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Abstract

The question of 'What is the "Coase Theorem"?' has no simple answer. The majority of articles covering a variety of issues on the 'Coase Theorem' still misrepresent the main message of Coase (1960). The remaining controversy over the 'Coase Theorem' is because the literature on Coase (1960) has been locked into a pathway which was set out by Stigler's 1996 book, *The Theory of Price*. Even almost 50 years after the publication of Coase's original article, the consequence of the initial condition under which Coase's contribution was first formulated (Stigler 1966) is not perfectly eliminated. The evolution of the 'Coase Theorem' has now become an example to intellectual path dependence in economics.

Keywords: Ronald Coase, 'The Problem of Social Cost' (1960), the 'Coase Theorem,' George Stigler, replication failure, intellectual path dependence

The 'Coase Theorem' vs. Coase Theorem Proper:

How an error emerged and why it remained uncorrected so long

George Stigler invited Ronald Coase to Chicago in 1959 to give a speech at a workshop that he organized. Coase accepted the invitation. After the workshop Coase asked the learned audience of Chicago to hold a special meeting to discuss his approach to the 'rationale of property rights' which the Chicagoans thought was an error and Coase should delete from his 1959 article, 'The Federal Communications Commission.' The meeting was arranged. Big shots of Chicago gathered at the residence of Aaron Director, the founder of the *Journal of Economics and Law*. Milton Friedman, Arnold Harberger, and John McGee were at the meeting. 'How could such a fine economist like Coase think,' his fellows at Chicago wondered, 'that there were costs involved in the operation of price mechanism in the market?' The discussion took about two hours. It was during this meeting that Coase convinced his Chicago colleagues of his argument. And so was it possible for the next generation of economists to know 'probably the most widely cited article in the whole of the modern economic literature.' 'I persuaded these economists that I was right,' reported Coase in his autobiographical Nobel Prize speech in 1991, 'and I was asked to write up my argument for publication in the *Journal of Law and Economics* …. Had it not been for the fact that these economists at the University of Chicago thought that I had made an error in my article on 'The Federal Communications Commission,' it is probable that 'The Problem of Social Cost [1960]' would never have been written' (Coase 1992) [1].

Coase's 1960 article deserves special attention in the history of economic thought. Firstly, the innovative idea that the article developed has spread fast and broad in economics (see Appendix A, B, and C). Secondly, the life history of the idea has featured distinguishing properties making the article unique in intellectual history [2]. In this essay, I focus on another specificity of the article: that the actual message of Coase has been misrepresented and Coase's main message in the article contradicted the 'Coase

Theorem.' A number of papers have already elaborated on this point. (See, for instance, Medema 1994, 1999, 2002, McCloskey 1998, Usher 1998, and Fox 2007.) My aim here is (*i*) have a clear idea about the significance of the contradiction between the meaning of the 'Coase Theorem' and the original message of Coase in his 1960 article by way of examining some of the most cited and recent literature mentioning the 'Coase Theorem' and (*ii*) account for why the 'market for ideas' (Coase 1974b) has failed to correct the misrepresentation which has long been reported, clearly and repeatedly, by Coase himself (Coase 1981) as well as many others in a number of publications.

In order to accomplish the first task I have conducted a survey in which I studied 40 articles mentioning the 'Coase Theorem' so as to see whether (and in what ways) economists have subscribed to the 'Coase Theorem' in their works. The survey resulted that of the most cited and recent articles referring to the 'Coase Theorem' 75 percent misrepresented Coase 1960. (For details about the survey, see below) [3]. Why did this failure happen and why did the misrepresentation remain uncorrected for so long? In order to explain this, I use a simplified model of path dependence and argue that the evolution of the 'Coase Theorem' features a property of intellectual path dependence in economics: the second-generation models built upon the 'Coase Theorem' have failed to replicate the results of the previous generation (i.e. Stigler 1966 and others) and the controversy in the original message of Coase (1960) has remained unresolved. The evolutionary mechanism that gives rise to such results is 'replication failure.' 'An economic view of replication failure in science suggest that errors and mistakes are a constant aspect of the scientific endeavor … [T]he continuous presence of faulty research is a by-product of scarce resources being focused on a quest for innovative discoveries' (Wible 1998: 43). The main reason for such contradictions in the history of ideas not to disappear easily (or not at all) is that the history of ideas does not always function so as to fix errors fully. In other words, the 'market for ideas' does not operate like a perfect market and the effects of several small events, such as errors and misrepresentations in analyses, often remain uncorrected for long periods due to high 'epistemic costs' of

replicating old findings. This suggests that the scholarly life of economists is a *positive transaction costs* world in which negative externalities (e.g. misrepresentations of ideas) are not always and perfectly self-corrective. Positive feedback loops in the world in which intellectuals live and operate (such as journals, conferences, and other informal meetings) do not allow perfecting solutions to come about so easily. The invisible hand in the market for ideas, so to speak, often operates undesirably and errors frequently remain uncorrected.

The essay consists of three parts. In the first part, I provide an overview of Coase's 1960 article and show what the main message of Coase (1960) was and how Stigler interpreted it in his 1966 book. In the second part, I summarize the findings of a survey in which I examine the ways in which the most cited and recent articles on the 'Coase Theorem' use Coase (1960) or rely on the methodology of Coase (1960) in their works. The third part is on how replication failure works and how it can be used as an explanation of the unresolved controversy in the evolutionary history of the 'Coase Theorem.' Finally, conclusions follow.

Coase Theorem Proper and the 'Coase Theorem' As Economists Know It

The main point in Coase's 1960 article, 'The Problem of Social Cost,' was to provide a criticism of the established theory of negative externalities. According to Coase, accounts of negative externalities were inadequate; the price mechanism was not easily able to solve the problems that arose out of the harmful effects of individual actions on others. Economists, since Arthur Cecil Pigou, have believed that taxes and other kinds of governmental regulations were the best ways of diminishing the negative effects of individual behavior. In view of that, the government should restrain those responsible for the 'harmful effects' of individual action in the market. Although this was not unwise, Coase argued, such a solution would depend on whether the 'gain from preventing the harm is greater than the loss which would be suffered elsewhere as a result of stopping the action which produces the harm' (Coase 1960). There is no single solution to every

problem in the market. Economists should be more concerned with the consequences that happen in actual cases – not merely with the consequences that happen on the blackboard only.

For Coase, the problem was to understand the causation between the parties in which one party is supposed to inflict harm upon the other. The problem featured a reciprocal nature: 'To avoid the harm to B would inflict harm on A,' wrote Coase, 'The real question that has to be decided is: should A be allowed to harm B or should B be allowed to harm A? The problem is to avoid the more serious harm.' Carrying out market transactions (such as conducting negotiations with parties, drawing up a contract, reaching an agreement about the terms of the contract, and so on) were costly – 'sufficiently costly at any rate,' wrote Coase, 'to prevent many transactions that would be carried out in a world in which the pricing system worked without cost' (Coase 1960). In other words, the positive transactions cost world in which we live does not always allow parties to conduct negotiations that end up with an efficient (re-)allocation of resources and rights. Under positive transaction costs, 'the initial delimitation of rights does have an effect on the efficiency with which the economic system operates' (Coase 1960). Then, assigning private property rights (no matter to whom) might be a solution to the problem of social cost as negative externalities are not self-corrective. In other words, in the world we live we need a legal system that prevents one party from inflicting harm on another, instead of a ruling state that punishes, by way of introducing taxes, the party responsible for the harm. The problem is, therefore, to decide on the appropriate social arrangement for possible harmful effects. This requires a case-by-case investigation of different ways of handling the problem. [4]

Coase introduced his view in 1960. But the 'Coase Theorem' as economists know it has become established in economic theory only after Stigler's third addition of his *Theory of Price* (1966). (The first edition of the book appeared in 1952. It did not mention any of Coase's works.) According to Stigler, Coase's 1960 article raised important issues about the efficiency of markets, government intervention, and property

rights. In a famous passage, Stigler said thus: '[t]he Coase theorem thus asserts that under perfect competition private and social costs will be equal. It is a more remarkable proposition to us older economists who have believed the opposite for a generation, than it will appear to the young reader who was never wrong, here' (Stigler 1966: 113). Having introduced the 'new' conception into economic theory, Stigler, in his later career, did not seriously return to any other original publication of Coase but cited Coase (1960) in his more recent works only twice, in 1983 and in 1989 (see Stigler 1983 and 1989). The 'theorem' has since become an important topic of investigation.

Today, the controversy over 'Coase Theorem' lingers and a common misrepresentation regarding Coase's contribution dominates the economic literature. Today, picking up any text book from any library, one will see that the 'Coase Theorem' is elaborated as if Coase himself argued there were *no transaction costs* in the market. Coase, in fact, did not argue this. He instead argued that there *are* transaction costs in the market. The 'theorem' was not a proper formulation of Coase's message.

Coase did not argue that the pricing system worked without costs. The reason why he used the example of zero transaction costs was (*i*) heuristic (Zerbe 1980) and (*ii*) he showed that even under the assumption of zero transaction costs, the Pigouvian system was 'inadequate' and 'incorrect' (Medema 1995). Therefore, we cannot reduce Coase (1960) to the 'Coase Theorem.' In fact, Coase complained in his Nobel Prize Lecture in 1991 that his original message has long been misunderstood. Almost 50 years after Coase first published his 'The Problem of Social Cost,' the consequence of the initial condition under which Coase's contribution was first formulated (Stigler 1966) is not eliminated. The 'market for ideas' has failed to correct the error fully even today. 'I would not wish to conclude,' reported Coase (1981),

> that, while consideration of what would happen in a world of zero transaction costs can give us valuable insights, these insights are, in my view, without value except as steps on the way to the

> analysis of the real world of positive transaction costs. We do not do well to devote ourselves to a detailed study of the world of zero transaction costs, like augurs divining the future by the minute inspection of the entrails of a goose.

In effect, Stigler's interpretation of Coase (1960) has made Coase's contribution disappear. The 'Coase Theorem' in actuality had been stated long before Coase, and therefore does not belong to the works of Coase, but of Adam Smith. In other words, the 'Coase Theorem' existed even before Coase (Friedman, Mimeo). The 'core' of the 'Coase Theorem' was empty (Aivazian and Callen 1981). One would never need the 'Coase Theorem,' as Coase himself reports also, to say that 'people will use resources in the way that produces the most value' (Hazlett 1997). This amounts to saying that we are living in a world without transaction costs. However, Coase believed in the contrary: we live in a world of positive transaction costs. The naming of the 'Coase Theorem' is, therefore, erroneous because the theorem meant the opposite of what Coase wrote in his works. There may be a few exceptional occasions outside the blackboard world in which transaction costs are so low (still positive though) as to be taken into consideration. Coase did not exclude this possibility. Nevertheless, the origin of the theorem is controversial since the message of the 'Coase Theorem' is not what Coase meant in 1960. Implications of the 'Coase Theorem' are not always useful because the assumption of a zero transaction costs world is too restrictive and presupposes a world that does not comply with the facts of the world.

Survey and evidence

Below is a summary of the survey in which I examined 40 articles mentioning the 'Coase Theorem.' While picking the articles I relied on the search engine of ISI Web of Knowledge (as of March 2010.) The keyword I used to search the database was 'Coase theorem.' Alternative options to pick up the articles to examine were "Coase," "Ronald Coase," and "transaction costs." I, however, preferred not to use these keywords because

the contributions of Ronald Coase to the economic science are beyond the 'Coase Theorem' and searching for any of the three would yield less qualified results in the sense that the ISI would not filter the articles on, say, firm theory.

Authors of the articles reported in the survey contributed to the economic literature using the central theme in the 'Coase Theorem.' In so doing, they referred to the works of Coase as well as Stigler. The figure below is intended to provide a brief summary of the survey. The figure is organized in four sub-categories in all of which there are four columns showing (*i*) whether the article has referred to any of the works of Coase and Stigler and (*ii*) in what sense the article used the findings of Coase (1960).

FIGURE 1 ABOUT HERE

The findings are parallel to the results of another survey conducted by Buttler and Garnett (2003) in which they examined textbook representations of the 'Coase Theorem' only: 'A few get it right.' The survey conducted here relies on the most frequently cited and the most recent articles on or about the 'Coase Theorem' since 1968 and suggests the following:

1. Of the articles listed below almost 75 percent subscribe to the 'Coase Theorem.' Stigler's interpretation of Coase (1960) has dominated the history of economic ideas for five decades.

2. None of the articles in Category A, B, and C (30 articles in total) subscribe to the Coase Theorem Proper. Publications right after Stigler's *Theory of Price* (1966) as well as the most frequently cited articles on transaction costs and other related fields fully adopted Stigler's interpretation. Two articles (Kelman 1979 and Lemley 1995) reported the controversy about the 'Coase Theorem' but nevertheless did not adapt the correct interpretation in their works.

3. Not much has changed after Coase's Nobel Prize speech: none of the ten most cited articles after

1991 subscribe to the Coase Theorem Proper.

4. The most cited article on the 'Coase Theorem' (Kahneman, Knetsch, and Thaler 1990) did not cite any works of Coase. Additionally, almost half of the articles citing one (or more) of Coase's works also cited one (or more) of Stigler's works. Stigler has a visible impact on the literature.

5. In more recent years, the 'market for ideas' seems to have started to correct the error and replicate Coase's original findings (1960). In the past three years, half of the articles on transaction costs and other related fields subscribed to the Coase Theorem Proper. The powerful effect of Stigler's 1966 book still exists after 50 years and the 'Coase Theorem' is still widespread among economists even after several publications reporting Stigler's interpretation – even the web site of the University of Chicago Law School has not corrected the misrepresentation: http://www.law.uchicago.edu/socrates/coase.html.

Below are excerpts from a number of articles that are examined in the survey.

CATEGORY (A): Most cited 10 articles on the 'Coase Theorem'

Jolls, Sunstein and Thaler (1998): 'When combined with the notion that opportunity and out-of-pocket costs are equated (see fundamental principle two), this yields the Coase theorem – the idea that initial assignments of entitlements will not affect the ultimate allocation of resources so long as transaction costs are zero.'

Korobkin (1998a): 'The Coase theorem is generally understood to predict that contracting parties will bargain to the efficient allocation of rights and responsibilities, irrespective of initial entitlements if and only if transaction costs are low. Consequently, in a Coasean world, parties will agree on efficient contract terms if transaction costs are low, irrespective of the substance of default rules. The corollary to this application of the Coase theorem is that when transaction costs are high, contracting parties will not contract around inefficient

defaults.'

Krier and Schwab (1995): 'Absent any impediments to bargaining, an initial mistaken (inefficient) assignment of an entitlement can (will) always be corrected by subsequent transactions between the parties.'

Elhauge (1991): 'The Coase Theorem provides that, no matter how the legal rule assigns initial rights or liabilities, the efficient outcome will always result if private bargaining in unimpeded by transaction costs or other obstacles.'

Kaplow and Shavell (1996): 'As Coase emphasized, if there are no obstacles to the consummation of mutually beneficial bargains, it will make no difference what the legal regime is: thus, it will be irrelevant whether property rules or liability rules apply.'

CATEGORY (B): Most recent 10 articles on the 'Coase Theorem'

Halpin (2007) and Lai and Hung (2008) report the controversy about the 'Coase Theorem' but stick to the erroneous misrepresentation of the theorem in their works.

Charness et al. (2007): '… with well-defined property rights, no transaction costs, and fully symmetric information, efficiency is neutral to the assignment of responsibilities for damages; this result has come to be called the Coase theorem.'

Halpin (2007): '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.'

Lee and Sabourina (2007): 'This paper, by introducing complexity considerations, explores the extent of the validity of the Coase theorem. In particular, we highlight the role of "transaction costs" in explaining why individuals may not fully exploit mutual gains from trade via bargaining and negotiation. The central message of the paper is that, when each player has a preference for less complex strategies (at the margin), only efficient equilibria arise in complete information models of bargaining/negotiation without transaction costs while, in sharp contrast, perpetual disagreement, and inefficiency, are the only possible features of an equilibrium outcome with arbitrarily small transaction costs. Thus, in what follows the Coase theorem is valid if and only if there are no transaction costs.'

Rosenkranz and Schmit (2007): 'According to the celebrated Coase Theorem, rational parties always exploit all possible gains from trade, provided there are no frictions (specifically, if there is symmetric information). They will hence write a contract that induces party A to choose the efficient activity level and divide the gains from trade by appropriate transfer payments. Thus, if one does not make the assumption that the government has better information than the parties themselves (which many economists consider to be unrealistic), Coasean bargaining makes Pigouvian taxation unnecessary.'

CATEGORY (C): First 10 articles on the 'Coase Theorem'

Nutter (1968): '[Coase] showed that, whenever the costs of market transactions can be neglected, the 'damaging agent' will make the same calculation of marginal cost whether charged with responsibility for damages or not.'

Mumey (1971): 'Coase contends that with no transaction costs, victims of social costs will, in the absence of liability placement by law, offers bribes for abstention to inflictors of the costs.'

CATEGORY (D): Most cited 10 articles on the 'Coase Theorem' after 1991

Korobkin (1998b): 'In The Problem of Social Cost, the foundational article of the law and economics movement, Ronald Coase suggested that when transaction costs are zero, the initial allocation of a legal entitlement is irrelevant to its eventual ownership. Assuming no transaction costs, the Coase Theorem predicts that if part A values an entitlement more than does party B, A will keep the entitlement if it is initially allocated to him, and he will buy it if it is originally allocated to B. This powerful insight depends on the behavioral assumption that an individual's valuation of entitlements does not depend on ownership; that is, A values an entitlement neither more nor less if he is initially allocated that entitlement than if it is initially given to B.'

An Explanation: Replication Failure

The mechanism that has given rise to a discrepancy in the economic literature about the contribution of Ronald Coase is 'replication failure': economists thinking that Coase's contribution was important could and should have re-checked the theorem from the 1960 article instead of simply reproducing the conclusions of Stigler's 1966 book but they never did so until recently. Today, the 'Coase Theorem' has turned into a phenomenon of intellectual path dependence in which a small event – a (mis-)interpretation of an original contribution – grew so big – the 'Coase Theorem' – that it has dominated the entire economic literature.

Replication failure is the inability or unwillingness of researchers to test the result of previously published scholarly work. It is through replication that theories and research programs are checked in terms of their defensibility, consistency, and coherency. Although replication should be an essential component of scholarly work, such an endeavor is not handled by researchers frequently because 'an economist might allocate a larger proportion of time to producing new publishable results devoting relatively less time and effort to the tasks required for replication' (Wible 1998: 25). Replication of results is time consuming and

there is no reward for scholars to repeat another's work. No significant research devotes time and effort to replicating the findings of earlier theories and research programs without compensating their economic loss. Instead, researchers rely on the results of papers published in academic journals and they simply 'reproduce' their findings without examining its significance and validity (Mirowski and Sklivas 1991: 154).

James Wible reports that the reason why replication rarely takes place in scholarly life is that 'science is more complex than mechanical reenactments of simple experiments.' Many factors play important roles: for instance, processes of inference and judgment are not totally individual but rather a social phenomenon. It is difficult to replicate certain experiments without the specialized knowledge of earlier researchers. Sometimes, derived results of earlier works could be unreplicable: data may be lost, technical possibilities may not allow researchers to set up identical experimental environments, there may be informational asymmetries, and so forth and so on. Moreover, attempts by rival scientists and graduate students to criticize and publish new findings on older data as part of their routine scientific doings are construed as hostile acts (Wible 1998: 30).

However, scholarly work is 'chain-connected.' Subsequent research depends on previous studies. Findings of prior studies are used as input for upcoming research. For researchers, replication failure is an economic phenomenon. That is to say, there is an economical item that is often neglected by epistemologists, *time*. To put it in a straightforward way: economic behavior in markets is sensitive to the opportunity costs of time. When researchers start off a new research project, they allocate time between replicable and unreplicable research. 'The economizing of resources thus exposes science to mistakes,' writes Wible (1998: 31),

> At some point, these mistakes will be discovered and they will have to be corrected. From an economic point of view, there needs to be a balance between resources devoted to replication in its simpler forms and innovation. Attitudes and reward structures which are skewed toward innovation

> may set science up for replication failures of many types. But mistakes need to be corrected or they will impede scientific progress and innovation at some point.

Authors, referees, and editors of journals often assume earlier findings are valid without retesting them in significant ways because replication takes time and this imposes significant costs on researchers. Bypassing replication generates the probability of genetic (i.e. reproductive) errors that had occurred in an earlier study but not noticed in time. In scholarly life, it is expected that such errors will be corrected as scientists do further research on the subject matter. But because of the costs of running such tests, some errors may pass unnoticed and be left uncorrected. This is a source of intellectual path dependence in which scientific markets operate in the absence of an 'invisible hand' that could have prevented errors from happening or corrected them in the long run. Seeds of intellectual lock-in are stored in the scholarly market within the epistemic costs organically attached to pursuing scientific research.

Originality of the issue, as is formulated by Wible, is that not all research fails to replicate earlier findings. A considerable amount of time is in fact devoted to the replication of results. Only a certain proportion of findings are used without being tested by a significant method. Therefore, the problem is, 'by its very nature,' *small*. Certain mechanisms, such as replication failure, have an influence only on untested results that are miniscule in proportion to the amount of tested results. But, in practice, small errors grow really big.

FIGURE 2 ABOUT HERE

Figure 2 demonstrates a typical path formation in scholarly life. In this scenario, first generation models include influential articles whose findings, by virtue of innovative research programs, are (re-)formulated in original ways. After the first generation models, findings are popularized and spread in the market. Second generation models often take the forms of textbooks and secondary or follow-up research, the findings of

which are primarily borrowed from first generation models. Second generation models are so influential that they frequently cite first generation models as well as each other, as a result, their citation figures increase logarithmically. *Their* results are thus established in the market. The findings of the first generation models are not often replicated because of high opportunity costs of allowing time for re-testing the findings of others. Reputation and power also affect the selection process of researchers where scholars utilize the works of reputable authors to legitimize their own findings (Sterman and Wittenberg 1999, Busch and Muthoo 2003). For instance, research conducted by Nobel laureates and powerful institutions with which Nobel laureates are affiliated (such as Rand Corporation, see Mirowski 2002: 153-231) are highly credited and further research is often directed by the outcomes of such authors' work. During all of this, access to financial resources and possibilities of finding research partners play prominent roles (Dasgupta and David 1994, David and Keely 2002, Fallis 2006). This intermediary phase is thus *(i*) economically constructed so that growing popularity of the first and second generation models operates under increasing returns, (*ii*) the search for research funds is highly influential on the way further research (and its methodology) is conducted, and *(iii)* opportunity costs (i.e. epistemic costs) determine whether to replicate the findings of the original research program.

Replication failure operates in the following way: While a theory or research program spreads among scholars due to its intellectual merit, there is also an economic side to the progress of every research program. This economic side has to do with the costs arising out of the time that must be allowed to replicate the results in the scope of other scholarly works. Economic development of a theory examines the dynamic relations among scholars as well as their products (i.e. publications, conference meetings etc.) that positively feed back upon each other in mutual support with further evidence and further argumentation. The qualitative resonance among scholars is unique: a little achievement or a little error in scholarly theorizing may spread fast and

broad.

Figure 3 demonstrates the 'Coase Theorem' as a phenomenon of intellectual path dependence in the field of the history of economic ideas.

FIGURE 3 ABOUT HERE

The case shows that the 'Coase Theorem' is reproduced, but the main findings of the economist Coase have only been recently replicated. The 'market for ideas' had failed for a long time as Stigler's followers did not go to the trouble of looking up Coase himself. They contented themselves with the main findings of Stigler.

Conclusion

Some ideas in history exist in such institutionalized environments that we cannot easily eliminate the consequences of epistemic failures. The course of events in scholarly life often feeds itself endlessly in such a way that early events in the course generate intellectual pathways that last into the future. Such pathways sometimes generate positive results, and sometimes negative ones. What is certain is the following: Had such ideas not been invented or argued for initially, the entire history of ideas would have been completely different. The case of the 'Coase Theorem' is an example of the development of intellectual path dependence in the history of economic ideas in which a unique event – i.e., Stigler's interpretation of the writings of Coase – generated an unusual pathway in the evolution of economic thought – a pathway in which the message of the idea was dissimilar to Coase's argument in the 1960s, and onwards. Stigler's 'Coase Theorem' was not in Coase's 'The Nature of the Firm' (1937). Neither was it in 'The Problem of Social Cost' (1960). A chance element, namely the element of Stigler in the making of the history of economic ideas, influenced the way his contribution is construed by economists today.

Consequences of such events in similar courses of history can even result in 'fraud.' 'Fraud in this context,' writes Wible, 'is the deliberate violation of scientific principle for personal material gain and

professional advancement' (Wible 1998: 44). Whether the 'Coase Theorem' can be called a 'fraud' in the above sense is a different matter. What is certain in this case, however, is that a small event – Stigler's interpretation of Coase's contribution – was an error that lasted until today without being corrected fully and has generated an intellectual *path*ology in history. The problem of the social cost of Stigler's misunderstanding of Coase's writings to the community of intellectuals has been the failure of markets to correct an error that has lasted for decades.

Endnotes

[1] See also Stigler 1985: 75-80.

[2] For a survey of Coase's contribution to economic analysis see Zerbe 1980, Medema 1994, and Mercuro and Medema 2006.

[3] See also Buttler and Garnett 2003 for another survey in which the authors reported that of 45 economics textbooks 80 percent misrepresented Coase's main argument.

[4] For a collection of major articles on the 'Coase Theorem' see Volume II of Medema 1995.

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Appendix A: Some Top Ranking Articles in Economics

	Article	Number of citations
1	Jansen MC and WH Meckling 1976 'Theory of Firm'	4000
2	Ronald Coase 1960 'The Problem of Social Cost'	2964
3	GA Akerlof 1970 'Markets for Lemons'	2200
4	Alchian and Demsetz 1972 'Production, Information Costs, and Economic Organization'	2121
5	Herbert Simon 1980 'Verbal Reports as Data'	1192
6	Kenneth Arrow 1962 'The Economic Implications of Learning by Doing'	1218
7	Oliver Williamson 1979 'Transaction Cost Economics'	1146
8	Paul Krugman 1991 'Increasing Returns and Economic Geography'	1023
9	Milton Friedman 1968 'Role of Monetary Policy'	967
10	Paul David 1985 'Clio and the Economics of QWERTY'	905
11	Brian Arthur 1989 'Competing Technologies, Increasing Returns, and Lock-in by Historical Events'	802

The table ranks some of the most cited articles in (evolutionary) economics which has become as popular as Coase (1960). The table suggests that Coase's 1960 article has been one of the most, if not the most, cited in economics. Appendix B supports the finding. It shows that Coase's most cited article is his 1960 article. Coase (1937) should be equally important to Coase (1960). However, no data is available about Coase (1937) on the ISI database in which only articles published after the 1940s are calculated. Nevertheless, the available data imply that Coase has been influential in evolutionary economics and his 1960 article should be a special focal point into which historians should inquire.

SOURCE: Scientific - Thomson Reuters © ISI Web of Knowledge http://www.isiknowledge.com [Accessed in March 2010]

Appendix B: Total Number of Citations of the Works of Ronald Coase

	TITLE	YEAR OF PUBLICATION	NUMBER OF CITATIONS
1	THE PROBLEM OF SOCIAL COST	1960	2964
2	DURABILITY AND MONOPOLY	1972b	314
3	THE FEDERAL COMMUNICATIONS COMMISSION	1959	239
4	LIGHTHOUSE IN ECONOMICS	1974b	168
5	THE INSTITUTIONAL STRUCTURE OF PRODUCTION	1992b	154
6	MARKET FOR GOODS AND MARKET FOR IDEAS	1974c	61
7	THE COASE THEOREM AND THE EMPTY CORE - A COMMENT	1981	34
8	THE ACQUISATION OF FISHER BODY BY GENERAL MOTORS	2000	31
9	THE NEW INSTITUTIONAL ECONOMICS	1998b	30
10	SMITH,A VIEW OF MAN	1976	29
11	THE 1987 MCCORKLE LECTURE - BLACKMAIL	1988a	29
12	ADVERTISING AND FREE SPEECH	1977a	29
13	THEORY OF PUBLIC UTILITY PRICING AND ITS APPLICATION	1970	28
14	PAYOLA IN RADIO AND TELEVISION BROADCASTING	1979	19
15	ECONOMICS AND CONTIGUOUS DISCIPLINES	1978	19
16	LAW AND ECONOMICS AT CHICAGO	1993a	17
17	LAW AND ECONOMICS AND A. W. BRIAN SIMPSON	1996	15
18	CHOICE OF INSTITUTIONAL FRAMEWORK - COMMENT	1974a	14
19	ECONOMICS OF BROADCASTING AND GOVERNMENT POLICY	1966	13
20	ACCOUNTING AND THE THEORY OF THE FIRM	1990	9
21	COASE ON POSNER ON COASE	1983	8
22	EVALUATION OF PUBLIC-POLICY RELATING TO RADIO & TV	1965	7
23	THE INTERDEPARTMENT RADIO ADVISORY-COMMITTEE	1962	7
24	APPOINTMENT OF PIGOU AS MARSHALLS SUCCESSOR	1972a	6
25	THE CONDUCT OF ECONOMICS	2006	6
26	COMMENT ON THOMAS W. HAZLETT	1998a	5
27	MARSHALL ON METHOD	1975	5
28	THE BRITISH POST-OFFICE AND THE MESSENGER COMPANIES	1961	5
29	MARSHALL,ALFRED MOTHER AND FATHER	1984	3
30	THE REGULATED INDUSTRIES - DISCUSSION	1964	3
31	SYMPOSIUM ON THE NEW INSTITUTIONAL ECONOMICS	1993b	2
32	CONTRACTS AND THE ACTIVITIES OF FIRMS	1991	2
33	WEALTH OF NATIONS	1977b	2
	TOTAL		4277

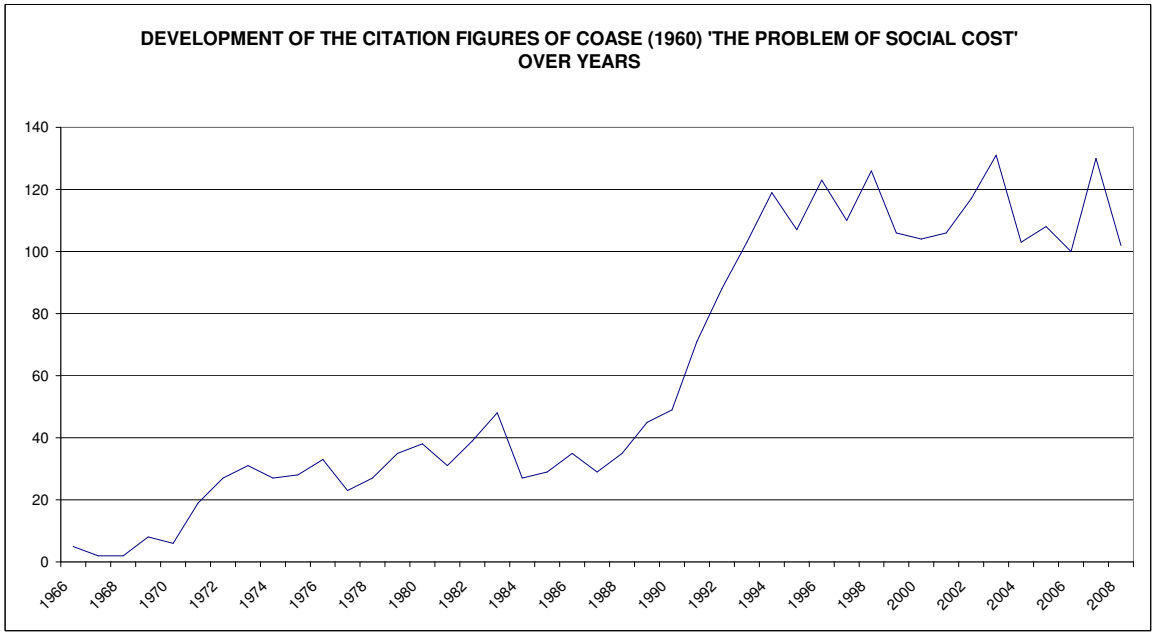
SOURCE: Scientific - Thomson Reuters © ISI Web of Knowledge http://www.isiknowledge.com [Accessed in February 2010]

* No data is available on Coase's 'The Nature of the Firm' (1937) as ISI Web of Knowledge reports publications after 1940s only.

* The table does not include all the publications of Coase but only those which have been cited at least once.

Appendix C: Development of the Citation Figures of Coase (1960) 'The Problem of Social Cost'

	PUBLICATION YEAR	RECORD COUNT
1	1966	5
2	1967	2
3	1968	2
4	1969	8
5	1970	6
6	1971	19
7	1972	27
8	1973	31
9	1974	27
10	1975	28
11	1976	33
12	1977	23
13	1978	27
14	1979	35
15	1980	38
16	1981	31
17	1982	39
18	1983	48
19	1984	27
20	1985	29
21	1986	35
22	1987	29
23	1988	35
24	1989	45
25	1990	49
26	***1991***	***71***
27	***1992***	***88***
28	***1993***	***103***
29	***1994***	***119***
30	***1995***	***107***
31	***1996***	***123***
32	***1997***	***110***
33	***1998***	***126***
34	***1999***	***106***
35	***2000***	***104***
36	***2001***	***106***
37	***2002***	***117***
38	***2003***	***131***
39	***2004***	***103***
40	***2005***	***108***
41	***2006***	***100***
42	***2007***	***130***
43	***2008***	***102***



SOURCE: Scientific - Thomson Reuters © ISI Web of Knowledge http://www.isiknowledge.com [Accessed in November 2008]

Figure 1: Survey Summary, the 'Coase Theorem' and the Coase Theorem Proper

(A): MOST CITED 10 ARTICLES ON THE 'COASE THEOREM'

	PUBLICATION	NUMBER OF CITATIONS	COASE	STIGLER	The 'Coase Theorem'	The Coase Theorem Proper
1	KAHNEMAN, KNETSCH AND THALER (1990)	623	0	•	•	0
2	JOLLS, SUNSTEIN, AND THALER (1998)	326	•	•	•	0
3	HOFFMAN, MCCABE, SHACHAT, AND SMITH (1994)	270	0	0	N/A	N/A
4	ELHAUGE (1991)	203	•	•	•	0
5	HOFFMAN AND SPITZER (1982)	131	•	•	•	0
6	KAPLOW AND SHAVELL (1996)	131	•	0	•	0
7	KELMAN (1979)	95	•	•	•	0
8	KOROBKIN (1998b)	90	•	0	•	0
9	KRIER AND SCHWAB (1995)	77	•	0	•	0
10	LEMLEY (1995)	69	•	0	•	0
	TOTAL	2015	8	5	9	0

(B): MOST CITED 10 ARTICLES ON THE 'COASE THEOREM' AFTER 1991

	PUBLICATION	NUMBER OF CITATIONS	COASE	STIGLER	The 'Coase Theorem'	The Coase Theorem Proper
1	JOLLS, SUNSTEIN, THALER (1998)	326	•	•	•	0
2	HOFFMAN, MCCABE, SHACHAT, AND SMITH (1994)	270	0	0	N/A	N/A
3	ELHAUGE (1991)	203	•	•	•	0
4	KAPLOW AND SHAVELL (1996)	131	•	0	•	0
5	KOROBKIN (1998b)	90	•	0	•	0
6	KRIER AND SCHWAB (1995)	74	•	0	•	0
7	LEMLEY (1995)	69	•	0	•	0
8	GROSS (2003)	64	0	0	N/A	N/A
9	KOROBKIN (1998a)	51	•	0	•	0
10	HOVENKAMP (1991)	49	0	•	N/A	N/A
	TOTAL	1327	7	3	7	0

(C): FIRST 10 ARTICLES ON THE 'COASE THEOREM'

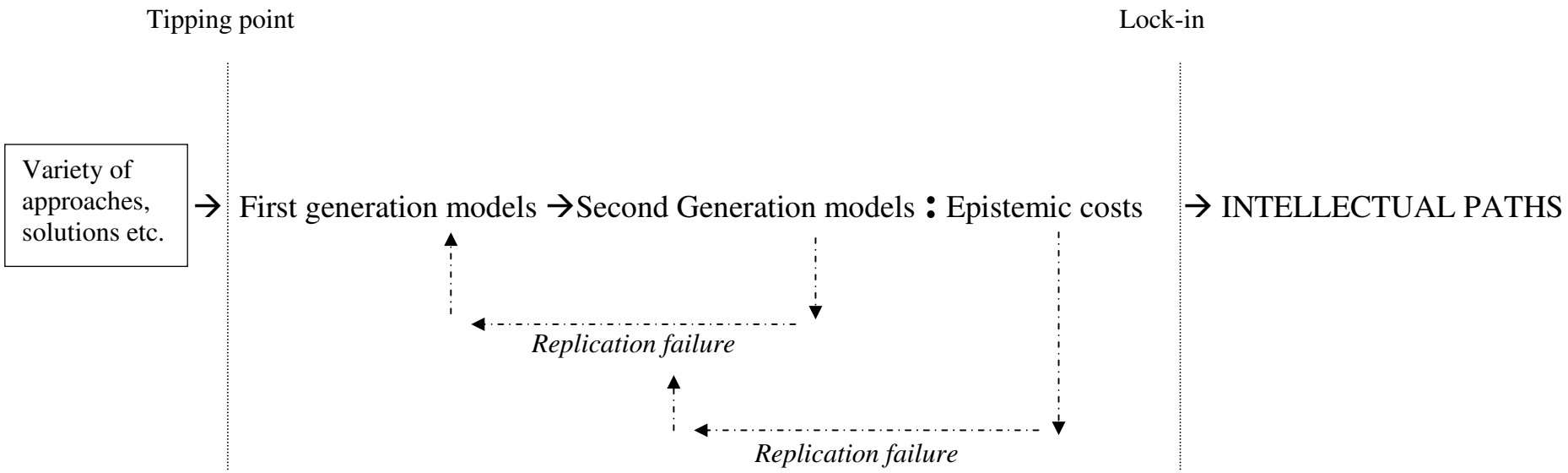
	PUBLICATION	NUMBER OF CITATIONS	COASE	STIGLER	The 'Coase Theorem'	The Coase Theorem Proper
1	NUTTER (1968)	18	•	•	•	0
2	MUMEY (1971)	17	•	•	•	0
3	GIFFORD AND STONE (1973)	14	•	0	•	0
4	DARGE (1973)	4	•	0	•	0
5	BUCHANAN (1973)	22	•	0	•	0
6	INADA AND KUGAK (1973)	8	•	0	•	0
7	FRECH (1973)	7	•	0	•	0
8	GIFFORD (1974)	1	•	0	•	0
9	SAMUELS (1974)	27	•	0	•	0
10	SHAPIRO (1974)	8	0	0	•	0
	TOTAL	126	9	2	10	0

(D): MOST RECENT 10 ARTICLES ON THE 'COASE THEOREM'

	PUBLICATION	NUMBER OF CITATIONS	COASE	STIGLER	The 'Coase Theorem'	The Coase Theorem Proper
1	MACHADO (2008)	0	•	0	•	0
2	LAI AND HUNG (2008)	0	•	•	•	0
3	ROBSON (2008)	0	•	•	0	•
4	WHITMAN (2008)	0	•	0	0	•
5	PITCHFORD AND SNYDER (2007)	0	•	•	0	•
6	HALPIN (2007)	0	•	•	0	•
7	ROSENKRANZ AND SCHMIT (2007)	0	•	0	•	0
8	CHARNESS *et al.* (2007)	0	•	0	•	0
9	COHEN AND SANTHAKUMAR (2007)	0	•	0	•	0
10	LEE AND SABOURINA (2007)	0	•	0	•	0
	TOTAL	0	10	4	6	4
	TOTAL (GENERAL)	3468	34	14	32	4

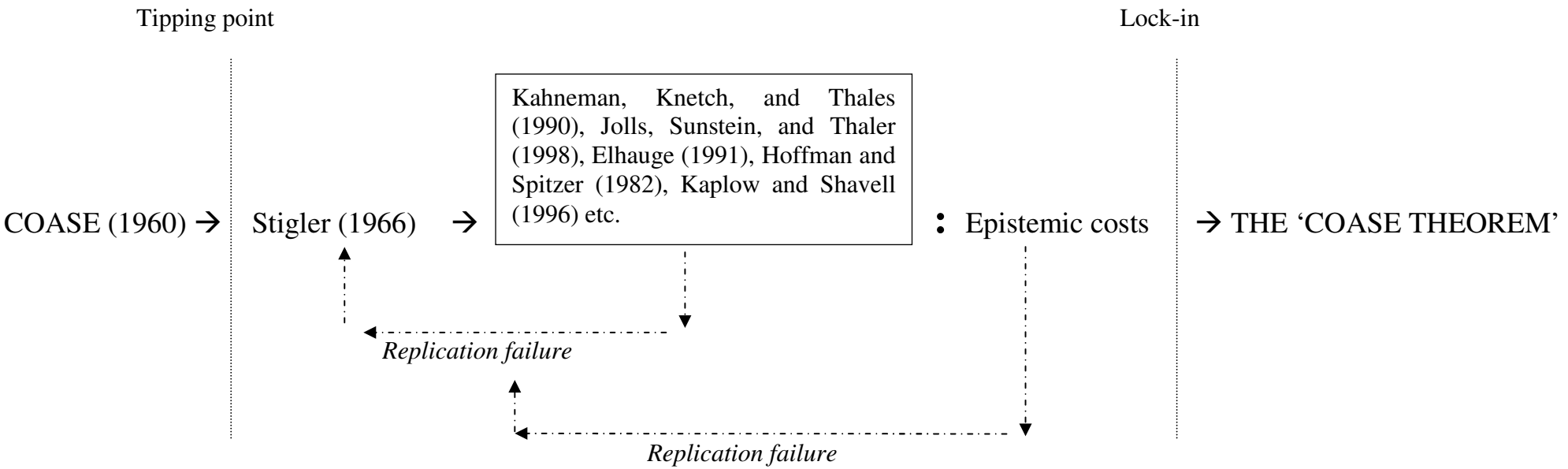
SOURCE: Scientific - Thomson Reuters © ISI Web of Knowledge http://www.isiknowledge.com [Accessed in December 2008, Updated March 2010]
* Only the works that appear in ISI Web of Knowledge are considered
* Works considered for column 'Coase': Coase (1937, 1960, and 1966)
* Works considered for column 'Stigler': Stigler (1966, 1971, 1974, and 1975)

Figure 2: Elements of the formation of intellectual paths in scholarly life



The diagram, by way of using symbols representing sequential stages and mechanisms between stages in the most simplistic form, depicts a typical transmission mechanism in the market for ideas in which decision processes of scholars failing to replicate the findings of past generations transform into intellectual paths. Boxes represent different stages in a typical decision process. Arrows with dots (- - - ▶) correspond to replication failures in the market where second generation models do not test the findings of the first generation models and principally rely on (i.e. reproduce) the results of the previous generation. Colum (:) signifies the costs generated during the transaction between first and second generation models where such costs take the form of epistemic costs. Epistemic costs are the opportunity costs of allowing time to replicate the results of the models in previous generations (i.e. models before the tipping point). Such costs disallow intellectuals to re-test past results and lock them into particular research programs in the long run. Bold arrows between stages (→) show the direction of the working mechanism. Tipping point is where a small event (such as a replication error) enters the intermediary stage. Lock-in is the final stage of the process in which consequences of small events (such replication errors) grow big by way of feedback mechanisms and evolve into intellectual pathologies in scholarly life. The diagram indicates that inputs in such systems, via certain mechanisms, transform into a particular result – intellectual paths.

FIGURE 3: Elements of the formation of the 'Coase Theorem'



The diagram, by way of using symbols representing sequential stages and mechanisms between stages in the most simplistic form, depicts the transmission mechanism in the 'market for economic ideas' in which scholarly processes of decision-giving authors after Stigler's 1966 article transform into an intellectual pathology. Boxes represent different stages in this unique process. Arrows with dots (⇢) correspond to replication failure in which second generation models (Kahneman, Knetch, and Thales (1990), Jolls, Sunstein, and Thaler (1998) etc.) do not test the findings of the first generation model (Stigler 1966) and principally rely on (i.e. reproduce) available results in the market. Colum (:) signifies the costs generated during the transaction between second generation models and Stigler (1966). In the case of the 'Coase Theorem,' epistemic costs are the opportunity costs of allowing time to replicate the results of Coase (1960). Such costs disallow intellectuals to re-test the result of Stigler (1966) and lock them into a particular research program – the 'Coase Theorem.' Bold arrows between stages (→) show the direction of the working mechanism. Tipping point is where the erroneous interpretation of Stigler was published in 1966. Lock-in is the stage in which the 'Coase Theorem' is accepted as the established message of Coase (1960). The diagram indicates that inputs in the 'market of economic ideas' such as errors in interpretation, via the mechanism of replication failure, lead to a particular result – such as the 'Coase Theorem.'