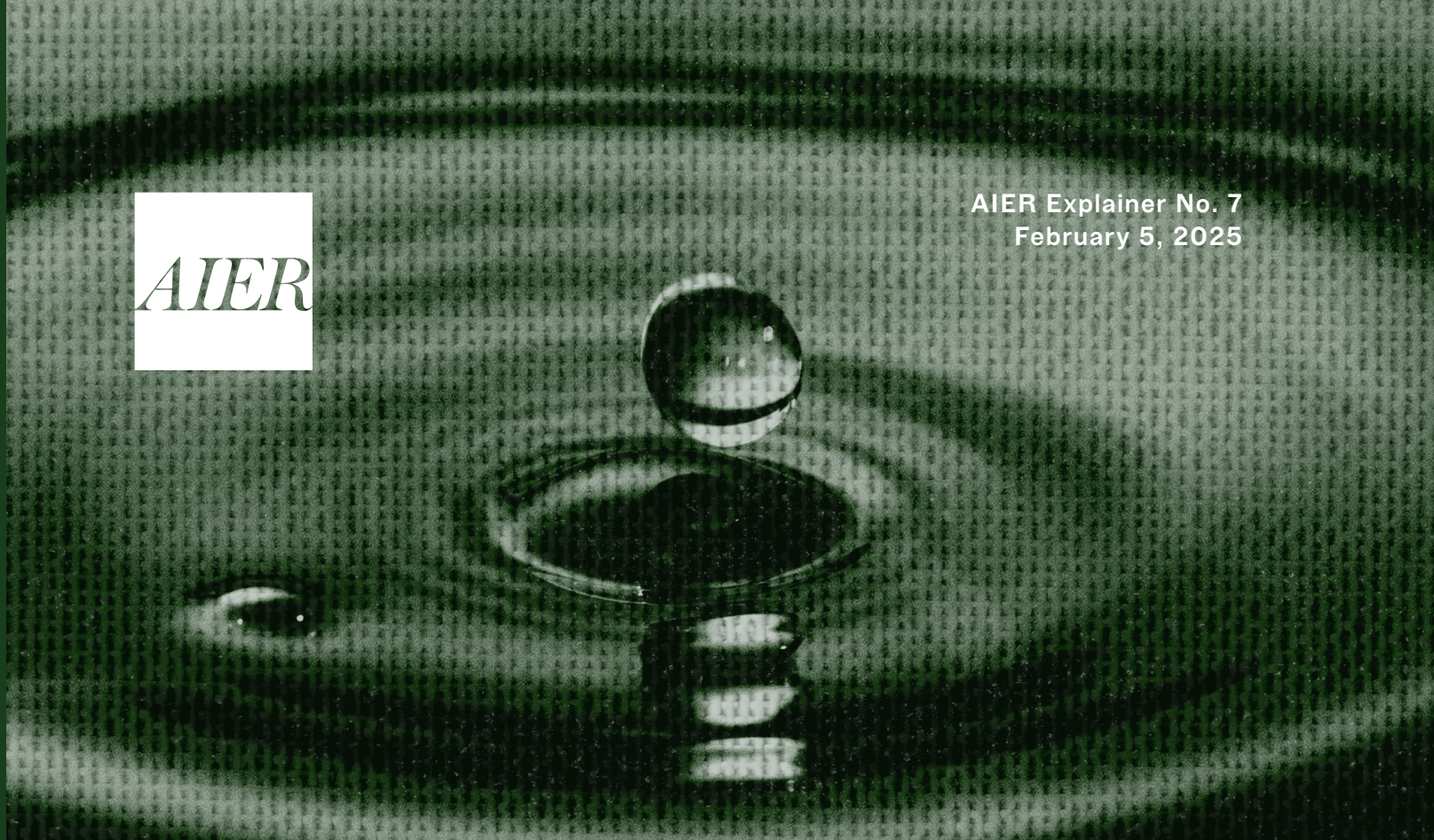

AIER Explainer No. 7
February 5, 2025

What, Exactly, Are Negative Externalities?

DONALD J. BOUDREAUX

The American Institute for Economic Research educates people on the value of personal freedom, free enterprise, property rights, limited government, and sound money. AIER's ongoing scientific research demonstrates the importance of these principles in advancing peace, prosperity, and human progress.

250 Division Street
PO Box 1000
Great Barrington, MA 01230
Telephone: 1-888-528-1216
Fax: 1-413-528-0103
info@aier.org

AIER is a 501(c)(3) Nonprofit registered in the U.S. under EIN: 04-2121305

Introduction

Economics textbooks feature a coherent theory of how markets can allocate scarce resources in ways that achieve what is plausibly described as maximum possible human satisfaction. This theory is grounded on certain foundational assumptions, such that the existing 'distribution' of wealth is legitimate, that each adult is a rational actor who knows his or her preferences and circumstances better than does anyone else, and that no one person's or group's preferences count for more than do those of any other person or group.

It is then shown that when markets are "perfectly competitive," *and when each person bears in full the marginal costs, and reaps in full the marginal benefits, of his or her actions,* the resulting allocation of resources will be one that, if altered, would worsen overall human satisfaction.[1] This model is not intended to describe reality but to provide a widely predictive tool related to human motivation and the inescapability of resource scarcity.

All students of formal economics know that conditions for such an ideal outcome to prevail are strict—so strict that they are impossible to meet. This fact often generates this policy conclusion: "Therefore, government intervention is necessary." But as all *careful* students of economics know, this conclusion is a *non sequitur.* The market certainly is imperfect, yet it doesn't follow that the government should intervene.

Government intervention is plagued by its own deep imperfections, the most prominent of which are the knowledge problem and the incentive problem. The former refers to the obstacles faced by government officials to acquire (and to correctly process) all the knowledge they would need to improve market outcomes; the latter refers to incentives that often push political actors to pursue their own interests in ways that conflict with the public interest.[2]

Recognition of either of these problems alone should create a presumption against government intervention. Taking cognizance of the simultaneous existence of these problems should make this presumption stronger. And this strong presumption should hold even when the existence of market imperfections is unambiguous.

By far, the market imperfection believed, at least by economists, to be most common is that of externalities. An externality, as defined by the Nobel-laureate economist George Stigler, "is an effect, whether beneficial or harmful, upon a person who was not a party to the decision."[3] Consult almost any economics textbook and you discover a similar definition of externality. Because harmful effects of this sort ("negative externalities") generally get more attention than do beneficial effects ("positive externalities"), the discussion in this *Explainer* will be confined to negative externalities, although most of the points I make apply also to positive externalities.

A classic example of a negative externality is a railroad that builds a line next to farmland and, when it runs its trains, throws sparks onto the farmland, occasionally burning the farmer's crops. The farmer suffers damage that he did not bargain for. If the railroad doesn't pay for this damage, it does not cover all of its operating costs, which include doing damage to crops. Because incurring costs restrains the actions that generate the costs, not having to pay all of its costs leads the railroad to run too many trains. And when the railroad runs too many trains, the farmer winds up supplying too few crops.

To induce the railroad to produce the optimal amount of railroad services, it must somehow be obliged to

pay not just for *some* of its costs of doing business—to pay not just wages to compensate its workers, and prices to compensate its suppliers of fuel—but to pay for *all* of its costs, including whatever damage it causes to farmers and other parties who suffer incidental losses as a result of the railroad's operation.

A.C. Pigou and Ronald Coase

The government can "correct" this market imperfection by imposing on the railroad a tax equal to the value of the crops damaged by its trains. This tax—called by economists a "Pigouvian tax" (after the British economist A.C. Pigou[4])—"internalizes" on the railroad the cost that it once imposed on the farmer. A cost that was previously external to the railroad's decision-making processes is now internal to it given that the railroad must pay the tax. With this cost "internalized" on the railroad, it will now produce the economically optimal amount of railroad services, and allow the farmer to supply the optimal amount of crops.

As Ronald Coase pointed out in one of the most influential economics papers ever written, such a tax isn't the only, and likely not even the best, means of internalizing this externality.[5] If the railroad and farmer can bargain with each other, all that needs to be done is for the property right to be clarified. With a clear understanding of prevailing property rights, the farmer and railroad will bargain with each other to reach an agreement that brings about the optimal amount of both railroad services and crop supply.

According to the famous "Coase Theorem," if bargaining is possible it does not matter economically what the property-rights assignment is, only that it exists and is known and unequivocal. A simple example makes the Coase Theorem clear.

Suppose that each train that runs alongside the farm causes $10,000 of crop damage, and that by running each such train the railroad earns a profit of $16,000. Further suppose (for simplicity) that the only way to prevent the trains from causing crop damage is to stop running the trains alongside the farm. If a court declares that the railroad has no obligation to compensate the farmer—which is to say, if the court rules that the farmer has no right to be free of the crop damage caused by the railroad—the railroad obviously will continue to run its trains alongside the farm. But suppose instead that the court rules that the railroad has no right to damage the farmer's crops. Legally, the farmer could then compel the railroad to stop running trains alongside his land. Prior to the publication of Coase's article, this outcome is the one that was believed would prevail. But the Coase Theorem helps us understand that the railroad will keep running the trains and do so *with the farmer's consent*.

The reason is that the railroad will offer to pay the farmer, for each train that it runs by the farmer's land, some amount above $10,000 and up to $16,000 for the right to run that train. If, say, the railroad offers the farmer $12,000 for each train that it runs alongside his land, the farmer will accept; it's better for the farmer to lose $10,000 of crops and receive in return a payment of $12,000 than to avoid losing $10,000 of crops and receive no payment from the railroad.

Now change the example to suppose that, while each train continues to cause $10,000 of crop damage, the profit that the railroad earns by running each train is only $8,000. It's clear that if the court rules that the farmer has the right to be compensated for any damage that the railroad causes to his crops, the trains will stop running. The railroad won't find it worthwhile to compensate the farmer for the crop losses.

Yet the trains will stop running even if the court rules that the railroad has no obligation to compensate

the farmer. The farmer will pay the railroad some amount between $8,000 and $10,000 to stop running its trains alongside his land. If, say, the farmer offers the railroad $9,000 not to run a train that would cause $10,000 of crop damage, the railroad will accept. Better not to run the train and get $9,000 from the farmer than to earn $8,000 of profit by running the train and thereby lose the opportunity to get $9,000 from the farmer.

Oceans of ink and gazillions of pixels have been devoted to the debate over just how realistic such bargaining is in the real world, as well as to identifying how it might go awry. (In the last example, what prevents the railroad from telling the farmer that the number of trains it plans to run is greater than the actual number that it plans to run? Courts deciding on where to locate, and just how to define, property rights must be aware of potential unintended consequences of their rulings. The details matter.) Nevertheless, the Coase Theorem reveals an important economic reality: When allowed to operate, markets tend to allocate property rights to those persons or parties who value them most highly, and such allocations are done in ways that are mutually beneficial.

It Takes Two to Externality

For all of its apparent cleverness, the Coase Theorem is actually mundane (as Coase himself understood). This theorem simply shows that, as long as individuals can bargain with each other, legal rights no less than goods and services will be acquired by those persons who value them most highly. Nor is the Theorem the most important part of Coase's paper (as Coase also understood).[6] That distinction belongs to Coase's insistence that *all* externalities are bilateral or multilateral. Jones cannot impose a loss on Smith if Smith is not in a position to be harmed by Jones. If there were no cropland adjacent to the railroad tracks, trains running along the tracks would cause no crop damage. The existence of the externality results from actions taken by *both* parties. In our example, the externality is caused no less by the farmer's actions to plant his crops where he does than by the railroad's action to situate its tracks where it does and run trains along them. Just as it takes two to tango, it takes at least two to "externality."

This reality has this implication: Because each party took steps to make the externality possible, each party can take steps to prevent the externality. The following question is thus raised: Which party should take that step? Answering a "should" question involves value judgments, but economics can lend a hand by pointing out that resources are saved if externalities are dealt with in the least costly way possible. It's not a terribly controversial normative stance to argue that the party who can eliminate the externality at lowest cost "should" be the party on whom responsibility for doing so is placed.

In the farmer-railroad example, most readers' sympathies likely lie with the farmer. The railroad, after all, appears to be the cause of the externality. But appearances can deceive. Suppose the farmer bought the land adjacent to the railroad tracks long after those tracks were laid and in full knowledge of their existence as well as of the fact that trains continue to run along them and throw off hot sparks. If the farmer then nevertheless plants crops near the tracks, who's responsible for the resulting crop damage? In this case, it's no longer obvious that the culprit is the railroad. The farmer could have bought land elsewhere, or chosen not to plant crops so close to the tracks so as to be burned.

In our world of scarce resources, we want to impose the legal responsibility for dealing with externalities on those parties who can do so at the lowest cost—that is, who can deal with externalities using the fewest

amount of resources. And so a 'good' system of property rights encourages those parties who can avoid externalities at lowest cost to be the ones who take the actions to do so. If the cost to the farmer of buying equally good cropland away from the existing railroad tracks is lower than the cost to the railroad of diverting its trains onto routes other than that which passes near the cropland, a 'good' system of private property rights encourages the farmer to do so. If under these circumstances the farmer nevertheless purchases the land adjacent to the tracks and plants crops on them, the courts 'should' therefore rule that he has no right to be compensated for the resulting damage to his crops. By so ruling, the courts oblige the farmer to bear the cost of his decision; he cannot offload this cost onto the railroad. This ruling will discourage farmers in the future from making a similar costly choice.

Costs Are Not Losses

Yet an even deeper point lurks in this example. It's commonplace among scholars in law and economics to describe the farmer in the last version of this example as the "low-cost avoider of the externality." But I argue that in the last version of this example there *is* no externality. If the farmer knows about the railroad tracks and the sparks that come from passing trains but still chooses to plant crops near the tracks, he cannot plausibly be said to suffer losses due to the railroad's operation. Prior knowledge of the railroad and its sparks was sufficient to internalize on the farmer the consequences of his decision to plant crops near the railroad tracks. Indeed, the price the farmer paid for the land must be assumed to have been discounted to reflect the likelihood of damage to any crops planted alongside the tracks – meaning that the farmer paid for the land a lower price than he would have paid had the tracks not been there. This discount on the price of the land compensates the farmer for the expected value of the crops to be damaged by passing trains. The fact that this compensation is "paid" in advance, in the form of a discount on the price of the land, is economically irrelevant. Resources are allocated the same way. When the trains now pass and burn some of his crops, these are damages that the farmer anticipated and for which he has already been compensated.

It's important to get the language straight. The value of the damaged crops, in this case, are not "losses." They are costs, and costs differ from losses categorically. This distinction might at first come across as one without a difference, but it is real and relevant. Before returning to the farmer and railroad, let's explore this difference.

By "losses," I mean the value that a party is denied when he or she is stripped of some property interest in which he or she has a legitimate legal entitlement. If a thief steals your car, you suffer genuine loss. If Jones builds a tall fence that blocks a view to which Smith has good reason to believe he is legally entitled, Smith suffers a loss. If a freak earthquake destroys my home in northern Virginia, I suffer a loss. Using conventional language we might say that the theft "cost" you $25,000, that Jones's fence "cost" Smith his lovely view, and that the earthquake "cost" me my home. But to get a clearer understanding of externalities, the decrements from your welfare, from Smith's welfare, and from my welfare are better called "losses" and not "costs," for it's important that losses and costs be kept distinct from each other.

Unlike losses, costs are what choosers *voluntarily* sacrifice in exchange for benefits. Both losses and costs, *each standing alone,* are decrements from individuals' welfare. But only losses spring from a series of human interactions (or Acts of God) that decrease that welfare on net. When someone suffers a loss, that person is made worse off. In contrast, when someone incurs a cost, that person is made better off.

This odd-sounding conclusion about costs follows from the fact that costs, unlike losses, are the flip-side of choices.[7] I choose to pay $20 for a pizza because I expect that the satisfaction that I will get from the pizza exceeds the satisfaction that I would get if I were to spend that $20 some other way. Because I can get satisfaction from the pizza only by incurring the cost of sacrificing $20 to obtain it, the process of incurring this cost makes me better off.

More precisely, my access to the opportunity to incur this cost makes me better off, for embedded in this opportunity is the prospect of my receiving a gain that is greater than the cost. This reality is not changed by the fact that the net increase in my welfare from taking advantage of this opportunity would be even greater were the restaurant owner to surprise me by giving me the pizza free of charge. The bottom line is that the $20 that I spend for the pizza is not a "loss," and no one would describe it as such.

Consider another example. Suppose that, to buy a home, I borrow $250,000 from a lender and agree to repay the loan, in monthly installments, at a certain rate of interest over fifteen years. I move into the home today and commence living in it. A Martian, with no knowledge of earthly conventions, visits earth three years from now and observes me sending a check each month to the mortgage holder. After a few months of observation, the Martian reports to his leaders on the red planet that each month the mortgage company inflicts on me a loss in the amount of my mortgage payment. The Martian and his leaders conclude that I would be better off were I not obliged to suffer a loss each month in the form of these monthly payments.

But no knowledgeable earthling would describe me as each month suffering a loss. When asked to describe the meaning of my mortgage payments, the earthling would say that I'm paying the *cost* of having borrowed money to purchase a home. The earthling would be correct. Of course, I would be delighted if, after I obtain the borrowed funds, the mortgage holder then relieved me of my obligation to repay. My welfare would be raised by such relief.

However, I clearly would be made *worse* off if, as a result of the mistaken conclusion that the practice of mortgage lending imposes losses on borrowers, creditors were prohibited from demanding repayment from debtors. While in my ideal world the mortgage lender would simply give me the $250,000 with no strings attached, I'm nevertheless better off in a world in which mortgage lenders can lawfully demand repayment of loans than I would be in a world in which such demands are unlawful.

Back to the Farm

And so it is with the farmer who chooses to plant crops near land that he knows will occasionally be set ablaze by sparks from passing trains. This farmer values the expected benefit of cultivating that particular piece of land by more than his cost of doing so. This fact implies that the farmer judged all other available options for using the time and resources that he invests in cultivating that land as inferior. By cultivating that piece of land, despite the expectation that crops grown on it will occasionally be burned, the farmer maximizes his net worth (and, in turn, his net welfare).

So the fires, when they do happen, cause the farmer no *losses;* the crop damage was expected beforehand and so the farmer, when making his plans, took the likelihood of this damage into account. This damage was "internalized" on him from the start of his operations. The farmer thus suffers no unexpected reduction in his net worth or welfare when trains pass by and set fire to his crops. The farmer obviously would

be pleasantly surprised if the actual amount of crop damage turns out to be less than he expected, but the crop damage that does occur as a result of the railroad's normal operation is nevertheless no net reduction in his welfare. This crop damage is merely among the farmer's costs of cultivating that land.

The situation would be entirely different if, when the farmer began cultivating his land, he had no good reason to believe that a railroad would be found to have the right to run spark-spewing trains near that land. In this case, the damage done to the farmer's crops by the railroad would indeed be losses to the farmer.

The challenge facing courts when hearing cases in which party A accuses party B of violating party A's property interest is to determine which party has the most legitimate expectation—that is, which party actually has the property interest. If the courts find that the farmer could not have legitimately expected to be free of crop-damage caused by the railroad, the courts will rule that the farmer suffered no losses that the railroad is legally liable to cover. In economic terms, the railroad imposed no externality on the farmer, for the expected crop damage was already "internalized" on the farmer when he, knowing of the fire risk, chose to plant crops near the railroad tracks. If instead the court finds that the farmer had a legitimate expectation to be free of such damage, then it will rule that the railroad is liable for any damage that it causes to the crops. In this case, unlike in the former, the railroad does indeed impose on the farmer a negative externality—that is, a loss.

Confining the Concept of 'Externality'

The reader at this point might ask, "So what?" The answer is this: "plenty."

In society people constantly choose and act in ways that negatively affect other parties, including many parties distant from the initial choice or action. If the concept of negative externality is taken to mean *any* negative effect suffered by Party A as a result of actions taken by Party B, then society overflows with negative externalities. My decision to skip lunch today denies to a local restaurant or supermarket the sales that it would have enjoyed had I chosen to eat lunch today. Steve's decision to ask Sarah to marry him—and Sarah's decision to accept Steve's proposal—makes it more difficult for Sam and Scott to get a date with Sarah. Americans' decisions to have fewer children reduce the sales of firms that produce baby food, diapers, and strollers. Tony's decision to open a pizzeria in town draws customers away from the local Pizza Hut, Domino's, and Taco Bell. The cascade of effects is endless.[8]

Because nearly every choice other than deciding in which position you sleep has some impact, positive or negative, on persons who have no say in that choice, the concept of externality, if it is to be useful, must be confined. Otherwise, the concept is so all-encompassing that it loses meaning. The appropriate way to confine the concept of negative externality is to use it as a label for those effects on third parties that are legitimately regarded as ones to be avoided. Negative externalities, thus, are effects on third parties that are considered so harmful or unacceptable, within a society's existing legal and normative structure, that they should be discouraged or prevented altogether. The vast majority of effects on third parties commonly called "externalities" do not fall into this category.

Ultimately, distinguishing third-party effects that should be discouraged or prevented from those that should be ignored involves a value judgment. In our society, it's widely regarded as inappropriate to appear unclothed in public, so someone who strolls naked down Fifth Avenue is appropriately described as

imposing on others a negative externality. Even for the classical liberal and most libertarians, it's thus no overreach by the government to enforce the wearing of clothing in public, and it's no defense of the naked pedestrian to point out that his or her activity is peaceful. In a society in which public nudity is accepted, that same activity would not be a negative externality and, thus, would be permitted.

The essential point here is that determining if some effect is or is not a negative externality isn't an exercise of pure, objective, universal science. What's required is knowledge of the society's prevailing norms —which, in turn, means knowledge of what are and what are not legitimate expectations in that society. People in modern America expect not to see adults strolling naked on public streets. When that expectation is violated, an externality exists.

Expectations are Key[9]

The great majority of the effects that one person's choices and actions have on third parties are so clearly in conformity with prevailing expectations that no one is tempted to think that negative externalities are afoot. You might dislike my hairstyle while I dislike your religion, and both of us dislike the fact that Larry, our beloved neighbor, has chosen to move to another state. Yet in modern America it doesn't dawn on you that my wearing my hair as I do imposes on you some harm for which you deserve compensation, and it doesn't occur to me to think that you're violating some right of mine that entitles me to seek redress in the courts. And both you and I agree that, although he worsens our welfare by doing so, Larry's decision to move to another state violates none of our rights. Larry owes us no compensation. In these cases neither you nor I are said to suffer losses as a result of the other's or of our neighbor's actions. None of these cases involves an externality.

At the opposite end of the spectrum are clear-cut cases of losses for which the victims unambiguously deserve compensation. If Joe murders Jack, Jack obviously suffers a loss, as does Jack's family. But even if Joe kills Jack accidentally, say, by negligently running a red light while driving, Joe and his family suffer losses for which, in our society, they deserve compensation. And the state is justified in taking steps both to punish Joe and to attempt to diminish the chances of similar killings taking place in the future. Rape, assault, battery, arson, theft, and fraudulent conveyance are likewise clear-cut cases of one party inflicting genuine losses on other parties. Each of these cases involves an externality.

Of course, using ordinary language we call none of these disapproved actions "negative externalities." Nor do economists use such language. These offenses are simply called "crimes." But each of these actions is a source of negative externalities. Each of these actions violates a legitimate property interest—an interest that exists not chiefly because it was declared to exist by the government but, rather, because the expectation is widely shared in society that individuals are to be free of these kinds of damages.

The kinds of actions that generally fall within the category of actions that the economics term "negative externality" is meant to embrace are, in legal lingo, torts. For example, Bob's tuba playing prevents his next-door neighbor Betty from sleeping soundly. Negative externality or not? It depends on the prevailing expectations. In modern American society, if Bob toots his tuba at 1:30am, a court will find that he violates a property interest held by Betty. Americans expect to be able to sleep at night without being disturbed by noise from their neighbors. If instead Bob practices his tuba playing at 1:30pm, a court will likely find that he has a right to do so - meaning that Betty has no property interest in being able to sleep without

neighborhood noise in the middle of the day. This court ruling will not change even if Betty proves to the court that she is nocturnal and sleeps during the day. The court will reason that the typical person sleeps at night and that people have more rights to make noises in their homes during daytime hours than during nighttime hours.

The economist who keeps the concept of externality properly confined will say that Bob's wee-hours tuba playing unleashes a negative externality, but his daytime tuba playing does not. The fact that Betty might happen to be discomfited by the latter more than by the former is immaterial because prevailing norms—prevailing expectations—allow more household noises during the day than during the night. Betty, living in modern America, should expect that she'll hear noise from her neighbors during the day. Because Betty should expect to hear noise from her neighbors during the day, Betty suffers no externality when she hears Bob's daytime tuba playing.

Put differently, Bob's daytime tuba tooting imposes no *losses* on Betty. Her hearing these noises during the day are among the costs that she must be presumed to have agreed to incur by choosing to live in a house in close proximity to other residences. If Bob were taxed for playing his tuba during the day, he would effectively be compelled to pay a cost that by right ought to be paid by Betty. The imposition of such a tax in this case would itself be a negative externality imposed by the government on Bob, for this tax would violate a right that prevailing social expectations give to him.

As this example shows, "externality" does not properly refer to any and all third-party effects. For the concept to make any sense at all—for it to be of use analytically as well as for guiding public policy—it must be confined to effects that violate rights or property interests. If Smith's actions violate no right or property interest held by Jones, Smith's actions are not properly regarded as sources of negative externalities suffered by Jones regardless of how much Smith's actions might in fact reduce Jones's welfare.

Economic Competition Is Not an Externality[10]

Insistence on properly confining the concept of externality is especially important when discussing economic competition. Suppose a new Burger King restaurant opens up near a long-standing McDonald's restaurant. Further suppose that this new Burger King so reduces the sales of this McDonald's franchise that the owner suffers a reduction in her net worth of $1 million. Alternatively, suppose that a neighborhood vandal inflicts on that McDonald's restaurant $1 million in property damage. In both cases the McDonald's franchisee is made $1 million poorer, and in both cases she is equally distraught. Yet only in the latter case has this franchisee suffered a genuine *loss*.

Because the franchisee had no reason to expect that her property would be vandalized, the vandal inflicts on the franchisee a negative externality. But in the case of the new competition coming from Burger King, the McDonald's franchisee had no legitimate expectation of being protected from competition. This franchisee knew—or reasonably should have known—that other restaurants can compete with hers. The necessity of competing for customers, and the possibility of being out-competed, are among the costs of operating businesses in a market-oriented economy. This cost is one that the franchisee knew - or reasonably should have known—she would have to pay. When this cost becomes a reality, it's just that: a cost. It is not a loss of the sort that the concept of externality identifies as a problem that must be solved.

The same logic applies to international trade. Consider an American steel worker who loses a job because fellow Americans start buying more steel from Brazil and, hence, less steel from Ohio. This worker suffers no loss. Instead, this worker pays a cost of participating in the modern commercial global economy. It is indisputable that this worker would prefer not to have to pay this cost, just as, in the example of me taking out a mortgage, it is indisputable that I would prefer not to have to repay my mortgage lender. But this reality does not transform the worker's (or my) cost into a loss.

Each worker in a modern commercial economy is very much like a mortgage holder or the McDonald's franchisee. Each such worker voluntarily participates in this economy because of the benefits he or she reaps from doing so. But these benefits are possible only because producers must compete for consumers' dollars—only because consumers are generally free to spend their incomes as they choose and are not regarded as contractually binding themselves, with their purchases, indefinitely to each producer that he or she patronizes.

These benefits are possible, in other words, because the law protects the physical uses and integrity of property and not properties' market values. In brief, neither competition in general, nor free trade specifically, create *losers* who in justice must be compensated for whatever costs they bear as a result of participating in the market economy.

Conclusion

This attempt to usefully define and confine the concept of negative externality does not answer all practical questions. Reality is complex, and it often offers up interpersonal conflicts for which it is not obvious which party's expectations are the ones that better align with those that are prevalent in society. Nor is it clear if global-level consequences such as those generated by carbon emissions are appropriately treated as negative externalities or, instead, as some other sort of potential problem that demands a collective response.

This paper will have served its purpose if it makes clear, first, that not all third-party effects are properly classified as "externalities;" second, that "costs" are not synonymous with "losses;" and third, that the existence or not of a negative externality depends on whether or not the actions that cause the third-party effect are ones that are approved by social norms and expectations and are in harmony with the larger body of rules that govern that society.

** Professor of Economics at George Mason and Senior Fellow at the Mercatus Center.*

For helpful feedback on an earlier version of this paper I thank Veronique de Rugy, Roger Meiners, Andy Morriss, and Bruce Yandle. Astute readers will detect in this Explainer the strong influence of the economist Terry Anderson (who, I hope, will forgive me for using the "e" word).

REFERENCES

1. See for example Tyler Cowen and Alex Tabarrok, *Modern Principles: Microeconomics,* 6th ed. (New York: Worth Publishers, 2024), Chapter 12.

2. On the knowledge problem, see F.A. Hayek, "The Use of Knowledge in Society," *American Economic Review* 35 (September 1945): 519-530. The incentive problem is the central focus of public-choice economics. See James M. Buchanan, "Individual Choice in Voting and the Market," *Journal of Political Economy* 62 (April 1954): 114-123, and Bryan Caplan, *The Myth of the Rational Voter* (Princeton: Princeton University Press, 2007).

3. George J. Stigler, "The Economists' Traditional Theory of the Economic Functions of the State," in George J. Stigler, Ed., T*he Citizen and the State* (Chicago: University of Chicago Press, 1975), 103-113. The quoted passage appears on page 104.

4. A.C. Pigou, *The Economics of Welfare,* 4th ed. (London: Palgrave Macmillan, 1932).

5. Ronald H. Coase, "The Problem of Social Cost," *Journal of Law & Economics* 3 (October 1960): 1-44.

6. Ronald H. Coase, "Notes on the Problem of Social Cost," in R.H. Coase, Ed., *The Firm, the Market, and the Law* (Chicago: University of Chicago Press, 1988), 157-185.

7. James M. Buchanan, *Cost and Choice* (Chicago: University of Chicago Press, 1969).

8. As Hayek put it, "every change in conditions will make necessary some change in the use of resources, in the direction and kind of human activities, in habits and practices. And each change in the actions of those affected in the first instance will require further adjustments that will gradually expand throughout the whole society." F.A. Hayek, *The Constitution of Liberty,* The Definitive Edition (Chicago: University of Chicago Press, 2011 [1960]), 79.

9. The chief idea in this section appears in an earlier form in Donald J. Boudreaux and Roger Meiners, "Externality: Origins and Classifications," *Natural Resources Journal* 59 (Winter 2019): 1-33.

10. Much of this section tracks closely with Armen Alchian, "Some Economics of Property Rights," which is Chapter 5 of Armen A. Alchian, *Economic Forces at Work* (Indianapolis: Liberty Fund, 1977), pp. 127-149.

250 Division Street | PO Box 1000
Great Barrington, MA 01230-1000
Telephone: 1-888-528-1216 | Fax: 1-413-528-0103
Press and other media outlets contact
888-528-1216
press@aier.org