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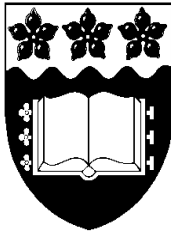
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The Social Cost of Blackmail

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The Social Cost of Blackmail

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Abstract

Despite the fact that blackmail constitutes a voluntary transaction between two parties, it is deemed to be a criminal offence in most legal systems. Traditional economic approach to this so-called ‘paradox of blackmail’ emphasizes welfare loss generated by the costly rent-seeking activities of potential blackmailers as the primary justification for its criminalization. This argument however does not extend to cases in which potentially damaging information about the victim was acquired by the blackmailer at no cost. It also does not seem to shed light on a related puzzle: why is it legal for a potential victim to bribe the other party with the purpose of achieving the same final outcome (suppression of information) as in the case of blackmail? This paper addresses these questions in a simple model of bargaining under asymmetric information which is used as a unified framework for studying both blackmail and bribery. Under asymmetric information the bargaining outcome is not efficient regardless of the distribution of the bargaining power. However, when the blackmailer is the monopolist seller of the information inefficiency results from his demands being too high relative to the social optimum, providing justification for the practice of penalizing blackmail. On the other hand, when a victim is the monopolist buyer of the information the equilibrium offer is inefficiently low implying that its punishment would be counterproductive. These arguments provide further support for the claim that under reasonable assumptions criminalization of blackmail can be justified on efficiency grounds.

1 Introduction

According to the standard definition, blackmail occurs when someone is threatened with a disclosure of potentially damaging information unless they agree to pay a monetary compensation to the threatening party. The “paradox of blackmail” refers to the fact that while both, threatening to reveal information and asking for money are legal acts if performed separately, taken together they constitute a crime (Lindgren, 1984). This paradox raises a number of difficult questions which over the years have received considerable attention from legal scholars.² Katz and Lindgren (1993), for example, argue that “... one cannot think about coercion, contracts, consent, robbery, rape, unconstitutional conditions, nuclear deterrence, assumption of risk, the greater-includes-lesser arguments, plea bargains, settlements, sexual harassment, insider trading, bribery, domination, secrecy, privacy, law

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² The issue of the legality of blackmail is also of practical importance, as evidenced by the significant number of blackmail attempts directed towards prominent figures in the entertainment industry routinely reported in the popular press.

enforcement, utilitarianism and deontology without being tripped up repeatedly by the paradox of blackmail.” The criminalization of blackmail also seems to contradict the logic of economic efficiency. If the blackmailer has a legal right to reveal the information and the victim knows that the threat is credible, wouldn’t the victim be better off having an *option* of preventing the damage caused by the revelation at some cost?

The traditional economic approach to the paradox of blackmail points out that in some cases it can be socially optimal to punish blackmail. In particular, Coase (1988) and Ginsburg and Shechtman (1993) argue that if blackmail were legal, large amounts of resources would be spent on collecting information about potential victims which would then be used to substantiate blackmailers’ demands. Alternatively, potential victims might choose to incur large costs by taking actions which reduce their chances of being blackmailed. In both cases, the expenditure of real resources to redistribute, or prevent redistribution of wealth from one individual to another would produce a net social loss. Therefore prohibition of blackmail improves social welfare. Recently a comprehensive analysis of this argument in the context of a formal game-theoretic model of the interaction between a blackmailer and a potential victim was provided by Gomez and Ganuza (2002). They show that criminalization of blackmail could be understood as a correction of the misaligned incentives to engage in rent-seeking behavior on the part of the blackmailer.

However, an argument based on the assumption of costly information acquisition can offer only a partial solution to the paradox of blackmail. As pointed out by Lindgren (1989), the Ginsburg-Shechtman-Coase (GSC) theory of blackmail is not applicable when the blackmailer acquires information serendipitously and at no cost. Lindgren further substantiates this argument by drawing on the work of Hepworth (1975), who identified four different types of blackmail: *participant* blackmail, which occurs as a result of a prior relationship between the blackmailer and the victim; *opportunistic* blackmail, based on accidentally acquired information; *commercial research* blackmail, based on the information which was acquired on purpose; and *entrepreneurial* blackmail, in which the blackmailer himself creates a set of circumstances involving the victim which are then used to substantiate blackmailers demands. Lindgren (1989) argues that the GSC theory of blackmail is incomplete because it cannot be applied to the cases of participant and opportunistic blackmail.

Another common criticism of the rent-seeking argument for the criminalization of blackmail is that it seems to ignore the so-called paradox of bribery. As noted by DeLong (1993, p.1664), “it is not unlawful for one who knows another’s secret to *accept* an offer of

payment made by an unthreatened victim in return for a potential blackmailer's promise not to disclose the secret. What would otherwise be an unlawful blackmail exchange is a lawful sale of secrecy if it takes the form of a 'bribe'. Lawful bribery poses an obvious challenge to theories that are premised on either the wrongfulness or wastefulness of the blackmail exchange..." Thus, the identity of the party making the offer seems to be of crucial importance when determining whether a given negotiation constitutes a crime or is a form of lawful bargaining.

This paper attempts to address the paradoxes of blackmail and bribery in a unified framework by drawing attention to the possible role of asymmetric information in justifying the criminalization of blackmail. It considers a situation in which the blackmailer obtains damaging information about a potential victim at no cost and decides whether to disclose it and receive a non-negative payoff (market price of information) or to demand a payment from the victim for suppressing it. The disclosure of the information imposes a damage on the victim, whose willingness to pay to avoid this disclosure is not known by the blackmailer. The victim, on the other hand, might not know the market price of information faced by the blackmailer. Under these assumptions both blackmail and bribery can be analysed in the framework of bilateral trade under asymmetric information, the problem which was extensively studied at least since Myerson and Satterthwaite (1983).

To emphasize the differences between blackmail and bribery this paper studies two extreme allocations of bargaining power. The first one corresponds to the regime of legal blackmail, in which case the blackmailer is assumed to be able to make a take-it-or-leave-it offer to the potential victim. The second configuration corresponds to the situation in which blackmail is criminalized and the potential victim is the monopolist buyer of the information. It is further assumed that in both configurations the parties can enter into a legally enforceable contract for the non-disclosure of information. Under the regime of legal blackmail, the blackmailer performs an important role in screening victim types by offering them an opportunity to avoid the information disclosure if their damage is large enough compared to the market price. This might seem to imply that blackmail should not be punished. However, because in equilibrium the blackmailer's demand is higher than the market price, information will be revealed too often compared to the social optimum. Therefore some form of regulatory remedy might be desirable. In particular, the optimal penalty would increase the cost of rejection to the blackmailer and induce him to lower his equilibrium demand. The opposite conclusion is reached under the assumption that all of the bargaining power lies with the potential victim. In this case the equilibrium offer is too low

compared to the social optimum, implying that punishing bribery would be counterproductive. This simple argument provides a clear rationale for the distinct treatment of blackmail and bribery by legal codes and shows that criminalization of blackmail can be justified on efficiency grounds even in the absence of wasteful rent seeking on the part of blackmailer.

The rest of the paper is organized as follows. Section 2 presents the model of blackmail and studies the welfare properties of the bargaining equilibrium. In section 3 the analysis of bribery is presented. Section 4 presents a discussion of the results and concluding remarks.

2 Blackmail

Consider a hypothetical situation of a reporter who obtains a piece of information that is potentially damaging to a celebrity. This information could be sold to a newspaper at the market price, in which case the victim would suffer damage due to reputation loss, the magnitude of which is known only to the victim. On the other hand, the two parties could reach an agreement under which the celebrity would pay the reporter a sum of money in exchange for the promise of silence. The paper will focus on the properties of the equilibrium bargaining outcome assuming that both sides of the transaction are risk-neutral utility maximizers. The approach taken here is similar to the framework used in the study of pre-trial negotiations with asymmetric information (Bebchuk, 1984; Nalebuff, 1987; Daughety and Reinganum, 1994), which typically rely on the ultimatum game setup in which one party has private information about the damage it would suffer in case no agreement is reached.³ The next section develops the main argument in favor of punishing blackmail under the assumption that the market price of information reflects its full social value. The subsequent section discusses how the relaxation of this assumption would affect the main qualitative results.

2.1 Model of Blackmail

Let $p \geq 0$ denote the market price of the information, and let L be the damage suffered by the victim if the information is revealed. The potential victim of the blackmail knows the value of L with certainty, while the blackmailer's beliefs about L are summarized by the

³ An important difference between the pretrial negotiation literature and the current model is that in the former the private information of the victim about damages affects the payoffs of both parties if the case goes to trial. In the case of blackmail, on the other hand, the damage done to the victim does not affect the blackmailer's payoff if the offer is rejected.

cumulative distribution function $F(\cdot)$, which is assumed to be continuously differentiable and log-concave.⁴ Because the social value of the information disclosure is equal to $p - L$, an efficient outcome involves the disclosure of the information when $p \geq L$, while non-disclosure is optimal if $p < L$. If there were no blackmailer, the celebrity would have an incentive to disclose the information if and only if $p \geq L$, and the outcome would be efficient. The presence of the blackmailer who does not bear the cost of information disclosure creates a negative externality and the two parties might try to reach a mutually beneficial agreement through the bargaining process. In this section it is shown that even though those victims who would suffer a relatively large loss if information were revealed are better off because of blackmail, the equilibrium of the bargaining game in which the blackmailer makes a take-it-or-leave-it offer to the victim is not always efficient. Intuitively, efficiency requires that information is disclosed only if the damage to the victim is lower than the market price (which is assumed to reflect the value of information to the rest of society). Under asymmetric information this condition will not be satisfied because the blackmailer will demand a payment which exceeds the market price. As a result a penalty which induces the blackmailer to lower his demand will increase social welfare.

Consider the case of blackmail as a legally enforceable contract under which the victim agrees to pay the blackmailer a sum of money in exchange for the guarantee that information will not be revealed.⁵ Suppose further that the blackmailer can make a take-it-or-leave-it offer by demanding x dollars from the victim in exchange for the promise not to reveal the information. The victim will agree to pay x to the blackmailer only if the demand is lower than the damage suffered if information is revealed, that is if $x \leq L$. The blackmailer's demand thus will be rejected with probability $F(x)$, implying that his expected profit is given by:

$$R(x) = pF(x) + (1 - F(x))x \quad (1)$$

The optimal payment demand x^* must satisfy the first-order condition for the maximization of the expected profit in Equation (1), which is given by:

⁴ Log-concavity is a standard regularity condition which is satisfied by most commonly used probability distributions (Bergstrom and Bagnoli, 2005).

⁵ Note that this assumption implies that blackmailer can credibly commit to making a take-it-or-leave-it offer.

$$R'(x^*) = (p - x^*)F'(x^*) + 1 - F(x^*) = 0 \quad (2)$$

The log-concavity of $F(\cdot)$ implies that $F'/(1-F)$ is an increasing function. In other words we must have $F''(x)(1-F(x)) + F'(x)^2 > 0$. The second derivative of the expected profit function is given by

$$\begin{aligned} R''(x^*) &= F''(x^*)(p - x^*) - 2F'(x^*) = \\ &= -\frac{1}{F'(x^*)} \left(F''(x^*)(1 - F(x^*)) + 2F'(x^*)^2 \right) < 0 \end{aligned} \quad (3)$$

where the second equality was obtained by using (2) to solve for $p - x^*$ and substituting the resulting expression in (3). Therefore, the assumption of log-concavity implies that the second-order condition for profit maximization is satisfied.

To show that the blackmailer's optimal demand x^* always results in a deadweight loss, note that (2) implies that $R'(p) = 1 - F(p) > 0$. Because $R'(x^*) = 0$, and from (3) we know that $R'(\cdot)$ is a decreasing function, we conclude that $x^* > p$, i.e. equilibrium demand always exceeds market price. This result is not surprising since the market price constitutes the disagreement payoff of the blackmailer in this bargaining game. Consider now the following three cases which enumerate possible relationships between market price, damage suffered by the victim and the blackmailer's optimal demand.

(i) $L \leq p < x^*$. In this case the blackmailer's demand will be rejected and the information will be disclosed. This is an efficient outcome because the victim's damage is lower than the market price of the information. Note that in this case, the victim also has an incentive to disclose the information himself.

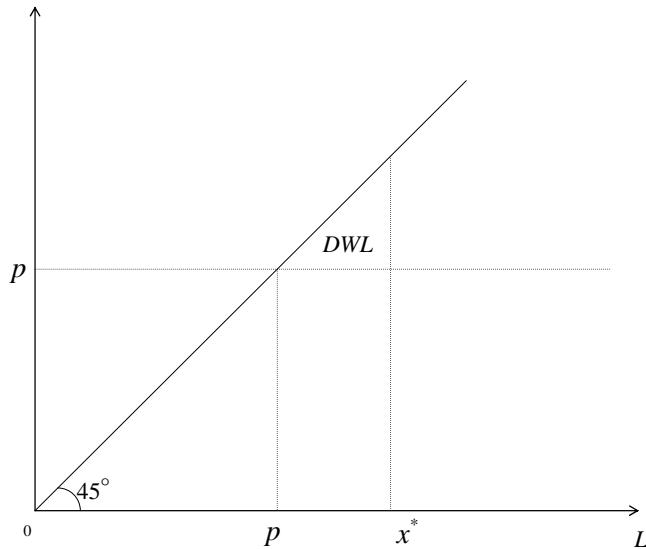
(ii) $p < x^* \leq L$. In this case the victim will agree to pay x^* and sign a non-disclosure contract with the blackmailer. This is an efficient outcome because $L > p$.

(iii) $p < L < x^*$. In this case the victim will refuse to pay and the information will be disclosed, which results in a deadweight loss because the social value of the information disclosure, $p - L$, is negative.

The equilibrium corresponding to case 3 and the range of victim's types which result in a deadweight loss are illustrated in Figure 1. The expected deadweight loss in this case is given

$$\text{by } \int_p^{x^*} (s - p) dF(s).$$

Figure 1. Deadweight loss from blackmail



The fact that equilibrium of the bargaining game is inefficient from the social point of view when the victim's type falls in the interval (p, x^*) provides a justification for the criminalization of blackmail. Note however that the outright prohibition of blackmail does not by itself improve efficiency: in the absence of bargaining between the blackmailer and the potential victim, information will be revealed in all of the three cases above. This will result in a net loss in Cases 2 and 3. In this model therefore blackmail could be welfare enhancing as long as the payment demanded is not too high compared to the market price of the information, allowing most of the "high damage" types (those with $L > p$) to avoid disclosure.

To improve on the equilibrium outcome government or social planner can impose a punishment for blackmail which would decrease the blackmailer's optimal demand. For example, consider a version of the above bargaining game in which the victim either accommodates the blackmailer's demand or, if the demand exceeds the damage, rejects it and

simultaneously reports the blackmail to the authorities. In this case, a non-disclosure agreement can no longer take the form of a legally enforceable contract. However it is reasonable to expect that the blackmail agreement can still be achieved as an equilibrium outcome of the interaction between the blackmailer and the victim when the blackmail is a criminal offence. Indeed, if the blackmailer reneges on his promise and reveals information after being paid by the victim, the latter can always report the case of blackmail to the authorities ex post. The possibility of this outcome would provide the blackmailer with a sufficient incentive to stick to his part of the deal. Alternatively, as pointed out by Gomez and Ganuza (2002) there might be other ways for the blackmailer to regain his commitment power even if the victim has no incentive to report the blackmail ex post. In particular, these authors provide several scenarios in which commitment arises endogenously due to the reputation effects or repeated nature of the relationship between the blackmailer and the victim when blackmail is not subject to legal regulation.

As an example of a possible incentive scheme in the criminal blackmail regime consider the case in which the blackmailer is liable to pay a monetary penalty equal to $t > 0$ if the blackmail is reported to the authorities. The purpose of this penalty is not to make blackmail prohibitively costly, but to change the blackmailer's behaviour at the margin in order to reduce the deadweight loss. The assumption that punishment for blackmail takes the form of a fine is made for analytical convenience. In principle, t is meant to represent the dollar value of all costs (including jail time, if any) imposed on a person found guilty of blackmail. Under this assumption the blackmailer's objective function is then given by

$$R(x) = (p - t)F(x) + (1 - F(x))x \quad (4)$$

This form of punishment thus simply reduces the blackmailer's payoff in case his demand is rejected by the victim. The first order condition then becomes

$$R'(x^*) = (p - t - x^*)F'(x^*) + 1 - F(x^*) = 0 \quad (5)$$

In this case the optimal demand $x^*(t)$ will be a function of the penalty for blackmail. Note that (4) and (5) taken together imply that

$$\frac{\partial x^*}{\partial t} = -\frac{F'(x^*)^2}{F''(x)(1-F(x))+2F'(x)^2} < 0 \quad (6)$$

The optimal value of the penalty would solve the problem of minimizing the deadweight loss resulting from blackmail subject to the incentive compatibility constraint which ensures that the blackmailer would prefer to screen victim types by engaging in the bargaining process as opposed to simply selling information on the market. That is, the optimal blackmail penalty \hat{t} must minimize $\int_p^{x^*(t)} (s-p)dF(s)$, subject to the constraint $(p-t)F(x^*(t)) + [1-F(x^*(t))]x^*(t) \geq p$. Because the incentive compatibility constraint implies that $x^*(\hat{t}) > p$, when the penalty is set at the optimal level equilibrium demand will be given by $x^*(\hat{t}) \in (p, x_0^*)$, where $x_0^* = x^*(t=0)$. While in general the regulatory remedy against blackmail need not take this particular form, it is clear from the discussion above that in this model some form of punishment for blackmail will be welfare enhancing despite the assumption of costless information acquisition.

2.2 Social value of information and criminalization of blackmail

The main qualitative results presented in the previous sections were obtained under the assumption that the market price of information p coincides with the social value of information disclosure, which implies that revelation is efficient when net social surplus $p-L$ is positive. Under this assumption bargaining under symmetric information always results in a Pareto efficient outcome and inefficiency of blackmail arises due to the absence of trade under asymmetric information when the victims type falls in the interval (p, x^*) . Because it is possible that the blackmailer will not capture the full social surplus from information disclosure it is important to study how this assumption affects the main conclusions obtained in the previous section. To this end, let V denote the social value of information which is assumed to exceed the blackmailer's payoff ($V > p$). In this case revelation is socially efficient if and only if $V-L > 0$. We have to consider the following cases:

(i) $V < x^*$. Because bargaining results in information disclosure when $L < x^*$, information revelation will be inefficient when $V < L < x^*$. On the other hand, information is suppressed

when $V < x^* < L$, which is an efficient outcome. Therefore in this case the main qualitative conclusion from the previous section remains valid: blackmail can result in inefficient disclosure of information, and this inefficiency can be alleviated by punishing blackmail on the margin.

(ii) $x^* < V$. In this case disclosure, which occurs in equilibrium when $L < x^*$, is always efficient. If information is not disclosed ($x^* < L$) then the outcome is inefficient when $x^* < L < V$. In this case the blackmailer's demand is too low from the social point of view. On the other hand, the bargaining outcome is efficient when $x^* < V < L$.

The overall conclusion emerging from the preceding discussion is that divergence between the blackmailer's private payoff and social value of information disclosure would change the conclusions reached in the previous section when the social value of information is much higher than the market price and also exceeds the blackmailer's optimal demand and the victim's damage ($p < x^* < L < V$). In this case a social planner would not want to diminish the blackmailer's demand on the margin (as described in section 2.2) but simply to prohibit blackmail altogether.

Because the qualitative results of the previous section are overturned when social value of information is much larger than the market price one might be interested in considering the types of situations in which this condition is likely to occur. The most prominent example is perhaps the case of information about a criminal offence committed by the potential target of the blackmailer's demands, when the society is likely to place a much higher value on information revelation than a blackmailer would. One way to restore efficiency in this case would be to prohibit blackmail (by imposing a sufficiently large penalty) only when information relates to a crime. This however would require the blackmailer to be able to infer whether the case at hand is a criminal offence or not and proceed accordingly, which might not always be an easy task. A viable alternative to the complete prohibition of blackmail would be for the social planner to signal the social value of information by providing sufficient incentives for the informed party to reveal it. If these incentives are set at an appropriate level the outcome will be efficient. Examples of such incentives include monetary rewards for providing information about a criminal act or social status and recognition obtained by whistleblowers who reveal socially valuable information. More generally one would expect that in cases when the social value of information is

particularly large the society would come up with an appropriate incentive scheme to ensure an efficient outcome. It is the criminalization of bargaining agreements which do not impose large external costs on other members of society which makes criminalization of blackmail paradoxical and which is the main focus of the argument for punishing blackmail developed in the previous section.

3 Bribery

Having demonstrated the rationale for criminalization of blackmail, we will show now that similar reasoning can be applied to the bribery paradox. To emphasize the differences between blackmail and bribery we study an ultimatum game in which the *potential victim* can make a take-it-or-leave-it offer to the other party to enter into a legally binding nondisclosure agreement in exchange for monetary compensation. Thus in the bribery game the distribution of bargaining power is reversed compared to the case of blackmail. In general the victim might or might not know the price at which the blackmailer can sell information to other parties. For this reason most of the analysis is conducted under the assumption of asymmetric information. Section 3.2 provides a brief discussion of the case in which the potential victim is fully informed.

3.1 Asymmetric information about market price

Let L denote the victim's damage from disclosure and suppose the victim's beliefs about the market price p are summarized by the cumulative distribution function $H(\cdot)$, which is assumed to be continuously differentiable and log-concave. The victim will choose the bribe level y to minimize the expected loss which is given by

$$D(y) = L(1 - H(y)) + H(y)y \quad (7)$$

That is the victim's offer will be accepted only if it exceeds the market price of information and rejected otherwise, in which case the victim will suffer a damage L .

The optimal bribe level must satisfy

$$D'(y^*) = (y^* - L)H'(y^*) + H(y^*) = 0 \quad (8)$$

Note that the second order condition for the minimization problem can be written as

$$-\frac{1}{H'(y^*)}(H''(y^*)H(y^*)+2H'(y^*)^2) > 0 \quad (9)$$

By log-concavity of $H(\cdot)$ the term in parenthesis is negative, which implies that the second order condition is satisfied. The structure of the victim's decision problem implies that the optimal bribe level can never exceed the actual damage, i.e. it must be the case that $y^*(L) < L$. This intuition is verified by noting that $D'(L) = H(L) > 0$ and that $D'(\cdot)$ is an increasing function. As in the case of blackmail the equilibrium in this game is not efficient. The inefficiency in this game stems from the fact that a victim with damage above market price might find it optimal to offer a bribe which is lower than the price and get rejected. However, it is easy to see that punishing bribery will not be welfare enhancing. Consider the following three cases.

(i) $p < y^*(L) < L$. In this case the offer will be accepted and no information will be revealed, which is an efficient outcome because $p < L$.

(ii) $p > L > y^*(L)$. In this case the offer will be rejected and information will be revealed, which is also efficient.

(iii) $y^*(L) < p < L$. In this case the offer will be rejected and information will be revealed, resulting in the deadweight loss.

The inefficiency arises in case (iii) because the bribe level is *too small* compared to the actual damage. In particular, the deadweight loss is increasing in the distance between $y^*(L)$ and L , implying that punishing bribery would be counterproductive.

3.2 Publicly known market price

It might be interesting to consider the case in which the market value of information is known to the victim with certainty, while the damage from disclosure remains their private

information. The plausibility of this assumption will vary from case to case but it is easy to imagine a situation in which it might be valid. For example, a celebrity at the risk of exposure might have a good idea about the price tabloids would pay for given information.

With this additional assumption the nature of equilibrium will depend on the social value of information disclosure, $p - L$. In particular, if $L < p$, then both, the blackmailer and the victim would have an incentive to disclose the information, and equilibrium is socially efficient. Conversely, if $L > p$, then in the bribery game the victim can make a take-it-or-leave-it offer $x \in (p, L)$ which will be accepted and information will not be disclosed. Therefore when the party affected negatively by the disclosure has the bargaining power and is fully informed about the market price, the bargaining outcome will always be efficient. In this, admittedly, special case the difference between blackmail and bribery becomes much sharper: a legal system that prohibits blackmail and simultaneously allows bribery constitutes the most efficient arrangement from the society's point of view.

Efficiency of bribery when the market price is known by the victim is an example of a well known result from the literature on the bilateral trade with asymmetric information. When a seller with publicly known costs engages in bargaining with a buyer whose value of the object is not known to the seller, an arrangement in which the buyer can make a take-it-or-leave-it offer, would maximize social welfare. Once the analysis of the case of publicly known price is rephrased in terms of bilateral bargaining setup, the answer to the question what is the most efficient allocation bargaining power between blackmailer and victim becomes apparent. Thus the main point of this sub-section is not to re-iterate this well known fact but simply to point out that it could be fruitfully applied in the analysis of the blackmail and bribery puzzles.

An important caveat that must be kept in mind here is that this argument can, in principle, go both ways. In particular, if the victim's damage but not the market price is publicly known, efficiency would require allocating all of the bargaining power to the blackmailer. This information structure however is not very likely to occur in practice: because the full damage will include monetary as well as psychic components, it seems reasonable to assume that the amount of damage inflicted on the victim is his private information. The market price, on the other hand, could be learned by any interested party including the potential victim. For these reasons we feel that the emphasis of the paper on the assumption of private (as opposed to public) information about victim's damage is justified.

4 Concluding remarks

In this paper the puzzles of blackmail and bribery were addressed in a unified framework of a stylized bargaining game with asymmetric information. In contrast to the previous approaches to the problem of blackmail we do not assume the blackmailer has to incur real costs to acquire information about the potential victim. In this simple setup presence of asymmetric information implies that punishing blackmail but not bribery will improve social welfare. In particular, because the blackmailer does not bear the cost from the revelation of information, his equilibrium demand will be too high relative to the social optimum and some form of regulatory remedy might be appropriate. On the other hand, the equilibrium bribe offered by the potential victim always lies below the socially optimal level, implying that punishing bribery would be counterproductive. The solution to the blackmail and bribery puzzles proposed in this paper is complementary and distinct from the existing theory of blackmail developed by Coase (1988), Ginsburg and Shechtman (1993) and extended by Gomez and Ganuza (2002).

There are several extensions of the model which could further improve our understanding of the paradoxes of blackmail and bribery. First, the assumption of take-it-or-leave-it bargaining structure can be relaxed by considering an infinite horizon game in which in each period the blackmailer decides whether to reveal information or to come up with a lower demand, conditional on the previous demand being rejected. A problem of this kind was considered by Fudenberg et al (1987), who studied a model in which an incompletely informed seller has an outside opportunity of selling a good to another party. They found that the presence of outside option resulted in existence of multiple equilibria, which poses additional challenges to welfare analysis.

A related issue that might be addressed is repeated blackmail, i.e. a situation in which the blackmailer keeps coming back with new demands over time. In this paper the possibility of repeated blackmail was ruled out by the assumption that the parties can enter into a legally binding non-disclosure agreement. In the absence of this type of contracting, the durability of information makes the blackmailer's problem similar to the problem faced by the monopolist selling a durable good (Coase, 1972). In this case even high damage victim types will lack an incentive to comply with the blackmailer's demands if they expect to be blackmailed again in the future. A dynamic model of bargaining between the blackmailer and the victim could be used to understand how blackmail can take place in the absence of credible commitment

mechanisms and how a lack of commitment might affect the rationale for criminalization of blackmail.

Finally, an interesting extension of the model would be to consider a setup in which the bargaining power is shared among the two parties. As argued in section 3, when the market price of information (or alternatively, the blackmailer's payoff from revealing it) is known to both parties it is socially efficient to allocate all the bargaining power to the potential victim. However, when only the blackmailer knows his payoff from information revelation the question of welfare maximizing allocation of bargaining power becomes a non-trivial one. As an alternative to the simple ultimatum bargaining assumption one could adopt a mechanism design approach in the spirit of Myerson and Satterthwaite (1983). In this setting an efficient outcome cannot be guaranteed under any mechanism, but it still might be of interest to consider the effects of criminal and legal blackmail regimes. These extensions are left for future research.

References

Bebchuk, L. 1984. "Litigation and Settlement Under Imperfect Information," *RAND Journal of Economics* 15 (Autumn): 404-415.

Bergstrom T. and M. Bagnoli 2005. "Log-concave probability and its applications," *Economic Theory*, 26: 445–469.

Coase, R. 1972. "Durability and Monopoly," *Journal of Law and Economics*, 15:143-149.

Coase, R. 1988. "The 1987 McCorkle Lecture: Blackmail," *University of Virginia Law Review*, 74: 655–676.

Daughety, A. and J. Reinganum 1994. "Settlement Negotiations with Two-Sided Asymmetric Information: Model Duality, Information Distribution, and Efficiency," *International Review of Law and Economics* 14: 283-298.

DeLong, S. 1993. "Blackmailers, bribe takers and the second paradox," *University of Pennsylvania Law Review*, 141: 1663-1693.

Fudenberg D., Levine K. and J. Tirole 1987. "Incomplete Information Bargaining with Outside Opportunities," *The Quarterly Journal of Economics*, 102(1): 37-50

Ginsburg, D.H. and P. Shechtman 1993. "Blackmail: An economic analysis of the law," *University of Pennsylvania Law Review*, 141: 1849–1876.

Gomez F. and J.-J. Ganuza 2002. "Civil and criminal sanctions against blackmail: an economic analysis," *International Review of Law and Economics*, 21: 475–498.

Hepworth, M. 1975. "Blackmail: publicity and secrecy in everyday life," Routledge and Kegan Paul, Boston, 73–77.

Katz L., and J. Lindgren 1993. "Blackmail Symposium: Instead of Preface," *University of Pennsylvania Law Review*, 141:1565.

Lindgren J. 1984. "Unravelling the paradox of blackmail," *Columbia Law Review*, 84: 670-717.

Lindgren J. 1989. "Blackmail: On waste, morals and Ronald Coase," *UCLA Law Review*, 36: 601-602.

Myerson, R and M. Satterthwaite 1983. "Efficient Mechanisms For Bilateral Trading," *Journal of Economic Theory*, 29(2): 265-281.

Nalebuff B. 1987. "Credible Pretrial Negotiation," *RAND Journal of Economics*, 18 (Summer): 198-210.