

## CALCULATION AND EQUILIBRIUM PROBLEMS IN THE COASE THEOREM

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*ABSTRACT:* To analyze the feasibility of applying the Coase Theorem, this article uses two traditional arguments, economic calculation and non-neutral effects, found in the Austrian literature. This article argues that the efficiency calculation a judge undertakes is problematic and that his decision should not be considered neutral with respect to the general equilibrium (even with zero transaction costs). These problems imply serious challenges to the application of the Coase Theorem.

*KEYWORDS:* Coase Theorem, calculation problem, transaction costs

*JEL CLASSIFICATION:* D23, P48, Q58

Ronald Coase's *The Problem of Social Cost* (1960) changed the interpretation of the problem of externalities in economics. The idea that externalities are not a market failure, but rather an absence of market, shed new light on the problem. A Pigouvian intervention is not needed to solve the problem, but property rights to bargain and correct the alleged market failure. In other words, there is no

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failure of the market because there is no market. Coase's reputation is certainly well deserved. Although Coasean analysis plays a central role in law and economics, the application of the theorem faces important challenges. Critiques and concerns regarding this approach have been raised from different points of view.<sup>1</sup>

Block (1977) asserts that the conclusion of the Coase theorem may fail in the presence of wealth constraints and psychic income even in the absence of transaction costs.<sup>2</sup> The problem of limited knowledge is expressed by O'Driscoll (1980), Rizzo (1980a, 1980b, 1985) and Stringham (2001). Kirzner (1973, pp. 226–227) also recognizes that property rights allocation is not enough and that entrepreneurial alertness needs to discover what the optimal allocation of resources would be. This Hayekian problem of information and knowledge is also mentioned by Boettke (1989). Similarly, Cordato (2000) and Stringham (2010) emphasize that because costs are also subjective, interpersonal valuations cannot be properly established.

Cachanosky (1997) states that the economic analysis of the law is better suited to helping the judge reach a compensation amount than to solving the problem of assigning liability. Stringham and White (2004) argue that the neoclassical analysis of tort law is incompatible with Kantian respect for the dignity of the person.

Other authors are less critical of the efficiency approach. Hummel (2008, p. 121) identifies the source of these market failures in transaction costs, an insight that comes from Coase. Another example could be Leeson (2010), who in "Trials by Battle," analyzes such a system as a substitute for the Coase Theorem when transaction costs were high when assigning land property in England. Leeson (2010, p. 7) finds an efficient rule in the application of the Coase Theorem: "If transaction costs are low, it's relatively unimportant who judges assign disputed property rights to [...]." This is a straightforward conclusion from Coase (1960). However, one issue is what happens with resource allocation *once* property rights are defined, and another is the feasibility of applying the Coase Theorem to a real problem.

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<sup>1</sup> For a brief summary of Austrian arguments see Stringham and White (2004, pp. 375–378). Also, Block (1996) offers an exercise of reduction ad absurdum using the O. J. Simpson case.

<sup>2</sup> See also Demsetz (1979), Block (1995), Demsetz (1997) and Block (2000).

A point that deserves further scrutiny, however, is the problem of third-party effects. This was mentioned by Rizzo (1980b) and Duncan (1981).<sup>3</sup> Both authors present concerns about taking this consideration into account when doing the efficiency calculation. In analyzing whether economics can rank slavery against free labor in terms of efficiency, White (2008) mentions that the Coase Theorem rests on the requirement that rights assignment has a negligible effect on the alternative uses of the resources.

But what if the judge is facing a trial where there are no reasons to be concerned about wealth constraints, and there are market prices that can be used as reference points? What happens to the conclusions of the Coase Theorem when considering the entire market rather than just the litigants? The above critics do a good job of presenting serious limitations and problems in applying the Coase Theorem. The purpose of this article is, however, to argue that judges face problems when calculating efficiency, and a judge's decision should not be considered neutral with respect to general equilibrium (even with zero transaction costs). The calculation problem and the non-neutral effects are two traditional arguments in the Austrian literature, and they can also be used to delimit the application of the Coase Theorem.

One of the objectives of this article is to advance the importance of the third-party effects and show how they affect the feasibility of applying the Coase Theorem. The first part will discuss the calculation problem, and the second part will discuss the equilibrium problem. Finally, if these two problems are not assumed away, then it is not possible for a Coasean judge to operate purely as an impartial and efficient calculator.

## THE CALCULATION PROBLEM

In his work, Coase (1960, p. 2) emphasizes the reciprocity involved in the problem of externalities. At the beginning of his article, he explains the reciprocal aspect of the problem in a passage where he contends that to restrict the harm A causes on B implies a harm on

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<sup>3</sup> See Duncan (1981, p. 422): "The basic notion of indeterminacy is an obvious one and should not be controversial, *although it seems to have received surprisingly little overt attention in the law and economics literature.*" (Emphasis added).

A, and that the lesser harm structure should be selected. As Coase puts it, the problem is to avoid the more serious harm to maximize social welfare.

This general statement, where the harm problem is reciprocal, is applied to many cases, such as the example of the man harboring rabbits that eat his neighbor's crops, where "the man whose crops are eaten is equally responsible" (Coase, 1960, p. 37).

While Coase is referring to a case where property rights are still undefined, the rabbit example involves damage that happens directly to the crop owner's property. However, a distinction should be drawn between cases such as an industry polluting a river and affecting the local fishing industry, and a train burning crops or a rabbit eating them.

In the first case, the polluting industry does not affect the private property of the fishing industry. The latter owns neither the river nor the fish in the river. No party can claim that its property has been damaged, yet as Coase points out, the permission to pollute imposes costs on the other party.

In the second case, there is actual damage to predefined property rights. This damage is an externality in the sense that something external has damaged the property, but it differs in that the external cost happens to something no one owns. The Coasean question, then, is whether the train owner, by using the crops as receiver of the sparks, has the right to operate on the farm as well (Cordato, 2000, p. 200).

The Coase Theorem, following Coase's reciprocity, suggests the use of the efficiency criteria as a guide: if transaction costs are high, then the judge should rule according to these criteria. If transaction costs are low, following the efficiency criteria is unnecessary (the market automatically adjusts to maximize efficiency).

The inclusion of cases like the rabbits eating crops (or the train sparks burning private property) as a problem where the judge could set the right to eat (or burn) the crops in the bundle of rights of the rabbit (or train owner) results, as expressed by Block (1995, p. 62), in private property being defined according to costs:

In this new view, property rights became the handmaiden of so called economic efficiency. The very determination of private property became

dependent on cost considerations. Another way to put this is that in the pre-Coasian days, property rights were exogenous to economics. Thanks to Coase and his followers (Demsetz, 1966, 1967; Posner, 1989; Landes, 1971, 1973, 1979), it is no longer true. Now, if anything, economics is the independent variable; property rights have become endogenous on it.

Further, reciprocity was nominated to take the place of previously sacrosanct causal relationships. It was no longer true that the factory that emitted sparks, which set ablaze the farmer's crops was at fault. The latter became equally blameworthy, or rather, since it became no longer appropriate to relegate blame to anyone, responsible. Had the farmer not planted in that spot, no harm would have befallen him.

This argument raises some conceptual questions on property rights. If the judge can make the crop owner liable because he is the least cost avoider, in what sense is the farmer the "owner" of "his" crops? Who is the real owner of the crops, the farmer or the judge?

If neighbor A's dog accidentally escaped, got into neighbor B's house through an open window, and damaged his furniture, should neighbor B be the one to bear the cost because he would be the least cost avoider by closing his window, or should neighbor A, who would have had to chase his dog? Or, to state the problem more extremely, as Cordato (2000, p. 202) suggests:

A rule of coming to the nuisance would simply not be applicable since the relevant property titles are not in dispute. Ownership of the air is not relevant. Air is only the vehicle through which the effluence travels before landing on the resident's property. To say that this is a dispute over the use of unowned air would be equivalent to making the same claim about a shooting where the bullet first travels through unowned air before striking its victim.

As Coase's analysis suggests, we can imagine a different arrangement of norms for a given society where rabbits and train owners have the right to damage crops owned by others, where it is not the responsibility of the dog owner to restrain his pet or where the risk of loose bullets falls on the potential victim rather than on the shooter. Because he is already immersed in a specific evolved set of norms, the problem any judge faces is different from that of assigning bundles of rights in any initial period. He needs to study the specific set of norms that has evolved over time. Some normative arrangements may be incompatible or at odds with the

actual evolved set of norms even if it happens, such as in the dog example, to be more efficient.<sup>4</sup>

There are still cases, such as the polluted river, where the damage happens through something no one owns. Thus, a position may be held to follow the Coase Theorem only for these cases. The Coasean reading suggests assigning rights in order to maximize efficiency. If, by definition, there are externalities but no property rights, how does the Coasean judge calculate efficiency in assigning liability? The problem is that the judge cannot base his decision on the science of human action simply because he lacks the required market information. He may employ a subjective hunch or intuition, but his decision is simply beyond the scope of the science of human action. Thus, the problem of how to assign property rights cannot be answered following an efficiency economic calculation, because such suggestions presuppose the existence of what is needed.

The application of the efficiency criteria to judges' decisions seems to suggest that there has been a shift in the problem of economic calculation from the sphere of the state to the sphere of the judge. The latter, however, is not in any better position to solve this problem than is the state.<sup>5</sup> The judge cannot solve his efficiency problem any more than the socialist ruler can solve his. The judge may use as a reference prices of "similar" goods in "similar situations" in other places or times. However, this is no different than the socialist government referring to the market prices of other non-socialist countries to solve its efficiency problem. Just as the socialist ruler cheats the socialist system when using outside prices as references, the judge cheats the efficiency criteria when he uses prices from outside the scope of the problem he must solve.

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<sup>4</sup> For a common law analysis on related issues see Rizzo (1985).

<sup>5</sup> See, for example, the opinion of Leoni (1961 [1972], pp. 18–19): *"However, its conclusions [the impossibility of economic calculation under socialism] may be considered as a special case of a more general realization that no legislator would be able to establish by himself, without some kind of continuous collaboration on the part of all the people concerned, the rules governing the actual behavior of everybody in the endless relationships that each has with everybody else. No public opinion polls, no referenda, no consultation would really put the legislator in a position to determine these rules, any more than a similar procedure could put the directors of a planned economy in a position to discover the total demand supply of all commodities and services."* (Emphasis original).

As there are no property rights according to the definition of an externality, the efficiency calculation cannot be performed on its proper grounds. In line with Stringham's (2000) argument, the judge can only use prices from outside the scope of his problem, which are also past prices. He cannot solve the efficiency problem without the assumption that those prices are valid as a reference. It should be considered that prices are historically exchanged ratios of particular goods between particular individuals in a particular place and time. There is no such thing as the price of good  $x$ , but only the ratio of exchange a particular good  $x$  had at a particular time and place between two particular individuals. To assume that such a price is valid as a reference, as the judge needs to do, requires more than mere efficiency calculation. However, in this case, the efficiency rule-of-thumb suggestion rests on the strength of this assumption. Regardless of how similar these goods might be and how recent their past prices are, the judge cannot avoid the fact that he will need to refer to his subjective understanding of the situation. This fact alone demonstrates that the judge cannot solve the problem based only on the rules of praxeology, just as the socialist ruler is not being purely socialist when using free market prices to solve his socialist problem.

Even if the judge decides to ignore this problem and resorts to market prices for a solution, these prices are in disequilibrium, and the specific conditions of the equilibrium are unknown. It can happen that the party determined to be the least cost avoider with prices in disequilibrium would find himself in a different situation with prices in equilibrium. Thus, as Rizzo (1980a, p. 309) pointed out, the judge may put forward an inefficient ruling precisely because he was following the efficiency criteria. The judge cannot avoid the need of resorting to external prices to solve an internal problem, nor are the market prices a reflection of disequilibrium any more than they are of equilibrium. The efficiency approach is beyond the capabilities of a Coasean judge.

It should be mentioned, however, that Coase (1960) and the implications deduced from the Coase Theorem in law and economics are not necessarily the same thing. While there are clear points of agreement between the Coasean or efficiency approach and "The Problem of Social Cost," different authors argue that the main

point of Coase's paper was lost in the transition.<sup>6</sup> Despite Coase's emphasis on the efficiency criteria, some of this evolution seems to be present in his conclusions (Coase, 1960, p.43):

But it is, of course, desirable that the choice between different social arrangements for the solution of economic problems should be carried out in broader terms than this and that the total effect of these arrangements in all spheres of life should be taken into account. As Frank H. Knight has so often emphasized, problems of welfare economics must ultimately dissolve into a study of aesthetics and morals.

## THE EQUILIBRIUM PROBLEM

Block raises a potential difficulty with the Coase Theorem in his debate with Harold Demsetz.<sup>7</sup> Block proposed a scenario in which a train, instead of burning crops, burns a flower bed with an important emotional value, but no market value, for the owner. In this scenario, Block argues, if the right to burn is assigned to the train owner, the gardener may not be able to pay the train not to burn his flower bed if there are wealth constraints. The conclusion that to whom the right is assigned is indistinct is not necessarily true, even with zero transaction costs.<sup>8</sup> Thus, the conclusion that there are zero transaction costs is irrelevant to whom the rights are assigned is not necessarily true.

It needs to be pointed out, however, that this does not necessarily indicate a problem in the logical construction of the Coase Theorem, but rather that the theorem works with the implicit assumption of no wealth constraints. Thus, the model deals only with a very

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<sup>6</sup> For example, Butler and Garnett (2003, p. 133) mention that a "small but growing number of economists, including Ronald Coase himself, argue that Coase's approach to externality problems is misrepresented by standard formulations of the Coase theorem." For Boettke (1977), Coase "has been largely misunderstood by formalist neoclassical economics." And McChesney (2006, p. 185) claims that the "lack of agreement as to what Coase is saying has indeed been remarkable."

<sup>7</sup> See Block (1977), Demsetz (1979), Block (1995), Demsetz (1997), Block (2000). For a comment on the debate see Brooks (2007).

<sup>8</sup> Note that because the flower bed has no market value, the farmer cannot use it as collateral to get a loan and pay the train manager to not burn his flower bed.

particular subset of all cases where external costs are present. Such cases may be too specific and rare to draw general conclusions.

A second difference, however, can be drawn if we consider asset changes to be non-neutral. We can assume asset changes (i.e., money changes) to be neutral because we want to isolate the non-neutral effects in our analysis or model, which can be considered a good or bad approach. However, to affirm that asset changes are actually neutral and develop economic or legal policies based on this assumption as if it were a fact, rather than an assumption, is very different. Following Menger's theory on the origin of money, any asset can play the role of money in an economic sense in any given exchange, independent of whether it has that legal definition. The non-neutral effect caused by changes in money is a particular case of changes in assets in general.

As long as the externality has economic value, when assigning property rights to any given agent, the agent's asset structure changes with non-neutral effects on the market as a whole, just as happens with money. Expressed in neoclassical terms, the Coase Theorem is focused on the partial equilibrium of the particular conflict, but it is silent with respect to what happens to general equilibrium when assigning property rights. The neutrality of the partial equilibrium cannot be extrapolated to general equilibrium. Even if transaction costs are equal to zero and the parties involved in the conflict always assign the resources in the same way, the final state of the rest of the economy would differ according to the party to whom private property rights are assigned. Thus, although the partial equilibrium may remain unchanged, the general equilibrium is dependent on the judge's decision. In what sense, then, can we say that if there are low transaction costs, the judge's decision to assign property rights is irrelevant or neutral?<sup>9</sup>

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<sup>9</sup> See Rizzo (1980b, p. 653): "If we assume, as it seems safe to do, that the courts cannot achieve wealth maximization in the general-equilibrium sense, then the normative attractiveness of this is highly dubious. Of what value is partial efficiency when one of the major purposes of legal rules is to take account of third-party effects?" Also, see Duncan (1981, p. 422): "If it is true that the setting of entitlements is a component in the distribution of wealth and hence of income, then it must follow that the setting of entitlements is a determining factor in the allocation of resources. Changing entitlements shifts wealth and income from one person to another, and should operate through the mechanism of consumer demand to influence choices about what to produce [...] Because entitlements are a

For the judge's decision to be neutral, there should be no wealth changes when assigning liability. This scenario can only happen if the market value of the externality is zero, which would cause the problem to dissolve itself in the first place. As long as the externality has any market value, the judge cannot make any ruling without affecting the final state of rest. This situation raises two problems. First, if the final states of rest are different, how does the judge compare and choose between them?<sup>10</sup> Second, even if we grant the rare possibility that the states of rest could be the same (as small as this probability could be), how do we know that the specific path to such states of rest has not been modified (in structure and/or length)? If it has been modified, how, again, does the judge compare them? As O'Driscoll (1980, p. 357) points out, "judges are human agents, not ideal observers; they do not possess superior knowledge of the future." If he cannot solve this problem, he cannot use the efficiency criteria. Because it cannot guarantee that the general equilibrium will not be affected even in the ideal case of zero transaction costs, the efficiency criteria suffer from calculation problems. The judge cannot resort to the efficiency criteria by arguing that, eventually, in the long run, his decision will be neutral with respect to resource allocation.

Note that this non-neutrality conclusion is focused on a general equilibrium, regardless of what happens in the partial equilibrium. While Block's argument lies inside this partial equilibrium, the non-neutrality principle can be applied to the general equilibrium even if we are not in the presence of wealth constraints.

Furthermore, because the same information can be subjectively interpreted, complete information does not necessarily guarantee equilibrium or efficiency because the agents may be interpreting the available information differently or incorrectly. Successful coordination requires more than information. It also requires coordination of subjective expectations and knowledge.

Coase suggests that the case of transaction costs is the most interesting. As in the real world, when there are transaction costs

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component of wealth, entitlement setting may influence the allocation of resources through 'wealth effects.'"

<sup>10</sup> Note that this requires the further assumption of perfect knowledge to know how each final state of rest will be.

that may prevent resources from being optimally assigned, the recommendation is to follow the efficiency rule when assigning property rights and to stay as close as possible to the ideal scenario of no transaction costs. This approach, however, faces unavoidable problems in efficiency calculation and non-neutral effects on the general equilibrium.

## CONCLUSIONS

Assumptions in the Coase Theorem, such as that of no wealth constraints, may still be used in trials where this does not seem to be a problem. Unless a judge is facing a case with clear wealth constraints, it can be argued that Coase Theorem still holds. The calculation and equilibrium problems, however, are always present. No judge, however ideal the case may be, can escape the need to subjectively interpret the situation and support the use of external prices to solve an internal problem. Furthermore, even if the position is that in some cases where the prices of liquid commodities and recent past prices can be considered representative, the judge cannot avoid the need to apply external prices to the problem needing to be solved. Even if he moves forward with these prices as a valid reference, he has no turnaround of the problem of non-neutral effects in the general equilibrium due to the fact that his prices come from disequilibrium rather than equilibrium.

Because property rights allocation implies a change in relative assets, this case involves non-neutral changes in the economy as a whole, and the final state of rest would differ depending on the party to whom the property right is assigned. The judge simply cannot make a neutral decision in the economy as a whole even if he considers other prices to be good references without any wealth constraints or transaction costs. The aim of the efficiency approach to maximize welfare is simply unattainable. This aspect presents important challenges to the Coase Theorem because it requires a general, rather than partial, neutrality. If not, it requires the judge to extend his efficiency calculation beyond the borders of the partial equilibrium to the market as a whole to reach a consistent solution. That any judge could perform such an analysis free of reasonable doubt of his results is an impossible task, even before taking into consideration the subjective valuations of each individual.

However, none of this implies that economic calculation in law and economics has no role at all. An economic analysis of the law could be a better tool to determine the penalty amount than a guidance to assign responsibility. Once the problem of responsibility has been settled, the judge will need to make a decision on the amount of the penalty if this is not already specified in the contract. Then, the economic analysis of law can be a tool to make decisions without relying only on the subjective opinion of the judge.<sup>11</sup> Assigning responsibility and the amount of a penalty are two different issues.

The Coase Theorem is built on the idea that it should be followed when property rights are not clearly defined. Not all of Coase's examples, however, seem to follow this scenario. Even in the cases without direct damage to private property and wealth constraints, the efficiency criteria cannot be sustained by arguing general equilibrium neutrality on resource allocation.

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<sup>11</sup> See Cachanosky (1997).

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