Economics and Philosophy, **23** (2007) 321–341
doi:10.1017/S0266267107001514

DISPROVING THE COASE THEOREM?*

Andrew Halpin
Swansea University

Fascination with the Coase Theorem arises over its apparently unassailable counterintuitive conclusion that the imposition of legal liability has no effect on which of two competing uses of land prevails, and also over the general difficulty in tying down an unqualified statement of the theorem. Instead of entering the debate over what exactly the theorem holds, this article suggests that the core of Coase's reasoning is flawed and to the extent that any version of the theorem relies upon this reasoning it can be disproved. The article commences by modelling the nature of the counter-intuitive thrust to the Coase Theorem, which is used to trace the development of Coase's reasoning, and ultimately to expose the flaw it contains. The heart of the article comprises the allegation of an error made by Coase when he transferred his core argument to the context of economic rents. Ancillary observations are made on the relationship between the Coasean analysis of characteristically legal problems and the conditions of general market equilibrium, and the theoretical status of Law-and-Economics.

1. WHAT DOES THE COASE THEOREM INVOLVE?

The Coase Theorem is extraordinary in a number of ways. First, it gained its appellation as a theorem not due to its being presented as such by Ronald Coase, the author of the work in which it is found,[1] but due to the subsequent portrayal of Coase's basic insight as a theorem by George Stigler.[2] Secondly, it has made a significant contribution to the development of an intellectual movement, Law-and-Economics (Coleman 1988: 72; Demsetz 1998: 270; de Meza 1998: 280–1), despite there existing

* I am grateful to Luc Bovens for valuable editorial advice.
[1] The theorem is usually associated with Coase's essay, The problem of social cost (1960), also found as chapter 5 of his *The Firm, the Market, and the Law* (1988a), together with a further chapter, Notes on the problem of social cost (1988b).
[2] A version of Coase's proposition was named the "Coase theorem" by Stigler (1966: 113).

no general agreement as to what the theorem states,[3] or quite how seriously to take it.[4] But the characteristic of the Coase Theorem which undoubtedly makes it such an extensive object of fascination[5] is its combination of counterintuitive conclusion with a straightforward and apparently unassailable demonstration.[6] It is this feature of the theorem which has prompted Richard Posner (1995: 418) to comment that "Coase is living proof of Whitehead's dictum that 'it requires a very unusual mind to undertake the analysis of the obvious.'"

A well known statement of the Coase Theorem within the legal literature is that provided by Jules Coleman (1988: 69) in the following terms:

> Given traditional assumptions of substantial knowledge, perfect rationality and the absence of both transaction costs and income effects, the assignment of legal entitlements in cases of two-party incompatible land uses will be neutral as to the goal of allocative efficiency.

In simple terms, the counterintuitive thrust of the theorem is that *it does not matter whether the law imposes liability on an activity or not*: the market value of the activity to *A* as against the market value of its absence to *B* will determine whether the activity goes ahead or not purely as a matter of efficiency.

This in turn provides a ready foundation to the Law-and-Economics movement, and more specifically the Chicago School of Law and Economics (Mercuro and Medema 1997: 66–9; Posin 1999: 629–30, 644–5). Law-and-Economics so understood accepts the positive finding of the Coase Theorem (economic efficiency dictates what happens to legal liability in practice) within a wider embrace of its normative application (legal liability should be decided on the basis of economic efficiency). Accepting the premise that economic efficiency should be pursued, Law-and-Economics derives the guiding principle that the courts should mimic the market: the courts should determine issues of liability on the basis of what the market in ideal conditions would determine as the efficient outcome of the dispute between the parties (Fletcher 1996: 167; Mercuro and Medema 1997: 69).

[3] As Dan Usher (1998: 3) has commented: "the only theorem to my knowledge with an established name but no universally-recognized content". See further, Cooter (1987).

[4] See de Meza (1998: 270): "Is this statement profound, trivial, a tautology, false, revolutionary, wicked? Each of these has been claimed." See further, Farber (1997).

[5] Richard Posner (1995: 406) refers to the wide belief that 'The problem of social cost' is "the most frequently cited article in all of economics". It has also topped the charts of law journal citations.

[6] George Fletcher (1996: 166): "this brief demonstration is sufficient to prove Coase's theorem". See also Posner (1995: 418): "the elementary arithmetical 'proofs' that Coase presents in 'The problem of social cost,' using locomotive sparks and straying cattle, are completely adequate."

This subordinates the law to the market, as an instrument to determine optimal social conditions, and does so by an apparently scientific assessment of the manner in which the two institutions function. If the law imposes liability on *A* in carrying out activity *a* because that activity interferes with *B*'s activity *b*, then the intuitive assumption is that the imposition of liability may affect whether *A* continues with *a*, and so have an effect on which activity is engaged in. The significance of the theorem lies in informing us that the market values of *a* and *b* are capable of determining which activity is engaged in, irrespective of which way the legal liability/entitlement issue is determined.

However, the precise content and standing of the Coase Theorem has never been completely clear for a number of reasons. There has been much discussion of the extent to which the theorem is limited or qualified by the impact of factors relating to transaction costs, wealth effects, and the clarification of property rights.[7] There has been further debate over whether the theorem holds in the form of an efficiency thesis alone (an efficient outcome will always prevail), or also in the form of an invariance thesis (one of the two conflicting activities will always prevail as the outcome).[8]

Taken as a statement dependent on the conditions of general equilibrium, which allow parties to reach mutually advantageous efficient bargains, the Coase Theorem can be regarded as stating the obvious, as trivial.[9] But in dealing with conditions of legal conflict that fall short of that state of mutual advantage, it is a matter of controversy as to what exactly the Coase Theorem is seeking to establish. As George Stigler (1989: 632–3) has pointed out, if we were to adopt all the conditions of general equilibrium, including full information, then the market would operate in the light of knowledge of where legal liability is to be imposed so as to absorb the costs of liability within the market evaluation of the activity, so affecting the price that people would be willing to pay to engage in that activity, and hence not affecting their ultimate income from it.

[7] See Cooter (1987), Medema and Zerbe (2000), for a discussion of a variety of factors that may serve to limit the scope of the theorem depending upon how the content of the theorem is understood. As an example of how the theorem may be limited by factors affecting the presumption that parties will remain passive in relation to the property rights assignment, see Jung et al. (1995); Medema (1997). And for concerns over the impact of wealth effects where the harm caused relates not simply to a loss of profits, but, e.g., to health, see Shavell (2004: 85, 103).

[8] The two theses are discussed by Regan (1972); Katz (1988: 80); Calabresi (1991: 1215 n. 12); Farber (1997: 406). Steven Medema (1994: 89–90) cites a number of references to demonstrate unequivocally that Coase himself upholds the invariance thesis.

[9] George Stigler (1989: 631): "Ronald Coase taught us, what of course we should have already known . . .".

The controversy over the Coase Theorem cannot easily be dispelled. The fact mentioned in the opening paragraph, that Coase himself did not rigorously expound a theorem, makes it difficult to assert what he himself intended by it. The difficulty is compounded by Coase's subsequent announcement (1988a: 13–16, 174) that the work from which the theorem is derived has not had the impact he had hoped for. What Coase was hoping to achieve in "The Problem of Social Cost" can be considered, and what Coase has himself stated subsequently about the Coase Theorem can be studied, as aids to constructing a statement of the Coase Theorem, but these are insufficient resources for providing an authoritative statement of the theorem which commands universal acceptance.

There is, accordingly, a certain degree of caution expressed in the query appended to the title of the present article. Without reaching a definitive statement of what the Coase Theorem seeks to prove, it is impossible to disprove it, and it is not surprising that much of the literature discussing the theorem engages in offering qualifications, or suggesting limitations on the scope of the theorem, rather than in attempting to disprove it.

Although we may not be able to resolve the controversy and establish from Coase's writing an authoritative indication of his view of the relationship between economic theory and practical legal conflict, and hence an undisputed statement of the Coase Theorem itself, it is possible to discern the key elements of his thinking which remain fundamental however we view his purpose: as upholding market mimicry as a solution to practical legal disputes; as encouraging enquiries into the extent to which law as an institutional practice (with its own inherent transaction costs) affects how far theoretical principles of the market are relevant in practice; or, even, as providing the basis for a broader vision of harnessing the resources of economics for law.

To the extent that it is possible to succeed in identifying the key elements of Coase's thinking, such that any formulation of the Coase Theorem is dependent upon them, then it is possible to claim that a refutation of them amounts to disproving the Coase Theorem without becoming embroiled in discussion as to what precisely the theorem states, or to what extent the theorem might still hold. Without detracting from the insights that previous objections and suggested qualifications to the Coase Theorem have provided, in the present article I shall bring about a more straightforward confrontation of the Coase Theorem by arguing that the apparently unassailable reasoning on which it is based is in fact flawed.

Before considering this reasoning in detail, it is helpful to state the basic background to Coase's thinking. The Coase Theorem is concerned with a practical problem of conflicting activities; different parties enjoy legal entitlements to these activities; there are established market values for the activities; the point of conflict is as yet unresolved; and the market is capable of determining the practical outcome of the dispute no matter

what legal resolution of the point of conflict is proposed. In addition, the reasoning employed by Coase depends on two important assumptions, which for the purpose of examining his reasoning we shall abide by. Firstly, the persons involved in the conflicting activities are assumed to be motivated by rational self-interest in seeking to maximize their returns from any legal entitlements they possess over these activities.[10] Secondly, the method of calculating returns to the individuals involved, and also of demonstrating the overall efficiency of any solution reached, is straightforward cost–benefit analysis (Posner 2001), and accordingly a Coase Theorem solution is compatible with Pareto or Kaldor–Hicks efficiency.[11]

2. THE FLAW IN COASE'S REASONING

2.1 Coase's counterintuitive insight

Let us begin by considering the intuitive position that Coase departs from. The idea that the imposition of legal liability on activity a may have a telling effect on whether that activity continues holds its intuitive appeal due to our considering in isolation just the two factors: the value of a without the imposition of liability; and the cost that the imposition of liability will bring. If we represent the initial value to A of engaging in activity a as v_a, and the cost incurred by A when liability is imposed as c, then it follows intuitively –

(1) If $c > v_a$, A will cease from a.
(2) If $v_a > c$, A will consider whether it is still worthwhile engaging in a with the depreciated value of $(v_a - c)$.

And hence, *the basic intuitive position*:

(3) The issue of whether the law imposes liability on a is relevant to determining whether a continues.

Coase's departure from this simple intuitive position is brought about by breaking out of the insulated environment composed entirely of v_a and c. Coase has been credited with what Stewart Schwab (1989: 1173) describes as a "fundamental insight" in "The Problem of Social Cost" by his treatment of externalities as a reciprocal problem. For example, pollution is not a problem merely because we have a factory emitting fumes, etc., but also because we have other parties who regard these emissions as noxious

[10] For doubts on this assumption, see Huigens (2001).
[11] See Cooter and Ulen (2004: 48); Mercuro and Medema (1997: 19–20). For critical discussion, see Markovits (1993).

https://doi.org/10.1017/S0266267107001514 Published online by Cambridge University Press

to their own persons or activities. In terms of considering the impact of liability, Coase considers the activity that may be subject to liability and the activity that may benefit from such liability being imposed, as well as the relationship between the two parties engaging in those activities.

Let us examine one of the well-known illustrations of the Coase Theorem with the details that Coleman (1988: 69–70, 75–76) provides. The two parties are rancher (R) and farmer (F) with adjoining land. The activity in question that may be subject to liability is R adding a further cow to his land which will stray and cause damage to the corn on F's land.

If the value of the cow to R in terms of the profit he can make on it is \$50, which is greater than the value to F of the corn damaged, say \$25, then the extra cow will arrive – either because the law initially permits it; or if the law initially gives F the right to forbid it, because R will buy from F the right to graze the extra cow for a sum that at least compensates F for the damaged corn but still leaves R in profit, say \$30.

On the other hand if the value of the corn damaged is the greater, \$75, then no matter what the law initially permits or forbids, the extra cow will not arrive – either because the law permits it, and F will pay R a sum greater than the value of the cow but less than the value of the corn to forgo the extra cow, say \$60; or if the law gives F the right to forbid it, because R cannot afford to pay F at least \$75 for the right to graze the extra cow and still remain in profit.

So the theorem holds in both scenarios that there is a unique outcome determined by established market values irrespective of how legal liability has been initially decided. The general principle that prevails in both scenarios is that the more valuable activity will if necessary be able to buy out the legal entitlement of the less valuable activity in relation to the point of conflict between the two. The following propositions cover the two scenarios, again representing the initial value to A of engaging in activity a without liability as v_a, and representing that value to B of engaging in activity b which will be lost due to the interference from a, as v_b.

We then have *the counterintuitive insight*:

(4) If $v_a > v_b$, A will continue with a
EITHER (i) with entitlement and retain v_a
OR (ii) where $v_a - v_b = s$
by paying $(v_b + (s - n))$ to B
and retaining n

(5) If $v_b > v_a$, B will continue with b
EITHER (i) with entitlement and retain v_b
OR (ii) where $v_b - v_a = s$
by paying $(v_a + (s - n))$ to A
and retaining n

Whichever of (4) or (5) holds, we have the counterintuitive contradiction of (3) above. The imposition of legal liability/entitlement is now irrelevant to determining whether a (or b) continues.

We should note that one scenario which would provide a counter-example to the Coase Theorem has been omitted, where neither of the two competing activities has a greater value than the other in relation to the point of conflict. In such a case, the imposition of legal liability/entitlement will, in the light of the reasoning employed in the Coase Theorem, affect which activity continues. Since neither party has a more valuable activity providing a surplus profit by which to buy out the other party's activity –

(6) If $v_a = v_b$
EITHER (i) A will continue with a with entitlement and retain v_a, and B will give up b
OR (ii) B will continue with b with entitlement and retain v_b, and A will give up a

In practical terms the significance of this counter-example may be considerable, since it indicates that only a party who is confident of earning profits from his activity to provide a surplus over the value of the competing activity of the other party should be rationally inclined to buy out the activity of the other party,[12] and given that profits are not always stable expectations,[13] the identification of a situation as falling exhaustively under (4) or (5) might not be so commonplace as at first thought. We might have a case falling under (6); or an approximate (6) where $v_a \approx v_b$; or even an indeterminate (6) where $v_a =/>/< v_b$ and uncertainty prevails over which it will be.

However, we shall put the possibility of such cases to one side and continue with our stated objective of showing that the reasoning used within the Coase Theorem is flawed, by considering further the counterintuitive propositions, (4) and (5).

2.2 A challenge to Coase's counterintuitive position

I suggested in the previous section that Coase's step out of the intuitive position captured in (3) came about by rejecting calculations of rational self-interest based purely on the relevance of v_a and c, through expanding the picture to consider v_a and v_b. But if the underlying premise is that parties will act rationally to maximize their own gain from a situation,

[12] The same point applies to the rational behaviour of the other party who has to consider whether it is worthwhile being bought out.

[13] At least in the practical situations of legal conflict which fall short of the state of general equilibrium.

https://doi.org/10.1017/S0266267107001514 Published online by Cambridge University Press

then it would be irrational to stop there, as much as it would be to stop at the preceding position of only considering v_a and c.

In the case where A has the more valuable activity but lacks legal entitlement, he sees the value of a diminish by a sum of $(v_a - n)$ due to the imposition of legal liability. On the figures in the illustration we have been considering, the value of R's activity falls by 60% $(50 - 30)$ to \$20 when he has to buy out F's entitlement. Similarly, the value of F's activity falls by 80% $(75 - 60)$ to \$15 when he has to buy out R's entitlement. There must come a point at which it would be rational for A to consider whether instead of buying out B he would be better off changing to a non-conflicting activity on the land, or moving his activity to other land where the conflict would not arise. For an illustration of this possibility, consider the conflict of use of land between a doctor requiring a quiet atmosphere in which to hold his surgery and a neighbouring confectioner whose grinding of ingredients necessarily involves a considerable amount of noise, as arose in the case of *Sturges v. Bridgman*, which is used by Coase (1960: 8; 1988a: 105) to illustrate the theorem. It may well have been rational for the doctor to have ceased practising at those premises and to have moved to different premises on which to hold his surgery, if he had been required to buy out the intrusive noisy confectionery business next door, due to the lowering of his income that this would have entailed. Thus imposition of legal liability would have had an effect on the use of the land.[14]

Where p represents an alternative activity for A (either a different activity on the same land, or the same activity on different land) and v_p represents the value of that alternative to A, then it would in fact be rational for A to maximize his gain not by buying out B but by switching his activity to p, whenever it was more valuable than continuing with the diminished value of a. This requires us to modify the counterintuitive insight, (4), as follows.

This provides *the challenge to the counterintuitive insight*:

(7) If $v_a > v_b$, A will continue with a
EITHER (i) with entitlement and retain v_a
OR (ii) where $v_a - v_b = s$
by paying $(v_b + (s - n))$ to B
and retaining n only if $n > v_p$
BUT (iii) will not continue with a
where $v_p > n$

[14] For illuminating discussion of the application of the Coase Theorem to this case, see Brian Simpson (1996), and the response by Coase (1996). Coase's response is particularly interesting in two respects, in providing an account of the development of his thinking relating to the Coase Theorem and for the gloss on his treatment of *Sturges v. Bridgman* (109) which implicitly acknowledges that the amount of income depreciation may be significant.

And similarly,[15] where q represents an alternative activity for B, we must modify (5) to:

(8) If $v_b > v_a$, B will continue with b
EITHER (i) with entitlement and retain v_b
OR (ii) where $v_b - v_a = s$
by paying $(v_a + (s - n))$ to A
and retaining n only if $n > v_q$
BUT (iii) will not continue with b
where $v_q > n$

Propositions (7) and (8), which follow from the premises on which the Coase Theorem is founded, would seem to disprove the Coase Theorem and return us to the basic intuitive position found in proposition (3), since the imposition of liability on a is now seen to be relevant to whether a continues. However, against this unfavourable conclusion Coase has himself mounted a further argument.

2.3 Coase's response to the challenge

Coase's argument against this challenge (1988b: 163–70) is to be found in an answer to critics of his theorem, such as Donald Regan (1972) who have doubted Coase's reasoning on the grounds that he has failed to make due allowance for the effects that imposition of legal liability will have upon the income of the parties and their subsequent motivation in bargaining towards an economically efficient solution to their dispute. Coase's strategy is simply to amplify the calculations that he originally provided, taking into account the possible permutations of how the parties could be affected by the imposition of legal liability or otherwise, given their relative starting points. He does this using the technical economic term "rents" to indicate the amount by which the value of each party's activity is greater than the next most profitable activity in which he could be engaged.

The permutations provided by Coase are: (a) damage to crops less than rents of F or R; (b) damage less than rents of R but more than rents of F; (c) damage less than rents of F but more than rents of R; (d) damage more than rents of F or R and rents of R more than rents of F; (e) damage more than rents of F or R and rents of F more than rents of R. At the conclusion of a great deal of detailed calculation, which he (1988b: 170) apologetically

[15] In both cases I do not consider the possibility of v_p (or v_q) $= n$, since the outcome here could not be determined by the assumption that parties will act rationally to maximize their own gain. It will fall either to the forces of inertia or the appeal of change, and as such will not be dependent on the imposition of legal liability.

https://doi.org/10.1017/S0266267107001514 Published online by Cambridge University Press

refers to as "tedious" but nevertheless affirms as "conclusive", Coase has argued that in each permutation surveyed there is still a unique solution as to the outcome of the dispute between the parties (166–70).

As Coase freely admits (163), the argument is a repeat of the reasoning found in his earlier demonstration of the Coase Theorem: in each case the unique outcome of the dispute is determined by which activity is the more valuable so that the party involved can if necessary afford to buy out the less valuable activity of the other party and still remain in profit, irrespective of the imposition of legal liability. The reinvigoration of his argument depends on expressing the values of both of the conflicting activities in rents, so that all the calculations occur beyond the reach of the value of alternative activities. This then would appear to make the Coase Theorem immune from the challenge to the counterintuitive insight suggested above, which depends on there being a more profitable option for the party to consider when his profits are reduced by the imposition of legal liability. However, Coase's argument is not as conclusive as he professes it to be. It suffers from three defects. The first two are concerned with particular cases, but the third inflicts fundamental damage to the core of his argument.

(1) *The case of no rents*. The first defect is Coase's treatment of a case where there are no rents (164),[16] which does not figure in the range of permutations considered above. This leaves Coase with the problem that there would be a more attractive activity available when profits decrease due to the imposition of legal liability. Coase attempts to nullify this troublesome counter-example by the following reasoning (164):

> Since in these conditions no one's income could be increased by possession of the right to pollute, no one would pay anything for it. The price would therefore be zero. How can one say that someone does not have the right to pollute when for a zero price he can acquire it?

The defect in this reasoning should be apparent to even the casual reader: the presupposition of the first sentence that there will be no motivation to purchase the right to pollute is contradicted in the outcome of the third sentence where someone wishes to acquire the right. In fact, the reasoning in this passage slides over two different points. In the first sentence there is the point that there is no economic incentive to pay for the right to pollute so as to continue the activity, because it would be more rational to move to an equally profitable activity and pay nothing. In the third sentence, there is the point that in the abstract it would be worthwhile

[16] Regan (1972: 433) considers this to be the "general case", and there is empirical evidence to suggest that it is the case for ranchers, found in Ellickson (1991: 20–2): with only 1–2% return on the value of the land, ranching in Shasta County gives way to selling plots of land for ranchettes when ranchers face a diminution in profits.

to acquire the release from having to pay compensation rather than paying the compensation. Taking both points together the net rational outcome is for the polluter not to purchase the release but to move activity. It is also obviously rational for the pollution victim not to give away the release from liability for nothing but rather to enjoy the freedom from pollution that the law grants. Coase avoids these obvious conclusions by his illusory reasoning which pivots on the proposition in the middle sentence of the passage quoted that requires us to accept "zero price" as a designation for what is paid when nothing is paid and nothing is bought,[17] so as to lead to the prospect of acquiring something of value for nothing – but the zero price only arises on the assumption, in the first sentence, that the thing is of no value and will not be acquired.

(2) *The missing case*. The second defect arises from Coase leaving out of his survey one crucial permutation, where the rents of *F* and *R* are the same and both are less than the damage caused to the crops. Legal liability would determine which activity prevailed, precisely because the party having to acquire the entitlement would not have sufficient surplus in his rents over the rents of the other party to buy out his activity, or to cope with the compensation. This repeats at the more complex level Coase's blindspot noted above in proposition (6).

(3) *The general error.* The above two defects in Coase's reasoning at the very least provide a number of counter-examples which limit the scope of his theorem as defended at the more sophisticated level of rents. The third defect is more fundamental, in affecting the core of his argument over rents. There is an error in Coase's calculations where at first sight the greater rents of one party would seem to lead ineluctably to a unique outcome irrespective of legal liability. The error arises because Coase after introducing rents to block out the consideration of alternative activities, has proceeded to deal with all his calculations on the basis of rents being the only factor needing to be taken into account.

The error can be illustrated with figures that Coase himself provides (169) for one of his permutations, case (d): rents of farmer $30, rents of rancher $40, and value of crops destroyed $50. In such a case, Coase argues that even if legal liability is imposed on *R*, he will be able to pay *F* a figure

[17] The reasoning resembles those mathematical "proofs" which demonstrate that one number equals a different number through the device of multiplying by zero, and allows Coase to conclude that both parties "are equally likely to stay or to leave" (165). Schwab (1989: 1184) is convinced by Coase's "clever" argument, but reconstructs it to be making the quite different point that where there are no rents oscillation in the use of land is natural irrespective of legal liability. This confuses the natural oscillation between two equally profitable activities of the one party in a case of no rents, with Coase's more complex argument involving two parties engaged in competing activities.

greater than his rents but less than *R*'s own rents to forgo his activity (say $35), and will still be able to continue with his activity of raising cows in profit – and since the remaining profit of $5 is rents, this is in fact $5 better than any alternative activity, so that contrary to the suggestion in the challenge to the counterintuitive insight, in (7) and (8) above, *R* will not leave his activity even in the case where he suffers a loss of profits due to the imposition of legal liability.

The flaw in this reasoning is to rely on rents to counter the possibility of there being a more attractive activity for *R* to turn to when his profits drop due to the imposition of legal liability, but to forget that so far we have only mentioned rents when considering the rational bargaining process between the parties. The point is that because we are looking at *F*'s rents, the payment of $35 will not be sufficient to prevent activity on the adjoining land which *R* would have to buy out if he continued to raise cows. In order for Coase's argument to hold, *R* must be in a position *to buy out all activity*, not simply the profitable level of activity represented by the rents, on the adjoining land where his cattle may stray and cause damage. As Coase (1960: 4; 1988a: 99) indicated in the original demonstration of his theorem: "that tract of land is left uncultivated". This will cost him not just the amount of the rents but also the amount of the profit capable of being earned by that land below the figure for the rents.

Even if we assume that *F* is a tenant of the land and is prepared to take the $35 to leave and embark on his next most valuable activity, there remains the potential liability of *R* to the next tenant, or to the owner. And if *F* is the owner of the land and proceeds to take up his next most profitable activity on the land in return for the $35, there is a distinct possibility that straying cattle will cause damage to that activity so landing *R* with further liabilities that he cannot afford.

It is remarkable that Coase overlooks this problem since it is adverted to by Regan (1972: 434–6): "So long as farming is the favored activity, it may be necessary to include every potential farmer in the deal" – in the very article that Coase purports to be responding to. The explanation for Coase's oversight perhaps lies in his preoccupation with the individuals' rational behaviour in relation to rents which sets the scene for his analysis (165): "they would be willing to abandon an activity in return for any payment greater than the sum of their rents". This possibly causes him to overlook the analysis of what needs to happen on the land itself. Coase's premise may lead to a correct analysis of how *"they" would "abandon an activity"* – because they would be willing to move to another activity with the compensation in their pocket and make from the combination of the compensation with their earnings from the new activity a greater sum than that earned from the activity abandoned. This premise does not lead to a correct statement regarding the *abandonment of the activity* (or any other activity) on the land.

In all cases where this initial profit figure equals or is greater than the difference between *R*'s and *F*'s rents, then it will make more sense for *R* with legal liability to give up raising cattle and to switch to his next most profitable activity. The alternative of paying *F* a total sum in excess of his initial profit and rents, to secure abandonment of conflicting activity on the land, would exceed the rent earned by *R* in raising cattle. (On the figures in Coase's illustration that we have been using, this would occur whenever *F*'s profit below the level of rents equals or is greater than $10; i.e., a total profit of $40 or more of which $30 is rents; requiring *R* to pay at least $41 in order to buy *F* out, which is greater than *R*'s rents of $40.)

2.4 The implications of the defects in Coase's reasoning

2.4.1 The invariance thesis. In the light of these three defects in Coase's reasoning, we are in a position to reconsider how far the attempt made by Coase to defend the counterintuitive thrust of the Coase Theorem has succeeded.

The first defect relates to Coase's failure to deal adequately with a case where there are no rents. This then still falls to be dealt with in accordance with propositions (7) and (8) above, representing the challenge to the counterintuitive insight.

The second defect relates to Coase's failure to account at all for a case where the rents of *F* and *R* are the same and both are less than the damage caused to the crops. We have seen that this allows us to replicate the counter-example falling under proposition (6) even where rents are brought into the analysis.

The third defect is the most fundamental, because once it is rectified, we realise that in order for it to be rational for a person with the greater amount of rents to buy out the activity of the other party when the legal entitlement is not in his favour, he has to be in a position to buy out all conflicting activity. This means that the cost of the buy-out may now well exceed the value of his own rents, and hence it will be rational for him to abandon his activity in favour of his next best alternative.

The general correction to Coase's reasoning with rents in fact holds across all of the three cases considered: it is not possible to assess the positions of the parties in terms of rents alone, in a case of no rents, a case of equal rents, or a case of one party enjoying greater rents than the other party. We may, accordingly, reinstate the challenge to the counterintuitive insight found in propositions (7) and (8). For the crucial factor in determining the rational outcome for *A*, once we acknowledge he will be involved in paying a sum greater than the whole value of *b* and not just the value of the rents, is still whether the cost of buying out *B* leaves *A* with a surplus greater than the profit he could obtain from his next best

https://doi.org/10.1017/S0266267107001514 Published online by Cambridge University Press

activity, i.e., $n > v_p$ in proposition (7) (and similarly, if the roles of A and B are reversed, $n > v_q$ in proposition (8)).

The additional information provided by rents at most allows us to proceed further with the calculations required by propositions (7) and (8), by giving us the value of the next best activity, v_p or v_q. It does not even fix which is the more valuable activity that might then buy out the other. For Coase fails to consider that although the rents of A may be greater than the rents of B, since the rents are calculated purely in terms of the respective alternative activities available to A and B, it may still be the case that $v_b > v_a$. In the example considered above, suppose that the rents of R are \$40 for raising cattle rather than sheep and the initial profit (which could also be obtained from raising sheep) is \$50; whereas the rents of F are \$30 for growing corn rather than oats and the initial profit (which could also be obtained from growing oats) is \$80. It will be the case that the party with the lower rents still has the more valuable activity: $v_b > v_a$, since the appropriate totals give us \$110 > \$90.

For the sake of completeness, we should mention one further complexity introduced in Coase's discussion of rents, due to his considering the damage done by R's cows as affecting part of F's wider activity (some of the corn on his farm) rather than wiping out the value of a discrete element of F's activity (all the corn on a particular tract of land). This must be the case since Coase allows in some of his permutations for the possibility of the rents being greater than the value of the damage. If all the corn were damaged, the value of the damage would necessarily wipe out all profit including rents and hence be greater in value than the rents.

In a case where damage is considered in relation to the wider activity affected rather than to the discrete part of that activity damaged, there is the possibility of R when liable finding it advantageous to pay F compensation rather than buying out all of F's activity. (This will occur in case (a) since F's rents are higher than the damage, so a buy-out would be more expensive; and also R's rents are higher than the damage, so he can absorb the compensation in his rents and still not have a more profitable activity to move to.)

Such situations still fall under proposition (7)/(8) with a clarification of how the value of each activity is calculated: taking v_a to indicate the value to A of that part of his activity which is causing the damage and would have to be abandoned, and taking v_b to indicate the value to B of that part of his activity which is damaged and would have to be abandoned or compensated.

There is danger of confusion arising in considering Coase's examples involving rents if rents are related to the wider activity but the point of conflict occurs in relation to a narrower discrete element of that activity. In some cases the wider activity may genuinely have to be considered precisely because a discrete part is not severable for consideration as a

viable activity – such as with the activities of neighbouring doctor and confectioner in *Sturges v. Bridgman*. In other cases, a part of the activity may be severable – as in the case of taking part of *F*'s land adjoining the railroad and turning it over as a fire break. In the case of roaming cattle damaging corn, it may be that part of *F*'s activity can be separated without attaching to a particular piece of land: the part of his activity which results in damaged corn. This will then enter the analysis as the point of conflict with *R* from *F*'s side. Compensation of that part of *F*'s activity, should it occur, effectively amounts to *R* buying out that part of *F*'s profitable activity.

The essential point to stress is that if an analysis of the rational behaviour of the two parties is to proceed properly, a consistent view of what exactly amounts to their respective activities at the point of conflict must be taken. Otherwise, distortion will occur, if, e.g., the value for the purposes of compensation relates to a narrow part of the activity whilst the value of rents or other profits is related to the wider activity.

Having dealt more fully with Coase's diversion of the discussion into rents, we find that the soundness of the challenge to the counterintuitive insight is upheld, so as to return us to the basic intuitive position found in proposition (3). Has the Coase Theorem been disproved by a return to the basic intuitive position, which the theorem attempted to depart from?

I suggested in the introductory section that it might be possible to disprove the Coase Theorem without reaching a detailed definitive statement of the theorem, by refuting the key elements of Coase's thinking. I have argued that central to Coase's thinking is the problem of dealing with practical legal conflicts, and providing a market-based resolution for such conflicts. I have also linked Coase's support for a market-based approach with his defence of the invariance thesis, and stressed the counterintuitive thrust that this gives to the theorem. The argument I have constructed against Coase has concentrated on denying the invariance thesis, and removing the basis for the counterintuitive aspect of his thinking.

2.4.2 The efficiency thesis. Without the invariance thesis, the efficiency thesis is insufficient to give Coase's insights the status of a theorem. The efficiency thesis does not offer anything substantial, that is not found within the analysis I have provided of the basic intuitive position, in proposition (3). At the most, Coase's insistence on the reciprocity of externalities contributes a fuller picture in which to work out whether *A* will consider that it is still worthwhile to engage in *a* after the imposition of legal liability. Moreover, the recognition that the imposition of legal liability can affect whether *a* continues, deprives Coase's thinking of the key element of providing a market-based approach to resolving issues of legal conflict. The decision to impose legal liability matters, in a way that cannot be dissolved in a mixture of prevailing market values and calculations of efficiency.

In considering the significance of efficiency to Coase's thinking, a further point arises over Coase's claims for his theorem (1988b: 166–70), that it demonstrates efficiency in terms of maximizing the value of production,[18] adopting the cost–benefit analysis with its apparent appeal, as Richard Posner (2001: 317, 319) describes it, of offering the world bigger pies without worrying about distributive considerations. More cautious thinkers have questioned whether the values in the law are all about the size of pies (Markovits 2001), or have noted that pie production depends on having ready ingredients and so it is legitimate to ask what sort of ingredients we should be starting with before simply making our pies bigger (Samuels 1974). The findings of the present article suggest a further note of caution even to those who have rushed headlong into the pie production business. The food regulations are not simply there to frustrate the production of bigger pies, as so much red tape to be overcome by the ingenuity of the pie makers, but may actually determine what makes a pie bigger.

If that seems like stretching a metaphor too far, consider again Coleman's example of the conflict between *F* and *R* used at the beginning of our examination of Coase's reasoning. According to Coase, the calculations go as follows. The pie in the first scenario is made up of \$50 from cow for *R* and \$25 from corn for *F*, but because the cow damages the corn we are left when there is no liability with a pie of \$50 ($R[50] + F[25 - 25]$). Where there is liability, and *R* has to buy the entitlement to graze the cow, then we are similarly left with a pie of \$50 ($R[50 - 30] + F[25 - 25 + 30]$). So the imposition of legal liability seems to be not only immaterial as far as determining the use of the land, but also irrelevant in determining the size of the pie. However, once we go beyond the restrictions of Coase's calculations and bring in the possibility of *R* moving to an alternative activity[19] that does not damage *F*'s corn because the law has made him liable, then we can consider two variants of the scenario, with or without rents, as follows.

[18] Coase's working through his examples is again affected by his problems in dealing with rents. In the example that we have discussed in detail, Coase suggests (169) that *R* buying out *F* maximizes the value of production by considering only *R*'s rents of \$40 – ignoring the diminution in those rents from the payment to *F*, which we have seen would in fact have to go beyond the level of rents to effect a buy-out; and ignoring what the picture would be if *F* kept his rents (and other profit), and instead of buying *F* out *R* moves to his next most profitable activity.

[19] Interestingly, Coase (1988a: 99–100 n. 4) does consider the possibility of *F* moving to an alternative activity, and the impact of this on calculations of the total value of production, but significantly ignores it for *R*, the person in the more profitable activity. I am grateful to Nick Wikeley for drawing to my attention Daniel Posin's article (1999), in which he criticizes Coase's failure to consider other alternatives available to the rancher. Posin argues from this insight to a particular counter-example for the Coase Theorem, where the next best business of the "perpetrator" of the externality is the business of the "victim".

If there are no rents earned by raising cows as against non-damaging alternative activities, then *R* may earn $50 from his alternative activity (alt.) which does not damage the corn, making the pie now $75 (*R*[50 alt.] + *F*[25]). If there are rents earned by raising cows as against non-damaging alternative activities, then *R* may still earn, say, $40 from his alternative activity which does not damage the corn, making the pie now $65 (*R*[40 alt.] + *F*[25]). Now it can be seen that the imposition of legal liability is not merely material in determining the use of the land but also relevant in determining how to make a bigger pie. Note in particular, that without the imposition of legal liability on *R*, there is no economic incentive on him to move to an alternative activity (with no rents he will not be any better off and if rents exist he will be worse off), and so the size of the pie will remain at $50; but with legal liability and an incentive to move, although *R*'s profit may drop to $40, the size of the pie is bigger at $65. The imposition of legal liability affects efficiency.

A complete analysis should bring in what happens to *F* when faced with the liability or entitlement of *R*. In particular, if *R* has the legal entitlement to raise the cow, then *F* may be motivated to move to an alternative activity which is not vulnerable to damage by straying cows. Suppose *F* may obtain $15 from such an activity (allowing rents for the corn), this would still provide a pie of $65 (*R*[50] + *F*[15 alt.]). It so happens on the figures selected that this pie is the same size as the one obtained above when *R* had to move to his alternative activity and lost his rents, and in that respect equally efficient. Clearly, this will not always be the case. We may have a situation where the rents of *F* or *R* are greater, and hence the diminution in profit by moving to an alternative activity is lesser or greater when either *F* or *R* moves, depending on which way the legal liability/entitlement is settled. Correspondingly, the size of the pie will diminish or increase.

In such a case, the imposition of legal liability will still affect land use, and efficiency. However, it would seem that the imposition of legal liability one way rather than the other will be more or less efficient. Suppose in the case considered above that the rents of *F* were $15 rather than $10, and the rents of *R* remain at $10. Then with liability on *R* and his moving to an alternative activity, the pie is $65 (*R*[40 alt.] + *F*[25]), as above; but with *R* having entitlement and *F* moving to an alternative activity so as to avoid damage, the pie becomes $60 (*R*[50] + *F*[10 alt.]). Accordingly, it seems that imposing legal liability on *R* is more efficient, in producing a bigger pie, and it might be argued that on economic grounds this is the way the law should be settled.

Notice, however, that this last argument is completely removed from the operation of the Coase Theorem. For the "efficient" outcome is dependent wholly on the determination of legal liability/entitlement. It is not a position reached by the bargaining of the parties irrespective of

how legal liability is settled. We have seen resolution of legal liability does affect which party is motivated to move (and hence the use of the land).

Furthermore, one outcome is more "efficient" only relative to the aggregate positions of the two parties adopting the market values of their activities *prior to* the resolution of legal liability. It is at this point that Stigler's insight (1989: 632–3), considered in passing above, becomes highly relevant. For once the issue of legal liability has been resolved one way or another, this will have repercussions on the subsequent calculation of efficiency, such that the size of the pie is still affected by the law.

Consider the \$60 pie when *R* has entitlement and *F* has to move to an alternative activity, which seems to be less efficient than the \$65 pie when *R* is liable and he has to move to an alternative activity. (Note that it is not simply a matter of taking the market values of the two conflicting activities and going for the more profitable, as Coase assumes. The market values of the alternative activities also have to be taken into account, and here it turns out that due to greater rents being obtained from the less profitable of the two conflicting activities, it would on the cases considered be more "efficient" to give the legal entitlement to the less profitable of these activities.) If this is used as an economic argument for imposing liability on *R* to provide a bigger pie then, according to Stigler's insight, it will backfire. For now that the law has been settled, when it comes to *R* selling his land (or his landlord renting it out to a new tenant) the land will only be able to command profits from the less profitable alternative activity rather than from ranching, resulting in less being paid for the land so as to maintain a decent level of profit. Stigler thus concludes that the profit level will rise back to the previous level obtained, and so the diminution in profits as a result of legal liability is short-lived.[20] However, this argument applies whichever way the issue of legal liability is determined. Following Stigler's argument, both the \$65 pie and the \$60 pie will ultimately revert to \$75 pies once the price adjustment to the land works through the market to allow a return to previous profit levels on whichever of the adjoining pieces of land is affected by liability and the need to move activity. The decision on legal liability will accordingly ultimately determine what constitutes a \$75 pie: either (*R*[50 alt. with reduced price of land] + *F*[25]) or (*R*[50] + *F*[25 alt. with reduced price of land]). The law, again, determines what is efficient and so in the final analysis it is impossible to choose how the issue of legal liability should be determined on the basis of efficiency.

A number of wider implications follow. Foremost among them is the need to reevaluate the work that has been erected upon the Coase Theorem by the Law-and-Economics movement. Indeed, the implications stretch to any approach within law and economics that seeks to rely on calculations

[20] Coase himself (1988b: 172) deploys the argument to suggest that there will not be income effects.

of efficiency to determine what the law should be. The falsification of the invariance thesis has proceeded all along on the assumption that parties will act rationally to maximize gain, and so as well as determining that legal liability can affect what happens in practice, it also yields the result that the imposition of legal liability can affect what will be regarded as efficient. If the law can determine what is efficient, what is efficient cannot be relied upon to determine the law.

3. CONCLUSION

Quite how the existence of rents, the availability of alternative activities, and the knock-on effects of liability on land prices, may work through in the case of a particular legal conflict, is doubtless a complex matter. However, I think it should now be clear that it is not a matter that is enlightened by adopting the reasoning of the Coase Theorem. I do not wish to disparage Coase's insight on the mutuality of externalities, nor to disagree with his scepticism over the inherent desirability of government intervention.[21] But to engage in the economic analysis of law with the flawed reasoning of the Coase Theorem is to misguidedly apply as economic theory, enjoying a scientific detachment from the law, that which is theoretically degenerate[22] in its selective treatment of the facts, and ideologically charged in its support of social interests: given that the basic mechanism in Coase's calculations is the possibility of the activity that is more profitable buying out the activity that is less profitable, there is an inherent bias towards existing distributions of profits.[23]

Finally, since the use of the Coase Theorem relies upon the market to provide established values for the competing activities, the failure of the Coase Theorem also brings into question the role of the market. In particular, the fact that the determination of legal liability/entitlement can affect the value of an activity to the party engaged in it, to the point of affecting whether the activity is continued or not, suggests that to rely on the market to establish for us the value of an activity is misconceived even in financial terms, and *a fortiori* to depend on the market as an arbiter of the value of human activities in any deeper sense.[24]

[21] Nor am I accepting the inherent undesirability of government intervention. As argued by Samuels (1974: 13–16), "inactivity" is as much a function of government as intervention. The point is that government has a responsibility to decide which cannot be abdicated by deference to a belief in the inevitability of market forces.

[22] For a general attempt to distinguish theory proper from degenerative theory or rhetoric, see Halpin (2001: ch. 2).

[23] For discussion of the ideological aspects of the Coase Theorem and the use to which it has been put, see Samuels (1974); Eastman (1997); Aslanbeigui and Medema (1998); Campbell and Picciotto (1998).

[24] See further, Halpin (2000). For a stimulating discussion of the Coase Theorem and the "fantasy" role of the market in Law-and-Economics, see Schroeder (1998).

REFERENCES

Adler, M. and E. Posner, eds. 2001. *Cost-Benefit Analysis: Legal, Economic, and Philosophical Perspectives*. Chicago, University of Chicago Press.

Aslanbeigui, N. and S. Medema. 1998. Beyond the dark clouds: Pigou and Coase on social cost. *History of Political Economy* 30:601–26.

Bouckaert, B. and G. De Geest, eds. 2000. *Encyclopedia of Law and Economics, Volume I: The History and Methodology of Law and Economics*. Edward Elgar.

Calabresi, G. 1991. The pointlessness of Pareto: Carrying Coase further. *Yale Law Journal* 100:1211–37.

Campbell, D. and S. Picciotto. 1998. Exploring the interaction between law and economics: the limits of formalism. *Legal Studies* 18:249–78.

Coase, R. H. 1960. The problem of social cost. *Journal of Law and Economics* 3:1–44.

Coase, R. H. 1988a. *The Firm, the Market, and the Law*. Chicago, University of Chicago Press.

Coase, R. H. 1988b. Notes on the problem of social cost. In Coase 1988a.

Coase, R. H. 1996. Law and economics and A.W. Brian Simpson. *Journal of Legal Studies* 25:103–19.

Coleman, J. 1988. *Markets, Morals and the Law*. Cambridge, Cambridge University Press.

Cooter, R. 1987. Entry on Coase Theorem. In Eatwell, Milgate and Newman (eds.) 1987.

Cooter, R., and T. Ulen. 2004. *Law and Economics*, 4th edn. Pearson Addison Wesley.

de Meza, D. 1998. Entry on Coase theorem. In Newman (ed.) 1998.

Demsetz, H. 1998. Entry on Coase. In Newman (ed.) 1998.

Eastman, W. 1997. Telling alternative stories: Heterodox versions of the Prisoners' dilemma, the Coase theorem, and supply-demand equilibrium. *Connecticut Law Review* 29:727–825.

Eatwell J., M. Milgate and P. Newman, eds. 1987. 1 *The New Palgrave: A Dictionary of Economics*. Macmillan.

Ellickson, R. C. 1991. *Order Without Law: How Neighbors Settle Disputes*. Harvard, Harvard University Press.

Farber, D. 1997. Parody lost/Pragmatism regained: The ironic history of the Coase theorem. *Virginia Law Review* 83:397–428.

Fletcher, G. 1996. *Basic Concepts of Legal Thought*. Oxford, Oxford University Press.

Halpin, A. 2000. Clamshells or Bedsteads? *Oxford Journal of Legal Studies* 20:353–66.

Halpin, A. 2001. *Reasoning with Law*. Oxford, Hart Publishing.

Huigens, K. 2001. Law, economics, and the Skeleton of Value fallacy. *California Law Review* 89:537–68.

Jung, C., K. Krutila, W. K. Viscusi and R. Boyd. 1995. The Coase Theorem in a rent-seeking society. *International Review of Law and Economics* 15:259–68.

Katz, A. 1998. *Foundations of the Economic Approach to Law*. Foundation Press.

Markovits, R. 1993. A constructive critique of the traditional definition and use of the concept of "The effect of a choice on allocative (economic) efficiency": Why the Kaldor-Hicks test, the Coase theorem, and virtually all law-and-economics arguments are wrong. *University of Illinois Law Review* 1993: 485–533.

Markovits, R. 2001. On the relevance of economic efficiency conclusions. *Florida State University Law Review* 29:1–54.

Medema, S. 1994. *Ronald H. Coase*. Basingstoke, Macmillan.

Medema, S. 1997. Comment: The Coase theorem, rent seeking, and the forgotten footnote. *International Review of Law and Economics* 17:177–8.

Medema, S. and R. Zerbe. 2000. Entry on the Coase theorem. In Bouckaert and De Geest (eds.) 2000.

Mercuro, N. and S. Medema. 1997. *Economics and the Law*. Princeton, Princeton University Press.

Newman P., ed. 1998. *The New Palgrave Dictionary of Economics and the Law*. Basingstoke, Macmillan.

Posin, D. 1999. The error of the Coase theorem: of Judges Hand and Posner and Carrol Towing. *Tulane Law Review* 74:629–58.
Posner, R. 1995. *Overcoming Law*. Harvard, Harvard University Press.
Posner, R. 2001. Cost-benefit analysis: definition, justification, and comment on conference papers. In Adler and Posner (eds.) 2001.
Regan, D. 1972. The problem of social cost revisited. *Journal of Law and Economics* 15:427–37.
Samuels, W. 1974. The Coase theorem and the study of law and economics. *Natural Resources Journal* 14:1–33.
Schroeder, J. 1998. The end of the market: A psychoanalysis of law and economics. *Harvard Law Review* 112:483–558.
Schwab, S. 1989. Coase defends Coase: why lawyers listen and economists do not. *Michigan Law Review* 87:1171–98.
Shavell, S. 2004. *Foundations of Economic Analysis of Law*. Harvard, Belknap Press.
Simpson, A. W. B. 1996. Coase v. Pigou reexamined. *Journal of Legal Studies* 25:53–97.
Stigler, G. 1966. *The Theory of Price*, 3rd. edn. Basingstoke, Macmillan.
Stigler, G. 1989. Two notes on the Coase theorem. *Yale Law Journal* 99:631–3.
Usher, D. 1998. The Coase theorem is tautological, incoherent or wrong. *Economics Letters* 61:3–11.