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1 Introduction

Firms with similar ethical codes and compliance systems can respond to corruption-related challenges in very different ways. Whereas many firms operate honestly and consistently with their codes of conduct, others offer secret bribes to procure contracts and/or other business benefits. The consequences of their chosen behavior are often uncertain, partly because they depend on external factors which are difficult to predict. A firm's attitude towards risk is thus intuitively an important element in any attempt to understand its propensity to offer bribes. However, the connection between attitude towards risk and bribery is not obvious.

The decision to offer a bribe carries several kinds of risk. The punishment for firms detected in bribery is now higher than ever, at least in the USA.[1] Customer reaction to a firm involved in corruption can be severe. At the same time, the benefits to be gained from bribery are often uncertain as bribery is an essentially illegal agreement that generally cannot be enforced in a court. Besides, the offer of one bribe may be followed by a demand for others, initiating an open-ended process of extortion.

The hazards of bribery suggest an incompatibility between risk aversion and bribery. However, the strategy of operating honestly also involves uncertainty and risk. When corruption is perceived to be widespread, it is more probable that a firm will have competitors who offer bribes. A firm that adopts an honest approach is more likely to fail in its attempt to procure contracts.[2] The distribution of unfair benefits and contracts among firms according to their different attitudes towards risk is therefore difficult to predict.

The propensity of firms to offer illegal bribes has not been fully explored by economists. This is in spite of a rapidly increasing literature on the phenomenon of corruption, the environments in which it thrives, the incentives of

[1] Titan Corporation paid $3.5 million to support the President of Benin's election campaigns and was subsequently fined $ 28.5 million under the US *Foreign Corrupt Practices Act* (FCPA). During 1998-2003 the Switzerland-based ABB offered bribes of more than $ 1.1 million in Nigeria, Angola and Azerbaijan. It too was prosecuted in United States and under the FCPA, and had to pay fines amounting to $16.4 million Further examples of FCPA prosecutions are available on the homepages of the US Securities and Exchange Commission (www.sec.gov) and of anti-corruption organisations, such as Transparency International (www.transparency.org).

[2] See Ehrlich and Becker (1972) who explain the implications of this form of self-protection.

politicians or public officials to demand bribes, and the welfare consequences thereof. In an early contribution to this literature, Huntington (1968) described bribery as the way of approaching "an over-centralized bureaucracy" (Huntington, 1968: 386), an approach also shared by Leff (1964). This attitude has largely fallen out of favour in economic theory. Myrdal (1968) was one of the first to challenge the 'grease money model' by showing how bribery creates incentives for public officials to put pressure on potential bribers, and actually causes bureaucratic delays. Rose-Ackerman (1978) described how corruption is an obstacle to welfare from several different perspectives, including that of firms. Andvig and Moene (1990) explain changes in the level of corruption on the basis of both supply and demand of bribes. The risk of being caught in corruption is included in their theory. Kaufmann and Wei (1999) also reject the grease money hypothesis, that bribery increases efficiency, and find a positive correlation between the propensity of firms to offer bribes and the time they waste through bureaucratic delays. Svensson (2003) considers the connection between the ability of an enterprise to pay bribes and its propensity to do so. Monezes and Montiro (2005) describe corruption in the context of auctions, and find the size of the bribes to increase in relation to the value of the benefit up for auction when the bidders are risk neutral.

Good recent overviews of the economic literature on corruption are provided by Bardhan (1997), Rose-Ackerman (1999, 2004), Aidt (2003) and Lambsdorff (2005). However, the connections between a firms' propensity to offer bribes, its attitude towards risk, and its reliance on self-estimated probabilities are not clear in this literature. There are, however, several results in the more general rent-seeking literature that are relevant, in particular those presented by Hillman and Katz (1984), Skaperdas and Gan (1995), Konrad and Schlesinger (1997), which I will discuss below, but also by Foster (1981) and Skaperdas (1991). An important question for the present paper is thus the extent to which these results are applicable to understanding the propensity of firms to offer business bribes.

Rent-seeking is an investment of resources made to obtain an uncompensated benefit as the result of a "favorable decision" on some public policy. Business corruption is indeed a form of such practice. However, most of the rent-seeking literature does not differentiate between legal lobbying and illegal corruption (Buchanan, Tollison and Tullock, 1980). Lambsdorff (2002) explains, in terms of welfare implications, the distinctions between rent-seeking in its general forms, and the specific category of corruption. He

points to the lack of transparency in cases of corruption and the consequences of these forms of misuse of authority. Bribery also differs from legal lobbying in that both parties to the transaction benefit from the offence. Legal lobbying, by contrast, only benefits the lobbyist and can constitute an annoyance to the decision-makers. Bhagwati (1982) discusses the distinction between legal and illegal forms of rent-seeking, but concludes that it is unimportant in analytical work on this topic.[3] Tirole (1997:78), by contrast, underscores the problems of generalizing about the phenomenon of rent-seeking: "As the rent-seeking games vary considerably in practice, we are obliged to analyze the issue case by case."

This paper focuses on the case of business-corruption from the perspective of the firms. It aims at defining the uncertainties and risks of bribery, and specifying their impacts on firms' propensity to offer bribes. A theory about business corruption is developed using empirical data from a business survey. The paper begins by presenting background information about this survey and some of its results (Søreide, 2006). This study provided important information about aspects of real life business corruption. For instance, it revealed how corruption imposes uncertainties on firms and the benefits they might expect from taking part in corruption.

The third section develops a more analytical approach to the question of bribery. It begins by presenting assumptions about the choices firms make between a legal and an illegal business approach. The significance of various uncertainties is examined, including the risk that the award of a tender might be influenced by corruption, the chances of getting contracts by an honest approach, and the risk of being caught in offering bribes. These uncertainties are treated as self-estimated probabilities, and it is demonstrated how they are likely to influence a firm's business approach.

The significance of business attitudes towards risk is examined in the fourth section. The section starts with a discussion of relevant results reported in the rent-seeking literature, and explains important differences between legal and illegal rent-seeking. The significance of risk aversion and risk attraction is then examined in terms of the model that was presented in the third section. This model differs from the rent-seeking models in four important ways: (i) there is a choice between a legal form of rent-seeking and illegal bribery; (ii) there is a risk of choosing the wrong strategy and be

[3]Bhagwati (1982) applies the broader term "Directly unproductive profit-seeking activities" (DUP).

excluded from the competition, i.e choosing an honest approach when the benefit is awarded in a corrupt procedure, and vice versa; (iii) there is a risk of being apprehended in a crime and sanctioned; (iv) this study focuses on the choice between a legal and illegal business strategy; rent-seeking models explain the connection between the size of the rent-seeking investment and the probability of obtaining a benefit.

However, the final results correspond to some extent with the most relevant results in the established rent-seeking theory, although the underlying assumptions and circumstances are different in the present study.

2 The perspective of firms

The survey was conducted among Norwegian exporters during 2004, with the broad objective of getting detailed empirical information about firms' experiences of corruption in overseas markets, their attitudes to it, and the actual choices they make in response (Søreide, 2006). Although the survey chose to focus on Norwegian industry for primarily practical reasons, this proved to be an excellent choice in terms of presenting an interesting case for the study of firms' propensity to offer bribes. Norwegian industry is oriented to overseas markets and well exposed to international business cultures and attitudes. Its primarily sectors of operation are among the most prone to corruption, notably construction, communications (IT/telecom), and energy (gas, oil, electricity). Even so, Norway scores well on corruption rankings, such as the Corruption Perceptions Index (CPI) by Transparency International (2005), and is also commended by the OECD for its implementation of new anti-bribery legislation (OECD, 2004). Thus, many Norwegian firms probably experience the challenge of combining the pressures of operating in markets where corruption is considered a common problem with the obligation to respect the new restrictions on bribery.

The survey-project, which was conducted in cooperation with the Confederation of Norwegian Enterprise (NHO), had three components: (i) A pilot study involving interviews with executives in charge of international sales and marketing in seven large Norwegian firms:[4] (ii) a mail survey questionnaire with about 100 questions on corruption to which top managers in 82 exporting firms responded. (iii) a smaller survey of Norwegian embassies in

[4]These were large firms, three of them on the FT list of the 500 largest companies.

countries outside the OECD area.[5]

The secrecy surrounding business corruption makes it difficult to estimate the actual scale of the practice. The respondents to the present business survey though described corruption as a widespread phenomenon in international business. And, the embassy representatives did not find it uncommon that foreign firms make use of business practices that most likely deviate from their own official anti-corruption codes of conduct.

A clear majority of the embassy representatives thought that Norwegian firms are sometimes or often confronted with corruption, and that an adjustment to local informal conventions would imply adopting procedures that would be considered unacceptable in Norway. Similarly, 18 of the 24 embassy respondents believed that a refusal to make irregular or informal payments could reduce business opportunities significantly. More than one third of the embassy respondents was either in doubt or likely to recommend firms to adjust to the local culture, even if this implied bribery.[6]

The majority of the responding firms reported encountering some form of corruption in their international operations. When asked about the extent to which "unethical business practices have placed the firm in a more adverse competitive position", almost 70 per cent claimed that unethical business practices by competitors had certainly or probably cost them important contracts. 42 per cent said that they had reason to believe that competitors influence tender procedures unduly. Few respondents admitted to practising bribery themselves. Ten per cent had agreed to meet a request for payment from an agent, an adviser or a consultant in the knowledge that this payment would most likely be used for bribery. 27 per cent of firms reported that they had been required to give valuable presents or bribes to be able to operate in certain markets.

The respondents did not respond to questions explicitly on risk aversion, but they can be categorized on competitive pressure as they were asked how pressured they were on the prices on their main products. The exposure to competitive pressure will perhaps inform about a firm's ability to take risk. However, it can be difficult to interpret this indicator. Competitive pressure may reflect a firm's ability to survive in spite of lost contracts, but also a more pressured situation where one single contract can be very important,

[5] Details and results are presented in Søreide (2006).

[6] The embassy respondents were also prepared to take up complaints about specific instances of business corruption at higher political levels.

and where the firm is forced to take greater risk. Nevertheless, exposure to competitive pressure tells us only about a firm's financial situation and external market conditions, not its attitude towards risk in the sense of utility functions.

The responding firms that considered themselves strongly exposed to competition were significantly more likely to believe that they had lost contracts because of corruption. They were also more inclined to think that tender procedures were pre-determined, and they were more likely to consider corruption a significant challenge to their foreign direct investments (FDI).[7] It is not clear if these results reflect actual higher levels of corruption in competitive markets, or rather greater suspicion about corruption in markets where the firms compete with more homogenous products. What it does reveal is a *perception* of higher extents of business-corruption among the firms which are exposed to competitive pressure.

The specific benefits obtained by business corruption take various forms. Probably the most common objective is to secure a contract. But by offering bribes firms can obtain other more indirect benefits such as reduced levels of taxation, ignorance of profitable collusion in the market, or a change in the legislation that provides the firm with market power or reduces its expenditure. The most common objectives of tender corruption, apart from securing a contract, were assumed by the respondents to be (in the following order): exemption from tender rules; secret inside information about the criteria used to evaluate tenders; secret information about competitors' bids; and advantageous adjustments in tender specifications. According to the respondents, the most important underlying motivation for bribery was "the fear of losing contracts because someone else has bribed the decision-makers".

Most firms preferred not to make any public reaction when losing contracts because competitors offer bribes, although five per cent would appeal to the tender authorities.[8] The survey asked what the firms would do if the challenge continued, and if complaints were ignored and/or rejected. 25 per cent replied that in such a case they would "adjust their strategies to the local business climate", 30 per cent considered "corruption part of the game",

[7] All results are significant within the five per cent level. According to a probit analysis, the respondents who considered themselves exposed to strong competitive pressure were 26 per cent more likely to believe that competitors had offered bribes.

[8] However, 26 per cent would request a formal explanation from the client. This is something they are supposed to get in any case, according to common tender rules, and is not a proactive response to corruption.

and very few would retreat from the market. The propensity to complain about the situation, whether to the authorities, through political channels or in other ways, was dependent on the level of corruption.[9]

These results, based on responses provided by firms with significant experience of international markets, reveal the extent to which corruption disturbs the business of many firms and introduces uncertainties into their overseas operations. On the other hand, the results also reveal a general reluctance to retreat from markets simply because of business corruption as well as a marked disinclination to speak out about corruption-related challenges and expenses.[10] One implication of these findings is that business corruption creates major challenges for Norwegian exporters, forcing them to chose between a legal business approach and illegal bribery.[11]

3 Uncertainty and bribery

I now develop a more analytical approach to the question of bribery. The survey results will form the basis for a simple theory about how a firm's propensity to offer bribes is subject to its calculation of probabilities. The purpose of the exercise is to illustrate a firm's uncertainties and risks in the choice between a legal and an illegal business approach. This then provides the context for a discussion of business attitudes towards risk in section 4.

3.1 Assumptions

Consider a firm whose goal is to make profits in a market where it operates in competition with other firms. The firm makes a number of choices, and this involves considering various forms of rent-seeking: The firm can hope to obtain benefits by lobbying on behalf of its industry and hope to win contracts by promoting its products with honest business procedures. Or, it

[9] The respondents were anxious about various consequences of speaking out about corruption. The impact on future business cooperation was the most frequent concern, although the possibility of customer sanctions was also an important consideration.

[10] However, one third of the firms surveyed had decided not to enter a market because of business corruption.

[11] There are, however, judicial grey zones between legal and illegal practices, and a firm may well adopt a combination of strategies, from legal forms of rent-seeking at one end of the continuum to the payment of large illegal bribes at the other end of the scale.

can seek to obtain benefits by offering illegal bribes to corrupt representatives of a bureaucracy, or to a client, at the risk of being caught in corruption.

As noted, the benefits obtained by rent-seeking or business corruption can take many forms. It can be a contract, a concession, a legal adjustment which produces tax cuts for the firm, or a political decision which favours some form of business strategy or reductions in the firm's production costs. Let us assume in this setting that a firm aims for an exclusive benefit, $\kappa > 0$, awarded by the authorities, for instance a license to operate or trade, that will be awarded to only one of several interested firms.[12] Pursuing this benefit, the firm's choice between a legal and an illegal business approach is not straightforward since important parameters and outcomes are uncertain. The firm will have to rely on its own estimations of the different probabilities. I will now describe uncertainties and risks in this situation, they will also be illustrated in Figure 1.

The level of corruption The perceived level of corruption, $c \in [0, 1]$, is important in a firm's choice between a legal and illegal business approach. The firm assumes that the authorities' decision-making process will be influenced by corruption with a probability which reflects the perceived extent of corruption, c, in the given institutions (or the country). This perceived extent of corruption also indicates the probability of succeeding with an honest business procedure $(1 - c)$. From the perspective of the firms, however, the extent of corruption is only an estimated parameter; corruption is essentially a hidden phenomenon about which firms form opinions but about which they seldom have certain knowledge. Their opinions about levels of corruption will be based on various kinds of evidence, including rumors, experience of other markets, published cross-country indices of corruption, or country analyses.[13]

Firm specific probabilities A firm's probability of gaining κ through its chosen strategy depends also on aspects that are independent of the presence of corruption. These can be market conditions and efficiency, but also personal relationships, which can be decisive in these settings. This firm specific

[12] The benefit κ will now be thought of as constant, and can not be increased by a bribe. This study concerns the uncertainties and risks of taking part in bribery, and rent-augmentation is not a central question.

[13] The challenges of estimating the level of corruption in a country in a particular country are discussed in Søreide (2005).

probability, $\rho_i \in [0,1]$, will differ between the case of bribery, ρ_b, and the case of legal rent-seeking, ρ_h, because firm specific conditions for success will differ in the two alternative strategies.[14]

A legal business approach With a legal and honest business approach, the firm will invest an amount $h > 0$ in various forms of rent-seeking expenditures, like lobbyism, promotion, etc., but also the cost of taking part in the competition, like tender expenses. The probability for success depends on the business climate, $(1-c)$, and its own specific qualities, ρ_h. The probability of gaining the contract will thus depend on other factors than the size of the investments made by (all) firms to be able to participate in the competition.

If the firm chooses an honest approach, by investing no more than the amount h in the procedures, it runs the risk of losing the contract, not only because of its own qualities, ρ_h, but also because the authorities' decision-making process is corrupt, which happens with the probability c. The cost of failing in the choice of strategy is identical to the investment, h. If the firms succeeds its outcome is $\kappa - h$.

An illegal business approach Also in the choice of an illegal business strategy a firm will have expenses similar to those invested in legal rent-seeking. Before it offers a bribe, the firm may have invested significantly in the process of market positioning, establishing the right contacts, and also tender expenses. These expenses are not part of the illegal bribe, still an investment which is lost if the firm fails in its business strategy. In the following, this cost will be assumed symmetric to the alternative case of a legal business approach, and equal to the rent-seeking expenses of h.

The firm's probability for success in the choice of an illegal business strategy depends on the level of corruption, c, and the firm specific probability, ρ_b. If the firm succeeds it gains the business benefit, κ, by offering an illegal bribe, $b > 0$, while also investing h in the process. However, the firm will not necessarily gain the business benefit if it decides to offer an illegal bribe, even if the level of corruption is assumed high. The representatives of the authorities may reject the proposed bribe, and the firm does not make any bribe payment. In such a case, the firm will not know whether it has been rejected because the public officials are honest (c reflects a *probability*), or

[14] The probabilities are individual and will differ between firms. However, I will consider only one firm's perspective here, and will not need the i-notation.

because they already have agreed a hidden agenda with another competitor. In either case, a rejected proposal of a bribe excludes the firm from the number of candidates, and the firm has waisted an amount h in a failed attempt to get the benefit through corruption.

The risk of sanctions The firm's concern if taking part in corruption, relates to the probability of getting caught and prosecuted for the crime, and incurring a penalty, $\theta > 0$. The probability of this outcome is likely to decrease in relation to the level of corruption, although it is difficult to determine the specific correlation.[15] Assume that $(1-c)^{\gamma}$ denotes this probability, and that $\gamma \in [0,1]$. The investigation and successful prosecution of a firm for corruption do not necessarily imply that the firm will forfeit the contract or other benefit it gained through the corruption. These cases tend to take time to come to court, and the firm has often secured the commercial benefit and/or carried out the content of the illegally secured contract by the time it is sentenced for the crime. The business benefit, κ, is therefore assumed independent of the consequence if caught in corruption, $\theta > 0$.

Figure 1 summarizes the different risks, and illustrates the uncertainties in the choice between a legal and an illegal business approach. The probabilities are denoted in italics, on the branches. The possible outcomes are described at the decision nodes.[16] To read the figure, assume that a strategy has been chosen, either legal, H, or illegal, B. The right-hand branch for both strategies denotes the probability, c, that the decision-making process is corrupt, the left-hand branch denotes the probability that this process is honest, $(1-c)$. For each strategy there is a given individual probability, ρ_h or ρ_b, that the firm's chosen strategy will succeed. An illegal strategy includes the additional risk of being caught in the crime.

The choice between a legal and an illegal business approach can now be formalized into a simple model. Let $E(H)$ denote a firm's expected revenue if

[15] The connection between the level of corruption and the probability of being caught in the crime is explained by Andvig and Moene (1990). However, firms can be caught by local institutions, by institutions in their country of origin, by their own security systems, and by the SEC in the USA if registered on a US stock exchange.

[16] The figure has the form of a tree only as an illustration; it does not reflect interaction between several players. Note also, the aim of this figure is to illustrate the different uncertainties and risks of firms in this situation, not to describe one single mechanism by the simplest possible model.

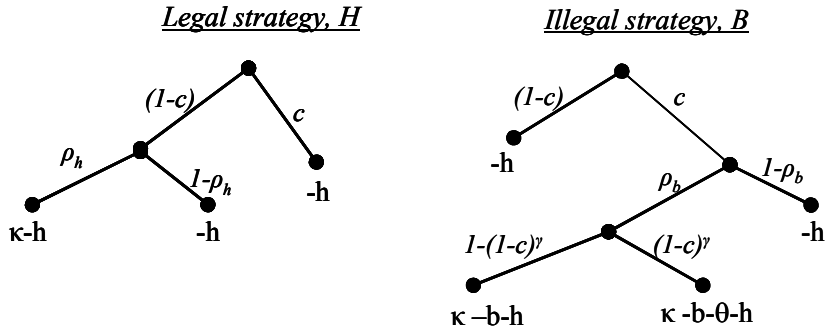

Figure 1: Outcomes and risks that a firm will consider in its choice between a legal and illegal business strategy.

it chooses an honest business strategy, and let $E(B)$ be the expected revenue in the choice of bribery. The forms of these expressions follow directly from Figure 1:

$$\begin{aligned} E(H) &= (1-c)\left[\rho_h(\kappa - h) + (1-\rho_h)(-h)\right] - ch \\ &= \kappa(1-c)\rho_h - h \end{aligned} \tag{1}$$

$$\begin{aligned} E(B) &= c\rho_b(\kappa - b - h) - c\rho_b(1-c)^\gamma\theta - (1-c)h - c(1-\rho_b)h \\ &= c\rho_b\left[\kappa - b - (1-c)^\gamma\theta\right] - h \end{aligned} \tag{2}$$

Figure 2 illustrates (1) and (2), which are denoted H and B, respectively.[17] The vertical axis describes the expected value of the chosen business approach, $E(H)$ or $E(B)$, while the horizontal axis is the perceived level of corruption, c.

A firm is indifferent between a legal and an illegal business approach for the levels of corruption, c^*, at which the curves intersect, i.e. where $E(H) = E(B)$. The expected value of an honest business approach decreases in the perceived level of corruption, c, while the expected value of an illegal business approach increases in this level.[18]

[17] The parameter values applied in Figure 1: $\kappa = 8$, $b = 2$, $h = 0.5$, $\rho_h = 0.4$, $\rho_b = 0.4$, $\theta = 5$, $\gamma = 0.7$.

[18] $\partial E(B)/\partial c = K - b - (1-c)^\gamma\theta$. These parameters can take values which result in

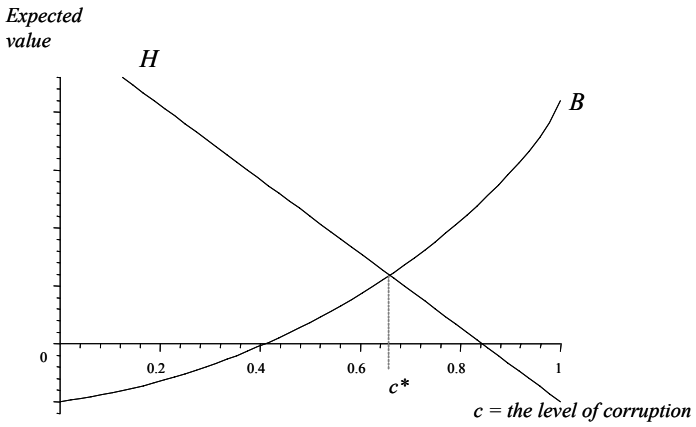

Figure 2: The expected revenues of bribery versus legal rent-seeking.

3.2 Comparative statics

The size of the business benefit Intuitively, the size of the benefit, κ, will have some impact on a firm's decision to operate legally or to participate in corruption. The specific connection, however, is not obvious. The sanction if caught in corruption, θ, is assumed independent of κ, and the expected outcomes of both bribery and of a legal rent-seeking strategy will increase if the potential business advantage, κ, increases:

$$\begin{aligned} \frac{\partial E(H)}{\partial \kappa} &= (1-c)\,\rho_h \\ \frac{\partial E(B)}{\partial \kappa} &= c\rho_b \end{aligned} \tag{3}$$

The impact of an increase in κ on a firm's propensity to offer bribes, will thus depend on the firm's perception of the level of corruption, c. Hence, $\Delta c^* > 0$ if $\partial E(H)/\partial\kappa > \partial E(B)/\partial\kappa$, which is the case when $(1-c)\,\rho_h > c\rho_b$, and the impact on a firm's propensity to offer bribes is uncertain. It will

$\partial E(B)/\partial c < 0$, i.e. that $E(B)$ decreases in the level of corruption. Note, however, that $E(B) < 0$ if $[K - b - (1-c)^{\gamma}\theta] < 0$, and a firm will not choose the illegal strategy unless $\partial E(B)/\partial c > 0$. The value of $E(B)$ increases therefore in c, when conditions under which a firm may consider this strategy is met.

depend on the level of corruption, and the firm's estimated probability to succeed in the two alternative strategies, ρ_h and ρ_b.[19]

The bribe and the rent-seeking expenses The impact of a change in the size of the bribe, b, or the rent-seeking expenses, h, is visible in (1) and (2). A change Δh will alter both curves in Figure 2 exactly the same, and the firm's decision, c^*, will not change. When h is equal in the two alternative strategies it is unimportant for the firm's decision to operate legally or take part in corruption. The effect if h differs in the case of corruption and the case of legal rent-seeking is also visible in (1) and (2). An increase only in the rent-seeking expenses as part of a legal strategy would decrease the expected outcome of an honest business approach. Bribery becomes relatively more rewarding, and c^* is reduced, which means that bribes will be offered at lower levels of corruption.[20]

A change in the size of the bribe that is required in the given context to get the benefit through corruption, b, alters only the expected outcome of bribery, $E(B)$. An increase in the size of the bribe, Δb, increases c^*, and the propensity to offer bribes is reduced.

The risk of sanctions An increase in the size of the fine, θ, if apprehended and penalized for bribery, will have an effect only on the expected value of an illegal strategy, $\partial E(B)/\partial\theta = -c\rho_b\left(1-c\right)^{\gamma}$. An increase in θ will reduce the propensity to take part in corruption, by increasing c^*. The effect is stronger if the firm's probability of obtaining the contract through corruption, ρ_b, is low. When this probability is high, the firm has a higher expected revenue of bribery, and will be more likely to offer bribes, in spite of the risk of being sanctioned with a significant penalty, θ.

[19] The expected benefit of bribery would be reduced if θ were a function of κ. The empirical connection between these parameters is not obvious. The penalty will usually be in proportion to the firm's total turnover. Whether it also increases in relation to the size of the business benefit obtained is unclear. This has been the trend in some of the latest court cases in the USA. Fines imposed in other cases of corruption have borne little relation to the resulting commercial gains.

[20] The probability of obtaining the benefit is independent of the size of the rent-seeking expenses, h. In this way the model differs from the rent-seeking theories, where the probability of gaining the benefit increases proportionally to h. Which one of them is the most realistic assumption depends on the circumstances, and the connection is not even obvious even when it comes to lobbying.

The effect of a large penalty will also depend on the connection between the level of corruption and the risk of being caught in the crime, γ. When the risk of being caught is lower for high levels of corruption (i.e. γ is high) the risk of sanctions decreases in the level of corruption, and hence the impact of a change in θ decreases in the level of corruption. Accordingly, if there is a strong connection, γ, between the local level of corruption and the risk of being apprehended in bribery, the consequences of being caught in corruption, θ, will have to be larger for higher levels of corruption than for lower levels of corruption, if the sanction is supposed to have the same deterrent effect on potential bribers for all levels of corruption, c.[21]

3.3 Overestimating the level of corruption

As noted, the extent of corruption is an uncertain variable in this model. The likelihood of a firm operating with unfounded perceptions about the level of corruption is thus significant, since the extent of corruption is difficult to estimate and is a variable that varies between countries, markets, sectors and individuals. The results of the business survey revealed a higher perception of corruption among the firms that were exposed to competitive pressure. There can be several explanations to this result, but it is possible that firms exposed to competitive pressure may consistently overestimate levels of corruption. For instance, in competitive markets firms may have lost contracts with offers that were very close to the winning bid, rather than because of corruption practiced by competitors as they allege.

To understand the consequence of overestimating the level of corruption in the local marketplace, let us assume that a firm thinks that the level of corruption is c^+, while it actually is $c^- < c^+$. Figure 3 illustrates this situation and its consequences when $c^- < c^* < c^+$, with the level of corruption on the horizontal axis and the expected value of the strategies on the vertical axis.

The figure thus shows how an overestimation of the extent of corruption can lead the firm to make the "wrong" choice of business approach, given the expected values described by (1) and (2) and $c^- < c^* < c^+$. If $E(B, c^+) >$

[21] The connection between the level of corruption and the risk of being caught in corruption, γ, will be reduced by the risk of being sanctioned in courts in other countries than the country where the benefit κ is to be awarded. This risk is increased by US legislation (the Foreign Corrupt Practices Act) and the OECD convention on combatting bribery of foreign public officials in international business transactions, a convention which now has entered into force in about 30 countries.

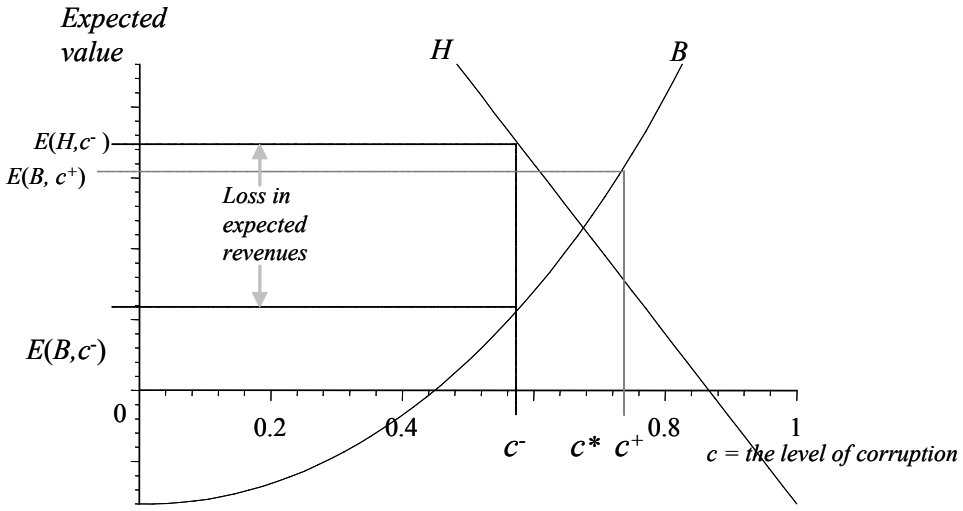

Figure 3: The loss in expected outcome if the extent of corruption is overestimated.

$E(H, c^+)$ the firm would choose an illegal business approach, B, whereas its highest probability of securing the business benefit might in fact lie in the choice of a legal rent-seeking approach, H. The expected loss in case of such an error of judgement is $E(H, c^-) - E(B, c^-)$, as is illustrated in Figure 3.

To offer a bribe to representatives of the decision-making authority can obviously result in failure if the latter are honest. If, on the other hand, these representatives are corrupt, an honest business approach reduces the firm's likelihood of securing the commercial benefit in question. If firms that are exposed to competitive pressure consistently overestimate levels of corruption, they also consistently suffer higher loss in revenues due to business corruption.

4 The significance of risk aversion

The significance of risk aversion in the given context is interesting as it may alter the choice between a legal and illegal business strategy. I will begin by summarizing how the connection between risk aversion and rent seeking has

been explained in economic theory. A discussion follows about the ability of this theory to explain business corruption as a specified instance of rent-seeking. Finally, I will describe the significance of risk-aversion in the given context of business corruption, and discuss the results in light of the rent-seeking theory.

4.1 Results on risk aversion and rent-seeking

Conventional approaches to understanding the implication of risk aversion for rent-seeking draw on the concept of the decision-makers' utility function.[22] According to this approach, risk aversion would entail that the utility of participation in the given rent-seeking contest is lower than the utility of the expected value of taking part in the rent-seeking contest, i.e. a fixed amount, κ, achieved with certainty gives higher utility than the participation in a lottery where κ is the expected gain. Risk attraction would correspond to the opposite opinion: in this case participation in the contest would be preferred. Risk neutrality means that the firm is indifferent between the two alternative situations.

This definition of risk aversion has been applied to understanding the impact of risk aversion on the more general issue of rent-seeking. Hillman and Katz (1984) find risk aversion to reduce the investments in rent-seeking activity in cases where rents are particularly large and where there is competition among the rent-seekers. The consequence is a limited spread in the dissipation of rents, in the sense that risk averse firms will invest less in rent seeking, and be less likely to obtain the given benefit. This result, however, holds only if the rent is large, such as monopoly profits.

Skaperdas and Gan (1995) examine the implications of risk aversion in several forms of rent-seeking contests where two rent-seekers have different attitudes towards risk. They demonstrate how the significance of risk aversion depends on assumptions about the rent-seekers' particular utility function. They compare the expected utility of competitors with different *contest success functions* (CSF) in winner-takes-all forms of contests. Most of the rent-seeking literature assumes a CSF such that $\rho_i = (h_i)/(h_i + h_j)$, in the

[22] Standard risk aversion refers to von Neumann-Morgenstern utility functions. The form of the utility function determines how the individual compares the expected utility of an investment versus the utility of the sum invested. See Kimball (1993) for a broad discussion. Shapiro and Titman (1985) and Greenwald and Stiglitz (1993) explain why firms act as if they were risk averse, in the sense of this conventional form of risk aversion.

case of two competitors, i and j, and where h is the rent-seeking investment. Skaperdas and Gan suggest an additional case, a logit CSF where $\rho_i = \exp(kh_i)/\left[\exp(kh_i) + \exp(kh_j)\right]$, and determine the impact of risk aversion under both cases. They find risk aversion is likely to increase the relative rent-seeking efforts in the first case, while the impact is ambiguous in the second case.

Skaperdas and Gan (1995) also study the impact of risk aversion under the circumstances when firms can borrow money to fund their rent-seeking activities. The firms are thus liable for the repayment of the loans even if they are unsuccessful and lose the contest in question. The surprising result in these cases is that a Nash equilibrium exists in pure strategies, in which the more risk averse agent will always make greater rent-seeking effort and thus increase its probability of securing the benefit. Skaperdas and Gan draw the intuitive conclusion that "the more risk averse are more fearful of ruin, bankruptcy and disaster and they thus put more efforts into avoiding it" (Skaperdas and Gan, 1995:960).

Konrad and Schlesinger (1997) separate the effects of rent-seeking expenditures into two categories. The first category refers to *rent-augmentation games*, in which efforts are made to increase the value of the given benefit. The second category denotes the more common model of rent-seeking, in which efforts are directed to increasing the probability of securing the benefit. The authors suggest that the effect of risk aversion differs between these two forms of rent-seeking. Rent-augmentation will always increase the (marginal) risk, and lead the risk averse decision-maker to decrease its investment. By contrast, rent-seeking, aimed at increasing the probability of securing the benefit, is proved to have an ambiguous impact on the marginal risk.

Risk aversion is thus proved to have an indeterminate effect on rent-seeking efforts in the context of winner-takes-all contests, and in this respect the results by Konrad and Schlesinger (1997) correspond to the conclusions drawn by Skaperdas and Gan (1995).

4.2 The relevance to business corruption

The analyses presented by Hillman and Katz (1984), Skaperdas and Gan (1995) and Konrad and Schlesinger (1997) offer important insights into how the propensity of firms for involvement in corruption is subject to their attitude towards risk, even if they fall short of specifying the precise relationship. The results reported by all three studies clarify the connections that can be

applied to understand the connection between the size of business bribes, firms' initial financial situation and the expected revenues of the given contest.

However, there are also some important distinctions between the basic forms of rent-seeking considered in these studies and the typical features of business corruption, as they were described under Figure 1. Hillman and Katz (1984), Skaperdas and Gan (1995) and Konrad and Schlesinger (1997) all assume that rent-seekers have symmetric possibilities of increasing their likelihood, ρ_h, of securing the benefit, κ, by investing an amount, h, in rent-seeking. One firm's probability of securing the benefit is assumed to decrease in relation to its competitors' rent-seeking investments. This assumption will usually be realistic for legal forms of rent-seeking. However, once rent-seeking efforts encompass illegal transactions and favoritism, assumptions about the fair distribution of opportunities appear optimistic. In cases of business corruption it could be more realistic to suppose that one firm's investment in illegal rent-seeking, b, actually excludes its competitors from the contest.

In most of the cited analyses, rent-seeking investments are limited by the rent-seekers' financial situation. Few, if any, rent-seekers will choose a strategy which implies expected deficit, and there is a restriction on the size of the rent-seeking expense, h. This assumption will not apply in many cases of business corruption. The expenses related to bribery, b, will not necessarily imply a reduction in the firm's endowment as the cost can be covered by the contract that is awarded as a result, for instance by inflating a price. Moreover, corrupt civil servants will be as willing as contractors to make arrangements to cover these expenses as both sides benefit from corrupt transactions. In the cases of legal rent-seeking, by contrast, it is obvious that the rent-seekers must cover all expenses.

The lack of a distinction between legal and illegal forms of rent-seeking in current economic theory also implies that there is no risk of sanctions, θ, a threat which both has potentially serious consequences and is difficult to predict. The legal rent-seekers' risk-related worries will usually be limited to the possible loss of their rent-seeking investments, $h < \kappa$. In illegal rent-seeking, however, the additional risk of being apprehended may imply a penalty which may be larger than κ. Threat of insolvency can thus constitute a direct risk in cases of business corruption, whereas it is either indirect or absent in cases of legal rent-seeking. However, there is one relevant parallel between legal and illegal rent-seeking, in this respect. The result presented by Skaperdas and Gan (1995) on risk aversion and liability includes an el-

ement of risk which analytically resembles that of a penalty. They explain that in cases of "soft budget constraints", where the rent-seeking expenses can exceed the firm's financial endowment, legal rent-seekers also take the risk of insolvency. As noted, Skaperdas and Gan find risk-aversion to increase rent-seeking expenditures under these circumstances. The risk is defined as a reduction in expected utility, and the increase in efforts, h, is explained by the self-protection argument. Higher efforts in respect of rent-seeking investments reduces the probability of deficit.

The argument made by Konrad and Schlesinger (1997) concerning rent-augmentation will not necessarily apply to business corruption. Their model describes circumstances in which rent-seeking is invested on behalf of a group (for instance when construction companies cooperate to lobby for a more extensive highways building programme than the authorities have planned). An illegal bribe will seldom be offered on behalf of a group of companies. Besides, an individual firm will seldom offer an illegal payment to increase the value of a contract, unless it already is certain that it will be offered the contract in question. The rent-augmentation argument will usually be relevant to business corruption in cases when a firm already knows that it is assigned the given benefit, and the elements of risk and uncertainty are reduced.[23]

To summarize, current rent-seeking models explain the implication of risk aversion with a focus on the legal forms of rent-seeking. However, as explained, there are some aspects of business corruption that may result in different conclusions when it comes to the connections between (illegal) bribery, the various uncertainties and the rent-seekers attitudes toward risk. The most relevant contrasts between firms' decision to offer illegal bribes and their decision to take part in legal rent-seeking are as follows: One, bribery may exclude competitors from the contest; under legal rent-seeking entry into the competition and engagement in rent-seeking is open to all. Second, a bribe may lead corrupt authorities to promise the briber the benefit in question. This effect is seldom present in cases of legal rent-seeking. Third, the risks attached to involvement in bribery are usually larger than the risks involved in taking part in legal rent-seeking.

In addition, the illegality if bribery involves a lack of transparency; legal

[23] The issue of creating a rent by help of corruption and legal rent-seeking is a related but different situation. Rent-creation activities are well illustrated by Naylor's (1998) study of the modern arms business.

lobbying occurs in the open.[24]. Both parties of the transaction benefit under illegal rent-seeking; legal forms of lobbyism benefit only the firms and the lobbyists, while it may annoy the decision-makers. Besides, business corruption requires that someone with influence is willing and able to misuse his or her power, and the possibilities to gain from bribery depends on the extent of corruption. Lobbyism, by contrast, is an element in the freedom of expression, and a recognized way to voice opinion and gain influence.[25]

4.3 Risk aversion and the propensity to offer bribes

Concern about the risk of being caught in corruption differs between firms. Their ability to take risk/deficit varies, their sunk cost varies, and executives have different levels of risk aversion. Some investors may even be attracted to risk. The rent-seeking theory suggests a relationship between a firm's attitude towards risk and its propensity to offer bribes. This theory suggests the following proposition, which will be examined using the model in (1) and (2), a model that includes important features of the distinction between legal and illegal rent-seeking.

Proposition 1 *Increased risk aversion may increase the propensity to offer bribes.*

Let the actual expected outcomes of the contest be determined by the expressions in (1) and (2). Let $u_i > 0$ be firm $i's$ utility, π_j is the firm's revenue, where j denotes the different outcomes, as described by Figure 1. Let risk aversion be determined by a concave utility function, $u_p = \pi_j^{1/2}$, let risk attraction be determined by a convex function, $u_o = \pi_j^2$, and let risk neutrality be the case where the utility of the competition is equal to expected revenues, i.e. the case illustrated by (1) and (2), $u_n = \pi_j$. The subscripts, p, o, n on the firm's utility denote risk aversion (pessimist), risk attraction (optimist), and risk neutrality, respectively. Hence, we have three

[24]This distinction has an impact on the size of the rent-seeking expenses. The size of payments made to the personal benefit of corrupt officials can be very small, and still have a larger effect than official rent-seeking, as was early explained by Buchanan et al. (1980). However, the difference between these expenses will also depend on bargaining power and other aspects (level of corruption, size of contracts, business sector), and it is difficult to determine a general rule about business bribes versus legal rent seeking expenses.

[25]Lambsdorff (2002) explains several of these arguments in detail, and categorizes the welfare consequences of legal rent-seeking versus illegal corruption.

functions of a firm's utility of the expected outcome of each of the optional strategies, H and B: risk attraction, risk neutrality and risk aversion. The appendix explains the calculation of the utility in these cases.

Figure 4 and 5 describe a firm's propensity to offer bribes when its decision is dependent of the firm's attitude towards risk. The curves represent the expressions in (1) and (2), now also with different attitudes toward risk. Both figures are drawn with expected utility on the vertical axis, and the level of corruption on the horizontal axis. The parameter values are the same for both figures.[26] Figure 4 compares the cases of risk neutrality and risk aversion. Figure 5 compares the cases of risk neutrality and risk attraction.

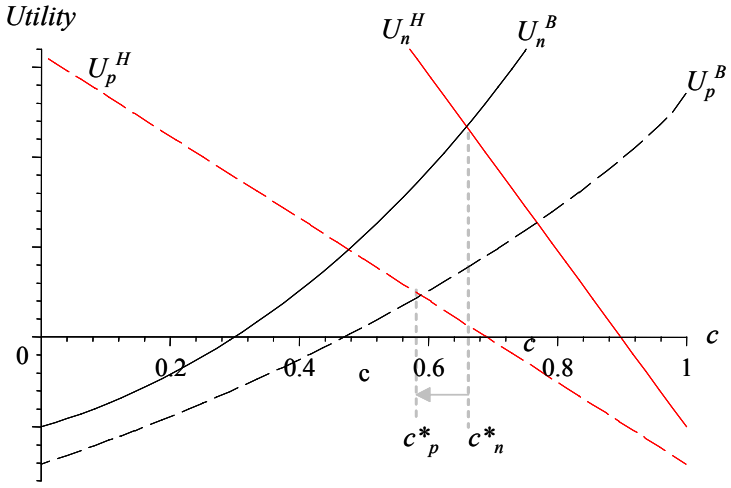

Figure 4: Utility of alternative choices in the cases of risk neutrality (solid curves) and risk aversion (dashed curves).

Figure 4 illustrates that a risk averse utility function reduces the critical level of corruption, c^*, in this example. The firm is indifferent between a legal business strategy, H, and bribery, B, at a lower level of corruption, which means that a risk averse firm will be more likely to offer bribes than a risk neutral competitor. Figure 5 illustrates the opposite effect. A risk attracted firm will have a higher expected outcome than the risk neutral, whatever strategy it chooses. However, in the choice between a legal and an illegal

[26] Paramter-values for both Figure 4 and 5: $\kappa = 7$, $h = 0.5$, $b = 2$, $\rho_b = 0.7$, $\rho_h = 0.7$, $\gamma = 0.7$, $\theta = 4$

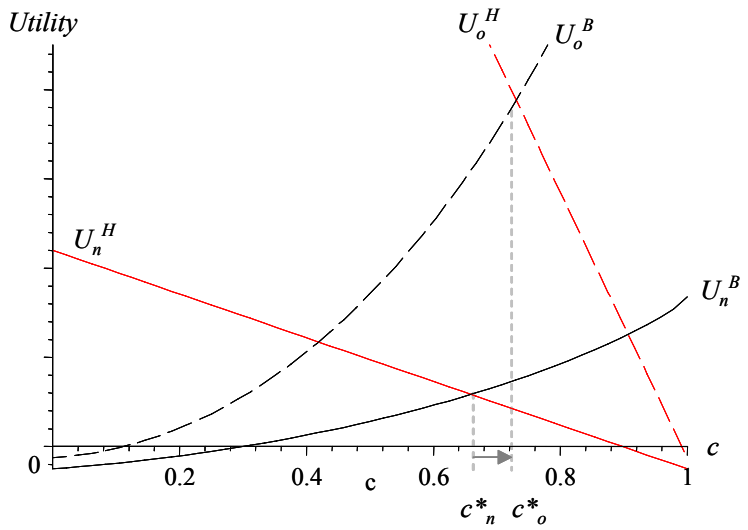

Figure 5: Utility in the cases of risk neutrality (solid curves) and risk attraction (dashed curves).

business approach, the risk attracted firm will be more likely to stay honest.

The model in (1) and (2), the utility functions described above, and Figure 4 and 5 make an example that is able to prove Proposition 1: those who participate in corrupt business practice are not necessarily more attracted to risk than those who prefer an honest business approach. The connection can actually be the reverse. Firms with risk averse attitudes can be more likely to offer bribes than their risk attracted or tolerant competitors.

4.4 Discussion

The result from this analysis seems surprising given the hazards associated with bribery, noted in the introduction. However, the result corresponds to Skaperdas and Gan's (1995) conclusions about risk aversion in the context of financial liability, although the underlying assumptions and functions in the two models are very different.[27] Will this result also imply that the significance of the differences between illegal corruption and legal rent-seeking

[27] The parallel results reported by Konrad and Schlesinger (1997) suggested an indeterminate effect, and do not contradict the result in the present paper.

are of limited importance when it comes to the relationship between risk aversion and the tendency to invest in rent-seeking?

Not necessarily, the correspondence between the two forms of analysis is not complete. The present result corresponds only to one specific result in the rent-seeking theory, that of an additional financial obligation and potential indebtedness. This result will not inform about the ability of rent-seeking theories in general to explain illegal business corruption. Besides, the present study does not explain a firm's willingness to make rent-seeking investments, which is the focus in corresponding rent-seeking models. This paper rather assumes that a firm in any case will invest in some form of rent-seeking, while the main question relates to its choice between legal and illegal business practice.

The intuition in the result follows from the self-protection argument; the marginal risk of losing the benefit in question increases with increasing levels of corruption. The mechanisms, however, are explained by the expressions in (1) and (2). The attitudes towards risk determine the forms of the utility functions (concave, linear, or convex). Given these expressions, a risk attracted firm will generally have a higher expected benefit of the contest, compared to a risk averse firm. One firm's decision between a legal and illegal business approach, whatever its attitude towards risk, will depend on the parameter-values in (1) and (2).

However, the important question in this analysis relates to the relationship between the corruption levels for which the different curves in Figure 4 and 5 intersect; the left-hand side of this corruption level, c^*, implies honesty, the right hand side implies an illegal business strategy. The parameter-values are only important to the extent to that they alter the relationship between the different critical corruption levels, which are subject to the different attitudes toward risk.

Figure 6 and 7 below illustrate an example where this relationship is altered, and where a risk attracted firm will be more likely to offer bribes than a risk averse. These figures present the same curves with the same axes as Figure 4 and 5, now with a change in the paramter values. The firm is thus indifferent between honesty and bribery, $E(H) = E(B)$, at a lower level of corruption, i.e. c^* has a low value. The arrow in Figure 6 points to the change in the relationship between the indifference level of risk neutrality, c_n^*, and the indifference level of risk aversion, c_p^*. Similarly, the arrow in Figure 7 points to the change in the indifference level of risk neutrality, c_n^*, and the indifference level of risk attraction, c_p^*. The parameter values in Figure 6 and

7 are identical.[28] The figures describe the difference between a risk averse firm and a risk attracted firm; the risk averse will stay honest for higher levels of corruption under the circumstances given by the parameter values. The risk attracted will offer bribes for lower levels of corruption.

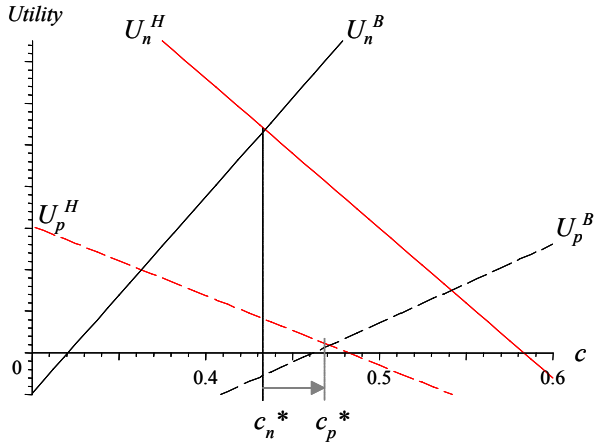

Figure 6: Utility of alternative choices in the cases of risk neutrality (solid curves) and risk aversion (dashed curves).

When a firm consider $E(H) > E(B)$ for most levels of corruption, c, its critical level, c^*, is high, which means that the firm is likely to stay honest, unless the level of corruption is very high. In this setting, however, a risk averse firm will have a stronger propensity to offer bribes than a risk neutral firm, under the given assumptions. When the firm considers $E(H) > E(B)$ only for low levels of corruption, the critical level of corruption, c^*, is low. In this case, when most firms consider bribery the more rewarding strategy, the risk attracted firms have the highest propensity to offer bribes in the given example.

The relation between $E(H)$ and $E(B)$ is determined by the parameter values. The circumstances in a real world will seldom suggest that $E(H) < E(B)$ for low levels of corruption. This may, however, be the case when there is a combination of several factors, for example, when the expected size of

[28] Parameter values applied in both Figure 6 and 7: $\kappa = 9$, $h = 3$, $b = 0.1$, $\rho_h = 0.8$, $\rho_b = 0.8$, $\gamma = 1$, $\theta = 0.3$.

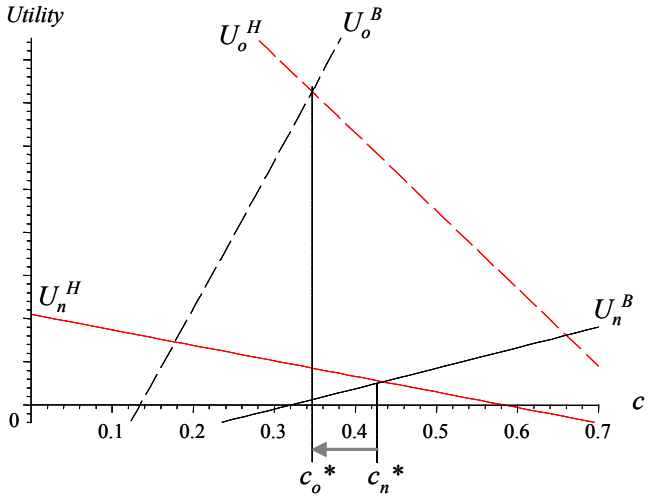

Figure 7: Utility in the cases of risk neutrality (solid curves) and risk attraction (dashed curves).

the bribe, b, is very low; when the legal rent-seeking expenditures, h, are high; when the sanction if caught in the crime, θ, is negligible; and/or when the firm has a very high individual probability to win through with an offer of a bribe, ρ_b, perhaps because of very good contacts. Under more realistic assumptions, however, the example shows that risk aversion will increase a firm's propensity to offer bribes when the level of corruption is high.

5 Conclusion

This paper explains the various elements of uncertainty and risk associated with business corruption. A main objective has been to describe how these factors will influence a firm's decision to approach a business opportunity by legal or illegal business practices.

The exercise demonstrated that the size of a potential business advantage will not necessarily increase a firm's propensity to offer bribes; this connection depends on the level of corruption. The risk of sanctions has an obvious impact on this porpensity. However, for the sanction to have a constant deterrent impact on the firms' behavior, the costs incurred by firms caught

in corruption will have to increase if the level of corruption increases. The perceived level of corruption in markets is assumed to be important in a firm's decision-making. The model describes the expected cost for a firm if it incorrectly assesses this level. Overestimating corruption levels may lead the firm to offer a bribe when honesty would secure a better outcome for the firm, while underestimating corruption levels may lead the firm to be honest when offering a bribe would secure a more profitable result.

The second part of the analysis examined the significance of risk aversion. Although a considerable literature had already described the connection between risk aversion and rent-seeking, it considers mainly the legal forms of rent-seeking, and is not necessarily applicable to understand business corruption. However, when standard theory of risk aversion was applied on the model presented on business corruption, the most relevant results in the rent-seeking literature appeared to correspond with the results on business corruption: Risk aversion will not necessarily prevent a firm from taking part in corruption. On the contrary, this study demonstrates that increased risk aversion can actually strengthen the propensity to offer bribes.

In the real world there are greyzones between legal and illegal business practice, and the distinction between the two will not necessarily be as clearcut as the models developed in this paper assume. However, real life choices will resemble the models in that firms generally will have to choose between strategies that are closer to illegal or legal business practice. The number of court cases involving business corruption is increasing, and the difference between legal or illegal business practice will become clearer in the years to come.

There are some very clear directions in which the research should be continued. The business survey revealed that business corruption takes many different forms, and that it can have various objectives. Better understandings of the phenomenon will obviously require the inclusion of more details on the specific circumstances. The differences between legal and illegal rent-seeking can also have implications beyond those considered in this study, for instance, on the scale of the investment. As noted, the size of the illegal bribe can sometimes (though not always) exceed the investment in legal rent-seeking. The factors that determine the size of these investments are unclear and require further research.

Finally, the consequences of overestimating the extent of corruption require closer investigation. The business survey is relevant here because it revealed that firms exposed to competitive pressure are more likely to con-

sider corruption a challenge in business. This suggests that the connection between market power and the propensity to take part in corruption should be a key issue for future research.

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7 Appendix

This appendix explains the calculation behind the curves in Figure 4-7. Let the expected outcomes of the contest be determined by the expressions in (1) and (2). Let $u_i > 0$ be firm $i's$ utility, while risk aversion is determined by a concave utility function, $u_p = \pi_j^{1/2}$, risk attraction is determined by a convex function, $u_o = \pi_j^2$, and risk neutrality by the expected revenues, $u_n = \pi_j$. j denotes the different outcomes, so that $\pi_1 = \kappa - h$, $\pi_2 = -h$, $\pi_3 = \kappa - b$, and $\pi_4 = \kappa - b - \theta$. This leads to three expressions of utility in the choice of a legal business startegy, H, and three expressions to describe uility in the choice of an illegal strategy, B:

$$\begin{aligned} u_n^H(c) &= (1-c)(\rho_h \pi_1 + (1-\rho_h)\pi_2) + c\pi_2 \\ u_p^H(c) &= (1-c)(\rho_h \pi_1^{1/2} + (1-\rho_h)\pi_2^{1/2}) + cp_2 \\ u_o^H(c) &= (1-c)(\rho_h \pi_1^2 + (1-\rho_h)\pi_2^2) + co_2 \end{aligned} \tag{4}$$

And in the case of an illegal business approach:

$$\begin{aligned} u_n^B(c) &= c\rho_b(1-(1-c)^\gamma)\pi_3 + c\rho_b(1-c)^\gamma\pi_4 + c(1-\rho_b)\pi_2 + (1-c)\pi_2 \\ u_p^B(c) &= c\rho_b(1-(1-c)^\gamma)\pi_3^{1/2} + c\rho_b(1-c)^\gamma\pi_4^{1/2} + c(1-\rho_b)\pi_2^{1/2} + (1-c)\pi_2^{1/2} \\ u_o^B(c) &= c\rho_b(1-(1-c)^\gamma)\pi_3^2 + c\rho_b(1-c)^\gamma\pi_4^2 + c(1-\rho_b)\pi_2^2 + (1-c)\pi_2^2 \end{aligned} \tag{5}$$

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SUMMARY

The presence of business-corruption in a market provokes firms to make choices between legal business approaches and illegal bribery. The outcome of a chosen strategy will usually be uncertain at the time the decision is made, and a firm's decision will depend partly on its attitude towards risk. Drawing on the empirical data provided by a survey of 82 Norwegian exporting businesses, the paper proposes a theory about firm's choices between legal and illegal business practices. It begins by describing the risks, uncertainties and benefits attached to bribery, and specifies their impact on firm's propensity to offer bribes. It then demonstrates how risk averse firms can be more inclined to offer bribes than risk neutral, and even risk attracted firms. Although the analysis diverges from existing theory in stressing the differences between illegal and legal forms of rent-seeking, the findings correspond to the results reported in the literature on legal forms of rent-seeking.

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