

Conclusion

Theories of market and government failure are valuable for framing public policy problems. Sometimes, as the analysis of Madison's taxicab regulation illustrates, appropriate policy alternatives naturally present themselves. Often, however, a wide range of policy alternatives could reasonably be considered. The next chapter provides a catalogue of generic policy alternatives that can be used as starting points for crafting policy alternatives appropriate for specific contexts.

For Discussion

1. For reasons of brevity and desired pedagogical emphasis, the Madison taxi analysis focused more on the nature of the market and government failure present than on the development and assessment of policy alternatives. What other policy alternatives might the analysts have considered?
2. Imagine that you are asked to analyze the regulation of taxi service in a city like Madison. Your research, however, leads you to predict that elimination of the 24/7 rule would result in the absence of service during some periods. Design an alternative that permits the entry of single-driver cab companies but also guarantees 'round-the-clock availability of service.

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Correcting Market and Government Failures

Generic Policies

Our discussion of the ways private and collective actions lead to socially unsatisfactory conditions provides a conceptual framework for diagnosing public policy problems. We now turn our attention to policy solutions. We focus on what we call *generic policies*—the various types of actions that government can take to deal with perceived policy problems. They represent a range of general strategies. Because policy problems are usually complex and always contextual, generic policies must be tailored to specific circumstances to produce viable policy alternatives. Nevertheless, familiarity with generic policies encourages a broad perspective that helps the analyst craft specific solutions.

Policy problems rarely have perfect solutions, but some policies are better than others. A primary task of the policy analyst is to identify those policies that have the best prospects for improving social conditions, as assessed in terms of specific goals and criteria. To facilitate this task, we indicate the market failures, government failures, or equity concerns that each generic policy most appropriately addresses, as well as the most common limitations and undesirable consequences associated with the use of each. In other words, we provide a checklist for systematically searching for candidate policies.

There are two caveats concerning our discussion of generic policies. First, we do not wish to imply that all policy analyses compare and evaluate across generic policies. Much policy analysis is relatively incremental. For example, you may be asked to compare the efficiency and equity impacts of a variety of voucher schemes. Familiarity with a broad range of generic policies helps you *know* that

you are examining relatively incremental alternatives; it may also enable you to exploit opportunities for introducing alternatives that are less incremental. Second, there is an enormous literature on each of the generic policies—too much material for us to review in any depth here. In order to prepare you to examine further the issues relating to each generic policy, however, we provide representative references to relevant literatures.

We group generic policies into five general categories: (1) freeing, facilitating, and simulating markets; (2) using taxes and subsidies to alter incentives; (3) establishing rules; (4) supplying goods through nonmarket mechanisms; and (5) providing insurance and cushions (economic protection). In the following sections we consider specific policies within each of these groups.

Freeing, Facilitating, and Simulating Markets

Market failures, government failures, and distributional concerns underlie perceived policy problems. Markets offer the potential for efficiently allocating goods. Markets therefore, provide the yardsticks against which to measure the efficiency of government interventions. If we determine that there is no market failure, then we should consider the establishment (or reestablishment) of a market as a candidate solution for our policy problem. Of course, other values besides efficiency may lead us to reject the market solution as a final policy choice. Nevertheless, letting markets work should be among the policies we consider if market failure does not appear to be inherent in the policy problem.

It is not the case, however, that governments can always create viable markets by simply allowing private transactions. Often, government must play a more affirmative role in enabling the market to function. In other circumstances, although an operational market, *per se*, cannot be introduced, market outcomes can be simulated with the use of market-like mechanisms.

As shown in Table 10.1, we distinguish three general approaches for taking advantage of private exchange (or market-like exchange between private citizens and governments) in dealing with policy problems: freeing markets, facilitating markets, and simulating markets. The second column of the table, which emphasizes that generic policies are responses to diagnosed market and government failures, notes the perceived problems that the generic policies might appropriately address, while the third column presents the typical limitations and collateral consequences.

Freeing regulated markets should be considered in those situations in which an effective market can be expected to reemerge with relatively minor efficiency distortions—in other words, where there is no inherent market failure. Keep in mind, however, that there may be large windfall, or distributional, gains or losses once the current government intervention is eliminated. In addition, at this general level of discussion we are not considering the possibility that other goals, such as national security, may be relevant. The absence of markets when there is no inherent market failure suggests either government failure or as yet unaccommodated changes in preferences or technology. Accommodation may require the affirmative establishment of property rights by government, an example of facilitating markets. Finally, even when the complete withdrawal of government may be neither feasible nor desirable, there may be opportunities to simulate markets via various auction processes.

Table 10.1 Freeing, Facilitating, and Simulating Markets

Generic Policies	Perceived Market Failure (MF), Government Failure (GF), Distributional Issue (DI), Limitation of Competitive Framework (LCF)	Typical Limitations and Collateral Consequences
Freeing Markets		
Deregulate	GF: Allocative inefficiency from rent seeking LCF: Technological changes	Distributional effects: windfall losses and gains, bankruptcies
Legalize	LCF: Preference changes	Transitional instability
Privatize	GF: Bureaucratic supply	
Facilitating Markets		
Allocate through property rights	MF: Negative externalities	Distributional effects: windfall gains and losses
Create new marketable goods	MF: Public goods, especially open access	Thin Markets
Simulating Markets		
Auctions	MF: Natural monopolies MF: Public goods DI: Transfer of scarcity rents	Collusion by bidders, opportunistic behavior by winning bidder, political pressure to change rules <i>ex post</i>

Freeing Markets

Unfortunately, a wide range of terminology is used to describe the process of freeing markets, the broadest and most popular being deregulation. We distinguish among deregulation, legalization, and privatization.

Deregulation. Clearly, it is difficult to justify government interference with private affairs on efficiency grounds in the absence of evidence of market failure. Historically, in the United States and many other countries, governments have engaged in price, entry, and exit regulation of competitive markets. (We consider these various forms of regulation, themselves generic policy solutions, in a later section.) Economists have been almost uniformly critical of the regulation of competitive industries: "if economics has any scientifically settled issues, one is sure that price and entry regulation in perfectly competitive industries generates economic inefficiencies."¹

We can usually identify various forms of government failure, especially legislators responding to rent seeking by industries, along with sometimes legitimate distributional

¹Paul L. Joskow and Roger G. Noll, "Regulation in Theory and Practice: An Overview," in Gary Fromm, ed., *Studies in Public Regulation* (Cambridge, MA: MIT Press, 1981), at 4.

concerns, as the primary explanations for government regulation of competitive markets. In other cases, changes in technology or patterns of demand may have radically altered the structure of an industry and, therefore, the need for regulation. As we saw in Chapter 5, the natural monopoly characteristics of an industry that justify regulation may erode over time with new technology. Advances in digital technology facilitating competition in some telecommunication markets, for instance. In such situations, the efficiency rationale for regulation may no longer hold at some point.

Whatever the putative rationale for regulation, deregulation almost inevitably involves complex efficiency and distributional issues. This should not be surprising in light of our discussions of market failure in Chapter 5, related failures in Chapter 6, and rent seeking in Chapter 8. One-shot, complete deregulation may be problematic from an efficiency perspective in those industries in which only a small number of firms operate, either because the legacy of regulation may have entrenched incumbents with a competitive advantage or because the industry may be incompletely contestable or otherwise imperfectly competitive. Deregulation in these contexts usually means the removal of formal entry barriers, but continuing regulatory oversight in one kind or another. The Federal Communications Commission, for example, has issued numerous regulations in its implementation of the Telecommunications Act of 1996, which permits competition in local telephone service.² Similarly, while many states have now allowed entry into local telephony, they have continued to regulate pricing and service quality.

Martha Derthick and Paul Quirk, among others, have pointed out that efficiency alone is rarely the determinative issue in deregulation. Vested interests—the workers and managers of protected firms, consumers enjoying cross-subsidies, sometimes the regulators themselves—have an incentive to fight to retain the advantages they enjoy under regulation. Consequently, successful deregulation often requires vigorous advocacy that details the failures of the regulatory regime and allays fears about distributional effects.³ However, in the past two decades the potential efficiency gains from deregulation have become widely known; deregulation, or at least more nuanced regulation, is now a worldwide phenomenon.

Evidence from the deregulations of the U.S. trucking, banking, railroad, airline, and other industries suggests that, as expected, large gains in social surplus result.⁴ Similar evidence on the deregulation of competitive industries has emerged from other countries. New Zealand, for example, engaged in a broad range of regulatory reforms, including deregulation, during the 1980s and 1990s. While, not surprisingly, some income groups experienced a lowered living standard, the overall process appears to have substantially raised living standards.⁵ One note of caution: in many

²Robert C. Harris and C. Jeffrey Kraft, "Meddling Through: Regulating Local Telephone Service in the United States," *Journal of Economic Perspectives* 11(4) 1997, 93–112. For a review of some other countries' experience, see Pablo T. Spiller and Carlo G. Cardilli, "The Frontier of Telecommunications Deregulation: Small Countries Leading the Pack," *Journal of Economic Perspectives* 11(4) 1997, 127–38.

³Martha Derthick and Paul Quirk, *The Politics of Deregulation* (Washington, DC: Brookings Institution, 1985). On trucking deregulation, see Dorothy Robyn, *Braking the Special Interests: Trucking Deregulation and the Politics of Regulatory Reform* (Chicago: University of Chicago Press, 1987).

⁴For a review of the evidence, see Clifford Winston, "U.S. Industry Adjustment to Economic Deregulation," *Journal of Economic Perspectives* 12(3) 1998, 89–110. For the gains in trucking, for example, see W. Bruce Allen, "Alternative Methods for Estimating State Welfare Gains from Economic Deregulation of Interstate Motor Freight Carriage: A Comparison of Results," *Transportation Journal* 44(1) 2005, 45–61.

⁵Atsushi Maki, "Changes in New Zealand Consumer Living Standards during the Period of Deregulation 1884–1996," *The Economic Record* 78(243) 2002, 443–50.

countries it is difficult to disentangle the benefits arising from deregulation from those arising from privatization (discussed below), as these often occur simultaneously.⁶ There is also evidence of efficiency gains in sectors, such as communications, which may be duopolistic or oligopolistic, rather than competitive, in structure.⁷ In sectors with these structural characteristics, however, the changes were rarely simply from regulation to no regulation, even though these changes were often described as deregulation. As we discuss later in this chapter (under price regulation), the switch was more often from highly intrusive regulation to more market-oriented, flexible, and less intrusive regulation. Here again, it is often difficult to disentangle the benefits that arose from more efficient regulation from those arising from privatization.⁸ A note of caution is that more permissive regulation has generally allowed further market consolidation in most of these industries; while this has facilitated efficiencies relating to scale and density, the evidence suggests that it has also increased market power.⁹

It is also apparent that deregulation has been traumatic and costly for many of the *stakeholders* (those with direct, especially economic, interests) in these industries. Remember, however, that firm failure is not synonymous with market failure; the evidence suggests that consumer gains often more than offset employee and shareholder losses.¹⁰ Furthermore, keep in mind that industries may be subject to more than one type of regulation so that deregulation need not apply to all the activities of the industry; pricing, entry, and scheduling within the U.S. airline industry were largely deregulated, while safety, traffic control, and landing rights were not.

Legalization. *Legalization* refers to freeing a market by removing criminal sanctions. There are intermediate steps toward legalization, such as *decriminalization*, through which criminal penalties are replaced by civil penalties, such as fines.¹¹ Decriminalization reduces the stigma and punishment associated with the activity but does not fully sanction the action as socially acceptable. The impetus for legalization and decriminalization often stems from changing social attitudes (for example, in regard to sexual behavior and drug use). Moves to legalize the market for prostitution

⁶See Graeme Hodge, *Privatization: An International Review of Performance* (Boulder, CO: Westview Press, 2000), esp. 198–202.

⁷Railroads and natural gas, for example, fall into this category. On the former, see John D. Bitzan and Theodore E. Keeler, "Productivity Growth and Some of Its Determinants in the Deregulated U.S. Railroad Industry," *Southern Economic Journal* 70(2) 2003, 232–253; on the latter, Kathleen G. Arano and Benjamin F. Blair, "An Ex-Post Welfare Analysis of Natural Gas Regulation in the Industrial Sector," *Energy Economics* 30(3) 2008, 789–806.

⁸For example, see Preetum Domah and Michael G. Pollitt, "The Restructuring and Privatisation of Electricity Distribution and Supply Businesses in England and Wales: A Social Cost-Benefit Analysis," *Fiscal Studies* 22(1), 2001, 107–46; Bernardo Bortolotti, Juliet D'Souza, and Marcella Fantini, "Privatization and the Sources of Performance Improvement in the Global Telecommunications Industry," *Telecommunications Policy* 26(5/6) 2002, 243–68; and Vladimir Hlasny, "The Impact of Restructuring and Deregulation on Gas Rates," *Journal of Regulatory Economics* 34(1) 2007, 27–52.

⁹John D. Bitzan and Wesley W. Wilson, "Industry Costs and Consolidation: Efficiency Gains and Mergers in the U.S. Railroad Industry," *Review of Industrial Organization* 30(2) 2007, 81–105.

¹⁰For a discussion of these distributional impacts in the U.S. trucking industry, see Thomas Gale Moore, "The Beneficiaries of Trucking Regulation," *Journal of Law and Economics* 21(2) 1978, 327–43. For evidence on Canadian deregulation, see Moshé Kim, "The Beneficiaries of Trucking Regulation, Revisited," *Journal of Law and Economics* 27(1) 1984, 227–41.

¹¹For a discussion of the complete continuum in the context of drug policy, see Robert J. MacCoun, Peter Reuter, and Thomas Schelling, "Assessing Alternative Drug Control Regimes," *Journal of Policy Analysis and Management* 15(3) 1996, 330–52.

that have occurred in the Netherlands and Australia, for example, fall into this category. It may also flow from government's desire for new sources of tax revenue and economic development. The rapid legalization of gambling in North America and elsewhere over the last two decades appears to fall into this category.¹² Finally, change may flow from the realization that criminalization is an ineffective policy with significant unintended negative consequences.

Privatization. The word *privatization* is used in several different ways: (1) the switch from agency subventions to user fees (discussed below as use of subsidies and taxes to alter incentives); (2) the contracting-out of the provision of a good that was previously produced by a government bureau (discussed below as a method of supplying goods through nonmarket mechanisms); (3) denationalization, or the selling of state-owned enterprises to the private sector; and (4) demonopolization, the process by which the government relaxes or eliminates restrictions that prevent private firms from competing with government bureaus or state-owned enterprises. Only these latter two types of privatization are directly related to the freeing of markets. Even denationalization, however, may not result in free market outcomes if other private firms are restricted from competing against the newly privatized firm. The nature of restrictions placed on competitors was one of the major criticisms of the privatization of British Telecom, for instance.¹³

The presence or absence of market failure is the crucial issue in evaluating privatization. Most public corporations in the United States have been, and are, in sectors for which there is at least some prima facie evidence of market failure. In many other countries, however, the linkage between market failure and the provision of goods via state-owned enterprises was much more tenuous. However, extensive privatization or partial privatization has now taken place in a wide range of countries, including the United Kingdom, France, Canada, and New Zealand, as well as in the former Soviet bloc countries and many parts of South America. At the urging of the World Bank and International Monetary Fund, many developing countries have also engaged in major privatization programs.

The aggregate evidence on privatization is that there have usually been major efficiency gains, both in allocative and technical efficiency.¹⁴ Although the evidence from the former Soviet bloc countries has been somewhat mixed, considerable evidence has now emerged concerning the benefits of privatization.¹⁵ The evidence from developing countries is also generally positive.¹⁶ In sectors that exhibit natural monopoly

¹²Charles T. Clotfelter and Philip J. Cook, *Selling Hope: State Lotteries in America* (Cambridge, MA: Harvard University Press, 1989); David Paton, Donald S. Seigel and Leighton Vaughan Williams, "A Policy Response to the E-Commerce Revolution: The Case of Betting Taxation in the UK," *The Economic Journal* 112(480), 2002, F296-F314.

¹³See Tom Sharpe, "Privatisation: Regulation and Competition," *Fiscal Studies* 5(1) 1984: 47-60.

¹⁴For a comprehensive overview of the empirical literature, see William Megginson and John Netter, "From State to Market: A Survey of Empirical Studies on Privatization," *Journal of Economic Literature* 39(2) 2001, 321-89. Specifically on the efficiency evidence relating to North America privatization, see Anthony E. Boardman, Claude Laurin, and Aidan R. Vining, "Privatization in North America," in David Parker and David Sallal, eds., *International Handbook on Privatization* (Northampton, MA: Edward Elgar, 2003), 129-61.

¹⁵See, for example, Daniel Berkowitz and David N. DeJong, "Policy Reform and Growth in Post-Soviet Russia," *European Economic Review* 47(2) 2003, 337-52; and Alexander Pivovarsky, "Ownership Concentration and Performance in Ukraine's Privatized Enterprises," *IMF Staff Papers* 50(1) 2003, 10-12.

¹⁶Nargess Boubakari and Jean-Claude Cosset, "The Financial and Operating Performance of Newly Privatized Firms: Evidence from Developing Countries," *Journal of Finance* 53(3) 1998, 1081-10.

or oligopoly, such as electricity, gas, water distribution, and railroads, the empirical evidence on privatization suggests that improvements in technical efficiency usually occur.¹⁷ One recent study concludes that even rail privatization in the United Kingdom, one of most maligned privatization of all, resulted in significant operating efficiencies, without evidence of lower output quality.¹⁸ However, realization of efficiency gains in these sectors for consumers and governments (especially longer-run efficiency gains) appears to be quite dependent on effective post-privatization regulatory structures that encourage ongoing dynamic efficiency improvements.¹⁹ In turn, this requires a regulatory framework that achieves a high degree of incentive compatibility between regulators and regulated firms.²⁰

Facilitating Markets

If a market has not existed previously, then it does not make sense to talk about freeing it. Rather, the process is one of facilitating the creation of a functioning market by either establishing property rights to existing goods or creating new marketable goods.²¹

Allocating Existing Goods. We saw in Chapter 5 that as demand increases, a free good can begin to shift into an inefficient open-access situation (or, put another way, a move from the SW1 cell to the SW2 cell in Figure 5.2) if comprehensive and effective property rights are not established. Obviously, it may be very costly and, therefore, unfeasible to allocate property rights effectively if the problem is structural in nature, but it may well be possible if the problem is institutional. For example, while a national government cannot allocate effective property rights to internationally migrating fish, it may be possible to allocate effective property rights to stationary shellfish. The allocation of effective property rights is usually extremely contentious, however. Those who previously enjoyed use at below-efficient prices will undoubtedly oppose any distribution of property rights that makes them pay more. Remember, however, that the Coase theorem suggests that from an ex post efficiency point of view it often does not matter who receives a property right, as long as the right is secure and enforceable. From a distributional point of view, however, it does matter who gets a property right. People may, therefore, expend resources on political activity to gain larger allocations (that is, they engage in rent seeking). From an ex ante efficiency perspective, we want allocation mechanisms that limit the political competition for new property rights. Auctions (which we discuss below) and lottery allocation can sometimes serve this purpose.

¹⁷For one recent analysis, see Anthony E. Boardman, Claude Laurin, Mark A. Moore, and Aidan R. Vining, "A Cost-Benefit Analysis of the Privatization of Canadian National Railway," *Canadian Public Policy* 35(1) 2009, 59-83.

¹⁸Michael G. Pollitt and Andrew S. J. Smith, "The Restructuring and Privatization of British Rail: Was It Really That Bad?" *Fiscal Studies* 23(4) 2002, 463-502.

¹⁹See, for example, Preetum Dornah and Michael G. Pollitt, "The Restructuring and Privatisation of Electricity Distribution and Supply Businesses in England and Wales: A Social Cost-Benefit Analysis," and Scott Wallstein, "An Economic Analysis of Telecom Competition, Privatization, and Regulation in Africa and Latin America," *Journal of Industrial Economics* 49(1) 2001, 1-19.

²⁰Colin Robinson, ed., *Regulating Utilities: New Issues, New Solutions* (Cheltenham, UK, and Northampton, MA: Edward Elgar, 2001).

²¹For a discussion of this issue in a somewhat broader context, see Elizabeth S. Rolph, "Government Allocation of Property Rights: Who Gets What?" *Journal of Policy Analysis and Management* 3(1) 1983, 45-61.

The allocation of property rights is highly relevant to water policy in the United States. State legislatures have increasingly come to recognize the importance of establishing property rights. For example, in 1982 the California legislature stated: "The Legislature hereby finds . . . that the growing water needs of the state require the use of water in a more efficient manner and that efficient use of water requires greater certainty in the definition of property rights to the use of water and greater transferability of such rights."²² Several studies have also documented the legal, administrative, political, social, and distributional barriers to the establishment of such property rights.²³

The Creation of New Marketable Goods. In certain circumstances it is possible for the government to create new marketable goods. The most common form of these goods is tradable permits, often referred to as cap-and-trade programs because the total number of permits is set at some upper bound (the cap). A recent study found that tradable permits have now been used in seventy-five applications in fisheries, nine in air pollution control, five in land use control, and three in water allocation.²⁴ Tradable permits have been successfully used in the United States to allocate the right to emit pollutants, including sulfur dioxide, into the air.²⁵ In theory, the allocation of tradable permits for emissions ensures that a specified level of air or water quality is achieved at a minimum total cost (including direct abatement costs and regulatory costs). Under such a tradable permit system, firms maximize profits by restricting emissions to the point where the price of an additional emissions permit equals the marginal cost of abatement. If all firms in the industry can buy and sell permits (including potential entrants), then each firm faces the same price for the last unit of pollution produced, and it would not be possible to find a less costly way of meeting the specified level of total emissions.

Thomas H. Tietenberg, among others, concludes that tradable permits are superior to emissions standards in terms of the informational burden, the speed of compliance, and in making appropriate trade-offs between economic growth and environmental protection.²⁶ Several critics, however, have emphasized the formidable institutional barriers, such as thin markets (few buyers and sellers), to the practical use of tradable permits.²⁷ Until 1990, emissions trading had seen limited application, mainly in the

²²California Assembly Bill 9491, Chapter 867, Statutes of 1982.

²³For a sample of the literature on this topic, see Terry L. Anderson, *Water Rights, Scarce Resource Allocation, Bureaucracy and the Environment* (Cambridge, MA: Ballinger, 1983); and Zachary Donohue, "Property Rights and Western United States Water Markets," *Australian Journal of Agricultural and Resource Economics* 53(1) 2007, 85–103.

²⁴Thomas T. Tietenberg, "Tradable Permits in Principle and Practice," in Jody Freeman and Charles D. Kolstad, eds., *Moving to Markets in Environmental Regulation: Lessons from Twenty Years of Experience* (New York: Oxford University Press, 2007) 63–94, 69.

²⁵Tradable permits in the environmental context were first extensively analyzed by John Daley, *Pollution, Property Rights, and Prices* (Toronto: University of Toronto Press, 1968). Their use in the implementation of import quotas, such as the U.S. Mandatory Oil Import Control Program, is much older. See Craufurd D. Goodwin, ed., *Energy Policy in Perspective* (Washington DC: Brookings Institution, 1981) 251–61.

²⁶Thomas H. Tietenberg, *Emissions Trading* (Washington, DC: Resources for the Future, 1985) and Thomas H. Tietenberg, "Tradable Permits in Principle and Practice."

²⁷Robert W. Hahn and Roger G. Noll, "Implementing Tradable Emission Permits," in LeRoy Grout and Frederick Thompson, eds., *Reforming Social Regulation* (Beverly Hills, CA: Sage, 1982), 125–58. For a more skeptical view of the feasibility of permits, see W. R. Z. Willey, "Some Caveats on Tradable Emission Permits," 165–70, in the same volume.

Los Angeles air shed. The 1990 Clean Air Act Amendments initiated nationwide trading of permits for emissions of hydrocarbons, nitrogen oxides, particulate matter, sulfur oxides, and carbon monoxide.²⁸ Commenting on the impact of sulfur dioxide emissions trading, Richard Schmalensee and colleagues are quite positive: "We have learned that large-scale tradable permit programs . . . can both guarantee emissions reductions and allow profit-seeking emitters to reduce total compliance costs . . . and to adapt reasonably efficiently to surprises produced elsewhere in the economy."²⁹

Simulating Markets

In situations in which efficient markets cannot operate, it may be possible for the government to simulate market processes. In 1859, Edwin Chadwick was the first to argue that, even when competition *within* a market cannot be guaranteed, competition *for* the market may be possible.³⁰ In other words, the right to provide the good can be sold through an auction.³¹

One context in which it has been suggested that an auction can appropriately simulate a market is in the provision of goods with natural monopoly characteristics—cable television, for example. It is not efficient to auction the right to operate the natural monopoly to the highest bidder, however. In a competitive auction, the winning bidder would be prepared to pay up to the expected value of the excess returns from operating the natural monopoly. The winning bidder would then be forced to price accordingly, resulting in the allocative inefficiency we described in Chapter 5. Rather, a more efficient approach is to require bidders to submit the lowest retail price at which they will supply customers. While no bidder will be able to offer to supply the good at marginal cost (as you saw in Chapter 5, this would result in negative profits), the winning bidder should be forced to bid close to average cost.

Oliver Williamson has pointed out a potentially serious problem with the use of auctions to allocate the right to operate natural monopolies. The winning bidder has both an incentive and an opportunity to cheat by reducing the quality of the good. To avoid this outcome, specifications for the good must be fully delineated and enforced. Yet, it is difficult to foresee all contingencies and costly to monitor contract performance. Williamson has documented how many of these specification, monitoring, and enforcement problems actually arose in the case of a cable television network in Oakland, California.³² Because of this, and probably also for political reasons, there

²⁸See Vivien Foster and Robert W. Hahn, "Designing More Efficient Markets: Lessons from Los Angeles Smog Control," *Journal of Law and Economics* 38(1) 1995, 19–48.

²⁹Richard Schmalensee, Paul L. Joskow, A. Danny Ellerman, Juan P. Montero, and Elizabeth M. Bailey, "An Interim Evaluation of Sulfur Dioxide Emissions Trading," *Journal of Economic Perspectives* 12(3) 1998, 53–68. In the same issue, see Robert N. Stavins, "What Can We Learn from the Grand Policy Experiment? Lessons from SO₂ Allowance Trading?" 69–88.

³⁰Edwin Chadwick, "Research of Different Principles of Legislation and Administration in Europe of Competition for the Field as Compared with Competition within the Field," *Journal of the Royal Statistical Society, Series A*, 22, 1859, 381–420.

³¹It is beyond our scope to look at the design of auctions. For a starting point in the theoretical and experimental literature, see Vernon L. Smith, Arlington W. Williams, W. Kenneth Bratton, and Michael G. Yamoni, "Competitive Market Institutions: Double Auctions vs. Sealed Bid–Offer Auctions," *American Economic Review* 7(1) 1982, 58–77; and R. Preston McAfee and John McMillan, "Auctions and Bidding," *Journal of Economic Literature* 25(2) 1987, 699–738.

³²Oliver E. Williamson, "Franchise Bidding for Natural Monopolies: In General and with Respect to CAVT," *Bell Journal of Economics* 7(1) 1976, 73–104.

have been few actual cases of the use of franchise auctions.³³ The end result of the interaction between government and franchisee may be quite similar to more traditional regulation.³⁴

Auctions are used extensively in the allocation of rights for the exploitation of publicly owned natural resources. As described in Chapter 4, these resources generate scarcity rents. If the government simply gives away exploitation rights, the rents accrue to the developers rather than the public. (Of course, we should not forget that who receives the rent is a distributional issue rather than an efficiency issue.) Additionally, we should keep in mind that these rents may partly or completely amount to a lottery prize, where unsuccessful explorers hold the losing (costly) ticket. In such cases, expropriating the rent will discourage future exploration.

An auction also has advantages relative to setting a fixed price for the allocation of exploitation rights. Most importantly, selling at a fixed price requires the government to estimate the value of the resource, which, in turn, requires estimates of the quantity of the resource, future demand and prices for the resource, and future demand and prices for substitutes. An auction, on the other hand, allows the market, and therefore information available in the market, to determine the appropriate value. The U.S. government, for example, underestimated the value of airwave spectrum it auctioned.³⁵ Problems can arise, however, if there are few bidders. If the number of bidders is small, then there is danger that they will collude to limit price. Even if the number of bidders is fairly large, they may not generate competing bids if the number of bids being offered is large. In general, the unsurprising lesson is that, unless auctions are skillfully designed, bidders will be able to behave opportunistically.³⁶

Auctions can be useful allocative tools in situations where governments must allocate any scarce resource. They are now being used in a wide variety of policy areas,³⁷ they might be usefully employed in other areas as well.³⁸ It is important, however, to design the auctions to ensure that there is not systematic underpricing.³⁹

³³See, Ronald M. Harstad and Michael A. Crew, "Franchise Bidding Without Holdups: Utility Regulation with Efficient Pricing and Choice of Provider," *Journal of Regulatory Economics* 15(3) 1991, 141-163.

³⁴This point has been made by Victor Goldberg, "Regulation and Administered Contracts," *Journal of Economics* 7(1) 1976, 426-48.

³⁵R. Preston McAfee and John McMillan, "Analyzing the Airwaves Auction," *Journal of Economic Perspectives* 10(1) 1996, 159-75.

³⁶For the sobering stories of the New Zealand spectrum auction and the Australian TV license auction see John McMillan, "Selling Spectrum Rights," *Journal of Economic Perspectives* 8(3) 1994, 145-62.

³⁷For example, since the 1950s the U.S. government has leased exploration and development rights for offshore oil and gas through *bonus bidding*—cash bids for the right to a lease with fixed royalty shares for the government (usually 12.5 percent). The Outer Continental Shelf Lands Act Amendments of 1978 opened up the possibility of experimentation with other bidding systems: fixed bonus with variable bidding on the royalty rate, fixed bonus and royalty rate with bidding on exploration expenditures, and fixed bonus and royalty rates with bidding on the rate of profit-sharing. Obviously, these systems have different implications for the sharing of risk between the government and the bid winner.

³⁸For example, emission permits could be distributed by auction. See Randolph Lyon, "Auctions and Alternative Procedures for Allocating Pollution Rights," *Land Economics* 58(1) 1982, 16-32. Also, notice facilities could be "awarded" to the community with the lowest auction bid; see Howard Kunreuther and Paul R. Kleindorfer, "A Sealed-Bid Auction Mechanism for Siting Noxious Facilities," *American Economic Review* 76(2) 1986, 295-99. However, this is only likely to succeed if the participants perceive that it is important and characteristically, *Journal of Policy Analysis and Management* 15(3) 1996, 353-76.

³⁹See Juan-Pablo Montero, "A Simple Auction Mechanism for the Optimal Allocation of the Commons," *American Economic Review* 98(1) 2008, 496-518.

Using Subsidies and Taxes to Alter Incentives

Freeing, facilitating, or simulating markets may prove inadequate if market failure is endemic or values other than efficiency are important. More interventionist approaches may be necessary. The first major class of these more intrusive policies that we examine consists of subsidies and taxes.⁴⁰ They aim to induce behavior rather than we command it. Subsidies and taxes, therefore, are market-compatible forms of direct government intervention.

Policy analysts, bureaucrats, and politicians have engaged in a heated debate on the relative merits of incentives versus other generic policies.⁴¹ While policy analysts, especially those trained in economics, generally view incentives favorably, bureaucrats and politicians have tended to be less enthusiastic. In the United States, this debate has primarily focused on the advantages and disadvantages of incentives relative to direct regulation. This terminology is confusing because incentives also require government intervention and, therefore, involve regulation. To clarify, we distinguish between incentives and rules.⁴²

We are primarily concerned with using taxes and subsidies in situations in which the intention is to correct market failures or achieve redistribution. We are not concerned with taxation intended mainly to raise revenue—even though these taxes induce behaviors that are relevant to policy issues. Indeed, taxes designed to raise revenue inevitably involve economic inefficiency—for example, by altering the trade-off between leisure and labor or the choice between savings and consumption. (The efficiency loss of the last dollar raised by the tax is called its *marginal excess burden*.) The net effect of these taxes on efficiency depends on how the revenues are ultimately used. If they help correct market failures, then the combined tax and expenditure programs may enhance efficiency. We are also not concerned with efforts to raise incomes generally (this is dealt with below under the category of cushions). Our concern here is with taxes and subsidies that change incentives by altering the *relative* prices of goods. Put simply, we are considering the use of taxes to raise the private costs of things that are too abundant from the social perspective and the use of subsidies to lower the private costs of things that are too scarce from the social perspective.

In general, taxes and subsidies can have one of three possible impacts on efficiency. First, where taxes and subsidies are aimed at correcting for externalities in particular markets, their impact may enhance efficiency. It is usually difficult in practice to estimate accurately either social marginal benefits or social marginal costs—measures needed to gauge the magnitude of positive and negative externalities. If social marginal costs and benefits are inaccurately assessed, then there may be no efficiency gains, and indeed, net efficiency losses may occur. Second, where taxes and subsidies are not aimed at correcting a market failure, there is inevitably some net deadweight loss. Of course, redistribution may itself enhance efficiency if there is utility interdependence between donors and recipients (remember our discussion of preferences in Chapter 6). Rarely, however, do we have sufficient information to make such assessments confidently.

⁴⁰The basic case for the greater use of incentives can be found in Charles Schultze, *The Public Use of the Private Interest* (Washington, DC: Brookings Institution, 1977), 1-16.

⁴¹For an overview of the debate, see Steven E. Rhoads, *The Economist's View of the World: Government, Markets, and Public Policy* (New York: Cambridge University Press, 1985), 39-58.

⁴²Many writers use the term *command-and-control* to describe rule-oriented policies. Lester C. Thurow distinguishes between *p-regulations* (incentives) and *q-regulations* (rules) in *Zero-Sum Society* (New York: Basic Books, 1980).

Third, taxes may be used in an attempt to extract scarcity rents that arise in the extraction of natural resources such as oil. In theory, such taxes can be designed to transfer rents without losses in efficiency; in practice, limited information about the magnitude of rents generally leads to market distortions.

In order to make our discussion of taxes and subsidies more concrete, we divide them into four general categories: supply-side taxes, supply-side subsidies, demand-side subsidies, and demand-side taxes. These categories are summarized in Table 10.2.

Table 10.2 Using Subsidies and Taxes to Alter Incentives

Generic Policies	Perceived Market Failure (MF), Government Failure (GF), Distributional Issue (DI), Limitation of Competitive Framework (LCF)	Typical Limitations and Collateral Consequences
Supply-Side Taxes		
Output taxes	MF: Negative externalities DI: Transfer of scarcity rent	Frequent adjustment of tax levels required
Tariffs	LCF: Market power of foreign exporters	Deadweight losses for consumers; rent-seeking by producers
Supply-Side Subsidies		
Matching grants	MF: Positive externalities MF: Public goods DI: Increase equity	Diversion to general revenue by reduction in effort
Tax expenditures (business deductions and credits)	MF: Positive externalities MF: Public goods	Misallocation of resources across industries; horizontal tax inequity
Demand-Side Taxes		
Commodity taxes and user fees	MF: Negative externalities MF: Information asymmetries MF: Public goods, especially open access	Deadweight losses and black markets
Demand-Side Subsidies		
In-kind subsidies	MF: Positive externalities LCF: Utility interdependence DI: Floors on consumption	Restricts consumer choice; bureaucratic supply failure; lumpiness leads to inequitable distribution
Vouchers	MF: Positive externalities DI: Increase equity GF: Bureaucratic supply failure	Informational asymmetries; short-run supply inelasticities; institutional resistance
Tax expenditures (personal deductions and credits)	MF: Positive externalities DI: Increase equity	Poor targeting of subsidies; vertical and horizontal tax inequities

Note that some policies fall into more than one category. For example, a tax on gasoline can be thought of as either a supply-side or a demand-side tax—the effect of the tax does not depend on whether it is collected from refiners or consumers. Nevertheless, we find these categories useful because they emphasize the behavior that is the target of the policy.

Supply-Side Taxes

We consider supply-side taxes under two broad categories: output taxes and tariffs.

Output Taxes. As we saw in Chapter 5, markets with negative externalities overproduce goods from the social perspective (see Figure 5.7). When transaction and coordination costs prevent Coasian market solutions through negotiation among the affected parties, government intervention is desirable to equalize marginal social benefits and costs. Theoretically, the appropriate tax raises price to the level of marginal social cost, thereby internalizing the externality.

The idea that an appropriate per-unit tax can lead to an efficient internalization of a negative externality is usually credited to A. C. Pigou and is often referred to as a *Pigovian tax*.⁴³ The major advantage of using taxes to correct for negative externalities is that they allow firms (or consumers) the choice of how much to reduce production (or consumption) to limit their tax payments. As long as each firm sees the same tax, the industry as a whole reduces the quantity of the externality in the least costly way to society.⁴⁴

The implementation of efficient externality taxes has proven to be difficult, however. The major problem is that the government needs to know the shapes of the social benefit and social cost schedules. The accurate estimation of social benefits from the reduction of a negative externality requires the determination of a damage function—a difficult task because it depends on the impact of a complex set of physical and biological forces upon human beings.⁴⁵ Information on the marginal costs of firms, needed to determine the difference between private and social marginal costs, may not be easily determined.⁴⁶ Critics have pointed out that if such information were available for private and social marginal costs and benefits, the government would be able to specify the appropriate level of production directly without having to deal with taxes at all. (Of course, polluting firms may have this information, but if they have such private information the calculation of efficient taxes is much more complex.⁴⁷) In practice, these problems, along with objections to firms receiving a “license to pollute,” have limited the political acceptability of taxes on pollutants.⁴⁸ Currently,

⁴³ Arthur Cecil Pigou, *The Economics of Welfare*, 4th ed. (London: Macmillan, 1946). For a non-technical overview, see N. Gregory Mankiw, “Smart Taxes: An Open Invitation to Join the Pigou Club,” *Eastern Economic Journal* 35(1), 14–23, 2009.

⁴⁴ For a more detailed discussion, see Allen Kneese and Charles Schultz, *Pollution Prices and Public Policy* (Washington, DC: Brookings Institution, 1975).

⁴⁵ See Peter Nemetz and Aidan R. Vining, “The Biology–Policy Interface: Theories of Pathogenesis, Benefit Valuation, and Public Policy Formation,” *Policy Sciences* 13(2) 1981, 125–38.

⁴⁶ For a discussion of this issue, see Thomas C. Schelling, “Prices as Regulating Instruments,” in Thomas Schelling, ed., *Incentives for Environmental Protection* (Cambridge, MA: MIT Press, 1983), 1–40.

⁴⁷ Tracy R. Lewis, “Protecting the Environment When Costs and Benefits Are Privately Known,” *RAND Journal of Economics* 27(4) 1996, 819–47.

⁴⁸ On the importance of this perception to environmentalists, see Steven Kelman, *What Price Incentives? Economists and the Environment* (Boston: Auburn House, 1981), 44.

however, various forms of supply side carbon (emission) taxes have begun to emerge, aided by recent estimates of the relevant social cost and benefit curves. William Nordhaus, for example, has recently estimated that a 2010 carbon price of around \$17 per ton carbon in 2005 prices—rising to \$70 per ton in 2050—would maximize the present discounted value of benefits minus costs.⁴⁹ Similarly, Winston Harrington, Ian Parry, and Margaret Walls have recently estimated that the optimal Pigovian tax on gasoline in the United States would be approximately \$2.10 a gallon rather than the current 40 cents.⁵⁰

While lack of information usually makes it difficult to set optimal tax rates initially, it may be possible to approximate such rates by trial and error after observing how firms respond. Trial-and-error experiments have serious drawbacks, however, including uncertainty, opportunistic behavior by externality producers, and political costs.⁵¹ Trial-and-error experiments may also involve substantial monitoring and administrative costs.

Despite these disadvantages, the potential for efficiency gains should be kept in mind: (1) lower cost—the same outcome can be achieved but at lower cost than with standards; (2) innovation—taxes encourage appropriate innovation as innovation continues until the marginal costs of new technology equal the marginal benefits of forgone taxes; (3) informational requirements—firms face incentives to acquire appropriate information; (4) intrusiveness—government intervention is minimized; (5) administrative complexity—economic incentives require the minimum level of administrative intervention; and (6) transaction costs—economic incentives avoid many of the hidden costs of bureaucratic regulation, such as negotiation and lobbying.⁵²

Thus far we have discussed supply-side taxes as a way of dealing with externalities. The use of such taxes in transferring rent has been much more common. As we saw in Chapter 4 (and in the policy analysis in Chapter 1), many natural resources generate scarcity rents. The distribution of these rents is often a contentious public issue. Ideally, any efforts to capture these rents for the public would not disturb the harvesting or extraction decisions of the private owners of the resources. Many different types of taxes have been used to transfer scarcity rents: flat-rate gross royalties (on the physical output), profit taxes, resource rent taxes, corporate income taxes, cash flow taxes, and imputed profit taxes.⁵³ While in theory some of these mechanisms could capture a portion of the scarcity rent without distorting private decisions about the use of the resource, in practice none is likely to be completely neutral because of limited information.⁵⁴ For example, a one-time tax on the value of the resource (a resource rent tax) would not interfere with the owners' decisions about future extraction

⁴⁹William D. Nordhaus, "To Tax or Not to Tax: Alternative Approaches to Slowing Global Warming," *Review of Environmental Economics and Policy* 1(1) 2007, 26–44.

⁵⁰Winston Harrington, Ian Parry, and Margaret Walls, "Automobile Externalities and Policies," *Journal of Economic Literature* 45(2), 2007, 373–99. A tax on gasoline internalizes several other externalities apart from carbon, including smog and congestion.

⁵¹See Clifford S. Russell, "What Can We Get from Effluent Charges?" *Policy Analysis* 5(2) 1979, 156–81.

⁵²Stephen L. Elkin and Brian J. Cook, "The Public Life of Economic Incentives," *Policy Studies Journal* 13(4) 1985, 797–813.

⁵³Lawrence Copithorne, Alan MacFadyen, and Bruce Bell, "Revenue Sharing and the Efficient Valuation of Natural Resources," *Canadian Public Policy* 11(Supplement) 1985, 465–78.

⁵⁴For a discussion of the information requirements of the various approaches to rent extraction, see Thomas Guntton and John Richards, "Political Economy of Resource Policy," in Thomas Guntton and John Richards, eds., *Resource Rents and Public Policy in Western Canada* (Halifax, NS: Institute for Research in Public Policy, 1987), 1–57.

of the existing resource. It would require, however, accurate information about future extraction costs and market prices. Further, its imposition may reduce the incentive for firms to explore for new stocks of the resource.⁵⁵

A potentially important role for output taxes is the preservation of rent in structural open-access situations. Rent capture through unit taxes is an efficiency-enhancing policy if it reduces extraction efforts that are dissipating rents.

Tariffs. A tariff is a tax on imported, and occasionally exported, goods. A tariff may either be a percentage of the price (an ad valorem tariff) or a fixed dollar amount per unit, independent of the price. Like any other tax, tariffs generate deadweight losses in the absence of market failures. They usually do so because they impose large consumer surplus losses on domestic consumers, in excess of the gains that accrue to domestic (and foreign) producers. They also impede the development of global comparative advantage and specialization based on increasing returns to scale. A vast array of arguments have been put forward in favor of tariffs and other barriers to trade, including the "infant industry" argument, international monopoly or monopoly conditions, "strategic trade policy" reasons, revenue enhancement, cultural protection, retaliation against another country's tariffs, and domestic redistribution.⁵⁶ We review two of the most important arguments here that are often used to justify tariffs.

The most common argument used to justify tariffs is that there are positive externalities from protecting a fledgling industry (the so-called infant industry argument). The idea is that a domestic industry may have a potential comparative advantage that cannot be initially internalized by specific firms because some factor of production such as skilled labor is mobile. Another version of the argument is that domestic firms have the opportunity to achieve minimum efficient scale under tariff protection. This argument assumes that investors are myopic, that they are not prepared to accept short-term losses for long-term profits. Many studies have argued, however, that the major impetus in the United States for tariffs, and protectionism in general, has stemmed from redistributive politics and is best understood in terms of government failure. One study from the 1980s estimates that the annual welfare losses caused by U.S. import restraints was approximately \$8 billion, with the cost to consumers per job saved ranging from a low of approximately \$25,000 to a high of approximately \$1 million.⁵⁷

Monopsony effects have also been used to justify import tariffs. If a country accounts for a large share of world demand for some good, then that country may be able to affect world price by restricting its demand through tariffs (or quotas).⁵⁸ Depending on the magnitude of the domestic and world elasticities of supply and

⁵⁵For an illustration of the efficiency effects of taxes on natural resources, see Jerry Blankenship and David L. Weimer, "The Double Inefficiency of the Windfall Profits Tax on Crude Oil," *Energy Journal* 6(Special Tax Issue) 1985, 189–202.

⁵⁶For an overview on market structure and trade policy, see James A. Brander, "Strategic Trade Policy," in Gene Grossman and Ken Rogoff, eds., *Handbook of Industrial Economics*, Vol. 3 (New York: North-Holland, 1995), 1395–454.

⁵⁷Gary Clyde Huffbauer, Diane T. Berliner, and Kimberly Ann Elliott, *Trade Protectionism in the United States* (Washington, DC: Institute for International Economics, 1986).

⁵⁸Quotas and tariffs are usually thought of as being equivalent: the same outcome can be achieved by either imposing a tariff or auctioning import permits. The equivalence breaks down, however, if world supply is not competitive. When suppliers have market power, the imposition of a quota may actually result in an increase in world price. See George Horwich and Bradley Miller, "Oil Import Quotas in the Context of the International Energy Agency Sharing Agreement," in George Horwich and David L. Weimer, eds., *Responding to International Oil Crises* (Washington, DC: American Enterprise Institute, 1988), 134–78.

demand, the imposition of a tariff may actually increase domestic social surplus by depressing the world price.⁵⁹ The monopsony effect is one of the rationales advanced in support of a U.S. oil import tariff—although supporters from oil-producing states seek the higher prices for domestic oil that would result. A similar kind of argument has been used to justify export tariffs where a country produces enough of a good to potentially have monopoly power in the world market. Individual domestic producers competing against each other will not be able to extract monopoly rents, but a government imposing an export tariff might be able to raise the world price and so extract the rent. (Governments may also use more subtle mechanisms, such as commodity pools and joint marketing organizations for the same purpose.) Export taxes are not very common, because producers prefer export quotas (which allow them to capture the rent more directly by selling the quotas). However, national governments sometimes preemptively impose export tariffs when another national government is threatening import tariffs.

Generally, the importance of tariffs is decreasing under global international agreements administered by the General Agreement on Tariffs and Trade (GATT) and its successor, the World Trade Organization (WTO). Under GATT, the tariffs of the industrialized countries have fallen from about 40 percent at the end of World War II to approximately 5 percent in the 1990s.⁶⁰ Tariffs have also been reduced under regional trade agreements, such as the North America Free Trade Agreement (NAFTA), although it is not as clear that such regional agreements are efficiency enhancing.⁶¹ Although tariffs are being reduced, in some cases countries are replacing them with less transparent barriers to trade (collectively, these are known as *non-tariff barriers*), such as the imposition of standards that favor domestic producers. The Uruguay Round of GATT tried to reduce these barriers with a process called *tariffication*, which assesses all trade barriers in terms of their equivalent tariffs so that national trade policies could be more easily compared and negotiated.

Supply-Side Subsidies

One way to increase the supply of goods is to give direct subsidies to their suppliers. The subsidies may be directed at either private firms or lower levels of government. Intergovernmental subsidies are usually referred to as *grants-in-aid*, or simply *grants*.⁶² In most respects, subsidies to internalize positive externalities are analytically symmetrical with the taxes on negative externalities described above. Broadly speaking, therefore, if there is a positive externality, an appropriately designed per unit subsidy to the supplier generates an increased supply of the good, reducing the undersupply caused by the externality and thereby increasing social welfare.

⁵⁹See Douglas R. Bohi and W. David Montgomery, *Oil Prices Energy Security, and Import Policy* (Washington, DC: Resources for the Future, 1982), 20–9.

⁶⁰Douglas A. Irwin, "The GATT in Historical Perspective," *American Economic Review* 85(2) 1995: 323–328.

⁶¹Although such agreements encourage trade between the trade bloc members (trade creation), they relatively discourage trade with nonmembers (trade diversion). For a discussion of these effects, see Jeffrey A. Frankel, Ernesto Stein, and Shang-jin Wei, "Regional Trading Agreements: Natural or Supernatural?" *American Economic Review* 86(2) 1996, 52–61. See related articles in the same issue by Ronald J. Wonnacott (62–66), Carlo Perroni and John Whalley (57–61), Jagdish Bhagwati and Arvind Panagariya (52–57), Gary Sampson (88–92), and Philip I. Levy and T. N. Srinivasan (93–98).

⁶²For a review, see Wallace Oates, *Fiscal Federalism* (New York: Harcourt Brace Jovanovich, 1972), 65–94.

Matching Grants. In Figure 10.1 we illustrate how a central government might use a subsidy to induce a local government to supply more of some public good X . The vertical axis measures the local government's expenditure on all goods other than X . The horizontal axis measures the quantity of X that the local government provides. The horizontal axis measures the quantity of X that the local government provides. For example, X might be remedial classes for children who are slow learners. Given a total budget of B , the local government could spend nothing on X and B on other services, nothing on other services and purchase B/P_X of X , where P_X is the price of X , or any point on the line connecting these extremes. Given this budget line, assume that the local government chooses to provide X_0 units of X . The indifference curve labeled I_0 gives all the combinations of X and expenditures on other goods that would be as equally satisfying to the local government (say, the mayor) as X_0 and b_0 spending on other goods.

Now imagine that the central government offers to pay 5 dollars to the local government for each unit of X that the local government provides. (We refer to this as a *matching grant* because it matches local expenditures as some fixed percentage. It is also *open-ended* because there is no cap on the total subsidy that the local government can receive.⁶³) The effective price that the local government sees for X falls from P_X to $P_X - S$ because of the subsidy. As a result, the budget line for the local government swings to the right. The local government now buys X_1 units of X , reaching the higher

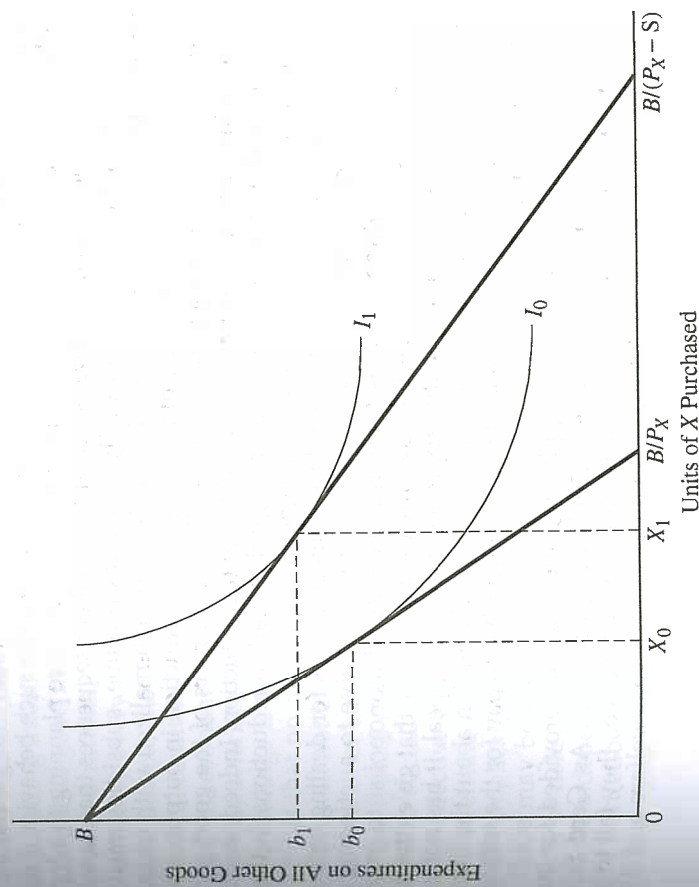


Figure 10.1 The Effect of a Matching Grant on Provision of Targeted Good

⁶³When a central government gives a local government a fixed amount to be spent on some good, it is providing a *block grant*. The in-kind subsidies in Figure 10.2 can be thought of as block grants to individuals. If a matching grant is closed-ended, it becomes equivalent to a block grant once the cap is reached.

level of satisfaction indicated by indifference curve I_1 . Note that the local government also spends more on other goods as well—some of the subsidy for X spills over to other goods. In the terminology of grants, part of the categorical grant has been *deallocated*.

To counter this spillover, the subsidy could be given with a *maintenance-of-effort requirement*: only units beyond X_0 would be subsidized. The budget line under the maintenance-of-effort requirement follows the original budget line up to X_0 and then rotates to the right so that it becomes parallel to the budget line for the subsidy without maintenance-of-effort requirements. The local government responds by purchasing more units of X and by spending less on other goods than it would in the absence of the subsidy. Thus, maintenance-of-effort provisions may be useful in targeting subsidies so that given expenditure levels have the greatest desired impact. Unfortunately, analysis in central governments do not always have sufficient information to design effective maintenance-of-effort requirements.

Subsidies can also be used to deal with negative externalities.⁶⁴ Instead of taxing the good generating the externality, firms can be paid for reducing the level of the externality itself. Such subsidies, however, are vulnerable to opportunistic behavior on the part of suppliers. Unless the government knows how much of the externality the firms would have produced in the absence of the subsidy, the firms have an incentive to increase their externality levels in anticipation of the subsidy. For example, if a firm expects a subsidy program to be implemented for reducing emissions of some pollutant, then it may temporarily increase emissions to qualify for greater levels of future subsidies. It would be particularly difficult to monitor such behavior if the firms simply slowed the introduction of reductions that they were planning to adopt anyway.

Subsidies also have different distributional consequences than taxes. While taxing goods with externalities usually generates revenue, subsidies must be paid for with other taxes. When negative externalities are internalized with taxes, consumers of the taxed good share some of the costs of the reduction in output; when negative externalities are reduced through subsidies, consumers of the good generating the externality generally bear a smaller burden of the reduction. Indeed, sufficiently large subsidies may induce shifts in technology that lead to reductions in the externality without reductions in the supply of the good.

Subsidies can sometimes be effective mechanisms for dealing with market failures other than externalities. For instance, an alternative to auctioning the right to operate a natural monopoly is to induce the natural monopolist to price efficiently (where price equals marginal cost) by providing a subsidy that gives the monopolist a positive rate of return. While this approach has some appeal, it has not been utilized much in practice. One reason is that it requires information about the firm's marginal cost schedule. Another reason is that government has to pay for the subsidy with revenue raised from somewhere.

Skeptics argue that most supply-side subsidies are provided for inappropriate distributional, rather than efficiency-enhancing, reasons. As Gerd Schwartz and Benedict Clements note, "Subsidies are often ineffective (i.e., they fail to benefit their intended target group) and costly (they have adverse real welfare and distributional

implications)."⁶⁵ While such direct help is relatively uncommon at the federal level in the United States, it is extremely common at the state level and in other countries. Such help may take the form of direct grants, loan forgiveness, loan guarantees, or tax expenditures. Such subsidies are frequently directed at declining, or "sunset," industries. They are likely to be especially inefficient if they simply slow the exit of unprofitable firms from the industry.

Tax Expenditures. Probably the most common form of supply-side subsidy is through *tax expenditures*, such as deductions to taxable income and credits against taxes otherwise owed under corporate income taxes.⁶⁶ One can best understand the nature of tax expenditures by realizing that a cash gift and a forgiven debt of the same amount are financially equivalent. If we assume that there is some benchmark tax system (or comprehensive tax base) that treats all taxpayers similarly, no matter what their expenditures, then we would have a system without tax expenditures. If one is forgiven a tax payment (that is, debt) from this benchmark rate, it is equivalent to being given a subsidy of the same amount. We classify tax expenditures as subsidies because they change relative prices by making certain factor inputs less expensive. For example, allowing firms to deduct fully investments in energy-saving equipment from their current tax liabilities makes such equipment appear less expensive than if they had to depreciate it over its useful life as they must for other capital goods. Again, to the extent that the tax expenditures do not correct for market failures, inefficiency results, including interindustry and intraindustry misallocation of resources.

The public good nature of certain aspects of *research and development (R&D)* may also serve as a rationale for subsidies. The U.S. government, as well as the governments of nearly every other industrial nation, directly and indirectly provides R&D assistance. Indeed, these subsidies are viewed as the cornerstones of industrial policies in several countries.

R&D investments will be supplied at inefficient levels to the extent that they have the characteristics of public goods. First, where exclusion of competitors from access to findings is not possible, private firms tend to underinvest in R&D.⁶⁷ The argument is that no market mechanism can ensure that some of the benefits of the innovation will not be captured by other firms. Some of the benefits will accrue to users as consumer surplus, while some of the producer surplus will go to other producers. The typical policy approach has been to subsidize private R&D in an attempt to raise it to socially optimal levels. Second, where exclusion is possible—through patents or effective industrial secrecy—firms tend to restrict the distribution of information concerning their R&D to suboptimal levels. Consequently, private firms may wastefully duplicate research.

There may be underinvestment because of problems hindering the adequate spreading of risks. Research is an inherently risky activity. If the returns on various projects are independent, however, as the number of projects approaches infinity, the risk of a portfolio of projects approaches zero. Research should be conducted to the point where marginal social benefits equal marginal social costs, regardless of the risk

⁶⁵Gerd Schwartz and Benedict Clements, "Government Subsidies," *Journal of Economic Surveys* 13(2) 1999, 119–47, at 129.

⁶⁶For a general overview, see Stanley S. Surrey and Paul R. McDaniell, *Tax Expenditures* (Cambridge, MA: Harvard University Press, 1985).

⁶⁷Kenneth Arrow, "Economic Welfare and Invention," in National Bureau of Economic Research, *Rate and Direction of Incentive Activity* (Princeton, NJ: Princeton University Press, 1962), 609–25.

⁶⁴Empty containers left in public places are a negative externality of beverage consumption. Many states try to internalize this externality by requiring consumers to pay a deposit at the time of purchase that is refunded when the empty container is returned to the place of purchase; see Peter Bohm, *Deposit Refund Systems* (Baltimore: Johns Hopkins University Press, 1981). For a comparison of taxes, subsidies and standards, see Karen Palmer and Margaret Walls, "Optimal Policies for Solid Waste Disposal Taxes, Subsidies and Standards," *Journal of Public Economics* 65(2), 1997, 193–206.

of individual projects. Yet, in a competitive market private firms generally cannot hold an adequate portfolio of independent projects.

The underinvestment argument is not without its critics. Gordon McFetridge has questioned whether the public sector is more effective than the private sector in dealing with risk. He argues that individuals in the market demand risk avoidance and that there are mechanisms, such as venture capital, available for pooling such risks. He also points out that the stock market itself is a mechanism for risk pooling (of projects) and risk spreading (for individuals).⁶⁸

Do public subsidies actually affect the efficiency and dissemination of R&D? Richard Nelson and a team of researchers conducted case analyses of seven industries: aviation, semiconductors, computers, pharmaceuticals, agriculture, automobiles, and residential construction. Their study addresses allocative efficiency, as well as distributional and implementation issues. Nelson concludes that government supply or funding of basic and generic research incrementally increases the aggregate of R&D activities and encourages the wide dissemination of information. On the other hand, the evidence on applied research and development is less clear.⁶⁹

Demand-Side Subsidies

Demand-side subsidies aim at increasing the consumption of particular goods by reducing their prices to final consumers. There are two basic methods of providing demand-side subsidies: subsidies (vouchers) and personal deductions and credits (tax expenditures). Two major efficiency rationales for intervention, each involving arguments about positive externalities, may be offered for demand-side subsidies. In other cases, demand-side subsidies are justified primarily on redistributive grounds. In many debates about such subsidies, confusion arises because the efficiency and equity dimensions are not clearly distinguished.

The distributional argument alone for such subsidies is weak because the recipients would always be better off (from their own perspective at least) with straight cash transfers (which would not alter relative prices directly). Therefore, the rationale for such transfers is often put in terms of *merit goods*.⁷⁰ While the term has no precise and generally accepted meaning, it usually incorporates a mix of redistribution and market failure arguments (most frequently, positive externalities but also information asymmetry and nontraditional market failures such as unacceptable or endogenous preferences).

In-Kind Subsidies. *In-kind grants* subsidize the consumption of specific goods. Strictly speaking, in-kind grants refer to the direct provision of a commodity to consumers. For example, the government may purchase food and distribute it directly to

⁶⁸Gordon McFetridge, *Government Support of Scientific Research and Development: An Economic Analysis* (Toronto: University of Toronto Press, 1977).

⁶⁹Richard R. Nelson, "Government Support of Technical Progress: Lessons from History," *Journal of Policy Analysis and Management* 2(4) 1983, 499-514. There is a vast literature on the effect of government expenditures on R&D; for a sample, see Barry Bozeman and Albert Link, "Public Support for Private R&D: The Case of the Research Tax Credit," *Journal of Policy Analysis and Management* 4(3) 1985, 370-82; Edwin Mansfield and Lorne Switzer, "Effects of Federal Support on Company-Financed R&D: The Case of Energy," *Management Science* 30(5) 1984, 562-71; and by the same authors, "How Effective Are Canada's Direct Tax Incentives for R and D?" *Canadian Public Policy* 11(2) 1985, 241-46.

⁷⁰On merit goods, see J. G. Head, "Public Goods and Public Policy," *Public Finance* 17(3) 1962, 197-220.

people. In the United States and Canada, however, most in-kind grants are distributed through vouchers that allow recipients to purchase the favored goods in markets. For example, the U.S. food stamp program distributes food vouchers to those meeting income requirements. In contrast, U.S. programs to distribute surplus agricultural products like cheese are literally in-kind grants. So, too, are public housing programs (in contrast to rent and construction subsidies); recipients receive housing services directly from the government at a subsidized rent.

Figure 10.2 illustrates the impact of a lump-sum in-kind subsidy of Z^* units of some good Z . The budget line initially connects the points B and B/P_Z . The introduction of the subsidy shifts the effective budget line to the right by an amount Z^* . If it is possible for the recipient to sell the subsidized good to others, then the effective budget line also includes the dashed line from point a to point b , which, for purchases of Z greater than Z^* , is identical to the budget line resulting from a cash grant of P_Z times Z^* , where P_Z is the price of the subsidized good. Even if resale were not possible, the subsidy level is sufficiently small so that the consumption level Z_1 is the same as would result from a cash grant of P_Z times Z^* . Note that in this particular illustration, the equivalence results even though the in-kind subsidy is larger than the presubsidy consumption level. Put bluntly, the disconcerting conclusion under these circumstances is that one may as well give the recipient booze as soup.⁷¹ Giving the grant in-kind rather than as money would only be relevant to consumption if the indifference curve I_1 were tangent to the extension of the budget line (the line segment ab).

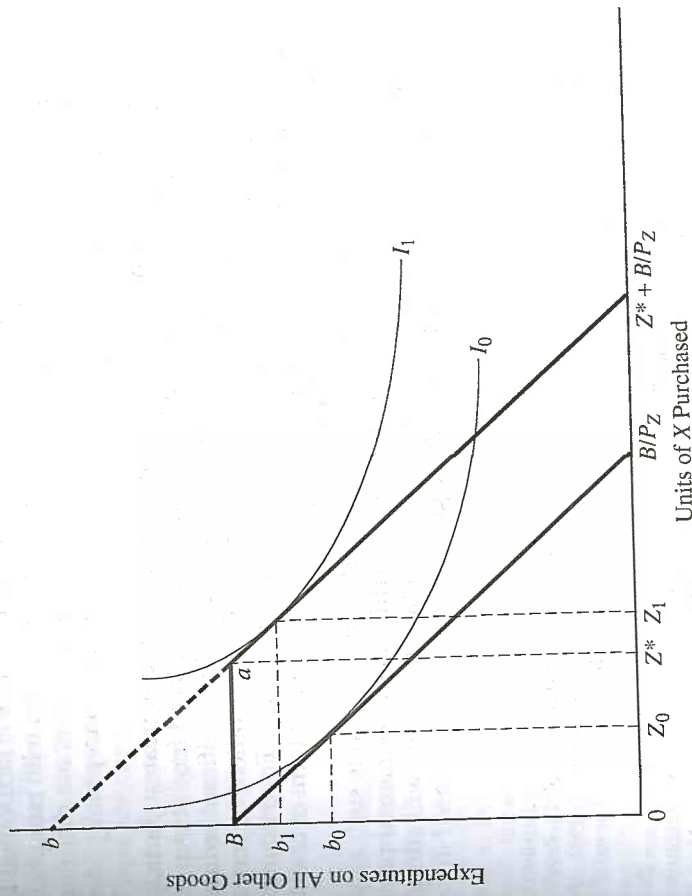


Figure 10.2 The Effect of an In-Kind Subsidy on Consumption

⁷¹See Mark Pauly, "Efficiency in the Provision of Consumption Subsidies," *Kyklos* 23(Fasc. 1) 1970, 33-57.

If the subsidy is sufficiently large, and nonmarketability can be enforced, then consumption of the subsidized good can be increased above the level that would result from an equivalent cash grant. What rationales might justify large in-kind subsidies and the necessary enforcement efforts to prevent trading of the subsidized goods in black markets? One putative rationale for effective (large and nontradable) in-kind subsidies based on efficiency grounds is that the givers of the subsidies derive utility from the specific consumption patterns of recipients. (Another way of describing this interdependence is that taxpayers receive a positive consumption externality from seeing recipients consume particular goods.)⁷² For example, many people place a positive value on knowing that the children of the poor are fed adequately. In the presence of utility interdependence, in-kind transfers may be more efficient than unconstrained (cash) transfers. This should not be surprising in light of our discussion of internalizing externalities—cash grants do not internalize the externality associated with the specific goods.

Another possible rationale is that the good in question generates positive externalities. There has been considerable debate about the existence, and magnitude, of positive externalities associated with the consumption of housing, education, health services, and food. Obviously, these are empirical issues that must be considered on a case-by-case basis.

Vouchers. In-kind grants are often administered through *vouchers*, which allow consumers to purchase marketed goods at reduced prices. Typically, the vouchers are distributed to selected consumers at prices lower than their face value. Those suppliers who sell the favored goods for vouchers, or consumers with receipts for purchase, then cash the vouchers at their face value. If the vouchers are distributed in fixed quantities at zero prices to consumers, then they are conceptually identical to the lump-sum in-kind grants analyzed in Figure 10.2.

The voucher system in the United States with the greatest participation is the food stamp program. Controlled experiments that replaced food stamp coupons with their cash equivalents have found either no statistically significant reductions in total food purchases (Alabama Food Stamp Cash-Out Demonstration) or very small reductions (San Diego Food Stamp Cash-Out Demonstration).⁷³ Food stamps, therefore, may currently be little more than an administratively costly form of cash transfer that nonetheless seems to enjoy political popularity.

Vouchers are used for subsidizing a wide range of goods such as primary and secondary education, day care, food and nutrition, environmental protection, and housing.⁷⁴ If the vouchers provide large subsidies, then they will stimulate market demand for these goods. Because these goods are usually purchased in local markets

⁷²See Harold M. Hochman and James D. Rodgers, "Pareto Optimal Redistribution," *American Economic Review* 59(4) 1969, 542–57. The approach has been modified by Russell D. Roberts, "A Positive Model of Private Charity and Public Transfers," *Journal of Political Economy* 92(1) 1984, 136–48. See also Edward M. Gramlich, "Cooperation and Competition in Public Welfare Policies," *Journal of Policy Analysis and Management* 6(3) 1987, 417–31.

⁷³For a review of the major policy experiments conducted in the United States, see David Greenberg and Mark Shroder, *The Digest of Social Experiments*, 3rd ed. (Washington, DC: Urban Institute, 2009).

⁷⁴For a review of covered goods and services, see Paul Posner, Robert Yetvin, Mark Schneidman, Christopher Spiro and Andrea Barnett, "A Survey of Voucher Use: Variations and Common Elements," in C. Eugene Steuerle, Van Doorn Ooms, George Peterson, and Robert D. Reischauer, eds., *Vouchers and the Provision of Public Services* (Washington, DC: Brookings Institution Press/Committee for Economic Development/Urban Institute Press, 2000), 503–39.

where short-run supply schedules are upwardly sloping, they may cause the prices of the subsidized goods to rise. For example, if the short-run supply schedule of housing in a locality were perfectly inelastic, the introduction of housing vouchers would simply drive prices up for all renters without increasing supply. These higher prices would, however, eventually induce new construction and the splitting of structures into more rental units. The price effects of housing vouchers were tested through the Housing Allowance Program, a more than \$160 million experiment sponsored by the U.S. Department of Housing and Urban Development (HUD).⁷⁵ Unfortunately, researchers disagree with the experimental findings that the housing vouchers did not increase local housing prices.⁷⁶ Nevertheless, HUD now assists more households through vouchers or certificates than through the more traditional public housing.⁷⁷

Many analysts have advocated vouchers as devices for increasing access to private primary and secondary education, for increasing parental choice, and for introducing competition among public schools.⁷⁸ The primary rationale for public support of education is that individuals do not capture all the benefits of their education—others benefit from having educated citizens and workers around them. Many see the direct provision of education through public institutions, however, as suffering from government failures that result from lack of competition. Advocates see vouchers as simultaneously permitting public financing and competitive supply. Critics counter that competitive supply suffers from information asymmetry (parents may not discover the quality of the education their children receive until they have fallen far behind), so that vouchers could not be effectively used without the direct regulation of quality that might reduce the advantages that private schools now enjoy relative to public schools.⁷⁹ Yet, less intrusive measures, such as regular reporting of average test score gains for students, might deal with the information asymmetry problem without subjecting private schools to excessive regulation.

There are currently a number of experiments with educational vouchers in U.S. cities, including public programs in Milwaukee and Cleveland, and privately funded programs in Dayton, San Antonio, New York, and Washington. Although the results from evaluations of these experiments have been controversial, especially with respect to assessing differences in educational outcomes, it seems to be the case that parents whose children are participating in voucher programs generally have higher levels of

⁷⁵For a description, see Harvey S. Rosen, "Housing Behavior and the Experimental Housing Allowance Program: What Have We Learned?" in Jerry A. Hausman and David A. Wise, eds., *Social Experimentation* (Chicago: University of Chicago Press, 1985), 55–75.

⁷⁶For a summary, see Gregory K. Ingram, "Comment," in Hausman and Wise, eds., *ibid.*, 87–94. For an extensive treatment, see Katharine L. Bradbury and Anthony Downs, eds., *Do Housing Allowances Work?* (Washington, DC: Brookings Institution, 1981). However, one review concludes that housing vouchers have a negligible impact on U.S. house prices; see George E. Peterson, "Housing Vouchers: The U.S. Experience," in Steuerle et al., *Vouchers and the Provision of Public Services*, 139–75, at 165.

⁷⁷Helen F. Ladd and Jens Ludwig, "Federal Housing Assistance, Residential Relocation, and Educational Opportunities: Evidence from Baltimore," *American Economic Review* 87(2) 1997, 272–77.

⁷⁸One of the earliest advocates was Milton Friedman in *Capitalism and Freedom* (Chicago: University of Chicago Press, 1962), 85–107.

⁷⁹Empirical investigations appear to be refuting this assertion: "we argue that a large enough subset of active and informed parents are driving the demand-side of the market-like setting and pressuring schools to compete. In other words, choice has created the conditions for a corps of marginal consumers to emerge and pressure schools to perform better, a phenomenon that has been documented in many markets for private goods and services." Mark Schneider, Paul Teske, and Melissa Marshall, *Choosing Schools: Consumer Choice and the Quality of American Schools* (Princeton, NJ: Princeton University Press, 2000), at 267–68.

satisfaction than they did when their children were in public schools.⁸⁰ There is some evidence, although again controversial, that vouchers may be helpful in closing the gap between the educational achievement of African American and white students in urban school districts.⁸¹ Reviewing the overall school voucher evidence, Isabel Sawhill and Shannon Smith conclude, "Whether the education their children receive is of higher quality remains somewhat unclear, but the results to date are modestly encouraging."⁸² In a survey of school vouchers globally, Edwin West reported that educational vouchers have been adopted in many countries, including Sweden, Poland, Bangladesh, Chile, and Colombia—usually in the form of a "funds-follow-the-children" model in which governments fund schools of choice in proportion to enrollment.⁸³ The mere existence of competition may create stronger incentives for public schools to improve.⁸⁴

Tax Expenditures. *Tax expenditures* are commonly used to stimulate individual demand for housing, education, medical care, and child care. Other tax expenditures stimulate demand for goods produced by certain kinds of nonprofit agencies, such as charitable, cultural, or political organizations. Tax expenditures have their effect by lowering the after-tax price of the preferred good. For example, being able to deduct the interest payments on mortgages from taxable income makes homeownership less expensive. In some cases, they may be intended to stimulate aggregate demand during recessions or periods of slow growth. For instance, depreciations rules under individual and corporate taxes may be temporarily reduced in an effort to speed up capital investment. Tax expenditures are an important source of subsidy in the United States. For example, the forgone revenue from allowing mortgage interest and property tax deductions in 2008 was estimated to be \$92.5 billion.⁸⁵ Additionally, the taxation of imputed income (an increase in wealth that does not directly accrue as a money payment) is not normally treated as a tax expenditure. For example, federal estimates of tax expenditures do not include the imputed income on equity in owner-occupied housing.⁸⁶

Most Western countries have come to recognize the importance of the magnitude of tax expenditures. The United States, Germany, Great Britain, Japan, and Canada all now require the annual presentation of tax expenditure accounts.⁸⁷ Critics argue that

⁸⁰John F. Witte, *The Market Approach to Education: An Analysis of America's First Voucher Program* (Princeton, NJ: Princeton University Press, 2000).

⁸¹William G. Howell and Paul E. Peterson, *The Education Gap: Vouchers and Urban Schools* (Washington, DC: Brookings Institution, 2002).

⁸²Isabel V. Sawhill and Shannon L. Smith, "Vouchers for Elementary and Secondary Education," in Steuerle et al., *Vouchers and the Provision of Public Services*, 251–291, at 278.

⁸³Edwin G. West, "Education Vouchers in Principle and Practice: A Survey," *The World Bank Research Observer* 12(1) 1997, 83–103.

⁸⁴See Caroline Minter Hoxby, "The Effects of Private School Vouchers on Schools and Students," in Helen F. Ladd, ed., *Holding Schools Accountable* (Washington, DC: Brookings Institution, 1996), 177–208; and Lori L. Taylor, "The Evidence on Government Competition," *Federal Reserve Bank of Dallas—Economic and Financial Review* 2nd quarter 2000, 2–10, specifically on education, 4–5.

⁸⁵Joint Committee on Taxation, *United States Congress, Estimates of Federal Tax Expenditures for Fiscal Years 2008–2012* (Washington, DC: U.S. Government Printing Office, 2008), 50–52.

⁸⁶See Michael Krashinsky, "Limitations on the Use of Tax Expenditures: Some Comments," *Canadian Public Policy* 8(4) 1982, 615–20.

⁸⁷Kevin McLoughlin and Stuart B. Proudfoot, "Given by Not Taking: A Primer on Tax Expenditures 1971–75," *Policy Analysis* 7(2) 1981, 328–37. For discussion of the tax expenditure reporting system in California, see Karen M. Benker, "Tax Expenditure Reporting: Closing the Loophole in State Budget Oversight," *National Tax Journal* 39(4) 1986, 403–17.

tax expenditures are less desirable than direct subsidies, for two reasons. First, because tax expenditures emerge from relatively hidden debates on the tax code, their role as subsidies is not rigorously analyzed. Consequently, various forms of government failure, such as rent seeking, are encouraged. Second, tax expenditures are notorious for their inequitable distributional consequences. Higher-income individuals are much more able to take advantage of tax expenditures than members of lower-income groups, who, not surprisingly, pay little or no tax in the first place.⁸⁸ Deductions, which reduce taxable income, avoid tax payments at the payer's marginal tax rate and thus favor higher-income persons in progressive tax systems. Credits, which directly reduce the tax payment, are worth the same dollar amounts to anyone who can claim them. Therefore, credits generally preserve progressivity more than deductions costing the same amount its forgone revenue.

Demand-Side Taxes

We divide demand-side taxes into two major categories: commodity taxes and user fees. Note, however, that other analysts may use other terminology, and even the distinction between these two categories is often unclear.

Commodity Taxes. The terms *commodity tax* and *excise tax* are frequently used interchangeably. We can think of commodity taxes as internalizing the impacts of goods with negative externalities. The most common applications are to reduce consumption of so-called demerit goods like alcohol. (See our earlier discussion of merit goods under demand-side subsidies.) The use of taxes in these contexts often appears to display a certain amount of schizophrenia. Will taxes only minimally affect demand and raise lots of revenue, or will taxes substantially decrease demand and generate much less revenue? Presumably, the idea in this context is to dampen demand, but the revenue goal often appears to displace it. Obviously, the price elasticity of demand determines the balance between reduced consumption and revenue generation in each particular policy context.⁸⁹

User Fees. The technical terms often used by policy analysts for *user fees* include *congestion taxes*, *peak-load pricing*, *marginal social cost pricing* (or often just *marginal cost pricing*), and *optimal tolls*. In more common bureaucratic parlance, they are usually called *license fees*, *rental charges*, or *fares*. There are two efficiency rationales for user fees. The first rationale is to internalize externalities. In this context, they are simply a demand side form of Pigovian tax. The second rationale is to price public goods appropriately, specifically in the context of nonrivalrous, excludable, congested

⁸⁸For a review of this argument, see Neil Brooks, "The Tax Expenditure Concept," *Canadian Taxation* 1(1) 1979, 31–35. Daniel Weinberg estimates that in FY 1985 over one-half of the \$250 billion in U.S. tax expenditures given through the individual income tax system went to the one-fifth of families with the highest incomes. Daniel H. Weinberg, "The Distributional Implications of Tax Expenditures and Comprehensive Income Taxation," *National Tax Journal* 40(2) 1987, 237–53.

⁸⁹What, for example, is the effect of high taxes on tobacco consumption? There is evidence that the price elasticity of demand for smoking is somewhat elastic so that higher tobacco taxes would reduce smoking, see Edwin T. Fujii, "The Demand for Cigarettes: Further Empirical Evidence and Its Implications for Public Policy," *Applied Economics* 12(4) 1980, 479–89. For evidence that youth price elasticities are much larger than adult elasticities, see Eugene M. Lewit, Douglas Coate, and Michael Grossman, "The Effects of Government Regulation on Teenage Smoking," *Journal of Law and Economics* 14(3) 1981, 545–69.

public goods (see NE2 in Figure 5.2), like bridges, and open-access resource goods (see SW2 in Figure 5.2), such as fishing grounds. We already reviewed the appropriate price for excludable public goods in Chapter 5 (see Figure 5.3).

Efficient allocation requires that the price charged equal the marginal costs users impose on other users (and, more generally, on all other members of society), implying a zero price during time periods of zero marginal cost (for example, implying uncongested) and a positive price during time periods of positive marginal cost (when the road is congested). Marginal costs may vary on any temporal dimension, including by time of day, time of week, time of year, or gradually increasing over time. In North America, for example, the social marginal cost of water is typically much higher in summer than in winter.⁹⁰ There are four problems with the practical implementation of efficient user fees.

First, "price should equal marginal cost" is only the appropriate rule when all other prices in the economy also equal marginal cost as well. For example, this implies that tolls on a given bridge are only efficient if all other congested bridges in a transportation system are tolled as well; otherwise, use will be inefficiently distorted as some drivers seek out the untolled alternatives. When this condition is not met, there is a *second-best* pricing problem. In such cases, the optimal price under consideration is in general not exactly equal to the marginal cost, and in some cases there can be a substantial gap between the two.⁹¹

Second, because marginal cost is often less than average cost, marginal cost pricing may involve prices that do not cover the costs of service provision. While, this is not problematic from an efficiency perspective, it does mean that service provision would require a subsidy. In the absence of subsidies, one approach is a *two-part tariff*. A two-part tariff can simultaneously satisfy the goals of efficiency and governments' revenue requirement. An efficient two-part tariff imposes both a fixed price on each user for access to service provision (an *access charge*) and additionally imposes user charges that equal marginal cost. The fixed charge paid by the customer is independent of the volume consumed and is akin to a lump-sum tax. It therefore does not influence the consumers' level of use or consumption.⁹²

Third, when users are accustomed to receiving a service at zero, or below marginal cost, prices they do not like to start paying. In other words, policymakers must deal with the political feasibility of such peak-load prices.

Fourth, the transaction costs of implementing user fees may be too high to make them practical. Historically, for example, when demand for water was low it did not make sense to install costly water meters in every household. One context where the feasibility of such pricing is changing rapidly because of technological advances is road congestion. Although road pricing had been considered in many jurisdictions,⁹³ it was not widely implemented until low-cost electronic monitoring

⁹⁰For a discussion of the benefits of efficient water pricing, see Steven Renzetti, *Waves of the Future: The Case for Smarter Water Policy* (Toronto: C. D. Howe Institute, 2009), 281.

⁹¹For a fuller discussion of this issue in the context of transportation, see Ian Parry and Antonio Bento, "Estimating the Welfare Effects of Congestion Taxes: The Critical Importance of Other Distortions Within the Transport System," *Journal of Urban Economics* 51(2) 2002, 339–366.

⁹²For a fuller discussion, see Hugh Sibley, "Efficient Urban Water Pricing," *Australian Economic Review* 39(2) 2006, 227–237.

⁹³As long ago as 1964 the Smeed Commission in the United Kingdom recommended road-use pricing. Ministry of Transport, *Road Pricing: The Economic and Technical Possibilities* (London: Her Majesty's Stationery Office, 1964).

became feasible.⁹⁴ It has now been introduced in a number of jurisdictions, including San Diego; Orange County, California; and Houston in the United States and in a number of other urban areas around the world, such as London and Singapore.

Establishing Rules

Rules pervade our lives. Indeed, they are so pervasive that we tend not to think of them as instruments of government policy. Our objective here is to emphasize that rules are like other generic policies, with advantages and disadvantages. Government uses rules to coerce, rather than induce (through incentives), certain behaviors. Policymakers may enforce compliance using either criminal or civil sanctions. We cannot always clearly distinguish between rules and incentives in terms of their practical effect, however. For instance, should one regard small fines imposed by the criminal courts as rules or as implicit taxes (in other words, negative incentives)? Although it is fashionable to focus on the disadvantages of rules (for example, relative to incentives), rules provide the most efficient method for dealing with market failures in some contexts.

We divide rules into two major categories: (1) framework rules, encompassing both civil and criminal law; and (2) regulations, including restrictions on price, quantity, quality, and information, as well as more indirect controls relating to registration, certification, and licensing of market participants. Table 10.3 sets out these generic policies.

Frameworks

We should not forget that it is meaningless to talk of competitive markets, *except* within a rule-oriented framework. Lester Thurow makes this point strongly:

There simply is no such thing as the unregulated economy. All economies are sets of rules and regulations. Civilization is, in fact, an agreed upon set of rules of behavior. An economy without rules would be an economy in a state of anarchy where voluntary exchange was impossible. Superior force would be the sole means for conducting economic transactions. Everyone would be clubbing everyone else.⁹⁵

The genesis of this idea goes back to Adam Smith, who recognized the need for frameworks when he pointed out that the first inclination of people in the same line of business when they gather together is to collude and subvert the operation of a competitive market.⁹⁶ The competitive market itself, then, can be thought of as a public good that will be undersupplied if left entirely to private activity. Contract law, tort law, commercial law, labor law, and antitrust law can all be thought of as *framework rules*.

⁹⁴For introductions to road pricing, see David M. Newbery, "Pricing and Congestion: Economic Principles Relevant to Pricing Roads," *Oxford Review of Economic Policy* 6(2) 1990, 22–38; also, the following article discusses the second-best problem in the context of transportation: Jan Rouwendal and Erik I. Verhoef, "Basic Economic Principles of Road Pricing: From Theory to Applications," *Transport Policy* 13, 2006, 106–114.

⁹⁵Thurow, *The Zero-Sum Society*, at 129.

⁹⁶Adam Smith, *The Wealth of Nations*, 1st ed. (New York: Penguin, 1977), Book One, Chapter X, II, 232–33.

Table 10.3 Establishing Rules

Generic Policies	Perceived Market Failure (MF), Government Failure (GF), Distributional Issue (DI), Limitation of Competitive Framework (LCF)	Typical Limitations and Collateral Consequences
Frameworks		
Civil laws (especially liability rules)	MF: Negative externalities MF: Information asymmetries MF: Public goods DI: Equal opportunity LCF: Thin markets	Bureaucratic supply failure; opportunistic behavior; imbalance between compensation and appropriate deterrence
Criminal laws	MF: Negative externalities MF: Public goods LCF: Illegitimate preferences	Costly and imperfect enforcement
Regulations		
Price regulation	MF: Natural monopolies DI: Equity in distribution of scarcity rent DI: Equity in good distribution	Allocative inefficiency; X-inefficiency
Quantity regulation	MF: Negative externalities MF: Public goods, especially open access	Rent seeking; distorted investment; black markets
Direct information provision (disclosure and labeling)	MF: Information asymmetries MF: Negative externalities	Cognitive limitations of consumers
Indirect information provision (registration, certification, and licensing)	MF: Information asymmetries MF: Negative externalities GF: Bureaucratic supply failure	Rent seeking; cartelization
Regulation of the circumstances of choice	LCF: Cognitive limitations to rationality	Few applications discovered so far beyond opt-out versus opt-in

Although few dispute that a system of criminal and civil rules is in and of itself efficiency enhancing, there is considerable debate over the most efficient structure of such rules. In civil law, for example, the exact nature of optimal liability rules (see negligence versus strict liability standards) is contentious.⁹⁷ Much of the burgeoning literature on law and economics is concerned with the specification of such optimal rules in various contexts.

One of the most basic public goods is the establishment and enforcement of property rights, including the rights to health and safety. In the United States, Canada

⁹⁷Much of this literature analyzes the specific nature and extent of market failure in particular contexts, such as product liability, in order to develop optimal liability rules. For a discussion, see George P. Johnson, "The Invention of Enterprise Liability: A Critical History of the Intellectual Foundations of Modern Law," *Journal of Legal Studies* 14(3) 1985, 461-527. For an overview of the evolution of U.S. tort law, see Richard A. Epstein, *Modern Products Liability Law* (Westport, CT: Quorum Books, 1980).

and other countries with roots in English common law, tort systems allow those who have suffered damages to seek compensation through the courts. Depending on the particular rules in force, the possibility of tort lowers the expected loss that consumers face from collateral damage and deters some risky behavior by producers in situations involving information asymmetry. Because tort often involves substantial transaction costs, however, it may not work effectively as a deterrent or compensation mechanism when the damage suffered by individual consumers is relatively small. (Small claims courts and class action suits are attempts to deal with this problem.) Because the liability of corporations is generally limited to their assets, tort may be ineffective when large losses result from products produced by small corporations. In addition, we expect tort to be least effective in limiting the inefficiency of information asymmetry in cases of post-experience goods because of the difficulty of establishing links between consumption and harmful effects.

Contract law can also be formulated to reduce the consequences of information asymmetry. For example, insurance law places the burden of informing the insured of the nature and extent of coverage on the insurer.⁹⁸ Even when contracts state explicit and contradictory limits, the reasonable expectations of the insured are generally taken by the courts in the United States as determining the extent of coverage. Indeed, most insurance agents carry their own "errors and omissions" insurance to cover their liability when the impressions they convey to clients diverge from the coverage implied by contracts. In many jurisdictions, other types of agents, such as those selling real estate, have a duty to disclose certain product characteristics related to quality. Such rules, however, may create an incentive for firms not to discover negative characteristics of their products. To be effective, therefore, they may have to be coupled with "standard of care" rules.

Antitrust law, which can be designed to employ either criminal or civil procedures, seeks to prevent firms from realizing rents through collusive efforts to restrict competition. As briefly discussed in Chapter 6, opportunities for collusion usually arise when an industry is dominated by only a few firms. Firms may form a cartel and attempt to allocate output among members in an effort to achieve the monopoly price. The allocations may be through such mechanisms as explicit quotas, geographic divisions of markets, and bid rigging to rotate contract awards. Where collusion is illegal, these efforts often fail because cartel members cannot make enforceable contracts to prevent cheating. The possibility of entry by new firms and the availability of substitutes also limit the ability of cartels to sustain prices above market levels. Nevertheless, active enforcement of antitrust laws may be necessary to preserve competition in some concentrated industries. One approach is investigation and prosecution under criminal laws by a government agency such as the Antitrust Division of the U.S. Justice Department. Another is the creation of incentives, such as multiple damages, to encourage those who have been harmed by collusion to bring civil suit.

Framework rules can also be used to counter some of the problems associated with government failures. For example, individual rights given as constitutional guarantees can protect minorities from tyranny of the majority under direct and representative democracy. Similarly, restrictions on gifts and perquisites that can be given to representatives may help avoid the most blatant abuses of rent seeking.

⁹⁸See Kenneth S. Abraham, *Distributing Risk: Insurance, Legal Theory, and Public Policy* (New Haven, CT: Yale University Press, 1986), 31-36.

Regulations

Whereas framework rules facilitate private choice in competitive markets, regulators seek to alter choices that producers and consumers would otherwise make in these markets. Regulations generally operate through *command and control*: directives are given, compliance is monitored, and noncompliance is punished. Regulation can be extremely costly. One estimate is that in the United States federally mandated annual environmental regulation costs rose from \$21 billion in 1972 to \$93 billion in 1990 (1990 dollars), or approximately 2.1 percent of gross national product.⁹⁹ The budgetary costs of U.S. Federal regulation (only a relatively small part of the total costs) have been estimated to exceed \$40 billion.¹⁰⁰ Similarly, the costs of industry-specific economic regulation have been massive.¹⁰¹ Of course, high cost alone does not imply that regulation is not worthwhile, but it reminds us that it should be rigorously justified. Additionally, the evidence suggests that, perhaps unsurprisingly, those subject to regulation tend to overestimate the cost of regulatory compliance.¹⁰²

Price Regulation. In Chapter 8 we analyzed the efficiency costs of imposing either price ceilings or price supports on a competitive market (see Figures 8.2 and 8.3). The conclusion that price regulation leads to inefficiency can be generalized to wage and price controls and income policies, which have frequently been adopted by Western governments, including the United States.¹⁰³ The extent of the inefficiency is often difficult to determine, however.

If the quality of a good is variable, then the imposition of price floors often results in firms competing on the basis of quality rather than price. The result may be excessive quality and higher prices but only normal rates of return. In contrast, price ceilings often lead to declines in product quality, enabling firms to sell at a price close to the competitive level for the lower-quality product. In other words, social surplus analysis that assumes that quality remains constant does not always tell the full story of the impact of price regulation.

Price regulation is frequently used as a method of preventing monopolies from charging rent-maximizing prices. For example, the Cable Television Consumer Protection and Competition Act of 1992 gave the Federal Communications Commission (FCC) authority to regulate cable TV rates. The FCC ordered a 10 percent rate rollback in 1993, and a further 7 percent reduction in 1994. The FCC estimated the competitive price by comparing prices of monopoly cable systems to those with duopoly systems (called "overbuilt" systems in industry parlance). It found that duopoly systems had prices that were, on average, approximately 16 percent lower than those

⁹⁹Ralph A. Luken and Arthur G. Fraas, "The US Regulatory Analysis Framework: A Review," *Over Review of Economic Policy* 9(4) 1993, 95–111.

¹⁰⁰Susan E. Dudley and Melinda Warren, "The Regulators' Growing Budget," *Regulation* 16, 2005, 6–7.

¹⁰¹Robert Hahn and John A. Hird, "The Costs and Benefits of Regulation: A Review and Synthesis," *Yale Journal of Regulation* 8(1) 1991, 233–78.

¹⁰²Winston Harrington, Richard D. Morgenstern, and Peter Nelson, "On the Accuracy of Regulatory Cost Estimates," *Journal of Policy Analysis and Management* 19(2) 2000, 297–322.

¹⁰³See H. Quinn Mills, "Some Lessons of Price Controls in 1971–1973," *Bell Journal of Economics* 6(1) 1975, 3–49; and John Kraft and Blaine Roberts, *Wage and Price Controls: The U.S. Experiment* (New York: Praeger, 1975).

of monopoly systems. It is estimated that these price reductions reduced industry revenues by \$3 billion.¹⁰⁴

As we saw in Chapter 5, if a natural monopoly can be forced to price at average cost, then deadweight losses are much lower than under rent-maximizing pricing. Many regulatory regimes attempt to force natural monopolies to price at average cost by regulating prices. Historically, the usual approach has been *rate-of-return* regulation. Large sectors of our energy, transportation, communication, and urban services sectors are, or have been, regulated in this way. Typically, the statutes authorizing regulations speak of "reasonable" prices and profits. In practice, however, it is often not clear what the relative importance of efficiency and equity in defining reasonableness is.

There have been two major lines of criticism to the use of this type of price regulation to limit undersupply by natural monopolies. First, in line with various forms of government failure, George Stigler and others have argued that the regulators are quickly "captured" by the firms that they are supposed to be regulating, such that the outcome may be worse than no regulation at all.¹⁰⁵ Second, such regulation induces inefficient and wasteful behavior. Two well-documented outcomes of such incentives are X-inefficiency and an overuse of capital under rate-of-return regulation.¹⁰⁶

To counteract these inappropriate incentives, a new form of price regulation, labeled *price cap* regulation, has emerged; it is also referred to as *yardstick competition* regulation. Although largely developed in Great Britain to regulate newly privatized and entry-deregulated industries, it is now being adopted in many countries, including the United States.¹⁰⁷ Over the last fifteen years, almost all states switched their regulation of local exchange telephone companies from rate-of-return regulation to price cap regulation.¹⁰⁸ Price cap regulation is frequently used to regulate industries with natural monopoly characteristics in conjunction with the removal of legal entry barriers, vertical disintegration, and sometimes market share restrictions. In this form of price regulation, the regulatory agency sets an allowed price for a specified time period, such as four years. The allowed price is adjusted annually to take into account inflation but reduced by a percentage to reflect cost reductions that the regulator believes the firm can achieve, based on some notion of the extent of previous X-inefficiency and the extent

¹⁰⁴See Thomas Hazlett, "Duopolistic Competition in Cable Television: Implications for Public Policy," *Yale Journal of Regulation* 7(1) 1990, 65–139; Robert Rubino, "Market Power and Price Increases in Basic Cable Service since Deregulation," *RAND Journal of Economics* 24(1) 1993, 1–18; and Jith Jayaratne, "A Note on the Implementation of Cable TV Rate Caps," *Review of Industrial Organization* 11(6) 1996, 823–40.

¹⁰⁵George Stigler, "The Theory of Economic Regulation," *Bell Journal of Economics and Management* 2(1) 1971, 3–21; Richard A. Posner, "Theories of Economic Regulation," *Bell Journal of Economics and Management* 5(2) 1974, 335–58; and Sam Peltzman, "Toward a More General Theory of Regulation," *Journal of Law and Economics* 19(2) 1976, 211–40. Their work formalizes an earlier tradition in political science including Samuel P. Huntington, "The Marasmus of the ICC: The Commissions, the Railroads and the Public Interest," *Yale Law Review* 61(4) 1952, 467–509; and Marver H. Bernstein, *Regulating Business by Independent Commission* (Princeton, NJ: Princeton University Press, 1955).

¹⁰⁶For an extensive discussion of these issues, see W. Kip Viscusi, John M. Vernon, and Joseph E. Harrington, *Economics of Regulation and Antitrust*, 4th ed. (Cambridge, MA: MIT Press, 2005). On the overuse of capital, see the seminal article by Harvey Averch and Leland L. Johnson, "Behavior of the Firm under Regulatory Constraint," *American Economic Review* 53(5) 1962, 1052–1069.

¹⁰⁷Price caps are now extensively used in the United States to regulate long distance telephone rates, Direct-Dial, Long Distance Telephone Rates," *RAND Journal of Economics* 20(3) 1989, 437–53.

¹⁰⁸Dennis L. Weisman, "Is There 'Hope' for Price Cap Regulation?" *Information Economics and Policy* 14(3) 2002, 349–70.

that new technology may allow cost reductions (that is, the potential for efficiency improvements, not related to X-inefficiency). For example, if the inflation is 3 percent annually and the required annual productivity gain is 4 percent, the nominal price allowed would decrease 1 percent annually. Typically, the regulated firm is allowed to reduce prices if it wishes to do so (in other words, there is a ceiling but no floor); as price cap regulation is often accompanied by open entry incumbents may, in fact, be forced to lower prices more quickly than the cap price.

An advantage of such regulation is that it focuses on dynamic efficiency: managers have an incentive to improve productivity over time because they get to keep the surplus if they can reduce costs faster than the cap price declines. However, price cap regulation requires the regulator to estimate the achievable cost reductions periodically. Ideally, the estimate should provide incentives for firms to reduce cost, but not to allow them to capture too-high profits. This draws the regulator into a process that has some similarities to old-style rate-of-return regulation where the regulator can be influenced by the regulated firms or other interest groups.¹⁰⁹ One important difference, however, remains between price cap regulation and rate-of-return regulation: price cap regulation requires investors in the firm to carry the risk of profit variability. There is evidence that price cap regulation has led to significant efficiency improvements for firms with natural monopoly characteristics. For example, one study found efficiency gains at the British Gas Corporation, even though the firm remained a (vertically integrated) monopoly during this period.¹¹¹ Again, though, these regulatory changes have been accompanied by other important changes, such as privatization, so that it is difficult to attribute efficiency improvements to one cause.

Notice that using price regulation to correct for market failure caused by natural monopoly is only one alternative. We have already considered the alternative possibilities of dealing with natural monopoly through auctions and subsidies; we will consider government ownership below. Here we see the substitutability of generic policies. Analysis of the specific context is needed to determine which generic policy is most appropriate.

Price ceilings are sometimes used in an attempt to transfer scarcity rents from resource owners to consumers. For example, during the 1970s ceilings kept the world head price of U.S. and Canadian crude oil well below world market levels. While these controls transferred rents from the owners of oil reserves to refiners and consumers, they reduced the domestic supply of oil, increased demand for oil, and contributed to higher world oil prices.¹¹² In general, the use of price ceilings to transfer scarcity rents involves efficiency losses.

¹⁰⁹For a discussion of these problems in the context of the water industry in England and Wales, see Caroline van den Berg, "Water Privatization and Regulation in England and Wales," *Public Policy for the Private Sector* 10(June) 1997, 9-12.

¹¹⁰For an explanation and evidence, see Ian Alexander and Timothy Irwin, "Price Caps, Rate-of-Return Regulation, and the Cost of Capital," *Public Policy for the Private Sector* 8(September) 1996, 25-28.

¹¹¹Catherine Waddams Price and Thomas Weyman-Jones, "Malquist Indices of Productivity Change in the UK Gas Industry before and after Privatization," *Applied Economics* 28(1) 1996, 29-39; Sumit A. Majumdar, "Incentive Regulation and Productive Efficiency in the U.S. Telecommunications Industry," *Journal of Business* 70(4) 1997, 547-76.

¹¹²For an overview, see Kenneth J. Arrow and Joseph P. Kalt, *Petroleum Price Regulation: Should We Decontrol?* (Washington, DC: American Enterprise Institute, 1979). For a more detailed treatment, see Joseph P. Kalt, *The Economics and Politics of Oil Price Regulation* (Cambridge, MA: MIT Press, 1981). For a discussion of the particular problems associated with domestic oil price ceilings of the context of oil price shocks in the world market, see George Horwich and David L. Weimer, *Oil Price Shocks, Market Response, and Contingency Planning* (Washington, DC: American Enterprise Institute, 1984), 57-110.

Quantity Regulation. We have already mentioned quantity regulation as a means of controlling negative externalities in our discussion of taxes and subsidies. Although quantity regulation is less flexible and generally less efficient than market incentives, it usually provides greater certainty of outcome. Therefore, it may be desirable in situations where the cost of error is great. For example, if an externality involves a post-experience good with potentially catastrophic and irreversible consequences, directly limiting it may be the most desirable approach. Should we risk using economic incentives to control the use of fluorocarbons, which have the potential of destroying the ozone layer? If, in the first taxing iteration, we overestimate the price elasticity of demand, the cost and difficulty of achieving reductions later may be great. Other potentially planet-threatening dangers, such as the greenhouse effect, raise similar issues.¹¹³ The relative steepness of the marginal benefit and marginal abatement (cost) curves should determine whether a price or quantity instrument should be used. Suppose that the marginal benefit curve of a given pollutant is quite steep, and the marginal costs are constant. In this situation, the benefits from changes in environmental quality vary greatly with changes in pollution levels: the costs from too-high levels of the pollutant will be high. Quantity controls are appropriate. If, on the other hand, the marginal benefit curve is flat but the marginal cost curve is steep, then the potential policy problem is the deadweight loss from too-tight regulation. Pollution taxes are appropriate.

In the United States, quantity regulation of pollutants has often taken the form of specifications for the type of technology that must be used to meet standards. For example, the 1977 Clean Air Act Amendments required that all new coal-fired power plants install flue gas scrubbers to remove sulfur emissions, whether the plant used low- or high-sulfur coal.¹¹⁴ This approach was appealing to representatives from states that produce high-sulfur coal, to owners of old plants whose new competitors would enjoy less of a cost advantage, and to many environmentalists, who saw it as a way of gaining reductions with minimal administrative costs.¹¹⁵ By raising the cost of new plants, however, the scrubber requirement may actually have slowed the reduction of aggregate sulfur emissions by reducing the speed at which electric utilities replace older plants. In general, regulating how standards are to be met reduces flexibility and thus makes the standards more costly to achieve.

Workplace health and safety regulation in the United States under the administration of the Occupational Safety and Health Administration (OSHA) has also focused on technology-based standards. This is partly because the U.S. Supreme Court explicitly rejected the use of cost-benefit analysis by OSHA in the administration of workplace safety and health.¹¹⁶ The standard-based approach of OSHA has been controversial, especially among economists. One recent review of the empirical literature concluded with the rather mixed message "... there is no evidence of a substantial impact of OSHA ... [but] ... the available empirical results for the overall OSHA

¹¹³John Houghton, *Global Warming: The Complete Briefing*, 2nd ed. (New York: Cambridge University Press, 1997).

¹¹⁴See Robert W. Crandall, "An Acid Test for Congress?" *Regulation* 8(September/December) 1984, 21-28. See also Bruce A. Ackerman and William T. Hassler, *Clean Coal/Dirty Air* (New Haven, CT: Yale University Press, 1981).

¹¹⁵Crandall, "An Acid Test for Congress?" 21-22.

¹¹⁶*American Textile Manufacturers Institute v. Donovan*, 452 U.S. 490 (1981).

impact . . . suggest that OSHA enforcement efforts may be beginning to enhance workplace safety.¹¹⁷

It is worth noting that tradable emissions permits (discussed earlier in this chapter, under simulating markets) also contain an element of quantity regulation. Before trading begins, a total quantity of allowable pollution must be established. Tradable permits, therefore, combine some of the advantages of quantity control with those of more market-like mechanisms, such as taxes and subsidies.

The use of quotas in international trade is another illustration of quantity regulation, albeit one that has been vigorously criticized.¹¹⁸ As we have already discussed, tariffs and quotas differ little in theory: in the case of tariffs, prices are raised until imports are reduced to a certain level; in the case of quotas, the government limits the import level directly, and prices adjust accordingly. In practice, tariffs have the advantage of being more accommodating than quotas to changes in supply and demand. Additionally, tariffs are generally easier to implement than quotas because the latter require the government to distribute rights to the limited imports. There are also important distributional differences between quotas and tariffs; quotas transfer rent to foreign producers, whereas domestic governments capture tariff revenue.

Jose Gomez-Ibanez, Robert Leone, and Stephen O'Connell have examined the impact of quotas on the U.S. automobile market.¹¹⁹ They estimate that the short-run consumer losses are in excess of \$1 billion per annum and that "it is apparent that under most assumptions the economy as a whole is worse off because of restraints."¹²⁰ They also point out that the longer-run "dynamic" efficiency costs may be even more significant than the short-run costs, as the Japanese automobile producers adjust their behavior in the face of quotas.

The most extreme form of quantity regulation is an outright ban on usage or ownership, usually enforced via criminal sanctions. For example, in 1984 the U.S. National Organ Transplant Act banned the sale or purchase of human organs.¹²¹ Many countries are currently considering whether to legally ban human cloning. More familiar prohibitions include bans on gambling, liquor, prostitution, and drugs such as heroin and cocaine. Again, countries have chosen to use this policy instrument differently. Many countries ban the private ownership of handguns, while most jurisdictions in the United States allow sale and ownership. On the other hand, no country that we know of has banned the use or sale of tobacco.¹²² There has not been a consensus on these types of prohibitions among the analytical community. This is not surprising

¹¹⁷Viscusi, Vernon, and Harrington, *Economics of Regulation and Antitrust*, 823; see their general evaluation on 814–24. See also W. Kip Viscusi, *Fatal Tradeoffs* (New York: Oxford University Press, 1992). Viscusi has emphasized that there are two other, more market-like mechanisms to encourage firms to maintain safe workplaces: first "compensating wage differentials," whereby risky firms and industries must pay higher wages ("Market Incentives for Safety," *Harvard Business Review* 63(4) 1985, 133–138); and, second, that they must pay higher worker compensation premiums.

¹¹⁸For an excellent overview of theory, as well as comprehensive estimates of the deadweight losses from quotas, see Robert C. Feenstra, "How Costly Is Protectionism?" *Journal of Economic Perspectives* 6(3) 1992, 159–78.

¹¹⁹Jose Gomez-Ibanez, Robert Leone, and Stephen O'Connell, "Restraining Auto Imports: Does Anyone Win?" *Journal of Policy Analysis and Management* 2(2) 1983, 196–219.

¹²⁰*Ibid.*, 205; see Table 2.

¹²¹National Organ Transplant Act, October 4, 1984, P.L. 98–507, 98 Stat. 2339.

¹²²There have been numerous calls for a ban on advertising, as opposed to selling, cigarettes. See Kenneth E. Warner et al., "Promotion of Tobacco Products: Issues and Policy Options," *Journal of Health Politics, Policy and Law* 11(3) 1986, 367–92; and, in the same issue, Rebecca Arbogoss, "A Proposal to Regulate the Manner of Tobacco Advertising," 393–422.

because many of the issues relate to strongly held ethical values. As we saw in our discussion of legalization, changes in such values often lead to calls for freedom of choice. If there is extensive consumer demand for illegal products, then the usual result is black markets, which generate deadweight losses and negative externalities.

One context in which criminal sanctions are now being used more extensively is the regulation of toxic chemicals. In one well-known case, several Illinois businessmen were convicted of murder and sentenced to twenty-five years imprisonment for the toxic-chemical-related death of an employee.¹²³ While such severe criminal sanctions may provide a powerful deterrent, they may also discourage firms from reporting accidents where they may have been negligent.

The design of efficient standards requires that noncompliance be taken into account. If we want those subject to standards to make efficient decisions, then they should see an expected punishment equal to the external costs of their behavior. For example, if dumping a toxic substance causes \$10,000 in external damage, and the probability of catching the dumper is 0.01, then the fine should be on the order of \$1 million to internalize the externality. The political system, however, may not be willing to impose such large fines. Nor may it be willing to hire enough inspectors to increase the probability that noncompliance will be detected. In general, the problem of non-compliance limits the effectiveness of standards.¹²⁴

Direct Information Provision. We discussed information asymmetry extensively in Chapter 5. We noted that the quality of many goods cannot be evaluated until long after they are consumed (for example, post-experience goods like asbestos insulation and certain medical treatments). As products become more technologically complex, product quality is likely to become an increasingly important area of policy concern.

The presence of information asymmetry suggests a relatively simple policy: provide the information! An important question is whether it is more effective for government to supply such information to consumers or to require the suppliers of goods to provide the information. Few studies directly address this important question. In practice, governments tend to engage in both strategies. For instance, the U.S. government, through the National Institutes of Health, provides information concerning the health impact of cigarette smoking. It also requires cigarette manufacturers to place warning labels on their products.

The practice of requiring firms to supply information about various attributes of product quality is becoming increasingly common.¹²⁵ Examples include appliance energy efficiency labeling, automobile mileage ratings, clothing care labeling, mortgage loan rate facts, nutrition and ingredient labeling, octane value labeling, truth-in-lending provisions, and warranty disclosure requirements.¹²⁶ Additionally, federal, state, and

¹²³See Daniel Riesel, "Criminal Prosecution and Defense of Environmental Wrong," *Environmental Law Reporter* 15(3) 1985, 10065–81; and Mark Schneider, "Criminal Enforcement of Federal Water Pollution Laws in an Era of Deregulation," *Journal of Criminal Law and Criminology* 73(2) 1982, 642–74.

¹²⁴W. Kip Viscusi and Richard J. Zeckhauser, "Optimal Standards with Incomplete Enforcement," *Public Policy* 27(4) 1979, 437–56. Nonetheless, one study has found that compliance is disproportionately high given the low expected costs of noncompliance; see David Well, "If OSHA Is So Bad, Why Is Compliance So Good?" *RAND Journal of Economics* 27(3) 1996, 618–40.

¹²⁵For an overview, see Susan Hadden, *Read the Label: Reducing Risk by Providing Information* (Boulder, CO: Westview Press, 1986).

¹²⁶Joel Rudd, "The Consumer Information Overload Controversy and Public Policy," *Policy Studies Review* 2(3) 1983, 465–73.

local governments have devoted much effort to instituting so-called plain language laws to make contracts readable.¹²⁷

Another variation on the theme of requiring suppliers of goods to provide information is to facilitate the provision of information by employees.¹²⁸ Currently, airline employees can communicate safety problems to federal regulators presumably without being exposed to employer reprisals. Clearly, airline pilots have a more direct incentive to report safety problems than do airline executives. Of course, this policy approach can be applied to government itself by facilitating the protection of whistleblowing employees who report inefficiency or corruption.

Organizational report cards, which provide consumers comparative information on the performance of organizations, such as schools, health maintenance organizations, and hospitals, are becoming increasingly common.¹²⁹ When organizations have strong incentives to participate, organizational report cards may be provided by private organizations. For example, colleges willingly provide information to *U.S. News & World Report* for its annual report card on colleges, because not being listed would hurt their efforts to compete for students. Many health maintenance organizations participate in report cards at the instance of large employers that purchase their services. When organizations do not have an incentive to participate, then the government may intervene, either to require the publication of information necessary for private report card makers or to produce the report cards directly. For example, many states now publish report cards on school districts or require the districts to provide parents with comparative information about particular schools.

Direct information provision is likely to be a viable policy response to pure information asymmetry problems. It is an attractive policy option because the marginal costs of both providing the information and enforcing compliance tend to be low. It may be less viable when information asymmetry is combined with other market imperfections, such as limited consumer attention, misperception of risk, endogenous preferences, or addictive products. For example, providing information about the adverse health effects of smoking may not be an adequate policy response because of the addictive properties of tobacco. If we believe that many smokers are incapable of rationally evaluating the health risks, then further regulation may be appropriate, including, perhaps, the imposition of quality standards.

Standards provide information to consumers by narrowing the variance in product quality. For example, the Food and Drug Administration (FDA) requires that scientific evidence of efficacy and safety be presented before a new drug can be sold to the public. These quality standards provide at least some information to consumers about marketed drugs.

The effective use of quality standards may be limited by government failure. Regulatory bureaus often lack the expertise to determine appropriate quality standards. Also, they may operate in political environments that undervalue some errors and overvalue others. For example, when the FDA allows a harmful product to reach

¹²⁷For a review of this topic, see Stephen M. Ross, "On Legalities and Linguistics: Plain Language Legislation," *Buffalo Law Review* 30(2) 1981, 317-63.

¹²⁸Eugene Bardach and Robert A. Kagan propose that information provision by employees not just be facilitated but mandated in some circumstances. They also view rules that define the authority of professionals, such as health and safety inspectors, within corporations to be a form of private regulation worthy of consideration. Eugene Bardach and Robert A. Kagan, *Going by the Book: The Problem of Regulatory Unreasonableness* (Philadelphia: Temple University Press, 1982), 217-42.

¹²⁹William T. Gormley, Jr., and David L. Weimer, *Organizational Report Cards* (Cambridge, MA: Harvard University Press, 1999).

the market, it is likely to come under severe criticism from members of Congress who can point to specific individuals who have suffered. In contrast, until recently the FDA had received virtually no congressional criticism when it prevented a beneficial product from reaching the market, even though large numbers of (generally unidentified) people were denied benefits.¹³⁰ Increasingly, however, the FDA is subject to pressure from organizations created to increase the availability of treatments for sufferers of particular disease in the wake of the successful efforts of HIV/AIDS advocates to speed up the release of experimental drugs—more than 3,000 disease-specific advocacy groups, many supported by pharmaceutical companies, engage in at least some political activity.¹³¹

Programs of quality regulation and information disclosure run the risk of regulatory capture. Firms in the regulated industry that can more easily meet quality and disclosure standards may engage in rent seeking by attempting to secure stringent requirements that inflict disproportionate costs on their competitors and increase barriers that make it more difficult for new firms to enter the industry. In addition to reducing competition, stringent standards may also impede innovation by forcing excessive uniformity.¹³² The retarding of innovation is likely to be especially serious when the standards apply to production processes rather than to the quality of final products. Delegating standard-setting authority to private organizations may facilitate incremental standard setting that better reflects changing technology.¹³³

Indirect Information Provision. Unfortunately, direct information about the quality of services, as opposed to physical products, usually cannot be provided. Typically, service quality is not fixed; it may change over time, either with changes in the level of human capital or the amount of input effort. Because the quality of services may vary over time, providing reliable information about their quality directly may be impractical. The infeasibility of providing such direct information has led policymakers and analysts to search for indirect ways of providing information. A common policy approach is to register, license, or certify providers who meet some standard of skill, training, or experience.

Licensure can be defined as "a regulatory regime under which only the duly qualified who have sought and obtained a license to practice from an appropriate agency or delegate of the state are legally permitted to perform or to take responsibility for given functions."¹³⁴ It can be distinguished from *registration*, which allows those seeking to practice to do so through a simple declaration. It can also be distinguished from *certification*, "under which qualified practitioners receive special designations or certifications which other practitioners cannot legally use; however, uncertified practitioners are legally permitted to provide the same functions, provided they do so under some other designation. Certification involves exclusive rights to a professional designation but not to practice."¹³⁵

¹³⁰For a more detailed discussion of the asymmetry in oversight of the Food and Drug Administration, see David L. Weimer, "Safe—and Available—Drugs," in Robert W. Poole, Jr., ed., *Instead of Regulation* (Lexington, MA: Lexington Books, 1982), 239-83.

¹³¹Daniel F. Carpenter, "The Political Economy of FDA Drug Review: Processing, Politics, and Lessons for Policy," *Health Affairs* 23(1) 2004, 52-63, at 56.

¹³²See the discussion of the dairy industry by Bardach and Kagan, *Going by the Book*, 260-62.

¹³³Ross E. Cheit, *Setting Safety Standards: Regulation in the Public and Private Sectors* (Berkeley: University of California Press, 1990).

¹³⁴Michael J. Trebilcock and Barry J. Reiter, "Licensure in Law," in Robert G. Evans and Michael J. Trebilcock, eds., *Lawyers and the Consumer Interest* (Toronto: Butterworth, 1982), Chapter 3, 65-103, at 66.

¹³⁵*Ibid.*, 66.

Milton Friedman has succinctly summarized the weakness of approaches: "The most obvious social cost is that any one of these measures, whether it be registration, certification, or licensure, almost inevitably becomes a tool in the hands of a special producer group to obtain a monopoly position at the expense of the rest of the public."¹³⁶ Because certification usually does not forestall entry, this criticism has focused particularly on licensure.¹³⁷

While the rationale for providing indirect information through licensure does not necessarily imply self-regulation, this is the route that almost all states have taken for occupational licensure. The typical steps are as follows: members form a professional association, the association sets up a system of voluntary licensure, and the professional petitions the legislature for mandatory licensure under the auspices of its association.¹³⁸ Occupational licensure suffers from a number of weaknesses: the correlation between training or other measurable attributes and performance may be low; the definition of occupations may lock in skills that become outmoded in dynamic markets; high entry standards deny consumers the opportunity to choose low-quality, but low-price, services; and when professional interests control the licensing standards, the standards may be set unduly high to restrict entry so as to drive up the incomes of the existing practitioners.¹³⁹

While all of these problems deserve serious attention, economists have tended to concentrate on the social costs of entry barriers and the resulting monopoly pricing—perhaps because it is one of the easier licensure impacts to measure. There is certainly strong empirical evidence that professional cartels do indeed raise prices and restrict competition.¹⁴⁰ In light of the existence of these excess returns and what you have already learned about rent seeking, you should not be surprised to hear that many professional and quasi-professional groups continue to seek licensure.¹⁴¹ We should, therefore, be cautious in advocating licensure as a policy alternative.

When we do, we should consider alternatives to professional self-regulation. Yet, we believe it is fair to say that the critics of professional regulation have not been particularly imaginative in proposing alternative policies.¹⁴²

Licensure is now spreading beyond its traditional boundaries. Numerous paraprofessional occupations are winning the right to license and self-regulate. One interesting proposal even suggests that prospective parents should be licensed before having children.¹⁴³

¹³⁶Friedman, *Capitalism and Freedom*, at 148.

¹³⁷For one study that finds efficiency benefits from certification, see Bradley S. Wimmer and Brian Chezum, "An Empirical Examination of Quality Certification in a 'Lemons Market,'" *Economic Inquiry* 41(3) 2003, 279–91.

¹³⁸William D. White and Theodore R. Marmor, "New Occupations, Old Demands," *Journal of Policy Analysis and Management* 1(2) 1982, 243–56.

¹³⁹We take these points from Trebilcock and Reiter, "Licensure in Law," 67–70.

¹⁴⁰For a sample of this large literature, see James W. Begun, "The Consequences of Professionalism for Health Services: Optometry," *Journal of Health and Social Behavior* 20(4) 1979, 376–86; Robert M. Howarth, "Wealth, Power, and Attorney Regulation in the U.S. States: License Entry and Maintenance Requirements," *Publius: The Journal of Federalism* 28(4) 1998, 21–33; Morris M. Kleiner and Robert T. Kudrle, "Does Regulation Affect Economic Outcomes? The Case of Dentistry," *Journal of Law and Economics* 43(2) 2001, 547–82; and N. J. Philipson and M. G. Faure, "The Regulation of Pharmacists in Belgium and the Netherlands: In the Public or Private Interest?" *Journal of Consumer Policy* 25(2) 2002, 155–201.

¹⁴¹White and Marmor, "New Occupations, Old Demands," 249–52.

¹⁴²For one proposal, see Aidan R. Vining, "Information Costs and Legal Services," *Law and Policy Quarterly* 4(4) 1982, 475–500.

¹⁴³John F. Tropman, "A Parent's License," *Journal of Policy Analysis and Management* 3(3) 1984, 457–59.

Regulating the Circumstances of Choice. In Chapter 6 we noted that behavioral economists seek to incorporate the findings of cognitive psychology into models of economic behavior. The potential usefulness of behavioral economics in policy design is suggested by the large differences usually observed between opt-in and opt-out systems—the latter usually produces higher levels of participation than the former in applications like savings plans. Richard Thaler and Cass Sunstein call policy design that takes advantage of such findings "choice architecture."¹⁴⁴ This approach responds to the evidence that people often do not invest heavily enough in making choices that might nonetheless be important for their wellbeing and that self-beneficial choices may be encouraged by changing the circumstances surrounding them.

Changing the circumstances of choice often involves making what the regulator believes to be the best choice an easier one for people to make. It may operate through changes in visibility or convenience. For example, to encourage children to eat healthier school lunches, foods may be arranged by order, height, and other factors affecting prominence to favor fruits and vegetables over deserts and fatty foods. Some college cafeterias have attempted to reduce waste in "common property" cafeterias by removing trays so that it is less convenient to take large quantities the first time through the line.

Although regulating the circumstance of choice is generally less intrusive than more direct quantity regulation, it may not always be viewed as such. For example, a recent proposal by British economist and public figure Julian Le Grand to require an annual license, issued at no charge, to buy cigarettes set off considerable controversy.¹⁴⁵

Summary: The Wide World of Rules (and Some Checks). As emphasized in the introduction to this section, rules are the most pervasive form of government policy in all our lives. National and subnational (state or provincial, local) regulations continue to multiply. One recent innovation in many jurisdictions such as New York State, however, is the requirement that major regulations be subject to cost-benefit analysis. If this trend continues, then it is likely to have a major impact on the regulatory process.¹⁴⁶

Supplying Goods through Nonmarket Mechanisms

Surprisingly, policy analysts have had relatively little to say about when government provision of goods through public agencies is an appropriate response to market failure. Peter Pashigian puts it bluntly: "Public production of goods and services is somewhat of an embarrassment to most economists. It exists, and will in all likelihood increase in importance, but it is difficult to explain. An acceptable theory of public production has not yet appeared."¹⁴⁷

¹⁴⁴Richard H. Thaler and Cass R. Sunstein, *Nudge: Improving Decisions About Health, Wealth, and Happiness* (New Haven, CT: Yale University Press, 2008).

¹⁴⁵Jeremy Laurence, "Unveiled: Radical Prescription for Our Health Crisis," *The Independent* October 23, 2007.

¹⁴⁶On the growth of cost-benefit requirements at the state level, see Richard Whisnant and Diane DeWitt-Cherry, "Economic Analysis of Rules: Devolution, Evolution, and Realism," *Wake Forest Law Review* 31(3) 1996, 693–743.

¹⁴⁷B. Peter Pashigian, "Consequences and Causes of Public Ownership of Urban Transit Facilities," *Journal of Political Economy* 84(6) 1976, 1239–59, at 1239.

Indeed, the choice between government provision and other generic policies have a convincing theory of market failure and an increasingly convincing theory of government failure, we have no overreaching theory that delineates the efficiency trade-offs between market failure and government failure.¹⁴⁸ As we discuss more fully in Chapter 12, perhaps the best hope for such an overreaching theory is transaction economics.

It is tempting to believe that the theory of market failure itself resolves the dilemma of the choice between public and private supply: direct government provision ignores the fact that there is endemic market failure. This is a weak argument because it ignores the fact that market failures can be addressed with other generic policies. Therefore, market failure provides a rationale generally for government intervention rather than specifically for direct provision by government. For example, consider the possible responses to natural monopoly: auctions to take advantage of competition for markets, subsidies to facilitate marginal cost pricing, and direct regulation. These approaches are alternatives to government ownership of the monopoly.

William Baumol provides the beginnings of a moral hazard theory of government production.¹⁴⁹ His insight is best introduced with an example: the provision of national defense. The common rationale for the provision of national defense by government rests on the argument that it is a public good. But this is only an argument for government intervention, not a public army, per se. Baumol's case for a public army is made in terms of moral hazard. A government intends to use its armed forces only when needed for its own purposes. An army provided by the market to the government under contract may have very different incentives that bring into question its loyalty and reliability.

We suggest that the moral hazard problem can be viewed more broadly in the context of transaction costs and, more specifically, opportunism (see Chapter 12 for more detail). Again, we can illustrate the crux of the problem using the example of national defense: armies cannot be trusted to carry out the contracts because the government does not have an independent mechanism of enforcement. In other words, the armies are in a position to engage in opportunistic behavior, like the soldiers in the Thirty Years' War who were lured from one side to the other with bonuses and higher wages.¹⁵⁰ Even if a particular private army does not engage in such behavior, the state will inevitably be forced into costly monitoring. For instance, the government would at least have to establish an office of inspector general to make sure that the contractor can actually muster the promised forces.

Although the danger of opportunistic behavior is most starkly revealed in the area of national defense, it is by no means unique to it. The collection of taxes, the printing of money, the administration of justice—all could potentially face serious agency problems if supplied by private firms.

Our analysis suggests a *double market-failure test* for the use of public agencies: first, evidence of market failure or a redistributive goal; second, evidence either that a

¹⁴⁸For this argument, see Lee S. Friedman, "Public Institutional Structure: The Analysis of Adjustment," in John P. Creane, ed., *Research in Public Policy Analysis and Management*, Vol. 2 (Greenwich, CT: JAI Press, 1981), 303–25.

¹⁴⁹William J. Baumol, "Toward a Theory of Public Enterprise," *Atlantic Economic Journal* 12(1) 1964, 13–20.

¹⁵⁰Andre Corvisier, *Armies and Societies in Europe, 1494–1789*, trans. Abigail T. Siddall (Bloomington, Indiana University Press, 1979), 45.

less intrusive generic policy cannot be utilized or that an effective contract for private production cannot be designed to deal with the market failure (that is, opportunism cannot be reasonably controlled). While we believe that this double market-failure approach provides a rationale for government production, only modest progress has been made in delineating the range of circumstances in which government production is likely to be the best generic policy.¹⁵¹ The task is especially difficult because public agencies themselves, as we saw in Chapter 8, are prone to serious principal-agent problems.

In spite of these theoretical difficulties, we can at least provide an overview of alternative forms of nonmarket supply. Broadly speaking, once a decision has been made to supply goods publicly, governments can do so either directly or indirectly. Direct supply involves production and distribution of goods by government bureaus. As outlined in Table 10.4, the major means of indirect supply are independent agencies (usually government corporations or special districts) or various forms of contracting out. Although these distinctions are theoretically clear, in practice they are often less so.

Direct Supply by Government Bureaus

The direct production of goods by government bureaus is as old as government itself. Karl Wittfogel argues that the stimulus for the development of many early civilizations in semiarid regions (for example, Egypt, Mesopotamia, and parts of China and India) came from the need to construct and manage water facilities collectively. This, in turn, also tended to generate direct government supply of nonhydraulic construction: "under the conditions of Pharaonic Egypt and Inca Peru, direct management prevailed."¹⁵²

The U.S. government provides a vast array of goods through such agencies as the Army Corps of Engineers, the Bureau of the Mint, the National Forest Service, and the Cooperative Extension Service of the Department of Agriculture. Even in the early days of the Republic, direct supply was extensive when the activities of the states were included.¹⁵³ Christopher Leman finds that domestic government production can be divided into ten functional categories: facilitating commerce; managing public lands; constructing public works and managing real property; research and testing; technical assistance; laws and justice; health care, social services, and direct cash assistance; education and training; marketing; and supporting internal administrative needs.¹⁵⁴ The "nondomestic" functions of government include national defense and the administration of foreign policy.

A perusal of these categories suggests that all could be justified by some market failure or redistributive rationale. This, however, does not address the question of whether these goods could be efficiently provided by other generic policies or provided

¹⁵¹For general treatments, see David E. M. Sappington and Joseph E. Stiglitz, "Privatization, Information and Incentives," *Journal of Policy Analysis and Management* 6(4) 1987, 567–82; and Aidan R. Vining and David L. Weimer, "Government Supply and Government Production Failure: A Framework Based on Contestability," *Journal of Public Policy* 10, 1990, 1–22.

¹⁵²See Karl Wittfogel, *Oriental Despotism* (New Haven, CT: Yale University Press, 1957), at 45. See also his Table 1 on government management in agriculture and industry, at 46.

¹⁵³Carter Goodrich, ed., *The Government and the Economy, 1783–1861* (Indianapolis: Bobbs-Merrill, 1967), xv–xviii.

¹⁵⁴Christopher K. Leman, "The Forgotten Fundamental: Successes and Excesses of Direct Government," in Lester Salamon, ed., *Beyond Privatization: The Tools of Government Action* (Washington, DC: Urban Institute Press, 1989), 53–87.

Table 10.4 Supplying Goods Through Nonmarket Mechanisms

Generic Policies	Perceived Market Failure (MF), Government Failure (GF), Distributional Issue (DI), Limitation of Competitive Framework (LCF)	Typical Limitations and Collateral Consequences
Direct Supply		
Bureaus	MF: Public goods MF: Positive externalities MF: Natural monopolies DI: Equity in distribution	Rigidity; dynamic inefficiency; and X-inefficiency
Independent Agencies		
Government corporations	MF: Natural monopolies MF: Positive externalities DI: Equity in distribution GF: Bureaucratic supply failures	Agency loss
Special districts	MF: Natural monopolies MF: Local public goods MF: Negative externalities DI: Universal provision	Agency loss; insensitivity to minorities with intense preferences
Contracting Out		
Direct contracting	MF: Public goods, especially local public goods GF: Bureaucratic supply failures	Opportunistic behavior by suppliers; lock-in and low-balling
Indirect contracting (nonprofits)	MF: Positive externalities GF: Bureaucratic supply failures DI: Diversity of preferences LCF: Endogenous preferences (behavior modification)	Weak coordination of services

indirectly by government. Clearly, some of these goods (or at least close substitutes) could be supplied using other generic policies; for instance, elements of health care can be variously provided in free markets, through market incentives, and under rules.

Leman also points out that other interventionist generic policies inevitably involve some level of *direct* government provision.¹⁵⁵ The following are some examples: the provision of in-kind subsidies requires a bureau to dispense the goods and vouchers; the use of rules requires agencies to monitor and enforce compliance and even the creation of tradable property rights may require agencies to act as banks and clearinghouses.

Our discussion in Chapter 8 of the various forms of government failure, especially those of bureaucratic supply, suggests that government supply is not a panacea. The policy pendulum appears to have swung against the use of public agencies, as shown by the current interest in privatization and contracting out.

¹⁵⁵Ibid.

Independent Agencies

The range and types of independent agencies are enormous (and discussed at more length in Chapter 12). The British have coined the term *quango* (quasi-nongovernment organization) to describe the myriad semiautonomous bodies that are not explicitly government departments. Such autonomous "off-budget" agencies have grown explosively in almost all countries around the world. The United States has not been exempt. Ann-Marie Walsh has identified more than 1,000 domestic state and interstate authorities, as well as more than 6,000 substate authorities.¹⁵⁶ These regional, state, and local agencies construct and operate a wide range of facilities, such as dams, airports, industrial parks, and bridges, and provide a wide range of services, including water, gas, and electricity. Because there is no broadly recognized nomenclature, however, even identifying and classifying such entities is problematic. Many authorities have considerable independence but are not corporate in form, while others are corporate but are formally included in government departments. Even more confusingly, formal inclusion in a bureau does not necessarily subject the corporation to departmental supervision or regulation.¹⁵⁷ Here we briefly review two forms of independent agency: government corporations and special districts.

Government Corporations. *Government corporations* are found everywhere, especially in developing countries.¹⁵⁸ In the United States the corporate form tends to be used for the delivery of tangible and divisible goods in sectors that at least appear to be natural monopolies. Government corporations generally operate with their own source of revenue under a charter that gives them some independence from legislative or executive interference in their day-to-day operations. For example, electric utilities owned by municipalities generate revenue from the electricity that they sell. Usually, their charter requires them to do so at the lowest prices that cover operating costs and allow for growth.

Although government corporations are less important in the United States than in many other countries, their presence is not insignificant. The Tennessee Valley Authority had assets of more than \$33 billion in 1997, making it the largest electric utility in North America; other important federally owned electricity producers include the Bonneville Power Administration, the Southeastern Federal Power Program, and the Alaska Power Administration. Major federal corporations include the Federal National Mortgage Association, the Postal Service, the Federal Deposit Insurance Corporation, and the Corporation for Public Broadcasting.¹⁵⁹ At the subnational level, major enterprises include the Port Authority of New York and New Jersey, the New York Power Authority, and the Massachusetts Port Authority.

What is the rationale for government corporations? Most government corporations, at least in the United States, meet the *single market-failure test*—that is, they are in

¹⁵⁶Ann-Marie H. Walsh, *The Public's Business: The Politics and Practices of Government Corporations* (Cambridge, MA: MIT Press, 1978), 6. See also Neil W. Hamilton and Peter R. Hamilton, *Governance of Public Enterprises: A Case Study of Urban Mass Transit* (Lexington, MA: Lexington Books, 1981).

¹⁵⁷See Harold Seidman, "Public Enterprises in the United States," *Annals of Public and Cooperative Economy* 54(1) 1983, 3–18.

¹⁵⁸World Bank, *Bureaucrats in Business: The Economics and Politics of Government Ownership* (Oxford, UK: Oxford University Press, 1995).

¹⁵⁹For a discussion of the potential privatization candidates among these corporations, see Anthony E. Boardman, Claude Laurin, and Aidan R. Vining, "Privatization in North America," in David Parker and David Sallal, eds., *International Handbook on Privatization* (Northampton, MA: Edward Elgar, 2003), 129–60.

sectors in which natural monopoly or other market failure suggests the need for government intervention. In our view, the critics of government corporations are implicitly arguing that few meet the double market-failure test.

The superficial appeal of government corporations is that they can correct market failures while presumably retaining the flexibility, autonomy, and efficiency of private corporations. Are government corporations less prone to principal-agent problems than government bureaus?

Louis De Alessi and other critics contend that government corporations, like government bureaus, are more prone to principal-agent problems than private firms.¹⁶⁰ The crucial difference between private and political firms is that ownership in the latter effectively is nontransferable. Since this rules out specialization in the latter, it inhibits the capitalization of future consequences into current transfer prices and reduces owners' incentives to monitor managerial behavior.¹⁶⁰ The theoretical force of this argument is somewhat weakened by the growing realization that large private firms are also subject to principal-agent problems, especially if shareholding is dispersed.¹⁶¹ The majority of empirical studies do, indeed, find that dispersed shareholding results in lower profitability and higher costs.¹⁶²

Are public firms less efficient than private firms? Several surveys of cross-sectional empirical studies that compare private and public performance find some edge for the private sector, but several others find no consistent differences.¹⁶³ These studies do generally suggest superior private sector performance in competitive sectors, such as oil and gas production and steelmaking. For example, Aidan Vining and Anthony Boardman compared the performances of the largest non-U.S. public, private, and mixed firms operating in competitive environments. After controlling for important variables, such as industry and country, they found that public and mixed firms appeared to be less efficient than the private firms.¹⁶⁴

The cross-sectional evidence, however, is more mixed in sectors such as electricity, gas and water collection and distribution where there is little competition (at least historically) and usually extensive (rate-of-return) regulation.¹⁶⁵ In some parts of these

¹⁶⁰Louis De Alessi, "The Economics of Property Rights: A Review of the Evidence," in R. Zerbe, ed., *Research in Law and Economics*, Vol. 2 (Greenwich, CT: JAI Press, 1980), 1-47, at 27-28.

¹⁶¹For a comprehensive review of this issue, see the special issue of the *Journal of Law and Economics*, "Corporations and Private Property," 26(2) 1983, Eugene F. Fama and Michael C. Jensen, "Separation of Ownership and Control," 301-26; "Agency Problems and Residual Claims," 327-50, by the same authors and Oliver E. Williamson, "Organization Form, Residual Claimants, and Corporate Control," 351-66.

¹⁶²For reviews of these studies, see Aidan R. Vining and Anthony E. Boardman, "Ownership versus Competition: Efficiency in Public Enterprise," *Public Choice* 73(2) 1992, 205-39; and Helen Shott, "Ownership, Control, Financial Structure and the Performance of Firms," *Journal of Economic Surveys* 8(2) 1994, 203-49.

¹⁶³Louis De Alessi makes a strong claim for superior private performance in "The Economics of Property Rights: A Review of the Evidence." Aidan Vining and Anthony Boardman also found superior private sector performance in "Ownership versus Competition." Tom Borcharding found a slight edge for the private sector in "Toward a Positive Theory of Public Sector Supply Arrangements," in J. Robert S. Pritchard, ed., *Crown Corporations in Canada* (Toronto: Butterworth, 1983), 99-184. A review that found few differences is Colin C. Boyd, "The Comparative Efficiency of State-Owned Enterprises," in A. R. Negandhi, H. Thomsen and K. L. Rao, eds., *Multinational Corporations and State-Owned Enterprises: A New Challenge in International Business* (Greenwich, CT: JAI Press, 1986), 221-44.

¹⁶⁴Anthony E. Boardman and Aidan R. Vining, "Ownership and Performance in Competitive Environments: A Comparison of the Performance of Private, Mixed and State-Owned Enterprises," *Journal of Law and Economics* 32(1) 1989, 1-34.

¹⁶⁵Lon L. Peters, "For-Profit and Non-Profit Firms: Limits of the Simple Theory of Attenuated Property Rights," *Review of Industrial Organization* 8(5) 1993, 623-33.

industries this may be due to natural monopoly conditions.¹⁶⁶ Here, X-inefficiency among private firms resulting from limited competition and rate-of-return regulation is not surprising. Performance differences appear to be small, suggesting that the degree of competition in a given market is a better predictor of efficient performance than ownership, per se.

From the 1990s on, however, a new type of evidence became available on comparative performance: "before-and-after" (that is, time-series) evidence on the privatization of public firms. This evidence strongly suggests large efficiency gains, both X-efficiency and allocative efficiency, and is broadly consistent over industrialized countries, former Soviet bloc countries, and developing countries.¹⁶⁷ However, the evidence from the Soviet bloc countries and from developing countries suggests the necessity of appropriate capitalist institutional environments for private corporate entities to create wealth—in other words, framework rules, considered earlier in this chapter, are a fundamental requirement. Without such an institutional environment, the corporation is unlikely to be superior to the bureau, even in the absence of market failure.¹⁶⁸

Certainly, many countries have, at least until recently, utilized government corporations in an extremely broad range of sectors where there is little evidence of underlying market failure. In France, for example, machine tools, automobiles, and watches have been all produced by state firms. Until 1987, the French government even controlled one of the largest advertising agencies in the country! In Sweden, there is a government corporation that makes beer. Following the financial sector meltdown of 2008-2009, many countries have now renationalized at least some of their banks.

Special Districts. *Special districts* are single-purpose government entities, usually created to supply goods that are believed to have natural monopoly, public goods, or externality characteristics. Such goods are typically local in nature but may extend to the state or region. By far the most common use of special districts in the United States is to provide primary and secondary schooling. Other examples include air pollution, water, and transportation districts. What are the advantages and disadvantages of special districts relative to cities and counties? Indeed, we might ask why we have cities at all. One advantage of special districts is that they allow consumers to observe the relationship between service provision and tax price clearly. Another advantage is that they can be designed to internalize externalities that spill across the historically evolved boundaries of local governments. A major disadvantage is the costs that consumers face in monitoring a whole series of "minigovernments" for different services: "... only for the most important collective functions will wholly independent organization be justified on cost grounds ... the costs of organizing each activity separately would be greater than the promised added benefits from alternative organization."¹⁶⁹

¹⁶⁶For a recent brief discussion, see Harry M. Trebing, "New Dimensions of Market Failure in Electricity and Natural Gas Supply," *Journal of Economic Issues* 35(2) 2001, 395-403.

¹⁶⁷See footnotes and discussion earlier in this chapter, under the privatization heading.

¹⁶⁸For a general discussion of these issues in the context of developing countries, see Paul Cook, Colin Kirkpatrick, and Frederick Nixon, eds., *Developing and Transitional Economies* (Cheltenham, UK: Edward Elgar, 1998). For empirical evidence, see Scott J. Wallsten, "An Economic Analysis of Telecom Competition, Privatization, and Regulation in Africa and Latin America," *Journal of Industrial Economics* 49(1) 2001, 1-19.

¹⁶⁹James M. Buchanan and Marilyn R. Flowers, *The Public Finances*, 4th ed. (Homewood, IL: R. D. Irwin, 1975), at 440.

An important consideration is that collections of special districts prevent logrolling across issue areas. As we discussed in Chapter 8, logrolling often leads to inefficient pork barrel spending. But it also permits minorities to express intense preferences that are not registered in majority voting on single issues where the social choice only reflects the preferences of the median voter. The more issues that are handled independently in special districts, the fewer that remain for possible inclusion in logrolls. Whether the reduction in logrolling contributes to efficiency and equity depends on the distribution of preferences in the population.

Contracting Out

In the past, private firms mostly provided services to government, while government itself provided the final product or service to the public (for example, private firms built the airplanes, but the government provided the army), but increasingly the private sector provides services directly to consumers. The U.S. government, for example, contracts for the supply of almost all military equipment. It also purchases about \$36 billion annually in regular commercial services like maintenance.¹⁷⁰ Contracting where the service is delivered to consumers is an important component of the health care system and is becoming increasingly important in some sectors of government activity traditionally associated with direct supply, such as corrections. (If the service was previously delivered by government directly, this is a form of privatization.)¹⁷¹ An International City Management Association survey found that contracting for a wide range of services increased rapidly in the 1980s, especially at the local level.¹⁷² The trend continues.

What is the evidence on efficiency of direct supply vis-à-vis contracting out? Here, the empirical evidence does suggest that contracting out is frequently more efficient than either market delivery (private subscription) or direct government supply: "... the empirical studies have found that contracting out tends to be less costly than government provision ... cover[ing] a number of distinct services and pertaining to a variety of geographical area."¹⁷³ The limitations of these findings, however, should be kept in mind (they are discussed at more length in Chapter 12). First, the services examined usually have tangible, easily measurable outputs, such as are found in highways, garbage disposal, transportation, and food provision. Consequently, monitoring the quality of output is relatively straightforward. Second, for these kinds of services contestability is high; and, third, neither party to the contract has to commit assets that become sunk (asset specificity is low). While opportunistic behavior is possible in such circumstances, even at its worst, it is likely to be limited in nature. (All three concepts—contestability, asset specificity, and opportunism—are explained in Chapter 12.) Additionally, almost all studies have only compared the production costs of contracting out versus in-house production. But contracting out imposes new, more complex contract-monitoring responsibilities on governments; this is costly. Scholars are just

¹⁷⁰Congressional Budget Office, *Contracting Out: Potential for Reducing Federal Costs* (Washington, DC: Congress of the United States, June 1987), vii.

¹⁷¹On some of the thorny issues in this particular context, see Ira P. Robbins, "Privatization of Corrections: Defining the Issues," *Federal Probation* September 1986, 24–30; and Connie Mayer, "Legal Issues Surrounding Private Operation of Prisons," *Criminal Law Bulletin* 22(4) 1986, 309–25.

¹⁷²Reported in Robert W. Poole, Jr., and Philip E. Fixler, Jr., "The Privatization of Public Sector Services in Practice: Experience and Potential," *Journal of Policy Analysis and Management* 6(4) 1987, 612–25.

¹⁷³*Ibid.* 615.

beginning to try and measure these costs. As policy analysts increasingly must make recommendations concerning the choice between in-house production and contracting out, we more explicitly address the costs relevant to the governance of government provision in Chapter 12.

Contracting out is not limited to common goods and services. The federal government effectively delegates responsibility for the development of rules to organizations of stakeholders in a number of areas where it would be difficult for an agency to maintain the expertise needed to gather and interpret necessary information on a timely basis. For example, the federal government delegates responsibility for the development of rules for the allocation of cadaveric organs to the Organ Procurement and Transplantation Network. These kinds of arrangements are often politically attractive to legislators. Legislators wish to avoid having to intervene with regulatory agencies in situations where the potential costs from being blamed by unsatisfied constituents is greater than the potential benefits from receiving credit from those that are satisfied.¹⁷⁴

Providing Insurance and Cushions

Some government interventions provide shields against the "slings and arrows of outrageous fortune." We divide these into two general categories: insurance and, for want of a better word, cushions. Table 10.5 presents a summary of these generic policies: mandatory and subsidized insurance, stockpiles, transitional assistance, and cash grants.

Table 10.5 *Providing Insurance and Cushions*

Generic Policies	Perceived Market Failure (MF), Government Failure (GF), Distributional Issue (DI), Limitation of Competitive Framework (LCF)	Typical Limitations and Collateral Consequences
Insurance		
Mandatory insurance	LCF: Adverse selection	
Subsidized insurance	MF: Information asymmetries DI: Equity in access LCF: Myopia LCF: Misperception of risk	Moral hazard
Cushions		
Stockpiling	LCF: Adjustment costs GF: Price controls	Rent seeking by suppliers and consumers
Transitional assistance (buy-outs, grandfathering)	LCF: Adjustment costs LCF: Macroeconomic dynamics	Inequity in availability
Cash grants	DI: Equality of outcome LCF: Utility interdependence	Reduction in work effort, dependency

¹⁷⁴David L. Weimer, "The Puzzle of Private Rulemaking: Scientific Expertise, Flexibility, and Blame Avoidance in Regulation," *Public Administration Review* 66(4) 2006, 569–582.

Insurance

The essence of insurance is the reduction of individual risk through pooling. Insurance can be purchased in private markets to indemnify against loss of life, damage to property, cost of health care, and liability for damages caused to others. As we discussed in Chapter 6, factors such as moral hazard, adverse selection, and limited actuarial experience can lead to incomplete insurance markets. Furthermore, people do not always make optimal decisions about purchasing insurance coverage because of biases inherent in the heuristics commonly used to estimate and interpret probabilities. Therefore, there may be an appropriate role for public intervention in some insurance markets. More generally, insurance can be used in conjunction with liability laws to deal with problems caused by information asymmetry.

In designing public insurance programs, care must be taken to limit moral hazard. By making certain outcomes less costly, insurance may induce people to take greater risks or bear greater compensable costs than they otherwise would.¹⁷⁵ One way to limit moral hazard is to invest in monitoring systems. Another is to design payment structures that reduce the incentive for beneficiaries to inflate compensable costs. For example, requiring beneficiaries to pay a fraction of their claimed costs through copayments reduces their incentive to incur unnecessary expenses. The general point is that in analyzing proposals for public insurance programs, it is necessary to anticipate how participants will respond to the availability of benefits.

Mandatory Insurance. When people have better information about their individual risks than insurers, adverse selection may limit the availability of insurance. For example, health insurance is sold primarily through group plans because they are less prone to adverse selection than individual policies. Because the premiums for individual policies are set on the assumption that the worst risks will self-select, good risks who do not have access to group coverage may decide not to insure. Government can use its authority to mandate universal participation in insurance plans to prevent adverse selection from operating.¹⁷⁶ Many proposals for national health insurance in the United States would mandate broader workplace coverage and require those not covered in the workplace to participate in public insurance programs.

Does the mere existence of an incomplete insurance market justify mandatory insurance? Usually, economists base the rationale for mandatory insurance on the argument that the losses suffered by those left uncovered involve negative externalities. For example, the personal assets of many drivers are insufficient to cover the costs of property damage and personal injury that they inflict on others in serious accidents. Therefore, many states mandate liability coverage for all drivers so that those injured have opportunities to obtain compensation through tort law.

Paternalism may also serve as a rationale for mandatory insurance. For example, one function of the Old Age, Survivors, Disability and Health Insurance Program, the U.S. Social Security System, is to insure against the possibility that people have insufficient savings for retirement because of myopia, misinformation, miscalculation, bad

¹⁷⁵For example, Robert Topel attributes one-third or more of all unemployment spells among full-time participants in unemployment insurance programs to the benefits provided. Robert Topel, "Unemployment and Unemployment Insurance," *Research in Labor Economics* 7, 1985, 91-135.

¹⁷⁶Nicholas Barr, "Social Insurance as an Efficiency Device," *Journal of Public Policy* 9(1) 1989, 35-58.

luck, or simple laziness.¹⁷⁷ People who do not save an adequate amount will either consume at low levels in retirement or receive assistance from private or public charity. It is worth noting that Social Security is not a pure insurance program but, rather, involves considerable transfers from high-income workers to low-income workers and from current workers to current retirees.¹⁷⁸ Mandatory insurance programs typically combine actuarially based risk pooling with income transfers. Of course, if the programs were not mandatory, those paying the subsidies through higher premiums or lower benefits would be unlikely to participate.

Mandatory insurance can also be used to privatize regulation. One reason legal liability alone cannot fully remedy information asymmetries and negative externalities is that firms often have inadequate assets to pay damages. This is especially likely for the fly-by-night firms that often exploit information asymmetries. By requiring that they carry minimum levels of liability insurance, the government can guarantee that at least some assets will be available for compensating those who have been harmed. Perhaps more important, the insurance companies have an incentive to monitor the behavior of the firms with an eye to reducing liability.¹⁷⁹

It is important to note that mandatory insurance does not require that individuals be restricted from purchasing additional, supplementary insurance. Conceptually, mandatory insurance only requires that everyone, no matter what his or her wishes, acquire the core insurance. Monopoly mandatory insurance is normally based on the argument that if individuals are allowed to purchase additional private insurance their support for the publically financed system will erode or that health care is so important that everybody should be required to utilize approximately the same amount.¹⁸⁰

Subsidized Insurance. Rather than mandate insurance, the government can provide it at subsidized premiums when myopia, miscalculation, or other factors appear to be contributing to underconsumption. For example, in the United States, the Federal Emergency Management Agency provides subsidized flood insurance under the Flood Disaster Protection Act of 1973. As might be expected, restrictions on coverage are necessary to prevent those who suffer losses from rebuilding in floodplains.

Fairness often serves as a rationale for subsidizing premiums. For example, residents and businesses in poor neighborhoods may find actuarially fair premiums for fire insurance to be so high that they forgo coverage. A perception that they are unable to move to other locations with lower risks may serve as a rationale for subsidy. Rather than pay the subsidies directly, governments often force private insurers to write subsidized policies in proportion to their total premiums. Such *assigned risk pools* have been created to provide subsidized premiums for fire insurance in many urban areas. They are also commonly used in conjunction with mandatory insurance programs.

¹⁷⁷Laurence J. Kotlikoff, "Justifying Public Provision of Social Security," *Journal of Policy Analysis and Management* 6(4) 1987, 674-89. For a detailed history of analyses dealing with Social Security issues, see Lawrence H. Thompson, "The Social Security Reform Debate," *Journal of Economic Literature* 21(4) 1983, 1425-67.

¹⁷⁸For calculations for representative age and income groups, see Anthony Pellecchio and Gordon Goodfellow, "Individual Gains and Losses from Social Security before and after the 1983 Amendments," *Cato Journal* 3(2) 1983, 417-42.

¹⁷⁹Paul K. Freeman and Howard Kunitreuther, *Managing Environmental Risk through Insurance* (Washington, DC: The AEI Press, 1997), 24-25.

¹⁸⁰For empirical evidence on this issue, see Steven Glosberman and Aidan R. Vining, "A Policy Perspective on 'Mixed' Health Care Financing Systems," *Journal of Risk and Insurance* 65(1) 1998, 57-80.

Cushions

Whereas insurance schemes reduce the variance in outcomes by spreading risk, *cushions* reduce the variance in outcomes through a centralized mechanism. From the perspective of beneficiaries, the consequences may appear identical. The key difference is that with insurance individuals make ex ante preparations for the possibility of unfavorable outcomes, while with cushions they receive ex post compensation for unfavorable outcomes that occur.

Stockpiling. In an uncertain world we always face the potential for supply disruptions or "price shocks," whether as a result of economic or political cartelization, unpredictable supply volatility, or human-caused or natural disasters. These shocks are unlikely to cause major problems unless they involve goods without close substitutes that are central to economic activity. In practice, the most serious problems arise with natural resources and agricultural products.

With respect to natural resources, if they are geographically concentrated, then the owners may be able to extract monopoly rents (as well as scarcity rents) from consumers. In a multinational context, cartels, whether they have primarily economic or political motives, may attempt to extract rents. While the long-run prospects for successful cartelization are limited because higher prices speed the introduction of substitutes, cartels may be able to exercise effective market power in the short run. In addition, the supply of concentrated resources may be subject to disruption because of revolution, war, or natural disaster.

The adverse consequences of these supply disruptions can be dampened with *stockpiling programs* that accumulate quantities of the resource during periods of normal market activity so that they can be released during periods of market disruption. For example, the United States has long maintained government stockpiles of critical minerals such as chromium, platinum, vanadium, and manganese, for which production was concentrated in South Africa, the former Soviet Union, and other countries of questionable political reliability.¹⁸¹ Experience with the program suggests that political pressure from domestic producers tends to keep items in stockpiles long after they have lost their critical nature and that there is a reluctance to draw down stocks at the beginning of supply disruptions when they are most valuable to the economy.¹⁸²

The most prominent U.S. program that stockpiles resources is the Strategic Petroleum Reserve (SPR), which stores about 700 million barrels of crude oil for use during oil supply disruptions.¹⁸³ Because much of the world's low-cost reserves of crude oil are located in the politically unstable Middle East, the possibility exists for sharp reductions in supply that would cause steep rises in the price of oil and consequent losses to the U.S. economy. Drawdown of the SPR would offset a portion of the lost supply, thereby dampening the price rise and reducing the magnitude of economic losses.

Because private firms could make an expected profit by buying low during normal markets and selling high during disruptions, we might ask why the government

¹⁸¹Michael W. Klass, James C. Burrows, and Steven D. Beggs, *International Mineral Cartels and Embargoes* (New York: Praeger, 1980).

¹⁸²See Glenn H. Snyder, *Stockpiling Strategic Materials: Politics and National Defense* (San Francisco: Chandler, 1966).

¹⁸³For a history of the SPR, see David Leo Weimer, *The Strategic Petroleum Reserve: Politics, Implementation, and Analysis* (Westport, CT: Greenwood Press, 1982).

should stockpile.¹⁸⁴ One reason is government failure: based on past experience, firms might anticipate the possibility that the government will institute price controls, preventing them from realizing speculative profits. Another is market failure: acquisition and drawdown decisions by private firms have external effects on the economy. In ancient times agricultural stockpiles served primarily as hedges against scarcity; in modern times they serve mainly as hedges against abundance. For example, the U.S. Commodity Credit Corporation in effect buys surpluses of grain from farmers to help support prices. While stockpiles of agricultural commodities provide security against widespread crop failures, they are costly to maintain. Further, modest price swings can probably be adequately accommodated by private stockpiling and by risk-diversification mechanisms like private futures markets.¹⁸⁵

State and local governments, which typically must operate with balanced budgets, can prepare for revenue shocks by stockpiling financial resources. These reserves are sometimes called *rainy day funds*.¹⁸⁶ They serve as a form of self-insurance for governments that have difficulty borrowing on short notice. As with stockpiles of physical commodities, an important question is whether political interests permit efficient decisions concerning acquisition and use. In particular, we might expect the pressures of the election cycle to lead to inefficient decisions concerning use.

Transitional Assistance. Policy analysts and politicians have increasingly come to realize that efficiency-enhancing policy changes are strongly resisted by those who suffer distributionally. This may result from the elimination of existing benefits or the imposition of new costs. Indeed, if there have only been transitional gains (as discussed in Chapter 8), the elimination of a benefit can impose real economic loss. Resistance to the elimination of benefits is likely to be especially bitter in these circumstances. Government may also wish to pay compensation when its projects would increase aggregate welfare but would impose disproportionate costs on particular individuals or localities.

Compensation may take either monetary or nonmonetary forms. Monetary compensation is typically in the form of a *buy-out*, whereby government purchases, at a fixed price, a given benefit. Examples of cash payments include relocation assistance payments to homeowners and renters displaced by federal urban renewal and highway construction projects.¹⁸⁷ Nonmonetary payment usually takes the form of either a *grandfather clause* or a *hold harmless provision*, both of which allow a current generation to retain benefits that will not be available to future generations. Grandfather clauses can increase political feasibility, but they can also reduce effectiveness.¹⁸⁸

Cash Grants. The most direct way to cushion people against advance economic circumstances is through *cash grants*. This generic term covers such programs in the United States as Aid to Families with Dependent Children before 1996 or Temporary

¹⁸⁴For a discussion of this question, see George Horwich and David L. Weimer, *Oil Price Shocks, Market Response, and Contingency Planning* (Washington, DC: American Enterprise Institute, 1984), 111–39.

¹⁸⁵Brian D. Wright, "Commodity Market Stabilization in Farm Programs," in Bruce L. Gardner, ed., *U.S. Agricultural Policy* (Washington, DC: American Enterprise Institute, 1985), 257–76.

¹⁸⁶Michael Wolkoff, "An Evaluation of Municipal Rainy Day Funds," *Public Budgeting and Finance* 7(2) 1987, 52–63; Richard Pollock and Jack P. Suederhuid, "The Role of Rainy Day Funds in Achieving Fiscal Stability," *National Tax Journal* 39(4) 1986, 485–97.

¹⁸⁷Joseph J. Cordes and Burton A. Weisbrod, "When Government Programs Create Inequities: A Guide to Compensation Policies," *Journal of Policy Analysis and Management* 4(2) 1985, 178–95.

¹⁸⁸For a discussion of these issues, see Christopher Leman, "How to Get There from Here: The Grandfather Effect and Public Policy," *Policy Analysis* 6(1) 1980, 99–116.

Assistance for Needy Families after 1996 (welfare) and Supplemental Security Income (aid to the blind and disabled). The 1974 Health, Education, and Welfare "megaproposal" summarizes the situations in which cash grants are preferable to vouchers: "the provision of cash benefits is an appropriate public action when the objective is to alter the distribution of purchasing power in general and when the recipient is to alter is to be left free to decide how to spend it . . ." while " . . . the provision of the benefit appropriate when the objective is to alter the distribution of purchasing power over specific goods and services when the supply of these can be expected to increase as the demand for them increases."¹⁸⁹

The advantage (or disadvantage) of cash grants is that they do not interfere with the consumption choices of a target population. Clearly, this is a valuable attribute if the goal is simply to raise incomes. On the other hand, if the objective is to *alter* consumption patterns, then cash grants are less effective instruments. While cash grants do not restrict consumption, they may affect other kinds of behavior, most importantly, the "leisure-labor" trade-off. Increases in unearned income, whether through cash grants, in-kind grants, or other subsidies, generally increase the demand for all goods, including leisure, so that the amount of labor supplied falls.¹⁹⁰

A fundamental trade-off between transferring income and discouraging work effort arises in designing cash grant programs. For example, consider the goals of a negative income tax: (1) to make any difference, the transfer should be substantial; (2) to preserve work incentives, marginal tax rates should be relatively low; and (3) the break-even level of income (the point at which the transfer reaches zero) should be reasonably low to avoid high program costs. Unfortunately, at least to some extent, the three are incompatible. For example, if a negative income tax guaranteed every family a floor on income of \$4,000 through a cash grant, then a tax rate of 20 percent on earned income would imply that only when earned income reached \$20,000 would net payments to families be zero. Raising the tax rate to, say, 50 percent would lower the break-even earned income to \$8,000. The higher tax rate, however, would reduce the after-tax wage rate and thereby probably reduce work effort.

If recipients reduce their work effort, then their chances of becoming dependent on the cash grants increase. For some categories of recipients, such as the permanently disabled, the increased risk of dependence may not be a serious concern. For others, however, there may be a trade-off between the generosity of short-term assistance and the long-run economic vitality of recipients. Work requirements may be one way to improve the terms of the trade-off.¹⁹¹ Unfortunately, they are typically costly and difficult to implement, especially for single-parent families with young children.

Cash grants can also influence choices about living arrangements and family structure. For example, Aid to Families with Dependent Children often made it financially possible for young unmarried mothers to set up their own households. The less generous are state benefit levels, the more likely it is that these mothers will stay with their parents.¹⁹² Indeed, the opportunity to gain independence may encourage some

¹⁸⁹Laurence Lynn E. Jr., and John Michael Seidi, "Policy Analysis as HEW: Story of Mega-Proposal Introduction" *Policy Analysis* 1(2) 1975, 232-73, at 235.

¹⁹⁰For a review of empirical evidence on the income elasticity of the labor supply, see Robert A. Moffitt and Kenneth C. Kehrer, "The Effect of Tax and Transfer Programs on Labor Supply," *Research in Labor Economics* 4, 1981, 103-50.

¹⁹¹Lawrence W. Mead, "The Potential for Work Enforcement: A Study of WIN," *Journal of Policy Analysis and Management* 7(2) 1988, 264-88.

¹⁹²David T. Ellwood and Mary Jo Bane, "The Impact of AFDC on Family Structure and Living Arrangements," *Research in Labor Economics* 7, 1985, 137-207.

teenage girls to have children. The general point is that the availability of cash grants may influence a wide range of behaviors.

Conclusion

A variety of generic policies can be used to address market and government failures. Table 10.6 indicates the generic policy categories that are most likely to provide candidate solutions for each of the major market failures, government failures, and distributional concerns. In many cases, more than one generic policy can provide potential solutions for the same problem. However, the solutions are never perfect. They must be tailored to the specifics of the situation and evaluated in terms of the relevant goals.

Table 10.6 Searching for Generic Policy Solutions

	Market Mechanism	Incentives	Rules	Nonmarket Supply	Insurance and Cushions
Traditional Market Failures					
Public goods	S	S	S	P	
Externalities	S	P	P	S	
Natural monopolies	S	S	P	P	
Information asymmetries			P	S	S
Other Limitations of the Competitive Framework					
Thin markets			P		
Preference-related problems	S	S	P		
Uncertainty problems			P		S
Intertemporal problems			S		P
Adjustment costs					P
Macroeconomic dynamics		P			S
Distributional Concerns					
Equity of opportunity		S	P		S
Equality of outcomes			S	S	P
Government Failures					
Direct democracy			P		
Representative government	P		S		
Bureaucratic supply	P	S	S	S	S
Decentralization	S	P		S	S

Sources for solutions (though not necessarily most often used): P—primary, S—secondary.

Our discussions of general problems and generic policy solutions lay the foundation for actually doing policy analysis. An understanding of market and government failure helps us to grasp the nature of public policy problems. Being aware of the generic policies and their collateral consequences helps us to begin our search for solutions to our specific policy problems.

For Discussion

1. Consider a developing country that has no policies regulating the discharge of pollutants into its surface waters. In the past, there has been some degradation of water quality from agricultural waste. Increasingly, however, factories have begun to discharge industrial wastes into lakes and rivers, raising environmental and health concerns. What are the generic policy alternatives the country might adopt to limit or reverse the reductions in water quality from industrial pollution?
2. Your state or province is concerned that too few children are being immunized against childhood illnesses. What are some of the generic policy alternatives that could be adopted to increase immunization rates?

Adoption

The adoption and execution of collective decisions inherently involve cooperation. Collective decisions begin as proposals in political arenas and culminate in effects on people. We can divide this process into two phases: *adoption* and *implementation*. The *adoption phase*, the focus of this chapter, begins with the formulation of a policy proposal and ends, if ever, with its formal acceptance as a law, regulation, administrative directive, or other decision made according to the rules of the relevant political arena. The *implementation phase*, the focus of the next chapter, begins with the adoption of the policy and continues as long as the policy remains in effect. Although policy analysts typically contribute to the policy process by formulating and evaluating proposals during the adoption phase, they cannot do so effectively without anticipating the entire process, from proposal to effect.

Yet, the distinction between adoption and implementation does not do justice to the complexity that typically characterizes the policy process. Adopted policies, especially laws, rarely specify exactly what is to be done. Additionally, they may require policy decisions to be made in other arenas. For example, a county legislature might adopt an ordinance that prohibits smoking in certain public places, makes violations punishable by fines, and delegates responsibility for enforcement to the county health department. Now the county's health department must adopt an enforcement policy. Should it simply wait for complaints about violations from the public, or should it institute spot checks? Should it issue warnings or immediately impose fines? Although the head of the health department may have legal authority to answer these questions as she sees fit, her decisions probably would be influenced by the (perhaps conflicting) advice of her