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THE END OF THE EXTERNALITY REVOLUTION*

By A. H. Barnett and Bruce Yandle

> The process of arriving at a useful concept of analysis is not only slow and painful, but may also go astray and attain nothing useful. Someone begins with one example or observation, followed by a theory which is intuitively plausible. A theoretical term associated with a vague concept is coined. Examples of a seemingly different type emerge, which call for another theory. The process goes on. As examples and theories continue to accumulate, the different categories under the same heading of analysis serve only to confuse and each associated theory becomes *ad hoc.* Such has been the fate of the concept of 'externality.' —Steven Cheung[1]

I. Introduction

Economist Steven Cheung's observation about externality—a cost or benefit imposed on or provided to others but not taken into account by the economic agents who generate the effect—seems as accurate today as when it was written almost four decades ago. This was at the height of the externalities revolution, that period when economists, including the authors of this essay, became enamored with the latest tool that rolled into the workshop. We, and others, seemed to see external effects everywhere. There was polluted water and air, noise, urban blight, traffic congestion, and other features of modern life that seemed to call out for some form of corrective action. Now, despite the large volume of literature dealing with externalities, or perhaps because of it, we believe that the understanding of the concept of external effects held by informed policymakers (and perhaps some members of the academy) remains, at times, fractured and confusing. (And the same is true of the political economy for dealing with these effects.) This confusion has been partly responsible for the use of externalities as a rationale for government intervention into a very wide array of markets. Indeed, it seems that by making externality arguments in an institutional vacuum, economists unwittingly developed a weapon of mass destruction that, in the hands of journalists and popular policy analysts, at times corroded

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[1] Steven N. S. Cheung, "The Structure of a Contract and the Theory of a Non-Exclusive Resource," *Journal of Law and Economics* 13 (1970): 49–70.

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almost to the point of uselessness the beneficial theory of markets and competition. The rise of externality thinking formed a veritable revolution in the way economists identified and addressed problems in the marketplace.

As the revolution unfolded, economists overlooked the importance of evolved legal and other institutions that formally and informally establish property and liability rules that cause decision-makers to face the cost of their actions, including what otherwise could be external costs imposed on unwilling third parties. With rare exceptions, the lessons of four hundred years of evolved common law were completely neglected. Overlooked as well were the tortuous workings of legislative bodies happily called to the task of correcting what seemed to be failures of the market process. While markets seemed to always fail, political institutions were seen systematically as without blemish, or so it seemed. It was this two-pronged failure—(1) a failure to consider and state assumptions about background institutional arrangements, and (2) a disregard for special interest politics—that became the Achilles' heel of the otherwise elegant externality arguments. At the end of the day, it was the modern institutionalists, scholars who focused on laws, regulation, and rules of the marketplace, who attempted to close the lid and drive the nails on the externality coffin.[2] By their efforts, the institutionalists countered the forces of the externalities revolution. But like Lazarus, and even though the revolution may have ended, externalities seem destined to rattle forth from the grave.

How did this confused state of affairs occur? Or was it all that confused? How did the development of externality theory have such a detrimental effect on the received theory of markets? Is it possible to provide a sensible resting place for externality theory, one that integrates the theory of externalities into a viable theory of markets?

This essay seeks to address these questions and by doing so prepare that resting place. The essay is the result of our effort to gain a better understanding of how externality theory first entered the economist's lexicon and how what at first appears as a relatively benign, if not arcane, concept became a foundation stone for prescribing government intervention in markets far and wide. There is also a turning point of sorts described in the essay, a point where modern institutionalists, led by Ronald H. Coase and James M. Buchanan and Gordon Tullock, seriously question externality theory and, at the very least, darken the prospects for rem-

[2] Prominent among the institutionalists are Ronald H. Coase, Terry L. Anderson, Donald R. Leal, Steven N. S. Cheung, Fred S. McChesney, and Elinor Ostrom. For related literature, see Ronald H. Coase, "The Problem of Social Cost," *Journal of Law and Economics* 3 (1960): 1–44; Terry L. Anderson and Donald R. Leal, *Free Market Environmentalism* (New York: Palgrave, 2001); Cheung, "The Structure of a Contract"; Terry L. Anderson and Fred S. McChesney, eds., *Property Rights: Cooperation, Conflict, and Law* (Princeton, NJ: Princeton University Press, 2003); and Elinor Ostrom, *Governing the Commons* (New York: Cambridge University Press, 1990).

edying externality problems by political means.[3] We make no claim for providing a detailed history of economic thought on the topic. Instead, we claim to describe and offer what we consider to be some of the major insights on externality theory, recognizing that our identification of what is major may not accord with the selections others might make. Our essay is organized as follows.

Section II traces the development of externality theory, focusing first on the rise and fall of what is termed the "pecuniary externality" school of thought. Unlike costs imposed on others by such things as pollution or noise, pecuniary externalities have to do with the cost effects of changing prices. For example, when oil prices rise because of global market forces, individual consumers suffer losses in welfare. Though benign, in the sense that the pecuniary externality debate had more to do with price theory than public policy, the scholarly discussion of pecuniary effects opened the door to an examination of other external effects. Problems such as the costs associated with pollution were eventually seen as being distinctly different from price effects; these became known as "technological externalities." Discussions of social cost loomed large in the economist's lexicon. This problem of social costs is the focus of Section III. At this point in the story, we focus on the dominance of A. C. Pigou's (1877–1959) interpretation of technological externalities.[4] Again, these are phenomena such as pollution, noise, and other unwanted spillover effects. Here, we explain how, overlooking common law remedies and concerned about transaction costs in the market, Pigou argued for political solutions to the externalities he found to be so pervasive.[5] We call this "Pigou I." Later, we note that, when faced with criticism, Pigou modified his arguments but stayed with his principal argument about an abundance of externalities. The externality story to this point is couched in the language of efficiency and welfare economics. The efficiency argument claims that externalities interfere with the efficiency-enhancing operation of markets. They should therefore be reduced or eliminated.

How property rights connect to externalities is the topic of Section IV. Since all externality problems can be considered as property rights problems, failure or inability to specify property rights to an asset leads to overuse. A lack of clear-cut ownership also limits the ability of interested parties to bargain or to bring suit. The result may be unwanted smoke in the air, or not enough smoke. The discussion here lays a brief foundation for two axioms about the existence of Pareto-relevant externalities, which is to say externalities that offer the potential for gains through trade.

[3] See Coase, "The Problem of Social Cost"; James M. Buchanan and Gordon Tullock, *The Calculus of Consent* (Ann Arbor: University of Michigan Press, 1965); and James M. Buchanan and William C. Stubblebine, "Externality," *Economica* 29 (1962): 371–84.

[4] A. C. Pigou, *The Economics of Welfare,* 1st ed. (London: Macmillan Publishing, 1920).

[5] Ibid.

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Efficiency considerations reenter. It is here that we see Coase setting aside the problem of social cost in favor of a market-based model that rests on the rule of property found in common law.[6] Coase, in contrast to Pigou, assumes a Lockean system of property rights where rights evolve from and are enforced by private action and private law.[7] Property rights are endogenous to the market process. Like Pigou, Coase focuses on transaction costs, but because of his recognition of actions taken at common law, Coase sees far fewer instances of unaddressed external costs. Coase provides profoundly important insights as to how markets operating within a rule of law minimize all forms of cost, including those termed externalities. Coase does not, however, focus on the political prospects of remedying external costs where private transaction costs deny bargaining activity. In brief, he does not deal with the public choice problem first recognized by Pigou himself.

Public choice considerations, cost and choice, are the focal point of Section V of our essay. Here, we see how, because of his recognition of special-interest politics, Pigou recants on the notion that his theory could become a basis for political action.[8] We label this "Pigou II." This section also emphasizes the fundamental contribution made by Buchanan and Tullock.[9] For these two authors, property rights, whether defined by markets or by politicians, are endogenous to a larger constitutional political economy that is itself constrained by constitutional limits. This consideration closes the circle of our effort to position the externality controversy in the context of markets and prevailing institutions. In closing the circle, we move from (1) a discussion of external effects analyzed in an institutional vacuum, to (2) a discussion of external costs that may be reduced by contract and bargaining, and then finally to (3) a discussion of constitutionally determined rules that either enable or limit the ability of the larger political economy to resolve externality problems. As we conclude the essay in Section VI, we focus on markets and politics as two competing institutions for resolving externality problems. In doing so, we offer summary statements as to the relative merits of the two institutions in different externality settings. At the very end of the piece, we find the externality problem has disappeared, but it has been replaced by the public goods problem.

[6] Coase, "The Problem of Social Cost."

[7] On this, see Leigh Raymond, *Private Rights in Public Resources* (Washington, DC: Resources for the Future, 2003).

[8] In spite of his recognizing the possibility of legislative anti-efficiency effects, Pigou apparently gave no consideration to the operation of private law in imposing cost on negligent producers of externalities. Pigou, it seems, embraced the system of property rights described by David Hume. (On this, see Raymond, *Private Rights in Public Resources.*) For Hume, property rights and their articulation were created and modified by government, not by market forces and private law. To Pigou, property rights are endogenous to the political process. We note that when politicians and government become endogenous to the story, the simple analytics of welfare economics get complicated.

[9] Buchanan and Tullock, *The Calculus of Consent.*

II. The Externalities Story Begins with Empty Boxes

A review of the pre-Coase literature on externalities leaves a number of strong impressions. First, the literature is large and confusing. Many of the best minds in the profession contributed. Starting with the early writings of Alfred Marshall and, later, Pigou, the topic attracted the attention of the likes of Frank H. Knight, Allyn Young, Piero Sraffa, J. H. Clapham, Frank D. Graham, D. H. Robertson, G. F. Shove, Lionel Robbins, R. F. Harrod, and Jacob Viner, among many others.[10] No doubt this literature made sense to writers at the time, but to the modern reader it is cryptic and obtuse in the extreme.

One clear impression from reading this pre-Coase literature is that the concept of externality (and the rationale externality provides for government intervention) was about as confusing to economists then as it is now. In a very real sense, our understanding of the nature and importance of externality has advanced very little over the last hundred years. Yet, even though confused in its origin and discussion, the concept of externality has been to microeconomics what Keynesian economics was to macroeconomics. Specifically, it provides a rationale for virtually unlimited government intervention into private transactions.

When viewed through this lens, unintended (uncontracted) effects are pervasive. They arise in virtually every sphere of human activity. In the eye of the beholder, each can be characterized as an externality, with a corresponding appeal for government action. Having said this, we hasten to add that from the perspective of market-based actions, most external effects are not worth the costs of "correction." Our value statement here rests on the logic of James Buchanan and William Stubblebine's notion that the cost of taking corrective action must be weighed against the benefits obtained.[11] If the costs of reducing the next unit of unwanted pollution, let us say, are greater than the benefits obtained from the action, then the observed pollution is termed by Buchanan and Stubblebine as a Pareto-irrelevant externality.[12] We might draw an analogy here with cold

[10] See Alfred Marshall, *Principles of Economics* (London: Macmillan and Co., 1920); Pigou, *The Economics of Welfare;* Frank H. Knight, "Some Fallacies in the Interpretation of Social Cost," *Quarterly Journal of Economics* 37 (1924): 582–606; Allyn A. Young, "Increasing Returns and Economic Progress," *Economic Journal* 38 (1928): 527–42; Piero Sraffa, "The Laws of Returns under Competitive Conditions," *Economic Journal* 36 (1926): 535–50; J. H. Clapham, "Of Empty Economic Boxes," *Economic Journal* 32 (1922): 305–14; Frank D. Graham, "Some Fallacies in the Interpretation of Social Costs," *Quarterly Journal of Economics* 39 (1925): 324–30; D. H. Robertson, "Those Empty Boxes," *Economic Journal* 34 (1924): 16–30; G. F. Shove, "Varying Costs and Marginal Net Product," *Economic Journal* 38 (1928): 258–66; Lionel Robbins, "The Representative Firm," *Economic Journal* 38 (1928): 387–404; R. F. Harrod, "Notes on Supply," *Economic Journal* 40 (1930): 232–41; and Jacob Viner, "Cost Curves and Supply Curves," *Zietschrift fur Nationalokonomic* 3 (1931): 23–46.

[11] Buchanan and Stubblebine, "Externality."

[12] Ibid., 371. We note that the concept of Pareto-optimality is used by most neoclassical economists to address the issue of efficient use of resources. In brief, a state of the world, with its associated allocation of resources, is considered efficient if there is no reallocation

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weather in February: Those who choose to live in a frigid climate wear coats but still suffer a bit from the uncontrolled cold. Apparently, the cost of escaping the remaining discomfort from the cold is greater than the benefits that might result from doing so.

Judging from the frequency and breadth of instances in which social scientists use externality as a tool for rationalizing government intervention in markets, it appears that these advocates have failed to distinguish the difference between relevant and irrelevant externalities. In terms of the cold weather analogy, the fact that winter brings unpleasant weather may be reason enough to call for intervention by government in the form of heated streets and sidewalks. Whether the cost of taking action exceeds the benefits obtained is beside the point. Indeed, from the perspective of some social scientists, the concept of externality is so powerful and so pervasive as to relegate neoclassical welfare analysis to the academic dustbin. William Kapp appears to make this point is his essay "On the Nature and Significance of Social Costs."[13] Speaking of arguments by some economists that many external effects can be internalized by private action, Kapp writes:

> However, these analytical devices cannot satisfy those who disagree with traditional economic analysis. These dissenters, among whom socialists and institutionalists have played a major role, hold that social costs [negative externalities] are normal and typical phenomena, and are moreover of such a character as to put in question the whole theoretical equilibrium theory including its practical conclusions. . . .
>
> The existence of social costs is always an indication of precisely those cumulative dynamic interdependencies between economic units, which raise serious doubts as to the validity and purpose of some of the most essential assumptions of economic theory. For if economic units with unequal power are able to shift part of their costs to others—and moreover are able to ply their sales and hence consumers' demand through sales promotional activities—market costs and prices must be regarded as more or less arbitrary and indeed unreliable measures of economic rationality. Hence it becomes necessary not only for the purpose of evaluation and measuring social costs but

of resources that could make at least one person better off (relative to the initial allocation) while leaving no one worse off. When a reallocation could make at least one person better off, while leaving all others no worse off, an inefficiency exists and a so-called Pareto-improvement is possible. A Pareto-relevant externality is an externality that produces an allocation of resources that is inefficient, so that a Pareto-improvement is possible. A Pareto-irrelevant externality is an externality that does not yield a potential Pareto-improvement. In other words, Pareto-irrelevant externalities do not cause inefficiency; thus, no policy for improvement is appropriate.

[13] William Kapp, "On the Nature and Significance of Social Costs," *Kyklos* 32 (1969): 334–47.

> also for the determination of priorities to elaborate a theory of social value in the sense of value to society based upon objective, i.e., empirically ascertained, criteria for what is necessary and essential for human life and survival.[14]

Kapp is making the point that if there are unwanted external effects generated by the market process, then it is impossible to assert that markets are welfare enhancing. Needless to say, modern social scientists have continued in that vein. Political scientists, sociologists, environmental scientists, and public policy analysts, as well as some economists, have adopted with a vengeance the externalities concept with its embodied interventionist rationale. To say that the concept of externality has become important in economics and public policy is a considerable understatement. But how did the concept arise? What are the origins of the externality argument?

The Empty Boxes. The study of externality began with what has come to be known as the "empty boxes" debate that began in the 1920s.[15] This debate involved a number of issues, including the meaning of social cost, the role of marginal versus average cost in firm supply decisions, the derivation of competitive supply functions, and economic rents. However, the central issue can be, and was, addressed in the context of externality.

The literary outpouring that constituted the empty boxes debate was initiated by Marshall's conclusion, elaborated in detail by Pigou, that industries that experience rising or falling costs as output increases can produce nonoptimal investment and output. Specifically, Marshall and Pigou argued that firms entering an increasing-cost competitive industry can, for several reasons, cause input prices for existing firms to rise. Input prices fall when firms enter a decreasing-cost industry. These input price changes are externally imposed by some firms on others. (We note that these are termed "pecuniary externalities.")

Because entering firms ignore the impact of their entry on others, Pigou further reasoned that the entry of new firms "externally" lowers (decreasing-cost industries) or raises (increasing-cost industries) the costs of existing firms, causing a divergence between the marginal private net product and the marginal social net product of investment.[16] To remedy

[14] Ibid., 335.

[15] The "empty boxes" debate takes its name from a 1922 article by J. H. Clapham (see note 10 above). The debate revolved around whether inefficiencies (Pareto-relevant externalities) existed with increasing-cost and decreasing-cost competitive industries. Assuming that inefficiencies existed, it would then seem appropriate for analysts to identify industries that are characterized by increasing or decreasing costs. Clapham, using an analogy of a shop with boxes on the shelf, suggested that analysts place industries in conceptual boxes labeled increasing-, decreasing-, or constant-cost industries. Clapham argued that the distinction was not useful—that the conceptual boxes were, in effect, empty. The subsequent debate, with its related spin-off issues, is referred to as the "empty boxes" debate.

[16] Pigou, *The Economics of Welfare,* 223.

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this inefficiency, Pigou advocated "bounties" for firms entering decreasing-cost industries and taxes for those entering increasing-cost industries.

Pigou's observation set in motion work by academic economists in two general areas. First, some set to work attempting to categorize industries as increasing, decreasing, or constant cost, presumably with the goal of identifying those that should be taxed and those that should be subsidized. J. H. Clapham characterized economists, "well educated in the dominant British school," as having mental boxes "labelled Diminishing Return Industries, Constant Return Industries, and Increasing Return Industries."[17] In giving a name to the discussion of the Marshall/Pigou hypothesis, Clapham complains:

> I think a good deal of harm has been done through omissions to make it quite clear that the Laws of Returns have never been attached to specific industries; that *the boxes are, in fact, empty;* that we do not, for instance, at this moment know under what conditions of returns coal or boots are being produced. . . . [T]here is, I hold, grave danger to an essentially practical science such as Economics in the elaboration of hypothetical conclusions about, say, human welfare and taxes in relation to industries which cannot be specified.[18]

Second, a number of economists, notably Allyn Young and Frank H. Knight, took issue with Pigou's observation that increasing- and decreasing-cost industries cause market failure.[19] While there were several points of attack, the final nail in the coffin of the Marshall/Pigou hypothesis was the observation that the external effects in question were pecuniary, and, hence, did not represent any divergence between social and private costs. The point here is that price changes in the market provide information that is used in organizing production and consumption. A rising price sends a signal that calls for reductions in consumption in favor of lower-priced goods and services. The movement of prices leads to more efficient consumption and production and is therefore welfare enhancing.[20]

Despite the great amount of academic energy that went into the empty boxes debate, the issues involved and the related literature have been relegated to a minor footnote in the history of economic theory. Our contention is that much of the current literature on externalities will (or should) follow the same path, at least in economics. In brief, modern

[17] Clapham, "Of Empty Economic Boxes."

[18] Ibid., 312 (emphasis added).

[19] See Young, "Increasing Returns and Economic Progress"; and Knight, "Some Fallacies in the Interpretation of Social Cost."

[20] The only thing of conceptual value that survives from the empty boxes debate is the distinction that is drawn between pecuniary and nonpecuniary externalities. See Howard Ellis and William Fellner, "External Economies and Diseconomies," *American Economic Review* 33 (1943): 493–511.

interest in externalities stems from two main factors: (1) a great deal of confusion about the nature and theory of externalities; and (2) the convenient rationale that externality can provide to justify intervention in private markets. The second issue is a topic worth pursuing but one we will only briefly pursue here. Instead, we will offer some observations on the economic theory of externality, along with observations that seem to us to imply that externality is, at best, misused in economic analysis and, at worst, adds little to our understanding of efficient resource utilization. More specifically, we will argue that the current view of externality contributes to confusion about the nature and importance of externalities problems, and leads to gross overemphasis on externalities as sources of "market failure."

III. From Empty Boxes to Boxes Loaded with a Rationale for Government Intervention

As noted in Section II, the concept of externality, though not the term, appears to have originated with the assertion by Marshall that increasing-cost (decreasing-cost) competitive industries are inefficient because the entry of new firms into an industry imposes external harm (benefits) on existing firms. In Marshall's terms, entering firms produce costs (benefits) that are external to the firm but internal to the industry.[21]

A. The rise of "Pigou I"

Marshall's discussion of external effects attracted little attention. Externalities became an important topic of debate only after Pigou developed Marshall's idea and greatly broadened the application of the externality concept to cover a large variety of supposed "divergence[s] between private and social net product."[22] Pigou's discussion of externalities generated debate on two fronts. The first was the "empty boxes" debate. The second debate, though far more important in retrospect, involved fewer participants and generated far less attention.[23] This debate launched a position we call "Pigou I" and concerned Pigou's assertion that a divergence between private and social net product cannot be corrected by private contractual arrangements. Pigou was very clear in his expressed view that government intervention was necessary to resolve external effects.

[21] Alfred Marshall, *Principles of Economics* (London: Macmillan and Co., 1920), 225.

[22] Interestingly, given the Pigouvian tax tradition, Pigou did not limit acceptable government interventions for equating social and private net product to taxes and subsidies. He also speaks very favorably of a wide variety of regulations and legal constraints.

[23] We take some liberties in characterizing this as a debate, for there were few protagonists before Coase, chiefly Pigou and Knight, and Pigou appears either to have conceded (though not explicitly) the point without much debate or to have simply ignored the issue raised by Knight.

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Indeed, he went so far as to suggest that private contracting activity would make things worse.

In a famous 1924 essay, Knight took issue with that view.[24] In his first edition of *The Economics of Welfare* (1920), Pigou had used road congestion, where drivers impose external costs on other drivers by entering a congested road, as an example of an externality that could not be removed by private contracting. Using Pigou's example of two roads, one shorter but with congestion and one longer but without congestion, Knight demonstrated that if the "faster" road were privately owned, the owner of that road would have an incentive to impose prices on road use that would optimally resolve the alleged divergence between social and private net product. In short, Knight demonstrated that, contrary to Pigou's assertion, it was possible to structure property rights and private contractual arrangements so that private contracts resolve the inefficiency. Pigou removed the "offending" example from later editions of *The Economics of Welfare* but did not explicitly concede the point. From all indications, Knight won the intellectual battle, but few acknowledged the victory, or even noticed that there had been a battle.

While perhaps conceding on the example of the two roads, Pigou did not retreat from the view that the private market fails to achieve efficiency for a large number of other cases. In his fourth (and final) edition of *The Economics of Welfare,* Pigou cited a number of examples of both positive and negative external effects (what he termed "incidental services" and "incidental disservices") that are, by implication, both Pareto-relevant and that seem, from Pigou's perspective, to call for government intervention.[25] His examples of Pareto-relevant positive externalities included lighthouses,[26] constructing roads and tramways that increase the value of adjacent property, planting forests that produce beneficial climatic changes, lamps erected at doors of private houses that throw light on streets, private pollution abatement expenditures, and scientific research.[27]

Pigou's examples of negative externalities include uncompensated harm done to surrounding woods by the sparks emitted by railway engines, game preserving activities by a landowner that cause rabbits to invade neighboring property, building factories in a manner that "destroys a great part of the amenities of neighbouring sites," building in "a way as to spoil the lighting of the houses opposite,"[28] running motor cars that wear out the

[24] Knight, "Some Fallacies in the Interpretation of Social Cost."

[25] A. C. Pigou, *The Economics of Welfare,* 4th ed. (London: Macmillan and Co., 1932), 182–203.

[26] Pigou attributes this example to Henry Sidgwick.

[27] Ibid., 183–85.

[28] On this point, Pigou laments in a footnote: "In Germany the town-planning schemes of most cities render anti-social action of this kind impossible; but in America individual site-owners appear to be entirely free, and in England to be largely free, to do what they will with their land." Pigou's view that the freedom of site-owners is the source of "anti-social action" may offer some insight into his mind-set regarding external effects. (See ibid., 186.)

surface of roads, the sale of intoxicants that make necessary additional expenditures on law enforcement and prisons, "certain types of foreign investment" in which investors accept foreign "promises" that adversely impact exchange rates, foreign investments and the "diplomatic manoeuvres employed in securing the concession for [them]" that may facilitate preparations for war, competitive advertising, bargaining over prices and wages, and (what Pigou called "[p]erhaps the crowning illustration") "the work done by women in factories . . . for it carries with it, besides the earnings of women themselves, grave injury to the health of their children." [29]

It is here that we find one of the most interesting elements of Pigou's argument for government action. The clear implication of his discussion is that Pigou considers bargaining itself wasteful. He further implies that positive transaction costs can be a sufficient justification for government intervention in markets. This seems very telling about his mind-set. Of course, if we knew how bargains would be resolved, imposing that solution and avoiding using resources in bargaining would increase welfare. But that seems a bit like taking Pareto-optimality to the lunatic fringe.

There are three important features of Pigou's examples of market failure. First, they cut across a large range of human activity. Like many modern writers, Pigou obviously saw market failure everywhere. Second, he argues that transaction costs can and should be avoided by moving decisions to the political arena. Third, and most troubling from the standpoint of public choice thinking, he saw each of the externality instances as one in which government could, and presumably should, intervene to constrain individual action. To use Pigou's words:

> Over and above these, there are many obstacles that prevent a community's resources from being distributed among different uses or occupations in the most effective way. The study involves some difficult analysis. But its purpose is essentially practical. It seeks to bring into clearer light some of the ways in which it now is, or eventually may become, feasible for governments to control the play of economic forces in such wise as to promote the economic welfare, and, through that, the total welfare of their citizens as a whole.[30]

Not only did "Pigou I" find externalities behind every bush and under every rock, he, despite Knight's contrary illustration, continued to assert that private arrangements were incapable of resolving externalities problems. On this issue, he states:

> It is plain that divergences between private and social net product of the kinds we have so far been considering cannot, like divergences

[29] See ibid., 134, 186–87, and 196–203.
[30] Ibid., 129–30.

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> due to tenancy laws, be mitigated by a modification of the contractual relation between any two contracting parties, because the divergence arises out of a service or disservice rendered to persons other than the contracting parties. It is, however, possible for the State, *if it so chooses*, to remove the divergence in any field by 'extraordinary encouragements' or 'extraordinary restraints' upon investments in that field. The most obvious forms which these encouragements and restraints may assume are, of course, those of bounties and taxes.[31]

B. "Pigou I" writ large

Here we have "Pigou I" writ large. Externalities (market failures) are ubiquitous. In the name of efficiency, government should take action to put the market on a proper footing. The literature following Pigou and preceding Coase is large but unfocused. As Coase notes, the treatment of externalities, and particularly the Pigouvian approach to externalities, is fragmentary, "often involving little more than a reference to Pigou plus some explanatory comment."[32] Further, the few additional insights in this literature went largely unnoticed. Indeed, it generally appears that the authors themselves did not understand the full importance of their observations for a clearer understanding of the range of policy mechanisms available for efficient resolution of externalities.

Arguably, one of the more important cases of lack of understanding (perhaps including by the author himself) of a fundamental insight into external effects is James Meade's analysis of "two types of external economy and diseconomy."[33] Meade terms his two types of externality "unpaid factors of production" and "creation of atmosphere."

His example of an unpaid factor was a depletable (private) asset, the nectar in apple blossoms that was consumed by beekeepers without payment to apple farmers. His example of creation of atmosphere was a nondepletable (public) asset, the broadly dispersed micro-climatic benefits that occur when forests are planted. This is remarkably similar to the later categorization of externalities offered by William Baumol and Wallace Oates.[34]

[31] Ibid., 192 (emphasis added).

[32] Coase, "The Problem of Social Cost," 35.

[33] See James E. Meade, "External Economies and Diseconomies in a Competitive Situation," *Economic Journal* 62 (1952): 54–67. It is telling that Meade's essay is remembered almost exclusively for one of his examples, the famous beekeeper and apple farmer example, rather than for a basic insight contained in the distinction he makes.

[34] See William J. Baumol, "On Taxation and the Control of Externalities," *American Economic Review* 62 (1972): 307–22; and William J. Baumol and Wallace Oates, *The Theory of Environmental Policy* (Englewood Cliffs, NJ: Prentice Hall, 1975). Meade's discussion, however, had one advantage over the later discussion by Baumol and Oates. Specifically, Meade implies that it is the depletability of the asset whose use gives rise to external effects, not the depletability of the externality itself, which is significant. This is a subtle but potentially important distinction.

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The important implication of the distinction between externalities that arise with the use of depletable assets and those that arise with the use of nondepletable assets is that with this distinction it becomes clear that any inefficiency that arises from the former is simply attributable to the fact that the asset is "unpaid." All that is required is that property rights be assigned so that a market in the asset can evolve. Indeed, this is precisely what has happened in the beekeeper/apple farmer case. The renting of bee hives to apple producers is commonplace. Interpreted in this way, Meade's insight has a decidedly Coasean ring.

Of course, one could argue that property rights could be assigned, and market prices could evolve, for the case of "creation of atmosphere" externalities that arise with the use of nondepletable assets. The obvious difference is that the "public" nature of nondepletable assets may give rise to free-rider problems that make private contracting prohibitively costly. However, there is strong evidence that privately inspired and organized actions to protect or provide public goods can be successful in the face of the potential free-rider problem.[35]

IV. Property Rights and Market Failure

As noted by Cheung in the quotation at the beginning of this essay, the concept of externality has evolved through a process of accumulated examples, ad hoc generalizations, and categorizations of external effects. The resulting literature is large and (unnecessarily) complex. Those who contribute to that literature have separated into several loosely defined camps with competing views. Some advocate a Pigouvian view. Inspired by the concept of "market failure," these authors focus on appropriate government mechanisms for control (e.g., taxes, subsidies, regulations, or marketable permits).

Other authors (e.g., Terry L. Anderson, Donald R. Leal, and Bruce Yandle) promote the view that inappropriately defined property rights are the source of most externalities problems. Work by these individuals is often substantially anecdotal, focusing on examples in which property rights have resolved externalities problems.[36]

At times these camps appear to merge, while at other times strong lines are drawn between competing views. Among many other issues, disagreements have arisen over which of the externality-linked parties should pay a tax or be subsidized when external costs are generated,[37] the efficacy of liability rules versus government regulations or marketable per-

[35] See Bruce Yandle, "Environmental Turning Points," *Independent Review* 9 (2004): 211–26.

[36] See Anderson and Leal, *Free Market Environmentalism;* and Bruce Yandle, "Coase, Pigou, and Environmental Rights," in Peter J. Hill and Roger E. Meiners, eds., *Who Owns the Environment?* (Lanham, MD: Rowman and Littlefield, 1998), 119–52.

[37] Central to this point are Coase, "The Problem of Social Cost"; Buchanan and Stubblebine, "Externality"; Ralph Turvey, "On Divergences between Social Cost and Private

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mits,[38] the measurement of external benefits and costs,[39] and the proper criteria for social decision-making.

In some measure, these disagreements stem from philosophical differences. However, the differences are facilitated by failure to fully appreciate certain fundamental principles related to external effects. Our goal here is to draw attention to these fundamental principles that, taken together, can add insight in the study of externalities. In doing so, we do not claim that our observations are original. All that we address can be easily found in the literature. At best, we add some structure to the discussion by drawing attention to several fundamental axioms regarding external effects.

A. Externalities and gains from trade

Consider two fundamental axioms regarding inefficiencies:

> *Axiom #1:* All inefficiencies, including Pareto-relevant externalities, represent unexploited gains from trade.
>
> *Axiom #2:* When free exchange is allowed and transactions are costless, all Pareto-relevant inefficiencies will be negotiated away.

Both propositions are obvious and entirely noncontroversial. Indeed, they capture the bargaining essence of Buchanan and Stubblebine's analysis[40] and what is now termed the Coase Theorem. The theorem states that what might be a budding externality problem can be resolved efficiently by the assignment of property rights to either party in a two-party setting. With property rights assigned and with negligible transaction costs, the two parties can bargain to an efficient outcome. In addition to describing how a definition of property rights can eliminate externality problems, Coase explained how the same outcome can be achieved irrespective of whether the property rights are assigned to the producer of the external cost or the receiver of the externality. In either case, given negligible transaction costs, the two parties will bargain to the same solution. Where Pigou saw politics beckoning, Coase saw a market opportunity. Of course, property rights and rules of liability were central to Coase's solution.

The two axioms call attention to several important issues that are often overlooked. The Coase Theorem is clear enough, but why are the poten-

Cost," *Economica* 30, no. 119 (1963): 309–13; and Baumol, "On Taxation and the Control of Externalities."

[38] For example, see Roger E. Meiners and Bruce Yandle, "Common Law and the Conceit of Modern Environmental Policy," *George Mason University Law Review* 7 (1999): 923–63.

[39] On this, see Coase, "The Problem of Social Cost"; and Edgar L. Browning, "External Diseconomies, Compensation, and the Measure of Damage," *Southern Economic Journal* 43 (1977): 1279–87.

[40] See Buchanan and Stubblebine, "Externality."

tial gains from trade unexploited? What prevents people from negotiating an efficient solution? There are two obvious answers to this question. First, as pointed out by Baumol and Oates, the costs of negotiating private solutions may exceed potential gains from trade.[41] This might occur, for example, when both (i) the asset whose use gives rise to external effects is a public good, and (ii) a large number of persons are involved. A large-numbers setting may generate prohibitive transaction costs. With a public good, any individual affected by the public good gets benefits without paying, since there is, by definition, no way to fence out nonpaying parties. In this case, free-rider problems make it costly for private parties to define property rights such that all impacted parties are included in (Pareto-relevant) bargains. This complication may make transaction costs sufficiently high that they swamp even large potential gains from trade. Examples where this is the case are surprisingly difficult to find. Air quality, ozone depletion, and climate change are possible examples. Cases like traffic congestion are not such examples, because it is feasible for private road owners to assign and collect a price, and to exclude nonpayers from road access.

A second reason that private negotiated solutions may not occur is that some socially constructed impediment exists, typically imposed by government, which prevents or limits private transactions. This is the case with so called common-access property resources. Common grazing lands, public parks and forests, fisheries, and traffic congestion are possible examples. In other words, when government action is held constant (which is to say, when government and its rules are deemed to be exogenous to the market process and are assumed to be unchanging), we can make Pareto pronouncements about the efficiency of private action in the market. Then, all else equal, whatever may be seen as market failure is either a case of irrelevant costs where actions to correct them are more costly than the gain obtained or a case of politically induced barriers that limit private action. This said, we recognize that what may be described as an irrelevant cost to an economist can be seen as an opportunity to curry favor with special interests by a politician. Put another way, ceteris paribus does not necessarily hold when Congress is in session.

B. Assets, transaction costs, and persistent externalities

Externalities do not differ in any substantive way from any other kind of inefficiency. Externalities, like any inefficiency, can occur in a wide variety of circumstances, but those that persist do so only because something prevents contracting. Obviously, those that are transitory are not an issue. Only those that persist warrant attention.

[41] Baumol and Oates, *The Theory of Environmental Policy.*

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As we noted above, two things can prevent bargaining and produce persistent externalities: (1) government constraints that prevent marketable rights from evolving or that prevent market transactions in existing rights, or (2) transaction costs that exceed gains from trade. Little needs to be said about the first case. It includes private goods, such as common property resources, public parks, and traffic congestion. (These are all cases where priced private consumption is known to work effectively.) The second case includes public goods where free-rider problems produce transaction costs that exceed gains from trade. This can occur even when gains from trade are high. As previously noted, it is difficult to find clear examples of such cases.

A key here is the very simple observation that external effects do not arise in a vacuum. They occur when an asset is used in mutually incompatible ways. This observation, though noncontroversial and certainly not new, is at the root of much disagreement and is essential to understanding the nature of the externalities problem. Authors often categorize externalities without clear reference to the assets whose use gives rise to the external effect. For example, Baumol and Oates divide externalities into those that are depletable and those that are nondepletable.[42] Others talk about separable versus nonseparable, reciprocal versus nonreciprocal, or consumption versus production externalities.

While these distinctions may have virtue in the context of a particular analysis, such distinctions lose sight of the fact that it is not the externality per se that is depletable or nondepletable, but the asset whose use gives rise to external effects. Recognition that it is the characteristics of the asset that matter focuses attention on problems in exchange of the asset, and hence on transaction costs, rather than on devices for correcting external effects. That, in turn, focuses attention on ways to reduce transaction costs. This is opposed to focusing on imposed solutions that bypass or attempt to mimic the market, e.g., taxes and subsidies. More specifically, we would expect high transaction costs when assets have public-goods characteristics and the number of market participants is large, and we would expect lower transaction costs when the asset has private-goods characteristics. Hence, we would expect externalities to persist only (i) when the asset being used has public-goods characteristics, or (ii) when governments constrain private exchange in the asset in question. (In saying this, we see ironically that actions taken by government because of alleged public-goods problems can indeed become a barrier to transacting away the difficulties that led to the government's public-goods undertaking.)

This line of reasoning suggests a mind-set (for lack of a better term) that is productive for analysis of externalities. Following this line of reasoning yields two conclusions. First, many previous attempts to produce a "theory of externalities" failed to fully integrate the nature of the good whose use

[42] Ibid.

gives rise to external effects. There is no conceptual difference between externalities and other kinds of inefficiency. Neoclassical theory tells us about public goods and, hence, tells us about the potential persistence of externalities that arise with the use of such goods. Neoclassical theory also tells us about the virtues of markets, and private bargaining, in allocating private goods. That theory translates exactly to the persistence of externalities that arise in the use of private goods.

Second, in our analysis of external effects more attention should be focused on institutional arrangements that can reduce transaction costs. In this case, as in many others, the conclusions reached can be influenced by the questions asked. When our mind-set is "market failure," we tend to look for solutions that are substitutes for markets (particularly those that may mimic the market, such as marketable permits or pollution taxes). Directing attention instead to the observation that externalities can persist only when "artificial" impediments are placed on market transactions, and to the magnitude of transaction costs relative to gains from trade, should focus analysis on devices to remove the impediments to private bargaining or on ways to change institutional arrangements to reduce transaction costs.

Of course, if nontrivial externalities persist, there may be some scope for government action to remedy the problem. But government agencies are not perfect institutions, and public decision-makers are neither omnipotent nor pure public servants. Hence, even a clear instance of market failure may not justify a government attempt at remedy. Consideration of this issue is the task to which we now turn.

V. If It So Chooses

Pigou obviously reached across a chasm that separates private from public decision-making when he argued that government can and should address and resolve the problems he cites "if it so chooses." For example, when addressing public-goods aspects of environmental quality, Pigou senses that private contracting costs will be excessive. He writes:

> No "invisible hand" can be relied on to produce a good arrangement of the whole from a combination of separate treatments of the parts. It is therefore necessary that an authority of wider reach should intervene to tackle the collective problems of beauty, of air and light, as those other collective problems of gas and water have been tackled.[43]

A. The arrival of "Pigou II"

The authority appealed to here must confront the problems of collective choice. Were it not for collective decision-making problems, Pigou's neat

[43] Pigou, *The Economics of Welfare,* 4th ed., 195.

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solutions might indeed be worthy of serious consideration. Indeed, in the absence of political transaction costs, where political agents could make efficient side payments to affect outcomes, Pigou's solution would converge with that of Coase's market-based model, which must also face transaction-cost problems. In his argument for government action, Pigou was obviously not thinking about a world where rent-seeking behavior dominates the political process, where special-interest competition tends to overwhelm public-interest considerations, and where rational ignorance combines with expressive voting to yield what a Pigouvian might term an "unintended consequence." When confronted with the politics of the problem, "Pigou II" emerges:

> [W]e cannot expect that any public authority will attain, or will even wholeheartedly seek, that ideal. Such authorities are liable alike to ignorance, to sectional pressure and to personal corruption by private interest. A loud-voice part of their constituents, if organized for votes, may easily outweigh the whole.[44]

In short, it is clear that Pigou was mugged by the reality of the political marketplace. Even so, his name remains attached to the notion that negative externalities are ubiquitous and that government is systematically superior to markets in reducing the associated social costs. In this sense, the notion of Pigouvian thinking is an exaggerated caricature of Pigou himself. But while Pigou seems to sense the public choice problem, he does not analyze it. In an even stronger sense, Pigou's later followers, lured by the prospect of an efficiency-enhancing government, were even less inclined to consider politics without romance.

In reflecting on the heyday of the externality concept, Buchanan describes the situation this way:

> Again, it is necessary to appreciate the prevailing mind-set of social scientists and philosophers at mid-century. The socialist ideology was pervasive, and this ideology was supported by the allegedly neutral research program called *theoretical welfare economics,* which concentrated on the identification of the failures of observed markets to meet idealized standards. In sum, this branch of inquiry offered theories of market failure. But failure by comparison with what? The implicit presumption was always that politicized corrections for market failures would work perfectly. In other words, market failures were set against an idealized politics.[45]

[44] Ibid., 332.

[45] James M. Buchanan, "Public Choice: The Origins and Development of a Research Program," in Richard M. Eberling, ed., *Champions of Freedom,* vol. 31 (Hillsdale, MI: Hillsdale College, 2004), 25 (emphasis in the original).

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B. Public choice and the end of the externality problem

What can now easily be called the public choice revolution emerged in economic thought when James M. Buchanan and Gordon Tullock published their seminal book, *The Calculus of Consent.*[46] The book is noted for discoveries that obtain when individualistic market logic is applied unrelentingly to political decision-making. And paradoxically, the lessons of public choice tell us that when government is called on to resolve externality problems, the action taken can result in a Pareto-optimal outcome. Saying this, however, is not the same thing as saying that the politically obtained outcome will be superior to a resolution of the externality problem by means of private bargaining. As always, there is more to the story. But before we get to the comparison of private versus public choice, let us first review one of the major lessons taught by Buchanan and Tullock.

Buchanan and Tullock carry the reader to the constitutional tent where rules of the game are to be devised by participants who are uncertain about their particular role when the game is played later. Under these conditions, the constitution builders avoid the prospects for assigning tasks to the collective that might be handled privately. In the absence of a unanimity-voting rule, there is a high risk that politics will yield redistribution that is harmful to the politically weak, and, of course, the constitution builders are uncertain about whether they will be among the blessed or the cursed. "Pigou II" might dominate.

In the post-constitution period, when the game is being played, Buchanan and Tullock point out that even redistribution activity can yield Pareto-optimal outcomes, provided that side payments can be made in the voting process.[47] The votes are property rights used in determining outcomes. If the votes are for sale and can be traded, then all gains from trade associated with different political outcomes will be obtained. In applying this thinking to the problem of externality, Buchanan and Tullock argue that when government addresses an externality problem, just as when two parties bargain in a private setting, all Pareto-relevant externalities will be bargained away in the political process so that, at the end of the day, no relevant externalities remain and Pareto-optimality is obtained. Put differently, no moves can be made without making someone worse off. If we take to the legislature Pigou's problem of smoke imposing costs on the laundry next door and call for a tax or some other kind of remedy, Buchanan and Tullock remind us that political bargaining will develop. Smoke producers will organize and offer payments to politicians, as will laundry operators. The side that bids the most will gain the deciding votes. No unrealized gains from trade will exist when the final vote is

[46] Buchanan and Tullock, *The Calculus of Consent.*
[47] Ibid., 189–90.

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taken. The outcome, whatever it is, will be Pareto-optimal, and no one can predict ex ante which of the two parties will gain relief. Unexpected outcomes will rule the day when the legislature is in session. Even so, the externality problem will have disappeared.

C. Do the two solutions converge?

Let us close this essay by inquiring about the relative merits of the two final solutions to the externality problem. On the one hand are property rights, markets, and bargaining. On the other hand are voting, politicians, and collective decision-making. We start by assuming that some relevant externality exists, and that some underlying system of property rights makes it possible for affected parties to bargain. We assume first that the number of affected parties is small. Under these ideal conditions, the parties will contract away the problem. If similar conditions occur in other locations, the bargaining parties may find alternate ways of writing contracts or affecting the real cost of the external effect. Market-driven creativity enters the solution. Uniform outcomes for similar external effects are not expected to obtain in each and every externality situation.

Consider now predicted outcomes when the small-numbers case is taken to the legislature. Assume that side payments are allowed. Unlike privately contracted outcomes, which may vary across space and time, legislative solutions tend to apply throughout the polity. Uniformity is the predicted outcome. This raises the stakes for all affected parties. Rent-seeking possibilities enter the picture. Bargaining and voting ensue and a Pareto-optimal outcome obtains. Political creativity enters the solution. Rent-seeking behavior is encouraged, and the cost of transacting as well as the deadweight loss from rent-seeking will take a toll on the net benefits obtained. We note that given the voting rules and with side payments, the political outcome is Pareto-optimal, but it is not necessarily the same outcome as would be obtained in a decentralized market setting. Where multiple small-numbers externality problems emerge, logic suggests that private bargaining will generate a less costly Pareto-optimal outcome, provided there are enforceable property rights that can be exchanged.

Consider next a large-numbers externality case, a case where property rights are available to bargaining parties, but where the cost of organizing the bargaining groups is high. Alternate institutions may emerge to deal with the externality. For example, liability and property insurance may emerge that imposes costs on policyholders who find it to their advantage to insure against the harms caused by the externality. The insurance firm bears the cost of organizing the market, and competition among insurance providers drives down the cost of insurance. Compare this with a political solution. Turning to politics does not make the large-numbers problem go away. One is still dealing with large numbers of affected

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parties. In fact, turning to politics increases the large-numbers problem. There are now more interested parties, since political bargaining provides logrolling as well as side-payment opportunities. In short, rent-seeking activities rise with the size of the affected group. Rational ignorance affects informed participation. Again, the outcome will be Pareto-optimal, but it will be a different outcome from that obtained through private action.

Finally, consider the extreme public-goods case. Stating the problem this way implies there is no private solution. In short, politics trumps markets for providing public goods. And what is the risk? The risk lies in defining what is a public good and how public-goods problems such as climate change and ozone depletion can be addressed effectively by separate governmental bodies. What might be thought of as efficiency-enhancing cap-and-trade approaches for reducing carbon and ozone-depleting emissions generally cannot include all emitting countries. The free-rider problem stands in the way.

VI. Conclusion

The externalities literature spans nearly a hundred years, thousands of journal articles, and more than a few books that collectively brought about a virtual revolution in views on market failure and the proper role of government. This literature includes a staggering array of instances in which authors find market failure, and a wide variety of proposed government mechanisms to be used in correcting the market's errant ways. The authors of this essay are as guilty as others. We have also analyzed externalities and proposed government-imposed solutions, but now we wish to repent for the sins of our youth.

Simply put, markets seldom fail because of externalities. Nontrivial externalities that arise in the use of private goods will certainly occur, but they can persist only if governments prevent markets from working. In the absence of government impediments to market transactions, only such things as climate change and ozone depletion can yield such vast degrees of publicness that externalities will persist, and even this case is subject to qualification. Externality may be a term that is useful in categorizing resource allocation problems, but it adds little more.

More to the point, a great deal of public policy is inappropriately based on the externality rationale. Neoclassical welfare economists let this genie out of the conceptual bottle. It is time to do what we can to put it back.

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