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Fractured Markets and Legal Institutions

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Fractured Markets and Legal Institutions

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I.   INTRODUCTION

How should the legal system address conflicts that occur in very small environments? The conflicts come in many kinds, including a nuisance dispute between neighbors, an impending collision between two moving vehicles, a joint decision between spouses about whether or on what terms to continue their marriage, or a disagreement between managers and shareholders within a firm.

The literature often refers to these small environments as "markets." Considering them in that way, however, averts our attention from larger environments that should be included in the inquiry but that often do not function well as private markets. The term "institutions" is better, because it encompasses environments in which people have both market (exchange-based) and non-market interactions. Further, institutions are human creations, while environments need not be.

One way to think of the problem is as "market fracture," or the cost of breaking the arenas in which people interact into excessively small pieces. Focusing on the larger rather than the smaller arena can enable an increase in social wealth or welfare but may also require greater state oversight. In the process it may also require us to abandon the language of markets or constrain its use, particularly in situations where instability (cycling) or behavioral issues are prominent. In these settings the "market" is often little more than an unhelpful metaphor.

People's options often narrow as their commitment to a course of action becomes deeper or more specific. One good example is marriage. While the market for getting married is large and competitive, depending on the size of the community, the market for divorce is a bilateral monopoly: you can get a divorce only from the one you are with. This partly explains why most divorces are more costly than most weddings. But if we assumed that the divorce rate is excessive and something should be done about it, the fix might require state intervention in the marriage market. That is, it may be preferable to fix this problem earlier rather than later.

Alternatively, employers and prospective employees may bargain over jobs in a competitive market. Post-hiring promotion or termination issues are negotiated in a much smaller institution, however, which may also be a bilateral monopoly in some cases.

Similarly, when a farmer in early spring makes a decision about what to plant, the "market" she faces includes the full range of products she is capable

of growing on her land and with her existing equipment. Once she has planted beans, however, the market she faces is typically reduced to that product, although it may be salable over a large geographic range. After the beans have been delivered to a particular store, the market for them may consist only of the subset of people who shop there. Each further stage in the process fractures the market further and leaves people with a smaller range of choices, provided that the costs of reversing the decision are greater than the payoffs from switching.

To the extent reversal is costly, making a decision earlier saves more resources than making it later. Indeed, the prospective farmer faces her largest range of choices before she has settled on farming as a career at all. At that time even her purchase of land and equipment is one of many options. In addition, the decisions to enter farming, to grow beans in a particular year, or to sell them to a particular store may have been mistakes. If so, they are corrected more cheaply earlier rather than later.

In *The Problem of Social Cost*, Ronald Coase identified the costs of bargaining as the main impediment to the free and efficient flow of resources.[1] As a result, Coase argued throughout his career that transaction costs make a legal system important to social ordering.[2] Coase wrote about several common law disputes among neighbors whose economic activities conflicted with one another. One of them was *Sturges v. Bridgman*, a 19th-century British nuisance case between the two occupants of a duplex building sharing a party wall.[3] Octavius Sturges was a London pediatrician who specialized in childrens' respiratory diseases, such as pneumonia. Frederick Horatio Bridgman was a confectioner to Queen Victoria, whose process for making sweets required him to use a mechanical mortar and pestle to pulverize substances such as chocolate.[4] The nuisance dispute arose when Sturges complained that Bridgman's machine, with its repetitive pounding, made it impossible for Sturges to use his stethoscope to diagnose patients.

Coase argued that if high transaction costs did not interfere, private bargaining would provide a solution to the problem of conflicting uses, which he characterized as "efficient." By that he meant that the right to continue would be given to the person who valued it most.[5] For example, if the pediatrician valued the right to relative silence at £100, while the confectioner valued the right to conduct his business at £60, the efficient solution would preserve the pediatrician's £100 value over the confectioner's £60 value. If no

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1.   R.H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 15 (1960).

2.   *See, e.g.*, R.H. Coase, Professor, Univ. Chi. Law Sch., The Institutional Structure of Production, Prize Lecture for the Alfred Nobel Memorial Prize in Economic Sciences (Dec. 9, 1991), *in* 82 AM. ECON. REV. 713 (1992).

3.   *See generally* Sturges v. Bridgman, LR 11 Ch.D. 852 (1879).

4.   For more on the players and the facts in *Sturges v. Bridgman*, see generally A.W. Brian Simpson, Coase v. Pigou *Reexamined*, 25 J. LEGAL STUD. 53, 54–58 (1996).

5.   Coase, *supra* note 1, at 16.

one else was affected, then this outcome made society as a whole wealthier as well.

Alternative solutions might preserve the ability of *both* parties to operate, however, generating a social value of £160. Coase did not consider these, because the tiny market he considered was too small to include them. He was concerned with transaction costs, and on his assumptions the only parties who could transact were Sturges and Bridgman. This tiny microcosm was the appropriate institution for analysis because Sturges and Bridgman were locked together by virtue of their own previous investments. Stepping back to an earlier point in time and considering a broader range of alternatives was not economically feasible if the payoff to extraction was less than the payoff to staying inside their tiny market and reaching an agreement.

The greater benefit from stepping back does not result from eliminating or internalizing an externality. The problem is not that looking at the smaller environment ignores an uncompensated injury that one person imposes on another, but rather that the larger environment prevents certain injuries from arising in the first place. Neither does it have anything to do with transaction costs: the parties might be able to bargain costlessly to a maximizing solution within their current environment but would still be unable to achieve the gains that the larger environment permits.

These costs of reversal are sometimes transaction costs, but often they are simply a cost of moving resources. For example, the farmer who realizes too late that planting beans was a mistake may have to plow up the bean field, prepare the soil a second time, and plant spinach or some other crop. Assuming she does the work herself, however, most of these costs would not be costs of transacting, although some transactions, such as the purchase of substitute seed, could be involved as well.

Transaction costs in one's current setting are only a portion of the costs of locating the best place for resources. Considering all relevant costs usually requires us to focus on larger institutions and longer time periods than the fractured markets that inhabit Coase.

A good counterexample to Sturges and Bridgman is the law and economics of automobile accidents, where assumptions about the high costs of bargaining have turned attention to the overall markets where automobiles operate rather than individual pairwise arrangements. When we refocus our attention in this way, the results that Coase described as efficient are frequently suboptimal. In fact, as developed below, the practical inability of rapidly moving motor vehicles to negotiate with each other over who should yield has forced decision makers to step back and consider the larger setting in which these decisions are made. As a result, outcomes in cases involving traffic rules are inherently superior to outcomes in cases involving nuisance disputes between neighbors.[6]

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6.   *See infra* note 26 and accompanying text.

One important source of social savings is determining where resources should be assigned initially, thus limiting the occasions and costs for further movement. Discovering that planting beans or marrying a particular partner is a mistake is best made before planting or marrying. Further, these costs of waiting are higher as initial resource investment is less coordinated, more costly, or more specialized as to activity and location. Determining the initial location of resources often requires us to consider the interests of larger numbers of players, however, encompassing a larger institution in which resources move around. Markets like those envisioned in *The Problem of Social Cost*, which move resources only by unanimous consent, work more poorly as the number of participants increases.[7] Coase himself realized that in such cases government intervention may be preferable even for relatively simple conflicts traditionally analyzed under the common law of nuisance or trespass. Finally, as the next section develops, when we consider the full range of relevant decisions only a small portion of the costs to be considered are "transaction" costs.

II.   THE COSTS OF RESOURCE MOVEMENT

Moving things from one place to another is costly. I may have a second television that would be of better use in my son's apartment, because he has none. If he values it more than I do, moving it might be a good idea. But I live in Iowa City, while he is in New York. Moving the television to New York might cost $150, and he could buy a good used one or perhaps a small new one in New York for less. In that case moving the television actually decreases its net value even though he values my television more than I do.

Most people spend substantial time considering the costs of moving resources around. We make decisions about where to live in relation to work, where to go on vacation, where to shop and how to organize a multi-store trip, or whether to shop in person or online. The best course of action is usually to get our plan right the first time, for fixing it later costs more. The relevant costs can range from relatively small, as in a poorly organized grocery list, to quite large, in the case of a bad choice of a location for one's home or business, or marriage partner.

Traditionally, economics paid surprisingly little attention to the cost of moving resources. Nobel laureate Douglass North once complained that neoclassical economics avoided "all of the interesting questions," because "[t]he world with which [economics] is concerned is a frictionless one in which institutions do not exist and all change occurs through perfectly operating markets. In short, the costs of acquiring information, uncertainty, and transactions costs do not exist."[8]

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7.   *See infra* notes 52–54 and accompanying text.

8.   DOUGLASS C. NORTH, STRUCTURE AND CHANGE IN ECONOMIC HISTORY 5 (1981); *see also* MARTIN HOLLIS & EDWARD J. NELL, RATIONAL ECONOMIC MAN: A PHILOSOPHICAL CRITIQUE OF

In economic models, resources often move without friction from lower-value to higher-value positions until the economy is in equilibrium, or a steady state in which no further gains from resource movement are possible. One important economist who took exception to this was Cambridge economist Arthur Cecil Pigou. Writing in the 1920s and 1930s, he was deeply concerned about the costs of moving resources.[9] Prior to the time of Coase, however, Pigou was somewhat at odds with his discipline.

Coase's work turned people's attention to "transaction costs," particularly to his theory that the cost of reaching a suitable private agreement is what accounts for the legal system. Transaction costs are only a subset of the costs of moving resources, however, and often a fairly small subset. If I loaded my TV into my van and drove it to New York, getting it there would be costly. These would not be "transaction costs," however, except for purchases of gasoline, tolls, and perhaps a motel room along the way. Indeed, Coase argued in his well-known 1937 article, *The Nature of the Firm*, that minimization of all kinds of costs, including transaction costs, determines which things a firm will do for itself internally and which it will purchase on a market.[10] For example, cleaning the office windows could be done by the firm's own employees or else by contracting with a window washing service. When it makes this decision, the firm really does not care that one of these is a "transaction" cost while the other is not. The only thing that matters is which costs less.

The term "transaction costs" is overused in law and economics, particularly when it is applied to costs unrelated to transactions. For me to wash my own windows is costly, but using my own labor is not a transaction cost. Often nontransaction costs are wrapped up into a bargain in such a way that they disguise the deal's nontransactional components. For example, if I am an apple grower selling to a retailer 50 miles away, my crop of apples will need to be shipped. Shipping could clearly be part of our negotiated transaction. Shipping in this case is not a "transaction" cost, but rather a cost of resource movement. If I grew my apples in one place and owned a fruit stand 50 miles away, I would still have to ship them, even though no transactions are necessarily involved. I might load them onto my own truck and drive them to the fruit stand myself. Whether or not I "transact," the apples must still be moved. Indeed, if I purchased transportation services in a competitive market, only a small part of the price would reflect transaction costs; the rest would cover the physical cost of getting my apples from one place to another.

NEO-CLASSICAL ECONOMICS 233–37 (1975) (arguing that the neo-classical "assumption of easy, costless transfer of resources is nonsensical"); Charles K. Rowley, *Rent-Seeking Versus Directly Unproductive Profit-Seeking Activities*, *in* THE POLITICAL ECONOMY OF RENT-SEEKING 15, 18 (Charles K. Rowley et al. eds., 1988) (describing neo-classical economists' views on transfers).

    9.   *See infra* notes 13–20 and accompanying text.
    10.   *See generally* R.H. Coase, *The Nature of the Firm*, 4 ECONOMICA (n.s.) 386 (1937).

Coase observed that if the costs of transacting were greater than the increase in value that resulted from a transfer, then the transaction would not occur. He began with the traditional economic observation that resources under free choice move from lower to higher value uses. But then he added the important qualifier that "this assumed costless market transactions."[11] Further,

> Once the costs of carrying out market transactions are taken into account it is clear that such a rearrangement of rights will only be undertaken when the increase in the value of production consequent upon the rearrangement is greater than the costs which would be involved in bringing it about. When it is less, the granting of an injunction (or the knowledge that it would be granted) or the liability to pay damages may result in an activity being discontinued (or may prevent its being started) which would be undertaken if market transactions were costless. In these conditions the initial delimitation of legal rights does have an effect on the efficiency with which the economic system operates. One arrangement of rights may bring about a greater value of production than any other. But unless this is the arrangement of rights established by the legal system, the costs of reaching the same result by altering and combining rights through the market may be so great that this optimal arrangement of rights, and the greater value of production which it would bring, may never be achieved.[12]

Pigou had made exactly the same point three decades earlier, but he spoke more globally of the "costs of movement," which encompassed all the costs of getting a resource from one use to another:

> Suppose that between two points A and B the movement of a unit of resources can be effected at a capital cost equivalent to an annual charge of n shillings for every year during which a unit that is moved continues in productive work in its new home. In these circumstances the national dividend will be increased by the movement of resources from A to B, so long as the annual value of the marginal social net product at B exceeds that at A by more than n shillings . . . .[13]

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11.   Coase, *supra* note 1, at 15.

12.   *Id.* at 15–16. *See generally* Coase, *supra* note 2.

13.   A. C. PIGOU, THE ECONOMICS OF WELFARE 138 (4th ed. 1962). Pigou used the term "national dividend" to mean aggregate social income—specifically, "the national dividend is that part of the objective income of the community, including, of course, income derived from abroad, which can be measured in money." *Id.* at 31; *see also* Herbert Hovenkamp, *Antitrust and the Costs of Movement*, 78 ANTITRUST L.J. 67, 71–72 (2012) (explaining how antitrust policy can relate to the costs of resource movement other than transaction costs); Herbert Hovenkamp, *Coase, Institutionalism, and the Origins of Law and Economics*, 86 IND. L.J. 499, 504 (2011) (noting

Many of the things that Pigou included as costs of movement were ones that Coase later characterized as transaction costs.[14] In addition, however, were many other costs, including lack of information and education,[15] transportation,[16] and commuting distances and time for workers.[17] He also included some costs that today might be characterized as behavioral, such as imperfect knowledge, noting that imperfect knowledge might cause people either to exaggerate or understate the costs of moving a resource.[18] Pigou observed that reducing these costs of movement enabled a division of labor, resulting in cheaper or better quality goods.[19] For example, Pigou noted that machine production reduced the demand for skilled labor, and that unskilled laborers could generally be redeployed at lower cost than skilled workers, thus enabling workers to be shifted more cheaply as product needs changed.[20]

A. *RELATIVE DEADWEIGHT LOSS*

The costs of movement in general, or transaction costs in particular, are sometimes described as an economic "dead-weight loss."[21] That conclusion is not useful for policy purposes, however, unless we ask "compared to what?" For example, we speak of the deadweight loss of monopoly only by comparing it to a competitive economy, or else to some alternative market thought to be

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that "[p]rior to Pigou . . . the marginalists largely ignored the *cost* of moving resources"); Herbert Hovenkamp, *The Coase Theorem and Arthur Cecil Pigou*, 51 ARIZ. L. REV. 633, 637–38 (2009) (discussing Pigou's contributions to the Coasian theory of transaction costs); *cf.* Harold Demsetz, *The Problem of Social Cost: What Problem?: A Critique of the Reasoning of A.C. Pigou and R.H. Coase*, 7 REV. L. & ECON. 1, 7 (2011) (acknowledging the differences between transaction and other resource movement costs); Lee Anne Fennell, *The Problem of Resource Access*, 126 HARV. L. REV. 1471, 1483–93 (2013) (using the term "resource allocation" to describe movement costs).

14.   *E.g.*, PIGOU, *supra* note 13, at 158:

> [P]ayments that have to be made to various agents in the capital market, promoters, financing syndicates, investment trusts, solicitors, bankers, and others, who, in varying degrees according to the nature of the investment concerned, help in the work of transporting capital from its places of origin to its places of employment.

15.   *See id.* at 149–57 (discussing the impact of imperfect knowledge on the movement of resources).

16.   *See id.* at 290–317 (discussing the effects of railroad rate structure on the movement of resources).

17.   *See id.* at 482–84.

18.   *Id.* at 144–45.

19.   *Id.* at 488–518.

20.   *Id.* at 488–511.

21.   Ronald J. Colombo, *The Role of Trust in Financial Regulation*, 55 VILL. L. REV. 577, 579 (2010) (internal quotation marks omitted); *see also* Frieder Frasch, *Transaction Costs of the EU Emissions Trading Scheme in German Companies*, 7 SUSTAINABLE DEV. L. & POL'Y 48, 48 (2007) ("[A]ll transaction costs are 'deadweight losses.'"); Jeff Sovern, *Toward a New Model of Consumer Protection: The Problem of Inflated Transaction Costs*, 47 WM. & MARY L. REV. 1635, 1683 (2006) (explaining the objectionable nature of transaction costs as "deadweight losses that reduce efficiency").

more competitive.[22] By contrast, if we are speaking of social gains from innovation, then there is ample support for the position that the monopolist produces greater value than a group of competitive firms, so the net deadweight loss from monopoly may actually be negative.[23]

If the baseline is a frictionless economy in which everything moves costlessly from one use to another, then any cost of movement is a deadweight loss. But no one inhabits such an economy. A more useful definition is that a cost of moving a resource is a deadweight loss to the extent that it is more costly than equally good and available alternatives. *Ceteris paribus*, going from more to less costly means of moving resources, will generally produce net gains, provided that nonparties are not adversely affected. An important corollary is that a search for greater efficiency, assuming that is our goal, requires us continuously to seek out lower costs of moving resources around and—equally important—mechanisms for getting them into the right place to begin with.

B.   *The Choice of an Initial Position and the Value of Planning*

Another important corollary, stressed by Pigou and later by Calabresi, but not by Coase, is that placing resources *initially* in their highest value use is efficient to the extent it makes further movement unnecessary.[24] It does not matter whether these costs of movement are transactional or nontransactional. For example, Pigou was particularly concerned about the extent to which workers were often initially assigned to low-value occupations, largely because of family tradition or lack of education.[25]

In Coase's conception, efficiency is undermined by externalities whose costs cannot be internalized because transaction costs are too high. For example, the noise of Bridgman's mortar and pestle imposes a negative externality on Sturges. This is a resource conflict the parties can address by bargaining. If the legal system assigns the right to the wrong person, however,

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22.   *See, e.g.*, HERBERT HOVENKAMP, FEDERAL ANTITRUST POLICY: THE LAW OF COMPETITION AND ITS PRACTICE 19–20 (4th ed. 2011).

23.   *See* CHRISTINA BOHANNAN & HERBERT HOVENKAMP, CREATION WITHOUT RESTRAINT: PROMOTING LIBERTY AND RIVALRY IN INNOVATION 9–10 (2012).

24.   *See* PIGOU, *supra* note 13, at 138.

25.   Pigou explained this problem as a result of ignorance:

> The most fundamental way in which the first of these causes, ignorance, operates is by impairing the initial distribution of new generations of workpeople as they flow into industry. Those persons who direct the choice of avocations made by young men and women entering industry are ignorant both of the level at which the demand price for any given quantity of labour of any given grade will stand in different occupations at a later period of those young persons' lives, and also of what the quantity of labour offering itself in those different occupations at that period will be.

Id. at 492. On the problem today, see generally Aytek Erdil & Haluk Ergin, *Improving Efficiency in School Choice*, *in* THE HANDBOOK OF MARKET DESIGN 170 (Nir Vulkan et al. eds., 2013).

high transaction costs may prevent it from being transferred to the correct one.

But suppose that upon first entering the confection trade, Bridgman could have chosen between two equally suitable buildings that cost the same. He chose the one that later created the conflict with Sturges. The other building would be occupied by a different noise-making business that would not have been bothered by Bridgman's mortar and pestle—say, an implement sharpener. Once the decision creating the conflict is made, relocating to the alternative place would cost £25, but initially it would have cost Bridgman the same amount to move into either location, so the net cost would be zero. This lost £25 shows up now to the extent that reciprocal bargaining obliges either Bridgman or Sturges to pay it, depending on how the law assigns liability. For example, if the law finds against Sturges, holding that there is no nuisance, then Sturges must pay Bridgman at least £25 to get him to move. By contrast, if Bridgman had moved into the correct place to begin with, neither would have to pay and society would be £25 richer.

Of course, if resources moved without friction or other cost, then Bridgman's initial choice would not have made any difference. Planning would be unimportant because any mistake could be costlessly reversed. In the world we live in, however, getting the first decision right is an essential element in efficiency. Or, to state it more generally: long-range planning becomes more important as all of the costs of movement, both transactional and nontransactional, are higher and more costly to reverse. To that extent, planning enables society to avoid the cost of market fracture.

The law and economics of traffic accidents takes a very different approach to this problem. It considers the full market in which automobiles operate rather than the relationship, or market, that exists between a pair of automobiles approaching one another.[26] For example, the American rule requiring driving on the right side of the road, or the uniform state-imposed rule that automobiles must yield to trains at grade crossings, perform the same function: they ensure that operators need not engage in pairwise bargaining just before a collision is about to occur. These are basically "zoning" rules for the road, which rely on conventions or cost avoidance as a surrogate for bargaining. Their goal is to get people into the right place from the beginning, so that subsequent bargaining will not be necessary. The premise for state-enforced traffic rules is that greater government intervention is needed because individual bargaining is less likely to be effective. When all the relevant costs of land-use externalities are considered, however, including the cost of not being in the right place from the beginning, the differences between traffic rules and zoning rules become relatively insignificant. Common law nuisance rules, such as those in *Sturges v. Bridgman*, take the

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26.   *See generally* GUIDO CALABRESI, THE COSTS OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS (1970); *infra* notes 41–42 and accompanying text.

parties where they are already located. By contrast, zoning rules prevent them from moving into conflict-producing situations in the first place.

III. Coasean Markets

Those who read Coase have seen a variety of things, many of which Coase himself did not see or would likely have rejected. Nevertheless, the institutions that are central to the functioning of the legal system in Coase's analysis have some distinctive features. One is Coase's very narrow conception of "efficiency" or social savings.[27] A second is that the markets that occupy his analysis are typically very small. How small they are is determined by the costs of movement, both transactional and nontransactional, from a given starting position.[28] A third feature of Coasean markets is that moving resources within them requires unanimous agreement of the relevant participants. As Coase himself acknowledged more than once, this fact has important implications for the efficacy of bargained solutions as the number of individuals bargaining increases.[29]

A. *Identifying the Efficient Outcome*

Traditional competitive markets typically have large numbers of buyers and sellers, but a single buyer and a single seller are sufficient to make a trade. For example, if I buy a loaf of bread from my grocer, both the grocer and I are better off. The market for bread contains many other buyers and sellers who did not participate in this transaction. They are largely indifferent to my particular deal, except to the extent that one or more of them had been competing for my trade, or that I took the last loaf on the shelf. In some cases others will use information about my trade to inform their own choices. They will go on to make their trades with others. While a particular transaction occurs at the "micro" level, the overall market could be very large, perhaps even nationwide or worldwide.

These traditional markets are not the ones contemplated in *The Problem of Social Cost*. There, the trade and the market are the same size. Think back to *Sturges v. Bridgman*, which Coase used to illustrate how private bargaining could resolve the dispute without the intervention of the legal system. Rather than thinking of one party as a victim of a wrongdoer's negative externality, Coase argued, we should treat each as having a tradable property interest that conflicts with the interest of the other. They are like two people vying to park their cars in the same spot. Assuming that they bargain, the winner will be the person who places the higher value on the right. Suppose Sturges values the right to be free of the noise by £100, while Bridgman values the right to use his noisy machine by £60. Suppose also that the law said Sturges would lose

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27.   *See infra* Part III.A.

28.   *See infra* Part III.B.

29.   *See infra* notes 52–54 and accompanying text.

his lawsuit because the operation of the mortar and pestle is not a nuisance. Sturges would pay Bridgman a sum between £60 and £100, Bridgman would shut down the machine, and both parties would be better off. For example, if Sturges paid Bridgman £75, Bridgman would be £15 better off and Sturges would be £25 better off. Suppose, however, that the law of London provided that the machine was a nuisance, entitling Sturges to an injunction shutting it down. Bridgman might wish to settle with a money payment, but the most he would pay is £60 and the least Sturges would accept is £100. No settlement would occur and the injunction would shut the machine down.

This story illustrates both the "invariance" corollary and the "efficiency" corollary of the Coase Theorem.[30] The invariance corollary is somewhat counterintuitive and its domain has been controversial, particularly where the participants are not risk neutral.[31] The decision whether Bridgman's mortar and pestle continues to operate is not determined by whether it is an unlawful nuisance, but rather by the respective values that the two parties place on the right in question. In its strongest form, the theorem states that in the absence of transaction costs, common law rules have nothing whatsoever to do with how resources are allocated, although they may force some money to change hands. In the nuisance jurisdiction the mortar and pestle is shut down and neither party pays anything to the other. In the no-nuisance jurisdiction the mortar and pestle is also shut down, but this time physician Sturges pays Bridgman between £60 and £100 to shut down.

In order for the invariance thesis to apply the rights in question must be "alienable," which means that they can be traded through private settlement of a lawsuit.[32] Common law rights are generally alienable in this fashion. However, many statutory rights or public regulations are not. For example, even if a noisy machine produced larger gains to its owners than harm to others, neighbors would not be able to negotiate around a zoning statute that forbade it. A neighbor typically has no right to "waive" his neighbor's obligations under the zoning laws.

The efficiency corollary of the Coase Theorem states that in a well-functioning market the outcome will be "efficient," which means that it maximizes the wealth of the two parties and thus social wealth, assuming that no one else is affected. The Coasean bargain assigns the disputed interest to

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30.   *See* STEVEN SHAVELL, FOUNDATIONS OF ECONOMIC ANALYSIS OF LAW 101–06 (2004).

31.   Under declining marginal utility or an "endowment" effect, the invariance corollary may not hold true, at least not for human actors or firms that are not risk neutral. *See generally* Herbert Hovenkamp, *Legal Policy and the Endowment Effect*, 20 J. LEGAL STUD. 225 (1991); Herbert Hovenkamp, *Marginal Utility and the Coase Theorem*, 75 CORNELL L. REV. 783 (1990); Daniel Kahneman et al., *Experimental Tests of the Endowment Effect and the Coase Theorem*, 98 J. POL. ECON. 1325 (1990). For additional analysis, see Russell Korobkin, *The Endowment Effect and Legal Analysis*, 97 NW. U. L. REV. 1227, 1228 (2003) (noting that the endowment effect is "the principal that people tend to value goods more when they own them than when they do not").

32.   *See* Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1106–10 (1972).

the person who values it most highly. In the given example, the physician's right to be free of the noise is worth £100, while the confectioner's right to create the noise is worth only £60. Forcibly granting the right to the confectioner would destroy £100 in resources in favor of a value of only £60. Thus the "efficient" outcome is defined as the one that produces the £100 right.

Describing this as the "efficient" outcome is myopic, however, in one critical sense. We must ask, "Compared to what?" Clearly an even more efficient outcome would be one where *both* Sturges and Bridgman could conduct their business without interference from the other. This would generate total value of £160. Coase did not consider this a viable alternative because he took the location of Sturges and Bridgman in the same building as a given. The fractured market in which he analyzed the conflict was one in which Sturges and Bridgman faced only each other.

Society's ability to attain the £160 by looking at the longer run has nothing to do with either externalities or transaction costs in the micromarket that Sturges and Bridgman occupy. Efficiency queries typically look at the wealth created (or destroyed) in the market at hand. Harms imposed on others are externalities to the extent that they are not settled by bargaining or imposition of the correct legal rule. But stepping back and looking at a larger setting often permits superior solutions if extraction is costly. In a larger environment this particular externality may not have come into existence in the first place.

B.   *MICROMARKETS: FUNCTIONALITY AND FRACTURE*

Coase focused the economic analysis of law on "micromarkets," or situations involving very small groups of traders who are locked together by some preexisting commitment, whether it be tenants sharing a duplex, neighbors in a subdivision, two automobiles speeding toward one another, an unhappy marriage, or disputes between shareholders and managers in a single corporation.[33]

One problem with these Coasean markets is that they are rarely very competitive. Sturges and Bridgman have only each other to bargain with, and bilateral monopolies of this sort often lead to difficulty in reaching outcomes. They can generate high transaction costs because there is no competition to discipline each person's ask or offer prices. Joint maximization may be frustrated by each person's incentive to hide information from the other.[34]

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33.   *See generally* RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW (9th ed. 2014) (discussing the application of the Coase Theorem in family law, torts, corporations and other business associations, and financial markets).

34.   *See generally* Roger D. Blair et al., *A Pedagogical Treatment of Bilateral Monopoly*, 55 S. ECON. J. 831 (1989). On bilateral monopoly and the Coase Theorem, see generally Robert Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 1 (1982). Among the earliest observations of indeterminacy in strictly bilateral trading is FRANCIS YSIDRO EDGEWORTH, MATHEMATICAL PSYCHICS: AN ESSAY ON THE

These problems are exacerbated as Coasean markets have larger numbers of actors because unanimity is a precondition to trading. Such markets are not "bilateral" monopolies. Nevertheless, they have all the efficiency-challenging characteristics of bilateral monopolies, except magnified.[35]

London in 1879 undoubtedly had hundreds of physicians, hundreds of confectioners, and thousands of duplexes or other buildings suitable for business. When we ordinarily talk about markets we would think of this range of providers. Physicians compete with each other, as do confectioners and landlords, and new ones continuously enter the trade. But the "market" at issue in Coase's article was a peculiar one, limited to a single physician, a single confectioner, and a single building. This is so mainly because the size of the market under contemplation depends heavily on the time at which we view it.

What makes the relationship between solitary Sturges, solitary Bridgman, and their solitary duplex a "market"? The answer is that prior commitments plus the costs of movement define this market's boundaries. Sturges and Bridgman are stuck together by virtue of a previous investment each of them had made in the same building and that later turns out to be mistaken.[36] As a result, neither competition with other confectioners or physicians nor the possibility of new entry is relevant. For example, suppose as before that Sturges valued the right to be free of Bridgman's noise at £100, while Bridgman valued use of the mortar and pestle in his business at £60. But suppose that for £35 Bridgman could move to an equally good location with no noise or other conflict and no harm to his business. No matter how liability was assigned, Bridgman would move. In a nuisance jurisdiction he would move rather than shut down. In a no nuisance jurisdiction Sturges would pay him to move, which would require less than paying him to shut down. If Bridgman had moved to a location with no conflict to begin with, however, his moving costs would be zero.

Coase had actually recognized this in 1937, in *The Nature of the Firm.*[37] A profit-maximizing firm would compare the cost of all available alternatives for getting something accomplished, choosing the value maximizing solution.[38] The message of Coase's 1937 article is that when we consider the problem of

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APPLICATION OF MATHEMATICS TO THE MORAL SCIENCES 29–33 (Augustus M. Kelley Publishers 1967) (1881). *See generally* Fritz Machlup & Martha Taber, *Bilateral Monopoly, Successive Monopoly, and Vertical Integration*, 27 ECONOMICA (n.s.) 101 (1960).

35.   *See infra* notes 49–51 and accompanying text.

36.   Compare this with "lock in" as a theory justifying very small markets in antitrust cases. HOVENKAMP, *supra* note 22, at 103–04. For example, those who already own a Kodak photocopier are locked in to an ongoing supply of service and repair parts, thus making "Kodak parts" or "Kodak service" a relevant market to them. *See* Eastman Kodak Co. v. Image Technical Servs., Inc., 504 U.S. 451, 458–59 (1992) (accepting this theory); 2B PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 564b (4th ed. 2013) (critiquing the *Eastman Kodak* decision).

37.   *See* Coase, *supra* note 10.

38.   *Id.* at 394–95.

Sturges and Bridgman, focusing exclusively on transaction costs and on the micromarket that their dispute created can lead us astray. Rather, we should consider all of the costs of moving resources, including transaction costs, as well as the full range of places and times where movement can occur. The differences can be important. Coase's approach in *The Nature of the Firm* compared the cost of transacting against the cost of getting something done by any other means, not limited to transactions. By transacting, a firm would shift activity outside of the firm. By not transacting it would perform that activity inside. For those purposes, the cost of redeploying resources initially invested badly would also be a cost. The "cheapest cost avoider" gets it right the first time.

By focusing exclusively on transaction costs from a position defined by previous investment, Coasean thinking shifted our attention to the fractured micromarkets in which disputes arise in the short run. Previous choices bind the two actors together, and extraction is costly. But suppose that we had been able to steer either Sturges or Bridgman to a different location to begin with, a policy that Pigou advocated strenuously.[39] In that case the cost of movement could have been even lower, certainly less than the cost of moving to one address and then relocating to another. The truly efficient solution to *Sturges v. Bridgman* is the one that permits each of them to operate without interference by the other. Further, the most efficient version of that choice is likely to be one that defines their property interests in such a way that they never become neighbors in the first place.

In an example that Coase used frequently, once a polluting smokestack and a residential neighborhood are constructed and in place, bargaining assigns the right to the higher value participants.[40] But an even higher value could be obtained if a zoning law forbade smokestacks and homes from locating in close proximity to begin with—or perhaps if the parties had the foresight to see into the future and bargain about location before making any initial investment. The Coasean reasoning forces us to think of the "market" as the relationship between neighbors whose uses are already in place, in the process ignoring a larger market that presented a greater array of choices.

C.   THE COUNTEREXAMPLE OF AUTOMOBILE ACCIDENTS

The law and economics of automobile accidents went in a different direction from nuisance law, largely because actual transacting was such an unpromising solution. In the first law review article to cite *The Problem of Social Cost*, Walter Blum and Harry Kalven, Jr., from the University of Chicago, noted the importance of Coase's work in assessing resource conflict.[41] They

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39.   *See supra* note 13 and accompanying text.

40.   Coase, *supra* note 1, at 1–2, 11–13.

41.   Walter J. Blum & Harry Kalven, Jr., *Public Law Perspectives on a Private Law Problem—Auto Compensation Plans*, 31 U. CHI. L. REV. 641, 699–700 (1964).

concluded that it could not be applied to automobile accidents, however.[42] In traffic collision cases people do not know in advance who their bargaining opposites are until it is too late, and there are other significant limitations to their ability to bargain over such issues as the right of way.[43]

Guido Calabresi responded that the way to think about the problem is to imagine who *would* have won the bargain in a regime in which bargaining had been possible. Under bargaining in a well-functioning market, the person who ends up taking the precaution is the one in a position to avoid the accident at the lowest cost. Thus the "cheapest cost avoider" entered the lexicon of law and economics.[44] As Calabresi observed, a "pure market" approach to the problem of minimizing accident costs would be to "allocate the costs to those acts or activities that an arbitrary initial bearer of accident costs would (in the absence of transaction and information costs) find it most worthwhile to 'bribe' in order to obtain that modification of behavior which would lessen accident costs most."[45]

While Calabresi was responding to a problem of extremely high transaction costs, his solution to the traffic accident problem is not about transaction costs at all, but about the generally *nontransactional* costs of movement. For example, consider the common law rule adopted by the Supreme Court and apparently every state that, at grade level railroad crossings, trains have the right of way over wagons, cars, or other vehicles who cross the tracks. Nineteenth century courts at all levels derived the rule from the "character and momentum" of the train as opposed to a wagon or automobile:

> From the character and momentum of a railroad train, and the requirements of public travel by means thereof, it cannot be expected that it shall stop and give precedence to an approaching

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42. *Id.* at 700.

43. *Id. See generally* Steven G. Medema, *Rethinking Market Failure: 'The Problem of Social Cost' Before the 'Coase Theorem'* (2013), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2188728 (exploring Coase's early influence).

44. CALABRESI, *supra* note 26, at 135 & n.1. Calabresi observed that these costs were not transaction costs at all, but rather alternatives, or substitutes, for transacting. *See* Guido Calabresi & Jon T. Hirschoff, *Toward a Test for Strict Liability in Torts*, 81 YALE L.J. 1055, 1060–61 n.20 (1972); Guido Calabresi, *Transaction Costs, Resource Allocation and Liability Rules—A Comment*, 11 J.L. & ECON. 67, 69 (1968). Coase had also observed in relation to pairwise bargaining that when transaction costs are high, the legal system should assign the right initially to the person who placed the highest value on it. Coase, *supra* note 1, at 15–17.

45. CALABRESI, *supra* note 26, at 135. The first edition of Richard A. Posner's *Economic Analysis of Law* expressed the same idea in terms of mimicking the market. RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 18 (1st ed. 1972) ("Transaction costs are minimized when the law (1) assigns the right to the party who would buy it from the other party if it were assigned to the other party instead and if transaction costs were zero, or (2) alternatively, places liability on the party who, if he had the right and transaction costs were zero, would sell it to the other party." (emphasis omitted)).

wagon to make the crossing first: it is the duty of the wagon to wait for the train.[46]

The rationale is fairly simple: it costs a great deal more to stop and restart a train than to stop and restart a car. If the train would incur costs of $2.00 while the car would incur costs of 20 cents, then the parties would bargain for an outcome in which the train would have the right of way. If payment were necessary, the amount would be somewhere between 20 cents and $2.00.

While this problem can be recast as one in transaction costs, it is not a transaction cost problem at all, but one related to the mechanical and energy costs of stopping and restarting heavier versus lighter or faster versus slower vehicles. Indeed, the fact that the problem relates to engineering or mechanical costs rather than bargaining costs is what permits us to generalize across the full range of similar conflicts. We can address the problem on a "class" basis, or legislatively, rather than by assessing individual pairwise conflicts. Thinking of the problem as one in bargaining may be an interesting metaphor, but it does not add anything to the solution. It indicates only the truism that the costs of movement that require a bargain are always at least as great as the costs of movement alone. If we required a transaction, then the higher total costs of reaching the right result would make the good outcome less certain, but that is only because we have added the complexity of an unnecessary bargain.

One important difference between transaction costs and nontransactional costs of movement is that the latter typically relate to engineering, transportation, or sometimes social convention (such as driving on the right side of the road). These are all processes that are capable of evaluation by outside observers. By contrast, transaction costs depend on willingness-to-pay and willingness-to-accept—numbers that are subjective and much more difficult to observe, particularly if we are talking about natural persons rather than business firms. When we think about good traffic rules, casting the problem in terms of one person's willingness-to-pay and another's willingness-to-accept overly subjectifies what is fundamentally a problem in risk management. For example, a civil engineer's observations about appropriate rules for trains and cars at grade crossings gives us much better

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46.   Cont'l Improvement Co. v. Stead, 95 U.S. 161, 164 (1877); *accord* Grand Trunk Ry. Co. of Can. v. Ives, 144 U.S. 408, 431 (1892) (noting that a person "approaching a railroad crossing, ought to make a vigilant use of his senses of sight and hearing, in order to avoid a collision"); Brown v. Tex. & P. Ry. Co., 7 So. 682, 683 (La. 1890) (commending the district court judge for applying the *Continental Improvement Co.* rule); Del Buono v. Ill. Cent. R. Co., 124 So. 694, 696 (La. Ct. App. 1929) (discussing the "superior right of the train"). The Supreme Court's "character and momentum" statement was used in state court jury instructions on duty to yield. *See, e.g.*, Kan. City, M. & O. Ry. Co. v. McDaniel, 165 P. 1144, 1144 (Okla. 1917) (considering a collision between a train and a wagon); Brogdon v. Nw. R.R. Co. of S.C., 139 S.E. 459, 462 (S.C. 1927) (considering a collision between a train and an automobile).

and more useful information than any notion about the states of mind or the bargaining strategies of the operators.

D. *KEEPING CONTRACT AND BEHAVIORAL EXPECTATIONS WITHIN APPROPRIATE BOUNDS*

Ronald Coase's work served to establish a strong link between contract rights and private legal disputes. Every resource conflict becomes a bargaining problem. When we think of legal conflicts in terms of the cost of moving resources rather than simply the costs of bargaining, however, the link between contract bargaining and outcomes in the legal system becomes weaker. This is not to say that bargaining or the right to bargain is not important. In many situations the legal system does and should defer to parties' contractual judgments rather than the objectively defined costs of moving resources. Buyers and sellers in competitive markets make highly individual choices about with whom to transact, what to buy, and how much to pay. People who are of age have a right to select each other for marriage, even if friends believe that this particular resource movement is a bad idea and may lead to costly redeployment in the future.

But imagining bargains in situations where they are unnecessary, as the Coasean analysis sometimes does, may force people to identify particular solutions as desirable even though more satisfactory solutions are available. On the illustrative numbers given previously, the "efficient" solution to *Sturges v. Bridgman* is for Bridgman to shut down his mortar and pestle, thus preserving Sturges's more valuable interest. This solution is seen as efficient only because we are viewing it myopically, however, within the context of a micromarket that the parties' own prior decisions had created. Once we look at the bigger market where the services of physicians and confectioners are sold, then solutions emerge in which both Sturges and Bridgman can continue to operate. While stepping back provides opportunity for resources savings, however, it also opens up the universe of potential bargainers and makes actual bargaining much less likely. Theoretically, everyone in or about to go to London could bargain over the best location for each.

But now the bargain begins to resemble a social contract rather than a real, executed contract. The peculiarity of social contracts is that, whatever their strengths as justifications for social ordering, they cannot possibly be the products of actual bargains involving all interested participants. The bargains have to be "reconstructed" through the making of more external judgments about who profits, by how much, what we should presume about participants' attitudes about risk, and so on.[47]

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47. For examples from diverse ideologies, see generally RICHARD A. EPSTEIN, TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN 110–12 (1985) (defending the classical liberal version of the Takings Clause); RICHARD A. EPSTEIN, THE CLASSICAL LIBERAL CONSTITUTION: THE UNCERTAIN QUEST FOR LIMITED GOVERNMENT 20, 370 (2014) (defending

Written on a smaller scale, this observation extends to a wide variety of circumstances, such as the proverbial smokestack industry and the downwind homeowners. Once affected parties with opposing interests have invested in their position, they become the entire market for bargaining purposes. The efficient solution will impose considerable costs on at least one group. But earlier, before their positions have been established, a range of more attractive solutions is available that can limit or eliminate the damage to all. Perhaps for this reason, more than a half-century of Coasean analysis has not placed a noticeable dent in the prevalence of basic zoning rules that segregate polluting industry from residential uses. When we think about the initial assignment in such settings, pairwise bargaining is not the best way to allocate land uses.

When we examine the cost of traffic collisions and the cheapest way of avoiding them, the imaginary bargain that we use to identify who would have won the right of way is only a "bargain" in a metaphorical sense. Ultimately, these questions reduce to ones of engineering, technical ability or superiority, or some other factor that has nothing to do with a bargain. Deciding whether the train or the car should yield the right of way is fundamentally not a problem in bargaining. Making it into one involves many behavioral and transactional complexities, while giving nothing in return.

Such solutions do limit property and contract rights to the extent that they forbid individuals from creating harmful externalities in the first place. Perhaps land occupants should have a property right or liberty of contract to invest in any activity and resolve externality issues later by making or imposing costly divestments. Or perhaps automobile drivers should have a right to drive on whichever side of the road they please, bargaining to yield whenever traffic approaches. To be sure, drivers do not own the roads and consent to traffic rules are a price of admission. But that answer is incomplete. One can say the same thing about property rights generally: someone has a right to own property but not a right to use it to harm others. One characteristic of most externalities is that they have no respect for property lines, whether it is Bridgman's noisy machine or the polluter's smoke. Accepting the Coasean analysis, however, entails that we have already subordinated these liberty rights to concerns about efficiency.

Nontransactional costs of movement can more easily be predicted across categories of persons because our thinking is not complicated by the need to consider hypothetical bargains. For example, the emergent field of behavioral economics is complex, often indeterminate, and difficult for courts to apply.[48] But behavioral economics, like all other economics, is fundamentally about

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the classical liberal version of the social contract); JOHN RAWLS, A THEORY OF JUSTICE (rev. ed.1999) (arguing that society has entered into a hypothetical social contract).

   48.   *See infra* notes 97–99 and accompanying text.

bargaining. Often the best way to avoid these issues of indeterminacy is to avoid bargaining metaphors altogether.

The domain and usefulness of behavioral law and economics are currently up for grabs.[49] One thing that is clear, however, is that incorporating behaviorist assumptions into economics makes transaction analysis both more complex and less robust. An important way to limit the complexities that behavioral economics imposes is to limit the situations in which bargaining metaphors are required. Coase largely ignored these issues, even as he insisted that the problem be cast as one of bargaining. A much more direct route to the same result is to ignore bargaining altogether in situations where bargaining is unnecessary or where bargaining metaphors are unhelpful.

IV. COASEAN MARKETS WITH MANY PLAYERS

Economics often encounters markets with many players. Outcomes vary with assumptions. For example, the First Welfare Theorem (perfect competition) is relatively easy to prove, while strict proof of the Coase Theorem is very difficult. The reason is that all actors in the perfectly competitive market are powerless and strategic behavior is impossible. If the market price is P, a prospective seller can either sell or not sell, and a prospective buyer can either buy or not buy. The seller invariably sells if its willingness-to-accept ("WTA") is less then P, and the buyer invariably buys if her willingness-to-pay ("WTP") is greater than P.[50] That is, there is no room for strategic behavior. In the Coasean situation, by contrast, the price is indeterminate, and one cannot conclude that a trade will be made any time it is jointly profitable, and certainly not in the case of three or more players. As a result, the proof requires significantly stronger, and perhaps more idiosyncratic, rationality assumptions.[51] If there are three or more

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49. For divergent views, see generally Ryan Bubb & Richard H. Pildes, *How Behavioral Economics Trims Its Sails and Why*, 127 HARV. L. REV. 1593 (2014) (analyzing retirement savings, consumer credit, and environmental protections to illustrate behavioral law and economics); Ehud Guttel & Alon Harel, *Matching Probabilities: The Behavioral Law and Economics of Repeated Behavior*, 72 U. CHI. L. REV. 1197 (2005) (discussing how the probability of costs and benefits associated with a particular choice can be addressed in the legal context); Russell Korobkin, *Comparative Effectiveness Research as Choice Architecture: The Behavioral Law and Economics Solution to the Health Care Cost Crisis*, 112 MICH. L. REV. 523 (2014) (describing the benefits and costs of implementing relative value health insurance); Russell Korobkin, *What Comes After Victory for Behavioral Law and Economics?*, 2011 U. ILL. L. REV. 1653 (suggesting that theorists turn their attention to the value of autonomy, subjective utility, and the consequences of individual differences in the extent of bounded rationality); Joshua D. Wright & Douglas H. Ginsburg, *Behavioral Law and Economics: Its Origins, Fatal Flaws, and Implications for Liberty*, 106 NW. U. L. REV. 1033 (2012) (arguing that even libertarian paternalism, the least paternalistic theory of behavioral law and economics, will reduce both welfare and liberty).

50. "Willingness-to-accept" is the lowest price a prospective seller will take; "willingness-to-pay" is the highest price a prospective buyer will pay.

51. *See generally* Martin Zelder, *The Cost of Accosting Coase: A Reconciliatory Survey of Proofs and Disproofs of the Coase Theorem, in* COASEAN ECONOMICS: LAW AND ECONOMICS AND THE NEW

participants, each nonunanimous coalition can be defeated by a different nonunanimous coalition, and we can face a situation akin to the provision of a public good. Further, the comparative advantage of bargaining over legislation disappears. If we require stronger rationality assumptions about Coasean bargaining, then in order to be consistent we need to make the same assumptions about legislative bargaining.

Making a trade requires at least two people, but often not more. In the traditional markets that have dominated classical and neoclassical economics, the number of people who make a trade is only a small subset of the market's total participants. For example, the competitive market for bread contains thousands of buyers and sellers, but a trade requires only one of each, and the rest of the market is largely unaffected.

Coasean markets are different because trading requires all participants to agree.[52] Even in the two-person setting, such as Sturges and Bridgman, this market functions less well than a competitive market because it is a bilateral monopoly. Each one can trade only with the other.[53] As the number of bargainers necessary to make a trade increases and their individual interests are more diverse, reaching a bargain becomes much more difficult.[54]

Coasean bargaining with many players can yield cycling problems, although they are somewhat different from the cycling problems encountered in political (majority vote) markets.[55] In political markets a common problem is that a nonunanimous but initially winning coalition can be defeated by a different nonunanimous coalition, as developed in Condorcet's Paradox and

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INSTITUTIONAL ECONOMICS 65 (Steven G. Medema ed., 1998). For further reference, see also Herbert Hovenkamp, *Rationality in Law & Economics*, 60 GEO. WASH. L. REV. 293, 303–04 (1992) (discussing the assumptions required to prove the Coase Theorem). For equivalent problems in two-person Coasean markets, or bilateral monopolies, see generally Blair et al., *supra* note 34.

52.   *See* Herbert Hovenkamp, *Coasean Markets*, 31 EUR. J.L. & ECON. 63, 65 (2011).

53.   *See supra* notes 34–35 and accompanying text; *see also* OLIVER E. WILLIAMSON, MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS 238–47 (1975) (explaining the numerous difficulties of trading in less than competitive markets).

54.   On the relevance of diversity to transaction costs, see generally Ian Ayres & Eric Talley, *Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade*, 104 YALE L.J. 1027 (1995); Carol M. Rose, *The Shadow of* The Cathedral, 106 YALE L.J. 2175, 2184 (1997).

55.   On cycling problems in Coasean markets, see generally Varouj A. Aivazian & Jeffrey L. Callen, *The Coase Theorem and the Empty Core*, 24 J.L. & ECON. 175 (1981); R.H. Coase, *The Coase Theorem and the Empty Core: A Comment*, 24 J.L. & ECON. 183 (1981); Hovenkamp, *supra* note 51. For more skeptical views, see generally Thomas W. Merrill & Henry E. Smith, *What Happened to Property in Law and Economics?*, 111 YALE L.J. 357 (2001); Maxwell L. Stearns, *The Misguided Renaissance of Social Choice*, 103 YALE L.J. 1219 (1994).

later formalized by Arrow's Impossibility Theorem.[56] As a result, purely democratic markets can be unstable unless the vote is unanimous.[57]

In the Coasean market a unanimously agreed-upon solution is stable because it would take another unanimous choice to change it. The cycling problem shows up in reaching the decision in the first place. Suppose a factory's smokestack belches smoke that injures 100 homeowners but is in a non-nuisance jurisdiction. The homeowners must pay the smokestack if they want to shut it down. That payment will theoretically occur if the aggregate value that the homeowners place on freedom from smoke is greater than the value that the factory places on continued operation in that location. But how will the payment be divided among the homeowners? A coalition of the most nearby homeowners may agree on an equal payment for everyone, but more remote homeowners will object that they are injured less by the smoke and thus place a lower value on its removal. Or those who have property interests that are less valuable or less vulnerable to smoke damage will argue that payments should be proportioned to provable harm. Or some homeowners may object that the prevailing winds force the smoke into a path that injures some homeowners more than others. The result could be an endless set of proposals, coalitions, and counterproposals, with no proposal ever achieving the unanimous consent that is needed.

The same thing could happen in a nuisance jurisdiction where the value of operating the factory is greater than the injury to the homeowners. In that case the factory would be willing to compensate the homeowners, but only after they agree on how the compensation should be divided. The same problems emerge. Any proposed agreement could be defeated by an alternative proposed agreement.

One might be tempted to say that the problem of reaching and maintaining efficient outcomes in many-player Coasean markets is one of transaction costs. These costs may become higher, even insurmountable, in markets that have large numbers of participants and that give rise to the formation of alternative coalitions. The issue is more complex than that, however. If bargaining were literally costless, it would go on forever. A rational

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56. *See generally* KENNETH J. ARROW, SOCIAL CHOICE AND INDIVIDUAL VALUES (Yale Univ. Press 2d ed. 1963). On the Theorem's relation to governance, see generally Herbert Hovenkamp, *Arrow's Theorem: Ordinalism and Republican Government*, 75 IOWA L. REV. 949 (1990). On voting cycles in democratic nonunanimous decision making, see DENNIS C. MUELLER, PUBLIC CHOICE III, at 72–78 (2003).

57. DANIEL A. FARBER & PHILIP P. FRICKEY, LAW AND PUBLIC CHOICE: A CRITICAL INTRODUCTION 38–39 (1991). *See generally* Saul Levmore, *Ambiguous Statutes*, 77 U. CHI. L. REV. 1073 (2010) (discussing cycling in legislative contexts); Robert D. Tollison, *Public Choice and Legislation*, 74 VA. L. REV. 339 (1988) (discussing cycling in legislative processes). On the implications of Condorcet's paradox on democratic institutions, particularly where preferences are not naked but are arrayed around specific policies or ideologies, see generally WILLIAM V. GEHRLEIN & DOMINIQUE LEPELLEY, VOTING PARADOXES AND GROUP COHERENCE: THE CONDORCET EFFICIENCY OF VOTING RULES (2011).

decision maker would continue to bargain as long as the expected value of improving one's position exceeded the cost of continuing to bargain, which would be zero. Under zero-cost bargaining any possibility of an improvement would yield a further offer. Indeed, in such situations it is more likely that positive, although manageable, bargaining costs serve to induce equilibrium by making continued bargaining costly.[58]

One possible solution to the cycling problem is a damages rule rather than an injunction rule. For example, suppose that 100 homeowners object to a smokestack. Their individual damages are diverse but the aggregate is $1000. The value of operating the smokestack is $1200, so it is willing to pay the $1000. An injunction rule might yield infinite cycling, but under a damage rule a third party such as a jury could assess the loss to each homeowner, who would then be forced to accept that amount in lieu of an injunction. Coase himself once observed that switching to damage rules in such cases could prevent cycling.[59] The result, however, is to give the smokestack something akin to the power of eminent domain.[60] In any event, the harm is done, and the damages must be paid only because the homeowners and the smokestack were permitted to move into such close proximity in the first place. Prohibiting this could have made both an injunction and damages unnecessary by preventing the harm altogether.

An additional feature of the damages rule is that in most situations bargaining or bargaining analogies are no longer part of the solution. For most injuries damages rules turn into a variation of the "cheapest cost avoider" problem with respect to automobile accidents[61] by substituting engineering or objective resource movement costs for bargaining. For example, if the smoke pollution is injuring a downwind homeowner's roses, the relevant question becomes the market value of the ruined roses, replacement costs, or something akin to that. We no longer care about parties' bargaining strategies or, in most cases, even their subjective values.

A. *The Public Goods Character of Many-Player Coasean Markets*

Coase himself recognized the problem of bargaining in markets with large numbers of players. He was particularly concerned with smoke pollution, writing about it in both his 1959 article on the Federal Communications Commission and a year later in *The Problem of Social Cost.* One can speculate that his interest resulted from his earlier life in heavily-

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58. Coase's response was that determining what would happen under zero transaction costs is simply "without value except as steps on the way to the analysis of the real world of positive transaction costs." Coase, *supra* note 55, at 187.

59. *Id.*

60. *See* Richard A. Epstein, *A Clear View of* The Cathedral*: The Dominance of Property Rules*, 106 YALE L.J. 2091, 2112 (1997) (noting application of a damages rule as one difference between eminent domain and voluntary transactions).

61. *See supra* Part III.C.

polluted London. In *The Federal Communications Commission,* Coase observed that "[w]hen large numbers of people are involved, the argument for the institution of property rights is weakened and that for general regulations becomes stronger."[62] Speaking of smoke pollution in particular, he acknowledged that "if many people are harmed and there are several sources of pollution, it is more difficult to reach a satisfactory solution through the market."[63] As a result, "[i]n these circumstances it may be preferable to impose special regulations . . . ."[64]

In *The Problem of Social Cost* a year later, Coase returned to smoke pollution.[65] Interestingly, his most extensive discussion was of *Bryant v. Lefever,* a dispute between a single defendant and a single plaintiff. Coase himself acknowledged that the situation was "novel."[66] The nuisance dispute arose when the defendant rebuilt his house, giving it a higher roofline that prevented the plaintiff's chimney from clearing its smoke.[67] Coase later addressed "the standard case of a smoke nuisance, which may affect a vast number of people engaged in a wide variety of activities."[68] Coase conceded that private bargaining might not be able to determine the result and that we might wish to call upon the government as a "super-firm" to solve the problem.[69]

Coase also discussed the problem of railroad trains that throw sparks from their engines, sometimes causing fires on nearby land.[70] The relevant cost to the individual landowners is the probability that a fire will occur on their property multiplied by the expected amount of damage. The relevant cost to the railroads is the cost of minimizing the sparks, perhaps by proceeding more slowly or installing spark-suppressing technology or switching fuels, or perhaps even by ceasing operation or relocating.

A single railroad line might pass by hundreds of landowners, and a deal with any one of them will not bind the others. Suppose that the cost of eliminating the sparks is less than the risk-adjusted cost of expected injury to the landowners. In a well-functioning Coasean market the parties would bargain to a solution in which the railroad eliminated the sparks by some means. If the parties are in a nuisance jurisdiction the outcome is fairly simple: no deal will result. The most the railroad is willing to pay will be less than the

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62.   R.H. Coase, *The Federal Communications Commission*, 2 J.L. & ECON. 1, 29 (1959).

63.   *Id.*

64.   *Id.*

65.   *See* Coase, *supra* note 1, at 1–2, 11–13.

66.   *Id.* at 11.

67.   *Id.* The *Bryant* court used the type of "wrongdoer" analysis that Coase rejected—namely that while making smoke and injuring a neighbor might be a nuisance, in this case the plaintiff was being injured by his own smoke. *Id.* at 12.

68.   *Id.* at 17.

69.   *Id.*

70.   *See id.* at 29.

value the landowners place on being free from the risk imposed by the sparks. The railroad will have to take whichever avoidance mechanism is effective and cheapest.

But what if the parties are in a no-nuisance jurisdiction? The landowners will have to pay off the railroad. We can assume that the gross amount of the payment is easy to compute because it applies to the railroad alone. For example, if effective spark-arresting technology costs $1 million, the railroad would accept any amount in excess of that. But how is the payment to be divided up among the, say, 1000 landowners adjoining the tracks? First, they are very likely quite diverse. Some have grazing land adjoining the tracks, making the expected cost of spark-induced fire relatively small. Others may have assets that are easily and cheaply moved further from the tracks.[71] Others may have houses or other buildings close by, and for them the expected cost of a fire will be much greater. Some may have 100 feet of frontage along the tracks while others have 500 feet, greatly increasing their exposure. Some may be in a direction that is persistently upwind while others are downwind. Some may be in areas where trains travel or accelerate much more than in other areas, and thus emit more sparks.

The result will be either underinvestment in efficient technologies or activities, or else a great deal of negotiating and cycling through various alternatives. For example, the landowners may form coalitions whose members can be siphoned off by alternative coalitions. Small owners might agree to pay $500 each, leaving large landowners with $5000. But then a subgroup of the large landowners might reform as a coalition of those having houses along the tracks, asking others to join them and offering $4000 each.

In such a situation Coasean bargaining under a unanimous-consent rule can turn into endless cycling with no agreement ever being reached. The story is a little like Charles Dickens' *Bleak House*, where numerous potential heirs and devisees contested a will, each asking for more than someone else or trying to exclude others until the entire estate was consumed by litigation costs.[72] The parties would have been much better off if they had been able to agree, but an agreement would have required unanimous consent among all of those with a colorable claim.[73]

Each landowner will have a tendency to understate his exposure, thus making his share of the payment smaller. In addition, each landowner knows

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71. *E.g.*, LeRoy Fibre Co. v. Chi., Milwaukee, & St. Paul Ry. Co., 232 U.S. 340, 341 (1914) (discussing how landowner's injury from railroad sparks was from stacks of straw that were positioned very close to the track); *see also* Mark F. Grady, *Common Law Control of Strategic Behavior: Railroad Sparks and the Farmer*, 17 J. LEGAL STUD. 15, 37 (1988).

72. *See generally* CHARLES DICKENS, BLEAK HOUSE (Signet Classics 2003) (1853).

73. *See* MARGARET F. BRINIG, FROM CONTRACT TO COVENANT: BEYOND THE LAW AND ECONOMICS OF THE FAMILY 202–03 (2000); *see also* Anthony T. Kronman, *Contract Law and the State of Nature*, 1 J.L. ECON. & ORG. 5, 7 (1985) (describing property disputes among multiple actors in a "state of nature").

that once the spark arrester is installed it will benefit everyone, so they may be able to get away without paying anything at all.[74] That is to say, the many-player Coasean market effectively becomes a market for a public good in the sense that a costly but efficient fix, once installed, benefits the entire affected population. The railroad cannot insist on individual payment by selectively denying protection. At the same time, however, each landowner has an incentive to understate the value of the interest in question.[75]

To be sure, the available solutions might be diverse, with some resembling public goods more than others. For example, the railroad might accept compensation in order to run more slowly alongside the farms of payors, even decreasing its speed as they pay more. In that case it might be able to bargain with each landowner individually. If it installs the spark-arresting technology, however, all landowners will be protected, whether they pay or not. The first solution may be superior from a bargaining standpoint, while the second may be superior technologically.

It also does not add much to say that efficient outcomes will emerge when gainers from a certain rule can compensate the losers, who stand to lose less than the gainers gain. If actual bargains were at issue, the recipients would still have to agree with each other about how the compensation is to be divided, or the payors would have to agree on the size of each person's obligation. The same cycling problems re-enter.[76]

Coase himself recognized the public goods character of some Coasean markets. In his article *The Lighthouse in Economics*, he noted a history in which lighthouses were privately financed with harbor taxes charged against ships who came and went.[77] But Coase never adequately addressed the problem of ships that simply passed by, benefitting from the lighthouse but not required to pay the tax. The lighthouses were never really private, and to the extent

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74. On whether the problem of nonpayment by free riders is a "transaction cost," see HAROLD DEMSETZ, FROM ECONOMIC MAN TO ECONOMIC SYSTEM: ESSAYS ON HUMAN BEHAVIOR AND THE INSTITUTIONS OF CAPITALISM 116–17 (2008) (arguing that the cost of free riders is an ownership cost rather than a transaction cost).

75. *See* DAVID D. FRIEDMAN, LAW'S ORDER: WHAT ECONOMICS HAS TO DO WITH LAW AND WHY IT MATTERS 49–50 (2000) (discussing the public goods problem in some Coasean markets).

76. *But see generally* Francesco Parisi, *Political Coase Theorem*, 115 PUB. CHOICE 1 (2003) (arguing that Coasean markets with zero transaction costs, single-peaked preferences, and side payments could yield stable outcomes). In most cases, including the illustrations discussed in the text, the preferences of individual landowners are not single-peaked because they divide into different categories that cannot be arrayed along a single line. For example, if the only variable was each landowner's distance from a smokestack, the array of preferences might be single-peaked. But different landowners might also be engaged in different types of activity that is more or less harmed by smoke, and this array might be uncorrelated with distance from the smokestack. Another array might be correlated with prevailing wind direction, or the nature of the assets at risk. The aggregation of these preference sets is not single-peaked. In any event, bargaining depends on *declared* willingness to pay or accept, not on objective measurement of cost or profit. If we use the latter, then we are no longer relying on a bargaining metaphor.

77. R.H. Coase, *The Lighthouse in Economics*, 17 J.L. & ECON. 357, 360–61 (1974).

they were, they failed.[78] In any event, the harbor tax was assessed by a government agency or its equivalent.

Bargaining problems in many-player Coasean markets have numerous real world manifestations. One example is the previously discussed issue of whether land uses are best allocated legislatively through the zoning system or else by private bargaining. In the first two decades after *The Problem of Social Cost* was published, several writers advocated private restrictive covenants as efficient alternatives to legislative zoning.[79] Pairwise resolution of disputes among people who have already made their investments is always suboptimal, however, if the investments themselves are suboptimal and extraction is costly. If we want maximizing solutions—the kind where *both* uses can coexist—then we must identify the problems before the conflict arises. This entails a system more like the one for traffic rules, which focuses on the entire area in which resource conflicts arise, on classes of users rather than individuals, and on the overall costs of moving resources. In general, the more costly it is to move or redeploy a poorly located resource (such as a smokestack), the greater the value in getting it right the first time. Zoning and subdivision servitude decisions typically involve questions such as how far commercial and noncommercial uses should be separated from one another, whether polluting or noise producing industry should be segregated, whether to have separate professional and industrial parks, how to consider commuting costs in locating residential and commercial areas, and so on. Assuming we can predict with at least minimal accuracy, the costs of making the right decisions before investment occurs are almost certain to be significantly lower than the later costs of extraction from badly made decisions.

B. *EXCESSIVE CYCLING OR EXCESSIVE STABILITY?*

Even when unanimous consent is initially achieved, Coasean bargaining rules are suboptimal when they make it more difficult to respond to changed circumstances. Rules initially established by unanimous consent might later become inefficient. If unanimous consent is required to change them, however, there will be holdouts that prevent the change from taking place. That is, the Coasean market then produces excessive stability, which makes such rules particularly troublesome in changing markets.

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78.   *See* Elodie Bertrand, *The Coasean Analysis of Lighthouse Financing: Myths and Realities*, 30 CAMBRIDGE J. ECON. 389, 390 (2006).

79.   *See, e.g.*, BERNARD H. SIEGAN, LAND USE WITHOUT ZONING 77–84 (1972); Robert C. Ellickson, *Alternatives to Zoning: Covenants, Nuisance Rules, and Fines as Land Use Controls*, 40 U. CHI. L. REV. 681, 711–19 (1973); Douglas W. Kmiec, *Deregulating Land Use: An Alternative Free Enterprise Development System*, 130 U. PA. L. REV. 28, 66 (1981); Robert H. Nelson, *Contracting for Land Use Law: Zoning by Private Contract, in* THE FALL AND RISE OF FREEDOM OF CONTRACT 157, 171–73 (F. H. Buckley ed., 1999); Robert H. Nelson, *Privatizing the Neighborhood: A Proposal to Replace Zoning with Private Collective Property Rights to Existing Neighborhoods*, 7 GEO. MASON L. REV. 827, 828–29 (1999).

Excessive stability has proven to be a significant problem in subdivisions where land uses are governed mainly by restrictive covenants, easements, or other servitudes. Some residential subdivisions have attempted to solve this problem by permitting nonunanimous voting to change an existing restriction that is no longer desirable.[80] But switching to nonunanimous rules simply substitutes one cycling problem for another. The nonunanimous rules have all the defects of democratic voting systems generally.[81] As a result, the courts have frequently had to intervene to protect minority rights. For example, several courts have held that even where a set of restrictions permit changes by less than unanimous voting, unanimity would be required for a proposed change that would affect only a single lot in the subdivision.[82]

One alternative approach is to re-conceptualize the problem of multi-player bargaining as a time series of pairwise contracts. That is what frequently happens when residential subdivisions are initially developed. The developer draws up a list of land use restrictions for a particular subdivision, typically by making an economic prediction concerning the uses that will maximize subdivision value—a prediction, incidentally, that is based on externally measured assessments of value rather than actual willingness-to-pay. The developer then places these restrictions into the chain of title and sells the homes individually, with each buyer agreeing to the restrictions. Once the restrictions are in place and buyers have begun to purchase, acceptance of the restrictions is largely mandatory—take them or leave them. This avoids the problem of dozens or hundreds of homeowners having to bargain at once. This "vertical" series of pairwise transactions must eventually turn into a

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80.   *See, e.g.*, Miller v. Miller's Landing, L.L.C., 29 So. 3d 228, 235 (Ala. Civ. App. 2009) (concluding that a rule permitting less than unanimous consent to amend a restriction is subject to a judicially enforced reasonableness test); Brown v. Martin, 794 N.W.2d 857, 859 (Mich. Ct. App. 2010) (considering a provision permitting amendment of the covenant by less than unanimous vote in certain circumstances); Lake Wauwanoka, Inc. v. Spain, 622 S.W.2d 309, 311 (Mo. Ct. App. 1981) (explaining the subdivision's rule that allowed a majority of the residents to amend a covenant); Lawton v. Schwartz, 308 P.3d 1033, 1036 (N.M. Ct. App. 2013) (examining rules that allowed 75% of owners in a community to change the restrictive covenant); Estates at Desert Ridge Trails Homeowners' Ass'n v. Vazquez, 300 P.3d 736, 745 (N.M. Ct. App. 2013) (considering the validity of a rule requiring unanimous consent to amend a covenant during the first 25 years of its creation, but permitting less than unanimous decisions thereafter).

81.   *See generally* Herbert Hovenkamp, *Bargaining in Coasian Markets: Servitudes and Alternative Land Use Controls*, 27 J. CORP. L. 519 (2002) (arguing that zoning has an advantage over private bargaining); Neal Kumar Katyal, *Stochastic Constraint*, 126 HARV. L. REV. 990 (2013) (reviewing JACK GOLDSMITH, POWER AND CONSTRAINT: THE ACCOUNTABLE PRESIDENCY AFTER 9/11 (2012)); Stewart E. Sterk, *Foresight and the Law of Servitudes*, 73 CORNELL L. REV. 956 (1988) (discussing the disadvantages of public intervention in servitudes); Stewart E. Sterk, *Freedom from Freedom of Contract: The Enduring Value of Servitude Restrictions*, 70 IOWA L. REV. 615 (1985) (proposing the changed conditions doctrine be limited to situations where unanimous consent is required for modifications).

82.   *See, e.g.*, Licker v. Harkleroad, 558 S.E.2d 31, 34 (Ga. Ct. App. 2001); Walton v. Jaskiewicz, 563 A.2d 382, 386 (Md. 1989); Maatta v. Dead River Campers, Inc., 689 N.W. 2d 491, 498 (Mich. Ct. App. 2004).

"horizontal" arrangement among the homeowners, who eventually take it over and operate it themselves under contract rules. By that time the servitudes are already in place.[83] It would be as if Sturges and Bridgman had been obligated before making their purchase (or lease) to agree to a covenant restricting the use of noisy machinery. If such a covenant had been in place Bridgman would presumably have decided to go elsewhere, where his machinery would not interfere with Sturgis' stethoscope.

However, this approach would not solve the problem of servitudes that no longer serve their social purpose. We can still expect post-agreement hyperstability. Restrictions remain enforceable even after they serve to reduce rather than increase value. For example, if a neighborhood subject to residence-only restrictions has changed and surrounding areas have gone commercial, a significant majority may wish to profit by selling off their property for commercial use. But a small number, perhaps those in the interior, want to maintain the residential restrictions because they like where they are living and the surrounding, similarly restricted homeowners provide a buffer.[84] In such cases the courts have sometimes provided relief, but of course in so doing they are imposing a judicial judgment that conflicts with the contract-based judgment of the homeowners, and often where there is no obvious injury to outsiders.[85]

C. *FRACTURED MARKETS AND THE OPTIMAL SOURCE OF REGULATION*

Another difference between servitude rules and zoning rules is domain. Both private restriction systems and legislative systems can be subject to fracture, but private restrictions are more prone to the problem. The boundaries of subdivisions or other private residential developments such as condominiums are often drawn too small to encompass the areas over which resource conflicts arise. Subdivision boundaries are not only smaller than municipal boundaries, but they are often a function of nothing more than previous ownership of a parcel of land. For example, a developer might

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83.   The developer typically has the power to enforce the servitudes as long as it owns at least one protected lot in the subdivision; but once it has sold the last lot, it no longer has standing. *See* Promenade at Playa Vista Homeowners Ass'n v. W. Pac. Hous., Inc., 133 Cal. Rptr. 3d 41, 49–50 (Cal. Ct. App. 2011) (finding that developers lacked standing because they "no longer ha[d] an interest in the land"). Some cases are less specific, permitting the developer to retain control for a "reasonable time" to fulfill its marketing efforts. Barclay v. DeVeau, 429 N.E.2d 323, 328 (Mass. 1981).

84.   *See, e.g.*, Redfern Lawns Civic Ass'n v. Currie Pontiac Co., 44 N.W.2d 8, 11–12 (Mich. 1950) (refusing to apply the changed conditions doctrine to grant relief from a servitude where maintenance of a single-family home restriction operated as a buffer benefitting interior lots); Matthews v. Winstanley, No. 242472, 2003 WL 22976411, at *5 (Mich. Ct. App. Dec. 18, 2003) (refusing to set aside a deed restriction where the character of the neighborhood had changed substantially).

85.   For a critique, see generally Richard A. Epstein, *Notice and Freedom of Contract in the Law of Servitudes*, 55 S. CAL. L. REV. 1353 (1982).

acquire the "Smith farm" in order to subdivide it for residential purposes. But the boundaries of the Smith farm have little to do with prevailing patterns of air or water movement, traffic, noise, congestion, or any of the other harmful effects that zoning is designed to address. Further, because servitudes are contractual, the only people who can enforce them are typically those who were parties to a contract or an estate in the encumbered land. For example, a lot owner in the Smith farm subdivision will very likely have standing to assert the no-smokestack covenant against another lot owner in that same subdivision, but she will not be able to enforce the restriction against a landowner across the street who is not part of the subdivision.[86]

Zoning by small communities can be subject to these problems as well, but in that case regional or statewide land-use regulation can be stacked above it so as to encompass larger markets.[87] This simply reflects the principle that the entity imposing a regulation should be geographically large enough to encompass the entire market that is being regulated. Otherwise we can expect self-dealing and myopic decision making.[88]

D.   EX ANTE *AND* EX POST *DECISION MAKING: EFFICIENCY AND THE LONG RUN*

Using the nuisance case of *Sturges v. Bridgman* as one illustration, Coase's social cost analysis identified the efficient solution as the one where the higher value activity is preferred while the lower value activity is shut down or perhaps ameliorated.[89] As noted previously, this solution is "efficient" only if we confine our analysis to the micro-market involving Sturges and Bridgman, which is often smaller than the markets in which the parties' activities

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86.   *See, e.g.*, Waikiki Malia Hotel, Inc. v. Kinkai Props. Ltd. P'ship, 862 P.2d 1048, 1063 (Haw. 1993) (holding that a property owner across the street from a height-restricted subdivision could not enforce the restriction even if he was injured); *see also* Shaff v. Leyland, 914 A.2d 1240, 1245 (N.H. 2006) (holding that a person who no longer owned property in a subdivision could not enforce a covenant restricting the number and architectural nature of the subdivision's homes); Santa Fe Estates, Inc. v. Concerned Residents of Santa Fe N., Inc., 207 P.3d 1143, 1147 (N.M. Ct. App. 2009) (holding that a group of interested citizens who were not landowners in the subdivision could not enforce the subdivision's restrictions); Stegall v. Hous. Auth. of Charlotte, 178 S.E.2d 824, 829 (N.C. 1971) (holding that a person who did not own a lot in a subdivision could not enforce the subdivision's single-family home restriction); Lakewood Racquet Club, Inc. v. Jensen, 232 P.3d 1147, 1153 (Wash. Ct. App. 2010) (holding that once a property had been sold, the previous owner's heirs could no longer enforce the covenant).

87.   On "stacking" as a fix for institutional fracture, see *infra* Part VI.

88.   *See* Herbert Hovenkamp, *Regulatory Conflict in the Gilded Age: Federalism and the Railroad Problem*, 97 YALE L.J. 1017, 1044–45, 1070 (1988) (discussing the dispute over state versus federal regulation of the American railroad system). On the fracturing problem in zoning, see generally Richard Briffault, *The Local Government Boundary Problem in Metropolitan Areas*, 48 STAN. L. REV. 1115 (1996); Sheryll D. Cashin, *Localism, Self-Interest, and the Tyranny of the Favored Quarter: Addressing the Barriers to New Regionalism*, 88 GEO. L.J. 1985 (2000); Herbert Hovenkamp & John A. Mackerron III, *Municipal Regulation and Federal Antitrust Policy,* 32 UCLA L. REV. 719 (1985).

89.   *See supra* Part II.

operate.[90] Once we look at the broader market for confectioning, doctoring, or small business generally, then we may be able to produce solutions in which both activities can continue without harming one another. In order to do that we would need to consider all of the costs of moving resources, not merely those that are involved in transacting. We must also examine the longer run, because an important part of the cost of moving resources is correcting for previous mistakes. In most situations the optimal course is to put them into the correct place to begin with.

Blum and Kalven were correct in 1964 that pairwise bargaining would not work as between two automobiles facing an impending collision.[91] Calabresi responded with a solution that re-focused the automobile accident question on the *entire* market in which such collisions likely are to occur.[92] Because bargaining is possible between neighbors with stable relationships and predictable disputes, Coase was able to focus on tiny markets that told us a great deal about bargaining but said little about optimal allocations of resources in the greater markets in which these activities occurred. The truly efficient solution to the *Sturges v. Bridgman* problem requires broadening our vision to take into account the entire set of market choices that these two people faced before they made their investments in a particular location. That necessarily includes a much larger area that encompasses both of their uses, as well as a longer period of time. In the process, we will have involved a much greater number of persons and greater diversity of interests in the negotiating process.

As between two parties in a resource conflict, the person who places the greater value on a right after interests are in place is not necessarily the one who would have valued it most highly before he moved in. For example, our hypothetical numbers assumed that Sturges's use of his stethoscope was more valuable than Bridgman's use of his mechanical mortar and pestle. However, looking *ex ante* it may also be true that relocating Bridgman's bulky candy manufacturing equipment is much more costly than relocating Sturges's lightweight stethoscope. In addition to assuming that Sturges valued use of his stethoscope at £100 while Bridgman valued use of his mortar and pestle at £60, suppose that it would cost Sturges only £25 to relocate while it would cost Bridgman £40. In that case a more efficient outcome occurs when Sturges moves and both parties continue their operations. If the jurisdiction finds a nuisance, Bridgman will have to pay Sturges to move. If there is no nuisance Sturges must pay his own moving costs. While professionals often have highly valuable occupations, they also frequently have fairly mobile assets. The cost

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90.   *See* Williamson, *supra* note 53, at 24 (noting the partial equilibrium nature of Coasean analysis).

91.   *See* Blum & Kalven, *supra* note 41, at 700.

92.   CALABRESI, *supra* note 26, at 135 & n.1.

of moving a law office might be considerably less than the cost of re-locating a cement production plant.[93]

The most efficient solution to the *Sturges v. Bridgman* problem is to allocate property rights in such a way that the problem never arises in the first place. Then we can have both confectioners and physicians. This means that the initial position must be one from which further movement is least likely to be necessary. For example, if we can assign Sturges's right to a place where he will be free to practice without interference we would have the social value of his activity, or £100. If we can do the same thing with Bridgman we will also have the social value of his activity, or £60. Making such decisions, however, almost always requires looking beyond Sturges and Bridgman. While each building has only one actual owner, it may have a very large number of potential owners. One relatively private approach to the problem would be a set of servitudes that segregated business activities by the amount of interference that they caused. For example, relatively noisy activities such as confectioning could be assigned to one land area, while professional activities such as practicing medicine could be assigned to a different area. This could only happen in a relatively large subdivision, however. It would thus place us in territory that involves multi-player negotiating and all of the problems attending such markets, as discussed above.

At this point subjective bargaining analogies fail us, but there are alternatives. The Arrovian theory predicting endless cycling in many political, majority rule markets assumed "naked" voter preferences that were noncomparable from one actor to another.[94] But identification of the "cheapest cost avoider" in accident law makes no such assumption. Instead of inferring "preferences," as bargaining theory does, it looks directly at the problem of the cost of moving resources, typically focusing on engineering costs, health costs, productivity, or other factors that can be estimated directly from market prices without using individual preference as a surrogate. For example, making cars stop rather than trains is not a matter of assessing the preferences of drivers and engineers, but rather of doing a cost-benefit analysis of different assignments of the obligation to stop.

V. Managing Fracture Through Default Rules

Default rules can provide a presumptive solution to resource conflicts but then permit parties in individual settings to select a different arrangement. They are particularly useful when the "gross" rules for a particular situation are relatively clear and common, but finer rules require more individualized decisions. For example, the Uniform Commercial Code provides that title to goods passes when the goods are delivered, but permits the parties to agree

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93.   *See* Boomer v. Atl. Cement Co., 257 N.E.2d 870, 873 (N.Y. 1970) (using nuisance law to address cement plant pollution where relocation was costly).

94.   *See generally* Hovenkamp, *supra* note 56.

to an alternative.[95] One defense of such a rule is that it takes the issue of title passage off the table for the great majority of covered bargains, but permits parties to bargain around the rule when an alternative increases net value. A well-designed default rule assigns the right so that it creates the greater value in most situations (or situations producing the greatest value), making bargaining unnecessary. It then permits the parties to bargain around the default whenever the values are switched. Default provisions are particularly important in situations where the parties must bargain but high transaction costs, risk aversion, or an endowment effect obstructs trading to a higher value.[96]

Because common law rules permit settlements, default rules are ubiquitous in any regime where private common law governs legal outcomes. But they can also be valuable in a mixed regime of regulation and private ordering. In addition, they protect individual autonomy by giving people both the choice to act as they wish but a certain amount of state control in situations where the social value of a particular outcome is high but individual costs are relatively small. That is, they serve to soften the paternalism of more heavy handed regulation.

Much of the literature on default rules has been concerned with contract law, and their relevance in contractual situations is obvious. For commercial contracts in particular, default rules serve to fill in the gaps when contracts are incomplete. When the gap is explicitly filled in, however, the default gives way to the parties' expressed preferences.[97] Default rules exist in many other legal settings, however, quite aside from contract law. Construction of legal documents, statutes, regulatory choices, and even the Constitution also involve default rules that apply mainly when language is ambiguous or incomplete.[98] For example, Chief Justice Taney's famous conclusion in the *Charles River Bridge* case that in grants from the government "nothing passes

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95.   U.C.C. § 2-401 (2012).

96.   *See generally* Hovenkamp, *Marginal Utility and the Coase Theorem, supra* note 31. For additional discussion, see Russell Korobkin, *The Status Quo Bias and Contract Default Rules*, 83 CORNELL L. REV. 608, 613–17 (1998); Cass R. Sunstein, *Switching the Default Rule*, 77 N.Y.U. L. REV. 106, 110–12 (2002).

97.   *See* Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87, 87 (1989).

98.   *See, e.g.*, EINER ELHAUGE, STATUTORY DEFAULT RULES: HOW TO INTERPRET UNCLEAR LEGISLATION (2008); Omri Ben-Shahar, *A Bargaining Power Theory of Default Rules*, 109 COLUM. L. REV. 396, 429 (2009) (arguing that applying default rules in contracts is a distributive task); Bubb & Pildes, *supra* note 49, at 1628–30 (considering default rules in the context of retirement programs); Gillian E. Metzger, *Congressional Authority and Constitutional Default Rules in the Horizontal Federalism Context, in* WHY THE LOCAL MATTERS: FEDERALISM, LOCALISM, AND PUBLIC INTEREST ADVOCACY 101 (Kathleen Claussen et al., eds., 2008), *available at* http://www.law.yale.edu/why_the_local_matters_final_122109.pdf; Cass R. Sunstein & Lucia A. Reisch, *Automatically Green: Behavioral Economics and Environmental Protection*, 38 HARV. ENVTL. L. REV. 127 (2014); Tara Mikkilineni, Note, *Constitutional Default Rules and Interbranch Cooperation*, 82 N.Y.U. L. REV. 1403 (2007).

by implication," writes a default rule into the Constitution's Contract Clause: a grant of land or a franchise from the state does not include a monopoly right unless the granting language does so explicitly.[99]

The Coase Theorem assumes default rules to the extent that common law rules create alienable entitlements.[100] The invariance thesis states that in a zero transaction-cost world assignment of the default does not matter.[101] For example, whether or not Bridgman's mortar and pestle is declared a nuisance, the parties will bargain to the more efficient result. Default rules can matter, however, when the costs of bargaining are greater than the bargaining space, or the different valuations placed by the two parties. For example, if Sturges values the right to be free from Bridgeman's thumping by £100 while Bridgman values use of the machine at £60, the parties may not be able to agree on the efficient result if transaction costs exceed £40.

Traditional command-and-control regulation takes market choices away from individuals. Assuming that the regulation is well designed, this removal of market choice can be justified by generalizations from large numbers. For example, the rationale for a regulation that forbids anyone from conducting a business in a suburban area zoned R-1, or residential-only, is that the affected group as a whole is better off. Further, the statute accomplishes this much more efficiently than large numbers of conflict resolutions among disputing neighbors, particularly when we include the costs of extraction from previous mistakes.[102] Default rules may also be inappropriate when the purpose of the regulation is to protect someone from the market itself. For example, suppose the minimum wage were a default rule. By default people must be paid at least $7.50 per hour, unless they agree to a lower amount. The effect could be the same as if there were no minimum wage statute at all.

While legislation typically operates at a macro level, affecting large numbers of people, default rules often operate at a "micro" level. For example, the default rules developed in the Uniform Commercial Code apply to a very large number of commercial contracts. Deviating from them, however, typically requires an agreement between a single seller and a single buyer.

Default rules look less like "default" rules and more like absolute rules as the costs of defaulting increase. These costs can be either transactional or nontransactional. For example, once the smokestack and the homeowners are in place, a default rule declaring that the smokestack is not a nuisance may be absolute to the extent that (1) reaching an agreement among the multiple parties is costly; or (2) relocating the smokestack is costly. The first is a cost of

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   99.   Proprietors of the Charles River Bridge v. Proprietors of the Warren Bridge, 36 U.S. 420, 546 (1837); *see also* HERBERT HOVENKAMP, ENTERPRISE AND AMERICAN LAW, 1836–1937, at 110–14 (1991).

   100.   *See supra* note 32 and accompanying text.

   101.   *See supra* notes 30–31 and accompanying text.

   102.   *See supra* notes 38–39 and accompanying text.

transacting; the second is simply a cost of relocating a heavy and specialized installation that was built in the wrong place.

A.   *DEFAULT RULES FOR DIFFERENT LEGAL INSTITUTIONS*

The idea of default rules is that in appropriate circumstances people can bargain around them.[103] When markets are unimportant, however, because resources are being allocated in some other way, default rules may be unimportant as well.

The theory of private default rules has not done an adequate job of differentiating their use in different institutional settings. A complete theory of private default rules must address three distinct issues. First, how should the legal policy maker select a default rule? Second, when should the rule be default and when should it be absolute? Third, what kind of bargaining coalition is needed to reverse the default?

1.   The Selection of a Default Rule

The proper default rule should reflect a reality that occurs in the great majority of cases, or that produces the greatest value, but where socially valuable deviations are likely to occur when people intentionally deviate from the default. One good candidate is to place liability on the "cheapest cost avoider." That rule does a reasonably good job of predicting who would have won the entitlement in a well-functioning market. To the extent that common technologies have similar costs, rules that place liability on the "cheapest cost avoider" should increase social value most of the time. Another good candidate is "first in time is first in right," or the rule that priority of possession determines title. Another is that during the period after a land sale contract has been executed but before delivery of the deed the risk of loss is on the party in possession.[104]

A good default rule also should be able to reduce bad outcomes when transaction costs are sufficiently high that the parties would not be able to negotiate around the default. But a good default rule also reduces the deadweight loss of transaction costs even when the parties could bargain to an efficient alternative. For example, if Sturges values the right to be free of Bridgman's noise by £100 while Bridgman values the right to make it by £60, the parties might be able to negotiate to the efficient result even if the law improperly assigned the right to Bridgman, provided that transaction costs are less than £40. For example, executing a real covenant forbidding

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103.   *See* Cass R. Sunstein & Richard H. Thaler, *Libertarian Paternalism Is Not an Oxymoron*, 70 U. CHI. L. REV. 1159, 1175 (2003); *see also* CASS R. SUNSTEIN, SIMPLER: THE FUTURE OF GOVERNMENT 101–04 (2013); RICHARD H. THALER & CASS R. SUNSTEIN, NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS 85–87 (Penguin Books rev. ed. 2009) (2008); Cass R. Sunstein, *The Storrs Lectures: Behavioral Economics and Paternalism*, 122 YALE L.J. 1826, 1882 (2013).

104.   *See infra* text accompanying note 117.

Bridgman from operating his mortar and pestle might cost only £35. But that £35 is a pure deadweight loss if the law could accomplish that result *ex ante* and at no cost. Here, as in other areas, getting it right the first time saves resources.

Even when transaction costs are very low, default rules might serve to address behavioral issues, including inertia and limitations on perspective. One of the insights of behavioral economics in this area is that, while transaction costs certainly impose inertia, they are not the only source of inertia. The question is, how should this affect policy? Any cost of movement is a "cost," whether or not it involves a transaction.[105] Often no more than a very small cost is necessary to deter a person from changing her position. The problem with many common law approaches to conflict is that their after-the-fact nature induces people to make conflict-producing choices first and extract themselves later. Extraction is less likely as the costs, whether transactional or otherwise, become higher.

The writing on behavioral economics observes that certain forms of inertia cannot be explained by "transaction costs." For example, when employers adopt "opt out" rather than "opt in" rules for retirement plans, participation rates are significantly higher even though transaction costs are low.[106] Cass Sunstein and Richard Thaler give the example of the cafeteria that puts the dessert in a more remote place than the vegetables.[107] This "soft paternalism" may in fact induce people to consume more vegetables and less dessert. We can assume that "transaction" costs are zero because nothing is being transacted, but the choice nevertheless imposes other types of costs, just as when the grocery store places staples such as milk and bread in the back, making customers walk through the high margin snacks and sweets. These costs typically have nothing to do with markets. Rather they are embedded in the human psyche, instincts, perceptions or other limitations.

Decisions that are given effect "internally" can be just as costly as decisions that are made on a market—a point that Coase illustrated in *The Nature of the Firm*.[108] Behavioral economics often has much less to do with human evolution or irrationality than with the fact that even completely nontransactional behavior imposes a cost. The hard thing is making sense of preferences that are never exercised on a market.

When we want a certain outcome it may not matter all that much what the source of a cost really is. Opt-in versus opt-out rules for retirement plans is a good example. The employer presumably puts some resources into determining a plan that is best for its own employees as a general matter,

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105. *See supra* Part II.

106. Bubb & Pildes, *supra* note 49, at 1609.

107. Sunstein & Thaler, *supra* note 103, at 1166.

108. Coase, *supra* note 10, at 394–96. *See generally* Harold Hotelling, *Stability in Competition*, 39 ECON. J. 41 (1929).

assesses the presumptive contribution, but then gives employees the opportunity to opt out. At that point, it may not matter so much whether the choice to stay with the default is a consequence of transaction costs, costs of movement, or some "irrational" behavioral characteristic such as inertia.

As noted above, default rules are intended for situations where we can identify the high-value user, or the person who would have won a hypothetical bargain, on a "class" basis. One possible approach is to consider what most of the relevant parties would want or what they would want most of the time. For example, the employer might ask employees to vote on whether they want money withheld for a retirement plan by default. If the majority votes yes, then withholding will be presumptive but employees will still be able to opt out individually. Majoritarian default rules in contract settings operate in this way.[109]

If our goal is to maximize value, however, the majoritarian approach can give the wrong result if parties' individual valuations are unequal. Consider the example of the non-default grade crossing rule, which gives trains the right of way. Undoubtedly many more cars than trains drive through railroad grade crossings. Simply taking a vote among automobile drivers and train operators would give the right of way to cars. By contrast, the "cheapest cost avoider" approach weighs cars and trains differently by focusing on the cost of stopping rather than the number of vehicles that must be stopped. In other cases, where the opposing interests are randomized or more equally weighted, majoritarian default rules may be an efficient way of allocating initial assignments. For example, if the interests of buyers and sellers are more or less equally weighty, then the majority rule linking risk of loss to passage of title is much more likely to be the appropriate default.

As a class, it costs more to stop trains than to stop individual cars,[110] but there can be exceptions. Perhaps a particular train has only two cars and is travelling empty, while 60 automobiles are approaching the track from two different directions. Or one of the vehicles might be an ambulance with a patient in need of emergency care. In such cases it might be much cheaper to stop the train than the cars. But the transaction costs of identifying these situations in time and reversing the rule would be very high. Busy grade crossings typically have warning signals and even gates that descend to block automobiles, but this technology is unable to choose who gets the right of way by assessing the comparative cost of stopping. Traffic lights with inductive loop detectors do a highly simplified version of this, parsing out green or red lights depending on where the device detects traffic. In general, however, their ability to do this is limited to the "binary" situation where the cost of

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109.   For differing views of the nature and merits of majoritarian default rules, see generally Ian Ayres & Robert Gertner, *Majoritarian vs. Minoritarian Defaults*, 51 STAN. L. REV. 1591 (1999); Alan Schwartz & Robert E. Scott, *Contract Theory and the Limits of Contract Law*, 113 YALE L.J. 541 (2003).

110.   *See supra* Part III.C.

stopping from one side is zero, because it does not detect any cars in that lane.[111]

In other situations "class" identification of the "cheapest cost avoider" is even less likely and individual analysis is needed. For example, in *Sturges v. Bridgman* it is easy to say that if we want to avoid bargaining costs we should assign the interest to the person who values it most. But this requires a particularized evaluation of each party's situation. This explains why the common law of nuisance has always been fairly nontheoretical and fact specific.[112] We can chop off a few uses at one end of the spectrum as clearly nuisances "per se," and some at the other end as clearly non-nuisances. But most cases in the middle require individual analysis, which we usually accomplish by balancing either utilities or values through negotiation or litigation.[113]

The *Restatement of Torts* has incorporated a version of this approach since it was first published in 1939, making a nontrespassory activity that injures another's land a nuisance "unless the utility of the actor's conduct outweighs the gravity of the harm."[114] Such an approach, which reflected the influence of the marginalist revolution in legal thought at the time,[115] hardly eliminates the need for individualized analysis and often requires costly, case-specific fact finding.

2.   Choosing Between Default and Absolute Rules

The second consideration is determining when a legal rule should be a default and when it should be absolute. "Cheapest cost avoider" rules come in both kinds. The rule that trains have the right-of-way over cars at grade crossings assigns the duty to the "cheapest cost avoider." That rule does not

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111.   On inductive-loop technology, see 1 FED. HIGHWAY ADMIN., U.S. DEP'T OF TRANSP., TRAFFIC DETECTOR HANDBOOK ch. 2 (3d ed. 2006), *available at* http://www.fhwa.dot.gov/ publications/research/operations/its/06108/06108.pdf. In addition, some emergency vehicles have the capacity to control traffic lights remotely. *See* FED. HIGHWAY ADMIN., U.S. DEP'T OF TRANSP., TRAFFIC SIGNAL PREEMPTION FOR EMERGENCY VEHICLES: A CROSS-CUTTING STUDY 2-1 (2006), *available at* http://www.gtt.com/wp-content/uploads/Traffic-signal-preemption-for-emergency-vehicles-A-cross-cutting-study.pdf.

112.   *See* HERBERT HOVENKAMP, THE OPENING OF AMERICAN LAW: NEOCLASSICAL LEGAL THOUGHT, 1870–1970, at 123–59 (2015).

113.   A doctrine of "nuisance per se" brands a few activities as nuisances without balancing utilities and harm. *E.g.*, Koeber v. Apex-Albuq. Phoenix Express, 380 P.2d 14, 15–16 (N.M. 1963) (distinguishing "nuisances in fact" from "nuisances per se" (quoting Denney v. United States, 185 F.2d 108 (10th Cir. 1950)) (internal quotation marks omitted)). At common law, even fairly noxious activities were not a declared nuisance per se. *See, e.g.*, Murphy v. Ossola, 199 A. 648, 651 (Conn. 1938) (noting that storage of dynamite "does not constitute a nuisance per se").

114.   RESTATEMENT (FIRST) OF TORTS § 826 (1939); *see also* RESTATEMENT (SECOND) OF TORTS § 826 (1979) (restating the *Restatement (First)*'s rule that a nuisance exists only if "the gravity of the harm outweighs the utility of the actor's conduct"); RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL & EMOTIONAL HARM § 20 cmt. c (2010) (same).

115.   *See* HOVENKAMP, *supra* note 112, at 123–59.

ordinarily contemplate that the parties can bargain around it. Indeed, you can get a citation for running a stop sign even if there is no traffic on the cross street.[116] By contrast, a "cheapest cost avoider" default rule emerged in the late 19th century to govern risk of loss when real property is destroyed after a contract of sale had been executed but before the title was transferred. A strong economic case can be made that the risk of loss should travel with the party in possession, because that person is in the best position to avoid or minimize the loss. Indeed, a party not in legal possession may be powerless to minimize certain types of losses, such as risk of fire caused by activities inside the building. The nonpossessor has no right of entry.[117] At the same time, however, there is no good reason why the parties should not be able to negotiate a different date for placing the risk of loss, assuming that there is no coercion and that defrauding of insurers, mortgagees, or other third parties is not involved.

Absolute rules are necessary when the social costs of the wrong outcome are high and we cannot trust participants to reach the correct outcome on their own, or else when permitting them to bargain itself imposes significant social risk. For example, we could make the rule that cars yield to trains or that automobiles drive on the right side of the road a mere default rule, permitting participants to bargain for the alternative in specific cases. But the social gains from moving to a default rule are likely to be small, and there would be a certain number of miscommunications with perhaps fatal results.

3. Minimum Coalition to Reverse a Default

The third consideration is the minimum coalition needed to deviate from the default. The minimum coalition depends on the market type. The paradigm examples of private default rules involve pairwise relationships where no one else is affected, such as an agreement between a buyer and seller on the date title will pass, or the risk of loss rule in real estate sales. In a traditional competitive market transaction costs can be quite low, particularly if the good or service being traded is relatively fungible. The purpose of default rules in such markets is to facilitate mass transactions, such as through the use of form contracts. As products are more costly, more complex, or more differentiated the correct default may be more difficult to assign. However, to the extent only the buyer and seller are affected no greater coalition is needed to reverse the default, even though the market as a whole contains thousands of players.

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116.   *E.g.*, 625 ILL. COMP. STAT. ANN. 5 / 11-1204 (West 2012 & Supp. 2013); N.Y. VEH. & TRAF. LAW § 1172 (McKinney 2012).

117.   Samuel Williston, *The Risk of Loss After an Executory Contract of Sale in the Common Law*, 9 HARV. L. REV. 106, 122 (1895) (explaining that "it is wiser to have the party in possession of property care for it at his peril, rather than at the peril of another"); *see also* UNIF. VENDOR AND PURCHASER RISK ACT § 1 (1935).

In multi-party Coasean markets, by contrast, several people are affected by an outcome, and the minimum default coalition must typically be as large as the minimum bargaining coalition. For example, a covenant forbidding commercial uses in a ten-lot subdivision expresses a default rule. Because the covenant is contractual the owners can agree later to deviate from it. This does not mean, however, that one owner can give one neighbor the right to build a gasoline station; rather, agreeing around the default requires the unanimous consent of all ten owners. That is, ordinarily the same coalition that created the rule in the first place is needed to change it.[118]

B. *DEFAULT RULES IN TRADITIONAL MARKETS: COMMERCIAL VS. NONCOMMERCIAL*

Default rules are often used in traditional markets, where only two people are needed to make a trade and other parties are largely unaffected. An example is the widespread use of default rules in commercial contracts.[119] Default rules can be used to fill "gaps" in otherwise incomplete contracts, while permitting the parties to bargain around the rule in specific cases. The result is to reduce the cost of high-volume contracting.[120] For example, in many markets deals are facilitated by form contracts that permit the parties to "redline" specific provisions in order to deviate from the form by agreement.[121]

Contract default rules grew up mainly in the law of commercial contracts, and it is easy to see why.[122] By relatively early in the 20th century, marginalist economists had developed the theory of business firm profit-maximization, which provided some objective criteria for predicting a firm's best course of action. For example, the "hedonical calculus" developed by Jeremy Bentham was used by the late 19th-century marginalist F.Y. Edgeworth to predict bargaining behavior from assumptions about individual maximization.[123] That methodology ended up working better for business firms than for individuals, because business firms have profit functions that can often be specified, at least roughly, by an outside observer using objective tests.[124]

Profit-maximization is a useful criterion for identifying default rules because it need not rely on state of mind or incommensurable utility preferences. It is also a way of escaping the complicating features of behaviorism in market economics. The "cheapest cost avoider" in Calabresi's

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118.   *See supra* note 80.

119.   On default rules in the Uniform Commercial Code, see Randy E. Barnett, *The Sound of Silence: Default Rules and Contractual Consent*, 78 VA. L. REV. 821, 825–26 (1992).

120.   *See* Ayres & Gertner, *supra* note 97, at 108–11.

121.   *See, e.g.*, Kimaco, LLC v. Wright Dev. W. Coast, LLC, No. 66435-1-I, 2012 WL 556034, at *2 (Wash. Ct. App. Feb. 21, 2012) (citing attorney edits and redlines of a form contract for commercial construction as evidence that the parties actually consented to the contract's terms).

122.   *See* HOVENKAMP, *supra* note 112, at 123–59.

123.   *See generally* F.Y. Edgeworth, *The Hedonical Calculus*, 4 MIND 394 (1879).

124.   *See generally* Wesley C. Mitchell, *Bentham's Felicific Calculus*, 33 POL. SCI. Q. 161 (1918).

theory of accidents works in this fashion.[125] We do not really care what the train engineer and the automobile driver are thinking, how much they would actually be willing to pay, what their bargaining strategies are, or their different and perhaps idiosyncratic attitudes toward risk. We merely need to know the engineering cost of stopping and restarting each vehicle. Even though the traffic at a grade crossing may include both commercial and noncommercial vehicles, in this case we are not particularly worried about idiosyncratic utility preferences. We assume that both sides want to avoid the accident and that the cost of stopping and restarting is the most important factor in assigning the obligation to stop. These results are admittedly external to state of mind and, to that extent, normative: they force behavior without regard to individually asserted preferences.

Workable default rules for purely personal contracts are more difficult to develop because individuals maximize utility rather than profit, and utility is difficult or impossible to observe objectively. In addition, biological individuals, as opposed to firms, evaluate risk and process information differently. As a result it is more difficult to "fill in the gaps" in a putative agreement to, say, have sex or to marry. We rightfully insist on relatively complete manifestations of both consent and the content of the agreement. As outcomes are based more on idiosyncratic behavioral characteristics rather than objectively determined assessments of value, default rules are less useful as gap fillers.

C. DEFAULT RULES FOR COASEAN MARKETS

The more costly the bargaining process, the more important it is to assign a default rule correctly. If they are to be used at all, the selection of the correct default rule is more critical in Coasean markets than in traditional markets because Coasean markets generally function less well. The two-person Coasean market is a bilateral monopoly, in which bargaining is often thought to be difficult. Nevertheless, the common law properly permits the parties to change the default by mutual agreement, provided third parties are not injured. Indeed, this is what the basic Coasean story is all about. If the common law default rule is that Bridgman's mortar and pestle is not a nuisance, then Sturges might nevertheless pay Bridgman to shut it down.

The optimal default rule in such cases will assign the right to the person who places the highest value on it. That will make bargaining unnecessary to create the right outcome in situations where high transaction costs threaten to prevent the bargain from occurring. As noted earlier, application of this principle may be difficult in certain situations, such as the law of nuisance, because identifying the person who places the higher value on the right often requires case specific analysis.

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125.   *See supra* Part III.C.

Coasean markets also require unanimous consent to move a resource. As Coasean markets expand beyond two persons the costs of bargaining around the default can rise appreciably, and setting the correct default thus becomes increasingly important.[126] Unfortunately, default rules also work less well in Coasean markets that have large numbers of players. Two-party agreements around the default will not work. For example, a jurisdiction might create a default rule that a factory smokestack in a residential area is a nuisance. In that case the smokestack cannot negotiate with a single landowner for a waiver from the rule because all the other injured landowners would still have the right to object.[127]

VI. "STACKING" LEGAL INSTITUTIONS TO MINIMIZE FRACTURE: "ONE WAY" DEFAULTS

Zoning laws typically are not default rules. They create rights and obligations that cannot readily be bargained away. For example, the zoning law might prohibit operation of the smokestack in a residential neighborhood. If that rule were simply a default, then the smokestack could bribe all affected landowners for the right to operate.

But zoning laws do typically create asymmetrical, or "one way" defaults. They forbid bargaining over the activities they prohibit, but not over the activities they permit. This permits the zoning regime and private bargaining to be "stacked" in socially useful ways. Assume, for example, that Bridgman's mortar and pestle is not unlawful under the zoning laws. Sturges could still pay Bridgman to shut it down. That is, the zoning statute might prohibit the confectioning business in a certain area, but it is not likely to *require* the land owner to engage in that business.

Macro- and micro-rules for legal institutions can sometimes be stacked so as to permit making initial, or "baseline," resource allocations efficiently, while letting private decision making apply ad hoc corrections in one direction. For example, under-deterrent zoning rules may be a good idea, as long as more restrictive alternatives can be bargained in. The zoning law would prohibit those uses that are highly likely to be inefficient in a given area and for which a large number of people have something at stake, but permit others that are subject to case specific bargaining, particularly where only a small number of people are affected. The bargaining regime occurs *on top of* the regulatory regime.

The system that we have for land use has largely evolved into one such as this, using zoning rules to establish baseline use standards but then permitting privately negotiated servitudes to impose stricter standards. For example,

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126. *See supra* notes 27–31 and accompanying text.

127. *Cf.* Frank H. Easterbrook, *The Race for the Bottom in Corporate Governance*, 95 Va. L. Rev. 685, 691–92 (2009) (complaining that various rules designed to limit corporate takeovers are not default rules, assuming that shareholders could effectively agree to negotiate around them).

zoning rules might keep smokestacks out of residential communities, on the theory that separating them from the beginning is the most efficient solution. No amount of private bargaining (other than obtaining a legislative zoning amendment) can overturn that result. This result is typically good because negotiating around such a rule would require unanimous consent of all affected parties, so the cost of making the right decision initially is far lower than the cost of mistakes and subsequent extraction. The premise, of course, is that segregating smokestacks from houses is rarely a mistake that needs to be corrected later. One could say the same thing about railroads in close proximity to residences.[128]

But the zoning regime ordinarily *does* permit more intrusive private restrictive covenants that can be individualized over smaller groups of decision makers. These covenants manage at a more micro-level, extending to things such as more specific uses, types of building materials, pet ownership, landscaping, or outbuildings.[129] The grosser zoning regulations ensure that people almost always get their assets located in the right place from the beginning, thus minimizing the costs of subsequent movement. But the "finer" servitude regulation permits more nuanced judgments, typically involving smaller groups of landowners, and typically in situations where the grosser judgments are much more difficult to make or likely to be mistaken.

In addition to servitudes, the variance or special exception system in zoning ordinances creates a limited default rule with a relatively high burden. Zoning might separate industrial from residential uses but then give individual owners relief from proven mistakes that render the government's initial decision suboptimal. The Supreme Court's first forced "variance" decision, *Nectow v. Cambridge*, is a good example. The City of Cambridge mistakenly zoned Nectow's land residential, even though it was completely surrounded by an automobile assembly plant, a soap factory, and railroad tracks, making the property worthless for residential purposes. The Court

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128.   *E.g.,* Nectow v. City of Cambridge, 277 U.S. 183, 188–89 (1928) (invalidating on Fourteenth Amendment grounds the application of a zoning ordinance that made petitioner's property worthless).

129.   *See, e.g.*, Heritage Heights Home Owners Ass'n v. Esser, 565 P.2d 207, 211 (Ariz. Ct. App. 1977) (upholding a covenant prohibiting fences); Nahrstedt v. Lakeside Vill. Condo. Ass'n, 878 P.2d 1275, 1292 (Cal. 1994) (in bank) (upholding a covenant restricting pet ownership); Rhue v. Cheyenne Homes, Inc., 449 P.2d 361, 363 (Colo. 1969) (en banc) (upholding a subdivision architectural committee's decision to prohibit a certain style of home); Wilshire Condo. Ass'n, Inc. v. Kohlbrand, 368 So. 2d 629, 631 (Fla. Dist. Ct. App. 1979) (upholding covenant against pet ownership); Woodward v. Cutrer, 838 So. 2d 180, 185 (La. Ct. App. 2003) (upholding covenant prohibiting piers or boathouses); Heston v. Ousler, 398 A.2d 536, 539–40 (N.H. 1979) (upholding a restriction against docks and outbuildings); Syrian Antiochian Orthodox Archdiocese of N.Y. & All N. Am. v. Palisades Assocs., 264 A.2d 257, 262 (N.J. 1970) (upholding an architectural committee's decision to prevent a certain building from being erected).

declared this application of the statute unconstitutional, thus forcing municipalities to provide administrative relief from such errors.[130]

Under modern law the resolution of the *Sturges v. Bridgman* nuisance dispute could come about by either zoning legislation or private agreement. Both parties were operating businesses, so a simple zoning rule segregating business and nonbusiness uses would not prevent them from moving into the same building. A more refined zoning ordinance that classified types of business might have done so, but such refinement would very likely increase the likelihood, and thus the social cost, of initial regulatory mistakes. So a zoning classification system might permit a confectionary and a physician's office to operate in close proximity, perhaps under a classification such as "mixed use," "commercial," or "retail and professional." These classifications generally permit non-polluting and relatively non-invasive businesses to be located on adjoining properties. Beyond that, however, developers or adjoining landowners could negotiate servitudes or similar private agreements that would provide additional limitations on a contractually negotiated basis.[131] Failing that, of course, they could use the law of nuisance and the court system.[132] A well-designed system of this sort would minimize the sum of the cost of initial mistakes and forced movement, as well as subsequent bargaining.

VII. CONCLUSION: THE DESIGN OF MARKETS

We do not usually expect highway drivers to bargain over the right-of-way. By the time the bargaining relationship is set up, it is too late because extraction is too costly. People bargain in markets, but the market for optimal rules about rights-of-way does not consist of a single pair of drivers confronting each other at the danger point. Rather, it includes all those driving on a jurisdiction's roads who are in a position to have a resource conflict with one another. The "cheapest cost avoider" solution is not a bargaining solution at all, but one driven by engineering or safety concerns,

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130. *Nectow*, 277 U.S. at 188–89; *see* Erin Ryan, *Zoning, Taking, and Dealing: The Problems and Promise of Bargaining in Land Use Planning Conflicts*, 7 HARV. NEGOT. L. REV. 337, 345 (2002) ("To withstand constitutional scrutiny a zoning regulation must yield a legitimate public benefit without unduly burdening any individual citizen.").

131. *E.g.*, Bd. of Zoning Appeals of Meridian Hills v. Schulte, 172 N.E.2d 39, 45 (Ind. 1961) (finding that the city could not constitutionally exclude a church from an area zoned primarily residential); Martellini v. Little Angels Day Care, Inc., 847 A.2d 838, 840 (R.I. 2004) (holding that although the zoning ordinance permitted daycare facilities on residential property, petitioner was not precluded from enforcing a restrictive covenant that prohibited them).

132. *E.g.*, Beam v. Cloverland Farms Dairy, Inc., No. Civ.A. 2179-S, 2006 WL 2588991, at *4 (Del. Ch. Sept. 6, 2006) (holding that noisy air compressors on the roof of a grocery store lawfully built in a commercial zone was not a common law nuisance); A to Z Paper Co., Inc. v. Carlo Ditta, Inc., 775 So. 2d 42, 47–49 (La. Ct. App. 2000) (holding that a concrete batching facility lawfully built in a "mixed use" zoning classification was not a nuisance); Karpiak v. Russo, 676 A.2d 270, 271 (Pa. Super. Ct. 1996) (holding that a landscaping business lawfully operated in a commercial zone was not a nuisance under the *Restatement (Second)* nuisance rule adopted by the court).

or else it is simply a convention that must be consistent over a larger number of transactions. For example, driving on the right may not be inherently safer than driving on the left, but a uniform rule for either side is certainly safer than permitting drivers to negotiate with one another on a pairwise basis as they are approaching.

Are markets involving more established pairwise relationships any different? Coase thought so because he accepted previously locked-in commitments as his starting point. Once neighbors have invested in their current locations, a bargaining analogy is helpful because it helps determine which is the least harmful among the alternatives available at that point. But a superior solution may be an *ex ante* rule that forbids them from locating in close proximity in the first place. Coase underestimated both the value of that consideration and the number of times that the State would have to be involved in making it.

A well-designed system for allocating resources necessarily involves the heavy use of markets, but markets must be properly designed. Coase's suggestion that the legal system would be unimportant but for transaction costs[133] could literally apply only to a social contract formed during some initial position when people had made no resource commitments whatsoever. As soon as the first investment is made, however, all bets are off. From that point the movement of resources can be costly with or without transactions, and a well-designed legal system must minimize the costs of movement by both transactional and nontransactional means. To be sure, while *bargaining* over the price of moving a smokestack might be costless and perfect, someone still has to tear the smokestack down and rebuild it in a different place.

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133.   *See* Coase, *supra* note 1, at 16.