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ORIGINAL ASSIGNMENT OF PRIVATE PROPERTY

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Abstract

Within the context of property rights' systems, developed either by traditional tribal communities or by modern political communities, one will always be confronted with the problem of non-appropriated and abandoned assets. In the legal tradition we use to call the first category *res nullius*, the second *res derelictae*.

The question arises by which rule or procedure *res nullius* and *derelictae* should be brought under an ordered property rights' regime and be put, provided transferability of such assets is recommendable, within market circulation.

This entry summarizes the modern economic theories on these issues.

JEL classification: K11

Keywords: First Appropriation, Capture, Occupation, Auction, Title, Initial Acquisition

1. Introduction

Within the context of property rights' systems, developed either by traditional tribal communities or by modern political communities, one will always be confronted with the problem of non-appropriated and abandoned assets. In the legal tradition we use to call the first category *res nullius*, the second *res derelictae*. The origins of the *res nullius-res derelictae* problem are obvious: (1) either already known assets are not yet appropriated by members of the concerned community or are abandoned again by these numbers; (2) new types of scarce resources, which were not known or not regarded as scarce at the moment of the articulation of the rules of the property rights system, may appear. Examples of (1) are: newly discovered, acquired or conquered land such as the American West, wild animals, water from seas, oceans and streams. Examples of (2) are: inventions and artistic creations, frequencies of the broadcast spectrum, subsurface minerals, orbital spaces.

The question arises by which rule or procedure *res nullius* and *derelictae* should be brought under an ordered property rights' regime and be put, provided transferability of such assets is recommendable, within market circulation.

In order to demarcate the subject matter of this chapter as clearly as possible from other topics, it is necessary to point to some differences with the problem of the emergence of a property rights system as such and with the notion of adverse possession.

The problem of emergence of property rights systems regards the economic rationale and the involved cost categories of setting up a property rights rule system and institutions as such. Under the heading of emergence of property rights, the evolutionary process from an institutionless and ruleless open access-situation towards an ordered system of rights, administrative, policing and adjudicative institutions, is analyzed. In this chapter a problem is discussed which will necessarily always emerge also within established property rights systems. The problem of the emergence of property rights systems implies also the rights' area of political power. For this subject matter we suppose that the constitutional problem of the right political power-balance is solved in an economically rational way, so that the problem may be defined as a choice to be made by an economically rational political or judicial agent between different alternatives concerning the establishment of property rights on *res nullius* or *derelictae*. Of course, there are strong similarities between the two subjects. In both cases, for instance, one has to deal with initial open-access situations and one will be faced, as a consequence, with the problem of establishing property rights on stock or rights of capture on flows of stocks.

The problem of initial acquisition should also be distinguished from the problem of *adverse possession*. In the former case, one is dealing with assets which are unowned in terms of the concerned legal systems (for example, land of the American West in terms of the US legal system, not necessarily in terms of native American tribal systems). In the latter case, one is dealing with assets which are, though still owned, not in factual possession of the owner but of another person, that is, the adverse possessor. The problem of adverse possession regards both the relationship of the adverse possessor with third parties and with the real owner (see further in this volume, 1200, Adverse Possession and Title Systems). In both cases, however, one has to deal with the problem of the definition of possession; in the first case because often first possession constitutes the legal base of initial acquisition, and in the second case in order to determine when one is entitled to claim the protection the possessor enjoys against third parties, and to determine the start of prescription periods.

2. First Appropriation or Auction?

The rule of first appropriation ('first come, first served'; 'finders, keepers') is firmly rooted in Western legal culture and social practice. Also in state of nature situations, such as the allocation of parking places on the street and seats in a restaurant, people regard it as natural that the first occupant should be respected. Probably the possessive advantage explains a lot of this spontaneous attitude.

Legal rules, endorsing first appropriation, are often considered as expressions of a democratic and egalitarian spirit. Everyone has an equal chance at the start, without regard to his class-status, race or religion.

The *American Homestead Act* of 1862 is probably one of the most striking examples of this egalitarian philosophy (Allen, 1991; Lueck, 1995). The act allowed families to claim 160 acres of land, a surface considered as sufficient to feed a large farmer's family. At the payment of ± 10 dollars and the uninterrupted occupation of the claimed land during five years, the claimants obtained a valid title. The Act was applicable to the vast territories, west of the Mississippi-Missouri. About 250,000,000 acres were patented under the Act. Under *Roman law*, first appropriation (occupation) was possible for goods which did not belong to anybody (*quae antea nullius erant*), such as wild animals, for goods taken from enemies (*quae ex hostibus capiuntur*), for abandoned goods (*res derelictae*) (see Gaius 2, 66; see D. 41, 1,1,1-7; D. 41,7,1. Van Oven, 1948). For *treasure trove* (*thesaurus*) finders keepers applied when the treasure was found in the finders' land. When another found the treasure half of the treasure accrued to the finder, half to the owner (see I, 2, 1, 39. Van Oven 1948; see also art. 716 Belgian and French C.C.).

The *Common law* upholds also a rule of first appropriation concerning unowned things such as wild animals, as is illustrated by the famous case of *Pierson v. Post* (3 Cai. R., 175, N.Y. Supreme Court, 1805 - see further).

First appropriation is also deeply rooted in *liberal legal philosophy*. According to John Locke first appropriation through mixing his own labour with the land constituted the only way of initial acquisition in the state of nature. As a consequence, Western colonists could freely homestead land in America, for Indians still lived under a state of nature (Grunebaum, 1987; Tully, 1994).

While the first appropriation rule is firmly rooted in our legal tradition and social practices, many economic studies criticize this solution as *an inefficient rule* (Anderson and Hill, 1990; Barzel, 1968; Libecap and Wiggins, 1984; Merrill, 1986). Before discussing the economic merits or shortcomings of the first appropriation rule, we have to make an important distinction between the possession of a *resource stock* and the possession of *resource flows* (Lueck, 1995). In the first case the possessor, able to control

the stock in a stable way, has the prospect to future flows of this stock. In the second case, the possessor, unable to control the stock as such, is only able to capture flows once they are generated by the stock.

Examples of the two categories are:

<i>Stock Possession</i>		<i>Flow Possession</i>
- fields	-> crops	- ocean fisheries
- cattle	-> meat, milk	- water from streams
		- wild game
- real estate	-> rents	- fugitive resources (oil, gas)
- copyright	-> royalties	- underground water
- money	-> interests	

The discussion about the efficiency of initial acquisition rules has another dimension in cases of stock possession than in cases in which only flow can be captured. Consequently we discuss the case of stock possession first.

In several economic analyses it is pointed out that first appropriation rules concerning resource stock provoke a race among potential claimants, by which ownership is established *too early*. This may lead to a *full dissipation of the rental stream of the asset*. In order to show this source of inefficiency, we compare with the situation in which only *a single claimant* is interested in establishing ownership of a stock resource. We assume also that the flow value *grows overtime*, due to increases for in the demand the asset caused, for instance, by population growth (Lueck, 1995, p. 398).

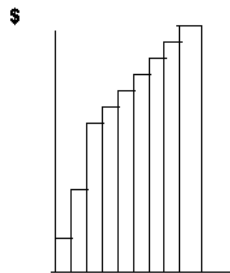
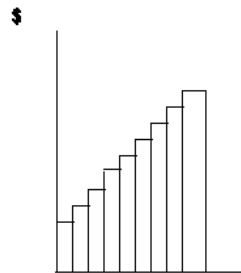
Under these assumptions the optimal time t^x to establish ownership for a single claimant is the point where the marginal return from waiting, that is, the present value of the stock flow at t^x , equals the marginal cost of waiting, that is, the present value of the opportunity cost of establishing rights also at t^x .

When a first appropriation rule opens an *unconstrained competition among many potential claimants* and these claimants are more or less homogeneous (more or less at an equal starting point in the race, due to equality of physical strength, investments and information), rents will be entirely dissipated.

The competitive rush between potential claimants to claim rights causes ownership to be established at the t^R , when the present value of the rental flow at t^R equals the present value of the entire costs of establishing ownership at t^R . Rights are, compared with the single-claimant situation, established too early. The race equilibrium implies that the rental stream is fully dissipated.

The condition of homogeneity among potential claimants is, however, very unlikely. Several factors in the real world cause heterogeneity among

claimants by which a full dissipation of rental streams of resource stock does not occur. Heterogeneity in this context does not refer to the variance of distribution of the costs of establishing ownership among potential claimants, but to the cost gaps between the lowest-cost contenders.

Figure 1a**Figure 1b**

The distribution of costs in Figure 1b is at greater variance than in Figure 1a, yet heterogeneity, as understood in this context, is higher in the distribution of costs in Figure 1a because the differences between the lowest cost-contenders, the ones most likely to participate to the race, are larger.

In the case of relevant heterogeneity the lowest-cost contender may enjoy such an advantage to the next best contender that his appropriative behavior becomes similar to that of a single claimant, by which appropriation at an efficient time may occur. Heterogeneity of potential claimants can be the result of different factors such as unequal distribution of talents and information, an historical advantage in investment, or random factors. It can be diminished by investments, for instance a company investing in research capacity in order to fill the gap with a competitor who had started already his rush to a patentable invention. The other factors are, however, important enough to preserve in most cases a decisive margin of heterogeneity.

Beside natural factors such as uneven distribution of talents and random factors, heterogeneity can also be preserved by an institutional factor. Possession can be defined in such way that competitive races are excluded. The finders keepers rule, for instance, attaches crucial legal importance to the random fact of finding, so that competitive rushes become impossible. As a consequence, one must conclude that a first appropriation rule does not lead necessarily to full dissipation of rents. When heterogeneity among

potential claimants is guaranteed, dissipation will be avoided and property rights will be established on efficient point in time.

The main alternative for a first appropriation rule, which can be defended on economic grounds, is the auction. This procedure presupposes of course a pre-appropriation by a third instance, such as public authorities, which pretend to have a general claim on assets, especially land, on the basis of legal prerogatives such as eminent domain, or the right to the spoils of conquest or discovery. These pre-appropriated assets are then submitted to an auction procedure, through which the asset is allotted to the highest bidder. By this procedure, it is argued, assets are on average allotted to the most efficient users because these users expect the highest return of the asset and will consequently bid away with the highest offers. This market-mimicking procedure implies, however, also some costs (Lueck, 1995, p. 403). Mainly three cost-categories must be envisaged:

- (1) *Defining the auctioned assets*: an auction requires a definition of the auctioned assets; such a definition requires costly information (search costs, prospection, valuation) about the assets in order to avoid the so-called winners curse. Such costs can be prohibitively high, so that an auction procedure has to be written off for initial acquisition. An extreme example in this respect regards inventions. In order to auction them, the auctioneer has to invent them first, in order to define them. A first to invent policy, which allots the intellectual property to the inventor himself, is obviously much cheaper because it avoids the transaction costs between inventor and auctioneer, and auctioneer and bidders.
- (2) *Costs of the auction*: auctions are costly, not only on the side of the auctioneer, but also on the side of potential bidders.
- (3) *Costs of protection of property rights*: in order to auction, the auctioneer has to secure property rights on the auctioned assets.

In the choice between the two main alternatives, that is, first appropriation or auction, a trade-off exists between two categories of costs: the efficiency losses due to too early establishment of property rights in competitive races on one hand, and the different costs of auction procedures on the other hand. In particular two factors are decisive in this respect: the heterogeneity-homogeneity of potential claimants for the cost levels of first appropriation; and the possibilities to define and to evaluate ex ante the concerned assets for cost levels of auction.

3. Rules of Capture

When the establishment of property rights on an entire stock is impossible or at least too costly, because exclusion costs are prohibitively high, property rights will only prevail on the flow of the stock.

For instance, instead of establishing property rights on an entire oil well underground, property rights are only possible on pumped oil; instead of establishing property rights on herds of wild animals, property rights are only possible on captured and killed game; instead of establishing property rights on entire streams or rivers, property rights can only be established on water taken from them.

A situation of capturing only flows can lead to *an open access dissipation* (see also Chapter 2000 in this volume). With an increasing number of users the marginal return to the effort of using declines. Due to the lack of any restriction, the numbers of users increases until the marginal return is equal to the marginal effort, which means that all rents from the flow of the resource are dissipated (Lueck, 1995, p. 403).

Take, for instance, a river in a desertifying area, submitted to an open-access regime of capture. The evolution of returns is as follows:

Number of Users	Effort Cost	Average Return	Total Profit
10	10	100	900
20	10	90	1600
30	10	80	2100
40	10	70	2400
50	10	60	2500
60	10	50	2400
70	10	35	1750
80	10	20	800
90	10	10	0
100	10	0	-1000

The optimal amount of users is 50 while under an open-access -regime additional users will show up until the cost of effort is equal to the average return, which is at the same time the marginal return for each user separately because in the example each user is supposed to exhaust water during the considered period. Consequently, only once the number of users will increase up to a number of 90. At that number profits of water use are nil.

With this problem in mind, we may assume that several institutions, legal as well as customa, which regulate a situation of flow capture, may find their economic rationale in an attempt to solve or to alleviate this problem. We can distinguish the following ones:

3.1 Common Property Arrangements

The open access is restricted to some users. By this a kind of common property on the asset is introduced, the commoners being the ones entitled to capture. This can lead to more optimal use-levels. On the other hand exclusion costs may increase. Because there is an inverse relationship between exclusion costs and the number of included, the trade-off between exclusion costs and costs of rent dissipation may lead to a number of users, which is higher than the optimal amount (Lueck, 1995, p. 422).

Examples of such a common-property arrangements are:

(1) *Riparian rights*: the system of riparian rights prevails in England and in the eastern American states. It is based on old common-law doctrine. Water rights are tied to ownership of land, bordering the water. Owners (or people with a derived right) of such land are entitled to correlative and reasonable use of the water. The water rights cannot be sold apart from the land (Lueck, 1995, p. 427; Rose, 1990).

The system creates a common property regime of adjacent landowners to the water. Due to the restriction the users are able to control each other in order to prevent overuse and dissipation. The common property regime by the bordering landowners permits also a low-cost -control. Downstream owners will suffer from overuse or pollution from upstream -owners and will react quite swiftly. The setting up of expensive superincumbent control agencies can be avoided in this way.

(2) *The commons*: in most villages in Europe some land, such as wasteland and pasture-land, was held in commons. All families of the village were entitled to use this land for gamekeeping, for gathering dead wood and for grazing their cattle. Because the villages were involved in long-term and multiplex relationships, rules on overuse were easy to implement. In fact, most historical commons do not reflect the dramatic picture of the tragedy of the commons as depicted by Hardin (Ellickson,1993; Lueck, 1995, p. 422).

(3) *Wild game*: in feudal England, the right to capture game was limited to feudal lords as a privilege. This restriction, based on class origin, limited access and probably prevented inefficient over-hunting (Lueck, 1995, p. 424). It was expected that the collapse of this feudal privilege system would lead to overuse and rapidly declining populations of wild game. This was effectively the case at the beginning of the French revolution, when all farmers suddenly started to hunt, mainly in order to protect their crops against pigeons and rabbits. As a consequence, strict regulation had to be imposed to control the hunting of game in France. Also in England, game hunting privileges were abolished during the nineteenth century and ownership rights to wild game were granted to all landowners. The effect was, however, far less dramatic in England than in France.

The enclosure movement had created large consolidated holdings. This permitted large wild game stocks to live on a few holdings. Agreements to control game capture remained as a consequence, easy to reach and to implement.

In America, with its scattered private landholdings (see also the Homestead Act) and its wide-ranging species, control of game capture by private owners was difficult, so states were granted extensive regulatory control over the access and use of wildlife.

3.2 Intensive and Stable Group Interaction

As mentioned already in quoted examples, multiplex relationships between the members of the capturing community will stimulate spontaneous (that is, not imposed and not enforced by an external authority) restriction of the use of flows and the prevention of open-access dissipation.

If some members of the same community care more than others about the common and the future wealth of it (moral entrepreneurs) they will be able to develop restrictive rules and practices, which can be enforced by second-party control (tit for tat, because multiplex relationships imply repeated games) and by third-party control, based on gossip and reputation (Ellickson, 1991).

Historical examples of such close-knit societies, restricting spontaneously the capture of flows, are easy to find: the 'commons' of agricultural villages; hunting and fishing rights in tribal societies (Johnsen, 1986); and customs of lobstermen in Maine (Acheson, 1989).

3.3 Maintaining Homogeneous Group Membership by Equal Contingent Rules

Often groups whose members are entitled to flow capture apply a rule following which each member is entitled to a same amount of capture. At

first sight such a rule seems to be inefficient, as the highly productive capturer will spend too little effort, while the less productive too much.

It is possible, however, that equal-contingent rules are maintained in order to stimulate homogeneity of group membership. These rules force a group to preserve homogeneity by screening potential members, by indoctrination and by limiting the transfer of membership rights (see below) (Lueck, 1995, p. 408).

By preserving homogeneity the group prevents the more efficient capturers from eliciting a race for capturing, which leads to overuse and open-access dissipation. As an historical example we can quote the equal access of English villagers to the common resources (pasture - grass, estover - wood, diggings - coal and stones, turbarry - burf and peat, piscary - fish) (Lueck, 1995, p. 422).

3.4 Restriction of Transfer of the Right to Capture

Restrictions of trade are usually inefficient as they hamper the allocation to the highest bidder, on average the most efficient user of the good. When property rights can be established on entire stocks, limits to transfer, which might have existed for religious and military reasons, tend to disappear. The gradual marketization of land in European legal history serves as an example. When rights can only be established on flows of stock, the restriction of transfer may find its economic rationale in the preservation of homogeneous membership and the avoiding of open access dissipation (Lueck, 1995, p. 409). When rights of capture are transferable one can expect a rapid decline of homogeneity as rights will be always traded to more efficient users, offering a price which is higher than the expected capture returns of the present user. Consequently, trade of capture rights will lead to heterogeneity of users, possibly leading to a race for capturing. Examples of such restrictions of trade are: the rights of English villagers to the commons, the right of riparian owners to use water for household consumption.

4. Definition of Possession as a Title for Initial Acquisition

Under a rule of first appropriation the person who took control over the concerned asset becomes the owner. This apparently simple rule is, however, often difficult to apply to practical cases as questions may arise about the concrete acts and signs necessary to establish factual control. This is illustrated by the famous case *Pierson v. Post, 1805*. Post was hunting a fox on an unowned beach. He almost had the beast in his sights when an interloper appeared, killed the fox and ran off with the carcass. Post sued on the theory that his pursuit established his property right to the fox. The court

however, decided otherwise, arguing that only the one who killed or at least mortally wounded the animal and thereby bringing it under a certain control had a claim to ownership. One can find similar cases in all legal systems, about which long doctrinal debates developed.

Does economics have to say anything in this debate? Can we develop an economic criterion for an efficient definition of possession in order either to apply the first appropriation rule or to fix the beginning of prescription in case of adverse possession ?

From an economic point of view the definition of possession should meet two criteria: clarity and stimulation of heterogeneity of potential claimants.

4.1 Clarity

The acts and circumstances which serve as a sign of possession should be clear and unambiguous to the members of the legal community. They must reveal in a clear way one's intent to appropriate.

By linking ownership rights to unambiguous, visible signs of possession one avoids further inefficient racing for a specific asset and endless trials about possession. The preference for clarity is illustrated by the famous case *Brumagin v. Bradshaw 1870* (39 Cal. 24 1807; Rose, 1985). The case concerned a considerable amount of land in the Potrero district of San Francisco. Before this land had become a residential and commercial area, it had been settled by a certain George Treat, who pastured livestock on the land. The party which claimed through Treat alleged that the latter had repaired a fence across the neck of the Potrero peninsula. The other party alleged that outsiders could still land in boats and that there was a gap in the fence. The court ruled that a jury should consider whether Treat's fences gave sufficient notice to the public that he had appropriated the property.

Also in the case *Pierson v. Post 1805*, the court ruled in favor of Pierson, who killed and the fox took the carcass. The court decided in favor of the party which had itself put in the clearest position of possession and about which uninformed outsiders would most likely recognize the possession.

The preference for clarity in the definition of possession implies also a trade-off between inefficient racing and litigation costs on one hand, and the impairing of incentives of efficient appropriation by saucy intruders on the other hand. In the case *Pierson v. Post*, Pierson free-rode on the efforts of Post. Such a ruling could stimulate free riders' attitudes in general, by which efficient appropriative behavior would be hampered and suboptimal appropriation levels would prevail (Rose, 1985).

4.2 Stimulation of Heterogeneity among Claimants

As mentioned already (see Section 2) the dissipation of rental streams is the highest when potential claimants are homogeneous. By defining possession in a certain way it is possible to influence the homogeneity-heterogeneity level of potential claimants and to prevent rent dissipation to a certain extent. As a consequence, some possession rules may find their economic rationale in the stimulation of claimants' heterogeneity. The following examples can be given:

(1) *Finders Keepers Rule for Finds*: this rule applies often for treasure trove, abandoned property (voluntary parting) and lost property (involuntary parting). Salvage rules under maritime law, however, allow for a division of the spoils (sunken ship and their cargo) between finder and the former owner.

Art. 716 Code Civil (Belgium-France) also allows for a fifty-fifty division of treasure trove between finder and owner, when the treasure is found on somebody else's land (see also art. 939 Code Civil Quebec) (Dukeminier and Krier, 1993; Lueck, 1995, p. 413).

The finders keepers rule limits competition among potential claimants to time 'first come first served', by which appropriation becomes largely dependant on random factors. Consequently, other potential claimants than the finder are not able to eliminate heterogeneity by investments.

(2) *Telepossession*: in the case *Columbus-American Discovery Group Inc. v. Atlantic Mutual Ins. Co.*, 1992 (974, F. 2d 450-4th Cir 1992) (Lueck, 1995, p. 413) the court allowed the establishment of rights on a sunken treasure through the use of remote video cameras which produced live images. It did not require physical possession, but coined the term telepossession.

By such a definition of possession in this case the court maximized heterogeneity among sea explorers and prevented costly duplication in exploration.

(3) *The Homestead Act 1862*: this already mentioned Act (see Section 2) seems to refute the thesis of efficient definition of possession. Rather, the procedures of this act concentrated on stimulating the homogeneity of potential claimants through publicly announcing and promoting the homesteading of the concerned areas.

Further elements of the historical context of this act, however, offer an explanation of these procedures. On the one hand, auctioneering and land sale by the government, the most used procedure prior to the Homestead Act, proved to be too costly for the frontier (definition and division of land tracts). On the other hand, squatting on the land at the frontier increased rapidly, which created rising problems for protecting the squatters against Indians and criminal gangs. By opening blocks of land tracts to the public, by organizing races among many potential claimants for these tracts, dense

settlement of land was promoted, by which land enforcement costs were mitigated (Allen, 1991; Lueck, 1995, p. 414).

4) *Hard rock mining*: the American General Mining Law of 1872 establishes a first appropriation rule for mineral rights on public lands. The miner who discovers a valuable mineral deposit, locates the claim and does the assessment work, can apply for a patent. While prospecting, he is protected by the doctrine of *pedis possessio*. The law protects the possession of the miner in order to obtain a patent eventually later on, at the moment when heterogeneity is the highest, that is, at the moment of the discovery (Lueck, 1995, p. 416).

(5) *Intellectual property*: for this type of property, mostly a first to invent policy is followed by applying the rule of acquisition by creation (Dukeminier and Krier, 1993).

The auction alternative would only be possible here after the invention or creation, which would impair incentives for research or artistic creativity a lot.

Several studies point to the fact that the law tends to grant the invention ownership very early, when claimant heterogeneity is still large.

Also courts tend to grant broad patent protection when a new invention signals room for many improvements, thus preventing a race for ownership. When an idea has limited room for improvement, only a narrow protection is granted (Grady and Alexander, 1992).

(6) *Whaling norms*: as for wild game the rule of first appropriation may pose a problem for whale fishing. Often whales are pursued by one ship, harpooned by another and, after breaking loose, killed and captured by a third ship. Customary rules were developed among whalers which reflect the avoidance of wasteful races by fixing possession at the moment of high heterogeneity. These rules differed, however, according to the kind of whale being fished. When the right whale, a docile kind of whale, was mostly fished, whalers applied the fast fish-loose fish rule, that is, the whaling boat which kept the whale to the boat with the harpoon was the owner. If the whale got loose, it was open again for catching. This rule preserved maximum heterogeneity.

When whale fishery turned more to the catching of sperm whales, a very energetic kind, whalers applied the iron holds the whale rule, that is, even when the fish got loose but the boat whose harpoon was in the whale remained in fresh pursuit, this boat preserved its possession. The other rule became unpractical because sperm whales, once harpooned, could sink the boat by diving. As a consequence, a rule which preserved heterogeneity too, but was less dangerous, was applied (Ellickson, 1991, p. 195).

Acknowledgements

The author would like to thank Roger Van den Bergh for organizing the anonymous refereeing procedure.

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