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OPTIMIZING ACROSS THE VALUE CHAIN: EXTERNAL COMPETITIVE THREATS AND THE USE OF COST INFORMATION IN BUYER-SUPPLIER NEGOTIATIONS

By

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ABSTRACT

OPTIMIZING ACROSS THE VALUE CHAIN:
EXTERNAL COMPETITIVE THREATS AND THE USE OF COST INFORMATION
IN BUYER-SUPPLIER NEGOTIATIONS

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The opportunity to minimize costs across a greater portion of the value chain has prompted many firms to strive for collaborative relations with their customers and suppliers. A key to the success of such efforts is the sharing of cost information that can be used to discover the most economical production strategies across firms. The detailed cost driver information provided by activity-based costing (ABC) systems can be used to discover a wider variety of cost minimizing choices than can the less detailed information provided by volume-based cost systems. However, the results reported here show that individuals are more reluctant to share detailed ABC information as compared to less detailed information. Consequently, when detailed cost information is not shared, cost minimizing options are often foregone.

In addition, the study hypothesized that the prospect of losses induced by a strong competitive threat impacts the decision to share cost information. Prospect theory predicts that individuals expecting losses will be more willing to share cost information than those expecting profits. However, they will still be relatively less willing to share detailed ABC information, regardless of the competitive environment. The results are consistent with these predictions, and although fewer subject pairs shared ABC

information, the agreements reached by those that did were closer to the optimal than the agreements reached by pairs where either no information or less detailed cost information was shared. In addition, the sharing of either more or less detailed cost information lead to a greater sense of cooperation among negotiators and greater satisfaction with outcomes.

The study highlights an important conflict related to the use of ABC information in a negotiation context where the bargainers have both cooperative and competitive motivations. The cooperative motive results from the integrative potential of the negotiation, whereby the total amount of joint profits can be increased if cost minimizing options can be discovered and agreed upon. The sharing of ABC information increases the chances that these options will be found and total joint profits maximized. However, a competitive motive arises because both negotiators have an incentive to maximize their individual profits. The focus on individual rather than joint profits can result in a reluctance to share ABC information, resulting in foregone cost savings. Further research is needed on how to overcome this reluctance so that the integrative potential of a negotiation can be realized, while concurrently ensuring that the resulting joint profits are divided equitably among the parties.

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CHAPTER 1

INTRODUCTION

Overview

During the 1980's, research showed that a primary factor contributing to the competitive strength of many Pacific rim firms was the prevalence of collaborative, long-term relationships between manufacturers, customers, and component suppliers (Cole and Yakushiji, 1984). Such collaboration allowed these firms to optimize processes across a larger portion of the value chain. This was possible because transactions between buyers and suppliers often involved integrative potential, whereby the participants could increase the total available profits by actively working together to discover cost saving innovations. One key to discovering such innovations was the explicit sharing of information between firms.

Recognition of the potential benefits of collaboration has prompted many U.S. firms to rethink their own supplier relations (Bensaou and Venkatraman, 1995; McMillan, 1990; Cole and Yakushiji, 1984). Efforts to increase the level of cooperation between buyers and suppliers in the U.S. have met with mixed success, however. Often, a critical element missing is a good-faith effort by both parties to share information and search for mutually beneficial solutions (Richardson, 1993; Dyer, 1996a, 1996b). Given that cost reduction has been found to be a primary motivation behind establishing more cooperative buyer-supplier relations (Ellram 1995), the sharing of cost information is the focus of the current study. The sharing of cost information is necessary to minimize costs across firms because the choices made by one firm often impact the costs of the other. Based on the goal of minimizing costs across firms, the primary objectives of this

experimental study are to: 1) examine the impact of sharing more vs. less detailed cost driver information on the overall profitability of negotiated agreements; 2) determine the relative willingness of negotiators to share more vs. less detailed cost information, and; 3) investigate whether the external competitive environment influences the relative willingness of negotiators to share more vs. less detailed cost information.

The distinction between more vs. less detailed cost information is important because the level of detail contained in the cost information shared is likely to affect the extent of its usefulness in identifying cost minimizing options. In the current context, the level of detail refers to the number of cost drivers (and related costs) that are explicitly displayed in a cost report that can be shared with another negotiator. A "less" detailed report has information on only a limited number of cost drivers related to the production of a component. In contrast, a "more" detailed report contains information on a greater number of relevant cost drivers. This distinction parallels a general difference between modern cost accounting systems, such as activity-based costing (ABC), and more traditional, volume-based cost systems. The focus of volume-based cost systems is often on the costs of labor and materials, while the drivers of overhead costs are largely ignored. In contrast, ABC systems provide managers with information regarding overhead cost drivers, in addition to the drivers of labor and material costs. The additional overhead cost driver information provided by ABC systems can be used by managers to optimize production processes involving overhead costs within their firms, in addition to processes involving materials and labor. However, such cost information also has the potential to help managers optimize processes *across* firms, particularly when the production choices of one firm impact the costs of other firms.

Buyer-supplier negotiations represent a suitable setting in which to study cross-firm optimization because there is an opportunity for both parties to suggest changes to how a component is produced. Shared cost information can be used to identify which suggestions are most cost effective across both firms. Given the potential role of shared cost information in maximizing cross-firm profits, identifying and examining factors that impact whether or not negotiators share cost information is critical.

The underlying competitive environment in which buyer-supplier negotiations take place is one potentially important variable related to the sharing of cost information. For example, a common factor many successful buyer-supplier partnerships share is that one or both parties recognized that they were facing a "competitive threat," either individually or as an industry, that put the long-run viability of their firm(s) at risk (Ellram and Edis, 1996; Johnston and Lawrence, 1988). Examples of such competitive threats included falling profits, declining market share, or the prospect of more efficient external competitors. The presence of one or more of these competitive threats seemed to induce some buyers and suppliers to work with, rather than against, each other. Again, a vital factor contributing to successful buyer-supplier collaborations was the sharing of information.

For simplicity, this study defines the presence or absence of a competitive threat in terms of the combined payoff earned by a buyer-supplier pair adopting a status quo agreement involving the sale of an intermediate component. In the presence of the competitive threat, adopting the status quo agreement leads to financial losses to both parties. In the absence of the competitive threat, adopting the status quo agreement leads to profitable outcomes to both parties. The external competitive environment induces the

profits or losses resulting from the status quo agreement by impacting the market price of the final product produced by the buyer, and the market price of the intermediate component produced by the seller. The study presents an argument based on prospect theory for why managers facing a competitive threat (losses) are relatively more willing to share cost information than managers facing no such threat (profits).

Willingness to share cost information is an important area of study because despite the logic that sharing cost information may lead to cost reductions, firms in the U.S. are in general very reluctant to share this information (Helper, 1991). One reason firms hold their cost information proprietary is that revealing it unveils their profits from ensuing deals. Due to the traditional competitive nature of buyer-supplier relations, there is a fear that the other party will use the information to extract a higher share of the joint profits. This fear is justified given numerous studies of bargaining behavior which show that the revelation of individual profits during a negotiation where the parties are motivated to maximize their own outcomes can have a dramatic impact on final agreements and profit splits (Roth, 1995; Ochs and Roth, 1989; Roth and Murnighan, 1982; Roth and Malouf, 1979).

As noted above, the competitive environment can have an impact on the decision to share cost information (that also reveals profit information) by inducing a profit or loss frame of reference in which the negotiation is taking place. A considerable amount of research has shown that individuals behave differently toward risky decisions when facing potential losses than when facing potential gains (Kahneman and Tversky, 1979; Kahneman, Knetsch and Thaler, 1991; Tversky and Kahneman, 1986, 1991, 1992; Tversky, Slovic, and Kahneman, 1990). In the current experimental context, the sharing

of cost information is designated as a risky choice relative to not sharing because of the greater uncertainty of the consequences. A negotiator that chooses to share his/her cost information could realize increased profits if the information is used to discover cost saving options and the negotiator receives a share of the increased profits. However, lower profits could also be realized if the information is used by the other negotiator to garner a greater share of the joint profits. Not sharing cost information is designated as less risky because it will likely result in a profit level that is near to a known, standard amount. The influence of loss aversion, specified within the tenets of prospect theory, predicts that managers will be relatively more willing to choose a given risky option (i.e. sharing cost information) when facing potential losses than when facing potential gains of similar magnitude. In addition, loss aversion is used as the basis for predicting that managers will be relatively *less* willing to share more detailed ABC information than they will less detailed cost driver information. Furthermore, theory predicts that this relative unwillingness to share more detailed cost driver information will remain, regardless of which of the gain or loss frames of the current context is present.

In summary, the overall objective of this study is to examine the decision of whether or not to share cost information within the context of a buyer-supplier negotiation. The goal is to investigate how managers react to the potential risk and rewards of sharing more vs. less detailed cost driver information, and how the external environment can affect this reaction. The amount of detail contained in the cost information that can be shared is manipulated via an "official" cost report that can be given to the other negotiator. The "more detailed" report, denoted as the ABC report, provides the costs and cost drivers of all labor, material and overhead costs. The "less

detailed" (STC) report provides cost driver information on only labor and materials costs. Overhead costs are shown in the STC report simply as the lump sum that would be allocated to the component if it was produced according to the status quo agreement. Parties that choose to share ABC reports face the greatest opportunity for discovering cost reductions, but also leave themselves more vulnerable by exposing a more complete payoff structure to their opponent. Sharing the less detailed STC report may reduce the chances of discovering all possible cost reductions, but allows the sharer to retain private information regarding her payoff structure. In all conditions, negotiators are aware of their own costs and drivers and may verbally communicate this information rather than explicitly sharing the cost report. However, only information contained in the cost reports can be considered credible, or "true." Again, the principles of prospect theory predict that negotiators are relatively more willing to share less detailed rather than more detailed cost information, regardless of the competitive environment.

The explicit sharing of cost information is hypothesized to lead to agreements that are closer to the optimal than when no cost information is shared. However, it is also predicted that sharing ABC information will lead to agreements that are relatively closer to the optimal than agreements where less detailed information is shared. Similarly, sharing either type of cost information is predicted to lead to more efficient negotiations, where less time and effort are required to reach agreement. However, sharing ABC information is predicted to lead to more efficient negotiations than sharing the less detailed STC information.

A final objective of the study is to investigate post-negotiation attitudes among buyer-supplier pairs. It is hypothesized that pairs that share cost information exhibit

greater feelings of cooperation and are more satisfied with negotiation outcomes. A post-experiment questionnaire is used to assess these perceptions among subjects. The examination of post negotiation attitudes is important because research has indicated that the attitudes negotiators hold toward one another may be associated with future collaborative behavior (Brodt, 1994; Thompson and Hastie, 1990).

Importance of Research Issues

The issues examined in the study are important for several reasons. First and foremost, the minimization of costs across firms has come to represent a competitive advantage in some industries and a necessity for survival in others. Factors that affect the efforts of firms to accomplish this goal can help explain their resulting success or failure. The sharing of cost information within the context of a buyer-supplier negotiation is the factor investigated in the current study. Both the competitive environment and the behavioral influence of loss aversion are hypothesized to affect the decision to share cost information.

Secondly, ABC systems have been used to minimize costs and streamline processes within firms. The next important step is to investigate whether ABC systems are useful in minimizing costs across firms. For example, the activities of one firm, such as a supplier, can often impact the costs of a subsequent activity performed by the customer. The choice or option that minimizes costs within the supplying firm may not minimize costs in the buying firm, and vice versa. The explicit sharing of detailed cost driver information can be essential to attain overall cost minimization across both firms. Thus, factors that impact whether and how detailed cost driver information is used across

firms warrants further research. The factor focused on in the current study is the relative willingness of buyers and suppliers to share more versus less detailed cost driver information. If negotiators are hesitant to share more detailed cost information, cost saving opportunities may be foregone.

Contribution of Research

The study contributes to the literature in several ways. First, for buyer-supplier relations, the outcomes reported here show the importance of sharing cost information in the context of negotiations with integrative potential. The tenets of prospect theory are used to illustrate that the competitive environment and the influence of loss aversion can affect decisions to share this information. Although the importance of information sharing has been noted in previous research on buyer-supplier relations, little research has been done on what factors impact these decisions. In addition, the study provides supporting evidence that satisfaction with outcomes is higher when cost information is shared in a negotiation. This result is in contrast to the belief that sharing such information would lead to dissatisfaction with outcomes, due to the other party using the information to garner a higher share of the joint profits.

Secondly, the study has implications for firms adopting more sophisticated cost systems, such as activity-based costing, that yield more detailed cost driver information. This information, if used in a collaborative manner, can lead to substantial cost reductions across firms. However, the reluctance of managers to share highly detailed information implies that some of the benefits of these cost systems may be forfeited.

Third, the study contributes to research on integrative bargaining by investigating how the explicit sharing of cost information impacts the outcomes of a buyer-supplier

negotiation. The study shows that agreements are significantly closer to the optimal when cost driver information is shared. Further, the sharing of more detailed information leads to better outcomes than the sharing of less detailed information. This is contrary to the subset of bargaining literature that suggests that negotiation itself should be sufficient for the parties to discover and adopt the optimal agreement because preference information is revealed through the process of offers and counter-offers.

Fourth, the results reported here add confirming evidence that the predicted effects of loss aversion from prospect theory hold in a complex, integrative bargaining context. The context requires the negotiating managers to make a choice between a relatively certain option (i.e. not sharing their cost reports) and an option involving uncertain outcomes with unknown probabilities (i.e. sharing their cost reports). In addition, although prior studies have used the tenets of prospect theory to predict the decision making behavior of managers regarding risky and riskless choices, this is one of the first to use the decision to share cost information as the risky option.

The next chapter provides a review of relevant literature related to buyer-supplier relations, alternative costing systems and prospect theory. Chapter three develops the formal hypotheses while the experimental procedures are outlined in chapter four. The results of the study are discussed in chapter five. Chapter six acknowledges the limitations of the study, suggests areas for future research and contains the concluding discussion.

CHAPTER 2

LITERATURE REVIEW

Buyer-Supplier Relations

Cooperative buyer-supplier relationships have been repeatedly cited as a significant factor contributing to the competitive strength of many Japanese manufacturing firms (Bensaou 1997, Dyer 1996a, 1996b, Richardson 1993). Compared to their Western counterparts, Japanese buyer-supplier relations are characterized as long-term, highly collaborative in nature, and mutually beneficial. Relatively few suppliers are used and buyers and suppliers often consider each other partners and work together to solve manufacturing problems and increase productive efficiency across a wide range of activities. The sharing of cost and other strategic information is routine in many Japanese partnerships (Dyer 1996a, McMillan 1990). Such collaboration and information sharing has often led to the discovery of incremental cost saving measures which have resulted in a competitive advantage (Dyer 1996a, 1996b, Cusumano and Takeishi 1991, Cole and Yakushiji 1984).

In contrast, traditional buyer-supplier relations in the U.S. and Europe are described as tenuous, short-term, non-cooperative, and often hostile. Western manufacturers have tended to maintain numerous suppliers with whom they engage in short-term, arms length transactions. There is often little information sharing coupled with feelings of mistrust between buyers and suppliers. This traditional view is highlighted by Ashkenas (1990) who notes that the competitive nature of buyer-supplier relations has "led to dynamics which unintentionally result in minimization or destruction

of competitive value (p. 386)." Limited information sharing and a lack of joint problem solving are noted as consequences to this competitive orientation:

> "Companies in the value chain tend to withhold information from each other such as real costs of materials, in-process quality problems, profit margins, and all manner of problems that are viewed as 'dirty linen'." (Ashkenas 1990 p. 386)."

To reap the benefits of collaboration, recent research has suggested that firms make an effort to increase the level of cooperation in their inter-firm relations (Bensaou, 1997; Bensaou and Venkatraman, 1995; Cusumano and Takeishi, 1991; Helper, 1991; McMillan, 1990; Ashkenas, 1990). Surveys indicate that although numerous firms in the U.S. are attempting to establish more cooperative buyer-supplier relations, progress and satisfaction vary widely (Edelman, 1997; Ellram, 1995; Richardson, 1993). As indicated by the above quotation from Ashkenas (1990), a high level of information exchange has been repeatedly cited as a critical factor determining the quality and success of buyer-supplier partnerships (Ellram, 1995; Richardson, 1993). For example, in a survey of 80 buyer-supplier pairs that identified themselves as being part of a mutual "partnering" relationship, Ellram (1995) notes that buyers ranked two-way information sharing as the most important factor determining the success of the partnership. For suppliers, the importance of two-way information sharing was second only to top management support (Ellram 1995, p. 41). Similarly, poor communication was cited by both buyers and suppliers as the number one factor contributing to the failure of past partnering efforts.

Successful collaborative efforts among U.S. firms have often resulted in substantial cost savings and process improvements. For example, Chapman et al. (1998)

present the experiences of several firms who chose to work closely with a few select suppliers. They cite a fast food chain that was successful in their efforts:

> "The result has been not only annual cost reductions of 4 to 5 percent over several years, but faster product development and innovative packaging...(p. 64)"

Also cited is an automotive manufacturer that began integrating suppliers into the development process with substantial benefits:

> "One development team that collaborated with a supplier to redesign an instrument panel was able to cut the part count by 30 percent, halve the number of assembly steps and materials specifications, and shrink development time from years to months (p. 64)[1]."

Given the importance of information sharing on successful collaborative efforts, this study focuses specifically on the sharing of cost information that can be used to discover cost minimizing options involving more than one firm. The next section briefly reviews a subset of the cost system literature highlighting the differences in the information provided by traditional and modern cost systems. The section also describes how the information from different cost systems can be used to minimize costs across firms.

Alternative Cost Systems and Cost Minimization Within and Across Firms

During the 1980's, research revealed that traditional cost systems that focused on direct material and direct labor costs were inadequate to manage operations that were becoming increasingly overhead intense (Johnson and Kaplan, 1987; Anderson, 1995;

[1] Chapman et al. (1998) also note that limiting the number of suppliers may not always result in cost savings. The opportunities for suppliers to take advantage of their "single-source" status may result in higher costs. They describe the experience of a pulp and paper company which selected a single supplier to provide all of its miscellaneous parts. The supplier charged the firm prices that were up to 70 percent higher than the market price.

Swenson, 1995; Argyris and Kaplan, 1994). Traditional, volume-based cost systems tended to allocate overhead to products by aggregating overhead costs and then assigning it to products based on a volume-based measure, such as units produced or direct labor hours. In an effort to measure and manage costs more effectively, more detailed cost systems, such as activity-based costing (ABC) were advocated.

ABC systems focus on providing more detailed overhead cost information by identifying the activities related to overhead costs and then determining a cost driver for each activity. Once a cost per unit of each cost driver is calculated, overhead costs can be assigned to products based on activity usage. For example, suppose the main activity of the purchasing department is placing orders, and the related cost driver is determined to be the number of orders placed. Once a cost per order is determined, purchasing costs can be assigned to individual products based on the number of purchase orders that are required. The detailed information regarding the cost driver of purchasing costs can be used by the product manager to determine an optimal number of purchase orders for the product. In contrast, under a traditional system the costs of a firm's purchasing department might be added to an aggregate overhead cost pool and then allocated to products based on direct labor hours. The system provides little information that a product manager can use to optimize the purchasing costs of a particular product, unless purchasing costs are truly related to direct labor hours.

Studies of successful implementations of ABC systems have highlighted that the more detailed overhead cost information was used by managers to make better pricing and product mix decisions (by having a better picture of the true costs of various products) and to manage activities better (by having more information on what drives

costs) (Dedera, 1996; Ness and Cucuzza, 1995; Drumheller, 1993). Drumheller (1993) in describing how ABC was successfully implemented at a small manufacturing firm notes that an important function of the new ABC system was to aid in the minimization of overhead process costs:

> "Determining (overhead) process costs made it clear what the cost of adding a new part number, a new vendor, or additional manufactured parts would be. Process costing made it possible to forecast how overhead costs would be affected by change. Decisions about designing or redesigning a product could thus be made to minimize overhead costs and not simply direct labor (Drumheller, 1993, p. 23)."

A specific example of how ABC information was used to solve an optimization problem within a production process is highlighted by Ness and Cucuzza (1995 p. 137) in a study describing the successful implementation of ABC at Chrysler. The ABC information was used to address the problem of how many wiring harnesses were needed in the production of a new minivan. The options ranged from one to nine harnesses, with different parties advocating different numbers. The design engineers, who were evaluated on how well they kept material costs down, wanted nine harnesses so that the minimum necessary amount of materials would be put onto each vehicle. However, producing nine harnesses increased production complexity. Manufacturing plant managers advocated using only one harness to minimize inventory and direct labor costs. The key to finding the optimal solution of two harnesses was using the ABC information to figure out which number minimized total costs.

Similarly, other studies of ABC implementations note that success of the new system is critically linked with better decision outcomes regarding cost minimization (Swenson, 1995; Shields and McEwen, 1996). However, for the ABC information to be

used effectively, it must often be shared with other parties because the costs are often controlled by many individuals (Drake, Haka and Ravenscroft, 1999). A study by Drake, Haka and Ravenscroft (1999) provided participants with ABC information and found that if the information was not used as part of a coordinated effort across multiple individuals, cost reductions pinpointed by the ABC information were not undertaken. The presence of competitive incentives was found to be a major hindrance to coordination efforts. In the current context of a buyer-supplier negotiation, a competitive orientation exists because both parties are trying to maximize their own payoffs. This competitive element may prevent negotiators from sharing the ABC information. Without the relevant information, cross-firm cost savings may not be identified, much less adopted.

Cross-firm cost minimization becomes more important as firms become less vertically integrated. These firms need to take a value chain perspective and look across their organizational boundaries for cost saving opportunities (Cooper and Slagmulder 1998, Shank and Govindarajan, 1992). Cooper and Slagmulder (1998) note:

> "For the majority of the 20th Century, management accounting practice has limited its scope to the boundaries of the firm. This limitation makes it difficult for the firm to take advantage of any cost-reduction synergies that exist across the supply chain. Such synergies can only be achieved by coordinating the cost-reduction activities of multiple firms (p. 18)."

The problems caused by a lack of coordination between firms is highlighted in a case described in Shank and Govindarajan (1992, p. 20). The case involved a large U.S. car manufacturer that determined it could reduce its costs at assembly plants by implementing a just-in-time approach to the inventory provided by suppliers. Reducing inventory buffer stocks did reduce costs at the assembly plants, but the resulting scheduling variability imposed on the suppliers resulted in increased costs at the suppliers

end. The increase in supplier costs more than outweighed the cost savings experienced by the assembly plants, resulting in higher total costs across the value chain.

In contrast, Roberts and Silvester (1996) report a case where ABC information was used successfully to improve overall profits between a firm and its customers. Prior to the implementation of ABC, the firm's managers believed that the cost of placing printed numbers and letters on the printed circuit boards it manufactured was immaterial. The ABC information revealed that the process cost was not immaterial, and through working with its customers management, was eventually able to eliminate it. Importantly, the cost savings were shared with the customers.

Although the benefits to coordination between firms seem intuitive, the actual practice of coordination and the sharing of cost and other information across firms is difficult due to the traditionally competitive nature of buyer-supplier relations (Helper, 1991). In describing the overall cost savings that can be discovered by cross-firm interactions, Cooper and Slagmulder (1998) note:

> "To achieve these savings, all of the firms must be willing to cooperate, share information, and work for the common good. Unfortunately, the adversarial character of many buyer-supplier relationships in Western firms is not conducive to these types of interactions (p. 19)."

Factors that dampen the competitive aspect of a negotiation and encourage the parties to work together to maximize total joint profits represent an interesting avenue of research. This study investigates whether the prospect of losses induced by a strong competitive threat to both negotiating parties, induces them to take the risky option of sharing their cost information and working together to find optimal production solutions.

The next section of the paper reviews literature related to prospect theory that provides a basis for predicting that losses associated with competitive threats can induce a greater level of cost information sharing.

Prospect Theory and Expected Utility Theory

Since the seminal work of Von Neumann and Morganstern (1944), expected utility theory has reigned as the predominant normative model of choice under risk and uncertainty (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992). Based on a set of plausible axioms, it implies that there exists a utility function such that an individual's preferences over a set of risky prospects can be ordered according to the expected utility of the prospects (Varian, 1992). A key characteristic of expected utility theory is that the value of a prospect is based on final wealth, regardless of the initial wealth position of the decision maker[2]. This suggests that different representations of an objectively identical choice problem (in terms of final wealth) should not affect a subjects' preference order (Kahneman and Tversky, 1979).

Although normatively appealing, research has uncovered systematic violations of the predictions of expected utility theory (Kahneman and Tversky, 1979; Tversky and Kahneman, 1986, 1991, 1992; Kahneman, Knetsch, and Thaler, 1991; Tversky and Simonson, 1993). The results of the following two experiments in Kahneman and Tversky (1979) implies that the carriers of value are gains and losses relative to a given

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[2] Kahneman and Tversky (1979) describe this characteristic as "asset integration," meaning that "a prospect is acceptable if the utility resulting from integrating the prospect with one's assets exceeds the utility of those assets alone. Thus, the domain of the utility function is final states (which include one's asset position) rather than gains or losses (p. 264)."

reference point, not the final amount of wealth or assets as implied by expected utility theory.

Experiment 1: Imagine you have been given $1,000 and must choose between

A) a 50% chance of winning $1,000 and a 50% of winning $0 and

B) winning $500 for sure.

The majority of participants (84%) chose B, the risk averse option.

Experiment 2: Imagine you have been given $2,000 and must choose between

C) a 50% chance of losing $1,000 and a 50% chance of losing $0 and

D) losing $500 for sure.

The majority of participants (69%) chose C, the risky option. However, A and C are identical in that they involve a 50% chance of walking away with $2,000 and a 50% chance of walking away with $1,000. Similarly B and D are identical to the certainty of walking away with $1,500. Based on expected utility theory, if a subject prefers B to A, she should also prefer D to C because the choice problem is the same in experiments 1 and 2 in terms of final wealth. The results of these experiments are relevant to the current study because the presence or absence of a competitive threat induces similar frameworks within which negotiators must make the decision to share or not share their cost information.

Another key component to describing choice under risk and uncertainty is the proposed shape of the utility function, $v(\cdot)$. Although expected utility theory does not place restrictions on the shape of the function per se, common applications of the theory have imposed that the utility function is concave over the entire wealth domain (i.e. the

second derivative, $v^{\cdot}$, of the function is less than zero). There are two significant implications of this proposed shape. First, it implies diminishing marginal utility of wealth, such that the change in utility of receiving an additional $100 is greater at a starting point of $10 than $10,000. Second, it implies risk aversion over the entire wealth domain.

In contrast, prospect theory implies that the utility/value function is concave ($v^{\cdot} < 0$) for amounts above the reference point and convex ($v^{\cdot} > 0$) for amounts below the reference point. The implication is that risk averse behavior is predicted for situations involving amounts greater than the reference point, but risk-seeking behavior is predicted for amounts less than the reference point (Kahneman and Tversky, 1979; Tversky and Kahneman, 1986). This prediction is consistent with the results given above for Experiments 1 and 2 from Kahneman and Tversky (1979). The proposed shape of the value function also implies that the marginal utility of a change in wealth decreases with the distance from the reference point, in either direction. Thus, the impact on utility of a $100 loss will be less at an initial loss position of -$10,000 than at an initial position of -$10.

An additional critical aspect of prospect theory is the tenet of loss aversion. Loss aversion implies that, relative to a given reference point, the pain of losing $100 is greater than the pain of a foregone gain of $100. Thus, the value function is "steeper" in the domain of losses than in the domain of gains. Overall, prospect theory predicts a non-linear, S-shaped value function that is asymmetric relative to a neutral reference point.

Prospect theory is used in this study for two reasons. First, a sample of reported cases where buyer-supplier relations have involved the "risky" practice of information sharing and collaborative problem solving reveals that the firms involved were often facing strong competitive threats (Ellram and Edis, 1996; Richardson, 1993; Johnston and Lawrence, 1988). Such threats indicate that the decision to share information with a buyer-or supplier was made in the context of potential losses to the participants. Thus, the risky decision to share information would be consistent with the risk seeking behavior under losses implied by prospect theory. In addition, prospect theory can also be used to describe the relative willingness of subjects to share less detailed versus more detailed cost information under the contexts of both profits and losses.

The following section presents a review of literature tying the predictions of prospect theory to the context of a buyer-supplier negotiation in which integrative potential exists.

Implications of Prospect Theory for Buyer-Supplier Relations and Negotiations

Ellram and Edis (1996) describe how Kodak established a successful business partnership with its suppliers. At the time of establishing the partnership, Kodak was facing extremely stiff competition and price erosion. One strategy Kodak used to remain competitive in the imaging industry was to reduce costs. An area identified as a key source of possible cost reductions was the set of transactions and processes involving Kodak's suppliers. To realize these potential cost savings, Kodak engaged in an extensive effort to change the nature of its relations with its suppliers. Instead of engaging in a multitude of arms-length, competitively-oriented transactions with numerous suppliers, it strove to establish more cooperative relationships with a few key

suppliers. The resulting "partnerships" involved a higher level of communication and early involvement of suppliers in the product development stage. Through greater collaboration with its suppliers, substantial cost and time savings were realized. These improvements have helped Kodak remain profitable and competitive in the imaging industry.

Similarly, Johnston and Lawrence (1988) describe the case of McKesson, a wholesale health care product distributor that recognized that the independent drugstores it supplied were in danger of being put out of business by large chain stores, such as Kmart and Walmart. Realizing that its own future depended on the survival of its customers, McKesson began to search for ways to help the independents stay competitive. By actively working with its customers, several innovations and process improvements were devised that resulted in cost savings for both itself and its customers. McKesson and its customers became what Johnston and Lawrence (1988) describe as a "value-adding partnership" defined as a "set of independent companies that work closely together to manage the flow of goods and services along the entire value-added chain (p. 94)."

As indicated by the above cases, some successful buyer-supplier partnerships have in common the presence of a competitive threat, which has had (or is predicted to have) a significant detrimental impact on the financial condition of the involved firm(s). In general, firms facing such threats are likely to be facing actual or potential losses for the near future. The managers of such firms are similarly facing "losses" in the form of lower pay if their compensation is tied to firm performance.

The competitive threats to Kodak and McKesson prompted an effort to switch

The competitive threats to Kodak and McKesson prompted an effort to switch from the traditional, competitive buyer-supplier paradigm to more collaborative relationships involving greater communication and problem solving activities. A key aspect of such collaborative relationships is the sharing of information that can be used by the parties to discover cost saving opportunities. This experimental study investigates the decision to share cost information with a buyer or supplier during the negotiation of the sale of a component. The sharing of cost information is critical because the context examined involves inter-related costs and integrative potential. The costs are inter-related because the agreed upon production options impact the costs of both firms. Integrative potential exists because total joint profits can be increased if the optimal set of options can be discovered and agreed upon. The combined cost information from both firms can be used to determine which set of options minimizes total costs[3]. However, the sharing of cost information is assumed to represent a "risky" option relative to not sharing. As detailed in the paragraphs below, the sharing of cost information is risky, due to the negative consequences that are possible in a context where negotiators have an incentive to maximize their own gains. The tenets of prospect theory are applied in the current study to predict that negotiators are relatively more willing to engage in the risky action of sharing cost information when they are faced with a competitive threat that induces a "loss" frame of reference.

[3] It is technically sufficient to discover the optimal set of options if only one of the parties shares their cost information. The party with both their own and the others' cost information has all the information necessary to figure out the optimal set.

The sharing of credible cost information is considered to be the 'risky' choice, relative to the status quo of keeping it confidential, because the potential profits or losses to the sharer could exhibit a greater variance than if the information is kept private. The assumption that sharing information is considered risky is based on past negotiation research which notes the general hesitation of bargainers to share information revealing their payoffs (Pruitt and Carnevale, 1993; Lax and Sebenius, 1986). Lax and Sebenius (1986) note that negotiators realize that sharing information could lead to higher joint gains, but fear that their share of the joint gains can be reduced if the other party is able to use the information to negotiate a larger share of those gains.

Negotiators can use the other party's cost information, in conjunction with their own, to estimate the payoffs that would accrue to both parties as the result of a given offer involving an exchange price (and any related terms and conditions). Experimental studies of bilateral bargaining have shown that the distribution of payoff knowledge can have a dramatic impact on resulting profit splits[4] (Roth and Malouf, 1979; Roth and Murnighan, 1982). For example, an early study by Roth and Malouf (1979) involving binary lotteries showed that when negotiators were informed of only their own payoffs, they tended to split a given amount of lottery tickets equally, affording each an equal chance of winning his/her prize. However, when both negotiators knew the others' prize, they tended to split the lottery tickets such that the negotiator with the larger prize received a smaller share of tickets. Thus, under full payoff information, both negotiators ended up with approximately equal expected values. For the party with the larger prize, the sharing of payoff information resulted in a lower expected value, while the party with

the smaller prize faced a greater expected value. Such experimental evidence provides justification for the aforementioned view that sharing cost information with a buyer or supplier in the context of negotiation is "risky" because of the potential impact on final payoffs. Within the context of a buyer-supplier negotiation, each manager faces the risk that if they share their cost information, they may be forced to accept a lower profit agreement than if they had kept the information private.

The idea of applying the predictions of prospect theory to managerial decision making was proposed by Bowman (1980, 1982) after noting an interesting paradox that seemed contrary to economic theory. Using after-tax return on equity and its variance as measures of return and risk, respectively, Bowman (1980) examined 85 industries over the period 1968-1976. The results showed a negative risk/return relation within 56 (68%) of the industries and a positive relation for only 21 (25%). The remaining 8 industries were indeterminate. The overall conclusion was that "in the majority of industries studied, higher average-profit companies tended to have lower risk, i.e., variance, over time (p. 19)." The findings appeared contrary to the standard economic argument that risk and return should be positively correlated[5].

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[4] For a more extensive review of this literature see Roth, 1995.

[5] Bowman (1980) notes that the firm level paradox documented in his study may be eliminated in shareholder markets through the pricing of securities. In a large, efficient capital market, firms with high returns and low risk will be higher priced, affording the shareholder a lower return for a lower risk security.

A follow-up study (Bowman 1982) directly examined the hypothesis that troubled companies, via their managers, take more risks than their more successful counterparts by using content analysis of annual report data. Again, the results supported the predictions of prospect theory. The managers of firms with lower and more variable profits took on a greater number of risky activities, such as acquisitions, divestitures, and new projects (Bowman, 1982). The findings were also consistent with experimental results reported by Laughhunn, Payne, and Crum (1980) which showed that when facing below target returns, managers preferred risk seeking behavior as opposed to risk averse behavior. Since these early studies, the negative risk/return relation and its consistency with the predictions of prospect theory have been replicated by several authors (Bettis and Mahajan, 1985; Singh, 1986; Fiegenbaum and Thomas, 1988; Miller and Bromiley, 1990; Lee, 1997).

In summary, research illustrates that the threat of losses due to strong competitive threats induce managers to engage in riskier behavior than they would under more profitable conditions. The sharing of cost information during a negotiation represents an example of such "risky" behavior. Based on prospect theory, the next section of the paper hypothesizes that the proportion of managers who choose to share their cost information will be greater under the specified loss context than under the profitable context. The theory is also used to predict that under both contexts, the proportion of managers choosing to share more detailed ABC information will be less than the proportion choosing to share less detailed information. Hypotheses regarding the impact of sharing both types of cost information on negotiation outcomes are also developed.

CHAPTER 3

HYPOTHESES

Competitive Threats and Cost Information Sharing

Given that reducing costs is a primary objective of buyers wishing to establish collaborative relationships with suppliers (Ellram, 1995), the sharing of cost information is the focus of the current study. Such information can be used by the parties to increase the total available surplus and/or it can be used by one party to extract a greater share of any surplus from the other party. The uncertainty regarding how the other negotiator might "use" shared cost information creates risk for the partner considering sharing, due to the potential for both positive or negative consequences. In the current study, the status quo of not sharing information is considered less risky because agreements are expected to center closely around a known standard sales arrangement. Past negotiation studies have shown that when information regarding individual preferences and payoffs is not shared between negotiators, simple compromises are often the result (Carnevale and Pruitt, 1992). Concordant with this finding, the standard sales arrangement consists of the compromise solution to each of the negotiable issues.

In accordance with prospect theory, the first hypothesis predicts that a greater proportion of negotiators will engage in the risky behavior of sharing their cost reports when faced with a competitive threat. The competitive threat induces a "loss" frame, whereas the absence of such a threat results in a profitable or "gain" frame. In this experimental study a dummy variable was used to record for each pair whether one or both negotiators shared their cost report with the other negotiator. A pair was classified as sharing if either one or both negotiators gave their "official" cost report to the other.

For Hypothesis 1, sharing is thus measured as the proportion of negotiating pairs in which one or both pair members chose to share their cost report.

> **H1: The proportion of negotiating pairs that choose to share their cost reports is greater under the presence of an external competitive threat than in the absence of such a threat.**

Sharing More vs. Less Detailed Cost Information

A second important question concerns the amount of information bargainers share. Are negotiators more willing to share *some* cost information, rather than all? The current study investigates this question by manipulating the level of detail contained in the "official" cost reports that can be shared. Under all conditions, negotiators are furnished with complete, private information regarding their own costs and cost drivers at the start of the experiment. During the negotiation, they are given the opportunity to provide the other party with a copy of their cost report which, depending on the experimental condition, will have *one* of two possible formats. One cost report format (ABC), provides a detailed description of all costs and drivers, while a second format (STC) describes only the costs and drivers of materials and labor, leaving overhead as an allocated lump-sum (on a per unit basis). The ABC format is modeled after activity-based costing methods, while the STC format is modeled after more traditional costing methods. The content of the reports is such that all information contained in the STC

report is contained in the ABC report, however the ABC report contains additional information on the costs and drivers of overhead[6].

The significance of the level of detail present in the two cost reports is that it changes the magnitude of the range of potential gains and losses that might be expected from sharing the cost report, but does not change the midpoint of the range. Relative to the status quo of not sharing any cost information, sharing a more detailed cost report offers the opportunity to discover more cost saving options than sharing a less detailed report. Thus, the potential gains from sharing a more detailed report are expected to be greater than those related to sharing a less detailed report. However, the magnitude of potential losses due to opportunism by the other negotiator is also greater (for a detailed numerical example see the Chapter entitled Experimental Manipulations and Procedures). Thus, the sharing of more detailed cost information has a greater outcome variance than the sharing of less detailed information.

Given the prediction that individuals engage in riskier behavior when faced with losses, it might be posited that managers will share more rather than less detailed cost information when faced with a competitive threat. However, although prospect theory predicts risk seeking behavior under losses/threats it does not necessarily imply that a prospect with a greater symmetric range of outcomes will be valued higher than a prospect with a smaller range with the same midpoint. Like expected utility theory, it

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[6] The ABC report can be described as mathematically *finer* than the STC report in that it contains all the information of the STC report and (possibly) more (Newman, 1980). This distinction is important because any observed differences in behavior across the two cost report formats can be attributed to more (less) information being present in the ABC (STC) report rather than the alternative explanation that the two reports contain completely different information.

supports the prediction that when faced with two gambles involving equal expected values but with different variances, the gamble with the lower variance will be preferred (Varian, 1992). Kahneman and Tversky (1979) supports this prediction based on the principle of loss aversion, meaning that losses involve a greater change in utility than that associated with gains of equal magnitude. They note that people find symmetric bets with a 50% chance of winning x and a 50% chance of losing x, "distinctly unattractive." Furthermore they note that "the aversiveness of symmetric fair bets generally increases with the size of the stake (p. 279)." Thus, if outcome x is greater than outcome y, a fair chance of winning or losing y is preferred to a fair chance of winning or losing x.

In the current study, subjects are informed that maintaining the status quo of not sharing their cost report will likely lead to agreements that are at or near the standard sales arrangement, which yields a known profit/loss amount. In considering whether or not to move away from the status quo, potential advantages and disadvantages will be evaluated relative to the status quo outcome. Sharing less detailed (STC) cost information has the potential to lead to a smaller symmetric range of advantages and disadvantages, relative to the status quo, than sharing more detailed (ABC) information[7]. Thus, a relatively greater proportion of negotiating pairs can be predicted to share STC cost information, regardless of the presence or absence of a competitive threat. The presence or absence of a competitive threat serves only to change the status quo reference outcome from a negative to a positive amount, respectively. The variance, in terms of

[7] For a more detailed description of the range of possible advantages and disadvantages to sharing more/less detailed cost information, see the Experimental Manipulations and Procedures Chapter and Table 2.

potential gains and losses relative to that status quo amount, remains the same under either threat condition

Recall that negotiators in the current study are furnished with only one of the two types of cost reports. Thus, it is predicted that the proportion of negotiating pairs that choose to share their cost reports is smaller in the group with more detailed (ABC) cost reports than in the group with less detailed (STC) cost reports.

H2: The proportion of negotiating pairs that choose to share their cost reports is greater among those that have the option to share an STC cost report than among those that have the option to share an ABC cost report.

The next hypothesis addresses the question of how the predictions of H1 and H2 can be combined. Recall that H1 predicts that a greater proportion of negotiating pairs will share cost information under the threat condition (losses) than under the no threat condition (gains). However the principle of loss aversion suggests that, regardless of the threat condition, a greater proportion of negotiating pairs will share under the STC cost report condition. Thus, the overall prediction is that there will be no interaction between the threat condition and the cost report format. If only main effects hold, the following hypothesis can be expected:

H3: The highest proportion of negotiating pairs sharing their cost reports occurs under the threat condition combined with the STC report format; the lowest proportion of pairs sharing their cost reports occurs under the no threat condition combined with the ABC report format.

Overall, under loss conditions a greater proportion of pairs share information in general, but the proportion that share less detailed (STC) information is greater than the proportion that share more detailed (ABC) information. Under gain conditions, the proportion of pairs that share is lower, but the proportion that share ABC information is

even less than the proportion that share STC information. The importance of this result is highlighted in the following section which describes the impact of sharing the two types of cost reports on the optimality of the resulting agreements.

Cost Information Sharing and the Optimality of Agreements

Distributive vs. Integrative Agreements

The majority of research on negotiation has focused on distributive settings, as opposed to those with integrative potential (Roth, 1995; Pruitt and Carnevale, 1993). A negotiation is distributive if bargainers have a fixed amount of resources to distribute among themselves, such that one bargainer's gain, must result in a loss to the other. In contrast, negotiations have integrative potential if the amount of resources to be distributed can be expanded, or the total utility can be increased, with some effort or thought on the part of the negotiators (Pruitt and Carnevale, 1993). Research has shown that negotiators often miss the integrative potential of a given situation, and settle on less than optimal agreements (Thompson and Hastie,1990; Bazerman, Magliozzi and Neale, 1985). A classic example was first described by Follett in 1940. Two sisters have one orange which they both want. They eventually agree to a simple compromise - they split the orange in half. However, one sister wanted the peel for a cake and the other wanted the juice to drink. If they had shared information regarding their needs and preferences, they would have discovered they both could have been happier if one sister received all the peel, and the other sister received all the juice.

Negotiations with integrative potential often involve numerous issues that are of differing importance to each party, as is true in this study. As seen in Table 1 and Appendices F and G, this study presents a multiple-issue negotiation with integrative

potential in that the total amount of joint profits can be expanded relative to a status quo agreement. For example, the status quo or standard casing agreement specifies that a casing be made of plastic. The seller's cost of making the casing out of plastic is $15 and the cost to the buyer of using a plastic casing is $25, for a total cost of $40. This total cost can be reduced to $30 if the negotiators can agree to make the casing out of steel. It costs the seller $25 to make the casing out of steel, but the costs to the buyer of using a steel casing are only $5. Thus, the joint profit can be increased by $10. Figure 2 illustrates how the total joint profits of the bargainers can be increased if integrative choices are made on all of the six negotiable items.

Information sharing has been found to be significant factor in the creation of integrative agreements (Pruitt and Carnevale, 1993; Thompson, 1991; Thompson and Hastie, 1990). Past studies have revealed that bargainers often go into a negotiation with the idea that there is a fixed amount of resources to be shared and in the case of multiple issues, they often believe the other negotiator's preferences are in direct opposition to their own (Brodt, 1994; Thompson, 1991; Thompson and Hastie, 1990). These beliefs bias the parties against searching for integrative agreements. Unless information is revealed during the negotiation, it is unlikely that the parties will reach an integrative agreement that maximizes their joint gain. Therefore, it is hypothesized that pairs that share their cost reports reach agreements that are closer to the optimal, integrative agreement, than pairs that do not share. Again, a pair is considered to have shared if one or both negotiators gives their respective cost reports to the other.

H4a: Negotiating pairs that share their cost reports reach agreements that are closer to the optimal than pairs that do not share.

In the current experiment, both members of each negotiating pair have the same type of cost report that can be shared, either ABC or STC. Negotiators can reveal some (all) of their private information if they choose to share their STC (ABC) cost report. Sharing an ABC report enables one or both parties to discover the optimal cost minimizing choice for each of the six negotiable casing features. Sharing an STC report enables only the discovery of the optimal choices for three of the six features. Therefore, it is predicted that the optimality of agreements is greater when negotiators share ABC reports than when STC reports are shared.

H4b: Negotiating pairs that share ABC reports reach agreements that are closer to the optimal than those that share STC reports.

In the absence of cost report sharing, it is predicted that neither the cost report type, nor the threat condition significantly impact the level of optimality of the agreements reached.

H4c: There are no significant differences across either the report type or the presence or absence of a threat in the optimality level reached by negotiating pairs that do not share cost reports.

Cost Information Sharing and the Efficiency of Negotiation

Most studies of bargaining recognize that there are non-negligible costs to continuing a negotiation, either through a longer period of time or through the exchange of more proposals (Rapoport, Erev, and Zwick, 1995; Rubinstein, 1982). It is therefore useful to examine the amount of time and the number of proposals necessary to reach agreement under the various experimental conditions.

Negotiators can often implicitly share information through their offers and counter-offers (Pruitt and Carnevale, 1993; Thompson and Hastie, 1990). Thus, it is

possible that negotiators may eventually agree on a near-optimal agreement even without explicitly sharing their cost reports. However, it is likely to take longer and/or require more proposals than if they had explicitly shared their cost information. Thus, the following hypothesis is proposed:

H5a: Negotiating pairs that share cost reports need less time/fewer proposals to reach near optimal agreements than pairs that do not share their cost reports.

In addition, it is hypothesized that negotiators that share more detailed ABC information, and reach near optimal agreements, will need less time/fewer proposals than will pairs that share less detailed STC information. Negotiators may still engage in back and forth offers and counter-offers in an attempt to discover the optimal choices for the overhead costs not disclosed in the STC report. This leads to the prediction of relatively less efficient negotiations when STC reports are shared than when ABC reports are shared.

H5b: Negotiating pairs that share ABC cost reports need less time/fewer proposals to reach near optimal agreements than pairs that share STC cost reports.

In the absence of cost report sharing, no differences in negotiating time or number of proposals are predicted for pairs to reach near optimal agreements for either the report type or the presence or absence of an external threat.

H5c: For negotiating pairs that do not share cost reports, there are no significant differences across either the report type or the presence or absence of a threat in the time/number of proposals necessary to reach near optimal agreements.

Cost Information Sharing and Negotiator Attitudes

As previously noted, information sharing has been associated with more cooperative, trusting relationships between buyers and suppliers. The link between information sharing and cooperative attitudes and outcome satisfaction is also supported in experimental studies of negotiation (Brodt, 1994; Thompson and Hastie, 1990). The discovery and adoption of integrative, mutually beneficial agreements has been found to lead to more cohesive relations and higher satisfaction with outcomes (Bazerman et al. 1985; Bazerman and Neale, 1985).

The current study examines the link between explicit information sharing and buyer-supplier relations by measuring the attitudes of negotiators toward one another after agreements have been reached. The measures include the perceived level of cooperation that took place during the negotiation, and overall satisfaction with the outcome of any agreements. Given the assumption that the act of sharing one's private information can be considered relatively more cooperative than keeping the information private, the following hypothesis is proposed:

H6: Negotiating pairs that share their cost reports exhibit a higher perceived level of cooperation than pairs that don't share their cost reports.

Recall that Hypothesis 4a predicts that pairs that share cost reports will reach agreements that are closer to the optimal than pairs that don't share their reports. If negotiators are relatively more satisfied with agreements that are closer to the optimal, the following can be predicted:

> **H7: Negotiating pairs that share their cost reports exhibit greater satisfaction with outcomes than pairs that don't share their reports.**

The next section of the paper describes the experimental manipulations and procedures followed in testing the above hypotheses.

CHAPTER 4

EXPERIMENTAL MANIPULATIONS AND PROCEDURES

Experimental Overview

Subjects randomly assigned to the role of either buyer or seller, negotiated the price and physical characteristics of an intermediate component during a face-to-face meeting. The component, or casing, was used by the buyer to produce a final product that was sold at a fixed price. Both buyers and sellers incurred materials, labor, and overhead costs which varied depending on the agreed upon features of the casing. In all conditions, buyers and sellers were aware of all of their own costs and cost drivers.

Prior to the negotiation, subjects were informed of the availability of a standard sales arrangement, consisting of a selling price and a given set of casing characteristics. The standard sales arrangement provided a reference point by which alternative offers could be compared. The specific payoffs to both parties from the standard sales arrangement depended on whether or not an external "competitive threat" existed (see Table 1). In the presence of a competitive threat, the standard arrangement resulted in moderate losses to both parties. In the absence of a competitive threat, the standard arrangement yielded moderate profits to both parties. Profits and losses were manipulated via the selling prices of both the standard casing and the final product produced by the buyer. The external threat had the effect of driving these prices down to below profitable levels.

Throughout all experimental conditions, both parties were aware of how their costs changed depending on the features of the casing (see Appendices F and G). In addition, each negotiator had an "official" cost report which they could choose to share

with their partner or keep to themselves (see Appendices H, I, J and K). The level of detail contained in the cost report varied depending on the experimental condition. In the activity-based costing (ABC) condition, the drivers of material, labor and overhead costs were explicitly described. In the standard costing (STC) condition, materials and labor costs were described as in the ABC condition, but overhead costs were combined and not explicitly described. Thus, the two cost system conditions varied the amount of detailed information contained in the official cost report which could be shared between negotiators. Regardless of the report format, sharing it revealed the giver's payoff resulting from the standard sales arrangement. In addition, if an ABC format was shared, the receiver could calculate the giver's payoffs to any agreement. The potential advantage to sharing cost reports is the discovery of mutually beneficial changes to the standard casing. As shown in Table 1, the total costs incurred across the two firms could be reduced by $40 (15%) if the negotiators agreed on the optimal combination of casing characteristics. Both negotiators could verbally communicate any information they wished, however, they were informed that only information contained in the cost reports could be taken as credible.

The primary measures taken in the study were whether subjects chose to share their cost reports and the optimality of agreements reached. Also measured were the efficiency of the negotiation, the level of cooperation felt between the negotiators, and the resulting satisfaction with outcomes.

Experimental Manipulations

One of the two primary experimental manipulations is the presence or absence of an external competitive threat. This is manipulated through both the payoffs from the

standard sales arrangement and by differences in the description of market conditions given to subjects prior to negotiations. In the absence of an external threat, profits accrue to both parties if they adopt the standard sales arrangement. In the presence of an external threat, losses accrue to both parties if they adopt this agreement. Table 1 and Figure 2 contain the profits (losses) of each party under the standard sales agreement given the presence or absence of the external threat. The descriptions of market conditions given to subjects under the alternatives are contained in Appendices B and C.

The second of the two experimental manipulations is the ability of negotiators to share more versus less detailed cost information with their partners. This manipulation was accomplished via the format of each parties' official cost report. The ABC format contains detailed information concerning the costs and drivers of materials, labor and overhead as shown in Appendices H and J. The STC format, shown in Appendices I and K, presents the cost drivers and related costs for only labor and materials, while leaving overhead as an allocated (per unit), lump-sum cost. Thus, parties who choose to share an ABC report reveal all information regarding production or usage costs. In contrast, those who share an STC report can retain specific information regarding overhead costs and drivers. It is important to note that under all experimental conditions, buyers and sellers knew all of their own costs and drivers and used the profit calculation sheets shown in Appendices F and G to calculate their profits/losses from alternative proposals.

As part of the cost report manipulation, subjects in the ABC (STC) condition were told that sharing their cost report was a riskier (less risky) option relative to sharing a report that contains partial (full) information (see Appendices B and C). Subjects were informed that greater risk is associated with a greater range of possible payoffs. Table 2

shows an example of how the range of payoffs could vary depending on more detailed (ABC) or less detailed (STC) information is shared. Take for example the casing seller under the no threat/STC condition. If she chose to share her cost report, one possible "best" outcome would be if she could convince the buyer to agree to the cost minimizing choices for her labor and materials costs (i.e. tin base, red blocks, and unassembled casings). If overhead costs remained unchanged (i.e. $65) her total costs could be reduced to $80 yielding a profit of $65, assuming the standard casing selling price of $145. In contrast, a possible "worst" outcome would be if the buyer forced her to accept the cost maximizing options for labor and materials (i.e. steel base, blue blocks, and fully assembled casings). Again, assuming overhead costs remained unchanged at $65, her total costs could increase to $180, yielding a loss of ($35) if the selling price were $145. Thus, the range of payoffs to sharing an STC report under this example would be ($35) to $65.

A similar logic can be applied to casing sellers under the no threat/ABC condition. In this case, the "best" outcome would involve an agreement that minimizes all of the seller's costs, including overhead. Under such an agreement, the seller's total costs could be reduced to $30, yielding a profit of $115 assuming the standard selling price of $145. The "worst" outcome would be an agreement that maximized all of the seller's costs resulting in total costs of $230. This agreement would yield the seller a loss of ($85) given the standard selling price of $145. Thus, the range of possible payoffs to sharing an ABC report is ($85) to $115, which is larger than the range of sharing an STC report.

A key aspect of the environment is that the negotiable casing features involve conflicting preferences, but only one cost-minimizing combination. For example, the casing producer prefers that the base be made of tin, while the casing buyer prefers that the base be make of steel. However, total costs across both buyer and seller are minimized if they agree on a steel base.

Overall, costs can be reduced by approximately 15% ($40) if negotiators can agree to various changes to the standard sales arrangement. The optimal agreement involves casings made with steel bases and large red blocks that are shipped to the buyer unassembled, double-bagged, and in three weeks from the date of agreement. Total costs of the standard sales arrangement equal $260, while the costs of the optimal agreement equal $220.

Experimental Procedures

To begin the experiment, subjects were randomly assigned to the role of either buyer or seller and asked to sign the consent form shown in Appendix A. Buyers and sellers were then separated and given instructions according to the scripts contained in Appendices B and C. After these instructions, subjects completed the "pre-questionnaire" shown in Appendix M to measure their perceptions of the experimental manipulations (threat and report format) and the riskiness of sharing their cost report.

Following this initial instruction period, all subjects were brought together and shown a scripted demonstration of a possible negotiation (see Appendices D and E). The purpose of the demonstration was to ensure that subjects understood how to use the proposal form shown in Appendix L and how to go about making offers and counter-offers. Once the demonstration was completed, subjects were taken to separate rooms to

negotiate. Once an agreement was reached, the experimenter was notified to verify the conditions of the agreement and the resulting profits accruing to each party.

To conclude the experiment, subjects completed the exit questionnaire shown in Appendix N. The questions measure factors such as subjects' attitudes toward the other negotiator and satisfaction with outcomes. To ensure that subjects could not "lose" money overall, they received an initial endowment of dollars at the beginning of the experiment ($7 under the no threat condition and $9 under the threat condition). Depending on their performance in the negotiation, subjects could increase or decrease this pool of dollars. The amount of money that subjects received (or were required to "pay" the experimenter) was equal to 7% of the profits or losses earned in the negotiation. The initial dollar amounts were calculated such that the total wealth of participants was approximately equal in both the threat and no threat conditions, taking into account the profit or loss from the standard agreement. As noted in Appendices B and C, subjects were informed that it was likely that their outcomes would be near the standard agreement if they did not share their cost reports. Thus, subjects in the threat condition would be facing a choice between not sharing their report and earning approximately $8 ($9 - .07($15)) and sharing their report and facing the potential gains and losses noted in Table 2. Similarly, subjects in the no threat condition would be facing a choice between not sharing their report and earning approximately $8 ($7 + .07($15) and sharing their report and facing the risky outcomes. Thus, subjects in both the threat (loss) and no threat (gain) conditions are choosing between $8 with relative certainty (by not sharing) and an uncertain amount (by sharing). Based on expected utility theory, the choice of whether to share or not should be independent of the threat/no threat condition, since the absolute

wealth associated with the certain outcome is approximately the same in both cases. The next section provides an example of how such a choice would be evaluated differently based on prospect theory.

Hypothetical Valuation of Experimental Prospects

As an example[8] of the predictions made by Hypotheses 1 and 2 as applied to the current experimental context, consider a hypothetical individual whose value function, v(x), is described by the following:

$$v(x) = x^{1/4} \quad \text{for } x \geq 0 \qquad \text{Equation 1}$$

$$v(x) = x^{1/3} \quad \text{for } x < 0$$

Where x is a change in wealth relative to a given reference point.

Figure 3 contains a simplified graph of the above value function. Consistent with prospect theory, the function has the following key properties:

i) it is concave with respect to gains ($v''(x) < 0$, for $x > 0$).

ii) it is convex with respect to losses ($v''(x) > 0$, for $x < 0$).

iii) it is steeper for losses than for gains ($v'(x) < v'(-x)$).

Assume also that the individual has a probability weighting function, $\pi(p)$, defined over the domain of objective probability, p, as follows:

$$\pi(p) = .1 + .9(p^2) \quad \text{for } 0 < p < 1 \qquad \text{Equation 2}$$

$$\pi(p) = 0 \text{ for } p = 0$$

$$\pi(p) = 1 \text{ for } p = 1$$

[8] The hypothetical value and probability weighting functions are taken (in part) from Newman (1980).

The above weighting function satisfies the properties that very small probabilities will be overweighted and moderate and large probabilities will be underweighted.

The value of a regular[9] prospect can be calculated by combining the value and probability weighting functions as follows (Kahneman and Tversky, 1979):

$$V(x_1, p_1; x_2, p_2) = \pi(p_1)v(x_1) + \pi(p_2)v(x_2) \qquad \text{Equation 3}$$

Where: x_1 and x_2 represent changes in wealth that will occur with probabilities p_1 and p_2, respectively and either $x_1 \leq 0 \leq x_2$, or $x_1 \geq 0 \geq x_2$, or $p_1 + p_2 < 1$.

Recall that at the start of the experiment subjects are informed that their firms' are experiencing either profits or losses based on the absence or presence of a competitive threat (see Appendices B and C). In the presence of the threat, the standard agreement results in a loss of $15; in its absence, the standard agreement results in a profit of $15. Subjects are informed that if they don't share their cost information in the upcoming negotiation, the outcome is likely to be near the standard agreement. Thus, a subject in the threat condition is faced with earning a loss of $15 with relative certainty if they choose to not share their cost information. A subject in the no-threat condition is faced with earning a profit of $15 with relative certainty if they choose not to share their cost information. As shown in Table 3, a subject with the value function described in equation 1 would value a certain gain of $15 at 1.97 and a certain loss of $15 at -2.47.

Recall from Table 2, that the range of possible gains and losses to sharing either cost report is symmetric around the profit or loss from the standard agreement, regardless

[9] Kahneman and Tversky (1979) define a prospect as regular "if it is neither strictly positive nor strictly negative" (p. 276) meaning that either $x_1 \leq 0 \leq x_2$, or $x_1 \geq 0 \geq x_2$, or $p_1 + p_2 < 1$.

of the threat/no threat condition. For example, if an STC report is shared, the most favorable outcome results in a $50 gain relative to the standard agreement and the least favorable outcome results in a $50 loss. The range associated with sharing an ABC report is twice as large; the most favorable outcome results in a $100 gain relative to the standard agreement and the least favorable outcome results in a $100 loss.

For simplicity, assume that the probability of the best and worst outcomes are considered equally likely so that p = .5 in all cases. From equation 2, this moderate value of p yields a probability weight equal to .325[10]. Applying Equation 3 yields a value of -.33 to the prospect of sharing an STC report and a value of -.48 to the prospect of sharing an ABC report, as shown in Table 3. The example supports the prediction of Hypothesis 1 that under the threat condition, the value to sharing either cost report is greater than not sharing. Similarly, the value to not sharing either cost report is greater under the no threat condition than sharing.

The example also supports the prediction of Hypothesis 2. Under either threat condition, a higher (less negative) value is placed on sharing an STC report than an ABC report. The following chapter presents the results of the experiment.

[10] For moderate values of p, the weighting function will exhibit subcertainty such that $\pi(p) + \pi(1-p) < 1$ (Kahneman and Tversky,1979).

CHAPTER 5

EXPERIMENTAL RESULTS AND DISCUSSION

The experiment was conducted on 53 negotiating pairs, consisting primarily of MBA, masters and upper division undergraduate students enrolled at Michigan State University. Each of the several experimental sessions took approximately 60 to 75 minutes. Subjects were compensated for participating in the experiment based on their performance and the average subject earned approximately $12.30.

Hypothesis 1

Hypothesis 1 predicted that the proportion of negotiating pairs that chose to share their official cost report would be higher for the group facing losses (as a result of a competitive threat) than for the group facing profitable conditions. Table 4 Panel A shows the percentage of pairs that chose to share their cost reports within the four experimental conditions. Of the 26 pairs randomly assigned to the competitive threat condition, 19 (73%) chose to share their reports. In contrast, of the 27 pairs assigned to the profitable, no threat condition, only 10 (37%) chose to share. It is interesting to note that of the pairs who chose to share, all involved a mutual sharing of reports. This result is consistent with Thompson and Hastie (1990) who also noted a reciprocity of information sharing within a bilateral bargaining experiment with integrative potential.

Table 4 Panel B presents the ANOVA results testing the significance of differences in the percentage of pairs that shared cost reports across the experimental conditions. The main effect of the threat/no threat condition was significant, yielding an F-statistic of 8.80 with a significance level of .005. This result, combined with the lack of a significant interaction between the threat and cost report format conditions provide

support for Hypothesis 1. The prospect of losses resulted in a significantly higher percentage of pairs sharing their cost reports than did the prospect of profits.

Hypotheses 2

Hypothesis 2 predicted that the proportion of pairs that shared their cost reports would be higher for the group with the option to share a less detailed (STC) cost report than for the group with the option to share a more detailed (ABC) report. Panel A of Table 4 shows that of the 25 pairs with the option to share an STC report, 18 (72%) chose to share their reports. Moreover, only 11 (39%) of the 28 pairs with the option to share an ABC report chose to share. The ANOVA results shown in Panel B of Table 4 reveal that this difference was significant (F-statistic: 7.29; p-value: .009). As with Hypothesis 1, this significant main effect for cost report format, combined with a lack of a significant interaction term, yielded support for Hypothesis 2.

Hypothesis 3

Hypothesis 3 predicts that the effects of the threat condition and report type will combine in an additive manner such that negotiators facing losses and having STC reports share those reports with the greatest frequency, while negotiators facing profits and having ABC reports share with the lowest frequency. Panel A of Table 4 reveals results consistent with this prediction. The highest incidence of sharing occurred under the STC/threat condition where 11 of the 12 pairs (92%) chose to share their reports. Under the ABC/no threat condition, only 3 of the 14 pairs (21%) chose to share.

To test the significance of Hypothesis 3, a contrast coded model was applied. Contrast coding is a method used to test the significance of a specific pattern of means among a set of experimental conditions (Rosenthal and Rosnow 1985, Buckless and

Ravenscroft 1990). By specifying the pattern of means, a more powerful test is created which uses only one degree of freedom[11]. To apply a contrast model, the set of experimental means is weighted by a corresponding set of contrast codes that matches the mean pattern to be tested. The coding must be chosen such that the set adds up to zero. For Hypothesis 3 it is predicted that the mean in the threat/STC condition is the highest, the mean in the no threat/ABC condition is the lowest, and the remaining means fall in the middle of these extremes. Thus, the following contrast codes (in parentheses) were applied[12]:

(1) Threat/STC; (-1) No Threat/ABC; (0) Threat/ABC; (0) No Threat/STC.

The results of testing the model are shown at the bottom of Panel B in Table 4 and provide strong support for Hypothesis 3 (F-statistic, 16.38; p-value < .001)[13].

To test the relative significance of a particular contrast model compared to other possible models, Rosenthal and Rosnow (1985) suggest applying the "net benefit test". The purpose of the net benefit test is to compare the proportion of variance accounted for by the model with the proportion of variance expected from an average, or randomly chosen contrast model. The difference between these two variance proportions is considered the "net benefit" of using the specific contrast model. The proportion of

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[11] The application of contrast coding represents a more powerful test because it tests for a specific ordering among a set of means. This is in contrast to "omnibus" F-tests that test for *any* differences among a set of means, regardless of order.

[12] Other sets of contrast weights that follow the basic pattern can also be used, as long as they sum to zero (e.g. 2, -2, 0, 0). However, the contrast weights applied (1, -1, 0, 0) provide a conservative test.

[13] The total explained sum of squares, degrees of freedom, and residual mean square from the standard ANOVA contained in Panel B of Table 4 are used to calculate the model sum of squares and F-statistic. Exact calculations can be found in Rosenthal and Rosnow, 1985.

variance accounted for by a given contrast model is equal to the squared correlation between the contrast weights and the related cell means (r^2). The proportion of variance expected from a random contrast is simply calculated as the inverse of the degrees of freedom (1/df) associated with the total explained sum of squares in the standard ANOVA. For Hypothesis 3, the squared correlation between the chosen contrast weights and the cell means was equal to .998. A random contrast applied to the current study would be expected to account for 1/3 or .333 of the variance. Thus, the net benefit of the applied contrast is equal to .998 - .333, or .665.

The net benefit calculated above can then be compared to the maximum possible net benefit given a particular experimental design. For the current 2 x 2 design, the maximum net benefit is calculated as (df - 1)/df, or 2/3. Thus, the obtained net benefit of .665 is over 99% of the maximum possible net benefit of .667. This suggests that there is little chance of another contrast model (with a different mean pattern) performing as well or better than the chosen model. To test the significance of the net benefit resulting from a contrast model an F-statistic can also be calculated as $r^2(df - 1)/(1 - r^2)$, which is distributed as F(1, df - 1) (Rosenthal and Rosnow 1985, p. 88). The F-statistic related to the net benefit of the current contrast model is 998, which is significant (p-value = .001).

In summary, the results provide considerable support for Hypothesis 3. The applied contrast model accounts for a significant proportion of the obtained variance in the standard ANOVA. In addition, the model accounts for a significant proportion of variance as compared to other possible models.

Hypotheses 4a, 4b, and 4c

Hypothesis 4a predicted that negotiating pairs that shared their cost reports would reach agreements that were closer to the optimal agreement than would pairs that didn't share. Table 5 shows the average percentage of the maximum possible cost reduction, relative to the standard agreement, that pairs obtained via their agreements. Recall that the standard agreement resulted in total costs of $260 across both negotiators. The optimal agreement would result in total costs of $220, so the maximum possible cost reduction is $40. The percentages listed in Table 5 are the obtained cost reduction divided by the $40 maximum. Thus, if a pair reached the optimal agreement they would be at 100% of optimal, whereas a pair that agreed to the standard arrangement would be at 0% of optimal.

Panel A of Table 5 shows that on average, pairs that did not share cost reports reached agreements that were only 33% of optimal. In contrast, Panel B of Table 5 shows that pairs that shared cost reports reached agreements that were 82% of optimal. The ANOVA results presented in Panel C of Table 5 provide support for Hypothesis 4a by revealing a significant main effect for pairs that shared vs. pairs that didn't (F-statistic = 12.9; p-value = .001) and a lack of significant interaction effects.

Hypothesis 4b predicted that pairs that shared more detailed (ABC) cost information would reach agreements that were closer to the optimal than pairs that shared less detailed (STC) cost information. The mean optimality levels contained in Panel B of Table 5 are consistent with this prediction. On average, pairs that shared ABC reports reached agreements that were 92% of optimal, while pairs that shared STC reports reached agreements that were only 76% of optimal. Also consistent with the prediction is

the reduction in the standard deviation of agreements among pairs that shared ABC information compared to pairs that shared STC information. Although the optimality levels are in the predicted direction, a t-test revealed the difference to be insignificant (t-statistic = 1.41; p-value = .09 (1-tailed)). However, given that the test was performed on a substantially reduced sample size (n = 27), the failure may be due to the reduced power of the test[14]. It is interesting to note that of the 11 pairs that shared ABC reports, 10 (91%) reached the optimal agreement. In contrast, only 10 out of 18 pairs (56%) that shared STC reports reached the optimal agreement.

Hypothesis 4c predicted that there would be no significant differences in optimality levels across the experimental conditions for pairs that did not share cost reports. The mean optimality levels for three of the four experimental conditions shown in Panel A of Table 5 are consistent with this prediction. The condition that produced a noticeably different optimality level was the ABC/No Threat combination. Pairs in this cell reached agreements that were only 10% of optimal, while pairs in the other cells reached agreements that were roughly 52% of optimal. However, an ANOVA revealed that there were no significant main effects or interactions for the experimental conditions, providing support for Hypothesis 4c[15]. Again, this result should be interpreted cautiously given the reduced sample size (n=24).

A contrast coded model was employed to test the combined predictions of H4a, H4b and H4c. As noted in the test of Hypothesis 3, such a model has the advantage of

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[14] The power of the test of H4b was estimated at 25% using the Pearson-Hartley Power Charts contained in Keppel (1991, p. 509-518).

using the entire sample size to test for a specific predicted pattern of means across all eight possible combinations of sharing, threat, and cost report format. The following contrast codes (in parentheses) were applied to the optimality levels shown in Panels A and B of Table 5:

(-2) Did not share/ABC/Threat; (3) Shared/ABC/Threat

(-2) Did not share/ABC/No Threat; (3) Shared/ABC/No Threat

(-2) Did not share/STC/Threat; (1) Shared/STC/Threat

(-2) Did not share/STC/No Threat; (1) Shared/STC/No Threat

The results of testing the contrast model are shown at the bottom of Panel C of Table 5. The model was highly significant (F-statistic = 13.8; p-value = .001), providing overall support for the combined predictions of H4a, H4b, and H4c. In addition, the net benefit of the contrast model was calculated as the difference between the proportion of variance accounted for by the model (.731) and the expected proportion of variance for an average, or random model, .143). The net benefit was then compared to the maximum possible net benefit of .86. The net benefit from the applied model represents 68.4% of the maximum possible net benefit. The associated F-test indicates that this proportion is significant (F-statistic = 16.3, p-value = .007).

Hypotheses 5a, 5b, and 5c

In addition to leading to optimal agreements, Hypothesis 5a predicted that negotiators that shared their cost reports would reach near optimal agreements in less

[15] A contrast coded model designed to test for a significantly lower optimality level within the ABC/No Threat cell (among only pairs that did not share cost reports) was also insignificant.

time/with fewer proposals than pairs that did not share. Likewise, Hypothesis 5b predicted that pairs that shared more detailed (ABC) information would require less time/fewer proposals to reach near optimal agreements than pairs that shared less detailed (STC) information. In the absence of sharing, no differences in the amount of time or number of proposals were predicted in Hypothesis 5c. Table 6 contains the average number of minutes necessary to reach near optimal agreements, while Table 7 contains the average number of proposals. Near optimal agreements were defined as those that achieved 50% or more of the total available cost savings, relative to the standard agreement. Only 34 of the 53 pairs met this standard.

Contrary to Hypotheses 5a, Table 6 and Table 7 show little difference between pairs that shared and pairs that did not in the number of minutes or number of proposals needed to reach near optimal agreements. Table 6 shows that pairs that did not share took an average of 25.5 minutes, while pairs that did share took 24.4 minutes. An ANOVA revealed no significant effect for sharing (F-statistic=.20, p-value=.66), report type (F-statistic=.18, p-value=.68) or threat condition (F-statistic = 1.23, p-value=.27) on the number of minutes needed to reach near optimal agreements. Similarly, an ANOVA run on only pairs that shared reports failed to find a significant effect for report type (F-statistic = 1.13, p-value = .30), thus there is no evidence to support either Hypothesis 5a or 5b. Although an ANOVA run on only pairs that did not share showed no significant differences in time needed to reach across the experimental conditions, the support for Hypothesis 5c is meaningless in the absence of support for Hypotheses 5a and 5b. To test

the combined predictions of Hypotheses 5a, 5b and 5c, a contrast coded model specified as follows was applied:

(2) Did not share/ABC/Threat;	(-3) Shared/ABC/Threat
(2) Did not share/ABC/No Threat;	(-3) Shared/ABC/No Threat
(2) Did not share/STC/Threat;	(-1) Shared/STC/Threat
(2) Did not share/STC/No Threat;	(-1) Shared/STC/No Threat

Even with the increased power of using the contrast coded model, the predictions failed to be supported. The model yielded an F-statistic of only .65 (p-value = .42).

Table 7 shows that pairs that did not share reports took an average of 3.6 proposals to reach near optimal agreements, while pairs that shared took only 3.0 proposals. Although in the direction predicted by Hypothesis 5a, an ANOVA again revealed no significant effect for sharing (F-statistic = 1.0, p-value=.32). An ANOVA run on only pairs that shared found no support for the prediction of Hypothesis 5b that sharing ABC reports would result in fewer proposals needed than sharing STC reports (F-statistic = 1.22, p-value = .28). As in the case of minutes needed, support for Hypothesis 5c is moot. As a final test, a contrast coded model similar to that applied to the number of minutes was used to test the combined predictions of Hypotheses 5a, 5b and 5c. The contrast model was also insignificant (F-statistic = 2.2, p-value = .14).

One explanation for the lack of support for Hypotheses 5a and 5b is that the experiment did not measure at what time during the negotiation pairs actually exchanged cost reports. If pairs exchanged early in the negotiation, they may have been able to use the information to reduce the time and/or number of proposals necessary to reach agreement. However, if pairs waited until late in the negotiation, they may not have been

able to significantly reduce these measures due to the 30 minute time constraint. Another explanation may be that analyzing the information contained in the cost reports and "figuring out" the optimal casing configuration took a significant amount of time itself. Thus, minutes that would have been spent "haggling" had the reports not been shared were instead spent on problem solving once the reports were shared. However, once reports were shared, the exchange of proposals may have been suspended until the partners finished analyzing the cost information. This combined scenario may explain why the number of proposals came closer to matching the predictions than did the number of minutes.

Hypothesis 6 - Perceived Cooperation

Hypothesis 6 predicts that pairs that share their cost reports exhibit a higher perceived level of cooperation than pairs that don't share. Table 8 shows the average summed responses per pair to three exit questionnaire items pertaining to cooperation and trust. The overall means shown in Panels A and B are consistent with the prediction - pairs that shared had a mean score of 17.7 while those that didn't had a mean of only 12.8. Panel C of Table 8 shows the difference to be significant, providing support for Hypothesis 6a (F-statistic = 32.5, p-value < .001). In addition, it is interesting to note that there was also a significant main effect for the threat condition. Pairs facing the threat had a substantially lower perception of the level of cooperation that occurred during the negotiation than pairs that faced no threat (F-statistic=6.86, p-value=.01), regardless of whether reports were shared or not.

Hypothesis 7 - Outcome Satisfaction

Hypothesis 7 predicted that pairs that shared cost reports would be more satisfied with the outcome of the negotiation than pairs that did not share. Table 9 shows the average summed responses per pair to three exit questions related to outcome satisfaction. An examination of the overall means support the hypotheses. Pairs that shared reports had a mean satisfaction score of 16.5, while pairs that didn't share had a mean score of 15.0. The ANOVA results presented in Panel C of Table 9 confirm that the effect was significant (F-statistic=9.28, p-value=.004). In addition, there were also significant main effects for report type (F-statistic=5.73, p-value=.021) and threat condition (F-statistic=4.38, p-value=.042). Thus, pairs that faced the threat condition were relatively less satisfied with their outcomes than pairs that faced no threat, while pairs with ABC reports were relatively more satisfied with their outcomes than pairs with STC reports. The lower level of earnings to be made strictly from the negotiation in the threat condition would explain the somewhat lower level of satisfaction across both report type and sharing conditions. Subjects would likely be happier earning a greater absolute amount on the negotiation than less. The effect for report type is likely be driven by the pairs that shared reports. Given the previous support for Hypotheses 4a, 4b and 4c, it is likely that pairs that shared ABC reports were able to garner more of the available profits, by getting closer to the optimal agreement, than pairs that shared STC reports. An ANOVA run on only pairs that shared reports found a marginally significant result for report type (F-statistic=3.67, p-value=.067), while an ANOVA on pairs that didn't share found relatively less support for report type (F-statistic=2.6, p-value=.12).

Manipulation Checks

At the beginning of each experimental session, buyers and sellers were given separate training according to the scripts contained in Appendices A and B. Immediately following this training, all subjects were asked to complete the Pre-questionnaire shown in Appendix M. This questionnaire were designed to assess the effectiveness of the script in making subjects aware of the experimental manipulations and of the risks associated with sharing their cost reports. Panels A and B of Table 10 show that subjects in all conditions knew how to calculate their own costs and understood that they had the option of sharing their official cost report during the negotiation. ANOVA results indicated no significant differences across experimental conditions for either of these two items.

Panel C of Table 10 shows the average summed responses within pairs to two questions pertaining to the presence or absence of the competitive threat (i.e. losses). The mean scores are in the predicted direction and an ANOVA revealed a highly significant difference in scores between the threat and no threat conditions. Also, there was no significant difference in scores across cost report types and no significant interaction effect. Overall, the threat/no threat manipulation appears to have been successful.

Panel D of Table 10 contains a similar analysis of the official cost report manipulation. Based on the average scores for the two items measuring this condition, subjects correctly perceived whether they had an ABC or STC report to share. The ANOVA revealed a significant effect for cost report type along with no significant effect for threat condition, or for the interaction of report type and threat condition.

Panels E and F of Table 10 present the average scores for items pertaining to the possible consequences and risk of sharing official cost reports. Appendices B and C

show that the training scripts for all conditions informed subjects that if they shared their report, the other manager "could use this information to obtain a better deal for himself, thus, reducing your profits." Panel E shows the average scores related to the item designed to assess whether subjects realized that sharing their report (regardless of type or threat condition) could result in negative consequences. The average scores in all conditions are high, indicating that subjects agreed that there could be negative consequences to sharing their reports. Moreover, an ANOVA revealed no significant differences in responses across the experimental conditions.

The item analyzed in Panel F of Table 10 was designed to measure subjects perception of the degree of risk to sharing their cost reports. Unlike the item in Panel E, the related sections from the scripts in Appendices B and C differed across report type. Subjects with ABC reports were instructed that it was relatively more risky to share their full information reports than to share reports with partial information. Subjects with STC reports were instructed that sharing their reports was moderately risky compared to not sharing, or sharing a report that revealed full information. Thus, when asked how risky they felt it would be to share their cost reports, subjects in the ABC condition should respond with higher scores than subjects in the STC condition. The results in Panel F support this prediction, and an ANOVA revealed that there was indeed a significant effect for report type, but no significant effect for threat condition or for the interaction between report type and threat condition.

Control Variables

Several possible confounding variables were measured in the exit questionnaire shown in Appendix N. Gender, degree program, grade point average, national origin, and

whether participants had ever held a job involving negotiation were all assessed with direct questions. In addition, a measure of risk aversion was obtained by having subjects make a series of choices between a sure "win" of a fixed amount and various "gambles."

As shown in Panels A through F of Table 11, an analysis of these variables revealed no significant differences across the experimental conditions for grade point average, national origin, or risk aversion. There were however, significantly more females within the ABC report condition, as shown in Panel G of Table 11. Using gender as a separate factor in testing the hypotheses failed to result in any significant effects for gender and did not materially change the main results reported in the analysis section. Likewise, as noted in Panel H, there were significantly more MBA students within the STC report condition. However, using MBA status as a covariate in the analyses did not result in any significant effects and the results for the hypotheses tests were essentially unchanged. Finally, there were more subjects who reported that they had held a job involving negotiation within the no threat condition (see Panel I of Table 11). Using this factor as a covariate in the analyses again failed to find significance for this "factor" and the main results of the hypotheses tests were not significantly affected.

CHAPTER 6

LIMITATIONS, FUTURE AREAS OF RESEARCH AND CONCLUDING DISCUSSION

Limitations and Future Areas of Research

The experimental nature of the study results in several limitations. Only a limited number of factors could be examined concurrently. The impact of other factors, such as the relative power of the negotiators, the size of the transaction, past negotiation history, etc. warrants further investigation. In addition, the experimental setting is very simplified and further research is necessary to determine whether the results can be generalized to less definitive settings.

Another limitation of the study also presents a future research opportunity. Due to time constraints, the study only involved one negotiating round. An obvious extension is to perform the experiment for several rounds to determine if the results reported represent equilibrium behavior, or whether subsequent rounds would result in changing behaviors, perhaps toward the sharing of cost information. Although the behavior reported in the current study may not be equilibrium behavior, the results are still important because the purpose of the study was to investigate factors that can impact whether cost information is shared in a bargaining situation where the status quo has been not sharing the information. The results may indicate the relative timing of information sharing under different contexts.

In the current experiment, both buyers and sellers had the option to share the same type of cost report, either aggregated or disaggregated. In many situations, one firm may possess disaggregated cost information, while the other firm only has aggregated

information. An interesting question is how sharing behavior is affected when one party is unable to reciprocate in an equivalent manner.

Another factor that may impact the relative willingness of managers to share cost information is the relative complexity of the transaction. The task in the current study was relatively complex, involving six cost drivers with three different levels for each driver. There were also cost drivers that were more or less important to each negotiator. In addition, these drivers resulted in different degrees of cost for the other negotiator. For example, to the buyers, minimizing installation costs was important because each level of the cost driver (material used) meant a cost saving of $20. Other items were less important as each level of the cost driver resulted in lower cost reductions. To the seller, the cost related to the use of different materials was relatively unimportant, because different materials resulted in cost changes of only $10. Thus, without having exchanged any cost information, it would seem relatively easy for the pair to agree on the optimal choice (steel) since it saved the buyer a relatively large amount and cost the seller a relatively small amount. In contrast, without sharing cost information, it may be relatively harder for negotiators to agree on cost minimizing options where the differences between the buyer and seller costs are closer together. Thus an interesting hypotheses is whether more or less information sharing would be observed during the negotiation of components of greater complexity (i.e. more cost drivers) and with smaller possible incremental cost savings. Relatively less information sharing might be observed for simple components and for components where the cost saving options can be discovered easily through the negotiating process. In contrast, more information sharing

might be expected for complex components and for components where there are only small incremental cost saving opportunities possible.

Concluding Discussion

The objective of this study is to examine factors which influence a manager's decision to share credible cost information with an outside customer or supplier. Using the assumption that managers consider the sharing of such information to be risky, the study hypothesizes that they act in accordance with prospect theory during a bilateral negotiation. It is predicted that managers are more willing to share partial, aggregated information than complete, disaggregated information, and managers facing losses brought on by a competitive threat are more willing to share information than managers facing gains. The results support these predictions and indicate that information sharing leads to more integrative agreements and supports improved relations between buyers and suppliers.

The results of this study suggest that adverse conditions present an opportunity for firms to break out of traditional, competitive interactions with customers and suppliers. The presence of an external competitive threat induces greater information sharing and problem solving, with the result being the optimization of processes across a wider portion of the value chain.

The results also indicate that managers are relatively more willing to share cost reports that are more aggregated and less detailed in terms of costs and drivers. Thus, firms with highly refined cost systems may not realize all of the gains from buyer-supplier transactions due to the reluctance of managers to share the information necessary

for inter-firm cost minimization. For firms with such refined cost systems, efforts to encourage information sharing may be necessary, especially during profitable times.

The study contributes to the literature on the behavioral impacts of alternative cost systems by demonstrating that a reluctance to share more detailed information can result in less than optimal returns from implementing highly refined, disaggregated cost systems. The experiment also contributes to the study of prospect theory by demonstrating that its predictions can be applied in a negotiation context where the "risky" decision involves the sharing of cost information. To the study of integrative bargaining, it provides further evidence that the option to share credible information regarding preferences and payoffs with differing levels of detail has a significant impact on the optimality of agreements.

An underlying goal of this study is to bring attention to the role that management accounting information can play in the area of buyer-supplier relations. As the study shows, cost information can be used to optimize processes that span more than one firm's boundaries. The key is to induce managers to share this cost information so it can be used in a collaborative, problem solving manner to reduce the total costs of cross-firm processes.

This is a particularly interesting time for studying the field of buyer-supplier relations due to the changes that are occurring in how these relationships are viewed. Efforts to change from the traditional, competitive paradigm to one of cooperation is likely impacted by the inherently mixed-motive nature of buyers-supplier interactions. Being from separate firms, negotiating managers have a competitive motive to try to garner as large a share of any joint profit as possible. However, there is also a

cooperative element in that joint profits may be increased if the competitive element can be put aside in favor of collaboration and joint problem solving. The study of factors that affect which of these two motivations takes precedence in managerial decision making during buyer-supplier interactions represents a exciting area of future research.

FIGURES

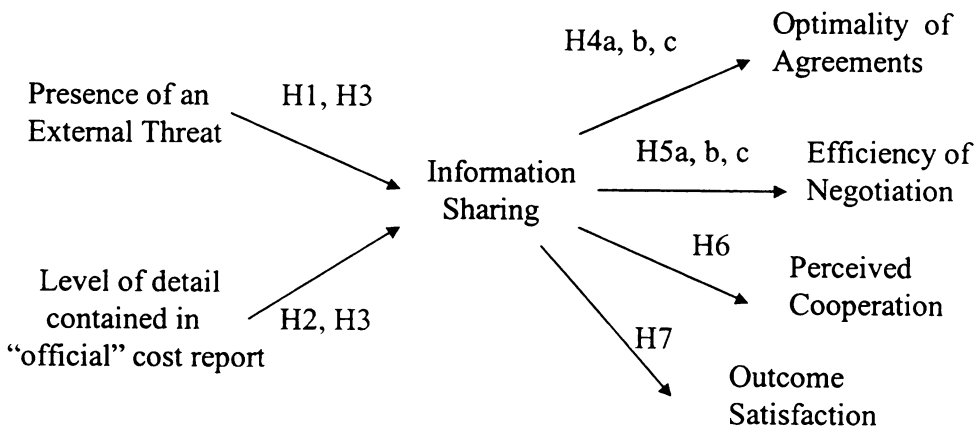
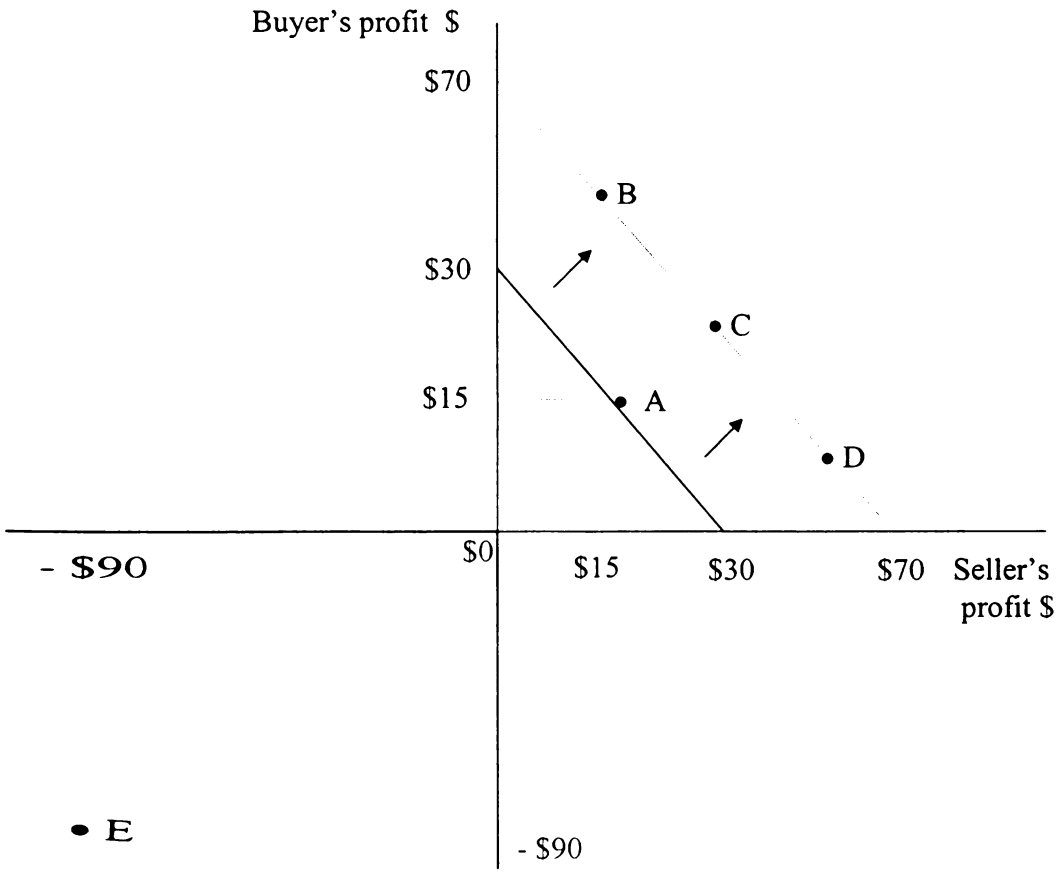


Figure 1

Overview of Hypotheses

Panel A: No Threat Condition



- Point A represents the profits accruing to the buyer, $15, and seller, $15, if they agree to exchange a standard casing at the standard price.

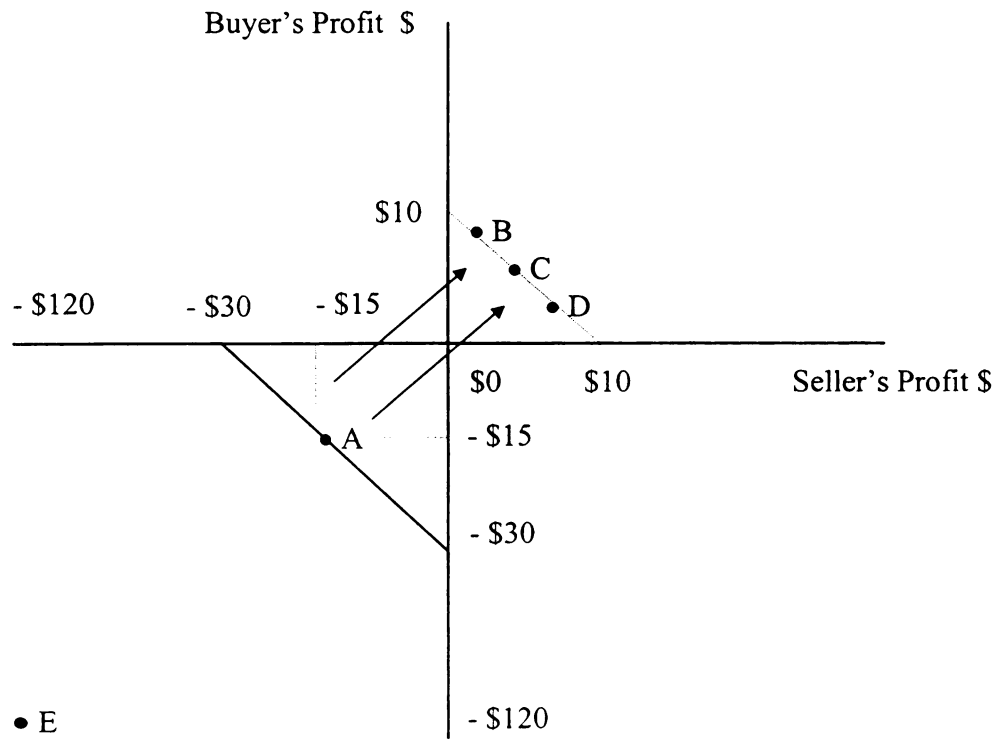
- Points B, C, and D represent possible profit splits if they agree to exchange a casing with the optimal combination of characteristics.

- Point E represents the no agreement payoffs to each party, - $90.

Figure 2

Illustration of Integrative Potential

Panel B: Threat Condition

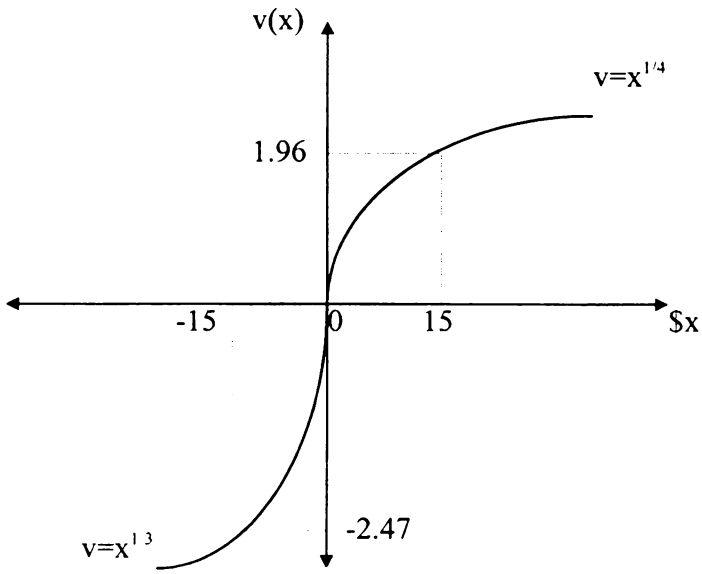


• Point A represents the losses accruing to the buyer, ($15), and seller, ($15), if they agree to exchange a standard casing at the standard price.

• Points B, C, and D represent possible profit splits if they agree to exchange a casing with the optimal combination of characteristics.

• Point E represents the no agreement losses to each party, ($120).

Figure 2 (cont'd)



Where:

x is defined as changes in wealth (in dollars), relative to a given reference point.

v is defined as the value placed on a change in wealth, x; and

$v(x) = x^{1/4}$ for $x \geq 0$

$v(x) = x^{1/3}$ for $x < 0$

Figure 3

Hypothetical Value Function

TABLES

Table 1

Standard Casing Profit Calculations

Panel A: No External Competitive Threat

Beta's Final Product selling price = $290
Alpha's Standard Casing selling price = $145

Calculation of total available surplus:

Standard Casing	
Final Product selling price	$290
Buyer's cost of using the standard casing	(130)
Seller's cost of producing the standard casing	(130)
Total surplus available	$30

Optimal Casing	
Final Product selling price	$290
Buyer's cost of using the optimal casing	(110)
Seller's cost of producing the optimal casing	(110)
Total surplus available	$70

Calculation of individual profits under the standard casing sales arrangement:

Buyer		Seller	
Revenues	$290	Revenues	$145
Casing cost	(145)	Production cost	(130)
Production cost	(130)	Seller profit	$15
Buyer profit	$15		

No agreement payoffs:

Seller: $90 loss

Buyer: $90 loss

Table 1 (cont'd)

Panel B: External Competitive Threat Present

Beta's Final Product selling price = $230
Alpha's Standard Casing selling price = $115

Calculation of total available surplus:

Standard Casing	
Final Product selling price	$230
Buyer's cost of using the standard casing	(130)
Seller's cost of producing the standard casing	(130)
Total surplus available	$(30)

Optimal Casing	
Final Product selling price	$230
Buyer's cost of using the optimal casing	(110)
Seller's cost of producing the optimal casing	(110)
Total surplus available	$10

Calculation of individual losses under the standard casing sales arrangement:

Buyer		Seller	
Revenues	$230	Revenues	$115
Casing cost	(115)	Production cost	(130)
Production cost	(130)	Seller profit	$(15)
Buyer profit	$(15)		

No agreement payoffs:

Seller: $120 loss

Buyer: $120 loss

Table 2

Possible Payoff Ranges from Cost Report Sharing*

No Threat		**Threat**	
	Range		Range
Seller		Seller	
STC	$(35) - $65	STC	($65) - $35
ABC	$(85) - $115	ABC	($115) - $85
Buyer		Buyer	
STC	$(35) - $65	STC	($65) - $35
ABC	$(85) - $115	ABC	($115) - $85

*Shows that the possible payoff ranges to negotiators are relatively greater when an ABC report is shared than when an STC report is shared. The ranges are calculated based on each negotiators best and worst outcome agreement given the type of report shared and the standard casing price of $115 (threat) or $145 (no threat).

Table 3

Hypothetical Valuation of Experimental Prospects

	Threat		No Threat	
	Share	Don't Share	Share	Don't Share
STC	-.33	-2.47	-.33	1.96
ABC	-.48	-2.47	-.48	1.96

Cells contain the calculated value, $V(x_1, p_1; x_2, p_2)$ of the associated prospect or outcome and is based on a hypothetical individual whose value, v(x) and probability weighting, $\pi(p)$ functions are as follows:

$v(x) = x^{1/4}$ for $x \geq 0$

$v(x) = x^{1/3}$ for $x < 0$

Where x is a change in wealth relative to a given reference point.

$\pi(p) = .1 + .9(p^2)$ for $0 < p < 1$

$\pi(p) = 0$ for $p = 0$

$\pi(p) = 1$ for $p = 1$

Where p = probability

and,

$V(x_1, p_1; x_2, p_2) = \pi(p_1)v(x_1) + \pi(p_2)v(x_2)$

Where: x_1 and x_2 represent changes in wealth that will occur with probabilities p_1 and p_2, respectively

Table 4

Proportion of Pairs that Shared Reports[1]

Panel A: Summary Statistics[2]

	Threat	No Threat	marginal means
ABC	57% [8/14] (.51) n=14	21% [3/14] (.43) n=14	39% [11/28] (.50) n=28
STC	92% [11/12] (.29) n=12	54% [7/13] (.52) n=13	72% [18/25] (.46) n=25
marginal means	73% [19/26] (.45) n=26	37% [10/27] (.49) n=27	

[1]Used to test H1, H2, and H3.
H1: The proportion of pairs that chose to share their cost reports is greater in the threat (loss) condition than in the no threat (gain) condition.
H2: The proportion of pairs that chose to share their cost reports is higher in the STC (less detailed) condition than in the ABC (more detailed) condition.
H3: The highest percentage of pairs sharing their cost reports will is in the threat/STC condition, while the lowest percentage is in the no threat/ABC condition.
[2]Cells contain the percentage of pairs that shared [number of pairs that shared/total pairs in condition], (standard deviation) and n=number of pairs per condition.

Table 4 (cont'd)

Panel B: ANOVA Results

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Report	1.48	1	1.48	7.29	.009
Threat	1.78	1	1.78	8.80	.005
Report x Threat	.001	1	.001	.01	.93
Explained	3.20	3	1.07	5.26	.003
Error	9.93	49	.20		
Total	13.13	52	.25		
Contrast Model	3.27	1	3.27	16.38	.000

Table 5

Optimality of Agreements[1]

Panel A: Pairs that DID NOT Share[2]

	Threat	No Threat	marginal means
ABC	46% (.34) n=6	10% (.30) n=11	23% (.35) n=17
STC	50% (.00) n=1	58% (.47) n=6	57% (.43) n=7
marginal means	46% (.31) n=7	27% (.43) n=17	Overall 33% (.40) n=24

[1]Used to test H4a, H4b and H4c.
H4a: Pairs that shared their cost reports will reach agreements that are closer to the optimal than pairs that did not share their cost reports.
H4b: Of the pairs that shared cost reports, those in the ABC (disaggregated) condition will reach agreements closer to the optimal than those in the STC (aggregated) condition.
H4c: Of the pairs that did not share cost reports, there will be no significant differences in the optimality level of agreements across either the report type or threat condition.
[2]Cells contain the average percentage of the maximum possible cost reduction (relative to the standard agreement) that pairs achieved, (standard deviation) and n = number of pairs per condition.

Table 5 (cont'd)

Panel B: Pairs that DID Share

	Threat	No Threat	marginal means
ABC	89% (.31) n=8	100% (.00) n=3	92% (.26) n=11
STC	69% (.40) n=11	86% (.28) n=7	76% (.36) n=18
marginal means	78% (.37) n=19	90% (.24) n=10	Overall 82% (.33) n=29

Panel C: ANOVA Results

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Share	1.53	1	1.53	12.90	.001
Report	.02	1	.02	.13	.717
Threat	.00	1	.00	.00	.999
Share x Report	.35	1	.35	2.97	.091
Share x Threat	.14	1	.14	1.19	.281
Report x Threat	.12	1	.12	.97	.329
Share x Report x Threat	.07	1	.07	.59	.446
Explained	4.57	7	.65	5.52	.000
Error	5.32	45	.12		
Total	9.90	52	.19		
Contrast Model	1.63	1	1.63	13.58	.001

Table 6

Minutes to Reach Near Optimal Agreement[1, 2]

Panel A: Pairs that DID NOT Share[3]

	Threat	No Threat	marginal means
ABC	30.0 (0.0) n=3	21.5 (4.9) n=2	26.6 (5.3) n=5
STC	25.0 (N.A.) n=1	24.3 (10.3) n=4	24.4 (8.9) n=5
marginal means	28.8 (2.5) n=4	23.3 (8.4) n=6	Overall 25.5 (7.0) n=10

[1]Near optimal agreements are those in which 50% or more of the available cost savings are achieved (relative to the standard agreement).
[2]Used to test Hypotheses 5a, 5b and 5c.
H5a: Pairs that shared their cost reports required less time to reach near optimal agreements than pairs that did not share their reports.
H5b: Of the pairs that shared cost reports, those that shared ABC reports required less time to reach near optimal agreements than pairs that shared STC reports.
H5c: For negotiating pairs that do not share cost reports, there will be no significant differences across either the report type or the presence or absence of a threat in the time necessary to reach near optimal agreements.
[3]Cells contain the average number of minutes needed to reach a near optimal agreement, (standard deviation) and n=number of pairs per condition.

Table 6 (cont'd)

Panel B: Pairs that DID Share

	Threat	No Threat	marginal means
ABC	23.6 (6.2) n=7	19.3 (2.1) n=3	22.3 (5.6) n=10
STC	27.1 (12.0) n=8	24.2 (8.6) n=6	25.9 (10.4) n=14
marginal means	25.5 (9.6) n=15	22.6 (7.3) n=9	Overall 24.4 (8.8) n=24

Panel C: ANOVA Results

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Share	15.06	1	15.06	.20	.659
Report	13.21	1	13.21	.18	.679
Threat	94.87	1	94.87	1.23	.272
Share x Report	39.68	1	39.68	.53	.475
Share x Threat	1.48	1	1.48	.02	.890
Report x Threat	28.60	1	28.60	.38	.543
Share x Report x Threat	14.68	1	14.68	.20	.663
Explained	249.72	7	35.67	.47	.845
Error	1961.34	26	75.44		
Total	2211.06	33	67.00		
Contrast Model	48.99	1	48.99	.65	.425

Table 7

Number of Proposals Needed to Reach Near Optimal Agreements[1, 2]

Panel A: Pairs that DID NOT Share[3]

	Threat	No Threat	marginal means
ABC	2.7 (1.5) n=3	3.5 (2.1) n=2	3.0 (1.6) n=5
STC	4.0 (N.A.) n=1	4.3 (1.7) n=4	4.2 (1.5) n=5
marginal means	3.0 (1.41) n=4	4.0 (1.7) n=6	Overall 3.6 (1.6) n=10

[1]Near optimal agreements are those in which 50% or more of the available cost savings are achieved (relative to the standard agreement).
[2]Used to test Hypotheses 5a, 5b and 5c.
H5a: Pairs that shared their cost reports required fewer proposals to reach near optimal agreements than pairs that did not share their reports.
H5b: Of the pairs that shared cost reports, those that shared ABC reports required fewer proposals to reach near optimal agreements than pairs that shared STC reports.
H5c: For negotiating pairs that do not share cost reports, there will be no significant differences across either the report type or the presence or absence of a threat in the number of proposals necessary to reach near optimal agreements.
[3]Cells contain the average number of proposals needed to reach a near optimal agreement, (standard deviation) and n=number of pairs per condition.

Table 7 (cont'd)

Panel B: Pairs that DID Share

	Threat	No Threat	marginal means
ABC	3.1 (2.7) n=7	1.3 (.56) n=3	2.6 (2.4) n=10
STC	3.5 (2.0) n=8	3.0 (1.7) n=6	3.3 (1.8) n=14
marginal means	3.3 (2.3) n=15	2.4 (1.6) n=9	Overall 3.0 (2.1) n=24

Panel C: ANOVA Results

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Share	4.2	1	4.2	1.02	.321
Report	5.92	1	5.92	1.46	.238
Threat	.53	1	.53	.13	.721
Share x Report	.00	1	.00	.00	.986
Share x Threat	4.04	1	4.04	.97	.328
Report x Threat	.19	1	.19	.05	.833
Share x Report x Threat	1.26	1	1.26	.31	.583
Explained	17.50	7	2.50	.62	.737
Error	105.44	26	4.06		
Total	122.94	33	3.73		
Contrast Model	9.08	1	9.08	2.24	.142

Table 8

Perceived Level of Cooperation[1,2]

Panel A: Pairs that DID NOT Share[3]

	Threat	No Threat	marginal means
ABC	10.5 (3.5) n=6	13.9 (2.9) n=11	12.7 (3.5) n=17
STC	7.5 (.00) n=1	13.8 (4.1) n=6	12.9 (4.5) n=7
marginal means	10.1 (3.4) n=7	13.9 (3.3) n=17	Overall 12.8 (3.7) n=24

[1]Average summed responses per pair to the following questions (Cronbach's Alpha = .77):

1. I think the other negotiator and I cooperated as a "team" to find the most cost effective way of making casings.
2. During the negotiation I felt like I was competing against the other negotiator (reverse scored).
3. Overall, I didn't really trust the other negotiator (reverse scored).

[2]Used to test H6: Negotiating pairs that share their cost reports will exhibit a higher perceived level of cooperation than pairs that did not share their cost reports.

[3]Cells contain the average level of cooperation as measured by the scale described above, (standard deviation), and n=number of pairs per condition.

Table 8 (cont'd)

Panel B: Pairs that DID Share

	Threat	No Threat	marginal means
ABC	18.2 (2.6) n=8	18.0 (1.5) n=3	18.1 (2.3) n=11
STC	16.5 (3.0) n=11	18.9 (3.2) n=7	17.4 (3.2) n=18
marginal means	17.2 (2.9) n=19	18.6 (2.8) n=10	Overall 17.7 (2.9) n=29

Panel C: ANOVA Results

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Share	315.69	1	315.69	32.52	.000
Report	7.04	1	7.04	.73	.399
Threat	66.54	1	66.54	6.86	.012
Share x Report	2.48	1	2.48	.26	.616
Share x Threat	27.42	1	27.42	2.83	.100
Report x Threat	13.90	1	13.90	1.43	.238
Share x Report x Threat	.09	1	.09	.01	.926
Explained	425.91	7	60.85	6.27	.000
Error	436.80	45	9.71		
Total	862.71	52	16.59		

Table 9

Satisfaction with Outcome[1,2]

Panel A: Pairs that DID NOT Share[3]

	Threat	No Threat	marginal means
ABC	14.9 (3.4) n=6	15.5 (2.4) n=11	15.3 (2.7) n=17
STC	10.5 (.00) n=1	15.0 (1.8) n=6	14.4 (2.4) n=7
marginal means	14.3 (3.5) n=7	15.4 (2.2) n=17	Overall 15.04 (2.6) n=24

[1]Average summed responses per pair to the following questions (Cronbach's Alpha = .62):

1. I am satisfied with the amount I earned on the negotiation.
2. I believe the arrangement we agreed upon was the most cost effective way to produce casings.
3. If I have to negotiate again, I would prefer to negotiate with the same person.

[2]Used to test H7: Negotiating pairs that share their cost reports will exhibit greater satisfaction with outcomes than pairs that did not share their cost reports.

[3]Cells contain the average level of satisfaction as measured by the scale described above, (standard deviation), n=number of pairs per condition.

Table 9 (cont'd)

Panel B: Pairs that DID Share

	Threat	No Threat	marginal means
ABC	17.3 (3.2) n=8	19.0 (2.3) n=3	17.7 (3.0) n=11
STC	15.2 (3.0) n=11	16.6 (2.1) n=7	15.7 (2.7) n=18
marginal means	16.1 (3.2) n=19	17.3 (2.4) n=10	Overall 16.5 (2.9) n=29

Panel C: ANOVA Results

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Share	68.51	1	68.51	9.28	.004
Report	42.28	1	42.28	5.73	.021
Threat	32.30	1	32.30	4.38	.042
Share x Report	.10	1	.10	.01	.907
Share x Threat	1.87	1	1.87	.25	.617
Report x Threat	5.82	1	5.82	.79	.379
Share x Report x Threat	8.46	1	8.46	1.15	.290
Explained	93.19	7	13.31	1.80	.110
Error	332.29	45	7.38		
Total	425.47	52	8.18		

Table 10

Manipulation Checks

All questions were measured on a 7 point Likert scale with 1 representing strongly disagree and 7 representing strongly agree.

Panel A: Ability to calculate costs. Expectation: high scores in all conditions.

Q: During the negotiation I can calculate all of my own costs.

	STC	ABC
Threat	6.3	6.4
No Threat	6.7	6.3

Overall mean: 6.4. No significant differences between conditions.

Panel B: Ability to share report. Expectation: high scores in all conditions.

Q: During the negotiation, I have the option of giving my official cost report to the other negotiator or keeping it to myself.

	STC	ABC
Threat	6.6	6.5
No Threat	6.9	6.7

Overall mean: 6.7. No significant differences between conditions.

Panel C: Understanding of threat/no threat condition (sum of the following 2 questions). **Expectation: significantly higher scores under the threat condition.**

Q: If the other negotiator and I agree to exchange a standard casing at the standard price, I will lose money.
Q: The industry in which the other negotiator and I operate in is currently facing strong competition which as driven prices below profitable levels.

	STC	ABC
Threat	12.8	12.3
No Threat	3.4	3.6

Threat Condition: overall mean = 11.9
No Threat Condition: overall mean = 3.1
Significantly higher scores in the threat condition (F-stat.=804.0, p-value < .001).

Table 10 (cont'd)

Panel D: Understanding of ABC/STC cost report format (sum of the following 2 questions). **Expectation: significantly higher scores under the ABC condition.**

Q: If I give my official cost report to the other negotiator, they will know what my labor and materials costs are (and what drives them) but NOT what drives my overhead costs (reverse scored).
Q: If I give my official cost report to the other negotiator, they will know what determines ALL of my costs and what those cost amounts are.

	STC	ABC
Threat	3.8	11.6
No Threat	2.8	12.1

STC Condition: overall mean = 3.3
ABC Condition: overall mean = 11.8
Significantly higher scores under the ABC condition (F-stat.=547.8, p-value<.001).

Panel E: Consequences of sharing. Expectation: high scores in all conditions.

Q: If I give my Official Cost Report to the other negotiator, they may be able to use the information to increase their own profits at my expense.

	STC	ABC
Threat	6.3	6.3
No Threat	5.8	6.3

Overall mean: 6.2. No significant differences between conditions.

Panel F: Perceived risk of sharing official cost report. Expectation: significantly higher scores under the ABC condition.

Q: Please rate how risky you feel it would be to share your Official Cost Report with the other negotiator (1=not risky at all; 7=very risky).

	STC	ABC
Threat	4.9	5.2
No Threat	4.3	5.5

STC Condition: overall mean = 4.6
ABC Condition: overall mean = 5.3
Significantly higher scores under the ABC condition (F-stat.=8.7, p-value = .005).

Table 11

ANOVA Results for Control Variables

Panel A: Grade Point Average

Source	Sum of Squares	Df	Mean Square	F-statistic	Significance of F
Report	.20	1	.20	2.15	.19
Threat	.12	1	.12	1.31	.26
Report x Threat	.09	1	.09	.94	.34
Explained	.41	3	.14	1.48	.23
Error	4.35	47	.09		
Total	4.76	50	.10		

Panel B: Subjects of U.S. or Canadian Origin

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Report	.00	1	.00	.001	.98
Threat	.01	1	.01	.074	.79
Report x Threat	.01	1	.01	.074	.79
Explained	.02	3	.01	.046	.99
Error	6.53	49	.13		
Total	6.55	52	.13		

Panel C: Subjects of Asian Origin

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Report	.00	1	.00	.01	.93
Threat	.03	1	.03	.28	.60
Report x Threat	.03	1	.03	.28	.60
Explained	.06	3	.02	.18	.91
Error	5.75	49	.12		
Total	5.81	52	.11		

Table 11 (cont'd)

Panel D: Subjects of European Origin

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Report	.00	1	.00	.21	.65
Threat	.01	1	.01	.41	.53
Report x Threat	.01	1	.01	.41	.53
Explained	.01	3	.01	.33	.80
Error	.69	49	.01		
Total	.71	52	.01		

Panel E: Subjects of Latin American Origin

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Report	.00	1	.00	.01	.91
Threat	.02	1	.02	2.10	.15
Report x Threat	.00	1	.00	.01	.91
Explained	.02	3	.01	.70	.56
Error	.46	49	.01		
Total	.48	52	.01		

Panel F: Risk Aversion

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Report	.31	1	.31	.17	.69
Threat	2.98	1	2.98	1.58	.22
Report x Threat	1.46	1	1.46	.77	.38
Explained	4.60	3	1.53	.81	.49
Error	92.38	49	1.89		
Total	96.97	52	1.87		

Table 11 (cont'd)

Panel G: Gender

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Report	.53	1	.53	4.97	.03*
Threat	.02	1	.02	.14	.71
Report x Threat	.06	1	.06	.59	.45
Explained	.61	3	.21	1.93	.14
Error	5.21	49	.11		
Total	5.82	52	.11		

*Note: Significantly more females within the ABC report condition

Panel H: Degree Program

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Report	1.06	1	1.06	5.35	.03*
Threat	.03	1	.03	.17	.69
Report x Threat	.00	1	.00	.01	.91
Explained	1.09	3	.36	1.93	.14
Error	9.71	49	.20		
Total	10.79	52	.21		

*Note: Significantly more MBA/masters students within the STC report condition

Panel I: Job Involving Negotiation

Source	Sum of Squares	df	Mean Square	F-statistic	Significance of F
Report	.25	1	.25	2.85	.10
Threat	.64	1	.64	7.37	.01*
Report x Threat	.17	1	.17	1.94	.17
Explained	1.05	3	.35	4.01	.01
Error	4.26	49	.09		
Total	5.30	52	.10		

*Note: Significantly more subjects with jobs involving negotiation within the no threat condition

APPENDICES

Appendix A

Informed Consent Declaration

The purpose of this research is to investigate the processes and outcomes of negotiation. In order to comply with University rules, it is necessary that you read and sign this form.

This research requires you to participate in several rounds of negotiation over the price at which an intermediate product will be sold to an outside firm. In addition, you will be asked some questions regarding how you went about negotiating and how you were paid. All the information you supply will be kept confidential by the researchers and will be seen only by them. You do not give your name on any form containing research results. The only place you write your name is on a sheet verifying receipt of your pay and possibly on a sign-up sheet if you would like to receive the results of the experiment when it is completed. The researchers have no way to connect your name on that list to any forms you fill out during the experiment or to the questionnaire you will complete at the end.

You will be paid U.S. dollars for participating in this experiment, but the exact amount will depend upon your performance. The details of how you'll be paid will be explained shortly during a training session that precedes the actual negotiations.

You may stop at any time during the session, but if you choose to do so, you will not be eligible for any compensation.

Along with these rights, you do incur some responsibilities by agreeing to participate. Your primary responsibility is to perform the negotiation task to the best of your ability and to answer honestly the questionnaire at the end of the experiment. We also ask that you do not discuss this experiment with students outside of this group.

If you have any questions or comments concerning this research, you may contact Sue Haka at 355-3388 or David Wright at 355-2180.

I certify that I have read and understood the rights and responsibilities I have incurred as a subject in this research. Given this understanding, I voluntarily agree to participate.

_____

Print your name, please

_____ _____

Signature Date

Appendix B

Introduction Script - Casing Seller

Good afternoon and welcome to The Alpha Casing Company. I'm happy to inform you that you've all been hired as Managers for Alpha. I'm going to spend a few minutes now to:

1. Explain what Alpha Casing makes and how it is used by our customers.
2. Tell you about what your job is going to be at Alpha as well as the current market conditions Alpha is facing.
3. Explain how you'll be paid and how it relates to your performance, and finally
4. I'll show you a demonstration of how you might perform your task to familiarize you with the decisions you'll be making.

So to start, what does Alpha make? (Show basic casing). Alpha Casing makes casings which hold and protect computer chips which are manufactured by our customers (show chips). A standard casing is composed of a base upon which various blocks are added. The open center space is where our customers install their chips. Once the casings are produced, they are packed in bags and shipped.

Your job today will be to sell casings to a computer chip manufacturer. Alpha has several plants which operate independently, so you'll each be responsible for your own plant and your own performance and each of you will deal with your own customers.

Market Condition - Threat

Currently, the industry that Alpha operates in is facing very stiff competition from overseas producers. As a result, the selling prices of both Alpha's casings and our customers products have fallen to below profitable levels. However, Alpha has decided to remain in business for the near future and has sufficient resources to continue operating at the present loss level for the next several periods.

Market Condition - No Threat

Currently, the industry that Alpha operates in is facing no serious competition. As a result, the selling prices of both Alpha's casings and our customers products are at profitable levels. Alpha has decided to remain in business for the near future and has sufficient resources to continue operating at the present profit level for the next several periods.

Now, let me explain how you'll be paid...

I'm going to start off by giving you each $9 (threat) or $7 (no threat), (give each participant $9 or $7). Now, depending on how successful you are at selling casings, you may increase or decrease this amount. If you earn a profit, I'll pay you more money. If you earn a loss, you'll have to pay back some or all of the $9 (or $7) to me. Alpha is a for profit company, and you should try to earn a profit and make as much money as you can.

Your profits or losses are determined by the price you sell the casings for, minus the costs of producing them. You will meet face to face with a customer and negotiate the selling price and conditions of the sales arrangement.

Based on current market conditions, I'm going to show you how the profits/losses from a sale of a Standard Casing, such as you see here, would be calculated.

(Hand out profit/loss calculation sheets - show overhead)
Please turn to the first inside page. This sheet is a sample profit calculation sheet. The column marked proposals is where you will evaluate trial proposals that haven't been agreed to yet. The column marked agreement is where you'll fill in your actual profit calculation based on your final agreement.

Market Condition - Threat

Based on recent past sales, a standard casing sells for an average of $115. So suppose you meet with the customer and you both agree to exchange a standard casing for that price. The $115 would represent your revenue.

Market Condition - No Threat

Based on recent past sales, a standard casing sells for an average of $145. So suppose you meet with the customer and you both agree to exchange a standard casing for that price. The $145 would represent your revenue.

The cost of producing casings is based on six things: two different materials costs, labor costs, and three types of overhead costs.

Casings are made up of two materials... a base and blocks. The cost of the base depends on the type of material used. If the base is made of tin, it costs $5. If it is made of plastic, it costs $15 and if it's made of steel the cost is $25. Standard casings are made of plastic, so the base cost would be $15.

Block costs are determined by what color blocks are used. If the blocks are red, the cost is $5. If the blocks are yellow the cost is $25, and if they are blue the cost is $45. Standard casings are made of yellow blocks, so the cost is $25.

Labor costs are based on how completely the casings are assembled prior to shipping. If the casing is completely unassembled, labor costs are $5. If the casings are partially assembled, meaning the caps are left off, the cost is $25. If the casing is fully assembled the labor cost is $45. Standard casings are partially assembled so the cost is $25.

Overhead consists of setup, supervision and handling costs. Setup costs are determined by the size of blocks used. Setup costs are $5 if large blocks are used, $20 if medium blocks are used and $35 if small blocks are used. Standard casings are made of medium blocks, so setup costs are $20.

Supervision costs are based on whether the casings are made within one, two, or three weeks. So supervision costs would be $5 if they're made in three weeks, $25 if they're made in two weeks and $45 if they're made in one week. Standard casings are made in two weeks, so supervision costs are $25.

Finally, handling costs are based on whether casings are shipped unbagged, single-bagged, or double-bagged. The cost is $5 if they are unbagged, $20 if they're single bagged, and $35 if they're double-bagged. Standard casings are single-bagged, so handling costs are $20.

Market Condition - Threat

Thus, the total costs of producing a basic casing would be $130 and your loss on the sale would be $115 - $130 or ($15). Now as far as your pay goes, I'll give you 7% of any profits you make, but you'll have to give me 7% of any losses. So on this deal, you'd owe me 7% of $15, or $1.05.

Market Condition - No Threat

Thus, the total costs of producing a basic casing would be $130 and your profit on the sale would be $145 - $130 or $15. Now as far as your pay goes, I'll give you 7% of any profits you make, but you'll have to give me 7% of any losses. So on this deal, I'd pay you 7% of $15, or $1.05.

Are there any questions about how profits or losses are calculated?

Now underneath this page are more blank profit calculation sheets you can use in each of the meetings today. Does everyone have a pencil with an eraser and a calculator? Again, the column marked proposals is for you to evaluate proposals during a given

meeting, sort of like scratch paper. The final column marked agreement is where you should calculate your actual profit or loss from the final agreed upon arrangement. The next thing I'm going to do is explain a little about our customers.

Market Condition - Threat

Beta Chips is Alpha's primary customer. Their product, which consists of a computer chip enclosed in a casing, sells for a fixed price of $230. (Show supplemental information on bottom of profit/loss calculation sheet). Their profits are determined by taking that $230 and subtracting what they pay for our casing and what it costs to insert their chips in the casing.

If you can't come to an agreement with Beta in the allotted time, you will both earn an automatic loss of $120, and you'll each have to pay me 7% of that or $8.40.

Market Condition - No Threat

Beta Chips is Alpha's primary customer. Their product, which consists of a computer chip enclosed in a casing, sells for a fixed price of $290. (Show supplemental information on bottom of profit/loss calculation sheet). Their profits are determined by taking that $290 and subtracting what they pay for our casing and what it costs to insert their chips in the casing.

If you can't come to an agreement with Beta in the allotted time, you will both earn an automatic loss of $90, and you'll each have to pay me 7% of that or $6.30.

When you go to negotiate with Beta you have the option of giving them Alpha's official cost report (show on overhead).

Cost Report Format - STC

It shows Alpha's materials and labor costs and what drives them. Overhead is shown as just the lump sum from producing a standard casing. So if you give Beta this information they will know exactly what your labor and materials costs are, but they won't know what drives your overhead costs.

Cost Report Format - ABC

It shows Alpha's materials, labor and overhead costs and what drives them. So if you give Beta this information they will know exactly what all of your costs are.

There are both advantages and disadvantages from giving the cost report to Beta. One advantage is that it may help you and the Beta manager figure out cheaper ways to

produce casings, because our costs may be linked to theirs. Thus, you may be able to increase overall profits and your own earnings. In addition, you only have 30 minutes in which to reach an agreement, and sharing the cost report may help you reach agreement quicker.

The disadvantage is that it will partially (STC) fully (ABC) reveal to Beta what you'll earn on any potential deal because they'll know the price they're offering you and some (STC) all (ABC) of your costs. The Beta manager could use this information to obtain a better deal for himself, thus, reducing your profits.

In past negotiations, the cost report has been kept confidential and the standard casing agreement has been the result. It is predicted that if you don't share the cost report, your agreements and payoffs will be very close to the standard arrangement.

Cost Report Format - STC

Choosing to share the cost report is considered riskier than keeping it confidential because it's expected that if you share, your payoff may be higher or lower than if you had not shared. However, since the report only contains partial cost information, sharing it is less risky than if full cost information had been revealed. In summary, it is riskier to share the report than keep it confidential, but it's not as risky as if all the cost information were revealed.

Cost Report Format - ABC

Choosing to share the cost report is considered much riskier than keeping it confidential because it's expected that if you share, your payoff may be substantially higher or lower than if you had not shared. In summary, since the report contains full information, it is considered the riskiest option relative to the low risk option of not sharing, or the moderate risk associated with sharing a report that only revealed partial information.

Beta also has the option of giving you a similar report on their costs of using casings and you may request their cost report if you wish.

During negotiations both you and Beta may verbally communicate any information you wish, however, only information contained on official cost reports is considered reliable and verifiable. Thus, any verbal statements or information may or may not be "true".

Are there any questions so far? I'd just like you to fill out this questionnaire before we go on. Pass out pre-questionnaire **(Make sure pair code on sheet matches name-tag).** Now, the last thing we're going to do is show you how to fill out the proposal forms. (Hand out sample offer forms). Bring everyone into the same room.

Appendix C

Introduction Script - Casing Buyer

Good Afternoon and Welcome to The Beta Chip Company. I'm happy to inform you that you've all been hired as Managers for Beta. I'm going to spend a few minutes now to:

1. Explain what Beta Chips makes
2. Tell you about what your job is going to be at Beta as well as the current market conditions Beta is facing.
3. Explain how you'll be paid and how it relates to your performance, and finally
4. I'll show you a demonstration of how you might perform your task to familiarize you with the decisions you'll be making.

So to start, what does Beta make? (Show white computer chips). Beta Chips makes computer chips which are installed in protective casings such as this (Show basic casing). Once the chips are inserted in the casings the final product is shipped to our customers to use in various electronic devices. Beta manufactures the white computer chips while the casings are purchased from an outside supplier.

Your job today will be to purchase casings from a supplier. Beta has several plants which operate independently, so you'll each be responsible for your own plant and your own performance and each of you will deal with your own suppliers.

Market Condition - Threat

Currently, the industry that Beta operates in is facing very stiff competition from overseas producers. As a result, the selling prices of both Beta's product and our suppliers casings have fallen to below profitable levels. Beta has decided to remain in business for the near future and has sufficient resources to continue operating at the present loss level for the next several periods.

Market Condition - No Threat

Currently, the industry that Beta operates in is facing no serious competition. As a result, the selling prices of both Beta's product and our suppliers casings are at profitable levels. Beta has decided to remain in business for the near future and has sufficient resources to continue operating at the present profit level for the next several periods.

Now, let me explain how you'll be paid...

I'm going to start off by giving you each $9 (threat) or $7 (no threat). (Give each participant $9 or $7). Now, depending on how successful you are at buying casings, you may increase or decrease this amount. If you earn a profit, I'll pay you more money. If you earn a loss, you'll have to pay back some or all of the $9 (or $7) to me. Beta is a for profit company, and you should try to earn a profit and make as much money as you can.

Your profits or losses are determined by the selling price of the final product, which is fixed at $230 (threat) or $290 (no threat), minus the costs of purchasing the casings and the costs of inserting the chips. You will meet face to face with a supplier and negotiate the purchase price of the casings and conditions of the sales arrangement.

Based on current market conditions, I'm going to show you how the profits/losses from selling a final product using a Standard Casing would be calculated.

(Hand out cost sheet with covers - show overhead)
Please turn to the first inside page. This first sheet is a sample profit calculation sheet. The column marked proposals is where you will evaluate trial proposals that haven't been agreed upon yet. The column marked agreement is where you'll fill in your actual profit calculation based upon your final agreement.

Market Condition - Threat

The selling price of Beta's final product is fixed at $230. Thus, the $230 would represent your revenue. Suppose you meet with the supplier and agree to purchase a standard casing at the current average price of $115. The $115 would represent your "Casing costs."

Market Condition - No Threat

The selling price of Beta's final product is fixed at $290. Thus, the $290 would represent your revenue. Suppose you meet with the supplier and agree to purchase a standard casing at the current average price of $145. The $145 would represent your "Casing costs."

Now, the cost of inserting the chips is based on six things: materials costs, two types of labor costs, and three types of overhead costs.

Materials costs are based on the color of blocks used in the casing. If red blocks are used, materials costs are $35, if yellow blocks are used the cost is $20 and if blue blocks are used the cost is $5. Standard casings are made of yellow blocks, so materials costs would be $20.

Assembly labor costs are based on how completely the casings are assembled when they are shipped from the supplier. If they are completely unassembled, the cost is $35, if they are partially assembled, meaning the caps are left off, the cost is $20. If they are shipped fully assembled our labor costs are $5. Standard casings are shipped partially assembled, so our assembly costs are $20.

Installation labor costs depend on the material used for the base of the casing. If the base is made of tin, installation costs are $45. If it is made of plastic, the cost is $25 and if it made of steel, the cost is $5. The base on standard casings is made of plastic, so installation costs are $25.

Overhead consists of storage, inspection and testing costs. Storage costs are based on whether the casings are made in one, two, or three weeks from the time we order them. If they're made in three weeks, storage costs are $25. If they're made in two weeks, storage costs are $15 and if they're made in one week the cost is $5. Standard casings are made in two weeks, so storage costs are $15.

Inspection costs are based on whether casings are shipped unbagged, single-bagged, or double-bagged. If they're shipped unbagged, inspection costs are $45. If they're shipped single-bagged, the cost is $25 and if they're shipped double-bagged, the cost is $5. Standard casings are single-bagged, so inspection costs are $25.

Finally, testing costs are based on the size blocks used in the casings. Testing costs are $45 if large blocks are used, $25 if medium blocks are used, and $5 if small blocks are used. Standard casings are made of medium blocks, so testing costs are $25.

Market Condition - Threat

Thus, the total costs of inserting the chips would be $130. So, your overall profit would be $230 minus $115 to purchase the casing minus $130 to insert the chip, which equals a loss of $15. Now as far as your pay goes, I'll give you 7% of any profits you make, but you'll have to give me 7% of any losses. So on this deal, you'd owe me 7% of $15, or $1.05. Are there any questions about how profits or losses are calculated?

Market Condition - No Threat

Thus, the total costs of inserting the chips would be $130. So, your overall profit would be $290 minus $145 to purchase the casing minus $130 to insert the chip, which equals a profit of $15. Now as far as your pay goes, I'll give you 7% of any profits you make, but you'll have to give me 7% of any losses. So on this deal, I'd pay you 7% of $15, or $1.05. Are there any questions about how profits or losses are calculated?

Now underneath this page are more blank profit calculation sheets you can use in each of the meetings today. Does everyone have a pencil with an eraser and a calculator? Again, the column marked proposals is for you to evaluate proposals during a given meeting, sort of like scratch paper. The final column marked agreement is where you should calculate your actual profit from the final agreed upon arrangement.

The next thing I'm going to do is explain a little about our suppliers.

Alpha Casing is Beta's primary supplier. Alpha's profits are determined by subtracting their costs of producing the casing, from the price you agree to pay them.

Market Condition - Threat

If you can't come to an agreement with Alpha in the allotted time, you will both earn an automatic loss of $120, and you'll each have to pay 7% of that or $8.40 (Show supplemental information on bottom of profit/loss calculation sheet).

Market Condition - No Threat

If you can't come to an agreement with Alpha in the allotted time, you will both earn an automatic loss of $90, and you'll each have to pay 7% of that or $6.30 (Show supplemental information on bottom of profit/loss calculation sheet).

When you go to negotiate with Alpha, you have the option of giving them Beta's official cost report. (Show on overhead).

Cost Report Format - STC

It shows Beta's materials and labor costs and what drives them. Overhead is shown as just a lump sum from using a standard casing. So, if you give Alpha this information they will know exactly what your labor and materials costs are, but they won't know what drives your overhead costs.

Cost Report Format - ABC

It shows Beta's materials, labor and overhead costs and what drives them. So, if you give Alpha this information they will know exactly what all of your costs are.

There are both advantages and disadvantages from giving the cost report to Alpha. One advantage is that it may help you and the Alpha manager figure out cheaper ways to produce casings, because our costs may be linked to theirs. Thus, you may be able to increase overall profits and your own earnings. In addition, you only have 30 minutes in which to reach an agreement, and sharing the cost report may help you reach agreement quicker.

The disadvantage is that it will partially (STC) fully (ABC) reveal to Alpha what you'll earn on any potential deal because they'll know the revenue you get from selling the final product, the amount you'll pay for the casing and some (STC) all (ABC) of your costs of using the casing. The Alpha manager could use this information to obtain a better deal for himself, thus, reducing your profits.

In past negotiations, the cost report has been kept confidential and the standard casing agreement has been the result. It is predicted that if you don't share the cost report, your agreements and payoffs will be very close to the standard arrangement.

Cost Report Format - STC

Choosing to share the cost report is considered riskier than keeping it confidential because it's expected that if you share, your payoff may be higher or lower than if you had not shared. However, since the report only contains partial cost information, sharing it is less risky than if full cost information had been revealed. In summary, it is riskier to share the report than keep it confidential, but it's not as risky as if all the cost information were revealed.

Cost Report Format - ABC

Choosing to share the cost report is considered much riskier than keeping it confidential because it's expected that if you share, your payoff may be substantially higher or lower than if you had not shared. In summary, since the report contains full information, it is considered the riskiest option relative to the low risk option of not sharing, or the moderate risk associated with sharing a report that only revealed partial information.

Alpha also has the option of giving you a similar report on their cost of producing casings and you may request their cost report if you wish.

During negotiations both you and Alpha may verbally communicate any information you wish, however, only information contained on official cost reports is considered reliable and verifiable. Thus, any verbal statements or information may or may not be "true".

Are there any questions so far? I'd just like you to fill out this questionnaire before we go on. Pass out pre-questionnaire **(Make sure pair code on sheet matches name-tag).** Now, the last thing we're going to do is show you how to fill out the proposal forms. (Hand out sample offer forms). Bring everyone into the same room.

Appendix D

Sample Negotiation Script - Threat Condition

Now, the last thing we're going to do is show you how a typical meeting might go. (Hand out sample offer forms).

All proposals and agreements must be made out in writing on a contract proposal such as the one you have there. In the negotiation, the buyer from Beta Chips is responsible for making the first offer and will fill out proposal number 1. So, as a buyer, suppose my first offer is to purchase a standard casing for $105. I'd fill out the form like so...and I'd give the proposal to the casing seller. Now the numbers in this example are strictly hypothetical and may or may not have any resemblance to actual proposals. This just a demonstration. If the seller agrees, we'll both sign each others copy by placing a check next to our titles at the bottom. If the seller wishes to propose a different offer, they would fill out the next proposal form. There will be a box on your meeting table labeled unaccepted proposals, just put the old proposals in there. So, as a seller, suppose I'm not happy with that offer. I'd place it in the box and suppose I counter with the offer to sell a standard casing for $125 (fill out proposal). I'd hand the proposal to the buyer. Again, the buyer can accept it or propose something else. So, as a buyer suppose I decide to purchase a nonstandard casing such that the blocks are blue instead of yellow for $125. I'd fill out the form like this (fill out proposal). Anything that differs from the standard casing has to be written in the space marked "casing specifications". Everything besides the block color would be the same as in the standard casing. Now, suppose the seller agrees to this - we both place a check by our titles on each others copy and we each keep a copy. At this point we'd fill out the "agreement" column on our profit calculation sheet. As soon as you're finished, please notify one of us (we'll be outside in the hall).

At any time, you both have the option of stopping the negotiations and taking the losses from no agreement which were explained to you before.

Are there any questions on how to fill out the contract proposals? You'll have approximately 30 minutes in which to come to agreement and again, you have the option of sharing your official cost report with the other negotiator.

Now, due to changing conditions, you may or may not deal with each other in future negotiations.

Take each pair to separate room to negotiate.

Appendix E

Sample Negotiation Script - No Threat Condition

Now, the last thing we're going to do is show you how a typical meeting might go. (Hand out sample offer forms).

All proposals and agreements must be made out in writing on a contract proposal such as the one you have there. In the negotiation, the buyer from Beta Chips is responsible for making the first offer and will fill out proposal number 1. So, as a buyer, suppose my first offer is to purchase a standard casing for $135. I'd fill out the form like so...and I'd give the proposal to the casing seller. Now the numbers in this example are strictly hypothetical and may or may not have any resemblance to actual proposals. This just a demonstration. If the seller agrees, we'll both sign each others copy by placing a check next to our titles at the bottom. If the seller wishes to propose a different offer, they would fill out the next proposal form. There will be a box on your meeting table labeled unaccepted proposals, just put the old proposals in there. So, as a seller, suppose I'm not happy with that offer. I'd place it in the box and suppose I counter with the offer to sell a standard casing for $155 (fill out proposal). I'd hand the proposal to the buyer. Again, the buyer can accept or propose something else. So, as a buyer, suppose I decide to purchase a nonstandard casing such that the blocks are blue instead of yellow for $155. I'd fill out the form like this (fill out proposal). Anything that differs from the standard casing has to be written in the space marked "casing specifications." Everything besides the block color would be the same as in the standard casing. Now, suppose the seller agrees to this - we both place a check by our titles on each others copy and we each keep a copy. At this point we'd fill out the "agreement" column on our profit calculation sheet. As soon as you're finished, please notify one of us (we'll be outside in the hall).

At any time, you both have the option of stopping the negotiations and taking the profits from no agreement which were explained to you before.

Are there any questions on how to fill out the contract proposals? You'll have approximately 30 minutes in which to come to agreement and again, you have the option of sharing your official cost report with the other negotiator.

Now, due to changing conditions, you may or may not deal with each other in future negotiations.

Take each pair to a separate room to negotiate.

Appendix F

Profit/Loss Calculation Sheet - Seller

	Proposals	Final Agreement
Sales Revenue (Selling Price)		
Materials Costs - Base $5 if base is made of Tin or **$15 if base is made of Plastic** or $25 if base is made of Steel (Standard Casing base is made of Plastic)		
Materials Costs - Blocks $5 if casing blocks are Red or **$25 if casing blocks are Yellow** or $45 if casing blocks are Blue (Standard Casing blocks are Yellow)		
Labor Costs $5 if casings are Unassembled or **$25 if casings are Partially assembled** or $45 if casings are Fully assembled (Standard Casings are Partially Assembled)		
Overhead Costs - Setup $5 if made of Large blocks or **$20 if made of Medium blocks** or $35 if made of Small blocks (Standard Casings use Medium blocks)		
Overhead Costs - Supervision $5 if made in Three weeks or **$25 if made in Two weeks** or $45 if made in One week (Standard Casings are made in Two weeks)		
Overhead Costs - Handling $5 if casings are Unbagged or **$20 if casings are Single-bagged** or $35 if casings are Double-bagged (Standard Casings are Single-bagged)		
Overall Profit/Loss		

Additional Information:
Beta's final product sells for a fixed price of $230 (threat)/$290 (no threat)
Standard Casing selling price (based on past sales): $115 (threat)/$145 (no threat)
If you can't come to agreement:
You will earn a loss of $120 (threat)/$90 (no threat)
The manager of Beta will earn a loss of $120 (threat)/$90 (no threat)

Appendix G

Profit/Loss Calculation Sheet - Casing Buyer

	Proposals	**Final Agreement**
Sales Revenue	**$230 (threat)** **$290 (no thrt)**	**$230 (threat)** **$290 (no thrt)**
Casing costs (Purchase Price) (Standard Casing price: $145)		
Materials Costs: $35 if casing blocks are Red or **$20 if casing blocks are Yellow** or $5 if casing blocks are Blue (Standard Casings are Yellow)		
Labor Costs - Assembly $35 if casing are Unassembled or **$20 if casings are Partially assembled** or $5 if casings are Fully assembled (Standard Casings are Partially assembled)		
Labor Costs - Chip Installation $45 if casing base is Tin or **$25 if casing base is Plastic** or $5 if casing base is Steel (Standard Casing bases are Plastic)		
Overhead - Storage Costs $25 if casings are made in Three weeks or **$15 if casings are made in Two weeks** or $5 if casings are made in One week (Standard Casings are made in Two weeks)		
Overhead - Inspection Costs $45 if casings are Unbagged or **$25 if casings are Single-bagged** or $5 if casings are Double-bagged (Standard Casings are Single-bagged)		
Overhead - Testing Costs $45 if casings are made of Large blocks or **$25 if casings are made of Medium blocks** $5 if casings are made of Small blocks (Standard casings are made of Medium blks)		
Overall Profit/Loss		

Additional Information: Standard Casing selling price (based on past purchases): $115 (threat)/$145 (no threat). If you can't come to agreement: You will earn a loss of $120 (threat)/$90 (no threat) and the manager of Alpha will earn a loss of $120 (threat)/$90 (no threat).

Appendix H

Standard Casing Production Cost Report - ABC Format

The cost to produce standard casings is based on the following items:

1. **Materials Costs - Base**
   - $5 if base is made of Tin
   - $15 if base is made of Plastic
   - $25 if base is made of Steel
   - **Standard Casing base is made of Plastic** **$15**

2. **Materials Costs - Blocks**
   - $5 if casing blocks are Red
   - $25 if casing blocks are Yellow
   - $45 if casing blocks are Blue
   - **Standard casing blocks are Yellow** **$25**

3. **Labor Costs**
   - $5 if casings are Unassembled
   - $25 if casings are Partially assembled
   - $45 if casings are Fully assembled
   - **Standard casings are Partially assembled** **$25**

4. **Setup Costs**
   - $5 if casings are made of Large blocks
   - $20 if casings are made of Medium blocks
   - $35 if casings are made of Small blocks
   - **Standard casings are made of Medium blocks** **$20**

5. **Supervision Costs**
   - $5 if casings are made in Three weeks
   - $25 if casings are made in Two weeks
   - $45 if casings are made in One week
   - **Standard casings are made in Two weeks** **$25**

6. **Handling Costs**
   - $5 if casings are Unbagged
   - $20 if casings are Single-bagged
   - $35 if casings are Double-bagged
   - **Standard casings are Single-bagged** **$20**

Standard Casing: Total Cost **$130**

Appendix I

Standard Casing Production Cost Report - STC Format

The cost to produce standard casings is based on the following items:

1. Materials Costs - Base	
$5 if base is made of Tin	
$15 if base is made of Plastic	
$25 if base is made of Steel	
Standard Casing base is made of Plastic	**$15**
2. Materials Costs - Blocks	
$5 if casing blocks are Red	
$25 if casing blocks are Yellow	
$45 if casing blocks are Blue	
Standard casing blocks are Yellow	**$25**
3. Labor Costs	
$5 if casings are Unassembled	
$25 if casings are Partially assembled	
$45 if casings are Fully assembled	
Standard casings are Partially assembled	**$25**
4. Overhead Costs	**$65**
Standard Casing: Total Cost	**$130**

Appendix J

Standard Casing Usage Cost Report - ABC Format

The cost to insert chips into a standard casing is based on the following items:

1. Materials Costs

\$35 if casing blocks are Red
\$20 if casing blocks are Yellow
\$5 if casing blocks are Blue
Standard Casing blocks are Yellow **\$20**

2. Labor Costs - Assembly

\$35 if casings are Unassembled
\$20 if casings are Partially assembled
\$5 if casings are Fully assembled
Standard casings are Partially assembled **\$20**

3. Labor Costs - Chip Installation

\$45 if casing base is made of Tin
\$25 if casing base is made of Plastic
\$5 if casing base is made of Steel
Standard casing bases are Plastic **\$25**

4. Storage Costs

\$25 if casings are made in Three weeks
\$15 if casings are made in Two weeks
\$5 if casings are made in One week
Standard casings are made in two weeks **\$15**

5. Inspection Costs

\$45 if casings are Unbagged
\$25 if casings are Single-bagged
\$5 if casings are Double-bagged
Standard casings are Single-bagged **\$25**

6. Testing Costs

\$45 if casings are made of Large blocks
\$25 if casings are made of Medium blocks
\$5 if casings are made of Small blocks
Standard casings are made of Medium blocks **\$25**

Total cost of using a Standard Casing **\$130**

Appendix K

Standard Casing Usage Cost Report - STC Format

The cost to insert chips into a standard casing is based on the following items:

1. Materials Costs

\$35 if casing blocks are Red
\$20 if casing blocks are Yellow
\$5 if casing blocks are Blue
Standard Casing blocks are Yellow **\$20**

2. Labor Costs - Assembly

\$35 if casings are Unassembled
\$20 if casings are Partially assembled
\$5 if casings are Fully assembled
Standard casings are Partially assembled **\$20**

3. Labor Costs - Chip Installation

\$45 if casing base is made of Tin
\$25 if casing base is made of Plastic
\$5 if casing base is made of Steel
Standard casing bases are Plastic **\$25**

4. Overhead Costs **\$65**

Total cost of using a Standard Casing **\$130**

Appendix L

Contract Proposal Form

Date _____ Time _____ Pr _____

Instructions - Proposer: Fill out the form as you wish and then give it to the other manager.

Instructions - Receiver: Take and examine this proposal. If you **AGREE** to it, tell the other manager and place a check next to your title at the bottom of the form. Have the other manager put a check by his title. If you do **NOT AGREE**, fill out the next contract proposal.

Meeting # _____ Proposal # _____

Check one:

_____ I propose to buy/sell the standard casing at a price of $ _____

_____ I propose to buy/sell a non-standard casing with the specifications described below at a price of $ _____

Casing Specifications: Items not specified will remain as in the standard casing.

If you both agree to the terms above, each manager places a "check" next to his title AFTER you come to agreement. If you do not both agree to this offer, DO NOT MARK.

I accept this offer:

Manager, Alpha Casings _____

Manager, Beta Chips _____

Office Use Only:

Verified by: _____

Appendix M

Pre-negotiation Questionnaire

Date/Time _____ Pair _____

1. Please check one:

_____ I am going to sell casings to a customer

_____ I am going to buy casings from a supplier

Please answer the following questions by circling the extent to which you agree or disagree with each statement. Circling 1 means you strongly disagree with the statement; 4 means you neither agree nor disagree with the statement; 7 means you strongly agree with the statement.

2. During the negotiation I can calculate all of my own costs.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

3. If the other negotiator and I agree to exchange a Standard Casing at the Standard price, I will lose money.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

4. If I give my official cost report to the other negotiator, they will know what my labor and materials costs are (and what drives them) but NOT what drives my overhead costs.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

5. During the negotiation, I have the option of giving my official cost report to the other negotiator or keeping it to myself.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

6. If I give my Official Cost Report to the other negotiator, they may be able to use the information to increase their own profits at my expense.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

7. The industry in which the other negotiator and I operate in is currently facing strong competition which has driven prices below profitable levels.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

8. If I give my Official Cost Report to the other negotiator, they will know what determines ALL of my costs and what those cost amounts are.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

9. Please rate how risky you feel it would be to share your Official Cost Report with the other negotiator.

1	2	3	4	5	6	7
Not risky at all			Somewhat risky			Very Risky

Appendix N

Exit Questionnaire

Date/Time _____ Pair _____

1. Please check one:

_____ I sold casings to a customer

_____ I bought casings from a supplier

Please answer the following statistical questions. All information will be kept anonymous and confidential.

2. Sex (circle one): M F

3. What degree are you currently pursuing (circle one):

Undergraduate Masters MBA Ph.D. _

4. Grade point: _____

5. National/Cultural Background: United States or Canada _____ European _____
Asian _____ Latin America _____ Other (please specify)_____

6. Have you ever had a job where negotiation with others was required? Yes No
If yes, please describe_____

Please answer the following regarding the negotiation you just completed.

7. I gave my official cost report to the other negotiator: YES NO

8. The other negotiator gave me his/her official cost report: YES NO

9. We came to an agreement: YES NO

10. **Prior** to the experiment you just completed, how well did you know the other negotiator?

1	2	3	4	5	6	7
Had never met before			Had met him/her but did not know very well			Know him/her very well

11. **Prior** to the experiment you just completed, how would you characterize the nature of your relationship with the other negotiator?

1	2	3	4	5	6	7
Personal rival			Stranger			Close personal friend

Please answer the following questions by circling the extent to which you agree or disagree with each statement. Circling 1 means you strongly disagree with the statement; 4 means you neither agree nor disagree with the statement; 7 means you strongly agree with the statement.

12. I think the other negotiator and I cooperated as a "team" to find the most cost effective way of making casings.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

13. Overall, I didn't really trust the other negotiator.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

14. I am satisfied with the amount I earned on the negotiation.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

15. If I have to negotiate again, under the same market conditions I will NOT share my official cost report with the other negotiator.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

16. If I have to negotiate again, I would prefer to negotiate with the same person.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

17. During the negotiation, I felt like I was competing against the other negotiator.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

18. I believe the arrangement we agreed upon was the most cost effective way to produce casings.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

19. I think the other negotiator earned (check one)

Much more than I did _____
A little more than I did _____
About the same as I did _____
A little less than I did _____
Much less than I did _____

For each of the following pairs of choices, please place a check next to the option you prefer.

1. _____ winning $10 for sure or _____ a 10% chance of winning $20 and a 90% chance of winning $0

2. _____ winning $10 for sure or _____ a 20% chance of winning $20 and a 80% chance of winning $0

3. _____ winning $10 for sure or _____ a 30% chance of winning $20 and a 70% chance of winning $0

4. _____ winning $10 for sure or _____ a 40% chance of winning $20 and a 60% chance of winning $0

5. _____ winning $10 for sure or _____ a 50% chance of winning $20 and a 50% chance of winning $0

6. _____ winning $10 for sure or _____ a 60% chance of winning $20 and a 40% chance of winning $0

7. _____ winning $10 for sure or _____ a 70% chance of winning $20 and a 30% chance of winning $0

8. _____ winning $10 for sure or _____ a 80% chance of winning $20 and a 20% chance of winning $0

9. _____ winning $10 for sure or _____ a 90% chance of winning $20 and a 10% chance of winning $0

Appendix O

Agreement Verification Form

Date/Time _____ Pair _____ Start Time _____ End Time _____

The buyer (Beta) did/did not share their report with the seller (Alpha).
The seller (Alpha) did/did not share their report with the buyer (Beta).

Alpha Casing	**Final Agreement**
Sales Revenue (Selling Price)	
Materials Costs - Base $5 if base is made of Tin or **$15 if base is made of Plastic** or $25 if base is made of Steel (Standard Casing base is made of plastic)	
Materials Costs - Blocks $5 if casing blocks are Red or **$25 if casing blocks are Yellow** or $45 if casing blocks are Blue (Standard Casing blocks are Yellow)	
Labor Costs $5 if casings are unassembled or **$25 if casings are partially assembled** or $45 if casings are fully assembled (Standard Casings are Partially Assembled)	
Overhead Costs - Setup $5 if made of large blocks or **$20 if made of medium blocks** or $35 if made of small blocks (Standard Casings use medium blocks)	
Overhead Costs - Supervision $5 if made in three weeks or **$25 if made in two weeks** or $45 if made in one week (Standard Casings are made in two weeks)	
Overhead Costs - Handling $5 if casings are unbagged or **$20 if casings are single-bagged** or $35 if casings are double-bagged (Standard Casings are single-bagged)	
Overall Profit/Loss	**x .07 =**

Beta Chips	**Final Agreement**
Sales Revenue	**$290(threat)/$230 (no threat)**
Casing costs (Purchase Price)	
Materials Costs: $35 if casing blocks are red or **$20 if casing blocks are yellow** or $5 if casing blocks are blue (Standard Casings are Yellow)	
Labor Costs - Assembly $35 if casing are unassembled or **$20 if casings are partially assembled** or $5 if casings are fully assembled (Standard Casings are partially assembled)	
Labor Costs - Chip Installation $45 if casing base is tin or **$25 if casing base is plastic** or $5 if casing base is steel (Standard Casing bases are plastic)	
Overhead - Storage Costs $25 if casings are made in three weeks or **$15 if casings are made in two weeks** or $5 if casings are made in one week (Standard Casings are made in two weeks)	
Overhead - Inspection Costs $45 if casings are unbagged or **$25 if casings are single-bagged** or $5 if casings are double-bagged (Standard Casings are single-bagged)	
Overhead - Testing Costs $45 if casings are made of large blocks or **$25 if casings are made of medium blocks** $5 if casings are made of small blocks (Standard casings are made of medium blocks)	
Overall Profit/Loss	**x .07 =**

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