p. 214), Parkin (p. 262), and Stiglitz (pp. 321–23) proceed to describe three (but not necessarily the same three) conditions leading to efficiency, one of which is that MB
MC. Baumol and Blinder (p. 257) state the condition as \( \text{MU} = \text{MC} \). Edgmand et al. (p. 251) give the condition as \( \text{MB}_\text{SOCIAL} \geq \text{MC}_\text{SOCIAL} \); they are the only ones that make a distinction between private and social costs and benefits in defining efficiency. Mankiw (p. 145) states that an allocation that maximizes total surplus is efficient. Heyne’s description of efficiency is at a more conceptual level, focusing on human values as the primary feature of the efficiency concept: “Efficiency is inescapably an evaluative term” (p. 134). Thus, most of the authors invoke a condition for an optimal economic outcome, but only one draws a private/social distinction that immediately suggests that free markets may not yield the best outcome.

All the textbook authors argue that free markets will generally lead to efficiency, and most list a set of market failures that cause deviations from efficiency. However, none of the authors consistently invokes the optimal condition in explaining why governments may desire to correct market failures. For example, all of the textbooks draw the distinction between social and private costs in explaining negative externalities; Edgmand et al. (p. 54) and Mankiw (p. 204) also describe the distinction between social and private benefits in explaining positive externalities. Only Baumol and Blinder (p. 279), Edgmand et al. (p. 53), and Taylor (p. 337) invoke the optimal condition in discussing monopolies, however. Mankiw (p. 316), Parkin (p. 285), and Stiglitz (p. 390) use the concept of lost surplus or deadweight loss, whereas Heyne writes about lost mutually advantageous exchange opportunities (p. 195).

None of the textbook authors explains explicitly how public goods situations result in trades that violate the efficiency condition, although many of them point out that private market outcomes can be improved. Mankiw (chap. 11), for example, refers to market failure in discussing public goods but mentions efficiency only in the chapter’s conclusion. Stiglitz and Edgmand et al. say little about public goods. In total, the sampled textbooks fail to present a consistent framework in discussing market failures.

**EFFICIENT TRADES VERSUS INEFFICIENT TRADES**

Economics students must have a clear conception of the varied goals underlying government policies that alter market institutions or incentives. The above discussion shows that current textbooks fail to integrate the efficiency condition with subsequent discussions of market failures. I advocate making a clear statement of an efficiency condition that can be repeatedly referenced in discussing market failures and alterations to government policy. Pareto efficiency, the theoretical economics ideal, is a complex concept to invoke at the principles level, however.

As an alternative concept, one can teach that some market transactions are efficient, whereas others are inefficient. An economy will have an efficient outcome, in that all potential gains from trade will be exhausted, if the following condition holds for all trades:

\[
\text{MB}_\text{SOCIAL} \geq \text{MC}_\text{SOCIAL}.
\]
A trade is an efficient trade if the marginal cost does not exceed the marginal benefit and an inefficient trade if it does. This condition is termed the *efficiency rule*. 

Private agents, however, consider their own benefits and costs as

\[ MB_{PRIVATE} \geq MC_{PRIVATE} \]

This condition is termed the *private decision rule*.

Where a private decision rule does not match the efficiency rule, because \( MB_{PRIVATE} \neq MB_{SOCIAL} \) or because \( MC_{PRIVATE} \neq MC_{SOCIAL} \), a free market can result in inefficient trades, or may fail to generate all efficient trades, and there is a market failure. The government may be able to change market outcomes by improving decisionmaking. It can do so either by altering private decision rules to match the efficiency rule or by making efficient trades that private agents refuse to make. These alterations may yield a more efficient market system relative to a free market.

### DEFINITION OF BENEFITS AND COSTS

Before students consider these decision rules, they must first understand how economists define marginal benefits and marginal costs to society when analyzing the efficiency of market outcomes. The definition of marginal costs to society, the opportunity costs, is straightforward. Marginal benefits must be clearly defined, however, because their definition reveals the value system implicit in those economic analyses that focus on efficiency.

The unit of measure that economists use for the marginal benefit of a good to society is an individual’s willingness to pay for it. Although the choice of this measure may be obvious to an economist, students should realize that a normative choice has in fact been made and that the adopted measure has several characteristics. First, this measure is individualistic, in the sense that it represents the value to the individual consuming the economic good. If a person wants to pay for something, no matter how vile, trivial, illegal, or fattening, then his or her consumption of that good results in a gross social benefit (although there also may be a social cost, in the form of a harm to another individual). There is no notion that value arises from decisions that reflect duty or obligation to others. The measure embodies no shared societal ethic, other than the primacy of the satisfaction of individual preferences, which can be taken as libertarian. Second, willingness to pay depends not only on a person’s desire for a good but also on his or her ability to pay. Thus, according to this measure of value, the benefit to society is higher the wealthier the person consuming a good, *ceteris paribus*.

Third, although this measure is individualistic, it can be altruistic. For example, an individual may be willing to pay to donate emergency supplies to others after a natural disaster. Fourth, the measure is based on observed behavior, as opposed to preferences expressed in a political system. A good has value only to the extent one is willing to pay for it with one’s own money and so differs from values expressed in elections or surveys that can be expressed at little cost. Thus, economists, in making efficiency arguments, work with a particular metric of benefit, which determines the value system underlying those arguments. Note
that these characteristics of the value measure apply to the measure of costs as well, because the opportunity cost of a good ultimately reflects someone else’s willingness to pay to consume it or its components in some other manner.

WHY DO ECONOMISTS ADVOCATE EFFICIENCY?

Efficiency is one of many criteria by which decisions about government policies can be made. Why do economists argue for this particular one? One important reason is that a productive economy creates larger incomes, which then can be applied toward the achievement of other social goals. Griffin (1995, 5) cites Kaldor’s argument that production and distribution are separable; there is a “classical dichotomy.” Any undesirable distributional consequences, arising from making the economy as productive as possible, can be addressed by redistributive policies such as transfer payments. Thus, the economic pie should be made as large as possible; there will be more to redistribute, if desired. Griffin criticizes this view, pointing out the significant costs of any subsequent redistributive policy.

Of course, individual policy decisions whose purpose is to enhance efficiency will also have redistributional consequences. As Griffin points out, some argue that over time these consequences will even out, as winners from one policy change become losers from a subsequent policy change. In this view, applying an efficiency criterion to a series of policy decisions will eventually “float all boats.” This “evening out” argument may fail to apply in practice, however, because a systematic bias can exist across the decisions (Griffin 1995, 5). For example, poorer people will always express weaker economic values (preferences) for policy consequences than will richer people.

MARKET FAILURES

All three categories of market failure are accommodated in the framework of deviations from the efficiency rule, as summarized in Table 1. Firms with market power raise prices and produce less than the efficient levels of output. Expressing this point in the framework presented above, market power prevents some efficient trades from occurring (for which $MB_{SOCIAL} \geq MC_{SOCIAL}$) as sellers restrict output. This is because the seller’s marginal revenue ($MB_{PRIVATE}$) is less than the buyer’s willingness to pay ($MB_{SOCIAL}$), even though the latter is higher than marginal production costs ($MC_{PRIVATE} = MC_{SOCIAL}$). Thus, the private-decision rule deviates from the efficiency rule.

A government has several instruments available for controlling market power. It can subsidize the seller’s output, artificially raising $MB_{PRIVATE}$ to equal $MB_{SOCIAL}$. It can also use its coercive powers to eliminate market power through antitrust actions. When market power disappears, marginal revenue ($MB_{PRIVATE}$) becomes equal to price, which is $MB_{SOCIAL}$. Finally, it can modify seller behavior with economic regulation, such as price or rate-of-return restrictions, again raising $MB_{PRIVATE}$ to equal $MB_{SOCIAL}$. In the case of a natural monopoly, the government may only be able to apply a second-best policy, failing to fully alter private decisions to match the efficiency rule, unless it chooses to subsidize fixed costs.
Externalities also cause private marginal benefits or marginal costs to differ from social ones. Negative externalities in production (e.g., pollution) result in some trades occurring for which $MB_{S O C I A L} < MB_{S O C I A L}$, because private marginal costs do not reflect the external costs: $MC_{P R I V A T E} < MC_{S O C I A L}$. Other forms of negative externalities, such as loud music in a park, result in private marginal benefits being greater than social marginal benefits (because the benefit of the park for others is lowered), so again the efficiency rule is not followed. Negative externalities can also include those associated with competition over position such as those arising in expenditures during an arms race or, to some extent, on better education (Frank 1994, 683–86). Positive externalities in production or consumption prevent some trades from occurring for which $MB_{S O C I A L} ≥ MC_{S O C I A L}$, as economic agents fail to capture all the benefits of their activities and, thus, receive insufficient incentive to produce ($MB_{P R I V A T E} < MB_{S O C I A L}$). Examples include vaccines, knowledge spillovers from basic research, and network externalities (such as the demand for phone service or the choice among office software suites). Positive externalities affecting costs can also occur.

Some government instruments correct externality problems by changing private marginal benefits or costs, so that private decision rules match the efficiency rule. These include mandates, taxes, subsidies, and tradable permits. Governments can also provide institutions that internalize the externalities, such as clearly defined property rights backed by a legal system, with such features as torts and liability. These institutions equalize private and social marginal benefits and costs.

Finally, public goods lead to situations in which the private-decision rule fails to correspond to the efficiency rule. Although pure public goods are both nonexcludable and nonrival, market failures can also occur in the case of impure public goods, where only one of these characteristics holds, or where the second holds weakly. For example, open access goods are rival but nonexcludable, whereas club goods are excludable but partially nonrival. Cornes and Sandler (1996, especially chaps. 1, 6, and 8) discuss these possibilities in detail.

If a good is nonexcludable, a private provider of a good cannot capture the benefits arising from that good’s consumption because he cannot receive rev-

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**TABLE 1**

Deviations from the Efficiency Rule

<table>
<thead>
<tr>
<th>Market failure</th>
<th>Deviation from efficiency rule</th>
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<tbody>
<tr>
<td>Market power</td>
<td>$MB_{P R I V A T E} &lt; MB_{S O C I A L}$</td>
</tr>
<tr>
<td>Externality</td>
<td>$MC_{P R I V A T E} &gt; MC_{S O C I A L}$</td>
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<tr>
<td></td>
<td>$MC_{P R I V A T E} &lt; MC_{S O C I A L}$</td>
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<td>$MB_{P R I V A T E} &lt; MB_{S O C I A L}$</td>
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<tr>
<td>Public goods</td>
<td>$MB_{P R I V A T E} &lt; MB_{S O C I A L}$</td>
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<tr>
<td></td>
<td>$MC_{P R I V A T E} &gt; MC_{S O C I A L}$</td>
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enue. Thus, the good is not produced, and trades do not occur (the good is not consumed) even though $\text{MB}_{\text{SOCIAL}} \geq \text{MC}_{\text{SOCIAL}}$, because revenues ($= \text{MB}_{\text{PRIVATE}}$), being zero, are less than the marginal benefits to society ($0 = \text{MB}_{\text{PRIVATE}} < \text{MB}_{\text{SOCIAL}}$). If a good is nonrival, the marginal cost of providing the good to one more consumer is zero, yet a private firm must charge a positive price to recover its nonmarginal costs. Thus, some efficient trades do not occur because the price to consumers ($= \text{MC}_{\text{PRIVATE}}$), being positive, is higher than the marginal social costs incurred ($\text{MC}_{\text{PRIVATE}} > \text{MC}_{\text{SOCIAL}} = 0$). Thus, the positive price inhibits efficient consumption of the nonrival good.

If one or both of these problems exists, a government may attempt to improve the situation by producing the good itself or by subsidizing private provision of the good (contracts with private firms for municipal services, basic research subsidies), allowing free use by all. It thus takes the place of a private decisionmaker, and follows the efficiency rule. In the case of a nonexcludable good, the government can use its powers of taxation to generate sufficient revenue to produce the good. In the case of a nonrival good, the government can use its powers of taxation to pay for making the good, which it then distributes for free. Thus, the price of the good ($\text{MC}_{\text{PRIVATE}}$) is set equal to zero, which is the $\text{MC}_{\text{SOCIAL}}$. In either case, the government must balance the benefit from correcting the market failure against the market distortions caused by gathering tax revenues to pay for public provision.

There is no new analysis in these descriptions of market failures and possible government responses. The explicit distinction between private and social marginal benefits and marginal costs is in fact how externalities are commonly taught. The innovation advocated here is that one conveys to the student that the same form of analysis is used in all situations with market failure. Students should learn that an economist who wants a market to achieve an efficient outcome applies a rule for which trades should occur in the economy and which should not. The economist compares that rule with private market decision rules to see where they do not match, and he or she constructs a policy that appropriately alters private decisions. The choice of efficiency as a social goal is itself a normative choice, as is the measure, willingness to pay, used in determining whether efficiency has been achieved.

**CONCLUSION**

If current textbooks are any indication, students of microeconomics principles could receive a clearer picture of market failures and their relation to efficiency. I argue that textbook authors and instructors can unify the presentation of market failures by consistently invoking an efficiency rule. Such a consistent treatment will prepare students better for understanding when policies to alter market institutions or incentives may be potentially beneficial. This pedagogical framework focuses, rather than replaces, existing curricula.

Of course, economists make policy proposals reflecting criteria other than efficiency. Clarity of understanding requires that students, and citizens, be able to recognize the purpose of any proposal, and its effects on alternate objectives. Many
policy proposals are motivated by redistributional or ethical criteria. Students should understand that economists will point out the efficiency losses that those proposals may engender and suggest options that reduce the magnitude of the loss. Furthermore, a government may not be able to improve market outcomes, whatever the criterion, because of political constraints, bureaucratic constraints, tax distortions, or transaction costs. As an editorial in the *Economist* stated, “mainstream economists . . . are unfailingly quick to point out various species of market failure; they are usually much slower to ask whether the supposed remedy of government intervention might not, in practice, be worse” (Editorial, 1997).

NOTES

1. A referee has reminded the author of the misleading nature of the term *market intervention*, because market activity depends on an institutional structure, significant components of which are determined by government behavior. Thus, what is commonly referred to as *intervention* is actually an alteration of previously existing structures and incentives.
2. See Fort and Rosenman (1993) for a discussion of some of these issues.
3. Coase (1960) and Dahlman (1979) further analyze the role of transaction costs in the definition of externalities in particular.
4. Vickers (1997, especially chapters 4 and 6), presents an overview of the position of ethical considerations in economic thought.
5. Nelson (1987) describes how economists have participated in policymaking processes and how their role as “efficiency advocates” has evolved. Griffin (1995) reviews the distinction between Pareto Optimal and Potential Pareto Optimal as policy criteria.
6. Varian (1992, 409–10) gives an example of a welfare function under which the analysis of allocational and distributional effects are fully separable.
7. A referee pointed out that the poor can use their political power to block efficiency improving policies unless they receive compensation. Such applications of power, if prevalent in practice, would compel sufficient side payments to make efficient policy options distributionally sound as well. Thus, under this argument, the concerns some have for systematic biases when applying an efficiency criterion are misplaced.

Others would argue that systematic biases in the political process will prevent such applications of power from fully transpiring, and thus that criteria other than efficiency need to be included in decisionmaking, in order to properly weigh impacts on various groups. Such biases can include those caused by differences in political participation rates across income classes, by decision-making based on ideology instead of efficiency, or by the transaction costs of enforcing any agreements for the side payments. The historical record on the extent to which compensation and redistribution actually occur is subject to debate.

8. This framework supplements, rather than replaces, the usual graphical analysis of monopoly, using demand, marginal revenue, and marginal cost curves. In doing so it emphasizes the commonality between market power and other forms of market failure.
9. As a referee pointed out, such an analysis can easily incorporate “second-best” problems, where a policy that seems to violate the efficiency rule may in fact lead to a Pareto improvement if another market failure is present.

REFERENCES


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