1. Buchanan, coordination failures and the emergence of law

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# 1. Introduction

James Buchanan witnessed the birth of “law and economics” in the late 1950s and early 1960s as well as, about ten years later, its transformation and establishment as an “economic analysis of law”. He knew personally the founders – Ronald Coase, Guido Calabresi, Henri Manne and Richard Posner – and also some of the most important contributors to these fields – such as one of his co-authors, Gordon Tullock. However, Buchanan never contributed much to law and economics. Compared to the rest of his works, it can easily be said that he only wrote a few articles in which he dealt with law and economics issues (Buchanan 1970, 1972a & b, 1973, 1974, 1977).

 That these articles were written and published in the same period – the early and mid-1970s – can partly be explained by the fact that it was when law and economics was developing, was becoming accepted and recognized and institutionalized, which offered opportunities for participating in conferences and writing articles. More importantly, these were also the years when Buchanan’s pessimism regarding the situation in his country was at its peak. Not only there were conflicts that individuals seemed no longer capable of solving peacefully, that is within the existing set of given rules. Also, communities seemed unable to efficiently provide their own public goods, and instead of trying to find arrangements among them were relying on government intervention. The situation was such that even “a philosophical anarchist” – his own words, 1978: 29 – like himself had to develop claims against spontaneous order and against anarchy too. It is not so surprising that in this period Buchanan used the excuse of law and economics to defend the need for a social contract, answering a question he raised many times in his work “why is political or governmental organization required at all?” (Buchanan, 1965b: 9).

 The answer Buchanan gave over these years (which this paper analyzes extensively) is twofold. First, when individuals interact in large groups, in particular in public goods interactions, rational awareness that each individual’s own choices have no influence on the others’ unavoidably leads to a socially inefficient undersupply of these goods. Second, and relatedly, classic Coasian solutions based on efficient property rights allocations are unlikely to work. Why? The answer we propose is tentative, and only implicitly suggested by Buchanan’s work. Since defending hardly excludable assets form third parties’ misuse is costlier the larger the number of potential intruders, interactions in large groups cannot but lead to what Buchanan call “the atrophy of property rights”: right-holders do not find it rational to protect their entitlements when they are too frequently violated. In this case, property rights become void, atrophied. When they do, the only solution to elicit cooperation is to resort to a social contract:

The large number hypothesis in the theory of public goods supplies a possible logical explanation for the emergence of political-government institutions as replacements for market-exchange institutions in the provision of goods and services that exhibit the requisite “publicness” (Buchanan, ivi: 11)

 The purpose of this paper is to show that the criticism of spontaneous order that pervades the law and economics contributions Buchanan wrote in the 70s, and that fuels the defense of a social contract he drew in these years, is logically consequential to his views on coordination failures that one finds elsewhere in his writings, in particular, in those dealing with the theory of public goods. Secondly, the paper shows that this criticism, as well as the need for political-government institutions it implies, does not apply to all societal situations, but only, as already recalled, to those where individuals interact in large groups. Thirdly, the paper argues that the same large number dilemma that makes it rational for individuals to contribute inefficiently to public goods – or more generally, to behave economically instead of ethically, as discussed in Section 2 and by Buchanan (1965) – also undermines the possibility of using property rights to solve the problem. Let us insist: this line of reasoning is not explicit in Buchanan’s work. And yet, to us, seems largely consistent with the message conveyed by many of the writings he produced in the 60s on cooperation and coordination. Indeed, it is not unreasonable to postulate that property rights atrophy more easily when the frequency with which they are violated is so high that makes it irrational for right holders to enforce their entitlements. Hence, a side contribution of this paper is to show that albeit Buchanan was aware that “the pure theory of public goods remains in its infancy [when it comes to] distinguish or classify those goods and services that exhibit “publicness”, his theory on the atrophy of property rights may provide implicit indications as to when market-exchange institutions should be substituted with government political institutions.

 The remainder of the paper is organized as follows. Section 2 analyzes the criticism of spontaneous order that Buchanan put forward in the 70s. Section 3 relates this criticism to the works on cooperation and coordination he wrote in the 60s, especially with reference to his contributions to public goods theory. Section 4 shows that this criticism logically implies the need of a social contract, while section 5 discusses under which circumstances this need cannot be fulfilled by property rights, which, according to Buchanann, “atrophy” when right-holders find it irrational to enforce their entitlements. When they do, the only possible solution to escape the state of generalized non-cooperation that results (and that to Buchanan, also characterizes the anarchistic equilibrium) is to delegate enforcement authority to political-government institutions. This is in line with the idea that such institutions should replace the market in the provision of those goods and services that exhibit the requisite of “publicness” that communities spontaneously fail to provide. Section 6 concludes and summarizes.

# 2. Buchanan on spontaneous order

The point Buchanan made against spontaneous order in a contribution called “Law and the Invisible Hand” – a quite evocative title for the scope of the present paper – was simple and straightforward. He wrote that Hayek was wrong in “suggest[ing] that those institutions that have evolved spontaneously, through the independent responses of persons to the choices that they faced, embody efficiency attributes”. (1977, 32) Why? To make his point, Buchanan gave an example that corresponds to the provision of a public good (actually, the non-provision of a public bad): pollution on a beach – “consider... the dumping of litter on the beaches near San Diego. (We assume, for now, that there is no law against dumping such litter.) We should not be able to observe the result: beautiful beaches made ugly by litter.” If one admits that “beautiful beaches made ugly by litter” is not an objective that society wants to reach, then, clearly, the situation illustrates a case of market failure. In the absence of law, individuals fail to produce the public good they should produce, or rather, avoid to produce a public bad or, still in other words, to internalize the externalities they create. The pollution resulting from the absence of law, that Buchanan interpreted as the result of a spontaneous process, indicates that the situation is socially inefficient. Hence, one cannot presuppose that a spontaneous process of interactions among individuals necessarily produces efficient results, as Hayek did. This is why his analysis is “misleading” (Buchanan 1977, 32).

 One of the claims put forward in this paper is that to properly appreciate the point Buchanan wanted to make with this example one needs to dig deeper in his work on coordination and cooperation, especially (but not exclusively) in his contributions dealing with public-goods interactions. To do so, it is important to start from one point Buchanan made and that one finds in the quotation made above, namely, that efficient institutions cannot emerge spontaneously if individuals behave as if they were independent from the others. Now, in the example of the beach he gave, each individual’s utility is affected by the behaviors of the others. And yet, they behave as if their actions cannot affect those of their peers, or also have no consequences on the wellbeing of others. In this example, thus, Buchanan started from a very specific assumption – beach visitors make their littering decisions as if no interdependence linked them to one another. Now, if one looks at what Buchanan wrote on cooperation and interdependence, one realizes that individuals do not generally assume that such independence holds across all types of societal situations. Indeed, he does identify cases (as that of beach) in which individuals would not acknowledge the interdependence with others. In these situations, the criticism against Hayek applies. But there are also cases in which they do, in which case Buchanan could have agreed with Hayek: institutions may emerge spontaneously from the individuals’ cooperative efforts. In what follows, we shall go back to Buchanan’s works as to identify the criteria with which he classified these sharply different situations.

# 3. Buchanan on market or coordination failures

## 3.1. Joint supply and collective action

The example of the beach, which Buchanan gave in 1977, is similar to other examples of the same type that he quite recurrently used in his work. The (polluted) beach indeed belongs to a class of goods (or bads, in that case) that he repeatedly studied in the 1960s: the public goods or bads that are *jointly* supplied by individuals. Buchanan thus wrote many articles in the second half of the 1960s, and also a book – *The Demand and Supply of Public Goods* (1967) – that evidence the importance the question had to him.[[1]](#footnote-2)

 Buchanan discussed various examples, from the provision of health (Buchanan and Kafoglis, 1963) to the de-pollution of a river (1968b). In both cases, the question concerned the amount of goods individuals could provide individually compared to that they could provide collectively or, rather, jointly. The case of health is particularly significant. Buchanan and Kafoglis examined the amount of vaccine shots each individual must consume to produce a certain amount of health for each individual, measured in number of healthy days each individual can enjoy per year. Each individual can produce a given amount of healthy days with a certain quantity of vaccine shots. But there is no need for each individual to receive the individual optimal shots if others are also vaccinated. Indeed, each individual’s consumption of vaccine shots generates positive externalities that positively affects the others’ health and reduces the need they have to make efforts. Thus, individuals can produce a certain number of days of good health by buying and consuming the amount of vaccine required individually, or by benefiting from the fact that the others are also vaccinated and therefore less contagious. In the second case, the same quantity of health can be produced by using a lower amount of vaccine.

 The central point Buchanan then made was that individuals could benefit from joint supply and from the positive externalities it generates if, first, they understand that an interdependence exists between them and, second, they are able to organize themselves collectively to benefit from these positive spillovers. Thus, if each individual decides independently from the others, as if he was independent from the others, or if he decides privately, the optimal amount of efforts s/he has to put to provide the public good is higher than the amount s/he has to put if a collective action was organized. By contrast, if individuals acknowledge the interdependence that links them to one another, they can organize themselves to supply health jointly or, to put it differently, to benefit from the positive externalities produced by joint supply. This meant, as a rather important corollary, that there was then no need to resort to government intervention. Collective action was private and voluntary.

 In these articles, Buchanan made two tightly interrelated points that are of interest to understand the example of the beach and the need for law. First, he explained that what he calls the “independent adjustment” (Buchanan and Kafoglis 1963) is exactly a behavior that consists in acting independently from the others, where “the individual is assumed to take into account only the effects of his actions on his own utility or that of his family group” (403), thus neglecting “the external benefits that his own decisions impose on others” (408). Or, as Buchanan would explain again later – evidencing the importance of the point to him – acting independently means that “each person regards the behavior of the other as if the latter is simply a part of “nature” (1965b, 9). The individual “will adjust his own behavior in the light of actions taken by others” (Buchanan and Kafoglis 1963, 408), but “the others” cannot be influenced or controlled – “The behavior of the other is embodied as data in the choice calculus, but the other person is not considered to be subject to influence or control, positively or negatively.” (1967, 112).

 Second, in both articles, Buchanan insisted that the size of the group plays an important role in determining the individuals’ perception of the interdependencies that link them to one another, and also, of the benefits that may be achieved by choosing different behavioral patterns or by organizing some form of collective action to elicit cooperation: “when the interactions extend over a large number of persons, the costs of attaining voluntary agreements may become prohibitive, and any approach to the "optimal" solution in this fashion may be precluded” (Buchanan and Kafolgis 1963, 412); or,

In the pure public-goods interaction examined here, the shift in the size of the interacting group exerts an important influence on the relative reward to cooperative behavior on the one hand and to exploiting behavior on the other… As the number increases only from two persons to three, for example, the single person’s behavior affects his own enjoyment of the good by one-third rather than by one-half when behavior is symmetrical. He will, therefore, have less incentive to initiate cooperative action and more incentive to behave contrary to the whole group’s interest (Buchanan 1967, 115)

 The mechanism Buchanan highlights in this passage (i.e., group size determines the private returns to unilateral cooperation) is not the only one, nor the most relevant he chose to emphasize to explain the impact of numbers on the individual’s decision to cooperate. In his view indeed, the size of the group affects the individuals’ perception of the influence that their choices exhibit on the others’. To make this argument, Buchanan simply distinguished between two types of environments, small and large number environments.

## 3.2. Size matters: large groups vs small groups

Why would individuals behave differently in small compared to large groups? In large groups, Buchanan argued, individuals anticipate that their own behavior will not influence the behavior of others: “in such large groups the individual considers his own action to exert substantially no effect on the actions of others.” (Buchanan, 1965b, 9). As a consequence, individuals behave non-strategically, “simply react[ing] or adjust[ing] to the behavior of “others’’ in a manner similar to his reaction to natural environment.” (Buchanan, 1967, 113) “Natural”, here, refers to the fact that individuals treat others as part of nature, taking their behavior as given and assuming that how others behave is independent from their own behavior – “The behavior of the other is embodied as data in the choice calculus, but the other person is not considered to be subject to influence or control, positively or negatively” (ivi, 111).

 Conversely, in small groups, such as an “isolated setting” (1965b, 6) of 3 persons or “a desert island” (1965b, 6) when “personal interaction is recognized” (1968a, 86), “utility maximization... will not exhibit the observable properties of utility maximization in a large number setting” (1978, 366). More precisely, individuals no longer follow their “narrowly defined self-interest” (Buchanan, 1978, 366) but rather adopt “moral or ethical principles” (Buchanan, 1961a, 340), precisely, because they now expect their choices to influence their fellows’. Individuals adapt their behavior to the behavior of others or, to use Buchanan’s words, they behave “strategically” (1968a, 91). To Buchanan, being strategical means that the individuals adapt their behavior to the presence of others, knowing that this will affect the others’ behavior. They do not treat others as part of nature, as if their behavior was given. This means that, still in contrast with what happens in large number environments, individuals cannot ignore that their behavior matters and may affect others.

 Buchanan repeated the point many times over the years: each individual “will tend to recognize that his own choice of a rule, and subsequent adherence to it, will to some considerable extent influence the similar choices to be made and followed by the other two members” (1965b, 6). Or, later, “So long as the interaction is limited to small groups, [the individual] will recognize that his own action can exert some influence on the behavior of others in the group.” (1967, 115) Or, an individual who “contributes nothing... may assess the probability of noncooperation on the part of others higher than if he contributes some share.” (Buchanan, 1968a, 86) The conclusion ensued: “This change alone may be sufficient, on rational grounds, to cause him to contribute” (Buchanan, ivi, 86). Individuals, put differently, stop maximizing their own private utility only, and incorporate other motives (e.g., strategical, ethical) in their choice calculus. And since each individual (rationally) follows the same reasoning, one may expect that all individuals will eventually end up cooperating. The large-number dilemma disappears. Adam Smith’s invisible hand functions. The “principle of the spontaneous order of the market” (Buchanan 1977, 25), the “principle of spontaneous coordination” (Buchanan, ivi, 26), applies. Individuals eventually exhaust the gains from trade that remain un-exploited in large groups.[[2]](#footnote-3)

 In his 1965 contribution to ethical theory Buchanan generalized these conclusions by studying the effect of numbers on the choice of individuals between “ethical” and “economical” behavior. By selecting what Buchanan (1965b, 2) calls “the moral law”, “the individual commits himself to act in subsequent situations on the basis of something like the generalization principle. That is, he will not act in ways other than those which allow his particular action to be universalized, regardless of the specific consequences”. By selecting what Buchanan (ivi) instead calls the “the private maxim” or “the expediency criterion”: “he commits himself in advance to no particular principle of behavior. He retains full freedom to act on the basis of expedient considerations in each particular in-stance that arises”. Now, since the decision to retain the liberty of freely maximizing one's utility by adjusting one’s behavior to the outside mutated conditions, to follow the expediency criterion or the private maxim instead of sticking to something akin to the Kantian universalization principle comes from the belief that each individual cannot alter the others’ behavior, one understands that each individual makes this choice by ignoring what others do. In a world where cooperation is privately costly but generates non-excludable benefits, regardless of whether or not others cooperate, each individual belonging to a numerous group privately prefers not to cooperate – “[i]n a group of critically large size, the individual will tend to adopt the rule of following the expediency criterion even if he thinks that *all* of his fellow citizens are saints” (1965b, 7; italics in original). Why?

 On the one hand, because in large-number environments, they are unwilling to pay the private cost of unilateral cooperative behavior knowing that this will not induce others to do the same. On the other hand, because they have an incentive to free ride on the others’ labor without paying the private contribution cost. Regardless of the expectations on the others’ behavior, thus, the fact of knowing that their own choices cannot affect the others’ unavoidably leads to a state of generalized non-cooperation. Even if they understand that unconditional defection unavoidably leads to Pareto inferior outcomes and that everybody would be better off if ways could be found to cooperate with others. Aware that in critically large groups they are not able to influence the behavior of others, no one changes his own behavior. No reason can lead rational individuals to choose to behave differently – “Rationally, he cannot adopt the moral law as a principle for his own behavior.” (1965b, 7). Or, translated in a more standard economic jargon, individuals have a dominant strategy. They are unconditional defectors. Buchanan was rather clear about that: “The individual in a large-group, public-goods interaction... face[s]... no pressure or incentive to behave cooperatively”, because he behaves independently from others (1967, 121).

 As a consequence, individuals in large groups are trapped in what Buchanan called the “large number dilemma” (1965b), which is “similar to, although not identical with, that which is commonly discussed in game theory as "the prisoners' dilemma." (Buchanan, 1965b, 8) Similar, because individuals would be better off by cooperating but, for some reasons, are unable to do so. Different, because the reasons that make such coordination impossible are not the same as in a Prisoner’s dilemma. In the latter, cooperation fails because agents cannot communicate and agree on self-enforcing mechanisms that would make “cooperate” the dominant strategy. In the large number dilemma, the presence of many interacting individuals makes communication simply impossible, destroying a possible way out (enabling communication) that conversely solves the Prisoners’ dilemma. Another classical escape from the Prisoner’s dilemma that is also prevented in large number environments is repeated play (à-la Tit for Tat), because, in large groups, individuals would not expect to change the others’ behavior regardless of the time horizon of interactions.[[3]](#footnote-4) Yet, despite these differences, the two Dilemmas generate the same kind of socially inefficient outcome: the individuals know they would be better off if they adopted a cooperative behavior but cannot envisage changing their behavior. Or, to put it differently, individuals know that some gains could be made by adopting a different strategy, but cannot force themselves to adopt this strategy. Gains from trade remain unexploited.[[4]](#footnote-5)

 Let us note here that, to Buchanan, “The individual is caught in a dilemma by the nature of his situation; he has no sensation of securing benefits at the expense of others in any personal manner” (1968a, 83). Hence, when individuals find it rational to “defect” in large number environments, they behave “neither cooperatively nor competitively vis-à-vis his fellows […] psychologically, there is no conflict; there are no game-theoretic elements in behavior” (Buchanan, 1967, 119), something which further differentiates the large-number dilemma from the Prisoners’, which in fact, can also emerge in small settings (the “Prisoners” caught in the Dilemma are normally two). Said otherwise, in large number environments “the choosing individual enjoys no sensation of "riding free," of "letting George do it." There is no personal interaction present at all. The individual is simply reacting to an environment in which he finds himself, to "nature," so to speak, not in any way against his fellow citizens”. (1965b, 9) Not cooperating, (or following the expediency criterion, in the more general choice between that and the moral law), means that individuals maximize their own private utility being convinced that this will not affect the behavior of others, who reason in the same identical way. Each of them behaves as if others were not there.

 Thus, choosing not to cooperate in a large group was not interpreted by Buchanan as meaning that individuals would free ride. From this perspective, Buchanan found the terminology used in public economics about free riding "misleading” (1968a, 83). Indeed, free riding “suggests some deliberate effort on the part of the choosing individual to secure benefits at the expense of his fellows” (Buchanan, 1965b, 9). It implies that individuals try “to shift a major share of the burden onto the other while himself securing a share of the benefits” (1967, 114). They really adopt anti-social behaviors (see Marciano, 2015). Or, to use another of Buchanan's words, they try to “exploit” others. In other words, free riders acknowledge and take into account others, knowing that in some game-settings (coordination games) they may change the others’ behavior by modifying theirs, which is incompatible to how individuals are supposed to behave in large groups. In Buchanan’s view, free riding is more a behavior that could arise but does not in small groups. And why does it not? For the exact same reason, precisely because individuals acknowledge the interdependencies they have with others and recognize that if they decide to free-ride, the others will do the same, and vice-versa: behaviors are truly interlinked to one another.

# 4. From coordination failures to the law

How does this frame apply to the case of beach littering, and the (non)emergence of law? From the distinction Buchanan himself established, it seems rather straightforward to assume that, in a small group, individuals would have been incited to cooperate to maintain the beach clean or, more generally, to adopt an ethical rule of behavior leading to this result. Therefore, if the number of people using the beach is limited, small, one may then expect that everyone is going to bring their trash back with them when they leave the beach, instead of leaving it on the sand. The “spontaneous principle of coordination” applies. Then, progressively, a rule of conduct emerges and maybe a norm forms, according to which individuals do not litter (or clean) the beach. Buchanan should have then agreed with Hayek. He did not. In Buchanan’s 1977 chapter, indeed, cooperation fails. Why?

 Considering Buchanan’s conviction that cooperation would always emerge in small groups, one may find it surprising that he did not envisaged that individuals try, for instance, to create a club, define property rights that delimit the number of users, as well as the rules that organize the use of the beach (including, for instance, the fines that would apply to those who pollute the beach). This would not be a truly Hayekian solution, since it involves some form of collective action, but it is not too different since collective action here would remain private and voluntary. Moreover, this possible way out would have been consistent with the theory of clubs he developed in 1965 (Buchanan, 1965a) as well as with some of his previous works, about cleaning a swamp (see Buchanan, 1964) or about cleaning up a river (Buchanan, 1968b).

 Buchanan did, however, not analyze the problem in this way. He explicitly reasoned in terms of large groups, assuming (reasonably) that the number of visitors attending the beaches near San Diego was sufficiently large to elicit the rational perception that own choices cannot affect the others’ behavior, and that organizing collective action to delimit the number of users was also rationally impossible. Thus, the beach was used as an example of “generalized prisoners’ dilemma” (Buchanan, 1977, 28), a situation where the failure of cooperation was taken as given, with its causes and possible ways out left willingly un-investigated. In other words, Buchanan did not explicitly distinguish between small- and large-number settings when he discussed individual behavior and the (non)emergence of a spontaneous institutional order in the beach littering example. Rather, he simply analyzed individual behavior in terms of personal cost – “the personalized costs of cleaning up their own litter” (Buchanan, 1977, 27) – and personal benefits measured in terms of impact on the cleanliness of the beach – “the differential value of the marginal change in the total appearance of the beach that their own activity can produce” (Buchanan, ivi, 27), without mentioning how both may be affected by the size of the group. Implicitly, he was assuming that the individuals attending the beaches near San Diego were behaving independently from one another. In this example, indeed, Buchanan did not seem to envisage that (not) dumping trash could lead others to (not) dump their trash and would therefore end up in a clean place, and therefore that the appearance of the beach could be improved in the long run. He actually ruled out the possibility that beach litterers behave in a non-narrow self-interested way. A question may spontaneously arise then: why Buchanan did not take advantage of the example of the beach to emphasize once more the impact of numbers on cooperation?

 To understand why in this paper he focused so narrowly on his criticism of Hayek’s spontaneous order, it is important to remind that the 1977 essay, as many of Buchanan’s works of the early to mid-1970s, was written to explain why anarchy could not function (and, therefore, why a social contract was necessary). In this regard, the example of the beach was not meant to illustrate a simple cooperation failure, or even an incapacity to coordinate and devise institutions. It was meant to evidence how cooperation failures emerge in a very specific context, that of anarchy. Buchanan was thus having a specific purpose, namely, discussing the limits of anarchy, to paraphrase the title of one of his books (Buchanan, 1975). The beach was an example of what could produce anarchy – “The "order" which emerges, the littered beach, has been produced by anarchy” (Buchanan, ivi, 28). He insisted that his purpose was to “illustrat[e] that "invisible-hand explanation" may be as applicable to "orders" that are clearly recognized to be undesirable as to those that are recognized to be desirable” (Buchanan, ivi, 28). Or, that “The principle of spontaneous coordination, properly applied to our beach littering example, allows us to understand and to explain the possible economic inefficiency that would characterize the anarchistic equilibrium” (Buchanan, ivi, 30). And, even more precisely, to show that “In the equilibrium attained under anarchy no single person has an incentive to change his behavior or incentive to reduce the amount of littering that he does” (Buchanan, ivi, 29). This unfortunate outcome is exactly the same that unavoidably emerges when individuals interact in large-number environments. The question we want to pose, at this point, is whether these two arguments can be related to one another. Is the non-emergence of law in the anarchistic equilibrium a consequence of the large-number hypothesis? Or more precisely, is anarchy a situation that can only emerge in large groups? Unfortunately, Buchanan did not provide explicit answers to these questions. A tentative, twofold response may however be traced back in his work.

 First, in his 1977 essay, Buchanan was emphasizing a point of the utmost importance: anarchy is a situation in which individuals are “uninhibited and unregulated utility-maximizers… persons acting each independently or separately” (Buchanan, ivi, 29). Clearly, this is the same behavioral model he highlighted in the already recalled contributions where he put forward his large number hypothesis. In other words, anarchy was, to Buchanan, similar to a Hobbesian state of nature, where individuals have no incentive to adopt but purely self-interested behaviors. Convinced as he was that this kind of behavioral pattern do not emerge in small groups, a tentative conclusion may be advanced: anarchy is a large-number reality. If Buchanan’s large number hypothesis is correct, in fact, the “solitary, poor, nasty, brutish, and short” anarchistic equilibrium Buchanan was criticizing in 1977 cannot but emerge in those large number environments that unavoidably leads to cooperation failures and that call for the need for law.

 Second, another distinctive trait of the anarchistic equilibrium emphasized by Buchanan is that in such state, no form of collective action can be agreed upon. No institution at all could thus emerge. The gains from trade that could be realized by eliciting cooperation remain unexploited, and the generalized prisoners’ dilemma persists. This was the conviction for which he also rejected the possibility to discuss the beach littering example from the perspective of introducing property rights or in terms of clubs (Buchanan 1965a), two means that, as anticipated, would reduce the number of users and allow individuals to realize the interdependence with others. More precisely, although he explicitly admitted that the problem might be the consequence of the absence of property rights – “Some economists would go on to suggest that the observed results arise because of the absence of property rights in the commonly used resource, the beach” (Buchanan, 1977, 28). And although he noted that establishing property rights may apparently solve the problem, or at least provide individuals with incentives to take care of the latter – “If this scarce resource were assigned to some person or group, it would then be in their interest to maintain standards of cleanliness, to internalize the externalities, and in so doing to insure economic efficiency” (Buchanan, ivi, 28) – Buchanan did not study this possibility – “My purpose here... is not to discuss the particulars of this example or to raise the more general issues concerning the uses to which various constructions of "market failure" have been put.” (Buchanan, ivi, 28).

 Obviously, one cannot question Buchanan’s perspective. One may nonetheless wonder if Buchanan’s anti-Hayekian conclusions are not too strong if one compares them to one of his objectives – “I want to discuss the applicability of the principle of spontaneous coordination to legal institutions” (Buchanan, 30). Is it not possible to derive from the same beach littering example conclusions that would be more favorable to spontaneous coordination? Why, for instance, would property rights not emerge? What were Buchanan’s reasons to reject the establishment and enforcement of property rights as a means to solve the problem of the spontaneous emergence of institutions? Is there something specific to the beach littering situation that impedes the emerge of property rights? And in turn, is this something related to the large number hypothesis that generates the beach littering problem and the emergence of anarchy in the first place? The answer, we believe, is positive.

# 5. The “atrophy” of property rights

## 5.1. The costs of implementing property rights

Buchanan’s refusal to discuss property rights as a means to solve the problem of beach littering was primarily a consequence of his desire to explain why a social contract should be used to organize human interactions, and solve coordination problems, and also, to make sense of the inability of his fellow American citizens to spontaneously cooperate to produce the public goods they collectively need he observed in the 70s. But, then, Buchanan’s desire to explain the need to resort to social contract itself was caused by his belief that under certain conditions it might be impossible for property rights holders to establish or enforce property rights. That was exactly the point he made in *The Limits of Liberty* (1975). The argument, however, was not new for Buchanan. He had already discussed the difficulty to enforce property rights in the late 1950s. Thus, in 1959, Buchanan organized a conference in public finance and came to discuss the paper presented by Charles Tiebout (see Marciano, 2013). There was a point in Tiebout’s essay that matters for our discussion, and it relates to the case of newcomers who arrive in a place in which public goods are already provided and that they have therefore not contributed to finance. The newcomers thus benefit from the public goods without paying for them. If the word and the concept had been part of the language economists had, one could say that they behave as free riders.[[5]](#footnote-6) To deal with the situation, Tiebout then suggested to implement zoning laws that could thus exclude these potential intruders (so to pseak) from the consumption of the public good they did not have paid for (1961, 94; see also Tiebout, 1956, 420).

 Buchanan did not disagree with Tiebout’s suggestion. The zoning laws or restrictions Tiebout proposed and that were aiming at “[p]rohibition on entry” (1961b, 129) could indeed allow the “early settlers... to create a structure of property rights in ‘taxpayers’ surplus’” (129). Consequently, these early settlers, the individuals who had previously paid for the provision of the public goods, would be able to exclude the newcomers, thus transforming the non-excludable public goods in (quasi-)excludable club goods only enjoyable by early settlers, and therefore safeguard their surplus. In principle, thus, the solution was acceptable. But, Tiebout had forgotten to take into account an element on which Buchanan insisted in his discussions: excluding the newcomers was not free. Or, put differently, creating and enforcing zoning laws was not free. Especially, can we add, if the number of potential newcomers was particularly large. Beside paying a fixed cost to design the zoning law, in fact, early settlers should also have paid variable enforcement costs to punish each individual newcomer violating the restrictions. Since these costs clearly depend on the expected number of violations, the overall cost to establish the law is proportionally related to the number of newcomers. To exclude the newcomers and cover these fixed and variable expenses, the early settlers were obliged to “forego capital gains in order to prevent entry of "undesirables" into the community” (Buchanan, 128). And, as Buchanan explained, “this sacrifice of capital gains on possible land holdings may be more than offset by the retention of a greater share of taxpayers' surplus” (Buchanan, 128). The costs of creating these excluding devices could thus be too large compared to the benefits, especially, as we have just recalled, if newcomers are numerous.

 The impact of numbers on the establishment of rules, clubs, property rights or whatever other private solution that may be used to face the problem of newcomers, however, goes beyond the this mechanism – i.e., the cost of establishing and enforcing a zoning law system increases with the numbers of newcomers. Indeed, zoning laws themselves present an element of non-excludability that may further impede their creation. Once established, they protect all individual early settlers, regardless of whether they individually contributed to their costly formation. In this sense, effectively enforced zoning laws can be seen as a public good for the individuals in the early settlers’ community. As such, they may suffer from the large-number impediment recalled hitherto: if the community of early settler is large enough so that each of its members perceive that his or her own actions cannot influence those of their peers, no one will have a rational incentive to promote the creation of such laws. This meant that the early settlers will not enact, and then enforce, the laws that would be necessary to exclude the potential free riders arriving in the group. Therefore, in this situation, the early settlers would not try to create a property right to prevent free riders to benefit from the existing public goods.

 Applied to the beach, the analysis means that an individual or a group of individuals who want to have a plot of sand along the sea unpolluted – and therefore do not pollute it – might be tempted to establish the equivalent of zoning laws to exclude potential litterers. Establishing such rights would be costly, and it might not be impossible that these costs are too high compared to the expected benefits, so high that no one would be ready to pay for them. Or, more precisely, none of the rational individuals who maintain the beach clean would be ready to pay for what can be looked at as a public good, the creation of zoning laws. No property right would thus be created.[[6]](#footnote-7) This provides a first explanation to justify why Buchanan, in 1977, did not want to focus on property rights as a means to guarantee the efficiency of spontaneous order.

## 5.2. Pareto relevance and the atrophy of property rights

To generalize this point, one needs a concept that Buchanan had introduced a few years earlier, the concept of Pareto relevance. In itself, the idea is not very new. The novelty lies in the application Buchanan made with Craig Stubblebine to the concept of externality. Not even two years before he and Stubblebine wrote “Externality” (1962), Buchanan had already explained that some externalities could be perceived as “negligible” (1960, 237). In “Externality”, Buchanan and Stubblebine argued that some externalities could be Pareto relevant, while others were Pareto irrelevant. Two conditions were required to characterize a Pareto relevant externality: the affected party was willing to act in order to lead the acting party to reduce (or increase) his activity *and* the change was Pareto improving. The first condition means that the externality has to be potentially relevant, which means that the marginal utility of the affected party due to the acting party’s behavior is greater than the net marginal utility received by the acting party. In other words, if the benefits the acting party (say, “A”) gets from his activity are smaller than the affected party’s (say, “B”) disutility, then, gains were possible from a “trade” between the two parties: “A [could] surely work out some means of compensating B in exchange for B's agreement to reduce the scope of the activity” (380). Such potentially relevant externalities were defined as “Pareto-relevant” because “when the extent of the activity may be modified in such a way that the externally affected party, A, can be made better off without the acting party, B, being made worse of.” (374) By contrast, when “[t]he internal benefits from carrying out the activity, net of costs, [were] greater than the external damage that is imposed on other parties” (381), then the externality could be said to be Pareto irrelevant. The situation of the affected party can indeed be improved by removing the externality but the loss imposed on the acting party would be greater than the benefit received by the affected party.

 It took Buchanan about a decade to apply this concept to the enforcement of property rights. Now, the problem was not that of the creation of a property right but the enforcement of existing property rights. Let us assume that an individual does hold a property right, and that the assignment of rights is known in advance. Will the individual who is the nominal holder of the property right be able to enforce it? Or, to the contrary, are there not circumstances in which a divergence exists between nominal and effective or actual property rights? That was a question Buchanan raised in a 1972 essay, that remains unpublished to this date. He answered by using the concept of Pareto relevance and irrelevance. “Pareto-irrelevance,” Buchanan explained “implies that the value of the "internal economy" enjoyed by the acting party equals or exceeds the value of the loss that his action imposes externally on the affected party” (1972a, 1). Depending on who holds the property right in the first place, an externality can be either Pareto relevant or irrelevant. Thus, in the famous example of a farmer and a cattle rancher, if the latter hold the property rights and if the costs imposed by cattle on the farmer are lower than the benefit the same cattle brings to the rancher, then the external is irrelevant. It becomes relevant if the farmer holds the right in the first place – the costs and benefits are reversed.

 If we translate the analysis to the beach case, then whether one – or a group of – individual owns the beach or whether the beach is publicly owned would not result in the same consequences. This precisely explains the situation Buchanan describes in his 1977 essay. If the beach is publicly owned, it is not unlikely that the internal economy enjoyed by each littering visitor is greater than the loss imposed on each of the individuals composing the collectivity; therefore, the externality is likely to be Pareto irrelevant. But, if the beach is privately owned; the marginal cost imposed on the private owner(s) by all the littering visitors is likely to exceed the private benefit each of them receives from enjoying (and littering) the beach. The externality is more likely to become relevant, and the property right owner should be incited to enforce his property right. This implies, perhaps unsurprisingly, that we should expect more enforcement when the beach is privately owned. Again, the question is why the private owner is not able to do that? Why property rights are not sufficient to guarantee a spontaneous and optimal allocation of resources?

 As recalled above, a possible answer is that the enforcement costs that must be paid to punish littering visitors are prohibitively large. More specifically, they may be so large that once they are added to the external damage imposed on right holders they make it irrational for the latter to protect their entitlements, making the externality de facto Pareto-irrelevant. Indeed, in calculating whether an externality is Pareto relevant, one needs to consider the objective and pecuniary costs that right holders have to pay to enforce their entitlement– that consist in what the property right holder has to spend to sue an acting party – as well as the subjective and non-pecuniary cost related to legal actions – “personal discomfort”, “inconvenience”, “bother” or “time” (1972a).[[7]](#footnote-8) Then, obviously, when such costs exist, and we are in a farmer-rancher interaction as in the example Buchanan was discussing, then “the farmer may find that any attempt to enjoin or prevent external damage from the rancher’s cattle of to make claims for damages after it is done may cost more than the damage itself.” (1972a, 4)

 More generally, if “the anticipated external damage is less than expected enforcement costs […] the rational course of action for the potentially damaged party remains one of nonenforcement” (12-13). Non-enforcement becomes even more likely if “the rancher knows the payoff structure facing the farmer” (7). In that case, the rancher can reduce his activity to limit the damage imposed on the farmer below the level of the enforcement cost, to be sure that no action would be taken against him. Then, once the process of non-enforcement starts, there is no end to it. Indeed, if the holder of a property right does not enforce his nominal right at the first period, it is unlikely he will try to enforce it in the second period and even unlikelier in the subsequent periods. In these situations, the erosion or atrophy of property rights that Buchanan predicts is inevitable. Obviously, enforcing one’s property rights when the costs are higher than the expected benefits is irrational. It is thus only if property rights holders are irrational that property rights might not atrophy in circumstances of these sort.

## 5.3. The atrophy of property rights and numbers

An argument we would like to put forward at this point, is that the atrophy of property rights is closely related to the large number dilemma discussed earlier, or at least, that it is much likelier in a large number environment than in a small number environment. Hence, despite Buchanan himself did not put in relation these different pieces of his work, it is our contention here that they can be related to one another. How? According to the line of reasoning recalled above, property rights atrophy when enforcement costs make it irrational for right-holders to protect their entitlements. Since enforcement costs are variable and depend on the number of violations that right holders expect to counterfeit, property rights are more likely to atrophy (or not being established in the first place) when such violations are frequent. Hence, logically, property rights over goods that are potentially subject to frequent misuse (as, for instance, a large beach exposed to many visitors) are more likely to atrophy or not being established at all. The same large-number dilemma that prevents spontaneous cooperation makes it impossible to use property rights to solve the issue. If our interpretation is correct, the anarchistic equilibrium populated by self-interested individuals where no institutions can emerge at all is a twofold, self-reinforcing consequence of the large number dilemma. On the one hand, individuals do not cooperate because they know that their choices have no effect on the others’; on the other hand, they do not establish property rights because they anticipate that the large number of potential misusers make the enforcement of their entitlements irrational.

 This reasoning applies to the beach case straightforwardly. The farmer is in the same position of the potential property right owner of a beach, and the rancher in that of the potential litterer, the visitor of a beach. The property right owner faces many damages coming from various individuals. He cannot obviously engage a legal procedure for each piece of garbage that is forgotten on the beach, or for each damage caused to his property. Damages are too numerous. The costs would be disproportionate, compared to the benefits. And, obviously, once the owner of a beach has decided not to enforce his property right, it becomes more and more costly to enforce them. In the end, it happens what Buchanan described in “The Atrophy of Property Right”, an erosion of property rights. In the case of the beach, the problem is complicated by the fact that more than one “rancher” (visitor) is involved. The overall cost of pollution does not stem from the act of a single, well-identifiable polluter (the rancher): it results from the sum of the polluting actions of many, uneasy to identify individuals. Once these individuals have left the beach, it is even costlier to sue them (the costs of finding them are likely to be prohibitively high). Thus, the larger number nature of this problem undermines another possible solution Buchanan envisaged to deal with the atrophy of property rights. In the case of one farmer repeatedly interacting with one rancher, he indeed proposed to have the costs of enforcement paid by the rancher. In case of multiple “ranchers” (polluters) the solution does not apply.

 In the beach case, thus, there remained only one genuine solution to make the enforcement of property rights credible: to transfer the task to the government and turn “law enforcement” into “a genuine public good” (see also Buchanan, 1973, 121).[[8]](#footnote-9) Here, Buchanan explained why law enforcement should be a public good, a point that had not been explained carefully before – “the analysis here forces us to be more specific with respect to the community’s role in financing the enforcement costs that are incurred in defending nominally-assigned property rights” (Buchanan, ivi, 16). Indeed, that was precisely why property rights should be looked at as public goods: because it “tend[s] to increase [the farmer’s] willingness to initiate enforcement action” (Buchanan, ivi, 16). Indeed, the uncertainty farmers or any property right holders face would be reduced; ranchers and polluters of all kind would be obliged to respect property rights because they would know that these rights would be enforced. That would be costly to the government, Buchanan added, but “The presence of major efficiency gains suggests that the productivity of public investment in absorbing these costs may be large” (Buchanan, ivi, 18). That was exactly the solution Buchanan suggested in the 1977 essay in which he used the example of the beach.

# 6. Conclusion

Buchanan wrote “Law and the Invisible Hand” in a period in which he was trying to show that anarchy could not be more than an ideal. It had to be admitted, even by someone like himself who was “a philosophical anarchist” (1978, 29). It is in this period that Buchanan opposed the idea that law and institutions could emerge spontaneously from interactions between individuals. This point could be viewed as contradicting what he had demonstrated, a few years earlier, about cooperation in small groups. In such environments, in fact, Buchanan was convinced that individuals were able to understand that gains could be made from cooperating and build institutions to organize their cooperation, without any external constraint. Conversely, in “Law and the Invisible Hand”, Buchanan rejected this view, mainly, because he was trying to prove a very specific point: that anarchy unavoidably leads to a state of generalized non-cooperation. In doing so, he thus assumed a very specific definition of anarchy – the brutish state of nature Thomas Hobbes had envisaged in which individuals behave independently from one another, without departing from the pursuit of their narrow self-interest. Yet, Buchanan did not only reject spontaneous order because of this specific assumption. He also had reasons to believe that under some circumstances property rights could atrophy, that the nominal holders of property rights might not be able to have these rights respected. Indeed, the costs implied by the need to enforce property rights could be an obstacle to their enforcement. That was another reason for him to argue that in these cases, the government should pay for these enforcement costs, or even, substitute market-exchange institutions in the provision of those “goods and services that exhibit the requisite of “publicness”” (Buchanan, ivi: 11).

The purpose of this paper was to put together the philosophically intertwined althought sometimes seemingly contradictory insights that Buchanan put forward in a number of otherwise unrelated contributions he wrote between the 60s and 70s. More specifically, we have argued that the criticism of spontaneous order that pervades “Law and the Invisible Hand” (as well as many other contributions he wrote in the 70s) is only apparently in contradiction with the confidence he showed in those mid-60s contributions where he claimed that cooperation would always spontaneously emerge in small groups. Indeed, these two pieces of his work are easily reconciled once anarchy is understood as a situation that can only emerge in large-number environments, where individuals do not recognize the interdependence with others, exactly as they do, according to Buchanan, in the anarchistic equilibrium. Moreover, we have argued that the same large-number problem that, at least in our reading, generates the state of generalized non-cooperation that characterizes the anarchistic equilibrium is also the cause of why property rights are ineffective in solving the coordination problem that creates such state of “generalized non-cooperation”. To summarize, we have tried to highlight a sort of *fil rouge* in Buchanan’s work that keeps together the following otherwise seemingly unrelated propositions that one may however derive from his contribution: 1) in large groups individuals do not cooperate; 2) in large groups, property rights cannot be used to solve coordination problems; 3) in the anarchistic equilibrium, individuals do not cooperate; 4) in the anarchistic equilibrium, no institutions can emerge, and property rights cannot be used to solve coordination problems. Putting together propositions 1-2 with propositions 3-4, we argued, logically, that 5) anarchy is a large number reality. If this line of argument is correct, and given that it seems unabashedly true that “the sweep of history is considered to make inevitable and irrevocable the interaction of larger and larger numbers of person” (Buchanan, 1965b, 11), the need for law that Buchanan was invoking in the late 70s is more topical than ever, as sadly confirmed by the current wave of environmental degradation that witnesses once more that Buchanan’s intuition was correct: in large number environments, individuals fail to produce the public goods they need, and resorting to a social contract is the only way to escape the anarchistic equilibrium that otherwise eventually results.

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1. On March 15, 1965, Buchanan wrote Roland McKean: “Another of my current interests involves treating all externalities as cases of joint supply”. He was referring to an article that would be published in 1966, “Joint Supply, Externality and Optimality” in which he explained why externalities could be “classified as one sub-category of joint supply.” (1966, 404) [↑](#footnote-ref-2)
2. Why Buchanan was this confident that cooperation in small number environments would always emerge, of course, is another interesting question, which this paper leaves unanswered. [↑](#footnote-ref-3)
3. Buchanan was explicit about that: “The results emerge because of the absence of communication between the prisoners and because of their mutual distrust. The large-number dilemma is a more serious one because no additional communication or repetition of choices can effectively modify the results.” Later he added, “In a group of critically large size, the individual will tend to adopt the rule of following the expediency criterion even if he thinks that all of his fellow citizens are saints,” (1965b, 7) In other words, Buchanan was explaining, reciprocation is not an option. [↑](#footnote-ref-4)
4. This situation corresponds to what Samuelson, and other economists, viewed as the standard case of market failure. [↑](#footnote-ref-5)
5. Let us insist that neither Buchanan nor Tiebout used the term. Let us also insist that, to Buchanan, as he made it clear (and will repeat it in “Ethical Rules”, 1965b), the way newcomers behave is purely rational, and should not be viewed as trying to benefit from the public goods at the expense of others. It’s not cheating or parasitism. [↑](#footnote-ref-6)
6. One must note here that arguing that the creation of property rights might not be a mean to exclude free riders (because enforcing a property rights is costly and might be more costly than what the right yields) anticipates a condition that should be respected to allow the creation of a club, that Buchanan would discuss later: clubs can exist only if the costs of exclusion are smaller than the benefits each individual gets from belonging to the club. [↑](#footnote-ref-7)
7. “Everyday routines are interrupted by seeking legal relief; relationships with others in the social group may be made less pleasant; lawyers can only be hired for money; time delays involved in legal proceedings may be significant.” (4) [↑](#footnote-ref-8)
8. “Law enforcement qualifies as a genuine “public good” in that there are major efficiency gains from joint, as opposed to individual provision.” (1973, 121) Or “there are acknowledge to be major advantages from organizing law enforcement publicly rahter than through private and independent action.” (121) [↑](#footnote-ref-9)