GROW SOME LEMONS, SAVE THE RHINO: WHEN IT IS EFFICIENT TO RAISE TRANSACTION COSTS

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This paper argues that market failures are determined by inequality in transaction costs rather than by transaction costs per se. 'Good' institutions are those that equalize transaction costs over all potential exchanges, thus not distorting allocative efficiency by favouring one set of exchanges over others. Implication is that policy and institutions aimed at improving efficiency should not aim to minimize but to neutralize transaction costs, which might involve deliberately raising transaction costs of some exchanges. We illustrate this argument and the applicability of raising transaction costs as a policy instrument with discussions of public goods and common pool resources.

Keywords: Market failures, Coase theorem, Transaction costs, Externalities, Public Goods

I. Introduction

What causes market failures? Ever since Coase's seminal contribution (1960), a broad consensus exists that the ultimate cause of inefficiencies is transaction costs (Medema and Zerbe 2015). In absence of any costs to exchange, any inefficiencies would be internalized by rational parties through a process of voluntary bargaining (Calabresi 1968). Institutional economists have built on this insight, creating a theoretical framework in which the primary function of institutions is to reduce transaction costs, allowing more market exchange (e.g. North 1990; Wallis 2011). In this view, transaction costs are the root problem of market failures. 'Good' institutions minimize them[1].

Are lower transaction costs always more efficient? This paper challenges this fundamental premise underlying contemporary economic thinking about institutions and governance. Specifically, we argue that market failures do not so much depend on the presence or the level of transaction costs. They result from inequality in transaction costs between various possible exchanges. If all potential exchanges suffer transaction costs to the same extent, there will be no effect on the allocation. Only if a system of transaction costs favours one set of transactions over others, biases in the bargaining process emerge that affect the efficiency of the allocation.

Although simple, the implications of this argument for economic theory and policy are profound. In contrast to the institutional economics perspective, our reading of Coase's argument implies that what makes institutions so important is not that they define the degree of transaction costs. What institutions do is to define the balance of costs between various

[1] Over the years, an extensive literature has emerged discussing the validity of Coase's insights, and especially Stigler's (1966) interpretation of them (see Medema 2017 for an overview). While we recognize the importance of the qualifications highlighted in this literature, for the sake of argumentation our paper accepts the general insights of Coase as a starting point.

potential transactions available to agents. Markets function efficiently whenever transaction costs are neutral, affecting all potential transactions equally. This puts distributive considerations at the heart of institutional economics.

Also, our argument implies that the standard policy prescription following from the transaction costs interpretation of Coase's argument, which is to use law to minimize transaction costs (Coase 1960, p19; Cooter 1989, p65 ; Posner 1983, p71), is wrong. A blanket aim of minimizing costs may easily make the distortive effects of transaction costs worse, if it means that the discrepancy in costs associated with various alternative exchanges increases. Rather, the policy objective should be to design institutions thus that they deliver neutrality in transaction costs. The neutrality condition implies that reducing the transactions costs of 'desirable' exchanges is equivalent to increasing transaction costs of alternative exchanges**.** The question for policy is then simply which route is the easier one. If the objective is to achieve efficient allocations, it may often be preferable to raise rather than reduce some transaction costs.

We build this argument in two steps. First, we discuss Coase's argument and its boundary conditions in section II. Subsequently, we discuss the policy implications of these insights in section III. We illustrate our argument with examples concerning the provision of public goods and the conservation of common resources. Specifically, we show how under-provision of public goods may be addressed by weakening property rights to private goods, and how overconsumption of common pool resources may be countered by increasing information asymmetries. Section IV concludes.

II. Boundary Conditions of the Coase Theorem

Market failures, as Ronald Coase taught us, have their roots in transaction costs. In absence of any costs to exchange, any externalities would be internalized by rational parties through a process of voluntary bargaining. Whatever the initial distribution of rights, "a rearrangement of rights will always take place if it would lead to an increase in the value of production", creating an efficient allocation (Coase 1960, 15). Coase's reasoning has been extended to all market failures, such as public goods and monopoly (Calabresi 1968; Demsetz 1964; Dixit and Olson 2000). Whenever we do find market failures, the root problem is transaction costs (Medema and Zerbe 2015).

This important insight has inspired a rich literature focusing on the importance of institutions and governance in economics (see Alston 2016 or Ménard & Shirley 2005 for overviews). Transaction costs are central in modern economic thought about these topics, with the level of transaction costs determining the extent of the market (North 1990).

Surprisingly, Coase's original argument (1960) does not support this reasoning. What Coase does it to introduce transaction costs as a necessary condition for the persistence of market failures. What he does not do, however, is to state they are a sufficient condition. Under zero transaction costs, voluntary bargaining eliminates all inefficiencies. To derive from this that positive transaction costs must result in inefficiencies (e.g. McCloskey 1998; Medema and Zerbe 2015; Posner 1992) is a *non sequitur*. Inefficiencies imply transaction costs, but that does not mean that more transaction costs imply more inefficiencies[2].

[2] This interpretation is nonetheless widespread. McCloskey (1998, 368) claims that "Coase's actual point, the core of a Coasean economics, was to note what happens in the many important cases in which transactions costs cannot be neglected. If the situation does have high transactions costs, then it does matter where the liability for pollution is placed." Allen (2016, 381-2) argues that transaction costs "if zero, would lead to the 'Coase Theorem' holding…, if positive, would cause the theorem not to hold.". Posner (1992, 51) argues that '[s]ince transactions are never costless in the real world" the Coase theorem does not hold.

When do transaction costs result in market failures? To answer that question, let us go back to Coase's original argument. Perhaps the main insight of Coase (1960) is that externalities are always reciprocal. They are a product of the interaction between two parties rather than the consequence of the actions of any one party. In the example of cattle raisers and farmers he introduces, the problem of the damage to crops caused by straying cattle is the product of the decisions of both cattle raisers and farmers to locate in each other's proximity. The question for policy is therefore not how we can restrain one party from inflicting harm on the other. The relevant question is not: who is to blame?, but: which distribution of harm is socially optimal and how can we achieve that? Coase shows that under certain conditions, rational actors will always achieve the socially optimal allocation. Regardless of how rights are distributed initially, parties will enter a process of voluntary bargaining that eliminates all externalities and results in a Pareto-efficient allocation.

What are the conditions for this argument to hold? Coase highlights that voluntary bargaining is efficient when market exchange is costless. With positive transaction costs, parties may be prevented from making bargains that would otherwise improve allocative efficiency. When it is too costly to trade, rights remain in the hands of the party initially allocated them, even though the socially optimal solution may be to transfer them. Demsetz (1964) specifies the condition further, arguing that parties make exchanges as long as the gains from that exchange are larger than the transaction costs involved.

To illustrate this, let the damage done to farmers by straying cattle be 80. If the farmer owns the right to the land, then the rancher may decide to compensate the farmer for their loss due to straying cattle in exchange for the right to let cattle stray. Without costs of exchange, the

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Medema and Zerbe (2015, p 875) are most explicit, stating that "externalities…are found everywhere there are transaction costs". All these authors thus erroneously derive from Coase's argument the conclusion that positive transaction costs necessarily cause inefficiencies.

rancher would be willing to make such a deal as long as the gains of raising an extra unit of cattle are >80. But if we introduce transaction costs of 20, it follows that the rancher is only willing to compensate if the gains of raising cattle are > 100. Buying straying rights is profitable only as long as the gains from raising cattle outweigh the price they need to pay for straying rights plus the costs of negotiating this deal. If the gains from a unit of cattle fall below this level, the cattle raiser will decide not to raise this piece of cattle and leave the land rights with the farmer. Hence, for all situations in which gains range between 80 and 100, there will be no exchange of rights even though that would be socially optimal.

But what is a cattle-raiser going to do, if not raising cattle? (S)he is forced to go for a less lucrative opportunity, for instance opening up the ranch to tourists. As Coase duly notes, in the real word any transaction bears transaction costs (1960, 1981), so that applies to the sale of tourism services as well. It follows that the complete consideration of the cattle raiser is to weigh the price of straying rights plus the transaction costs involved in buying straying rights against the gains from raising cattle *plus* the transaction costs involved in selling tourist services. If the transaction costs of selling tourism are also 20, cattle raisers are again willing to buy straying rights as long as the profit of cattle raising is 80. Hence, even though transaction costs are clearly positive in this example, the outcome is identical to the zero-transaction costs case.

The reason for this outcome is that by buying straying rights the cattle raiser is not only able to realize the gains of raising cattle, but also avoids the costs involved in alternative transactions, raising the value of straying rights to the rancher. Analyses of the social costs-problem in economics have failed to take this latter element into account, and have thus been incomplete. With Coase, most of us have assumed implicitly that the alternative for a transaction with certain costs attached to it is no transaction—and hence no transaction costs—at all. In Coasean analysis, positive transaction costs of any particular exchange are

always a hurdle because the benchmark transaction costs of alternative actions is implicitly set at zero. In reality, all alternatives to the focal exchange are likely to carry transaction costs[3]. If frictionless transactions do not exist, it follows that any exchange not only carries costs, but also enjoys 'opportunity gains' in the sense of the transaction costs avoided by not taking any of the alternative opportunities. A proper analysis of the relation between transaction costs and externalities needs to take both elements into account. After all, "when an economist is comparing alternative social arrangements, the proper procedure is to compare the total social product yielded by these different arrangements"(Coase 1960, 21).

II.A. The problem stated anew: Public goods

While Coase focuses on externalities, his argument extends to public goods (Demsetz 1964; Medema and Zerbe 2015). Externalities and public goods represent essentially the same problem, which is the difficulty of excluding others from the services of a good. Following this reasoning, Demsetz (1964) argues that the dichotomous division in public and private goods is to be replaced by a continuum of goods with varying difficulty of exclusion. Creating effective property rights is more costly for some goods than for others. The costs of establishing and maintaining property rights are what transaction costs reflect (Allen 1991, 1999, 2015), implying that public goods are ultimately also retraceable to transaction costs.

To illustrate the problem, Demsetz (1964) uses the analogy of a city in which policing is very weak. As cars can easily get stolen, consumers have difficulty excluding others from consuming the service of their cars. When the consumption of cars is non-exclusionary, they become a partly public good with all the familiar consequences. The willingness of consumers to pay for cars is reduced, and the price offered lies below the social value of cars. If

[3] Arguably, this even extends to the option of doing nothing at all. If I decide to keep all my money in my pocket, I still suffer the costs of excluding others from its use, information costs about present and future bargaining value of my money, and the transaction costs involved in spending this money in the future.

consumers value a car at $10000, but they need to pay $2000 to get protection for their property, they are willing to pay only $8000 for the car. The transaction costs of excluding others from the use of one's car need to be subtracted from the utility that using the car adds to the consumer. For this price, there will be under-provision of cars.

Again, this analysis is incomplete. A consumer forgoing a 9000$ car because of the costs of establishing property rights still needs transport. Suppose that the alternative is buying bicycles for the household. Weak policing will also affect the property rights of the new bikes. If the transaction costs of excluding others from the use of one's bicycles are equally large ($2000), the price consumers are prepared to pay for cars is not affected by the weak enforcement of property rights. Because the transaction costs of all alternative exchanges renders these equally less valuable, the relative valuation of cars is identical to that in the complete private transaction costs situation. That even applies to the alternative of not spending any money on transport at all—keeping money in one's pocket carries the same costs of exclusion. Hence, the end result of a blanket breakdown in police enforcement may be a general reduction of welfare, but *not a change in allocation*. Allocative changes only occur when property rights are not equally enforced between goods—e.g. bicycles are protected, but cars are not. The problem of public goods, henceforth, is not their non-exclusionary nature. It is the unequally exclusionary character of public and private goods. That is as much rooted in the non-exclusionary character of public goods as in the exclusionary character of private goods. With all alternatives equally (non-)exclusionary, no misallocation would occur.

What this tells us is that it is not the presence or the level of transaction costs that creates inefficiencies, but their distribution over the various possible exchanges available to the parties involved in the problem. As long as the distribution of transaction costs is not distortive in the sense that they do not favour one set of transactions over others, transaction

costs will not affect allocative efficiency, regardless of their level. We can therefore reformulate the Coase theorem in these terms: *With **neutral** transaction costs, an efficient allocation of rights will come about irrespective of the initial distribution of legal entitlements.*

III. Policy Implications

The policy prescription following from the usual interpretation of the Coase theorem is to use laws and regulations to minimize transaction costs (Cooter 1989). If transaction costs are the root cause of market failures, the efficiency enhancing policy is to thought to be to bring them down as much as possible. This perspective inspired the work of North (1990, 1991) and other new institutional economists (e.g. Dixit 2009; Eggertson 1990). In this approach, institutions serve to reduce transaction costs, enabling exchange and letting markets function. Indicators of institutional quality (e.g. Kaufmann, Kraay and Mastruzzi 2011) are ultimately reflecting the ability of an institutional framework to keep transaction costs at a minimum level.

We have argued that inefficiencies do not so much arise from the level of transaction costs, but from the inequality in transaction costs between various alternative exchanges. How does this alter institutional theory and policy prescriptions?

A first implication of the neutrality interpretation is that the Coase theorem is more practically relevant than commonly considered. While transaction costs neutrality is still a presumably very stringent condition, it is certainly less limiting than the zero transaction costs condition. Even in the real world of positive transaction costs, the Coase theorem holds under certain conditions.

Secondly, the reformulated Coase theorem calls for a much more careful analysis of policy responses than the common recipe of minimizing transaction costs. In order for the efficiency-

generating set of transactions to take place, transaction costs need not to be brought all the way down to zero. They need to be brought to the level of the alternative sets of transactions, thus creating a level playing field. Reducing overall transaction costs to the minimum level practically feasible may in practice do more harm than good.

Coase's example of the cattle raiser and farmer illustrates this. Consider the same situation as before, but now an institutional improvement in the Northian sense takes place. As a result, there is an overall reduction of transaction costs such that the transaction costs of tourism fall by 15 while the transaction costs involved in trading straying rights fall by 5. It is easy to see that such a reduction of transaction costs makes the allocation less efficient. Purchasing straying rights now requires 80 compensation + 15 transaction costs. The benefits of doing so are the gains from the marginal unit of cattle plus the transaction costs avoided by not choosing for tourism (5). Ranchers are only willing to purchase rights if the gains from cattle are above (80+15-5=)90, where it would be socially optimal to do so for gains above 80. The reason for this fall in efficiency in our example is that while the *level* of transaction costs has declined, the *imbalance* in transaction costs has increased. While the world has grown closer to zero transaction costs, it has moved away from neutral transaction costs. It is the latter that matters.

A third implication of our argument is that we need to have a fresh look at what constitutes 'institutional quality'. Our analysis suggests that the function of institutions is not to bring transaction costs down, but to balance them between alternative exchanges. Institutions define the distribution of transaction costs over various exchanges. What kind of institutions do so neutrally? Institutional arrangements that privilege transactions between some members of society over others do not meet this criterion. Feudal structures, caste systems, networks, or lineage systems work by making transactions easier for some combinations of actors than others. Such biases represent fundamental inequalities in transaction costs between possible

exchanges, generating inefficiencies. For this reason, Fukuyama (2011) argues that eliminating the tendency to privilege within-lineage transactions over others in favour of rule of law is the fundamental challenge of the modern state. Institutional arrangements that are characterised by impersonality increase market efficiency (Wallis 2011). However, impersonality is not the whole story. While rule of law may remove transaction cost biases in the consideration with whom to exchange, it does not affect imbalances in the consideration which exchanges to make. To improve institutional quality, we need to also consider the content of the laws and institutional arrangements in order to make them more neutral.

A fourth implication, then, is that not all transaction costs are bad. Neutrality may be achieved by either bringing down the costs associated with the desirable set of transactions, or by *increasing* the transaction costs of alternative sets of transactions. This suggests that purposively increasing transaction costs may be an effective policy tool in many situations. Consider the example of car theft discussed before. The allocative inefficiencies generated by weak enforcement may be solved by investing in policing, up to the point where property rights to cars are equally protected as property rights to other goods. Such a policy may be prohibitively expensive in reality, however. An alternative approach may therefore be to weaken police enforcement of property rights to alternative goods, up to the level equal to the protection of property rights to cars. In practice, a mix of the two, shifting police resources away from protecting bicycles to cars is probably more feasible. This argument extends to public goods in general. Recall our assessment that the problem of public goods is the unequally exclusionary character of public and private goods, which is rooted both in the non-exclusionary character of public goods and in the exclusionary character of private goods. Addressing this imbalance may be done by increasing the exclusionary character of the public good, or by reducing the protection of private goods. Once transaction costs are similar for public and private goods, there will be no under- or overconsumption of either one.

III.A. Practical Example: How to save rhinos by growing lemons

We have argued that increasing transaction costs may be a valid policy response to market failures, since it may be the practically easiest way to reduce the imbalance between transaction costs over various alternative exchanges. To see the relevance of such an approach in practice, we illustrate our argument by an analysis of the market for rhino horn medicine.

The trade in rhino horn medicine is a persistent and growing problem, seriously threatening the survival of rhino species. Some species have already become extinct (Biggs, Courchamp, Martin and Possingham 2013). The problem from an economic perspective is that poachers profiting from selling rhino horn infringe on the rights of conservationists valuing survival of the species. Assuming that the combined utility gains from rhino conservation by conservationists are larger than the private gains of selling horn enjoyed by poachers, conservationists could in principle 'bribe' poachers to leave rhinos alone, ensuring an efficient outcome. However, the problem is that the transaction costs associated with such a bargain are prohibitive (Libecap 2014). The problem is characterised by number of classic contextual features hindering contracting (Heckerman and Maser 1987) or collective action (Ostrom 2000). Costs are inflated by conservationists' group size, increasing the number of lines of communication during negotiation and making defection more likely; by the spatial dispersion of conservationists; by uncertainty about consequences; and by the mismatch in the temporal distribution of costs and benefits accrued from poaching and conservation. In addition, hold-up problems may prevent contracting (Anderlini and Felli 2006), since poachers have the ability to renege on the contract once payment is received and additional groups of agents may threaten to start poaching if they do not receive compensation as well. Under these circumstances, buying rights to rhinos by conservationists is next to impossible, leaving the externalities of the rhino trade intact. In response, society and policymakers have resorted to a

blanket ban for rhino horn trading instead. Such a ban has proved difficult to enforce. The profitability and intractability of the trade makes prohibition not sufficiently effective, and has even been suggested to stimulate trade (Biggs et al 2013; Challender and MacMillan 2014; Rivalan et al 2007). The population of rhinos continues to decrease, so that extinction of more rhino species seems only a matter of time (Ripple et al 2015).

Our argument suggests a more effective approach to deal with the rhino horn trade. The prohibitively high transaction costs of the trade in rhino rights by conservationists are but one side of the problem. The other side the problem is the *comparatively* low transaction costs of the trade in horn-based traditional medicine. If transaction costs in the rhino horn medicine trade increased to a sufficiently high level, the effect would be to make conservation a more profitable option. Practically, such an outcome could be achieved by introducing large amounts of fake, 'lemon' horn into the market. The immediate effect of such a supply would be to reduce prices, while greatly increasing information asymmetries between suppliers and consumers. Consumers are less certain that they are buying a good product, running a risk that they pay a price for the rhino product that is higher than the consumer value realized. Under such circumstances, rational consumers will be unwilling to pay the full price for rhino horn. They reduce demand, causing the price to drop further. These price drops make it harder still for suppliers of genuine horn to compete, causing existing suppliers to leave the market (Fink, Maskus and Qian 2016) and killing the incentive for local entrepreneurs to enter the market (Maskus 2012) . Thus, a classic adverse selection 'problem' (Akerlof 1970) could be wilfully created to destroy the market for rhino horn. Raising transaction costs originating in information asymmetry to the level of transaction costs faced by conservationists buying rhino rights effectively erodes the conditions for the rhino horn medicine market to exist.

IV. Conclusion and Discussion

Since the seminal contribution of Coase (1960), the general consensus in economics is that the root problem of market failures is transaction costs. This has inspired a vast literature on economic institutions and governance, analysing them from the perspective of their ability to minimize transaction costs. In this paper, we have challenged these insights, building on the argument of Coase (1960) that costless transactions do not exist in reality. Implication of this is that the alternative to bearing the costs attached to particular transaction is not no transaction—and hence no transaction costs—at all, but an alternative exchange, with alternative transaction costs attached. From this perspective, we argue that any costs of a particular transaction need to be weighed against the transaction costs of potential alternative transactions rather than against an Utopian zero-transaction costs case.

Implication is that transaction costs distort allocative efficiency not when they are non-zero, but only when they are higher than the costs attached to alternative transactions. An identical amount of transaction costs applied to all potential exchanges in the economy evenly does nothing to the resulting allocation, no matter how high its level. It is the degree of inequality in transaction costs that affects allocative efficiency, by favouring some exchanges over others.

Applying this principle to the problem of under-consumption of public goods, we have argued that the problem is rooted as much in the non-exclusionary character of the so-called public good as in the exclusionary nature of the private good. Increasing the transaction costs of private goods (by weakening their property right enforcement for instance) to such an extent that it matches the transaction costs of public goods removes the bias in consumption patterns, restoring the efficient allocation.

Our analysis has various implications. First, it calls for a reinterpretation of what institutions do, and what constitutes institutional quality. The importance of institutions is not that they set the level of transaction costs, but that they define their distribution over various potential exchanges. Institutional quality, then, is about minimizing imbalances in transaction costs rather than minimizing their levels. ‘Good’ institutions are those that that neutralize transaction costs. This objective is arguably implicitly recognized in principles such as rule of law and impersonality, but not explicitly recognized.

More concretely, our analysis highlights a potentially effective but little considered policy tool, which is purposively increasing transaction costs of alternative exchanges. From a policy perspective, our argument suggests that allocative efficiency can be improved not just by reducing transaction costs of the first best set of transactions, but equally by increasing the transaction costs of alternative transactions. Illustrating the potential for such policies by discussing the market for rhino horn medicine, we have shown that generating transaction costs by harnessing information asymmetries may tilt the balance from one set of socially inefficient transactions to another socially more optimal one. The deliberate raising of the costs of some transactions may thus help to improve efficiency by restoring balance in transaction costs over various exchanges. We conclude that not all transaction costs are bad. Sometimes it is efficient to increase them.

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