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***Choice of subcontractor in markets with asymmetric information:
reputation and price effects***

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Choice of Subcontractor in Markets with Asymmetric Information: Reputation and Price Effects

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Abstract

Purpose -Buyers assessing bids from suppliers of experience services face both an adverse selection and a potential moral hazard problem. The purpose of this study is to examine (1) the relative importance of various signals of supplier reputation conveying information about unobserved supplier quality, which is important for identifying the best tender; and whether price is contingent on (2) supplier reputation, and (3) on buyer's quality sensitiveness in a competitive bidding situation.

Design/methodology/approach - This study builds on a conjoint experiment where 19 contractors consider alternative scenarios representing tenders from subcontractors of plumbing services. In the scenarios the subcontractors differ on their reputation and price variables, while the contractors differ in their quality sensitiveness. Multiple regressions analyzes the contingent price effects.

Findings – Although low price is generally important for subcontractor selection, quality sensitive buyers are willing to pay subcontractors a price premium to prevent quality debasement. On the other hand, despite the combined significance of supplier reputation on choice, buyers are not willing to pay price premiums to suppliers with a quality reputation.

Research limitations/implications – Conjoint studies produce multiple cases but the underlying sample is limited. Therefore, this study should be regarded as preliminary and a basis for further validation on larger samples.

Practical implications – In competitive bidding situations, suppliers with strong quality reputations may benefit most by low price offers. Thus, suppliers with a strong reputation should achieve profitability through a volume premium rather than a price premium effect. Suppliers opting for price premiums should target the quality sensitive segment of the market.

Originality/value – In contrast to previous findings in B2B brand equity studies, but in line with findings in information economics, this study suggests that suppliers with a reputation for quality will not receive price premiums. The results indicate that in bidding contexts in B2B markets, the reputation variables may enhance rather than reduce buyers' price sensitivity, because supplier reputation increases low price credibility.

Key words: Supplier selection, competitive bidding, asymmetric information, reputation, price premium, B2B marketing

Paper type: Research paper

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Introduction

In project markets, as building construction, contractors usually select subcontractors through a competitive bidding process (Blombäck and Axelsson, 2007; Eccles, 1981; Holt et al., 1995). Motivated by the attractiveness of the contract and fear of losing to competitors, subcontractors are likely to offer their lowest possible prices and best quality to gain customer preference (Anderson and Narus, 1999). Although contractors define strict task specifications in their tenders to ease subcontractor comparisons (Blombäck and Axelsson, 2007), non-contractable quality aspects of the suppliers' offerings still remain and make choice of supplier difficult (Edlin and Hermalin, 2000; Wuyts et al., 2009; Zolkiewsky et. al. 2007). In fact, uncertainty about quality is a widespread and important characteristic of markets for most firms' goods and services (Shapiro, 1982). Theoretically, when quality is uncertain and only can be assessed after use, as for services such as plumbing and electrical work, the buyers face two problems; that of adverse selection (Akerlof, 1970) and a potential moral hazard problem (Bergen et al., 1992; Shapiro, 1982). This context means that buyers may have pre-purchase problems in distinguishing between high and low quality suppliers and post-purchase problems in detecting contract compliance. Unfortunately, both adverse selection and moral hazard problems are likely to be worse where prices are low (Akerlof, 1970; Rao and Monroe, 1996). Rather than getting high-quality suppliers at a low price, buyers opting for the lowest prices risk ending up with low-quality supplies (Akerlof, 1970; Dyer, 1996; Holt et al. 1995). Still, acceptance of lowest bid is the dominating principle for bid acceptance in the construction industry despite emphasizing supplier quality would help identifying the best tender (Hatush and Skitmore, 1998; Holt et al. 1995).

This study draws on insights from the economics of information literature and focuses on selection of subcontractors to the building construction industry (in particular, subcontractors of water, ventilation and sanitary, hereafter plumbing services). However, the findings may provide insights to any industry where asymmetric information on supplier quality exists. One objective with this study is to

provide a more nuanced picture of selection criteria for suppliers with experience attributes in a competitive bidding situation by examining the relative importance of buyers' previous experience with the subcontractor, subcontractors' brand credibility and references, subcontractors' CSR certification, and price. These variables are various signals of supplier reputation conveying information about unobserved supplier quality (Kirmani and Rao, 2000), which is important for identifying the best tender (Hatush and Skitmore, 1998).

Second, the study examines to what extent price is contingent on supplier reputations (Aaker, 1991; Rao, 1993). In a survey among its members, the Norwegian construction industry has identified brand and reputation building as strategies to improve the industry's profitability (Espelien and Reve, 2007). Empirical studies in business-to-business marketing (e.g., Bendixen et al., 2004) suggest that suppliers with a quality reputation should receive price premiums. In contrast, findings from economics of information show that buyers will not pay price premiums to suppliers with a quality reputation (Rao and Bergen 1992). Third, assuming that B2B purchasing managers are both price and quality sensitive, this study explores whether price is contingent on purchasers' quality sensitiveness. Recent research in construction concludes that researchers and practitioners have realized that lowest price is not the promising approach to attain lowest project costs (Darvish et al., 2009).

This study builds on a conjoint experiment where contractors' purchasing managers consider alternative scenarios representing tenders from subcontractors of plumbing services that differ on their reputation and price variables, while the contractors differ in their quality sensitiveness. The findings indicate that a balanced picture of the selection criteria for subcontractors to building construction projects is warranted. Although low price is generally important for subcontractor selection, the results indicate that quality sensitive buyers are willing to pay subcontractors a price premium when poor quality may cause economic losses to the contractors. Furthermore, the combined effect of the reputation variables outweighs price. Still, buyers are not willing to pay price premiums to suppliers with a quality reputation; a finding contradicting extant B2B brand equity literature.

The rest of the article is organized as follows. The following section presents the conceptual framework including hypotheses. The next section describes the research design and the empirical tests. Finally, the article discusses the implications of the findings, the limitations of the study, and possible topics for further research.

Theoretical Framework and Hypotheses

Choice consists of selecting the optimal subcontractor balancing quality and price (Hatush and Skitmore, 1998; Wuyts et al. 2009) while reducing personal and organizational risk (Homburg et al., 2010). Consider a contractor assessing tenders from various subcontractors, some already known to the contractor and others unknown (Blombäck and Axelsson, 2007). Assuming information asymmetry exists, the buyer will have difficulty in distinguishing between high and low-quality suppliers. In the context at hand (plumbing services) where the suppliers can adapt their quality levels both to the specifications of the bid and during service delivery, the choice also involves a potential moral hazard problem for the buyer (Mishra et al., 1998; Shapiro, 1982). For example, when a contractor has chosen a specific supplier of services with experience attributes (Nelson, 1970) the supplier has the capability to change the quality level during service delivery. Because quality reductions provide immediate cost savings and are difficult to detect the supplier also might be motivated to undersupply quality by using substandard components or unskilled workers (www.HousingBottom.com, 2010; Mishra et al., 1998). There are examples that suppliers in the construction industry violate general CSR obligations by paying their workers below tariff wages, offering poor working conditions, using illegal workers, or not paying taxes to cut costs further and underbid competitors, thus undermining the industry's profitability and reputation (Gedde-Dahl, 2010; Sæter, 2010).

Sellers of experience services can reduce the information asymmetry by investing in various signals of quality (Kirmani and Rao, 2000).¹ Signals are actions

¹ More specifically, adverse selection problems are resolved by using signals, whereas moral hazard problems are resolved by using incentives (Mishra et al., 1998, Rao and Bergen, 1992, Rao and Monroe, 1996). However, adverse selection and moral hazard models apply the same principles for rewarding honesty and punishing dishonesty, and can therefore be analyzed simultaneously (Picard, 1987, Rao and Monroe, 1996).

that parties take to reveal their true characteristics (e.g., quality level). Signals incur costs or potential costs, or potential revenue losses to high-quality firms should they not fulfil their claims of high quality, whereas quality fulfilment will be rewarded with enhanced revenues (Homburg et al., 2010; Kirmani and Rao, 2000). In contrast, low-quality firms will lose money by signalling, since low-quality firms will not recover the costs through repeat business. Therefore, buyers can infer the suppliers' quality-level from their signalling strategy (Kirmani and Rao, 2000). More specifically, sellers may build a credible quality reputation through investments in previous quality work observed through buyers' experience (Blombäck and Axelsson, 2007; Liebeskind and Rumelt, 1989), in brand names and references (Akerlof, 1970, Kotler and Pfoertsch, 2007; Wuyts et al., 2009), third party certification (Akerlof, 1970; Rubin, 1990), and through charging price premiums (Kirmani and Rao, 2000). For example, the Norwegian construction industry has introduced a particular CSR-certification program for its members to increase supplier CSR credibility. Figure 1 shows the conceptual model.

Figure 1 here

Previous Experience

In the bidding-process, buyers receive bids both from unknown and previously known suppliers. One way for buyers to overcome the problem of information asymmetry is to select suppliers with a reputation for quality (Blombäck and Axelsson, 2007; Shapiro, 1982, 1983). Previously manufactured products and the history of delivery precision, as well as positive experiences with key personnel are examples of factors that potential customers consider in subcontractor selection processes (Blombäck and Axelsson, 2007; Shapiro, 1983; Wuyts et al, 2009). Reputation formation is a type of signalling activity: the investments in high-quality products, services and procedures in previous periods serve as signals of high-quality performance during the current period (Blombäck and Axelsson, 2007; Shapiro, 1983). Rather than using an unknown supplier, buyers use their previous experience with suppliers and repurchase as mechanisms to assure quality (Blombäck and Axelsson, 2007; Liebeskind and Rumelt, 1989; Nelson, 1970).

Hypothesis 1: Previous positive experience has a positive effect on the likelihood of choosing the subcontractor.

Company Brand Credibility and References

When buyers cannot acquire information about quality directly through experience (Nelson, 1970), a subcontractor's company brand name could convey information about unobservable quality (Akerlof, 1970; Blombäck and Axelsson, 2007; Kotler and Pfoertsch, 2007). More specifically, Kotler and Pfoertsch (2007, p. 358) note, "Brands in B2B markets are a guarantee of quality, origin and performance, thereby increasing the perceived value to the customer and reducing the risk and complexity involved in the buying decisions." Basically, the supplier's company brand name assures the buyer that the supplier is the responsible party should quality not meet expectations. Therefore, loss or damage to the reputation of the subcontractor's brand name is likely to put future profits at risk, and thereby increase the costs of cheating (Rao and Monroe, 1996).

However, with no other cues than the company brand name, the mere name conveys limited information about supplier quality, although dissemination of brand names and logos without developing comprehensive brand identities is the focus of many B2B firms' branding strategies (Homburg et al., 2010). As a solution, references from other buyers that have used the supplier previously may serve the purpose of building a credible company brand name (Helm and Salminen, 2010; Salminen and Möller, 2006; Üstuner and Godes, 2006). Firstly, prior investments in consistent quality for other buyers serve as a credible signal of quality to the current buyer (Shapiro, 1982, 1983; Helm and Salminen, 2010; Kotler and Pfoertsch, 2007; Wuyts et. al., 2009). Secondly, using reputable customers as references parallels the logic in the brand alliance literature that well-known, strong brands convey information about unobservable quality in their brand allies (Rao and Ruekert, 1994). For example, Blombäck and Axelsson (2007) find that the reputation of large and prestigious customers positively affects the corporate image of subcontractors. In turn, subcontractors' corporate brand image, the impressions of the company, is used as a proxy for subcontractor quality.

Hypothesis 2: Subcontractor's company brand credibility supported by well-established references has a positive effect on the likelihood of choosing the subcontractor.

Certification of Corporate Social Responsibility

Supplier quality is measurable not only by the quality of craftsmanship in the service delivery but also by the quality of the underlying processes for the bid, such as corporate social responsibility. Corporate social responsibility involves business operations that interfere with established social and human rights such as avoiding taxes, underpaying workers, or denying workers' rights to join unions (Vaaland and Heide, 2005). Measuring the quality of the underlying processes is particularly relevant where price is an important selection criterion. As an illustration, some critics accuse Wal-Mart of being able to offer its low prices due to underpaying its employees and offering poor working conditions (Palazzo and Basu, 2007). Similarly, in the Norwegian construction industry, some suppliers pay illegal workers at rates below the minimum wage for construction and also withhold compulsory taxes in order to cut costs and underbid on selling price (Berglund, 2008). As such, those companies are cheating on their corporate social responsibility promise in order to achieve a competitive advantage. Since cheating on corporate social responsibility is difficult to spot, a buyer receiving a bid cannot know whether the supplier is honest or not in this respect (Berglund, 2008).

A growing number of companies emphasize ethics and corporate social responsibility when choosing suppliers (Biong et al, 2010). For example, large pension funds now penalize companies that harm the health of their employees, fail to respect human rights and otherwise renege on their corporate social responsibility because bad supplier CSR-reputation transmits to the buyer (e.g., Biong et al., 2010; Blombäck and Axelsson, 2007). In general, cheating on corporate social responsibility is both an adverse selection and moral hazard problem and can be solved with the same mechanisms as when product quality is uncertain. Many industries have developed certification programs (Akerlof, 1970; Shapiro, 1982) guaranteeing a certain quality level. Examples are fair trade certificates, vessel classification programs, or ISO certification. Accordingly, the Norwegian construction industry has implemented a corporate social responsibility certification program for suppliers. However, participation in this program is voluntary. To obtain certification the supplier undergoes a due diligence process from a third party and pays a yearly membership fee. These processes are costly to the supplier and, therefore, have a signalling effect. The buyer knows that cheating on corporate social responsibility will exclude the

supplier from certification and the investments will be lost. Hence, it is in the supplier's interest to be honest and capitalize on the investment because buyers are expected to prefer certified suppliers.

Hypothesis 3: Certification of corporate social responsibility has a positive effect on the likelihood of choosing the subcontractor.

Price

Price may play multiple roles when purchasing products and services (Rao and Monroe 1988). Traditional economic theory suggests that price has a negative impact on choice since higher prices have a negative impact on buyers' budgets. The practice of introducing competitive bidding to determine the selling price underlines this perspective (Burt and Boyett, 1979; Holt et al., 1995; Wuyts et al., 2009). However, when quality is uncertain the effect of price on buyer choice may not be that simple. In some circumstances, quality sensitive buyers may be willing to pay a higher price than the normal competitive price, or a price premium, in order to receive high quality (Klein and Leffler, 1981). It is also important that the buyers spread the price premiums over several purchase occasions, or premiums are unlikely to motivate sellers to provide high quality. In project markets, buyers are not committed to repurchase once the project is completed. If then the buyer pays the entire premium during this first transaction the seller has little incentive to be honest, since the threat of future profit losses disappears (Rao and Monroe, 1996). In that case, rational quality sensitive buyers may take into consideration that profit-maximizing sellers might claim high quality but provide low quality when quality is unobservable prior to purchase. Therefore, the buyer may be willing to pay only a low price consistent with their expectations of low quality (Rao and Monroe, 1996).

Hypothesis 4: A negative relationship exists between price and the likelihood of choosing the subcontractor.

Price and Reputation

The underlying premise for this study is that buyers generally prefer high-quality suppliers and want the suppliers to be honest and supply high quality during all transactions. The economics of information literature suggests buyers to pay suppliers a price premium for this purpose (Rao, 1993; Klein and Leffler, 1981). A price premium is the difference between a "super-high" price and the competitive price for

high quality output.² This price premium provides the suppliers with above-average profits and is a monetary incentive to deliver high quality (see Rao and Monroe (1996) for an extensive review of causes and consequences of price premiums). In short, the buyer offers the supplier a “super-high” price for high quality, and offers to pay this extra high price every time they do business as long as the supplier does not debase quality. If the supplier debases quality, the buyer will punish the supplier by stopping buying and the supplier loses the supernormal profit (Klein and Leffler, 1981; Rao, 1993).

However, when the supplier already has provided a “hostage” against quality debasement through investments in a reputation for quality (previous high-quality deliveries, company brand name, and CSR-certification), is it then necessary for the buyer to pay the seller extra to be honest? Early works in economics of information (Klein and Leffler, 1981; Shapiro, 1982, 1983) supported by empirical studies (Ba and Pavlou, 2002; Erdem et al., 2006; Mishra et al., 1998) say yes. Sellers with a credible reputation for quality will receive price premiums as a return on their reputation investments. Although not building on the economics of information logic, empirical B2B brand equity studies also suggest that suppliers with a quality reputation (or brand equity) will receive price premiums (Bendixen et al., 2004; Hutton; 1997; Persson, 2010; Rauyruen and Miller, 2009).

In contrast, another stream of the literature answer no to the question above; when suppliers have developed a quality reputation there is no need for buyers to pay them price premiums for being honest. (e.g., Rao, 1993; Rao and Monroe, 1996). This is exactly what Rao and Bergen (1992) found. Reputable sellers received lower price premiums than did less reputable sellers. They explained their finding by arguing that reputable sellers received lower price premiums because were they to cheat on quality, their reputations would be damaged and their future income put at risk. A seller that intends to stay in the market has every incentive to deliver high and consistent quality, because future sales will not occur if quality promises are not true (Kirmani and Rao, 2000). Therefore, reputable sellers are less likely to cheat and they will receive lower

² It should be noted that price premiums are conceptually different from *premium prices*.

Premium prices are considerably above average market prices, reflecting the higher costs of producing high quality, but premium prices may not necessarily provide profit to sellers (Rao and Bergen, 1992).

price premiums to keep their high-quality promise. The higher the subcontractors' investments in reputation, the lower the need for buyers to pay them price premiums.

Hypothesis 5: The negative effect of price on the likelihood of choosing the supplier is stronger at higher levels of supplier reputation in terms of (a) previous experience (b) company brand credibility, and (c) certification (that is, there will be a negative interaction effect between price and the reputation variables on the likelihood of choosing the subcontractor).

Price and Quality Sensitiveness

Generally, the literature assumes that quality-sensitive buyers are more willing to pay price premiums than those who are less quality-sensitive (Rao, 1993). For example, the need to pay price premiums to ensure good quality increases if inferior quality from the supplier will lead to monetary losses for the buyer (Rao and Bergen, 1992). Leakage due to low-quality plumbing is the most serious and frequent damage to new buildings. Therefore, in order to prevent leakages, high-quality work is essential and the price premium will serve as an insurance against losses caused by low quality. Rao and Bergen (1992) suggest, based on their findings that when quality sensitiveness for experience products increases, the propensity to offer price premiums also increases.

Hypothesis 6: The risk of monetary losses caused by low quality services from the supplier positively moderates the negative effect of price on the likelihood of choosing the subcontractor.

Methods

Research Context and Sampling Frame

A conjoint analysis experiment among 19 contractors in the capital city region of Norway was used to gather information for this study. In practice this means nearly 100% of the total population within that region. However, this regional population could be viewed as a subset of the total Norwegian population of contractors. Within each contractor organization, the person responsible for selection of subcontractors of plumbing services was identified. Key informant ability was validated by willingness to participate and by influence on and experience and competence in selection of this

kind of suppliers (Campbell, 1955). The conjoint task was supplemented by a self-administered questionnaire for information on the informant and various aspects of the buying task. The research context, contractors' choice of subcontractors of plumbing services to their building projects, was chosen for several reasons.

Firstly, these services have a particular influence on the overall quality of the final building. For example, leakage caused by poor-quality plumbing is the most frequent cause of quality problems in new buildings (Ingvaldsen, 2008; Ramsdal, 2008). In Norway costs caused by poor-quality work on new buildings and renovations are estimated to be 9 percent of total turnover or 28 percent of added value (Ingvaldsen, 2008). These numbers compare well to other European countries.

Secondly, reviews of academic journals, trade journals, industry reports, and initial discussions with managers from subcontractors, contractors, and trade organizations suggested that the focal variables all manifest themselves in this setting to variable degrees. **For instance, contractors traditionally choose** subcontractors to construction projects based on a competitive bidding procedure, emphasizing price as an important choice criterion, though at the same time quality may suffer (Holt et al., 1995). To overcome problems with pre-selection quality evaluations, contractor managers emphasized the importance of previous personal experience with subcontractors' key employees in the consideration and choice processes. A comprehensive study on the Norwegian construction industry revealed poor profitability to be a problem for further development. The report, based on a survey among the industry members, identified brand and reputation building as promising strategies to improve the industry's profitability (Espelien and Reve, 2007). Particularly, the qualitative prestudy suggested previous successful projects and prestigious references to be strong signals of reputation and brand credibility. Finally, in this industry severe cases of social dumping and illegal work in order to cut costs have been observed, while also buyers have been accused of unethical buying behavior by selecting corporate irresponsible suppliers to achieve low-cost purchases. As a solution to this problem, the industry has introduced a special certification program where suppliers have to undergo a diligence process to ensure that they pay tariff wages, taxes, and generally operate in a social responsible way.

When organizational buyers select suppliers in a new task or modified rebuy situation, this selection is usually based on an evaluation of bids and proposals from a number of potential candidates (Dwyer and Tanner, 2006). A conjoint task very realistically mimics a contractor's decision problem when assessing tenders and choosing subcontractor to a building construction project (Wathne et al., 2001; Wuyts et al., 2009). The conjoint design also has important advantages for estimating the relative importance of price and reputation variables in influencing preferences. The conjoint task was designed to describe the situation faced by a contractor who had to select a subcontractor for a construction project and make a choice based on the joint consideration of price and reputation attributes. Managers were asked to envision a task in which their company had been appointed as main contractor for a residential building project of 30 high-quality apartments and where the manager was assigned the responsibility of selecting a subcontractor for the overall plumbing solutions. The instruction emphasized that the total responsibility for the project included completion of the project by the due date, keeping to budgeted total costs, and minimizing defects on the finished building. As such, overall quality was an underlying assumption for the choice task. A conjoint analysis also is closely related to traditional experimentation (Hair et al. 1995). As such, this method follows the suggestions of Rao and Monroe (1996) to conduct a behavioral experiment to test tradeoffs between reputation and price in a choice situation.

Development of Conjoint Scenarios

In developing the conjoint scenarios, the procedure as described by Wathne et al. (2001) was followed. Initially both the literature on supplier selection processes in the construction field and the trade press was consulted. Subsequently, personal interviews were conducted with key managers in the trade associations for contractors and for plumbing suppliers, as well as with two major contractors and one major plumbing company. From these exploratory investigations 16 conjoint scenarios (four factors each with two levels) were developed. These were subsequently tested on one business manager from the contractor side in a personal interview. This pretest revealed no major problems with completing the conjoint task.

Measures

The four factors of the conjoint task and the levels of each are as follows: (1) prior experience (with the subcontractor's key personnel), (2) company brand credibility supported with references, (3) certification (of corporate social responsibility), and (4) price. The Appendix gives a more detailed description of the factors and levels.

Moderator variable

In addition to the conjoint variables described above, one moderator variable - buyers' quality sensitiveness in relation to potential losses caused by inferior supplier quality - that could potentially influence the price variable was included (Rao and Monroe, 1996; Wathne et al., 2001).

Data Collection

An appointment for a personal interview was made with each informant who agreed to participate in the study. Two postgraduate students administered the conjoint experiment as part of their MSc thesis activity.

The contractors were presented with a full profile method to add realism to the conjoint task (Carroll and Green, 1995; Wathne et al., 2001). Each of the 16 scenarios was presented to the managers with verbal descriptions on cards. In addition to the 16 cards, the managers were given a short description of the context for decision making and the four factors to be considered. As such, each card represented a bid containing the focal variables and provided a very realistic task. The managers were asked to rank each scenario from 1 to 16, where 1 was the bid from the supplier that most probably would be preferred for the project. Next, the managers were asked to rate each hypothetical bid on an eleven-point scale that indicated the likelihood of accepting the offer from the supplier, where 0 = "very unlikely to accept the offer" and 10 = "very likely to accept the offer". Similar to the study of Wathne et al. (2001) the final regression analysis used the rating measure while the ranking task was used to facilitate the rating measure (Alwin and Krosnick, 1985).

Results

The size of the contractors in the study varied from 4 to 6000 employees with 150 as the median size. The background questions "Quality is critical when purchasing plumbing products and services" and "We are dependent on quality from

all suppliers in the supply chain” obtained mean values of 5.63 and 6.68 respectively on a seven-point scale, supporting the underlying assumptions of quality when selecting plumbing subcontractors.

The hypotheses were tested by estimating the relative importance of the factors and by estimating an ordinary least square model. The importance weights were computed by dividing each factor’s part-worth range by the sum of all part worth ranges. Table 1 shows the aggregated importance weights for both the ranking and rating task.

Table 1 here

The table shows that buyers consider price the most important variable, followed by previous experience, certification, and company brand credibility. Furthermore, the table shows that the aggregated reputation variables contribute 61 percent to the choice made while price contributes 39 percent based on the ranking task. The rating task produced similar results with even more emphasis on price. However, in interpreting the importance weights it is important to take into account their dependence on the number of factors and the specific factor levels included in the study, as in all conjoint studies.

When estimating the regression model an effect-coding scheme representing the different levels of the factors was used (Cohen and Cohen, 1983). In this scheme, the first level of each factor (e.g., no previous experience with key personnel at the supplier) is coded -1, and the other (e.g., positive experiences) as +1. Interactions were defined by multiplicative cross-product terms between the relevant variables (Green and deSarbo, 1979; Wathne et al., 2001). Since the dependent variable and one moderator (quality sensitiveness) use scaled items, these scales were checked for normality, reported in Table 2. The values are within the acceptable ranges to proceed with the regression analyses. When performing regression analysis on conjoint data by following the method as described, each informant in our study produces 16 cases. The 19 informants then produce a total of 304 cases. The model involved estimating a buyer’s tendency to choose a supplier’s offer as a function of prior experience, company brand credibility, certification, price, the interactions between price and the reputation variables, and between price and buyers’ quality sensitiveness. Before, estimating the interaction term between price and quality sensitiveness, the quality

sensitiveness scale was mean-centered (e.g., Homburg et al. 2010). Table 3 shows the estimated standardized and unstandardized coefficients, and associated t- and VIF-statistics.

Table 2 and 3 here

The results in Table 3 indicate the potential threat of multicollinearity to be low. The model explains a satisfactory amount of variance (adjusted $R^2 = .58$). The results show that previous experience with the supplier has a significant and positive effect on the buyer's likelihood of selecting the supplier ($t = 11.64$), thus supporting H1. Similarly, company brand credibility has a significant and positive effect on supplier choice ($t = 2.24$), providing support for H2. Consistent with H3, certification shows a positive and significant effect ($t = 5.79$). As expected, price has a significant and negative effect on the likelihood of selecting the supplier, which supports H4 ($t = -15.47$). Turning to the predicted interaction effects in H5, there is no significant effects between previous experience and price ($t = -.77$), and company brand credibility and price ($t = .33$), while the effect between certification and price is significant and negative ($t = -1.70$),³ giving partial support to the predictions of H5. As Table 3 shows, the moderator variable has no significant effect on the dependent variable. However, consistent with H6 risk of monetary loss caused by poor supplier quality moderates price positively and significantly ($t = 2.27$).

Discussion

Implications for theory

Competitive bidding is a market-based principle for supplier selection and is widely used even when selecting subcontractors with experience attributes. Although theoretical (e.g., Liebeskind and Rumelt, 1989; Rao and Monroe, 1996) and empirical (e.g., Hatush and Skitmore, 1998; Holt et al., 1995) studies advice buyers to be cautious about focusing too strongly on price when purchasing experience services, the results show that price is the single most important variable for selecting subcontractor in the context examined. As such, this finding corroborates the significance of price found in previous studies on supplier selection in B2B markets

³ Because of the directional hypotheses, one-tailed tests are used (e.g., Rokkan et al., 2003; Schroeder et al., 1986; Wathne et al., 2001).

(e.g., Bendixen et al., 2004; Håkansson and Wootz, 1975; Wuyts et al., 2009; Zablah et al., 2010). However, as noted, optimal subcontractor choice involves balancing quality and price (e.g., Darvish et al., 2009; Hatush and Skitmore, 1998; Plank and Ferrin, 2002). The fact that the combined effect of the reputation variables is higher than the effect of the price variable suggests that buyers might be aware of emphasizing price too much when selecting subcontractors where experience attributes play an important role.

The results show considerable differences between the reputation variables. Specifically, customers attached more weight to prior experience than to the other reputation variables. Relatively speaking, company brand credibility supported by strong references did not seem to be an important factor when choosing a supplier. This result parallels similar findings on branding in B2B contexts (e.g., Bendixen et al., 2004; Wuyts et al., 2009; Zablah et al., 2010). When interpreting the results, it is premature to disregard the significance of company brand name. Supplier selection research points out the important distinction between the consideration and final choice stage and shows that the effects of selection criteria vary by the stages in the selection process (Plank and Ferrin, 2002; Wuyts et al. 2009). While price and previous experience is important in the final choice, company brand, references and other reputation variables are shown to be far more prevalent in the consideration stage (Blombäck and Axelsson, 2007; Wuyts et al. 2009).

Consider next the interaction effects between price and the reputation variables. Although the regressions did not show the expected negative effects between price, and previous experience and brand credibility, the non-significant interaction effects indicate that when the supplier builds a reputation for quality, the buyer will not pay a price premium to a reputable supplier for fulfilment of quality expectations. Rather, the supplier puts its reputation at stake in case of quality cheating (Rao, 1993; Rao and Bergen, 1992). Therefore, the supplier will receive a normal, competitive price for the required quality level. The negative interaction between certification of corporate social responsibility and price, as predicted, is also noteworthy, suggesting that the effect of low price is higher for certified suppliers. This finding makes sense when considering the buyer's decision problem. Where buyers can choose between two low price bids, one from a certified and one from a non-certified supplier, whom do they choose? In the case of the certified supplier, the

buyer has an assurance that the low price is legally achieved, which might not be the case for the non-certified supplier. Taken together, the findings indicate that the presence of reputation variables makes a low price more trustworthy, and so enables the market mechanism to work when experience attributes are present (Akerlof, 1970). As such, the results indicate that in bidding contexts in B2B markets, the reputation variables may enhance rather than reduce buyers' price sensitivity opposed to findings in consumer goods research (e.g. Erdem et al., 2002, 2006).

Compared to findings in the B2B brand equity literature the findings might be puzzling. The mere impact of the reputation variables suggests a brand equity effect as found in studies not accounting for price (e.g., Gordon et al., 1993; Roberts and Merrilees, 2007; van Riel et. al., 2005; Zablah et al., 2010). However, other definitions of brand equity imply price premiums to suppliers with a reputation for quality (e.g., Aaker, 1991) as shown in empirical B2B studies (e.g., Bendixen et. al., 2004; Firth 1993; Hutton 1997; Persson, 2010). In contrast, this study suggests that suppliers with a reputation for quality will not receive price premiums, in line with findings in the economics of information literature (e.g., Rao and Bergen 1992). One explanation may reside in the distinction between price premiums and premium prices. As noted, a price premium is a price considerably above the competitive price for a specific quality level, which the buyer pays to the supplier for fulfilling its quality promise (e.g., Klein and Leffler, 1981). A premium price is a higher price for higher quality but still a competitive price for that quality level (e.g., Rao and Bergen, 1992). Without making those distinctions previous studies might have measured premium prices rather than price premiums. Still, reputable companies show superior financial performance (e.g., Roberts and Dowling, 2002). The perspective of Ailawadi et al. (2003) might add to our understanding of the brand equity effect by their suggestions of brand equity as composed by volume premiums and price premiums resulting in revenue premiums.

Finally, while buyers generally will not pay price premiums to reputable suppliers in the choice situation the positive interaction effect between quality sensitiveness and price indicates that quality sensitive buyers are willing to pay a price premium in order to receive high-quality services and avoid moral hazard after supplier has been chosen, even in a bidding situation. When inferior quality from the supplier might cause a loss to the buyer, receiving high quality really matters.

Therefore, buyers are more willing to pay a price premium to keep the supplier honest, consistent with the findings of Rao and Bergen (1992).

Implications for management

Selection of subcontractors through competitive bidding in project markets represents managerial challenges to contractors and to subcontractors. Contractors face the problem of selecting subcontractors with the appropriate quality while high-quality subcontractors meet the challenge of distinguishing themselves from low-quality competitors.

Due to the short-term nature of projects, subcontractors accuse contractors of focusing on price with negative consequences for quality, profits and margins (e.g., Hatash and Skinmore, 1998). Brand equity literature suggests that engaging in reputation building activities to differentiate themselves from competitors and to charge price premiums enable suppliers in competitive markets to increase their profitability (Aaker 1991; Bendixen et al., 2004; Firth, 1993). Similarly, the Norwegian construction industry has suggested brand and reputation building as profitability enhancing strategies (Espelien and Reve, 2007). The results do not support such a strategy if achieving price premiums is an objective. On the contrary, the findings suggest that reputation makes low prices more trustworthy. This result does not mean that suppliers should not invest in building a reputation for quality. Rather, the findings demonstrate that buyers generally prefer suppliers with a quality reputation. Suppliers should therefore have an interest in building a quality reputation for two reasons: (1) a quality reputation should increase the likelihood of coming on contractors' shortlist (e.g., Plank and Ferrin, 2002) and (2) reputation for quality generally increases the likelihood of being selected. Findings from the qualitative prestudy support these recommendations. When contractors consider potential subcontractors, they assess subcontractors' previous performance on timelines in deliveries, quality of key personnel, ability to keep budgets, documentation of financial situation, and routines for quality management. For new subcontractors, references from similar projects for reputable contractors are keys. Price is seldom an important issue at the prequalification stage, but increases in significance in the final choice (Wuyts et al., 2009). Thus, suppliers with a strong reputation should outcompete their less reputed competitors and achieve profitability through a volume premium effect (Ailawadi et. al., 2003; Rao, 1993).

Finally, as the findings indicate, suppliers wanting to earn price premiums are wiser to target the quality sensitive segment of the market. One strategy might then be to support the price premium with a warranty. This strategy puts future costs at risk and is not dependent on repeat business to act as a credible signal of quality (Kirmani and Rao, 2000).

Limitations and Further Research

Some limitations of this study exist. Firstly, although a conjoint design produces multiple cases, the underlying sample size is limited. In addition to the limited sample, we cannot disregard influences from potential idiosyncrasies of the Norwegian building industry such as norms, standards, regulations, and buyer behavior. The sample size reflects a basic problem to B2B-research in markets with a small total population. However, previous conjoint studies demonstrate that even small underlying samples can produce valid results (Wathne et al., 2001). One problem with small sample sizes is potential lack of variation. Despite consistent findings compared to previous B2B branding and supplier selection studies (e.g., Bendixen et al., 2004; Rao and Bergen, 1992; Zablah et al., 2010), this study should still be regarded as preliminary and a basis for further validation on larger samples, with different methods, in other countries, and in other industries where asymmetric information prevails. One promising avenue for validating the findings might be to conduct in-depth examinations of winning bids from specific projects and compare the buyers' emphasis on the various selection criteria - price and perceived reputation variables included - relative to the losing bids.

Secondly, this study's findings indicate that quality sensitive buyers will pay suppliers a price premium when poor quality may have negative economic consequences. On the other hand, the findings also indicate that buyers will not pay price premiums to suppliers with a quality reputation but only a competitive price commensurate with the suppliers' quality level. These findings are in line with empirical research in information economics (Rao and Bergen, 1992). In contrast, B2B brand equity studies indicate that suppliers with a reputation for quality, i.e. high brand equity are able to charge price premiums (e.g., Bendixen et al., 2004; Hutton, 1997; Persson, 2010). Unfortunately, empirical studies on price premiums and reputation in the economics of information perspective barely exist. Studies, exploring

the seemingly contradictory findings between the two perspectives should provide promising avenues for further research.

Finally, this study does not examine quality per se, although quality was an underlying assumption for supplier selection, as emphasized in the conjoint task and supported by the scores on background questions. Quality and moral hazard are serious problems for end-consumers in the construction industry. This study provides some insights into mechanisms that may reduce quality debasement caused by asymmetric information. However, as Klein and Leffler (1981) argue, when repurchase is uncertain, there is motivation for sellers to undersupply quality under a normal, competitive price. Therefore, studies examining whether bidding practices and strong price focus contribute to quality problems for experience services despite reputation building attempts might then be promising avenues for further research. Particularly, suppliers' quality reactions to price pressure and to variations in buyer behavior, from strongly adversarial and short-term to cooperative and long-term oriented should provide insight to trade-offs between price, quality and reputation.

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Appendix

Scenario and Measures for the Conjoint Task

The following scenario and factors describe the conjoint task presented to the informants for this study.

Assume the following situation:

Your company is main contractor for a construction project in the Oslo-region. The project encompasses the construction of a new residential building comprising 30 self-owned apartments. Your task is to select suppliers to this project. Specifically, you should select a supplier for the complete water, ventilation, and sanitary (plumbing) solutions.

As the overall contractor, you have the total responsibility for the project and it is important to keep to the due date for completion, the budgeted total costs for the project, and to minimize defects after the building has been completed.

Consider each card as representing a total offer, which includes products and installations. This study focuses on four factors. Keep other factors that might influence your choice of plumbing supplier as neutral as possible.

You will receive 16 cards each describing factors to consider in your choice of supplier. Regard each card as an offer from a supplier.

Factors

<p><i>Previous Experience</i></p> <ul style="list-style-type: none"> • Your company has no experience with key person(s) at this plumbing supplier from previous projects. • Your company has positive experience with key person(s) at this plumbing supplier from previous projects.
<p><i>Company Brand Credibility</i></p> <ul style="list-style-type: none"> • The supplier has done similar projects for less well-known contractors such as... (the names of two fictitious contractors were given as examples) • The supplier has done similar projects for well-known contractors, such as... (the names of two large and reputable contractors were given as examples).
<p><i>Certification</i></p> <ul style="list-style-type: none"> • The supplier is not a member of StartBANK (the construction industry's CSR certification arrangement). • The supplier is a member of StartBANK.
<p><i>Price</i></p> <ul style="list-style-type: none"> • The supplier quotes NOK 1,500,000 for the project. • The supplier quotes NOK 1,650,000 for the project

The first factor, experience, refers to the buyer's experience with key personnel at the supplier (Shapiro, 1983) since the persons are key influencers on service quality (Mishra, Heide, and Cort, 1998; Wuyts et al., 2009). Supplier references from other contractors on similar projects provide information to inform the second factor, company brand credibility (Blombäck and Axelsson, 2007; Helm and Salminen, 2010). A Google search ensures that the fictitious names measuring the low level do not actually exist.

The third factor, certification, described the membership in the Norwegian Construction Industry's certification program of corporate social responsibility. The fourth factor, price, refers to the suppliers offer for a complete water, heating, and sanitary installation project on a residential construction project described in the conjoint scenarios. Field interviews with representatives from large and experienced contractors of residential building assisted in deciding levels. The low level describes a normal price offer for this type of project. Information from the field interviews

indicated that the profit margin on projects as described in the conjoint instruction is normally 5 percent. As a result, we decided to set the high level at a 10 percent premium.

Moderator Variable

The moderator variable was anchored by 1 = completely disagree and 7 = completely agree.

Quality sensitiveness

We will suffer significant losses if the quality supplied by a supplier of plumbing services is low (modification of Rao and Bergen 1992).

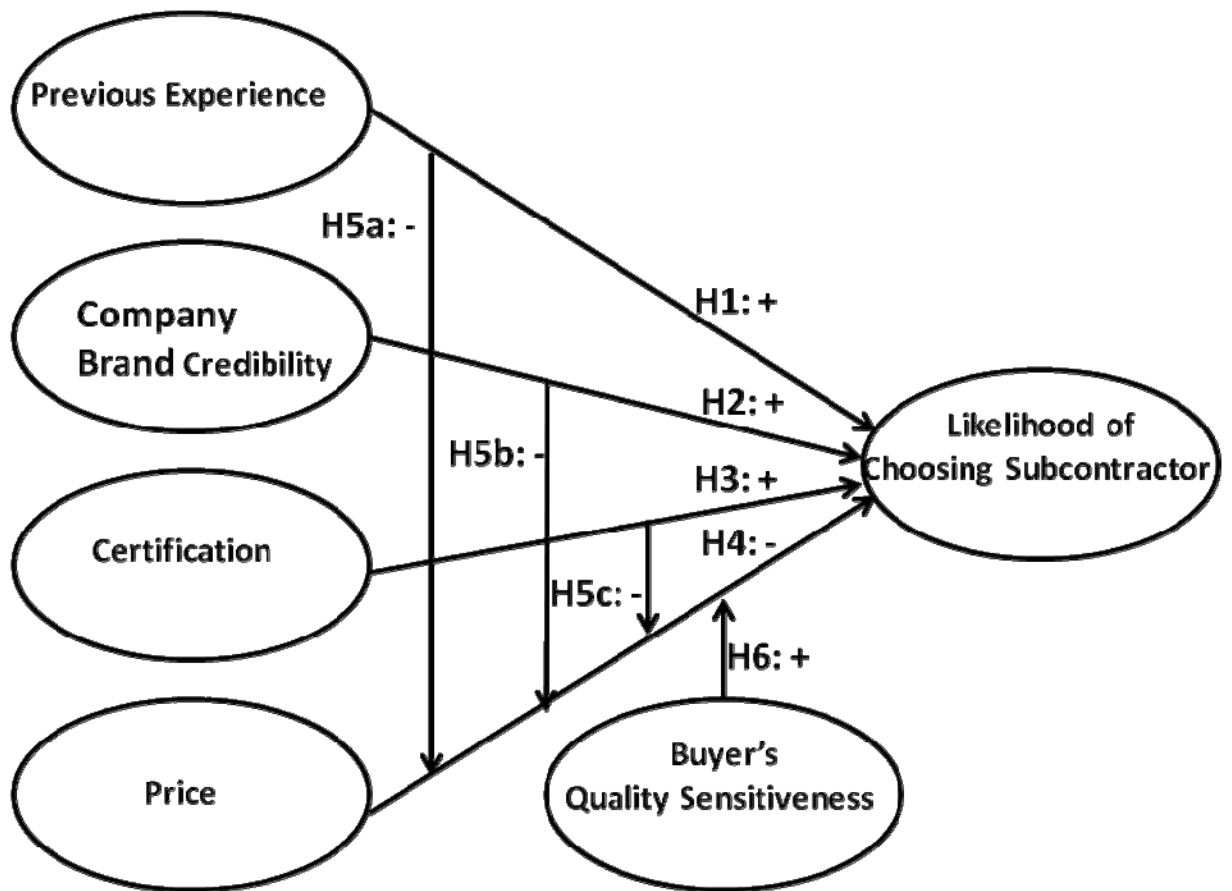
Figure 1**Conceptual Model**

Table 1**Conjoint Factor Importance Weights**

Conjoint Factor	Importance Ranking	Importance Rating
Previous Experience	35	34
Company Brand Credibility	8	7
Certification	17	16
Price	39	43

Table 2**Descriptive Statistics of Scale Items**

	Mean	Std. Deviation	Skewness	Kurtosis
Dependent variable: Likelihood of choice of supplier (Anchors 0 - 10)	5.42	3.23	-.10	-1.25
Moderator variable: Loss by poor quality (Anchors 1 – 7)	5.74	1.29	-1.12	1.27

Table 3**Regression Model**

Dependent variable: Likelihood of accepting offer from the subcontractor				
Independent variables	Unstandardized Coefficients	Standardized Coefficients	t-Value	Variance Inflation Factors
Previous Experience (H1 – supported)	1.40	.44	11.64**	1.00
Company brand credibility (H2 – supported)	.27	.08	2.24**	1.00
Certification (H3 – supported)	.70	.22	5.79**	1.00
Price (H4 – supported)	-1.86	-.58	-15.47**	1.00
Loss by poor quality (quality sensitiveness) (Moderator)	-.03	-.01	-.35	1.00
Price x experience (H5a – not supported)	-.09	-.03	-.77	1.00
Price x brand credibility (H5b – not supported)	.04	.01	.33	1.00
Price x certification (H5c – supported)	-.20	-.06	-1.70*	1.00
Price x loss by poor quality (H6 – supported)	.21	.09	2.27**	1.00
			R^2 adjusted = .58	

*p < .05

**p < .01

Notes: Because of the directional hypotheses, one-tailed tests are used.