

AN ESSAY ON GOODS AND MARKETS

by
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Abstract: This paper is presented in four sections. Section 1 studies perfect markets. Section 2 studies man-made market imperfections and examines the consequences as compared to perfect markets. Section 3 studies imperfections arising from other than man-made sources. It supplies and discusses examples of market failure (rather than market success) and considers possible correctives. Section 4 contains a taxonomy of goods and services.

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AN ESSAY ON GOODS AND MARKETS

Introduction

This essay is presented in four substantive sections. *Section 1* reviews the economist's notion of a perfect market (i.e., one that is free, private, and competitive). The section identifies some of the assumptions that underlie our way of thinking about markets and draws out some of its logical consequences. It also identifies some of the social consequences of perfect markets. *Section 2* examines how these consequences are altered when markets are *made* imperfect. *Section 3* considers markets in which imperfections arise for reasons other than man-made imperfections. The section determines sources and supplies examples of market failure (rather than success). *Section 4* concludes the substance of the essay with a taxonomy of goods and services. In this section, we learn of the existence of a broad class of goods (and bads) that are of critical importance to humankind and indeed to all of life.

With this essay, I mean to show that a very large set of real-world economic phenomena *cannot* be addressed properly with the pop-version of economics that restricts itself only to the consideration of completely unfettered markets, i.e., a falsely understood “free-market economics” that supposedly addresses and solves all relevant problems. But I also mean to show that a very large set of real-world economic phenomena *can only* be addressed with the proper use of economics.

1. Economists' bliss: free, private, competitive markets

Microeconomics is the study of a single market at a time, rather than the study of all markets jointly at the same time (that would be called macroeconomics). Ordinarily, economists study the quantity traded of the good or service in question (the “good”) as a function of a variety of factors. For instance, the *quantities demanded* of a good (say, a computer) are usually thought of as dependent on of its own price (the hardware), the price of complementary goods (the software), the price of possible substitute goods (another brand), of the income or budget at the disposal of the buyer, of the influence that various forms of advertising exert on the purchasing decision, and so on. Similarly, the *quantities supplied* to the market place are modeled as a function of the number of sellers of the good, the cost of producing the good (as compared to alternative uses of one's time and other resources), and so on.

Equilibrium, excess supply, and excess demand

Nowadays, much of the modeling is handled mathematically. For simplicity, and holding constant all relevant factors other than the good's own price, we might write for instance that

$$(1) Q_D = 100 - 10P$$

and

(2) $Q_S = -20 + 10P$

where Q_D is the quantity demanded and Q_S the quantity supplied. As stands to reason the larger is the value of P (price), the smaller the quantity demanded, hence the negative sign in equation (1). Similarly, the larger the value of price in equation (2), the more forthcoming are the quantities supplied, hence the plus sign in that equation. Since, by definition, any quantity *traded* involves the equality of what is demanded with what is supplied, we write

(3) $Q_D = Q_S$, i.e.,

(4) $100 - 10P = -20 + 10P$

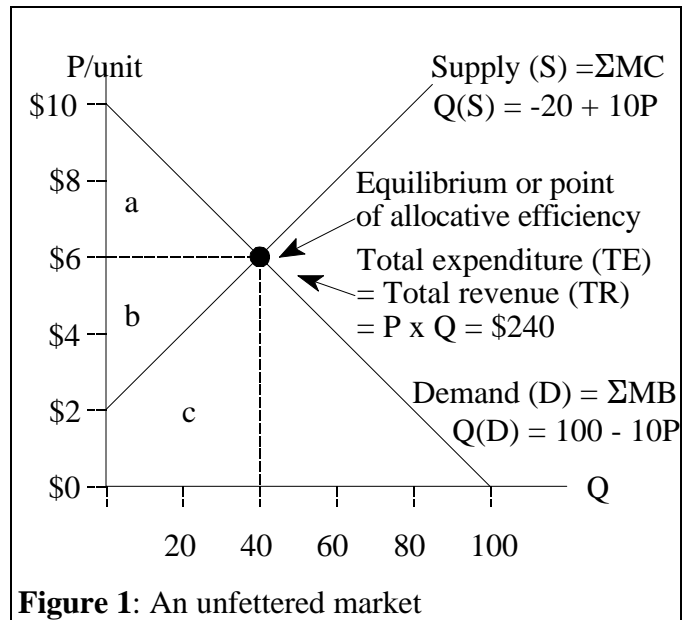


Figure 1: An unfettered market

and solve (one equation with one unknown) for price, $P = \$6/\text{unit}$. This result can be substituted back into the original demand and supply equations, (1) and (2), so that $Q_D = Q_S = 40$.

At the introductory level economists restrict themselves to geometric rather than algebraic representations. For simplicity, we usually confine ourselves to a two-dimensional space. Thus we draw figure 1, depicting price per unit (P/unit) on the vertical axis and quantity (Q), for a given time and geographic region, on the horizontal axis. The intersection of the demand and supply curves is referred to as the *equilibrium* in this market. Equilibrium means that this particular price-quantity combination of $Q=40$ and $P=\$6$ will remain stable into eternity *unless* one or the other of the many non-price determinants of supply or demand changes.

Note that the total expenditure (TE) buyers incur is $P \times Q$ or $\$6 \times 40 = \240 . By the same token, the total revenue (TR) sellers obtain is also $P \times Q$ or $\$6 \times 40 = \240 . (This is equivalent to areas “b” and “c” in the figure.) Also note that a price other than $\$6/\text{unit}$ cannot persist. If price were $\$8$, suppliers would wish to supply $Q=60$, but buyers would wish to buy only $Q=20$. The resulting *excess supply* of forty units causes a problem for suppliers. One handy way to eliminate the excess, over repeated rounds of trading, is by lowering the price until equilibrium is restored. Similarly, if the price were $\$4/\text{unit}$, buyers wish to buy $Q=60$ but sellers offer only $Q=20$. Over repeated rounds of trading, the *excess demand* is eliminated by a rising price until equilibrium is restored. (This can be demonstrated experimentally, and from time-to-time I have done so right in my own classroom.)¹

¹ For classroom experiments, see e.g., Brauer, 1994.

Buyer and Seller Surplus

Demand is defined as what buyers are willing and able to buy at a certain time given the circumstances they face. For example, *given* a certain level of disposable income, *given* the prevailing levels of advertising to which consumers are subjected, *given* buyers' own preferences of taste, style, and fashion, *given* the prevailing prices of complement and substitute goods, *then if* the price of the good is, say, \$8, buyers are willing and able to demand a quantity of 20.

Instead of proceeding from the price axis to the demand curve and then "down" to the quantity axis to read off the quantity demanded, an alternative is to reverse the process by saying that the person expressing demand for the 20th unit is willing and able to pay up to \$8, i.e., that this person subjectively values this good as worth of \$8 of his monetary resources. Eight dollars therefore measures the dollar value of the *benefit* this person assigns to and believes to derive from consumption of this good. Actually, we refer to this as the *marginal benefit* (MB), to emphasize that the \$8 value holds for the person demanding the 20th unit of good, but not for the person demanding, say, the 10th unit (whose subjective dollar valuation is \$9) or the person demanding the 80th unit of the good (whose subjective dollar valuation is \$2). The valuations vary because different persons attach different values to the same good. This is so in part because they each face different circumstances, such as different incomes, that influence their valuation of the same good. The sum of these valuations (Σ MB) measures the total benefit (TB) for the market as a whole and is visually represented by the demand curve (or marginal benefit curve).

Since the prevailing market price actually is \$6, it follows that the person who would have been willing and able to pay \$8 ends up saving \$2. The person willing and able to pay \$9, would save \$3, and the person willing and able to pay \$7 would save \$2, and so on. What buyers are willing and able to pay is the dollar value they assign to the benefit they expect the good to yield to them. The difference between the dollar value of the benefit (B) and the dollar value actually paid (P) is referred to as *buyer surplus* because it represents dollars the buyer now can expend on other, additional goods or services. The *total* dollar value of buyer surplus can be computed as the sum of *each* buyer's surplus. In figure 1, it consists of area "a," i.e., of the triangle defined by the area above the price of six dollars to the left of the demand curve, D. The area of the triangle is computed as

$$a = (\$4 \times 40)/2 = \$80.$$

In words, even though the buyers incur a total expenditure of \$240 (areas "b" and "c"), they *would* have been willing and able to spend an additional \$80 (area "a") because the total benefit as valued by them is \$320 (areas "a," "b," and "c"). One presumes that they are happy that they actually spent only \$240.

The same concepts apply to the supply side. Supply is defined as the quantity that sellers are willing and able to provide given the circumstances they face, such as the prevailing state of technology, the cost of inputs into the production process (e.g., raw materials, facilities, labor, interest payments to bond holders, dividend expectations of shareholders), and so on. All this amounts to a set of costs to the firm which determines what the firm is willing and able to offer to the market place. *Seller surplus*, then, is the amount that a seller can charge above and beyond the cost of

producing the good in question. For example, the producer supplying the 20th unit does so at a cost of \$4 (and that is the value the firm assigns to this good), but it can charge the market price of \$6, obtaining a seller surplus of \$2 in the process. More precisely, economists refer to this firm's cost as the *marginal* cost to differentiate it from other firms' costs (or, indeed, to differentiate this firm's costs when it produces, say, 20 rather than 25 or 30 units of output).

Since some producers are more efficient than others, some make more surplus than others. The *total* seller surplus is the sum of each seller's surplus. In figure 1, this is indicated by area "b" and, by coincidence, amounts to \$80 as well. The total revenue to sellers is \$240. Of that, \$80 is surplus. It follows that total cost to all sellers is \$160 (the dollar value of area "c," i.e., the area below supply and to the left of $Q=40$).

Maximized value: the point of allocative efficiency

To summarize the story thus far: the total dollar value that buyers assign to the quantities they buy is \$320, but their total expenditure is only \$240, resulting in buyer surplus of \$80. Similarly, the total cost of producing the goods is \$160, but the total revenue to the firms is \$240, resulting in seller surplus of \$80. Thus, the total surplus (buyer and seller) is $\$80 + \$80 = \$160$. A different way of putting this is to say that this market generated *surplus value* of \$160. But the term "surplus value" is already booked (in Marxian economics), and we therefore use the terms "value" or "total surplus," instead of surplus value.

Algebraically, if we define *value* (V) as the difference between benefit (B) to the buyers and cost (C) to the sellers, we can write

$$(5) V = B - C.$$

Adding and subtracting P from the right-hand side (RHS) yields

$$(6) V = B - C + P - P.$$

Rearranging (6) gives

$$(7) V = (B - P) + (P - C),$$

where the difference between benefit received and price paid ($B - P$) is the aforementioned buyer surplus (BS), and the difference between price received and cost incurred ($P - C$) is seller surplus (SS). Thus, the value generated in this market is equal to the sum of buyer and seller surplus. Value (V) is, as claimed, the same thing as total surplus (TS),

$$(8) V = BS + SS = TS$$

Given the set of circumstances which give rise to the demand and supply curves in the first place, it turns out that *there is no other combination of price and quantities in this market that will*

generate a greater amount of value! The equilibrium point in figure 1 is important not because of the trivial observation that supply and demand cross at that point, but because productive resources (such as raw materials and labor) *cannot* be allocated in any other way to yield a greater amount of surplus for society as a whole (where “society” is defined as the collective of buyers and sellers participating in all markets). The equilibrium point is therefore also referred to as the point of allocative efficiency. Since this conclusion — of the maximization of value — is true for *any* market, it is true for *all* markets.

Before proceeding, in section 2, to demonstrate the veracity of the statement that no other allocation of resources can result in value greater than that generated at equilibrium, I need to identify the set of assumptions under which this result was produced in the first place. Economists produce a long list of assumptions that includes items such as the following:

- there are many buyers and many sellers participating in each individual market
- the good is homogeneous (undifferentiated); a spade is a spade
- there is no brand recognition that confers advantages; indeed, advertising is unknown
- buyers and sellers are “well-informed”; there are no informational asymmetries
- participation in, and withdrawal from, the market is unimpeded (“free entry and exit”)

When *any* one of these assumptions is violated, the beautiful result of maximized value will not hold. Value will not be maximized, society-at-large loses some of the value it could have generated were an assumptions not violated. In section 2, I illustrate that when markets are interfered with, i.e., when the assumptions of the model of perfect markets are violated, value is reduced. But before showing that, I need to further impress upon you what generation of maximum value really means. It is crucial to impress you with that because the notion of maximum value — allocative efficiency — drives virtually everything in modern economies.

Return to figure 1. Suppose that you are the buyer buying the 20th unit of the good. You actually pay the market price of \$6 but, valuing the good at \$8, you generate surplus of \$2 for yourself. Rightly, you congratulate yourself for having made a good deal. You spent \$6 on something that, to you, is worth \$8. Suppose you were the seller of the 20th unit. You sell something for \$6 that, to you, was worth (“cost” to produce, including the cost of your time) only \$4. Rightly, you congratulate yourself for having made a good deal. Neither party engaged in unfair or deceptive trade practices; neither party cheated the other party. Both parties merely traded to their own, self-perceived best advantage. They are not selfish; they are self-interested. Both generate surplus. Both are happy. Because both stand to gain, both eagerly seek out opportunities to trade. They will resent, rightly, attempts to restrict or impede their *voluntary* trade. They *like* to trade, and they like it to be *free*, *private*, and *competitive!* Competitive means that there are many potential buyers per seller and many potential sellers per buyer.

A ready analogy to this conception of the operation of a perfect market is that of imagining a “perfectly healthy human being.” Physicians study an ideal type and then study disease as a deviation from the ideal type. Similarly, one may wish to view the “perfectly competitive market” as an ideal type (which occurs, if rarely enough), and economists study deviations from the ideal type (which occurs, if readily enough).

Economists did not develop this ideal type in order to discard it as they face “real world” markets. Rather, it is an ideal that is worth striving after; it is worth relentless pursuit — just as physicians relentlessly pursue the perfection of “health.”² The vision of the perfect market, and to bring about and achieve the outcome it promises (maximized surplus), is what inspires economists as they study *imperfect* markets — just as I hope my physician is inspired by what could be “right” with me (“health”), but is presently “wrong” (illness).

2. Economists’ misery: fettered markets, or how make perfect markets imperfect

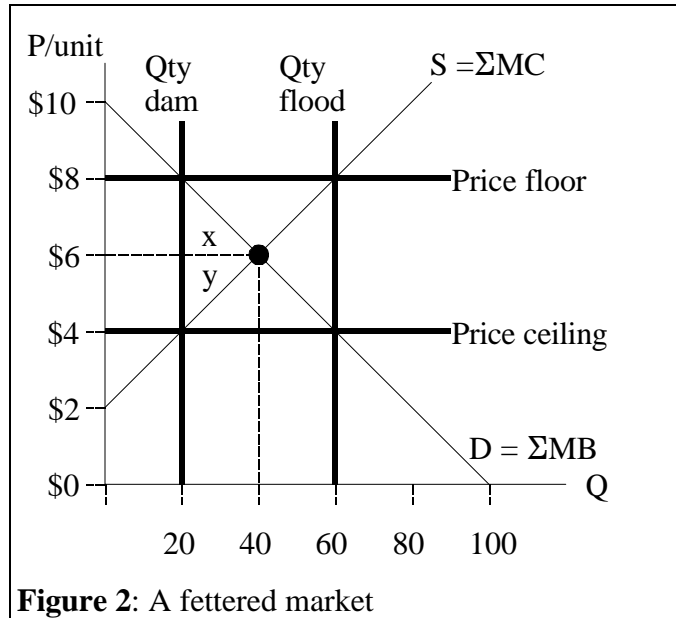


Figure 2: A fettered market

There are four fundamental ways in which to interfere with the perfect market as depicted in figure 1. Two of these occur from the price side (the price axis), two from the quantity side (the quantity axis). The two from the price side involve some agent or agency *setting* the price either above or below the \$6 free-market price that would prevail in the absence of intervention. The two from the quantity side involve some agent or agency *setting* the quantity to be traded either above or below the 40-unit free-market quantity that would be traded in the absence of intervention.

In figure 2, setting a price at \$8/unit is referred to as a *price floor* since the price is not permitted to fall below \$8, even though that is exactly what would occur under free market circumstances. Similarly, setting a price at \$4/unit is referred to as a *price ceiling* since the price is not permitted to rise above \$4, even though that is exactly what would occur under free market circumstances. On the quantity side, setting a limit to the quantity that may be traded (e.g., limiting the import of tons of steel) below the quantity that a free market would trade is called a *quantity restriction*, in essence erecting a dam that holds the traded quantity below its free-market equilibrium level. Not recognized, not even in the academic literature, is the obverse case, that of an agent or agency providing quantities *beyond* what the free market would trade. I call this case a *quantity flood* and will provide examples shortly (there are many).

Earlier I claimed that any intervention in the free market results in lost surplus or lost value to society. Let us compute the value lost for the example of the price floor set at \$8/unit. Precisely because the price is set at \$8, buyers demand a smaller quantity of the good: instead of $Q=40$ they ask for only $Q=20$. Therefore, even though sellers, induced by the artificially high price, would like

² Physicians make mistakes, to be sure, and so do economists. But, in the face of *learning* and generational changing of the guards, we do not deliberately abide by our mistakes for very long periods of time.

to supply $Q=60$, the actual quantity traded will be what buyers buy, i.e., $Q=20$. If the market were free, the excess supply would be eliminated through lower prices. But here, the volume traded in the market is cut in half, from $Q=40$ to $Q=20$. Instead of being free, this market is restricted.

What are the consequences? Since the volume of the market is cut in half, it follows that half of the potential buyers and sellers are being denied the opportunity to engage in *voluntary* trade! They are *coerced* not to trade to their own self-interested advantage. Buyers are told to go spend their money on some other good even though they would have preferred to expend it in *this* market. Sellers are told to forego production (and lay off employees) even though they would have preferred to produce for *this* market. Only the more efficient producers and the more desperate buyers will remain in this market.

For the surviving producers (those supplying $Q=0$ to $Q=20$) seller surplus increases since their cost of production has not changed but their revenue did, from \$6 to \$8/unit. For this half of the sellers still in the market, seller surplus now sums to \$100. In contrast, the sum of buyer surplus is reduced to \$20. Thus, we have

<u>Surplus</u>	<u>Before</u>	<u>After</u>	<u>Change</u>
Buyer (BS)	\$ 80	\$ 20	- \$ 60
Seller (SS)	\$ 80	\$100	+ \$ 20
Total (TS)	\$160	\$120	- \$ 40

Note that the loss in total surplus, or value, of -\$40 is equal to the dollar value of the two triangles, x and y , in figure 2. Economists refer to these triangles as *deadweight loss*. “Deadweight loss” because this is surplus that could and would have been generated but now is *irretrievably* lost to society.

The same kind of computation may now be carried out for the cases of price ceiling, quantity dam, and quantity flood. Without exception, the total surplus generated in the interfered market is *less* than the value generated in the free market.

To bring this discussion to life, consider some examples. Minimum wage legislation is an example of a price floor imposed by the federal government on the labor market. While one may debate the merits and demerits of minimum wage legislation on *social* or *political* grounds,³ there is no doubt that artificially imposed high wages reduce the quantity of labor services that employers wish to hire. The good news is that those employees who retain their jobs will receive a higher income. But the bad news is that some employees will be let go, and they will have no income whatsoever. Overall, figure 2 tells us, surplus will be lost to society-at-large. (Economists suggest that a more efficient way to assist low-income earners is to offer an income-tax *credit*, rather than to interfere with the workings of the free labor market.)

³ And I am sympathetic: after all at \$5.15/hour, a full-time employee working 2,000 hours a year, makes barely over \$10,000/year.

Another form of a price floor regularly crops up in the guise of agricultural “price supports” which are government guaranteed minimum prices for certain categories of crops. This form of a price floor is economically more insidious than minimum wage legislation because government, by guaranteeing minimum prices, also guarantees to purchase the resulting excess supplies. In terms of figure 2, a minimum price of \$8/unit will lead private buyers to buy only $Q=20$ but induce farmers to produce $Q=60$ with the government (i.e., taxpayer) purchasing, storing, and subsequently often destroying the excess production of $Q=40$. (If instead of a “price support” scheme one pays farmers to “idle” production, i.e., to pay them not to plant, the very same economic outcome results, as is shown further on under the quantity dam rubric.)

An oft-discussed example of a price *ceiling* is that of rent control in housing markets, particularly in urban markets such as Berkeley, CA, Boston, MA, or New York City. Here local, rather than state or federal, government steps in and prescribes the maximum amount of rent that a landlord may charge for some standard-footage apartment size. At first blush, this appears to be a good deal for tenants, but if landlords cannot earn a sufficient return on their investment, they might as well invest their funds elsewhere (either in unregulated housing markets or in another industry altogether). Thus, the long-run consequence is that the existing housing stock dilapidates, or that part of it is converted into condominiums, and that new housing construction falls.⁴ Eventually, the number of apartments available for rent falls, and less housing is supplied to the market. Those who remain in apartments gain from lowered rents, but those forced out of apartments lose. Again, the arithmetic underlying figure 2 tells us that society-at-large loses: the gainers’ gain is less than the losers’ losses.

Now consider a quantity restriction, a *quantity dam* as I have called it. Most commonly discussed in the US are import restrictions such as limiting the number of automobiles Japanese producers are permitted to export to the US, or the number of tons of steels South Korean or Brazilian exporters are permitted to ship into the US, and so on. The economic consequences are not benign. Limiting the available supplies drives up the market price. At first, this appears to be desirable since higher steel prices for US manufacturers makes those manufacturers more profitable and sustains steel production and steel employment. But the offsetting impact is that US manufacturers of automobiles and washing machines and skyscrapers (steel skeletons) and sundry other products are harmed by higher prices of steel, and so are their customers.

Yet again, figure 2 demonstrates that the economic gains to US steel producers are outweighed by the economic losses of everyone else in the US.⁵ The computation is straightforward. If the quantity traded is restricted to $Q=20$, then the price that emerges in this market is $P=\$8/\text{unit}$ (since at that price buyers are not willing or able to buy more than $Q=20$). Areas x and y represent the dollar value of prohibited trade, i.e., of lost surplus (\$40). The loss is far from trivial. One study (Winston, 1993), summarizing the effects of deregulation in the airline, railroad, trucking, telecommunications, cable TV, brokerage, and natural gas industries, estimates the gains since the deregulation movement

⁴ Moreover, a reduced and/or dilapidating housing stock will be appraised at lower value and reduce the amount of property tax collected by government.

⁵ Oddly, when investigating complaints about “cheap” imports, current US law does not permit US government agencies to take into account the harm caused to US buyers.

began in 1978 at between \$36-\$46 *billion per year* (in 1990 dollars), and that is, by construction, likely to be an underestimate of the gains from deregulating previously restricted markets. This does not include gains to be had from deregulating other industries such as water, electric utilities, aforementioned agricultural commodities (peanuts, sugar, wheat, cotton, you name it ...), and a multitude of other markets. Numerous other studies have computed the huge cost of “protecting” American automobile or steel workers jobs by limiting imports. The net cost to society-at-large per job saved regularly far exceeds the protected workers’ annual income, often by a large multiple. For example, in the mid-1980s, each auto worker job “saved” resulted in a net cost of between \$95,000 and \$220,000, the latter estimate being roughly ten times the already high auto workers’ annual income (at the time). The implication is that we could simply have paid these workers their annual wages and benefits, asked them to work not at all, and *still* be much better off by abolishing the import restriction.⁶

Finally, consider the case of horse manure. Some years ago *The Wall Street Journal* reported on a US Department of Agriculture field station in rural Vermont. The station really had nothing to do at all since farming in Vermont is not a sizable economic activity anymore and hadn’t been so for many a year. Yet the field office, in need of justifying its own existence and budget and employment of field officers, kept busy by volunteering to cart a private country club’s horse manure away — at taxpayers’ expense. Surely, the members of the country club could have and would have been willing and able to conduct this smelly business on their own. But they were glad to have their cost of doing so lowered to zero by having the field office take care of this odious job. This is an example of a *quantity flood*, an oversupply beyond what the free market would have done on its own accord. Yet again, figure 2 shows that society-at-large loses. Other examples readily come to mind: parents that fraudulently sign up their children for federally subsidized school lunch programs; people building and rebuilding beach homes whose reconstruction costs are federally insured (thus lowering private market insurance rates below the market value that otherwise would obtain); western ranchers grazing cattle on federal lands at near zero cost; federal giveaways of mineral-mining licenses on western lands; and so on. If, in figure 2, the quantity flood is set at $Q=60$, the resulting “market” price will be $P=\$4$. That this is inefficient can be seen by noting that the buyer of the 60th unit values it at \$4, whereas the cost of providing the 60th unit is \$8. It follows that total surplus would have been larger were the seller not compelled to incur a loss on the 60th unit.

In sum, any time the free market is tempered or interfered with, the potentially available dollar value of total surplus to society is reduced. The sums involved are not small and probably go into the hundreds of billions of dollars each year for the US alone.⁷ The primary message of this section is clear: generally it is not the *presence* of free markets, but the very *absence* of free markets that causes the problems lay people falsely associate with unfettered “free market” economics. Much of the

⁶ On the auto industry, see Nelson (1996)

⁷ Yet another type of intervention is to tax either buyers or sellers. Although I will not show it here, it is easy to demonstrate that yet again the dollar value of potentially available surplus falls. In the case of taxation, however, the deadweight loss is not necessarily *irretrievably* lost to society since the object of taxation is to expend the funds on purchases of goods and services, in other markets, that presumably yield benefits to its buyers and sellers.

malaise underlying the current economic disturbances in Southeast Asia, and Russia, are not due to free market economics, but to the absence of free market economics.

3. Market failure: sources and examples

Section 1 set up the ideal type of free, private, competitive markets. Section 2 showed that if a market is fettered by man-made intervention, some segments of society gain but their gain is less than the larger expense caused to other segments of society. I left the strong impression that fettering markets by means of regulatory intervention is not only economically inefficient (reduced surplus), but morally wrong: by what right does government restrain people from *voluntary* association in order to engage with one another in mutually beneficial trades? Is, therefore, all economic regulation wrong? No. In this section we learn about cases where regulation is needed for the proper operation of markets. In this section we learn that the *absence*, rather than the *presence*, of regulation causes harm. In this section we learn that much of the malaise underlying the current economic disturbances in Southeast Asia, and Russia, are not due to the presence of regulation, but to their absence.

In this section, then, I examine and discuss cases not of markets fettered by unwise, man-made, surplus reducing interventions but of markets whose surplus is reduced for other reasons, markets that therefore require wise, man-made, surplus increasing intervention. These reasons generally involve violation of one or more of the assumptions listed in section 1. Table 1 provides a set of categories of market failures as well as domestic and international examples. The easiest-to-understand violation of an assumption is that of “many sellers.” Suppose that instead of many sellers there is only one, traditionally referred to as a *monopoly*. Monopoly can arise from a variety of sources. For example, government may grant copyrights to works of art and literature (including scholarly and scientific writings), government may grant patents to inventors, and government may issue licenses (e.g., to registered nurses and taxi cab firms and thereby create a monopoly of sellers of nursing services and taxi cabs). Alternatively, monopoly may arise when a firm owns a critical input and therefore controls the production of the output made possible by that input.⁸ Monopoly may arise for a variety of other reasons as well, and among those is the plain reason that one competitor may have “out-competed” all the others. (Indeed, one might quip that it is one duty of antitrust enforcement agencies to stoke everybody to run without letting anybody “win” the competitive race.)

When competition breaks down (when the competitive race ends), monopoly conditions arise. Although I do not do so in this essay, it can be shown that monopoly conditions are *analytically exactly equivalent* to the case of a quantity dam in figure 2. As compared to the case of perfect competition, buyers of monopoly products buy less ($Q=20$ instead of $Q=40$) and pay more ($P=\$8$ instead of $P=\$6$). The free, private, competitive market *fails* to deliver its promise — maximized total surplus — and this, and only this, is the sole justification for the existence of antitrust

⁸ For example, DeBeers still owns the vast majority of the world’s diamond mines, and it therefore exerts a major influence in the market for finished diamonds; only Microsoft owns the computer source code to the *Windows95* and *Windows98* computer operating systems; for a while only *SoftSoap* owned all the cheap plastic valve caps on soft soap bottles, thereby stifling entry by competitors into the liquid soap market.

Table 1
Illustrative table of national and international market failures and policy responses

FORM OF MARKET FAILURE	NATIONAL (MAINLY THE US)		INTERNATIONAL AND GLOBAL	
	EXAMPLE	POLICY RESPONSE	EXAMPLE	POLICY RESPONSE
<i>Public goods</i>	Lighthouses Highways Maintaining law and order	Government provision, financed from taxes and user charges National guard, conscription	Protecting the ozone layer Information superhighway Peace-keeping	Montreal protocol <i>None</i> UN peace-keeping, NATO
<i>Negative externalities</i>	Urban air pollution River pollution by paper mill	Clean air act Regulation	Emission of CFCs Marine oil pollution	Montreal protocol <i>None</i>
<i>Positive externalities</i>	Education Polio vaccination Home ownership	Govt provision, subsidies, tax breaks Government provision Tax deductibility of interest costs	Education (“reverse brain drain”) Smallpox vaccination Maintaining rain forests	<i>None</i> WHO program Debt-for-nature swaps
<i>Competitive breakdowns</i>	Standard Oil Co. (US) Railroad monopsony Natural monopolies	Sherman Anti-trust Act Promotion of competition Regulated public utility	OPEC US and EU auto markets Agricultural subsidies	Petrodollar recycling <i>None</i> GATT/WTO negotiations
<i>Information failures</i>	Effects of tobacco Interest rates on loans Investment information	Surgeon-General’s warning Truth-in-lending Full disclosure at NYSE + SEC	Nuclear testing Two-tier foreign currency market	<i>None</i> <i>None</i>
<i>Incomplete markets</i>	Credit for small business Insurance for the elderly	SBIC Medicare, Medicaid	Capital & credit for LDCs Balance-of-payments insurance	World Bank/IDA IMF (in theory)
<i>Merit goods</i>	Music and the arts	Subsidies, tax breaks	Preservation of historic treasures	UNESCO

Source: Ruben Mendez, “War and Peace from a Perspective of International Public Economics,” pp. 307-336 in Brauer and Gissy (eds.), *Economics of Conflict and Peace* (Aldershot, UK: Avebury Press, 1997). The table appears as table 14.1 on p. 309.

authorities. The charge of antitrust authorities is to prevent monopoly from arising (e.g., by approving or failing to approve applications for mergers and acquisitions on the basis of their likely impact on competition) and, if necessary, to break up existing monopolies (Standard Oil, AT&T, and perhaps Microsoft).

Another assumption that must hold for perfectly competitive markets to yield their fruit of maximum total surplus requires that buyers and sellers both are “well-informed” about available products, about the intrinsic product qualities, about each other, about prices, about incomes, and so on. In real life of course this is rarely the case, and we refer to this as *information failure*. For example, when your car mechanic informs you that your car needs a \$400 brake-job done, what do you do? When your physician tells you that yet another \$60 X-ray is necessary, what do you do? When your lawyer tells you that yet another expert witness (at \$150/hour) is necessary to argue your case, what do you do? When your professor tells you to read yet another 30-page article for next class, what do you do? All these, and many more, cases share the characteristic that one party to the trade (the potential buyer, broadly understood) is *not* well informed, is inadequately informed or even ignorant, about what the potential seller is selling. Informational asymmetries of this kind create market power for one side of the market and lend themselves to potential abuse of market power in the form of higher market prices and, therefore, reduced quantities traded. Market failure leads, once more, to a reduction in potentially available surplus for society-at-large.

To deal with and curb the worst of abuses, government often intervenes and rightly requires disclosure of information. Thus, cigarette makers need to put health warnings on their products, financial institutions need clearly to identify the ultimate dollar amount of interest charges that consumers pay on bank loans, and so on. Of course government frequently regulates where the free market is entirely capable of regulating itself, even if this self-regulation leads to absurdities such as styrofoam coffee cups in fast-food places being labeled, in multiple languages, “Caution: this is hot coffee, and it may burn you.” If government regulates unnecessarily, it absorbs resources (from taxpayers) to craft and enforce the regulation, and it thereby imposes additional costs on sellers and on buyers. When government regulates unnecessarily, total surplus shrinks. But when government regulates in order to improve or reduce or eliminate informational asymmetries, total surplus may rise as the market moves in the direction of meeting the assumption of “well-informed” buyers and sellers. It is of course precisely for this reason that those holding informational advantages resist regulation (and finance campaigns, lobby, and vote accordingly), whereas those facing informational disadvantages encourage regulation in their own favor. (It follows that a *market for regulation* emerges but, again, I shall not pursue this interesting avenue here.)

A different form of market failure occurs in the case of *thin or incomplete markets*. A thin or incomplete market is one in which demand is weak, too weak perhaps to entice suppliers to produce and provide the good or service in question. Alternatively, even if some suppliers operate in this market, demand is too thin to generate economies-of-scale and this results in unusually high average costs and prices. For example, the cost of processing a \$10 million loan application is not significantly different from the cost of processing a \$100,000 loan application. Thus, per dollar lent, the cost of processing the smaller loan is unusually high. Consequently, the small-business loan market is underserved and some form of intervention may be economically justified. (Whether or not that *necessarily* justifies the existence of the US Small Business Administration and its small business loan

program is open to question, for conceivably the market, if left to its own devices, might invent other ways of serving this segment of buyers of loans. Government's vicarious role may stifle or altogether prevent innovation in the financial markets.)

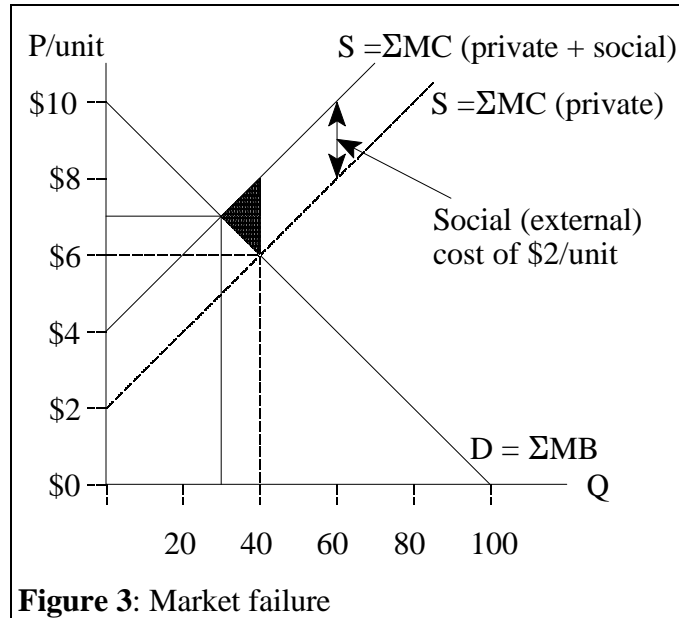
Merit goods are goods for which market demand is thin. Not only is market demand thin but market supply might die out, so that society's capacity to produce this good also dies out. For example, were it not for public subsidies of various kinds, it is virtually unquestioned that the production of items of fine arts would suffer severely. Few baroque music ensembles would survive in genuinely unfettered markets. Subsequently, interpreters of art would diminish in numbers (e.g., professors of music and art historians). Only because society attaches *non-market value* to the production of articles of fine art — a class of goods deemed to possess intrinsic merit — does it subsidize their production via taxpayer payments in spite of their relative lack of market value. Of course exactly what is of merit and demerit is subject to debate, sometimes fierce debate, and yields yet another insight: if the *market* does not ration the quantities traded by means of the free interplay of supply and demand that determines market price, then a rationing device *other* than price must be found to determine the quantities produced and consumed.⁹

Externalities, negative or positive, are defined as economic costs imposed or benefits bestowed upon a third party, a party other than the supplier and the demander of a particular good or service. Economists are highly respectful people. We respect that a smoker and a tobacco company voluntarily contract with one another to exchange money for cigarettes — we only wish to ensure that the two bear the full cost of their transaction and do not pass part of the cost on to non-smokers, for example in the form of higher health-insurance premia for non-smokers to subsidize the health needs of smokers. If gun buyers and gun sellers wish to transact with one another, economists respect that, provided that the cost is fully borne by them as a group and not borne by taxpayers in the form of higher police force costs, higher subsidies to hospitals to treat the injured, and increased judicial costs to prosecute and incarcerate those who abuse their guns as they commit crimes. If these *social costs* were internalized, i.e., if smokers' health-care premia tripled, and if gun prices quadrupled to reflect these social costs, the quantity of cigarettes and guns bought would be reduced. So long as the gains are privatized, and (some of) the cost is socialized, the private market *fails*; surplus is reduced below what it would be if the social cost were internalized and borne by those bringing these costs into existence. For this reason — because we can show that total surplus *increases* when externalities are internalized — economists recommend regulation.

Consider figure 3. If the private cost of producing the 40th unit is \$6 but the externalized, social cost (paid by others) is \$2, then the total cost of producing the 40th unit really is \$8 even though the market price is only \$6. If one were able to regulate this industry and make it internalize the social cost (so that what was a social cost becomes a private cost of production) the market price would

⁹ For example, if rent control negates the rationing function of price in the market for housing, then the limited supply of apartments must be allocated to the large number of potential renters by a means other than market price. This device might be a nightmarishly complicated bureaucratic scheme that tells people who may occupy which apartment when, or it might involve black markets ("key deposits," "furniture" purchases), nepotism, and the like. Economists prefer rationing by free-market prices. It is the best, simplest, and most easily monitored rationing device we know of.

rise. In the figure, it would rise to \$7 because sellers would not be able to roll over all of the internalized social cost to buyers. The effects are threefold: buyers of this product lose because instead of \$6 for 40 units, they pay \$7 for only 30 units. Sellers (and their employees) also lose because some of them go out of business (Q=40 to Q=30) and the remaining sellers sell the product for a dollar more (\$7 instead of \$6, but their costs increased by \$2/unit). But *society-at-large* gains. To show this to be true, compute buyer and seller surplus before and after the internalization of the externality:



Base case

BS (\$4 x 40)/2 = +\$80
 +SS (\$4 x 40)/2 = +\$80
 =TS = +\$160
 -TSC (\$2 x 40) = - \$80
 =TSS = +\$80

Externality internalized

BS (\$3 x 30)/2 = +\$45
 +SS (\$3 x 30)/2 = +\$45
 =TS = +\$90
 -TSC = \$ 0
 =TSS = \$90

Buyer surplus (BS) and seller surplus (SS) are computed as before. Their sum is total surplus (TS). But in the base case, we need to subtract to total social cost (TSC) imposed by market participants (e.g., smokers) on non-market participants (the rest of society). If 40 units are traded and the social cost is \$2/unit, then the total social cost is \$2x40 or \$80, to be subtracted from the apparent total surplus. From society’s point of view, then, total social surplus (TSS) is only \$80, rather than the apparent surplus of \$160.

In the case of internalized externalities, total surplus is \$90. Clearly, the buyers of this product lose buyer surplus (from \$80 to \$45), and the sellers lose seller surplus (also from \$80 to \$45). Here, however, we do *not* need to subtract any social costs since these have been internalized. Thus, total social surplus is \$90 — and this is \$10 more as compared to the base case. As was my claim, internalizing an externality raises value for society. The \$10 value difference is equivalent to the dollar value of the highlighted triangle in figure 3. The reason for this is that, for instance, at Q=40, buyers subjectively valued the good at \$6 whereas the social cost is \$8. Buyers should not have bought and would not have bought the product (since cost is greater than benefit) were it not that the cost had been subsidized by society. Buyers overbought and sellers oversupplied this good.

A *positive externality* is the obverse case. Here an economic activity, a trade between a supplier

and a demander, results in *unpaid-for benefits* for a third party. For example, if I buy rose stocks from my garden-supply center, and my neighbors derive enjoyment from my roses, then they receive a benefit at no cost to them. This is an innocuous, if charming, example. Let's pick another one. Educating undergraduate students at private universities reflects a contract between demanders (students and their parents) and suppliers (the universities). One presumes that the universities benefit and that the students benefit. Who else benefits? Most obviously, future employers gain (since graduated students are thought to be more mature and productive employees than un-graduated ones). Yet future employers do not usually finance the education of future employees. Therefore, higher education (all education, really) would ordinarily be undersupplied in the free, unfettered market. The free market *fails* to deliver maximum surplus. The benefits of education range far beyond those for future employers. It is well known, for instance, that educated people on average are less prone to violent and criminal behavior, are more civil and civic-minded, cause fewer problems with reckless drinking and associated behavior, look after their own and their children's health and well-being more vigorously, and participate in public life and go to the polls to vote more often, all of which generates unpaid-for benefits to society. It is because society recognizes benefits that go beyond the private contract between student and university, that their governments subsidize education (primary, secondary, and post-secondary education). The aim is to encourage the increased production and consumption of the good "education," thereby increasing total surplus.¹⁰

Enabling institutions

An assumption *not* listed in section 1 is that people must be free to own property. If I do not possess property rights in what I wish to sell, I cannot participate in a market (in an exchange).¹¹ Usually, buyers sell money in exchange for a good or service, and sellers sell the good or service in exchange for money. I myself, for instance, sell labor services for money that the buyer, my employer, offers in exchange. For markets to function, property rights must be well defined, they must be secure, and they must be enforced. Suppose for instance that your car could be driven off by anyone without fear of reprisal. Why would you, or anybody for that matter, buy a car in the first place if anyone could just drive off with anybody else's car? Lack of property rights, or insufficiently enforced property rights, increases uncertainty. This, in turn, reduces the quantities traded in the market and therefore reduces the potentially available surplus.

Economists refer to property rights as one example of a class of *enabling institutions*. The

¹⁰ The debate over school vouchers is *not* a debate over the value gains from subsidized education but a debate over a more efficient way of doing so. Subsidized education supplied via a monopolized public school system partially negates the value gains. Subsidized education supplied by competing schools paid via school vouchers is likely to further increase the value gains.

¹¹ More precisely, I cannot participate in a *legal* market. There are of course plenty of illegal markets, both for rightfully owned property as well as for unlawfully possessed property, and economists study these markets as well because they often yield valuable information. For example, black currency markets are very informative about what a country's exchange should be.

remaining source of market failure listed in table 1 — so-called *public goods* and, by extension, common-resource pool and club goods — is tightly interwoven with the notion of enabling institutions, such as property rights. But this requires a separate section altogether. Hence, we progress to section 4.

4. Beyond private goods

A taxonomy of goods and bads

Consider figure 4, a taxonomy of goods. The southwest corner depicts a *pure private good* — a piece of cheesecake — whose

privateness is characterized by two factors: first, if person A consumes the piece of cake, person B cannot consume the same piece also (so that the benefit the good yields is *rivalrous*); and, second, if person A does not pay the owner for the piece of cheesecake, A can be excluded from consuming the good (its benefits are *exclusionary*). Thus, for private goods, the degree of rivalry is high, as is the degree of exclusion.¹² It is these private goods that I discussed in some detail in sections one to three. Section 1 set the stage, section 2 perhaps reinforced the current “pop-economics” notions about the ascendancy and triumphant dominance of unfettered markets, but section 3 strongly suggested that regulation of economic activity is in fact necessary to correct or mitigate violations of assumptions underlying the model of perfect markets. Section 4 opens up a much vaster plain of goods and services to view, a plain that reaches far beyond the domain of private goods, a domain that “pop-economics” cannot reach, and a domain of crucial importance as we enter the 21st century.

The northeast corner of figure 4 depicts a *pure public good*, a good that, once provided, yields simultaneous benefits to all, i.e., a good whose benefits cannot be “used up” by any one beneficiary. Watching a sunset is an example since the enjoyment person A derives from watching the sunset does not detract from person B’s ability to enjoy the same sunset. The sunset is *non-rivalrous*. At the same time, the sunset is *non-exclusionary* since it is not feasible to exclude anyone from watching the sunset (the exclusion cost would be too high). Thus, the sunset is a *pure public good*; its benefits are non-rivalrous and non-exclusionary. I suggest that international security and global peace is another example of a pure public good, and I will return to this example later on.

The northwest corner of the figure depicts a *pure common-resource good*, a good whose benefits

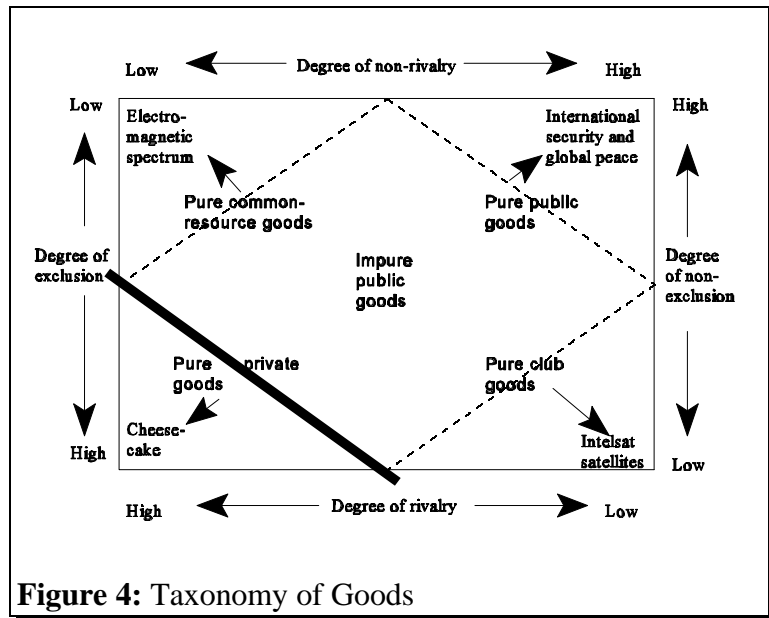


Figure 4: Taxonomy of Goods

¹² Others, for example Stiglitz (1988) and Holcombe (1996), have created figures similar to figure 4 but for different purposes, and certainly without regard to *global goods*, a highly important category of goods which I discuss later on.

are rivalrous in nature; even so, no one can feasibly be excluded from enjoying its benefits. The electromagnetic spectrum is a *pure common-resource good*. In principle, no one can be excluded from using the electromagnetic spectrum. For instance, since no one rightfully owns the spectrum, no one can rightfully be excluded from generating and beaming radio signals. But, clearly, the spectrum is rival since A's broadcasting on a specific frequency causes signal-interference when B broadcasts on the same frequency at the same time.

The southeast corner of the figure displays a *pure club-good*. A club good is one which by means of an exclusion mechanism makes goods non-rival even though they are, in principle, rival. That is, in the absence of exclusion, the good probably *would* become rivalrous due to crowding or congestion. For example, a nearly empty highway is non-rival since A's benefit of using it is not appreciably affected by B's simultaneous use. Moreover, since A cannot exclude B from driving on the highway, it is also non-exclusionary. Indeed, an empty highway is an example of a pure public good. But as usage increases, the highway becomes a commons-good and falls prey to Hardin's (1968) concern about resource overuse (traffic jams). To resolve the problem, an exclusion measure may be created — a private, toll-based, turnpike for instance — that excludes those unwilling or unable to pay. Within the group of payers, non-rivalry is re-established. The highway becomes a club good. A club, therefore, is an institution that uses *incentives* (fees) to assist in resource management.

Intelsat (www.intelsat.int) provides an interesting example. Geostationary satellites must orbit at 22,300 miles above the earth-equator, balancing centrifugal with gravitational forces. This physical requirement constrains satellites to an orbital band of about 165,000 miles in circumference. Additionally, to avoid signal interference when receiving signals from and relaying them back to earth, the satellites need to be spaced from one another at considerable distances (about 200 miles, although over time this may narrow with advances in technology). This leaves a total of roughly 800 satellite positions, most of which are already occupied. Indeed, many orbital areas are crowded, especially over areas covering North America, Europe, and the Indian Ocean. Geostationary orbital space is a scarce good. It is rivalrous in nature. But no one can be excluded from its use. If person A hauls a barge, a launch platform, a rocket, and a satellite into international waters to launch his/her very own geostationary satellite into space, so be it.

Crowding can be relieved through voluntary association by converting a common-resource good into a club good. This is what Intelsat does. Intelsat is a membership organization consisting of more than 140 public (governmental) *and* private (non-governmental) parties. Jointly they operate 19 satellites and regulate access through usage-based charges. A point of utmost importance — in this example and for the later consideration of international security and peace — is that geostationary orbits still are no one's private property, nor was the creation of any supra-national, world-wide *government* necessary, only the creation of supra-national *governance* by means of a private, *voluntary* association, a club.¹³

Return to the northeast corner of the figure. It displays an example of a *pure global public good*, namely international security and global peace. Once provided, global peace is non-exclusionary (one

¹³ On geostationary orbital matters, see the interesting accounts by Mendez (1992, pp. 253-258), Fischer (1997, p. 343), and Sandler (1997, pp. 157-158).

cannot be excluded from enjoying its benefits). It is also non-rivalrous (the peace that benefits A does not diminish the peace that benefits B). In striking contrast, national military expenditures for purposes of national defense are a pure public good only when seen purely from a nation-state point of view. Seen from a global point of view, one nation's public good may become another nation's public *bad* on account of negative externalities (Garrett, 1997; Mendez, 1997). This is the classic arms-race scenario. India arms to defend itself. But to Pakistan, India's arming is a threat; so Pakistan arms some more to defend itself. This, in turn, is a threat to India, and so on. What is rational for each may become irrational for both. What is a national public *good* for each of two nation-states when considered individually becomes a international public *bad* when considered jointly.

In figure 4, position changes are possible. For instance, *regional* security and peace, rather than its *global* version, may be achieved by members of a military alliance. Members in essence form an *international club* that provides non-rivalrous defense services in case of an attack by a non-member. In addition, because membership and a membership "fee" is required, the good is exclusionary. Defense services can be withheld from non-members. A military alliance thus meets the definition of a club good.¹⁴ Unfortunately, by analogy, what is an *alliance* public *good* for each of two opposing military alliances can become a mutual public *bad*.¹⁵ Global peace still would be the better buy.

Free-riding behavior and lack of property rights

Why is it that demand and supply readily emerges for private goods but not for public goods? For example, even though there is clearly much private demand for flood protection (levees, dams, flood plains, catchment areas, etc.), private supply of flood protection is rarely forthcoming. Usually, a governmental agency has to step in, coerce payment in the form of taxation, and then provide the good that people evidently desire. Or, why is it that plenty of people enjoy "commercial-free" *National Public Radio* broadcasts and yet it is *not* an entirely privately provided good? Why is it that global peace is clearly in demand, yet there are no private, nor reliable state suppliers of peace? Why are there no suppliers of peace services?

The answer to these puzzles lies in that all these goods are non-rivalrous and non-exclusionary.

¹⁴ Alliance membership actually is an *impure* international club good — providing partially (international) public and partially (national) private benefits — since, empirically, it appears that some members of the club free-ride, or "easy-ride," on the larger contributions of certain other members. In the case of NATO, the US seems to have provided a disproportional share of NATO's burden — implying easy-riding by non-US NATO members — and the USSR probably allowed its fellow WTO-members some degree of easy-riding as well (see Cornes and Sandler, 1996, *passim*; also see Sandler, 1992, pp. 99-106).

¹⁵ Moreover, the cold war between US-led NATO and USSR-led WTO generated spill-over effects (externalities) and affected countries that were not members of either alliance. For example, the "proxy wars" fought in Asia and Africa, the influence seeking in Latin America, the propping up of non-democratic regimes around the globe, and the sponsoring of revolutions and counter-revolutions in developing nations, are generally viewed as spill-over effects stemming from the US-USSR cold-war rivalry. These have abated, to some degree, with the end of the cold war, generating positive externalities stemming from the global public good of increased international security and peace (Garrett, 1997).

If any of these goods were provided then no one can be excluded from its use. Therefore, once provided by the first payer, all other potential demanders have a strong incentive to free-ride on the expense of the first payer, i.e., they suddenly possess a strong incentive to get something for nothing. But if, for the first payer, the expense of supplying the good outweighs the benefit, then there will never be a first payer. This is an instant of a *missing market* — even though people desire the good, it will not be supplied. For example, no militarily capable nation-state has an incentive to provide global peace services. For all but a handful of nations, the expense would be extraordinary, the benefit minuscule. It is much easier to free-ride on the efforts others make — if they would but make it! Instead, the peacekeeping pattern that we do observe is strongly influenced by the *private*, nation-state, benefits a nation receives. For instance, the United States intervened in Haiti or in Somalia or in Kuwait as the perceived benefits to the *US* outweighed the costs to the *US*. The *US* and *NATO* intervene in the Balkans as the benefits to *NATO* members of preventing a major Balkan war from spreading to elsewhere in Europe exceeds the cost to *NATO*. It should give everyone pause to note that *NATO* has done little to curb the slaughter in the Balkans but that, in contrast, it has done much to keep the slaughter bottled up and contained within the region! Free-riding and the theory of public goods explains why.

The problem of free-riding is limited to instances of *public goods*. A related problem applies to *common-resource goods*. The example of the electromagnetic spectrum, used earlier, illustrates that not being able to exclude people from using a particular frequency results in overuse of frequencies. Similarly, not being able to exclude people from oceanic fishing (fish in the ocean are nobody's property after all) results in overuse of the resource. Not being able to exclude people from grazing their cattle on common lands, results in overgrazing. Not being able to exclude the United States from polluting air that rains down as acid rain in Canada, results in overuse of Canadian airspace. And so on. Non-exclusion becomes a good's critical characteristic, and therein lie attempts at solving these problems. Sometimes, exclusion mechanisms can be invented by forming a club. A military alliance excludes non-members from protection. Intelsat excludes non-payers from using its geostationary satellites.¹⁶ For many generations, fishermen and farming communities regulated access to the commons by means of fascinatingly inventive social sanctions and punishments, intricately varied across time and culture (see, e.g., Anderson and Simmons, 1993). But at other times, exclusion mechanisms do not work because exclusion presumes private or communal, and enforced, property rights. But since no one owns the oceans, no one has property rights in oceanic fish stock, and therefore they tend to be fished to exhaustion and ecological collapse. No one owns global peace, therefore no one possesses a workable incentive for its preservation.

Where there is no property, there is no market. Note well then that it is not the *presence* of some rapacious free market forces, but that it is the very *absence* of market forces, that produce these results! Consequently, economists think about creating and assigning property rights in order to inject market forces into these cases. Within a nation-state, government may vicariously arrogate unto itself property rights in broadcast spectrum, and then auction off the spectrum to the highest bidder. But across nation-states, it is still much more difficult to appropriate or create and assign property rights

¹⁶ Non-members may use Intelsat satellites upon payment of access fees.

in global peace for instance, although occasional successes are noted, such as in the case of global agreements to reduce CFC-emissions.¹⁷

Taking a walk in goods-space

As various examples showed, goods are not necessarily permanently lodged in the goods-space of figure 4. Goods can migrate from common-resource good to club good (Intelsat) or from public good to common-resource good (highways) or from private good (national defense) to public bad (interstate threat of war). Briefly consider another two examples. They are unusual, but nonetheless economic, examples of goods: marriage and religion.¹⁸ I do not possess a private property right in my wife. But I do possess a *contract*, a marriage contract. It was voluntarily entered into and mutually agreed upon. There was no coercion. Even though this contract does not exist in physical form (although it could), it does exist in *legal* form. Family and marriage law in most societies recognizes that a man and a woman *contractually agree* to restrict mating access to each other. Man and woman therefore create a private good with the characteristics that their relation is rival and exclusionary. That is, upon entering the contract only I may have access to my wife and you, by force of the mutually agreed upon contract and the law and social agencies that enforce the contract, are excluded from mating access to my wife. The relation is “holy,” i.e., separated from others. The relation between husband and wife is a private good whose existence and private property sphere is signaled by symbols such as wedding ceremonies and the public display of wedding bands.

Infidelity, economically speaking, is the attempt to convert a private good into a common-resource good, a situation in which the good (the exclusive marriage relation with its prerogative of mating access) is still rival, but non-exclusive. Non-exclusion leads to the destruction of the private good, the marriage. If infidelity means wandering off in goods-space from a private good to a common-resource good, then a polygamous relation, a *legal* polygamous relation, would be wandering off in goods-space from a private good to a club good. A high degree of exclusion still exists, but rivalry (by design) is reduced. Love, caring, marriage, fertility, divorce, remarriage, and so on, all are topics that fall within the domain of explicable behavior by means of economic analysis, as do breach of contract (infidelity) and other forms of mating arrangements such as polygamy. The predominant analysis of marriage is of course as a private good (Becker, 1976), and we have already analyzed that. In principle the marriage market is no different from any other private good market.

Religious behavior is another unusual good economists analyze. As the marriage and other examples demonstrate, to an economist goods do not have to be material goods. Indeed, goods that one wishes to acquire do not even have to be contemporary goods. For example, economists readily discuss the so-called *bequest motive* in discussions of intergenerational transfers, i.e., bequests from

¹⁷ Global agreement on CFC reductions has, however, led to a burgeoning black market in CFCs, much as there is a large black market for illegal drugs, a huge trade in endangered species, and the like. This illegal activity leads, in turn, to cost/benefit analyses over who should pay for the enforcement of *global* agreements, a topic not taken up here.

¹⁸ On marriage, see Becker (1976); on religion, see Iannaccone (1998).

parent generation to child generation. This applies not only to the intergenerational transfer of private goods, but also to the intergenerational transfer to collective or public goods, passing on to our children goods such as a higher standard of living, clean air, water, and lands, and a diverse biosphere (see, e.g., Sandler, 1997). Religious goods fit into the categories of non-material, intergenerational, and transcendental goods. They *are* goods; thus they are amenable to economic analysis. Religious goods are primarily private goods. Clearly, there is demand for such goods; there is supply of such goods. There is product differentiation, both on the grand scale (the Jewish, Muslim, and Christian faiths, say) as well as product differentiation within the broad product categories (differentiation within the Christian faith, say). There is competition among suppliers of religious goods and, on occasion, customers switch from one product to another. That this happens rarely is readily explained by the high switching cost, and is entirely comparable (economically speaking) to the cost of switching from one major software program to another major software program: the cost of learning a new set of programming language and tricks-of-the-trade is huge, as is the cost of absorbing a new set of religious language, doctrine, customs, habits, and social behavior. Economic theory makes predictions about religious behavior. For example, in nation-states less respectful of free markets, religious choices will tend to be restricted. In contrast, in nation-states that respect free, private, and competitive markets one would expect a large variety and quality of, and prices for, religious goods. I can acquire religious goods almost free of charge by listening to “televangelists,” or I can pay an extremely high price, join a committed community, and forego my worldly ways, and I can even pay the ultimate price and buy religious fervor “even unto death.”

Religious goods may also be viewed from a club-theoretic approach. Here, religious goods are not solely private goods but jointly produced and consumed. The jointly produced good (worship services, religious instruction, socializing, and so on) is non-rival, indeed *must* be non-rival as its consumption or use depends on others benefitting from the good at the same time. Exclusion from the club is maintained through a set of doctrines to which members are asked to subscribe (the price paid). To avoid free-riding or easy-riding, the club may engage in mutual monitoring by requiring public display of proper prayer, heart-felt singing, teary-eyed testimonials, or other forms of demonstrating that the price for the consumption of the good has been paid. But the larger the club, the costlier it becomes to monitor behavior and the incidence of free-riding will increase. There are then two options. The first is to increase the cost, driving out free-riders by ever more sectarian doctrine and behavior. The second is to let the club good become an all-inclusive public good. (Hence the notion that all westerners are “Christian,” all northern Africans are “Muslim,” and other stereotypes.) In some instances this process has evolved so far as to provoke *taxation* of non-religious citizens to fund the continued production of the religious public goods and services (the Iranian theocracy, for instance), even to the point where the *secular* nation-state collects taxes on behalf of the religious organization (e.g., in Germany).

Conclusion

In the course of this essay, I have applied the model-of-the-market — in its unfettered, fettered, and market failure forms — to a large variety of examples, and I have even considered missing markets and bads rather than goods. The model-of-the-market is simple; it is not simplistic. It is a hugely

powerful analytical device (one that continues to inspire awe in me). Its mathematical underpinnings make the model rigorous and permits experienced practitioners to comprehend fully many real-world markets literally within seconds and also allows them to cut quickly through much of the non-sense that the “pop-economics” of ill-understood bastardized versions of unfettered free-market economics offers up every day in the newspapers and other media.

Take any group of seemingly highly *different* people. Strip away their clothes and skin and flesh, and you are left with a highly *similar* skeletal structure that all these different people share. Examine their genetic material and compare it to non-human mammals, and again two different groups turn out to be highly *alike*. And so on for mammals and non-mammals. This is what scientists do: we observe real-world phenomena, then we try to abstract the smallest number of internally coherent principles that would explain the largest possible number of externally observed phenomena. This is also what economists do. In this essay, I hope that I have demonstrated how a *single* concept — that of the market, or its absence — is capable of illuminating and explaining an *extraordinarily large* set of real-world phenomena.

Perhaps I have shocked you here and there in demonstrating the broad applicability of the model of markets, even and especially in areas that far transcend the pop-version of economics. If I may shock you even more, consider that there is absolutely nothing in the model of markets that would restrict its reach to the human species. The economics of non-human species — bioeconomics — is a very new field of inquiry but that should not surprise us in the least. After all, *all* species need to allocate resources to produce their livelihood, all need to distribute the fruits of their production, and all consume what they produce. In this regard, the human species is no different from any other species. Where differences do arise they lie in the conception of private or communal property and hence in the extend of the market. A market presumes that I possess something I wish to trade in for something I do not possess. Most species do not possess possessions, and therefore they do not trade. Instead they engage in self-production and self-consumption. They have not yet discovered the advantages of property, specialization, and trade. They have yet to discover the price system by which markets regulate the supply and demand of property offered for trade.

But there are exceptions. At the least, all beings own themselves, and this gives rise to sexual specialization and trade (reproduction). Another exception is that we observe trade not only within but among species! For example, symbiotic species *are* trading favors. There is indeed much *inter-species* trading going on, perhaps much more so than *intra-species* trade. (For example, at my home we are feeding our dog and cats in exchange more some ill-defined, but definite emotional goods.)

Some social species (e.g., social insects such as bees, ants, termites) appear to produce no private goods at all, but focus exclusively on the production of a single club good, the bee *hive*, the ant *colony*, and the termite *mound*. The good is non-rival but exclusion is fierce: bee hives are guarded, as are ant colonies. This leads me, finally (and briefly), to yet another leap of thought that the logic of economics invites: it is well known that some ant species specialize in imitating the odor of another ant species and thence *invade* a colony of that other species. We turn, thus, to crime and punishment. We turn from *production by making* things to *production by taking* things. We turn from trade to force, from voluntary exchange to involuntary submission, from peace to war.

All species guard against taking; all species expend resources to produce guarding. Whether this takes the form of bees guarding the entry to a bee hive or the form of a mother wolf expending

precious energy resources to find and protect a cave or other habitat or the form of humans installing burglar alarms and financing municipal police forces does not matter from the economic point of view. In each instance, the potential standard of living is reduced as resources are expended on policing. And in each instance, the cost of policing must be weighed against the expected benefit. It is for this reason that we guard only up to a certain point, but not beyond. As environmental conditions change, so will the cost and benefits of guarding and the cost and benefits of predation. For instance, one of the variables under the rubric of cost of predation is to probability of being caught with the consequence of being incarcerated (among humans) or being eaten (among some non-humans). Thus, we would expect that the incidence of predation falls either as the guardians become more efficient in producing guarding or as the predator is offered lower-cost choices of making a non-predatory living. An economist would therefore expect that a low unemployment rate (among humans) leads to a decline in predation (crime) and indeed that is what we generally observe.

How does economic science relate to other fields of scholarly inquiry? As demonstrated, vastly! Economics is defined as the science that studies the choices human and non-human beings make and the consequences these choices entail, given the set of environmental circumstances we face at the moment of decision-making. I hope you agree that economics is much more — and much more worthwhile — than the mindlessly bastardized, abridged versions of “pop-economics” that present-day news media, politicians, and assorted others would suggest.

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