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## Center for Law, Economics and Financial Institutions at CBS

LEFIC WORKING PAPER 2005-09

### **The Transfer of Property Rights by Theft – An Economic Analysis**

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# The Transfer of Property Rights by Theft

## – an Economic Analysis

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October 6, 2005

**Abstract:** This article studies the involuntary transfer of property rights by theft - a topic almost unexplored in the law and economics literature. The question is whether a buyer of a stolen good should obtain title to the good if he/she has purchased it in good faith. As described in the article different jurisdictions treat this issue differently. The traditional theory suggests that there is a trade-off between the costs of protecting the good and the costs of verifying the ownership. However, as shown, the rule of law concerning this issue significantly affects parties' incentives. Specifically, it is shown that a rule of law where good faith is irrelevant in determining the issue of property rights Pareto dominates a rule where good faith may protect an innocent buyer. Thus, an owner of an asset will spend more resources on protecting his property and potential buyers will incur higher costs in order to verify the ownership when good faith is decisive for the transfer of property rights.

**JEL Classification:** K11, K14 and K42

**Keywords:** property right law, theft, good faith and game theory

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## Introduction

Imagine a situation where a person has just purchased a good from a seller only to be confronted by another person demanding that the good be handed over, arguing that she is the rightful owner of the good and that a thief had just stolen it. The basic question is whether a buyer should be allowed to keep the good or not, assuming that the purchase was made in good faith i.e. the buyer assumed the seller was the rightful owner of the good. Moreover, the problem deals with the conditions under which the initial owner can contest the validity of the deal between a purchaser and a thief. The situation is identical to the case where the initial owner contracts with a buyer and afterwards resells the same good to another buyer, although this article focuses on the former case.

To illustrate, the Danish police recently accused one of the most famous soccer players in Denmark of handling stolen goods. He had bought a beautiful luxury watch on the busiest shopping street in Copenhagen (called Strøget) for 2,500 Danish crowns. A few days later he was being interviewed on national TV by a sports reporter when a viewer suddenly recognized the watch he was wearing as his own recently stolen one. He immediately contacted the police and was able to prove his ownership. The soccer player claimed in court that he thought the watch was a copy and was unaware of the fact that the watch was much more valuable than the price he had paid for it (the watch had a value of 150,000 Danish crowns), which was rejected by the court.

The term *rei vindicatio* stems from Roman law and describes an owner's right to claim his good back from a person who unlawfully has the good in his possession. *Natural law* or *jus naturale* was the dominant legal foundation for the majority of European countries that coincide with Roman law<sup>1</sup>. The rule was an absolute doctrine of vindication, which was regarded as an inherent attribute embedded in the notion of property rights at that time.

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<sup>1</sup> The Dutch legal scholar Hugo Grotius is regarded as the founder of the rationalistic natural law c.f. his work on the law of peace and war entitled "De jure belli ac pacis libri tres" (1625).

Different legal systems prescribe various solutions to this fundamental problem of property rights. Some legal systems place the entire risk on the buyer, whereas other systems place the risk on the initial owner. However, as this article shows, the choice of legal rule has important economic consequences and thus influences parties' incentives differently.

A person who is offered a television in the parking lot outside a bar is rarely in doubt that the television is stolen. In other situations, a person may find it difficult to determine the likelihood that the offered good is stolen. This is the case when used goods are offered for sale outside private homes (garage sales) or sold through pawn shops. In fact, most stolen goods are traded in workplaces where many people interact and rarely in sinister places. In some situations, a person may even place an order announcing his interest in a particular good, e.g. in a designer manufactured good or a rare cultural artifact.

Moreover, the problem of who should be the rightful owner does not only pertain to small private transactions, but also to large international transactions involving government agencies and private organizations. For instance, famous accredited museums in the Western world arrange exhibitions of foreign cultural artifacts. In many cases, the original country seeks to have the cultural artifacts returned, claiming that they are part of the country's national heritage and that they have been stolen or transported illegally abroad. Whether the museums are acting in good faith is difficult to assess for certain, but the choice of legal rule obviously raises some important cultural and financial aspects. For instance, should a country of origin receive some kind of compensation, and if so, how does one determine a just compensation in the absence of a market for such goods. The problem is complicated by the fact that the appropriate choice of law needs to be solved first. Besides these legal aspects, there is considerable political pressure from powerful interest groups that may try to influence the public debate on this question.

Another possibility is for a thief to sell the stolen goods through an auction, particularly if the auction house does not require that the ownership be documented, which is the case for some auction houses on the Internet. To illustrate, the Danish police had recently solved a case where very rare five-hundred-year-old Danish books were stolen from the Danish Royal Library. They were stolen by a former employee at the library who sold the books abroad at different auctions in Germany and the UK (Sweden has just experienced a rather similar case). The police are currently trying to track down the rare books, but have faced severe juridical as well as practical difficulties in seeking to repossess the books.

The problem does not only relate to the law of property rights but also to criminal law, since in almost all jurisdictions a person handling stolen goods is criminally liable. Therefore, one needs to take this fact explicitly into consideration, because a potential buyer is concerned not only about the risk of having to hand the good back to the original owner, but also about the expected punishment from a criminal court. Alternatively, instead of having a separate criminal article for handling stolen goods, the buyer might be charged with complicit participation. The reason for punishing a buyer who knows (or should have known) that the good is stolen is that legislature seeks to impede the distribution of stolen goods and thereby the aggregate number of thefts in the economy. The aim is to restrict such transactions to the black market, where trade is more risky.

Furthermore, the choice of legal rule also affects people's incentives to protect their property, e.g. through buying private security services (see Benson and Mast (2001) for a study of the effects of privately produced general deterrence). One would expect that in jurisdictions where the law allows a buyer to keep an asset given a buyer's good faith, property owners' expenditures for protecting their property would increase. It is a well-known fact that private expenditures on crime reduction may generate externalities (see e.g. Ayres and Levitt (1996)), although there is no guarantee that the rule mentioned coincides with the socially optimal level of private security. On the other hand, a

rule that places the risk on the buyer provides potential buyers with incentives to investigate and verify the ownership of a particular asset. Skogh and Stuart (1982) analyze crime rates, punishment and the social consequences of crime. They show that the social aggregate crime committed, total punishment and the total costs of crime in terms of resources do not necessarily have a straightforward relation to the extent of criminal justice. This implies that the optimal amount of crime prevention cannot in general be determined by a simple examination of the total or marginal amount of crime committed or punishment meted out.

This article formulates a game theoretical model analyzing how a rule of law that allows a buyer in good faith to keep the good influences parties' incentives compared to a regime where good faith does not protect the interests of a buyer. It is shown that incorporating good faith into the analysis significantly influences the incentives of an initial owner to protect his property as well as how much a potential buyer is willing to spend on verifying ownership. It is shown that the aggregate number of thefts is higher under the latter rule of law, where good faith is crucial, compared to a rule of law where good faith is irrelevant. More specifically, it is shown that a rule of law where good faith is Pareto irrelevant dominates a rule of law with good faith, since an owner under the latter rule spends more resources on protecting her property and thus provides a potential buyer with incentives to verify ownership. The article also describes how various jurisdictions deal with this issue of determining property rights, including a description of how the principle of good faith is modified in different ways in diverse jurisdictions.

The paper is organized as follows. In Section 2, a brief literature review is presented and in Section 3, a short overview of different jurisdictions around the world is presented concerning the conditions under which a buyer is entitled to keep a good. In Section 4, a formal game theoretical model is formulated, where the issue of good faith is explicitly incorporated. This is followed by a discussion in Section 5. The article ends with a conclusion in Section 6.

## 2. Literature

Law and economics literature on this interesting issue seems to be rather scarce. Cooter and Ulen, however, (2000) stand out as an exception. Cooter and Ulen argue that one may distinguish between a so-called American rule and a European rule; the former protects the buyer whereas the latter places the risk on the initial owner, as a buyer in good faith is entitled to keep the good.

They present an appealing and simple approach arguing that efficiency requires one to compare the lowest costs to the original owner of protecting against theft relative to the lowest cost to the purchaser of verifying whether a seller is indeed the rightful owner. If the costs of the former exceed the latter, it is more efficient for a good faith buyer to acquire good title against the original owner and vice versa. However, this straightforward approach ignores the strategic interaction between the parties involved that is typically embedded in such a situation. To elaborate, if a person who is offered a good for sale observes that the apparent owner of the property has spent a considerable amount on protecting his property, she is less likely to anticipate that the good is stolen. In addition, there is no empirical evidence of these values to leave room for a deeper analysis of the situation.

In Posner and Landes' (1996) analysis of the economics of art and other collectibles they study the consequences of good faith in terms of allowing an owner of a piece of art to find the thief with some probability. They define good faith as "one who having made the optimal investment in obtaining information about the title of the work prior to purchase, believes that there is a very high probability that the seller can transfer good title to him". One of their findings is that the more rights the original owner has against the purchaser of a stolen work (even though many transactions may separate the purchaser from the thief), the lower will be the price at which a thief can sell a work of art, thus reducing the incentive for art theft. However, as they mention, the incentive of the owner to protect his property against theft will also be lower, which will reduce the costs of stealing to the

thief. They argue that the analysis of optimal legal rules is complicated and claim that there is surely room for additional economic analysis. Contrary to the model constructed by Posner and Landes (1996), a game theoretical model may permit careful study of the strategic interdependency among the involved persons.

Levmore (1987) conducts a comparative legal examination of the conflict between the original owner and the good faith purchaser of stolen property. The legal survey does not only cover common law but also contains a description of some rather exotic ancient jurisdictions. For instance, the Code of Hammurabi addresses the problem of innocent possession of stolen goods, stating in “§ 281. If they are children of another land, the purchaser shall take oath before God as to the silver he has paid; and the owner of the slave, male or female, shall give to the trader the silver he has paid; and shall recover his male or female slave”. Levmore (1987) notices that it is uncertain whether the rule of § 281 extended to property other than slaves, but the system of Hammurabi was the only ancient legal system known to contemplate the unavailability of the thief. The post-biblical Jewish law formed by the rule of Exodus prescribes that once an owner is regarded as having despaired of recovering lost (including stolen) property, he is taken to have legally renounced title. Some rules of societies far removed from the path of Western civilization are also described, including Mongolian Tribal Law. Specifically, in the Mongolo-Oirat Regulations of 1640, the “owner of stray cattle has the right to retake them (in the presence of reliable witnesses); but if the cattle is in the hands of a bona fide third person who bought them, the original owner of the cattle is entitled only to the herd - the better part of the cattle- and the one who bought them to the rump – the inferior part”. Levmore (1987) argues that the differences in the treatment of the good faith purchaser found across different legal systems support the thesis that one source of variety is uncertainty, or reasonable disagreement, about the behavioral effects of alternative legal rules.

Ben-Shahar and Harel (1995) focus on the problem of synchronizing the efforts of governments and victims to reach the optimal combined enforcement, since the victims' incentives to take precautions usually diverge from what is optimal. The policy implication of their model is that in order to "correct" the victims' incentives, an incentive mechanism can be used in criminal law which they label a "contributory fault", i.e. a victim who fails to take the socially optimal level of precaution loses some of the publicly provided protection. Their analysis suggests that some criminal law doctrines can be illuminated by the contributory fault idea.

Eric Rasmusen (2004) addresses issues that arise in agency law when agents make contracts on behalf of principals. The main issue is whether the principal should be bound when the agent makes a contract with some third party on his behalf that the principal would immediately wish to disavow. The resulting trade-offs resemble those in tort law, so the least-cost-avoider principle is useful for deciding when contracts are valid and may be the underlying logic behind a number of different legal doctrines applied to agency cases. In particular, an efficiency explanation can be found for the undisclosed principal rule, which says that the principal is generally bound even when the third party is unaware that the agent is acting as an agent for him.

### **Rule of law in selected jurisdictions**

As mentioned, various legal systems solve this problem of property rights differently. Jurisdictions that protect the buyer emphasize the importance of promoting trade among independent parties, whereas jurisdictions that protect the initial owner regardless of the good faith of the buyer are concerned exclusively with property rights in society. However, if one considers the law in several continental European countries as well as in common law countries, the classification offered by Cooter and Ulen (2000) seems to be modified, as it is dubious whether one may talk about an American or European regime of law as such.

Under *English law* a purchaser acquires good title not only when the seller has voidable title or is an entrustee selected by the original owner, but also when the buyer was in a market overt, c.f. Sale of Goods Act §§ 23-24. This implies that a buyer avoids the risk of repossession by patronizing any shop in London or a market elsewhere. On the contrary, in *American law* an owner may recover the stolen property, c.f. Restatement (second) of Restitution § 45. Since a thief never acquires title an innocent buyer always loses to the owner but it is possible for a disappointed buyer to recover **the good** from the seller who breached an implied warranty of title, provided that the seller is not judgment proof c.f. U.C.C. § 2-312. However, when property is not stolen but is separated from its original owner by fraud, misrepresentation or duress, c.f. U.C.C. § 2-403 title passes to the misbehaving vendee, as the vendee's title is said to be "voidable" (see Levmore (1987) for a more thorough legal analysis).

In *German law*, it is not possible to acquire property of a stolen good, even if a buyer (as well as the seller) is in good faith. Paragraph 932 I of the Bürgerliches Gesetzbuch (BGB) formulates the general rule that one can acquire property by buying a piece of personal property, even if the seller is not the owner of the good, i.e. when the buyer is in good faith (and his ignorance is not caused by gross negligence, c.f. paragraph 932 II BGB). However, paragraph 935 I states an exception to the general rule of paragraph 932 I, namely that one cannot acquire title to a piece of personal property if this piece has been stolen or lost. The decisive factor is obviously that the former owner must have lost control over his property in a conscious and voluntary way in order to allow another person to acquire title to that property. But paragraph 935 I in BGB, together with an exception stated in subsection II, mentions some situations where one can become the rightful owner of a stolen or lost good when one is in good faith, namely in cases of money, bearer papers or goods that have been bought at a public auction.

In *Austrian law*, § 367 of the Austrian Private Law Code (ABGB) regulates this issue as follows: If the buyer was (1) bona fide regarding the ownership of the seller and if the good was sold (2.1) at a public auction or (2.2.) by a businessman who had a license to trade in the good sold or (2.3) the seller was a confidant (e.g. the owner lent the good to the person who then sold it), the buyer can keep the good she has bought. The first two cases also apply to stolen goods, whereas the third does not. If the seller is a merchant, then § 366 of the Austrian Commercial Code (HGB) applies and the buyer cannot keep stolen goods (§ 366 paragraph 4 HGB). However, the law makes exceptions to this and the commercial law is fundamentally very similar to the general provisions of § 367 ABGB.

In *Dutch law*, the relevant articles are 3:84 and 3:86 in the Civil Code. In general, transfer of ownership requires a title (a reason for the transfer, e.g. sale), authority of the person transferring the property i.e. a right to transfer the ownership of the rights to that good, as well as delivery (which can, for example, be accomplished by keeping the good in what is called *constitutum possessorium* or c.p.).

If a good is delivered c.p., someone who has an older right (like the original owner in our case) can ignore the delivery. Thus from the viewpoint of that person (and only that person) the delivery never took place. If a person wants to transfer a moveable non-registered good that the person does not own (like a stolen TV), he lacks the required authority. Normally the party seeking to acquire ownership is not granted it. There is an exception to this rule: if the good is received for a counter performance and the buyer acted in good faith, the lack of authority is repaired (assuming that the other requirements are satisfied) and ownership is transferred. This is the Dutch rule for all moveable non-registered goods and all situations in which the authority is missing. In the case of theft, there is a further exception in which an owner can claim back his stolen property within a period of three years after the good is stolen, regardless of whether or not the receiver acted in good

faith. Furthermore, there are two more exceptions to this exception to an exception. First, rights to paper (e.g. money and shares) are not included in the exception. Second, if a natural person (not a legal entity) who did not receive the good for his profession receives the ownership of the good from someone selling the good as his normal profession (except an auctioneer) in a building intended to be used for such a profession, the original owner cannot claim his property. To illustrate, a person who buys a stolen caravan in good faith from someone who sells caravans from a piece of grassland, where one caravan is permanently installed and used as an office, can keep the caravan.

Concerning non domini acquisition in *Slovenian law*, article 64 in the Slovenian Property Law Code regulates this issue. Ownership of a movable good is acquired even if the transferor did not have the right to dispose of the good, provided that the acquirer was in good faith at the moment of delivery and acquired the good on the basis of an onerous legal transaction. Ownership is acquired in this manner only if the movable good was sold at a public auction, if the transferor put such movables into circulation as part of his activity or if the transferor acquired possession of the movable by will of its owner. Within one year of the extinguishment of ownership the previous owner may demand that the acquirer sell the movable to him at the market price if it has a special importance for him. The rule is an exception to the general principle that nobody can dispose of rights that do not belong to him: *nemo plus iuris transfere potest quam ipso habet*. Acquisition by prescription is covered in the Slovenian Property Law Article 43. A proprietary possessor of movable property in good faith acquires ownership of it after three years. A proprietary possessor of immovable property in good faith acquires ownership of it after ten years.

Concerning *Italian law* in this particular case, where the goods are stolen, one needs to make the following distinctions: the requirements for becoming the proprietor of mobile goods are the buyer's good faith and possession, c.f. art. 1153 and art. 1161 in the Italian Civil Code, or, if the

purchase was not made in good faith, twenty years of possession (c.f. art. 1161). Regarding goods that are mobile as well as registered in a public official system (e.g. a car), the conditions are the buyer's good faith and registration plus three years of possession, c.f. art. 1162, or, if the purchase was not made in good faith, twenty years of possession (c.f. art. 1161). Finally, concerning things that are not mobile (e.g. a house), the requirements are the same as in the former case, but the number of years of possession is extended to ten years in the case of good faith, c.f. art. 1159. and twenty years when good faith is absent (c.f. art. 1158). In addition, there is a special regime in Italian law for *universalitas rerum* (referring to certain things that are owned by one person and ought to be considered as a unity, e.g. a flock of goats) together with a complex system to resolve litigation between buyers who both registered their contract in the case of registered goods bought from different persons, e.g. a thief and the legitimate owner.

In *French Law*, the problem is considered an excuse to void a contract due to fraud denoted "Dolus" (the other types are mistake and duress). The case will be considered as fraud under article 1116 of the Civil Code, since the thief deliberately hides the fact that the good is stolen when he contracts. French law (case law) makes a distinction between fundamental and non-fundamental fraud, and in this case it is regarded as fundamental fraud, because the buyer would never enter into this contract if he knew that the good was stolen. As a consequence, the contract is voided. But more importantly, the initial owner is entitled to keep the good despite the good faith of the buyer. The only thing the buyer can do is to claim damages for any amount paid for the good and any additional losses from the thief.

In *Spain*, if a thief steals a good from a household and sells it to a merchant, the household is entitled to keep the good, whereas if a thief steals the good from a merchant and sells it to another merchant or household, the buyer is entitled to keep the good given good faith.

In *Swedish law*, the situation is governed by law (c.f. Law No. 796 of 1986, Om godtrosförvärv av lösöre). In paragraph 4, I, it is stated that when someone has lost his property (including by theft) and the buyer is in good faith, the initial owner is entitled to receive the good in exchange for compensation to the buyer. Paragraph 4, 2 states that the initial owner is only entitled to claim the good back within a period of three months from the time he knew or should have known that the buyer was in possession of the good.

In *Danish law*, the situation is determined by case law, which gives the initial owner the property rights to the good regardless of a buyer's good faith. However, under very special circumstances, a buyer is entitled to keep the good provided that four conditions are all satisfied. First, the good must be in the buyer's possession and second, it must have been in the possession of the thief. Third, the buyer must not have been negligent about the fact that the good was stolen (simple negligence precludes the buyer's rights). It is up to a buyer to prove he was in good faith, for instance, by demanding an original sales contract from the thief. The fourth requirement can be interpreted as "something supplementary", as it is not enough that the previous conditions are satisfied; something more is needed to extinguish the property rights of an initial owner. According to Danish case law, only when the goods are bought from merchants or when the initial owner stands by and does not act to pursue his rights (denoted as passivity), is the buyer able to keep the goods.

As the description of the various jurisdictions reveals, it is hard to speak of one single European or an American rule of law rule. Instead, a whole palette of different legal solutions exists, each having its own requirements to allow a buyer to acquire good title to the good. A possible explanation of this legal divergence might be that the economic consequences associated with the rule of law have not been subjected to more careful analysis.

## 4. The Model

The model considers two risk neutral persons' strategic interaction: an initial owner of a good and a potential buyer. In addition, Nature serves as a random device representing uncertainty in the model personified by a thief as well as the police. The sequence of actions is as follows:

1. An initial owner of a good spends an amount of  $c$  dollars to protect the good from being stolen where  $c \in [0, \bar{c}]$  is observable. The owner derives utility  $V$ , while the good is in her possession but only 0 if the good is stolen.
2. Nature determines with probability  $\pi$  that the good is stolen and with probability  $(1 - \pi)$  that it is not stolen. Thus, we have  $\pi(c)$  where the probability of the good being stolen is increasing in  $c$ , but decreasing in its second argument, exhibiting a convex relationship. The probability distribution of  $\pi(c, \cdot)$  is common knowledge.
3. A potential buyer is sure to receive "a take it or leave it" offer to acquire a similar good for a price  $T$  outside the "normal" market for such goods. The potential purchaser does not know whether the good is stolen or not, nor the identity of the initial owner. Assume that the good is traded on a fully competitive market where marginal costs of theft equal price  $T$ , which for simplicity is normalized to 1 ( $T$  could in principle equal any positive number without changing the structure of the game).
4. The buyer may expend some effort  $e$  where  $e \in \{0, e_H\}$  in order to assess whether the good is stolen or not, which is verifiable in court, e.g. by making an inquiry at various public agencies asking if such a good has recently been stolen. Assume that  $u > (T + e)$ , otherwise no trade will

occur in the first place. The idea is that he might alternatively want to save these costs and maintain ignorance, if  $e = 0$ . The model captures the possibility of the buyer refraining from expending resources on learning the origin of the good. He might, for example, not ask how old the object is, or how the seller knows it is genuine, or how much it has been used - things he would like to know about and would ask if he were sure the object was not stolen.

Let  $\Pi(c, e)$  denote the potential buyer's "posterior" probability or "updated beliefs" that the good is stolen given  $e$ , which is specified as follows:

$$\begin{aligned} \Pi(c, e) &= \lambda\pi(c) & \text{if } e = e_H & \quad \text{where } \lambda \in [0, 1/\pi] \quad \text{and} \\ &= \pi(c) & \text{if } e = 0 \end{aligned}$$

These probabilities reflect the idea that a buyer after incurring effort  $e$  may revise his initial beliefs that the good is stolen, so that the posterior beliefs that the good is stolen may either increase or decrease. If the buyer incurs effort  $e$  and the new updated beliefs result in an increased probability that the good is stolen compared to the initial beliefs, then a buyer is said to be in *bad faith* i.e.  $\lambda\pi(c) > \pi(c)$ ; if, however, the probability decreases, i.e.  $\pi(c) > \lambda\pi(c)$ , he is said to be in *good faith*. The buyer is also in bad faith, if he deliberately chooses to stay in ignorance, i.e. when  $e = 0$ .

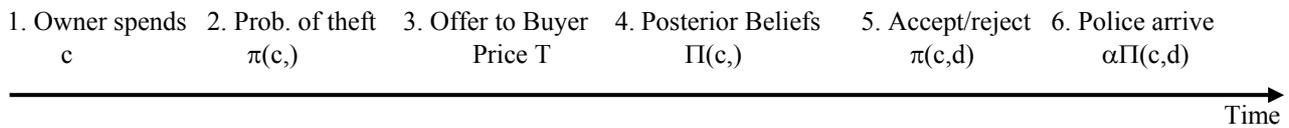
Furthermore, it is assumed that if a buyer accepts an offer to buy a good that might be stolen this will stimulate criminal activity, since it becomes easier to sell stolen goods; hence, the market for stolen goods becomes more profitable. This will cause more people to enter the market, and as a consequence the probability of theft increases in the economy.

The probability of theft now also depends on a potential buyer's decision, i.e.  $d = \{accept, reject\}$  with the following specification:

$$\begin{aligned} \pi(c,d) &= \varphi\pi(c,d) \quad \text{if an offer is } \textit{accepted} && , \text{ where } \varphi \in [1, 1/\pi] \quad \text{and} \\ &= \pi(c) \quad \text{if an offer is } \textit{rejected} \end{aligned}$$

5. Thereafter, the potential buyer either accepts or rejects the offer. Notice that the buyer may decide to buy, even if he is aware that the probability of the good being stolen has increased. The buyer enjoys utility  $U$ , if he buys the good, otherwise his utility is 0 (equal to his reservation utility).
6. If a buyer accepts the thief's proposal, there is a probability determined by Nature - hence, a risk for the buyer that the police will arrive at his home demanding that the good be handed over to the initial owner, which is equal to  $\alpha\Pi(c,d)$ , where  $\alpha \in [0, 1]$ . This probability captures the fact that the police do not capture all burglars, so with probability  $(1-\alpha)\Pi(c,d)$ , the police will not show up. In the former case, the buyer is subjected to a fine for fencing, which equals  $T$ . The price  $T$  paid to the thief is not recovered.
7. With a rule where good faith is legally irrelevant, the good is given back to the initial owner irrespective of any good faith and the purchaser's utility declines to 0, but at the same time the initial owner's utility  $V$  is restored. It is assumed that the initial owner can always document that she is the rightful owner. In contrast, the good is only handed over to the initial owner under a *good faith rule* if the buyer was in bad faith and if the case is solved by the police.

The model's sequence of events is as follows:



In the following, I will analyze how the rule of law influences both parties' incentives in an effort to determine which rule of law is most efficient. In doing so, the model will make use of game theory, which is particularly suited to modeling strategic interdependency, see e.g. Baird, Gertner and Picker (1998) for an interesting and pioneering work on game theory and the law. In order to predict how the parties will react, the analysis relies on the notion of subgame perfection that is the appropriate equilibrium concept given the formulated model. First, I study a regime where good faith plays no role followed by a model where good faith is decisive. The game is solved by backward induction, i.e. starting from the terminal nodes and finding the Nash equilibrium in every subgame. Notice that even though the subgame perfect equilibrium usually deals with games of perfect information, it can easily be extended to cover uncertainty or exogenous events, see e.g. Osborne and Rubinstein (1994) as well as Fudenberg and Tirole (1998).

#### **4.1. A regime where good faith plays no role**

As mentioned, the buyer is not able to keep the good in his possession, even if he is in good faith. To solve the game, we consider the terminal node, where the buyer must decide whether to accept or reject the offer, given that he has previously made his effort choice. Notice that when the potential buyer must decide whether to accept or reject the contract, the effort level is regarded as *sunk costs*. Therefore, it should not enter into the potential buyer's terminal decision problem, since the effort level has already been carried out.

Figure 1. Game in extensive form when good faith is considered irrelevant

[INSERT FIGURE 1]

In the case where the good is not stolen, depicted in the lower node, it is optimal to accept any proposal, since  $(1-\pi)(u-T)$  is strictly positive. In deciding whether to accept or reject an offer when the good is stolen (the upper node) the buyer must compare the following pay-offs: the right-hand side of equation (1) shows his expected pay-off from accepting the proposal, given that he has examined the good.

$$\pi(c, d)(1 - \alpha)(U - T) - \pi(c, d)\alpha(T + F) = 0 \quad (1)$$

Given the assumption that the fine  $F$  equals  $T$  and  $T$  is normalized to 1, we can simplify to obtain the following expression. Let  $\Delta = (U - 1)$  denote the difference in value in excess of the price. Hence expression (1) can be simplified to:

$$\Delta = \frac{2\alpha}{(1 - \alpha)} \quad (2)$$

If the left-hand side is larger than the fraction on the right-hand side, it is optimal for a buyer to accept an offer, since  $U > T = 1$ . Therefore, a potential buyer must balance his net utility from the good, i.e. delta with the probability that the case will be solved by the police, and he must return the good. Expression (2) shows that if alpha decreases, delta decreases. This means that if the risk that the police will arrive is reduced, the net utility from being in possession of the good must be lower

in order to induce an acceptance. On the other hand, if there is a large risk for the buyer that the case will be solved, his net utility from being in possession of the good must be sufficiently high in order to induce him to accept an offer.

However, the relationship is not linear, as demonstrated in Figure 2, where the graph of equation (2) is depicted showing an almost exponential relationship: the upper set above the graph corresponds to the acceptance region, whereas below the graph a potential buyer should reject an offer.

[INSERT FIGURE 2]

When equation (2) holds, it is optimal for a buyer to accept the proposal. The same was true when the buyer did not examine the ownership, i.e. when  $e = 0$ .

Now, working backwards, it remains to be determined whether or not the buyer should examine the good, given that condition (2) holds. Clearly, it is not rational for a buyer to examine the good, since the right-hand side of equation (3) is strictly larger than the left-hand side.

$$\{\phi\pi(c,d)(1-\alpha)\Delta - 2\phi\pi(c,d)\alpha\} - e_H < \phi\pi(c,d)(1-\alpha) - 2\phi\pi(c,d)\alpha \quad (3)$$

When determining the *initial owner's level of precaution*  $c$ , it is clear that he knows that a potential buyer will always accept an offer; hence criminal activity in the economy is increased, and a buyer will never spend any effort on investigating the ownership of the good. In order to analyze what is optimal for an owner under the prevailing rule of law, we derive the owner's expected utility. Denote the optimal level of precaution by  $c^*$ , where:

$$c^* \in \arg \max_c EV = \phi\alpha\pi(c,d)(V-C) - C\phi\pi(c,d)(1-\alpha) + (1-\phi\pi(c,d))(V-C) \quad (4)$$

$$= V + V\varphi\alpha\pi(c, d) - V\varphi\pi(c, d) - C$$

Notice that from the envelope theorem, we can immediately see that the owner's utility increases in alpha, so if the probability that the police solves the case increases, so does the utility of the owner.

Finding the first order condition yields:

$$\frac{\partial EV}{\partial c} = V\varphi\alpha\pi'(c, d) - V\varphi\pi'(c, d) - 1 = 0 \quad \Leftrightarrow \quad \pi'(c, d) = \frac{1}{(V\varphi\alpha - V\varphi)} \quad (5)$$

This leads to the first proposition relating to a regime of law, where good faith on the part of a buyer is neglected in deciding whether the buyer can keep the good or must return the good to the initial owner.

**Proposition I:** *Provided that condition (2) is satisfied, a regime that does not take into consideration the good faith of a buyer of a stolen good will induce a buyer to accept any offer. The buyer will avoid spending resources on examining the ownership of the offered good.*

## 4.2 A regime where good faith is pivotal

In the previous analysis, no attention was paid to whether a buyer was in bad or good faith. This no longer holds, since an innocent buyer may now keep the good. The rule of law affects the pay-off structure of the game, as the game depicted in Figure 3 shows.

[INSERT FIGURE 3]

Notice how the good faith of a buyer is incorporated in the game using conditional probabilities. The game is solved using backward induction starting from the terminal nodes, again recognizing that any effort level to examine whether a good is stolen is sunk. Consider the case where a buyer must compare the pay-offs from accepting and rejecting an offer, given that the good is not stolen. Since both  $(1-\lambda\pi)(U-T)$  as well as  $(1-\pi)(U-T)$ , i.e. the reservation utility from rejecting the offer, are always strictly larger than zero, the potential buyer will always accept an offer in this situation.

The next step is for a buyer to determine whether he should spend any effort on examining the ownership of the good. Recall that when the buyer examines the good, he will get a more precise estimate of whether the good is stolen or not, i.e. after incurring costs to verify the ownership, he will be more certain of whether the good is stolen or not compared to his initial beliefs. Given that  $\lambda\pi < \pi$ , the expected utility of seeking to verify the ownership exceeds the utility of remaining ignorant in this situation. Therefore, in the case where Nature selects the lower node, we know, just as in the previous case, that a buyer will always accept and thus spend resources to verify the ownership.

When Nature picks the upper node, the situation gets more complicated. The potential buyer must now decide whether or not to accept an offer.

Let  $\Pi(\lambda\pi < \pi) = \lambda\pi$  where  $\lambda < 1$  denotes the posterior beliefs when a potential buyer is in good faith and  $\Pi(\lambda\pi > \pi) = (1 - \Pi(\lambda\pi < \pi))$  denotes the posterior beliefs when a potential buyer is in bad faith. The left-hand side of equation (6) shows the expected utility when a buyer accepts an offer, while the right-hand side equals his reservation utility (again  $e$  is regarded as sunk costs).  $\Delta$  denotes the difference in utility in excess of the price  $T$ .

$$\alpha\phi\Pi\Delta - 2\alpha\phi(1-\Pi) + (1-\alpha)\phi\Pi\Delta + (1-\alpha)\phi(1-\Pi)\Delta = 0 \quad (6)$$

$$\Leftrightarrow -2\alpha\varphi + 2\alpha\varphi\Pi + \varphi\Pi - \alpha\varphi\Delta + \alpha\varphi\Pi\Delta = 0$$

$$\Leftrightarrow \Delta(\phi - \alpha\varphi + \alpha\varphi\Pi) = 2\alpha\varphi(1 - \Pi)$$

$$\Leftrightarrow \Delta = \frac{2\alpha(1 - \Pi)}{(1 - \alpha + \alpha\Pi)} \quad (7)$$

By comparing (2) and (7), we are able to determine whether a person under the previous rule of law is more likely to accept an offer than under the current rule with good faith. Since equation (2) exceeds (7), a person under a rule where good faith is irrelevant must have a higher net utility in order to accept a proposal than under a rule that takes into account the buyer's good faith. The reason is that in a situation where good faith is decisive a buyer is provided with stronger incentives to accept an offer given that all other parameters are held constant. Consider how the variables, i.e.  $\alpha$  and  $\pi$ , affect the difference in  $\Delta$  since the difference depends on the values of the parameters. Only if the parameters are identical under both rules of law is there a strong tendency to accept under a rule that allows a buyer in good faith to keep the good.

It is easy to show that a person who did not verify ownership is willing to accept an offer as long as condition (2) holds, i.e. there is no difference between the two rules of law in this situation.

Now it must be determined whether a person under a good faith rule is willing to examine the ownership given that he is prepared to accept an offer. A buyer is indifferent about examining the ownership when the following equation holds.

$$\{\Delta(1 - \alpha + \alpha\Pi) - 2\alpha(1 - \Pi)\} - e_H = \Delta(1 - \alpha) - 2\alpha \quad (8)$$

$$\Leftrightarrow \Delta = \frac{e_H}{\alpha \Pi} - 2 \quad (9)$$

Whether a buyer examines the ownership of a good therefore depends on the costs of effort as well as the joint probability that the police solve the case and that the belief that the good is stolen is reinforced. If the costs of examining the good are high then the buyer's net utility of being in possession of the good must also be higher in order to induce him to examine its ownership. Notice also that if the joint probability of  $\alpha$  and  $\Pi$  decreases, then the right side of (9) increases; hence, the buyer must value the good more in order to induce him to purchase. The relationship is represented in the following graph (which can also be illustrated by constructing various level curves for a given value of delta)

[INSERT FIGURE 4]

Figure 4 shows that for a given joint probability of  $\alpha$  and  $\Pi$ , a buyer would accept higher costs of examining ownership the more he values the good. It was previously shown that under an American rule of law, a person would never examine ownership. However, this no longer holds, since depending on the variables in expression (9), there are some persons who would prefer to examine the good. To illustrate, if delta is 3 and  $e_H$  is 2 and the joint probability is  $\frac{1}{2}$ , then the right hand side equals 2; in this case, therefore, a buyer derives a higher utility when he examines the good.

Turning to the owner's decision problem at the initial node, he knows that there is a higher probability of theft under a European rule of law, as expression (2) is higher than expression (7), where a potential buyer is indifferent about accepting or rejecting. In other words, a potential buyer under a good faith rule could accept a lower net utility of the good from buying than under a rule where good faith plays no role. Hence, the probability of theft under a good faith rule is higher

compared to a rule where good faith is irrelevant. The difference between conditions (2) and (7) determines the increased probability of theft under a good faith rule. Let  $\delta$  denote this increase in the probability of theft under a good faith rule.

$$\Pr\left(\frac{2\alpha}{1-\alpha} - \frac{2\alpha(1-\Pi)}{1-\alpha+\alpha\Pi}\right) = \delta \in \left[1, \frac{1}{\pi(c,d)}\right] \quad (10)$$

The owner now has this important information, so the relevant probability of theft now becomes  $\pi\delta$  compared to only  $\pi$  in the previous case.

$$c^* \in \arg \max_c EV = \varphi\alpha\delta\pi(c,d)(V-C) - C\varphi\delta\pi(c,d)(1-\alpha) + (1-\varphi\delta\pi(c,d))(V-C)$$

$$= V + V\varphi\alpha\delta\pi(c,d) - V\varphi\delta\pi(c,d) - C = 0 \quad (11)$$

$$\frac{\partial EV}{\partial C} = V\varphi\alpha\delta\pi'(c,d) - V\varphi\delta\pi'(c,d) - 1 = 0 \Leftrightarrow \pi'(c,d) = \frac{1}{(V\varphi\alpha\delta - V\varphi\delta)} \quad (12)$$

Comparing expressions (12) and (5), it is evident that the expression in (12) is negative, but more importantly it is *less* than expression (5). From the convexity assumption, this implies that an owner under a good faith rule spends more resources on protecting his property than under a rule which does not take a buyer's good faith into account. This leads to proposition II.

**Proposition II:** *Under a rule of law where good faith plays a decisive role in determining property rights, there is a positive probability that a potential buyer will incur costs in order to verify ownership. Compared to a rule of law where good faith is irrelevant, an owner will spend more resources on seeking to protect his property from being stolen.*

## **5. Discussion and conclusion**

The model has shown that allowing a person to keep a stolen good, if he is said to be in good faith, significantly affects parties' incentives. More importantly, a rule where good faith is not decisive Pareto dominates a rule where good faith may protect an innocent buyer, as a potential buyer wastes resources on trying to verify ownership and owners of goods incur higher costs in order to deter burglars from stealing their property. Not only is the aggregate number of thefts in the economy impacted by the rule of law, but the analysis has shown that explicitly incorporating the strategic interaction between economic agents reveals that we need to refine our understanding of how the two rules of law influence efficiency compared to the initial analysis as proposed by Cooter and Ulen (2000). The normative policy implication is, therefore, that jurisdictions that seek to protect an innocent buyer should be more reluctant to allow a person in good faith to keep a stolen good.

It is crucial whether the information available to the third party should lead him to take special care to check authority, as seen in the following three cases from the US, in which a bailee improperly disposes of goods entrusted to him. In the *Delicatessen as Art Gallery Case*, a person named Porter loaned a painting to von Maker, who hired deli employee Wertz to sell it to Brenner via a dealer named Feigen. Porter sued Feigen for return of the painting, c.f. *Porter v. Wertz*, 1979). The Court decided, however, that Wertz was not an art merchant in the sense of the Uniform Commercial Code, and that Feigen ought to have taken the precaution of telephoning one of the numbers Wertz gave him, which would have revealed his employment at the delicatessen.

Feigen argued that industry practice in the art business was to not inquire into the backgrounds of one's customers. The Court rejected this, saying, that Feigen's claim that the failure to look into Wertz's authority to sell the painting was consistent with the practice of the trade does not excuse such conduct. This claim merely confirms the observation of the trial court that 'in an industry whose transactions cry out for verification of title it is deemed poor practice to probe'. Indeed, commercial indifference to ownership or the right to sell facilitates traffic in stolen works of art. Commercial indifference diminishes the integrity and increases the culpability of the apathetic merchant (at 258).

The following case makes much the same point; a third party has a duty to investigate suspicious sales as seen in "The New Jersey Diamond Case". Wolf consigned a diamond ring to the auction company Brand with written instructions not to sell it without permission. Brand borrowed \$4,000 from Nelson, using the ring as collateral for that loan and for a previously bounced check to Nelson. Nelson then purchased the ring from Brand in return for canceling the loan, but without a written bill of sale. He consigned the ring back to Brand, who returned it to Wolf. The question was whether Nelson could recover the ring? c.f. *Nelson v. Wolf*, 1950. Nelson did not recover the ring in this pre-U.C.C. case, because although he did not know all these facts, (a) he knew Brand needed money and had bounced a check, (b) he knew Brand had trouble repaying the loan, (c) the lack of a bill of sale was suspicious, and (d) he was not an ordinary customer. In a case three years later, the New York Diamond Case, diamond merchant Harry Winston sent a diamond ring to the auction company Brand for examination, with written instructions not to sell it without permission, and allowed Brand to display it publicly. Brand then sold it to Jane Zendman. The question is whether she should own the ring? c.f. *Zendman v. Harry Winston*, 1953 (it is the same auction company as in the New Jersey Diamond Case!). The Court gave title to Zendman, since she, an ordinary customer, had no reason to be suspicious.

In addition (important in this pre-U.C.C. case), Winston had allowed public display of the ring together with Brand's other merchandise. The principal had not taken care, and the third party could not, so the principal bore the loss.

One may argue that civil liability should be taken explicitly into consideration in the analysis. However, in many cases it is not possible for a disappointed buyer to receive damages as it depends on whether the conditions for imposing liability on the owner are satisfied. Specifically, the buyer must prove that the owner acted negligently e.g. by not protecting his assets adequately. It is likely that a buyer bearing the onus of proof may fail to establish the matter on a balance of probabilities, see e.g. Beale, Bishop and Furmston (1995) p. 941 for a discussion concerning recovery of payments of property in English law. Thus under normal circumstances a thief will never be able to compensate a disappointed buyer due to his limited financial assets.

Another aspect this analysis does not incorporate is when a buyer becomes the rightful owner due to good faith. In such a situation he may resell the good on the legitimate market demanding a higher price as he can document that he is the rightful owner. This issue may be a factor that could influence the price on the black or grey market, as this is known by the thief but whether this may occur depends on the likelihood of the buyer reselling the good.

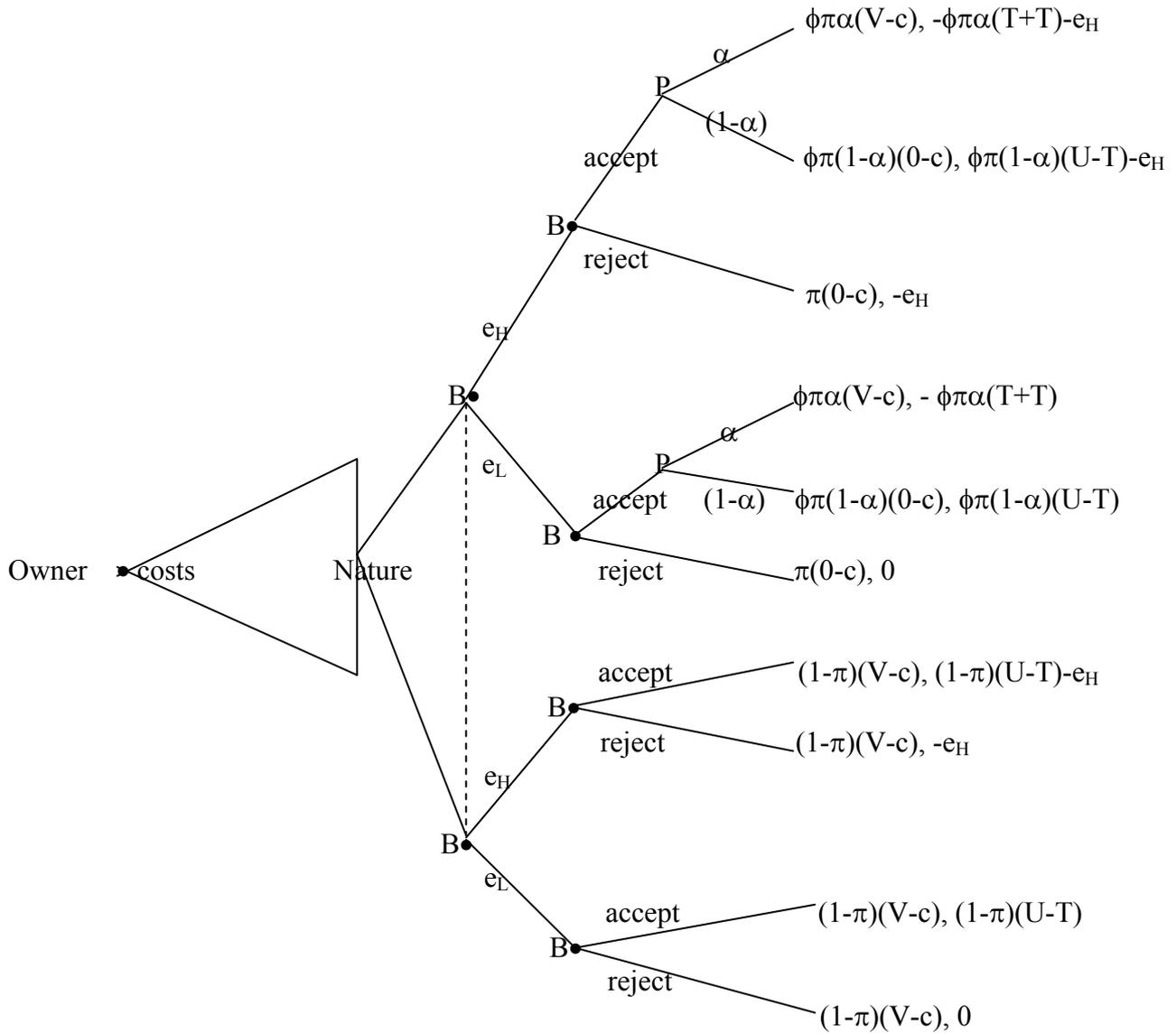
Ideally, one would expect to find that in countries where good faith plays a decisive role, persons incur higher costs in order to protect their propriety from being stolen compared to jurisdictions, where good faith does not serve as an excuse for a buyer keeping the good. However, the empirical findings may be difficult to interpret, not only because it is hard to estimate the exact amount people spend on protecting their property, but also because criminal activity is influenced by several other often latent variables. As a consequence, it might be the case, for example, that people in the US, spend more money on protecting their property than in Europe, but that this simply is due to the fact that there are other parameters that result in a higher crime rate in the US.

Another interesting issue which this analysis does not deal with is how the illegal market for stolen goods impacts the legal “normal” market. To illustrate, consider coins. Stamping of coins with the royal monogram has always been entrusted to very few selected loyal bodies. This has been done to avoid counterfeit coins, e.g. by mixing cheaper metals in gold coins, since counterfeit coins would be damaging to the monetary trade and thereby the wealth of the nation. More specifically, counterfeit coins or stolen goods may in some situations drive out goods that are sold through the normal market. This might result in a partial or complete market breakdown for legal goods depending on the rule of law. It seems plausible that a rule of law that protects a buyer in good faith, is more likely to experience such market failures, e.g. Akerlof’s (1970) pioneering work on the lemons market, where bad used cars drove out good used cars (known as Gresham’s law).

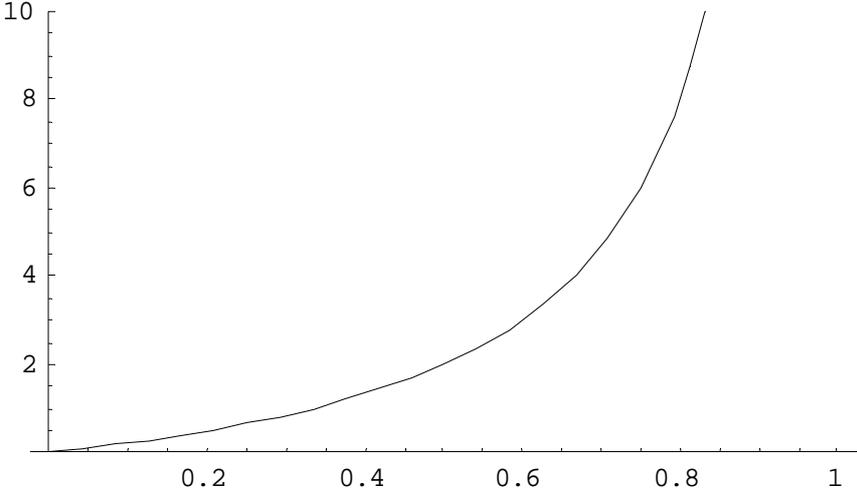
Parties were assumed to be risk neutral in the analysis. Incorporating risk aversion into the analysis seems a natural extension for future work in this area, in particular how the possibility of buying insurance changes the results.

## Figures

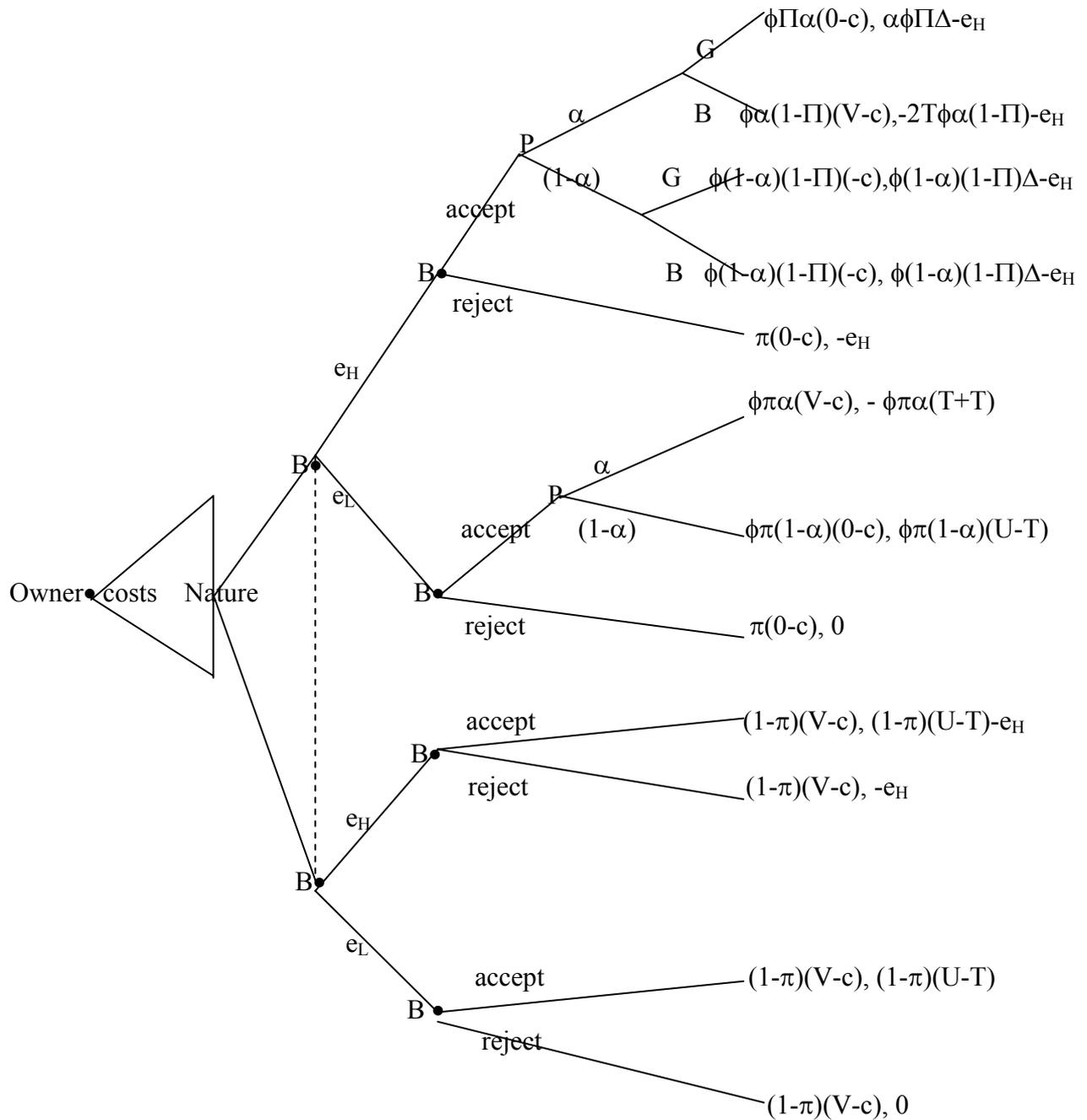
**Figure 1.** The game depicted in extensive form under a rule where good faith is absent. B indicates the decision node of a potential buyer and P equals police.



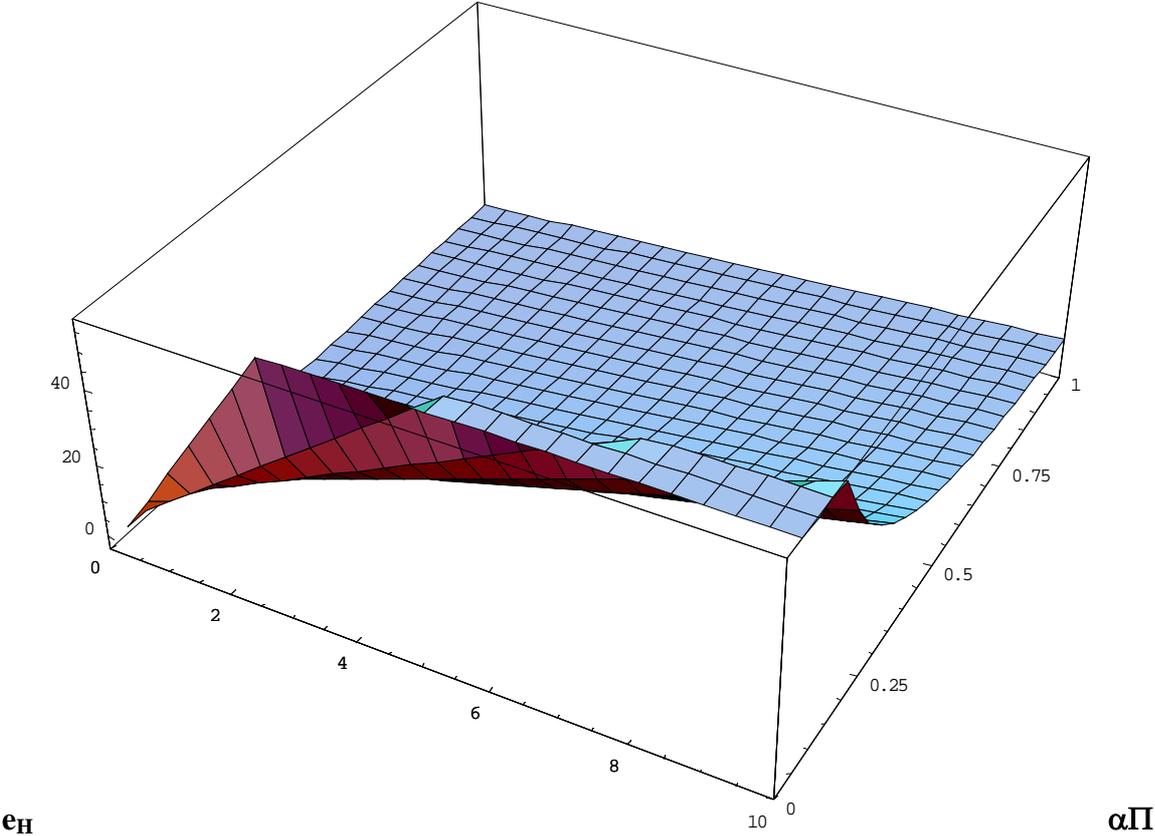
**Figure 2.** The acceptance region and the rejection region



**Figure 3.** The game in extensive form where good faith is pivotal. B indicates the decision node of a potential buyer and P equals police.  $\Pi = \pi(\pi\lambda < \pi)$  where  $0 < \lambda < 1$  for good faith and  $\pi(\pi\lambda > \pi) = 1 - \Pi$  for bad faith. Good faith equals G and bad faith equals B.



**Figure 4.**



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