Chapter 2

The Market: Ideal and Real

Every man hath a good and bad angel attending on him in particular, all his long life.
— Robert Burton

Having sketched the place markets occupy in our economy and having noted the value judgments we use to assess markets, we are now ready for a more detailed analysis. An outline of this chapter follows its aims:

1. To specify *ideal results* for the questions raised by scarcity—What? How? Who? and What's new?
2. To identify the *ideal conditions* that must hold for free markets to achieve one of those ideals—static efficiency.
3. To explain *how markets work* under these ideal conditions.
4. To identify *real world problems* with markets, problems that might justify government intervention.

I will assume (in later chapters as well as in this one) that you are familiar with demand elasticities and production costs. Hence, only a refresher on these points appears in an appendix to this chapter if you feel that you need it.

The main principle applied in what follows may be called *two-question logic*. A general statement of the two questions is easy:

Question 1: What are the *benefits* of doing something?

Question 2: What are the *costs* of doing it?

The logic, which relates to teleological ethics, compares answers:

If the answer to Question 1 is *greater* than the answer to Question 2, *do it.*

If the answer to Question 1 is *less* than the answer to Question 2, *don't do it.*

Application of two-question logic as we go along may seem complicated because the specific benefits and costs involved vary and so do the people asking the questions. For example, a price is a "benefit" to a seller because it reflects added revenue when sales occur, but that price is a "cost" to a buyer who must pay it to obtain the goods. To society as a whole, which is comprised of both buyers and sellers, price is neither a benefit nor a cost. For another example, society's "benefits" will sometimes take the form of reduced "costs," as when the "benefits" of eliminating 10 million tons of SO_2 pollution are the reduced "costs" of the damages otherwise caused by the pollution—for example, fewer dead trees, fish, and people. Still, complications aside, two-question logic is indispensable to understanding the market in its ideal and real states.

I. Ideal Answers to the Basic Economic Questions

Economic theory has ideal answers to the basic questions of what, how, who, and what's new. These ideal answers are used to evaluate the day-to-day performance of the market and the government, which together share the task of giving answers. To the extent that real-world markets and governments give answers to these questions that approach the ideal answers, we can say these institutions perform well for society. Hence, coverage of the ideal answers is critical. We start with static efficiency, which is theory's ideal answer to the what and how questions taken together. We then tackle who and what's new.

A. Static Efficiency (What and How)

What should be produced in what amounts? How should these goods and services be produced? Using our scarce resources one way as opposed to another always entails benefits and costs. **Static efficiency,** the ideal here, is achieved when we *maximize* the *net* benefit from the use of our resources, subtracting the total costs from the total benefits.

This statement of static efficiency refers to total dollar benefits and costs. Alternatively, this ideal can be stated in dollars per unit (e.g., per pizza produced) by the use of two-question logic. As long as the *marginal social benefit* (MSB) of using our resources in some way (e.g., producing pizzas) is greater than the *marginal social cost* (MSC), we should expand that production. Marginal social benefit is the added total benefit to society of an added unit. Marginal social cost is the added total cost of the added unit. As long as the added total benefit exceeds the added total cost, society's net benefit is rising. Once MSB equals MSC that net benefit is maximized, so MSB = MSC is an alternative statement of static efficiency. Producing units beyond the point of MSB = MSC reduces net benefit.

Figure 2–1 illustrates static efficiency. In each of the three panels the vertical axis represents dollars per unit (e.g., dollar benefit per pizza produced), and units of quantity are depicted horizontally. The curves representing marginal social benefit (MSB) and marginal social cost (MSC) are identical in each panel. All that varies across the panels is the level of output and, consequently, the benefits and costs associated with those different outputs. Static efficiency requires (1) production efficiency and (2) allocation efficiency. **Production efficiency** requires that the cost of producing any given amount be as low as possible. This is assumed for Figure 2–1 because all MSC curves are as low as possible. **Allocation efficiency** requires that the quantity produced be just right to maximize the total net benefit (given production efficiency).

Panel (b) of Figure 2–1 depicts static efficiency in two ways—first by a comparison of total benefits and costs and second by a comparison of the marginal benefits and costs. Total benefit of output Q_0 is the area under the MSB curve out to Q_0, namely, area N + C. Total cost is the

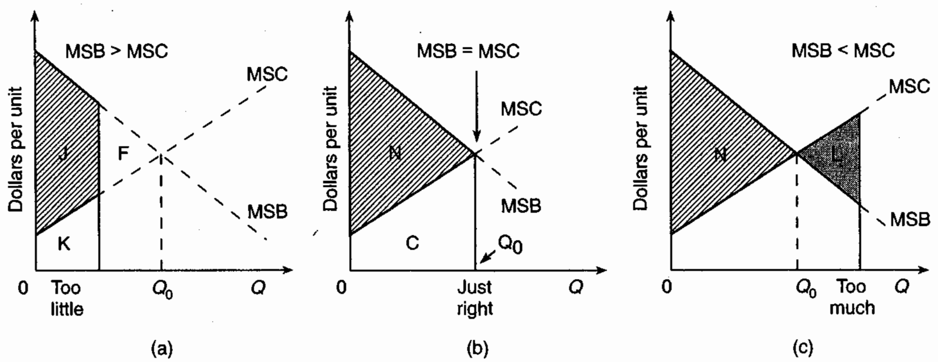

Figure 2–1
Static Efficiency (b), Flanked by Cases of Inefficiency: Too Little (a) and Too Much (c)

area under the MSC curve labeled C. Hence, total net benefit in this case is (N + C) − C, which is area N. This net is the largest total net benefit possible under the circumstances, and its attainment corresponds to the level of output that equates MSB and MSC, a result that would be obtained by applying two-question logic unit by unit.

Panel (a) of Figure 2–1 illustrates that outputs below Q_0 are not efficient because they are too little. Total benefit in panel (a) is area J + K, whereas total cost amounts to area K. Net benefit is therefore (J + K) − K, or simply J. This net benefit J is much less than it could be—that is, less than area N of panel (b). The amount of shortfall, or forgone net benefit, is shown by area F. (That is to say, J + F = N). Notice also that MSB is greater than MSC in this case.

Panel (c), in contrast, shows that outputs greater than Q_0 are not efficient because they are too much. As output expands beyond Q_0 in panel (c), MSB falls below MSC. Beyond Q_0, resources are being wasted on outputs that at the margin are not valued enough to warrant the effort (just as any resources devoted to the production of garlic-flavored mouthwash would be wasted resources). The loss for each unit beyond Q_0 is indicated by the amount by which MSB is less than MSC in each case. The total net loss depicted for the output beyond Q_0 in panel (c) is area L. Hence, the total net benefit of panel (c) could be N − L, where N is the total net benefit up to output Q_0 as before. Because (N − L) is less than N, the results of panel (c) are inferior to those of panel (b).

In short, panel (b) of Figure 2–1 depicts static efficiency because (1) the costs in MSC are as low as possible and (2) output Q_0 yields the greatest net benefit (N) with MSB = MSC. That is to say, static efficiency requires both production efficiency and allocation efficiency. In simple English, production efficiency requires that we produce as much of each desirable good or service as we can, given the production of other desirable goods and services. Allocation efficiency requires that we produce the goods and services people want most.

Another way of expressing static efficiency, a way that stresses the human experiences behind these welfare results, is called **Pareto optimality** (after its formulator, Vilfredo Pareto). This is *a situation in which no one can be made better off without making someone else worse off.* Conversely, we are *not* at Pareto optimality if Al's welfare can be improved at no loss to anyone else—Barb, Carl, Doris, whoever.

Figure 2–2 illustrates Pareto optimality for a simple society comprised of only Al and Barb. Vertical movements represent improvements in Al's welfare (e.g., more steak dinners and trousers for him). Horizontal movements depict improvements in Barb's welfare (e.g., more quiche dinners and dresses for her). The collection of points like Z and Y sloping downward are all points of Pareto optimality. Once a point like Z is reached, Barb cannot be made better off without reducing Al's welfare, and conversely Al could not be made better off without hurting Barb. Any point inside the boundary, like X, is not Pareto optimal because from there the welfare of either of these individuals could be improved with no loss to the other. Indeed, from X a movement toward Y would improve the welfare of *both* Al and Barb simultaneously. At X allocation efficiency would be absent (as, say, too much food is being produced and too little apparel). Also, production could be inefficient at X (as, say, wheat is being grown in Florida and oranges in North Dakota). Being the same as static efficiency, Pareto optimality requires the achievement of both allocation efficiency and production efficiency.[1]

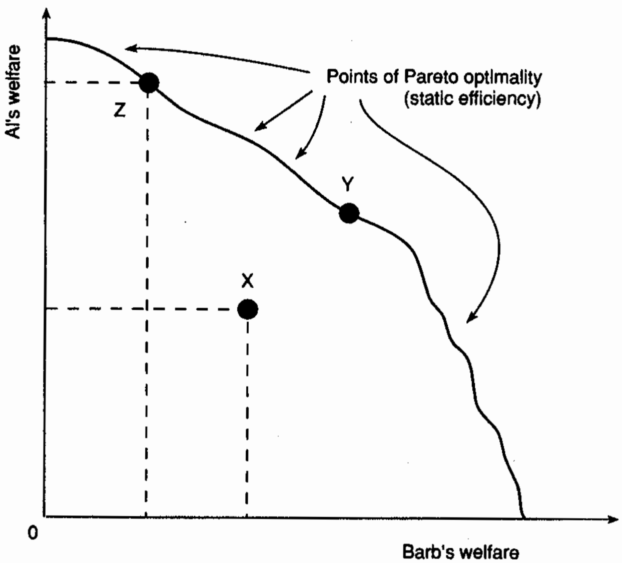

Figure 2–2
Pareto Optimal Points and Considerations of Equity:
Z is efficient but not equitable
X is equitable but not efficient
Y is both efficient and equitable.

B. Equity (Who?)

Equity is the ideal regarding the question of who gets the goods and services. Theorists have not yet devised a sweeping definition of equity that wins a consensus of approval. Unlike efficiency, equity grapples directly with issues of distribution. Difficulties arise partly because of difficulties in making interpersonal comparisons of well-being. For example, taking from the rich to give to the poor in hopes of improving society's overall happiness assumes that the resulting anguish of the rich is outweighed by the greater comfort of the poor, an assumption that cannot be proven or disproven. If we abandon teleological considerations such as this for more imperative value judgments concerning the "rights" of the poor, we move no closer to a consensus.

Still, some limited notions of equity receive widespread support.[2] We favor equal opportunity in employment, housing, consumer credit, and other respects. Although equal opportunity is not the same as equal results, it promotes equity. We also tend to oppose redistributions of income or wealth that take from the poor and give to the rich—Robin Hood in reverse.

Figure 2–2 illustrates another notion of equity and demonstrates differences in equity and efficiency. Generally, our society dislikes enormous disparities between the rich and the poor, so it favors government policies that reduce the degree of inequality that free markets yield. Such policies may create some inefficiencies but be supported for their achievements in equity. Notice in Figure 2–2 that point Z is a point of static efficiency (Pareto optimality), but it could be considered inequitable. At Z, Al enjoys immense wealth while Barb languishes in poverty. In contrast, point X is not efficient, but it represents greater equity between Al and Barb. If society wishes, it may prefer an outcome like X to one like Z. It would sacrifice efficiency in moving from Z to X, but value judgment priorities or imperatives might justify the change. (Y could be considered both efficient and equitable and thereby preferable to both Z and X. But Y might not be attainable for some practical reason.)

Figure 2–2 alerts us to other equity issues as well. Note *first* that Al and Barb are the only creatures taken into account in Figure 2–2. No consideration is given to northern spotted owls, blue whales, or other species that might be obliterated by human economic activities. Only human interests are of concern to efficiency. Nonhumans receive protection from pain or extinction by the efficiency criterion only insofar as humans include such protection in the calculation of their own (human) welfare. Is that equitable?

Notice *second* that Al and Barb are presently alive. They are not members of some future generation. Future generations are frequently affected by our present actions, as illustrated by the global warming that results from combustion of fossil fuels. But static efficiency ignores the interests of future generations to a degree that some people in the present generation might consider inequitable. They might say we are burning oil resources too fast, for instance.

C. Dynamic Efficiency (What's New?)

Future generations are not completely ignored by economic theorists or by present and past generations. A theoretical ideal for efficiency over time encompasses the interests of future generations to some degree. That is **dynamic efficiency.** An allocation of resources to future time periods is dynamically efficient if it maximizes the present value of the total net benefits that could be received from all possible ways of allocating those resources over those future time periods.[3] Total net benefits are once again maximized. But these net benefits occur in future years as well as in the present one. Because future dollars are not the same as present dollars (at least not to the present generation), future net benefits in 2010 dollars are not the same as those in 1998 dollars or today's dollars (even apart from inflation). Hence, all future net benefits are discounted into "present values" before they are added together for a calculation of dynamic efficiency.

Dynamic efficiency defies easy diagramming. It can be vaguely understood, however, by imagining a sequence of triangular total net benefits, such as the one shown alone in panel (b) of Figure 2–1, a sequence like the frames in a strip of motion picture film. Mentally discount each triangle in the sequence, discounting ever more heavily as the imagined net benefits appear later in time. Then sum these discounted net benefits. The allocation over time that yields the greatest present value of net benefits is dynamically efficient.

The purely theoretical nature of this concept needs emphasis. Its practical application suffers severe impossibilities. For example, no one knows what interest rate should be used for discounting. Indeed, it can be argued that for some purposes under some conditions the interest rate should be zero, implying no discounting of future generation benefits whatever.[4] Moreover, no one knows how to handle the huge uncertainties that the future hides.

The concept of dynamic efficiency is useful, though, for demonstrating that the future consequences of today's actions can be momentous. Energy policy cannot ignore conservation. Environmental policy cannot look only to present-day impacts of CFCs, nuclear wastes, or other materials that could mangle the well-being of future centuries. Today's investments in research and development will bring amazing future technological changes. And so on.

In short, dynamic efficiency is a crude way to imagine, at least in principle, an ideal for the what's new question. If nothing else, its acknowledgment points to a further limitation of static efficiency. For many purposes, static efficiency is much too tightly bound to the present, to this year and maybe the next, to be useful even in theory.

II. The Conditions for Markets to Achieve Static Efficiency

Limited though it may be, the ideal of static efficiency carries tremendous weight in Washington because it provides the foundation for benefit-cost analysis, which guides much governmental decision making. It also gives economists great influence.

In particular, economists find the concept of static efficiency useful for assessing the performance of markets. Under certain ideal conditions, the free market will in theory obtain static efficiency. Those conditions include the following:

1. *An absence of external benefits.* A market's buyers always act on their own marginal private benefits (MPB), such as the benefits you receive from eating a pizza. Absent external benefits, your marginal *private* benefits match the marginal *social* benefits associated with your purchase (i.e., MPB = MSB). However, private benefits fall short of social benefits when there are external benefits. You benefit when you buy a car with safe brakes, and you also benefit others by reducing the chances that you will run into them. Hence, MPB plus any external benefits equals MSB, and MPB < MSB when there are external benefits.

2. *An absence of external costs.* A market's sellers always act on their own marginal private costs (MPC), such as the cost your favorite pizza parlor bears to make you a pizza. With zero external costs, these marginal *private* costs will equal the marginal *social* costs associated with this sale (i.e., MPC = MSC). With pollution, however, there will be external costs. Airplanes create noise pollution. The CFCs from semiconductor manufacturing destroy the ozone layer of the upper atmosphere, which protects us from solar radiation. And so on. In these cases of external costs, MPC < MSC because MSC is then MPC plus any external costs.

3. *Pure competition.* Pure competition requires a very large number of buyers and sellers such that none of them acting individually can affect the market's price. A standardized product is also a must, which means that sellers offer identical products, each closely substitutable for the others (e.g., Farmer Smith's Grade A eggs are the same as Farmer Brown's). Finally, easy entry and exit are needed for pure competition. Under these several conditions, sellers have no power over price, so price will match their marginal private costs (P = MPC), including a normal profit.

4. *Full information.* All buyers must be fully informed about prices, product qualities, health effects, and so forth of their purchases. Ignorance throws buyers off. They buy more or less than they would had they full knowledge. They may pay more in price than they should. Meeting this condition of full information assures that buyers will not be ripped off. Specifically, each buyer's marginal private benefit must equal the price (i.e., MPB = P).

5. *No public goods or common property resources.* Public goods benefit everyone within their range, so excluding people from them is either impossible or too expensive. Classic examples include national defense and abatement of air pollution. As explained later, the market cannot cope with public goods chiefly because of the "free rider" problem. Common property resources are a variant of this theme because they are resources open to use by anyone without restriction. Examples are ocean fishing or the air before the days of environmental protection.

Table 2–1
Summary of the Conditions Necessary for the Market to Achieve Static Efficiency

MSB = MPB (No external benefits)				
	MPB = P (Full information)			
		P = MPC (Pure competition)		
			MPC = MSC (No external costs)	
MSB	=		MSC	(All the above plus strictly *private* goods and properties)

Source: Where MSB = marginal social benefit
MPB = marginal private benefit
P = market price
MPC = marginal private costs
MSC = marginal social costs

Because anyone can use common property resources, they tend to be wastefully overused. Absent public goods or common property resources, marginal social benefit can equal marginal social costs: MSB = MSC. Strictly private goods and private properties meet this requirement.[5]

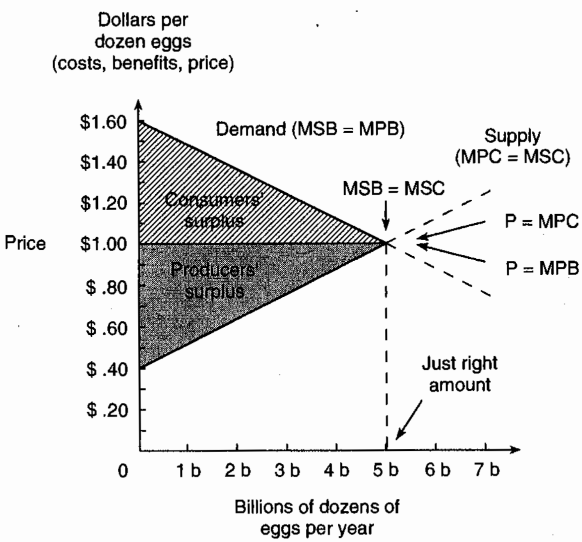

Figure 2–3
Conditions Necessary for the Market to Achieve Static Efficiency

These five conditions are summarized in Table 2–1. Notice the stairstep linkage between the lines. The MPB in the first line drops to the MPB in the second line, and so on. Notice also that in the end MSB = MSC if all the conditions are met. Each condition is thus a necessary but not sufficient condition for the market to achieve static efficiency. All must be met simultaneously.

These conditions come more alive in Figure 2–3, where the familiar demand and supply curves of economics textbooks are shown (hypothetically) together with specifications that meet the conditions of Table 2–1. With all the conditions met, 5 billion dozen eggs would achieve static efficiency. Price is $1.00 per dozen. Total *net benefit* is the combination of consumers' surplus and producers' surplus (which are defined shortly). And given MSB = MSC, this net is optimal.

III. How the Market Achieves Static Efficiency under Ideal Conditions

A quick understanding of how the market achieves static efficiency under ideal conditions may be achieved by consulting Figure 2–2 again. Steps toward static efficiency (Pareto optimality) would occur if *both* Al and Barb were made better off simultaneously, as in a movement from point X toward point Y. The market, by definition and everyday action, entails *voluntary exchange*. And whenever voluntary exchange takes place, the people involved in the exchange are becoming better off, improving their welfare. Otherwise, they would not engage in the exchange. For example, when you buy a hamburger at McDonald's, you feel better off with the hamburger than with your money, and McDonald's is glad to have your money instead of the hamburger. (This is not, in other words, the world of the Godfather, where people are given offers they cannot refuse because of the bloody consequences of refusal.)

Given ideal circumstances, these perceptions of improvement by market participants are genuine social improvements. That is to say, the parties are fully informed, so their gains are real. Moreover, there are no external costs from the exchange that adversely affect innocent bystanders. And so on. Under ideal circumstances, therefore, the market—with its countless voluntary exchanges creating benefits—will achieve static efficiency.

Figure 2–3 and two-question logic tell the same story differently. Consumers will buy additional dozens of eggs as long as the marginal private benefit (MPB) they experience from the eggs exceeds the price they have to pay for them. The MPB, which is represented by the demand curve in Figure 2–3, shows answers to the first question in the consumers' two-question logic (benefit per unit?). Price, which is $1.00 in Figure 2–3, represents the answer to their second question (costs?). As long as the benefits of buying (MPB) exceed the costs ($1), consumers continue to buy. The difference in these answers (MPB − $1) generates **consumers' surplus,** which is *the difference between what they would be willing to pay and what they actually pay.* The buying continues out to 5 billion dozen eggs in Figure 2–3. More than that would have MPB falling below price, which would violate two-question logic.

On the supply side, producers will sell additional dozens of eggs as long as the price they receive (their benefit) exceeds their cost of production (marginal private costs, MPC). Each dozen passing this test generates some surplus for the producers (in the form of profits or scarcity rents). **Producers' surplus** *is the difference between the total dollar amount producers receive and the amount they must give up to cover their costs.* Producers' surplus for each unit is positive out to 5 billion dozen eggs. More than that would fail their two-question logic because costs, MPC, would rise above the revenue that price represents.

Both consumers and producers act strictly in their own self-interest, according to their own benefits and costs, perceiving net benefits (surpluses) on every dozen eggs out to 5 million. Under ideal circumstances, this results in static efficiency in egg production. With MSB = MPB, MPB = P, P = MPC, and MPC = MSC, the overall result is MSB = MSC. Together the *combined consumer and producer surpluses comprise the maximum net benefits for society* because society is made up of both consumers and producers.

Strictly speaking, the ideal conditions must be achieved in *all* markets for Pareto optimality to prevail, not just those for eggs or for bacon and eggs. According to the theory of *second best,* we cannot be sure that welfare will be improved if we take steps to achieve these ideal conditions in just one market, such as eggs, or even in most markets, while the conditions remain unmet in some markets.[6] This problem reduces the usefulness of the static efficiency concept for public policy. The most that any policy can truthfully claim, given the theory of second best, in some partial, or local, improvement in static efficiency. This may or may not mean an overall improvement. Fortunately, the theory of second best does not completely ruin the usefulness of the static efficiency concept in identifying problems with real-world markets, which is our next task. Likewise, the theory of second best does not undermine other criteria besides efficiency that may motivate policy. Equity, for instance, remains intact, as does an appreciation for dynamic conditions.

Summary

Under certain circumstances, then, the market system is a wonderful social machine for coping with scarcity. It is attractive in both means and ends. Under ideal circumstances, its decentralized decision-making process, its efficient performance, and its achievements in other respects further most of the value judgments outlined earlier. Unfortunately, the purely competitive model that comprises part of the theoretical ideal is quite unrealistic (e.g., countless sellers) and is in some respects even undesirable (e.g., standardized products), so we cannot and should not slavishly pursue its formula. Still, it provides a foundation for notions of "workable competition," which we encounter later. And the ideal of static efficiency provides a basis for benefit-cost analysis, which much public policy relies on.

IV. Problems with Real Markets

If you believe that problems make life interesting, then you should find Table 2–2 and the ensuing discussion thoroughly engrossing. For outside the economic paradise just explored there is a crowd of instances when real-world free enterprise markets do not live up to the expectations or preferences of society. Among the market system's many past feats are the following: Faulty baby cribs that killed over 100 babies per year; a 40 percent increase in the price of steel following the merger of 170 steel companies; enough pollution to cause a river to catch fire; a concentration of wealth such that one-half of 1 percent of the population owned 30 percent; parts fraud for an estimated one out of every two TV set repairs.

The importance of these shortcomings and countless others is obvious. They may justify or explain government intervention.

Before probing Table 2–2's particulars, notice that the first two broad categories, "Imperfections" and "Failures," assume acceptance of static efficiency as the chief ethical criterion to be concerned about. The direction of deviation from marginal-social-benefit-equals-marginal-social-cost is indicated in each instance by MSB > MSC (for *under*allocations of resources) and by MSB < MSC (for *over*allocations of resources). Such designations are not appropriate for the last two broad categories because they concern problems arising outside the static efficiency context. Whereas the first two categories refer to free-market equilibriums that are undesirable, the last two are not really concerned with static equilibriums at all. "Dynamic Incapacities" includes problems encountered in moving from one equilibrium to another, such as the difficulties people may face in rapidly converting from a world of cheap energy to a world of expensive energy. "Ethical Criteria Other Than Efficiency" is distinguished by giving due recognition to the fact that free market results may not conform to society's notions of morality or fairness or equity. Thus, for instance, the free market may be superefficient in providing liquor, sex, gambling, and cocaine, but such efficiency would be (and has been) rejected by moral outrage. The differences in these broad categories are clarified by filtration through more detailed discussion.

A. Imperfections

1. MONOPOLY POWER

Three assumptions of the purely competitive model preclude the possibility of monopoly power—a large number of relatively small sellers, easy entry, and standardized products. These give firms

Table 2–2
Problems with Private Free Enterprise Markets
(MSB = Marginal Social Benefit, MSC = Marginal Social Cost, MPB = Marginal Private Benefit, MPC = Marginal Private Cost, P = Price)

A. Imperfections
  1. Monopoly power: MSB > MSC (because P > MPC)
    a. Artificially attained (e.g., mergers, cartels)
    b. Natural monopoly (e.g., public utilities)
  2. Information inadequacies
    a. Errors of commission MSB < MSC (because MPB < P)
    b. Errors of omission MSB > MSC (because MPB > P)
B. Market Failures
  1. Externalities
    a. External benefits MSB > MSC (because MSB > MPB)
    b. External costs MSB < MSC (because MPC < MSC)
  2. Public goods MSB > MSC
    a. People excludable, but zero marginal cost (highways)
    b. Nonexcludables (national defense, administration of laws)
  3. Common property resources MSB < MSC
C. Dynamic Incapacities
  1. Micro instability and transition immobilities
  2. Macro instability
  3. Growth: short-run protection and promotion for long-run gain
D. Ethical Criteria Other Than Efficiency
  1. Equity
    a. Income distribution
    b. Equal opportunity
    c. Resource conservation
  2. Merit goods: education, health, safety
  3. Demerit goods: liquor, tobacco, hazardous products
  4. Miscellaneous political and social goals

perfectly elastic demand curves. They are "price takers," not "price makers." Though Farmer Brown may fit this mold, IBM, GM, Procter & Gamble, DuPont, and the other giant firms that account for the bulk of our industrial output do not. Most of these enterprises are oligopolists, operating in industries dominated by just a few sellers, industries also protected by barriers to entry and providing differentiated, not standardized, products. These several characteristics bestow monopoly power of various degrees. And at the noncompetitive extreme, full-fledged monopoly prevails, with just one seller, blockaded entry, and a product that can be considered perfectly differentiated owing to an absence of close substitutes.

The static insufficiency created by pure monopoly is sketched in Figure 2–4. Monopoly raises price and reduces output in comparison with the purely competitive case shown in Figure 2–3. Price rises from \$1.00 to \$1.20 when output falls from 5 billion dozen to 3.4 billion dozen. This happens because the monopolist sees the entire marketwide demand curve. It's the only firm in the market. The answer, for each output, to the first question in the firm's two-question

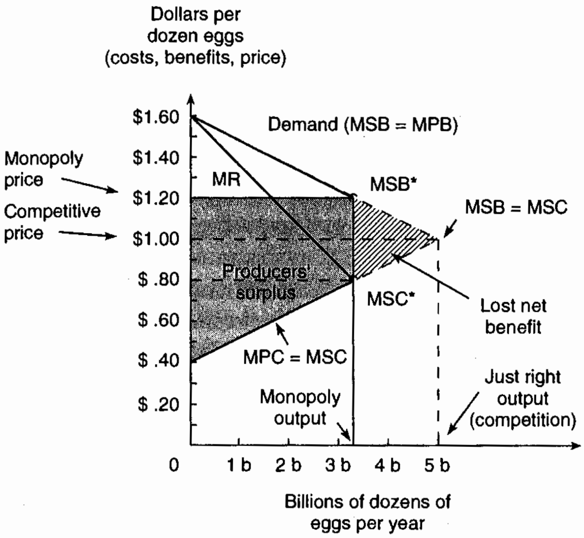

Figure 2–4
Monopoly Price and Quantity with Net Benefit Loss

logic to maximize profit is given by the marginal revenue curve (MR), which is the change of total revenue that results from added units of sale. The MR lies below the demand curve because price falls with added units of sale. Comparing MR to MPC, which answers the second question, the monopolist expands production out to 3.4 billion units but no further. The resulting producer's surplus of the dotted area is greater than before in Figure 2–3.

The lack of static efficiency can be seen two ways in Figure 2–4. First, at 3.4 billion units, marginal social benefit (MSB*) is greater than marginal social cost (MSC*). More precisely, MSB* = $1.20 and MSC* = $.80, so MSB* > MSC*. Second, the shaded triangular area to the right of 3.4 billion units shows the lost net benefit caused by monopoly, a situation similar to panel (a) in Figure 2–1.

Table 2–2 distinguishes between artificially attained monopoly power and natural monopoly. Sources of artificial monopoly power include mergers, cartelization, predatory practices, and other factors of human creation. In contrast, natural monopoly stems from technical imperatives or basic conditions, such as economies of scale, which make a single firm the lowest-cost means of supply. Examples include local telephone service, water supply, and electricity.

The customary policy for dealing with artificial monopolies or cartels in antitrust legislation aimed at maintaining competition. Monopolies may be broken up into a number of firms. Cartels may be banned. Anticompetitive mergers can be dissolved. And so on. The typical policy approach to natural monopoly is quite different. Single-firm dominance is endorsed and even encouraged in the belief that any attempt to enforce competition would be futile (because monopoly is inevitable) and even stupid (given that numerous firms would mean high-cost production or shoddy service). Good performance, though not necessarily static efficiency, is then sought through direct regulation of performance by public utility commissions or, less frequently, by outright public ownership and operation.

2. INFORMATION INADEQUACIES

The second broad category of market imperfections itemized in Table 2–2—information inadequacies—honors the fact that real-world buyers are often led astray by ignorance, misjudgment, and sundry other deviations. This is particularly true of household consumers as opposed to professional business and government buyers who tend to be experienced, well-informed experts. Thus, for instance, consumer ineptitude emerges from studies of the correlation between price level and brand quality. For a given product, low quality should sell only at a low price and high quality should sell at a high price, yielding a correlation coefficient near +1 if consumers really know what they are doing. But observed correlations are on average always much closer to zero than to one, and the range across products includes a substantial number of goods with *negative* correlations.[7]

Of course, we could not reasonably expect consumers to invest the necessary time, effort, and expense to become *perfectly* informed. Furthermore, private enterprise does supply some information by way of advertising and buyer's guides like *Consumer Reports*. But the very nature of the commodity in question—information—is such that imperfections prevent its optimal provision by free markets. One problem is that sellers of information may face the same problem as the little boy who climbs and shakes the apple tree but gets few of the fallen apples because his buddies on the ground run off with the loot before he can get down. This is "inappropriability," and it often applies to information because information may be spread by means outside the control of the information's original producer—for example, piracy by word of mouth. When private producers of information are not rewarded in just proportion to the social value of their effort, they expend less effort than is socially optimal. A second and more striking problem arises because buyers of information cannot be truly *well informed* about the information they want to buy. If they were, they would not need to buy the information.[8] In other words, sellers of information cannot let potential buyers meticulously examine their product prior to sale lest they thereby give it away free. Buyers of information therefore do not know the value of the product they seek (information) until after they buy it.

Advertising is often informative, but the purpose of advertising is not to inform. Its purpose is to persuade, so it is informative only to the extent the informative approach persuades, which is true mainly of ads for producers' goods, not consumers' goods. Indeed, it can be shown that advertising is *least* informative where it is *most* intense, and these conditions correspond to products about which consumers are inherently *least* informed—drugs, beer, soft drinks, prepared foods, cosmetics, detergents, and the like.[9] Still worse, advertisers frequently have an incentive to mislead, misrepresent, and even lie, behaviors that cannot be said to contribute to consumer competence.

Later, two directions of consumer error are detailed. *Errors of commission* occur when buyers make purchases on the basis of excessively favorable prepurchase assessments. The favoritism then leads to more spending than accuracy would entail and a consequent *over*allocation of resources to the favored brand or product. Conversely, *errors of omission* arise when buyers buy *less* than they would with full knowledge. The misallocation here would obviously be an *under*allocation. (See Table 2–2.)

B. Market Failures

Market failures occur when in one sense or another markets fail to exist. Free enterprise markets for clean air, clean water, national defense, criminal justice, and other highly desirable goods and services cannot be expected to flourish in the absence of some form of government intervention. Without viable markets, society's benefits and costs have no private decentralized place of registration and realization. Stated differently, a world of pure competition all around would not be sufficient to attain Pareto optimality. Much more would be required—an absence of externalities, public goods, and common property resources.

1. EXTERNALITIES

When Jones and Smith engage in free and voluntary exchange, they weigh only the benefits and costs they themselves experience. They do not take into account any benefits bestowed or costs imposed on third parties, say, Wong and the rest of us. Yet such "external" benefits and costs often arise, and the market's failure to account for them leads to free market misallocations of too little in the case of external benefits and too much in the case of external costs.

External Benefits. Your planting of a flower garden in your front yard benefits your neighbors as well as yourself. An airline's installation of engine silencers for the benefit of its passengers also benefits groundlings near airports.

When benefits extend beyond buyers as in these instances, the price buyers are willing to pay is not a good index of the social value of the purchased good. Price is an underestimate of the value. Figure 2–5 indicates the implications by showing two demand curves, one reflecting only the benefits buyers alone perceive, D_1, the other, D_2, reflecting *all* of society's benefits, external benefits as well. More technically, D_1 includes only marginal *private* benefit, MPB, whereas D_2, represents marginal *social* benefit, MSB, the difference being external benefit. The free market solution is output Q_1, which emerges from the intersection of D_1 (or MPB) and supply (MSC). The optimal solution, however, would be output Q_2, where D_2 and supply meet and where MSB = MSC. Most simply stated, the problem is one of too little production in light of society's true preferences. There is no market registering these preferences and rewarding producers for greater deeds done, so with the free market's Q_1, MSB at J exceeds MSC at K, or MSB > MSC. To hint at policy solutions, a subsidy equaling the external benefit would lower price to P_2 and thereby lead to optimal output Q_2.

External Costs. External costs are imposed on society and are *not* borne by producers or consumers in the course of production and consumption. Pollution provides the classic example of an external cost; pollution imposes costs of avoidance (air conditioning, moving out of town), of repair (painting, medical treatment), and of raw damage (death, ugly air) that are not paid for out of the pockets of polluters. Acting in their own best interests, market participants equate price with their own *private* marginal cost. But when external costs are recognized and added to these private costs, the result is MSB < MSC.

Figure 2–6 illustrates this problem with two supply curves—S_1, which reflects only *private* costs (and is therefore also labeled MPC), and S_2,

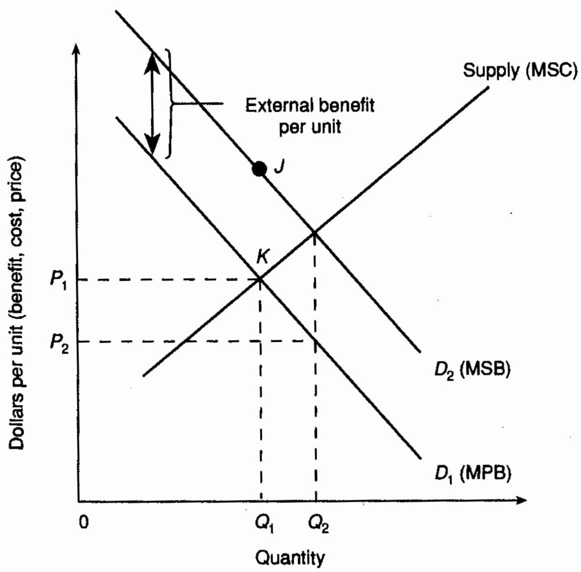

Figure 2–5
External Benefit and Underallocation

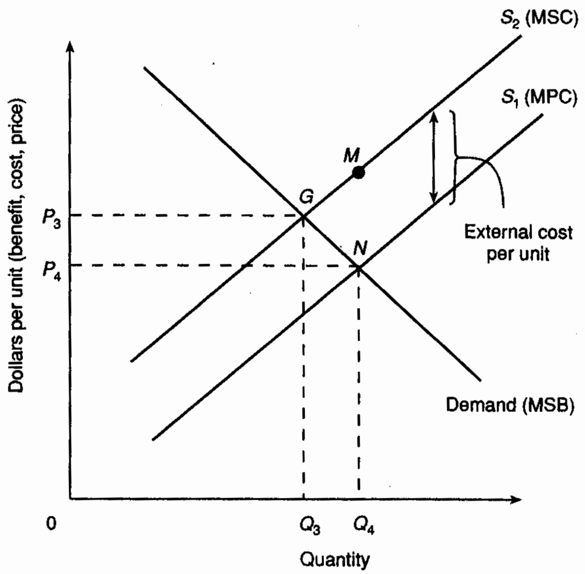

Figure 2–6
External Cost and Overallocation

which includes both private and external costs for all costs to society (MSC). A free competitive market would produce Q_4, as that is the result associated with P = MPC, or MSB = MPC. But this is too much. At Q_4, the marginal social cost M exceeds marginal social benefit N. Resources should be shifted out of this market into others until Q_3 is achieved and MSB = MSC at G, but the free market system fails to comply because these external costs are not imposed on producers here.

Whereas subsidies might be an appropriate policy to encourage added output in cases of external benefit, taxes might discourage the output of products laced with external costs. A per-unit tax matching external costs—the vertical difference between S_1 and S_2 in Figure 2–6—would raise costs of production to the point of reflecting all of society's costs, moving the market to output Q_3 and price P_3.

2. PUBLIC GOODS

There are various definitions of *public goods,* and there are three elements common to most definitions: (1) Their production and consumption usually coincide, so they cannot be inventoried. (2) One individual's consumption does not subtract from any other individual's consumption. And (3) additional consumers can partake of these goods at no additional social cost or near zero cost.[10] With marginal social costs of consumption approaching zero, the nature of the free market failure leaps to mind. *Any* positive price charged for these goods, as would be necessary to reward free market suppliers, would exceed marginal cost. The resulting P > MC, or more generally MSB > MSC, would then lead to the free market's underallocation of resources to these goods.

Excludable Public Goods. Two subcategories of public goods may be usefully distinguished.[11] The first may be called *excludables.* These public goods are illustrated by highways and bridges as long as congestion is no problem. In the absence of congestion, these are public goods because, once the highway or bridge is available, it costs nothing to have an additional trip or crossing. People can in principle be excluded from the use of highways and bridges by the judicious construction of limited entry points, and fares can be collected with toll booths; thus the name *excludable* public goods. But such restrictions are usually not imposed because they are costly.

Nonexcludable Public Goods. The second subcategory, the one of greatest interest to us, includes public goods like national defense, antitrust law enforcement, and clean air. Exclusion of individuals from their consumption is impossible even in principle, because we consume these goods *collectively.* If you wish, you may consume more apple cider, a private good, than I do. Indeed, the more for you the less for me, once cider output is given for the season. But whatever the level of national defense—say $300 billion worth in planes, tanks, ships, soldiers, and so on—we each and every one consume that amount precisely because that is a pure *collective* good.

A main problem with free market provision of these goods is the "free rider." Imagine the invention of an auto pollution control device that would provide the collective good of clean air in your city if almost all auto owners paid the modest $400 necessary to get it. Would you and everyone else scurry to garages and gas stations for its installation? Probably not. In fact, such a pollution control package was offered some years ago and its sales fizzled. Two possibilities deflate your motivation: (1) the possibility that even though you do not buy the device almost everyone else does, in which case you are a "free rider," getting clean air without paying a dime, or (2) the possibility that you pay your $400 for clean air but hardly anyone else does, in which case you have lost $400.

This, then, is what distinguishes these nonexcludable public goods from ordinary goods in the free market setting. With an ordinary good, you get it if you pay; you don't get it if you don't pay. Choice is individualized. Amounts may vary with taste and fortune among separate souls. Paying and receiving correspond closely. With a public good, however, you may get it even if you don't pay, and you may not get it even if you do pay. Free markets tend to be stunted under such conditions.

3. COMMON PROPERTY RESOURCES

Closely related to the foregoing are common property resources, such as fisheries, the radio spectrum, deep-ocean minerals, and at one time oil. These resources tend to be abused or used up too rapidly with competitive exploitation because the private costs of those using them fall short of the full social costs. With excessive haste in milking these resources, MSB is less than MSC.

A fisherman, for example, will face costs for fuel, labor, seaworthy capital equipment, and so on. He will also impose costs on others, however, because additions to his catch reduce the fish available to other fishermen, causing them to spend more time, effort, and energy for any given number of fish they may successfully net. The same, of course, applies to each fisherman. This communal working at cross-purposes is a form of external cost, which when not taken into account leads to an error in the direction of overallocation or, in this case, overfishing.

One corrective in many such cases is government's improved definition of property rights. Other approaches include quota systems, severance taxes, and government stewardship through public ownership. For international problems, like the recovery of mineral-bearing nodules from the ocean floor, treaties are needed.

C. Dynamic Incapacities

To this point we have merely sorted out desirable and undesirable equilibrium solutions, using Pareto optimality as a sieve. But situations of disequilibrium are equally important. Indeed, disequilibrium is the normal state of the world, and some economists claim a greater concern for the attendant dynamic problems than for the comparative static problems of previous pages.

1. MICRO INSTABILITY AND TRANSITION IMMOBILITIES

Substantial shifts of a market's supply and demand curves—due to cyclical swings, the vagaries of the weather, and other contingencies—can cause rocky instability. During the first decades of this century, for instance, prior to federal intervention in agriculture, farm incomes in some regions varied hundreds of percentage points from one year to the next.[12] Serious instability has also plagued petroleum markets at various times, as nature has alternately hidden and disclosed her black gold and as OPEC countries have occasionally withheld supplies. Such instabilities can lead to inefficiencies as producers and consumers try to hedge their bets in rather costly ways. Moreover, the instability itself may be judged rattling, injurious to national defense, and even downright painful for some in society, spawning government programs like price supports, commodity agreements, and insurance reserves.

Disequilibrium in particular markets may also accompany marked changes from one equilibrium to another. An obvious problem in this connection might be the *delay* society experiences in realizing the added welfare a new equilibrium will bring. As Peter Steiner has written, "If resources respond to market signals surely but slowly, the market process may prove an expensive way to achieve resource shifts."[13] Likewise, the burdens of shifting may press particularly hard on certain members of society. The move from Q_4 to Q_3 in Figure 2–6, for instance, benefits society as a whole but may hurt the paper makers, steelworkers, and others whose relocation out of polluting industries is necessitated by the transition. Indeed, failure to meet this problem may create strong political opposition to solving the external cost problem. More generally, such transitional disruptions are referred to as *frictional unemployment,* and government has sought to alleviate the welfare strain with unemployment compensation, job training, and payments to transform industries hard hit by import competition.

2. MACRO INSTABILITY

The Great Depression uncorked an era of fervent social concern for macroeconomic disequilibriums. Depression and recession are undesirable because they frustrate the employment and income aspirations of many people. Inflation has been an even more bruising bane of late. Rapid inflation drastically reshuffles people's real incomes; some keep up and others, especially those on fixed incomes, fall behind. It also creates speculators who dabble in otherwise worthless games of buy and sell. It shrinks savings, disrupts corporate finance, and undermines long-term projects.

The total dollar losses society suffers from macro instabilities could exceed its losses from market imperfections and failures. Thus, policy efforts abound in this realm, though this book focuses most diligently on micro issues.

3. GROWTH: SHORT-RUN PROTECTION AND PROMOTION FOR LONG-RUN GAIN

In the week these words were first written Congress passed a $20 billion subsidy program to promote the development of synthetic fuels (oil distilled from tar sands, oil shale, and coal), the Supreme Court ruled that patents could apply to manmade organisms created from recombinant DNA technology, and *Business Week* published a special issue bemoaning the U.S. economy's languid growth and urging a massive effort by business, government, and labor to achieve the "Reindustrialization of America." Each of these developments illustrates society's deep-seated concern for long-run achievement, for growth, for research and development, and for freedom from foreign dependency. Moreover, these events illustrate society's doubt that the free-market system can always perform satisfactorily on these scores. Thus, society willingly accepts some short-run sacrifices to offer inducements—such as the seventeen-year grant of patent monopoly—in hopes of building brighter futures. The exchange may often look no better than the few beans Jack-in-the-Beanstalk got for his mother's cow, but then we all know what happened to lucky Jack in the end.

For energy especially, it may be argued that there are immense external benefits from technological progress, benefits such as strengthened national defense, general economic prosperity, and improved foreign trade balances. Because private firms are unable to appropriate such benefits, their bland free-market inducements may occasionally need to be sweetened with government honey.[14]

D. Ethical Criteria Other Than Efficiency

The last broad category of Table 2–2 acknowledges that free-market solutions may be rejected on value judgment grounds. The efficient satisfaction of given individual preferences is an attractive ethical criterion, but there are other ethical criteria that decisively influence policy. After all, it is not a Statue of Efficiency that graces New York harbor. And A. Lincoln, W. Shakespeare, F. Nightingale, and M. L. King are not revered for their furtherance of Pareto optimality. It will become apparent that many of these other criteria rest on nonteleological imperatives.

1. EQUITY

Two ethical criteria guide assessments of equity. *Horizontal equity* holds that equals should be treated equally. A main difficulty lies in delineating and measuring the relevant characteristics that define equals. Should two families with the same income be taxed equally even though the source of one family's income is inherited property and the other's is manual labor? Should the water pollution of two agricultural enterprises be reduced by equal percentages even though one is braith would not dismiss the problem, because there are other, more sophisticated theories of similar thrust.[20] All this obviously overlaps with our previous discussion of information problems.

Closely related to merit and demerit goods are areas where policy is brought into play largely on *moral* grounds, where the consumer's or producer's material welfare is not so much at issue (as in the preceding), but his or her behavior is, in itself, judged to be right or wrong. Gladiatorial contests, pornography, painful slaughter of animals, extermination of species like the bald eagle and great blue whale, abortion—each of these fires strong moral indignation among millions in our society. And each of these therefore provoke policies of discouragement. It might be possible to fit these offenses into some standard economic shortcoming. Pornography establishments, for instance, allegedly have adverse effects on surrounding areas or external costs—that is, deteriorating property values, higher crime rates, and depressed neighborhood conditions.[21] But this is stretching economics a bit too far and needlessly so. Economics cannot explain everything.[22] Furthermore, its teleological ethics must occasionally give way to imperative ethics, at least in my opinion.[23]

4. MISCELLANEOUS POLITICAL AND SOCIAL GOALS

Finally, the goodness and badness of the free-market system is often judged by a variety of criteria that do not easily fit into any of the foregoing categories. Mention of a few of these miscellaneous goals to be cited later will give you the basic idea.

Let's start with decentralization of economic power. To sing the praises of the market, pure competition in particular, solely in the key of

decisions is a commitment to smallness and decentralization as ways of discouraging the concentration of discretionary authority.[24]

> The grounds for the policy include not only dislike of restriction of output and of one-sided bargaining power but also desire to prevent excessive concentration of wealth and power, desire to keep open the channels of opportunity, and concern lest monopolistic controls of business lead to political oligarchy.[25]

By the same token, there appears to be a soft spot in the heart of many Americans for small business. In social character, in charitable contributions to community, and in furtherance of independence and self-reliance, small business is often thought to be worthy of society's special support and attention. Such sentiments have found policy expression in the Small Business Administration's assistance programs, in the Robinson-Patman Act's prohibition of price discrimination injurious to competitors, and in favorable treatment under federal environmental, safety, and health regulations.

Other miscellaneous ethical standards that appear later are honesty and fairness. False advertising, unfair competition, and payola are the focus of policies, at least partly it seems, because they reflect behavior of scandalous repute.

Summary

Economic theory identifies ideal answers to the key questions raised by scarcity—what, how, who, and what's new? Static efficiency, or Pareto optimality, is theory's ideal for what and how. Static efficiency is achieved when we maximize the net benefit from our resources (in the current period). This requires allocation efficiency for the what question and production efficiency for the how question. Allocation efficiency is achieved by outputs that equalize marginal social benefit and marginal social cost (MSB = MSC). This assures that we produce what people want most. Production efficiency requires that the marginal social costs be as low as possible in a technical sense for any given level of output. This allows us to produce as much of each desirable good as possible in light of the production of other desirable goods.

Simultaneous achievement of both allocation and production efficiency yields Pareto optimality—a situation in which no one can be made better off without making someone else worse off (see Figure 2–2).

Theory has no clear, single notion of equity for the who question, but we tend to dislike extreme inequality or redistributions that take from the poor and give to the rich. Broader considerations would pay heed to the plight of nonhumans and future generations.

Dynamic efficiency is the ideal answer for what's new. This, in theory, is an allocation of resources over time that maximizes the present value of the total net benefits that could be received from all possible alternative allocations. This in practice is impossible to estimate. Still, the notion is useful for alerting us to the importance of dynamic considerations and for indicating the limits of static efficiency.

The conditions necessary for the market to achieve static efficiency include the following:

1. An absence of external benefits (MSB = MPB)
2. An absence of external costs (MSC = MPC)
3. Pure competition (P = MPC)
4. Full information (P = MPB)
5. No public goods or common property re-

these private benefits and costs, and when the other ideal conditions hold, these market forces lead to optimal results.

Unfortunately, free markets frequently come up short. As outlined in Table 2–2, they may suffer imperfections, failures, dynamic incapacities, and ethical inadequacies unrelated to efficiency. Imperfections and failures produce equilibriums that deviate from *Pareto optimal* efficiency. A market's deviation in the direction of underallocation of resources, or not enough, is symbolized by MSB $>$ MSC. Deviation in the direction of overallocation, or too much, is reflected by MSB $<$ MSC. In either case, correction gives society benefits that exceed the costs of change.

Dynamic incapacities arise from jarring instabilities, painfully prolonged disequilibriums, transition traumas, and gaps between short-run forces and long-run fortunes. Macroeconomic problems of inflation and unemployment are particularly important because of the massive costs they impose on society. Microeconomic problems of this type fit the micro focus of this book a bit better, so they receive greater attention.

Finally, government interference in the marketplace is often based on ethical criteria that cannot be calibrated in benefit-cost accounting. Equity, fairness, honesty, morality, and decentralization are among these criteria. Your value judgments determine whether or not you agree that considerations of this kind should guide government policy. As for myself, be warned that I am an economist, one of a breed that tends to be uncomfortable analyzing virtues and vices other than those measured in dollar benefits and costs. Still, I shall try to overcome my discomfort because the world is not ruled by economists (luckily so, perhaps).

Questions and Exercises for