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Incentive Pay for Team Selling: A Model with Propositions

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Incentive Pay for Team Selling: A Model with Propositions

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Abstract- **Although teamwork is necessary and often regarded as a crucial determinant in winning sales and building long-term relationships, the issue of how to design incentive pay for team selling has remains mostly because of "moral hazard" in team. We build an analytical model integrating behavioral motivation theory— in particular, expectancy theory—into an economic hazard model framework and proffer propositions pertaining to incentive pay for team selling. The analytical model suggests that a firm can induce the best efforts in a selling team. This potential increases as interaction intensity, peer pressure, membership stability, team size, and team uncertainty rise. The results suggest that the optimal team incentive rate inducing the best efforts increases when interaction intensity, team uncertainty, and team size decrease.**

I. Introduction

Team selling has become a critical, if not a sine qua non, for an increasing number of companies (Jones et al., 2005; Segalla et al., 2006; Rapp et al., 2010). It entails relying on "several individuals in an organization to sell products and services to all relevant decision makers" in the buying organization (Hair et al., 2009, p. 166). A key rationale behind the use of sales teams is to create long-term relationships between the buying and selling firm that are mutually beneficial vis-à-vis personnel, products, and companies (Menguc and Barker, 2005).

Although team selling is considered to be "a determinant factor in winning sales and building long-term partnerships" (Segalla et al. 2006, p. 419) and an effective promotional tool (Hair et al., 2009), sales force managers are likely to encounter difficulties when designing and implementing appropriate *incentive pay* systems for their sales teams. Fein (2010) has suggested that "[t]he most important thing about sales compensation planning is to make sure that you are motivating the salespeople to produce what the company needs."Doing so requires the sagacity of Solomon or the skills of Merlin the Magician!

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Sales managers establish incentive-based compensation systems to enhance selling team performance. Even the best of intentions, however, could lead to incentive plans that negate their intended purposes. Indeed, some research has ascertained that an incorrect incentive system can lead members to exploit (or play with) the system (e.g., Courty and Marschke, 2004; Larkin, 2008) or allocate job tasks in a way that is not propitious for the firm (MacDonald and Marx, 2001).Part of the problem in deriving appropriate incentive compensation programs for selling teams is a function of the performance appraisal mechanisms used to assess them. Moncrief and Shipp (1997) averred that some of the issues revolve around difficulties in distinguishing between individual from group outcomes, customizing performance metrics vis-à-vis the type of team, and measuring various effort components from members of cross-functional teams. Given the putative relationship between team salesperson performance and incentive-based compensation, such conundrums are understandable. As Burke (2011) has argued:

> The shift to a team focus poses some special challenges for a sales operation… [such as] how do you use rewards to encourage individual cooperation with a team approach? The answer depends on both the selling process and the behavior you are trying to instill. For instance, is the sale dependent on the coordinated interplay of several players? Or is it more a function of aggregating a number of individual "wins"?

The economics literature on "moral hazard" helps partly explain why the design of incentive pay for team selling can be problematic. Regarding moral hazard as "the problem of inducing agents to supply proper amounts of productive inputs when their actions cannot be observed and contracted for directly, "Holmstrom (1982,p. 324)propounded that there exists a free-rider problem with team work. Specifically, if one agent (such as a salesperson in a work group) shirks his or her duties, he or she still receives the full benefit for the diminished effort. The cost of the shirker's reduced endeavors, however, is shared by all the other agents (such as the other selling team members). Interestingly, though, Rasmusen (1987) showed that when risk aversion is sufficiently large and the efforts of the agents are not observable, the first-best effort is achieved through punishment contracts, such as "scapegoat"

and "massacre" contracts. In the scapegoat contract, an agent is chosen to be the "scapegoat" when output is low, and the other agents benefit at his/her expense. In the "massacre" contract, though, all of the agents are punished when output is low except for a randomly chosen agent who receives the entire output. Fabella (1988) relaxed the non-observability condition and found that "natural team sharing"—where the proportional share in total output equaled the proportional share of total input—can induce the first-best effort.

Although the moral hazard literature regarding teams recognizes problems in team compensation, it possesses limitations for constructing realistic, effective team compensation. First, most moral hazard models assume a "one-shot game" rather than a multi-period game. Yet, team selling most likely entails *multi-period* activities. Specifically, after each team transaction or reward period, members in the team are compensated; this process is repeated in typical cases of team selling (Moon and Armstrong, 1994). Second, Holmstrom's (1982) non-cooperative (i.e., the shirker) assumption can be challenged. Literature from organizational behavior has proposed that group dynamics—based on group norms, value systems, or shared assumptions—may well attenuate the assumption. Moreover, sales force culture might lead to abjuring the presupposition (Jackson et al., 1994; Jackson and Tax, 1995; Segalla et al., 2006), asit conceivably could induce sales team members not to compromise their efforts (a la "one for all and all for one"). In fact, Karau and Williams' (1993) meta-analysis found that individuals did not loaf when group cohesiveness was high. Furthermore, the use of punishment suggested by Rasmusen (1987)is unlikely to work in team selling compensation. After all, team spirit and cooperation could collapse when a firm emphasizes punishment (Ramaswami and Singh, 2003; Segalla et al., 2006).Also, a randomly chosen agent might conceivably perceive inequality from the punishment and thus have lower motivation (Adams, 1965).

Because of the preceding issues concerning sales team compensation, this paper develops an analytical model that assists sales managers in designing effective incentive pay systems for team selling. Prior work in marketing has found that the nature of reward structures can influence the satisfaction and performance of team members (Sarin and Mahajan, 2001). Jones et al. (2005) averred that one of the major trends in field selling is the increased importance of sales team structure. Brown et al. (2005) argued that this (among other professional selling dynamics) necessitates additional research on sales force compensation vis-à-vis the evolving sales force milieu. This paper partly seeks to answer that call.

The model incorporates behavioral motivation theory—in particular expectancy theory (Vroom 1964)—and economic moral hazard models. Although the majority of sales force researchers rely on insights from expectancy theory to examine motivational aspects of sales force compensation (e.g., Apasu, 1987; Churchill and Pecotich, 1982), little research has (a) applied expectancy theory to the issues of motivating and compensating team members in team selling, or has (b) attempted to integrate expectancy theory into an economic hazard model frame.

Prior to propounding the model, the nature of team selling is described, followed by an explanation of aspects of sales team compensation and of the motivation mechanism of each member in a sales team. Model dimensions are then proposed as being key aspects for sales managers to consider when designing an incentive pay system for team selling, along with attendant research propositions. Implications for sales managers and future research conclude the paper.

II. Nature of Team Selling

Various researchers have used different terms (e.g., selling team, selling center, national account management) to describe a multi-person selling effort. Moon and Armstrong (1994) developed a conceptual framework of team selling. They viewed selling teams as a continuum between a "core selling team" and "selling center." They defined a *core selling team* as a customer-focused group whose primary objective is to establish and maintain strong customer relationships. Its membership is stable, changing only as frequently as job assignments change. Moon and Armstrong (1994) proposed that the size of a core selling team would increase as the technical complexity of the seller's products or services augments. Alternatively, a *selling center* is defined by a transaction-oriented group whose objective is successful completion of the specific sales opportunity that it has been established to pursue. It is tactical in nature, and its membership is fluid. Moon and Armstrong (1994) also promulgated that as transactions become more novel or important to buyers or sellers, the selling center will exhibit a greater degree of vertical and horizontal involvement and be more extensive and connected.

As Moon and Armstrong (1994) stated, a sales team can possess various structures based on its mission and opportunities. Thus, the variety of the team structure should be taken into account when a firm designs an incentive pay system for team-selling efforts (Beersma et al., 2003). Five key dimensions are considered in this paper to investigate the effect of team structure on team compensation. The five were selected for inclusion in this research based on the selling team/selling center seminal work of Moon and Armstrong (1994) and Moon and Gupta (1997). Moon and Armstrong (1994) and Moon and Gupta (1997) considered these five dimensions to be explicitly or implicitly critical aspects of selling team structure that

can have a marked impact on the members of the sales team, as well as the outcomes of the team. Given the nature of these team structure dimensions (per the subsequent discussion) and Moon and Armstrong (1994) and Moon and Gupta's (1997) insightful analyses, these five dimensions may well influence a sales team's incentive pay system.

a) Intensity of Interaction among Team Members

I*ntensity (or degree) of interaction* among team members could affect the design of a sales team incentive pay system. Interaction among team selling members is a characteristic that is different from features of traditional individual selling. As team members interact, exchange of information can facilitate members' coordination of efforts and enhance their skill complementarities (Chan, Li, and Pierce, 2009). Indeed, they are likely to become cognizant of the various activities that are occurring among team members and the contribution each member is making to team output (Moon and Armstrong, 1994). This awareness seemingly should lead sales managers to develop a fair incentive system to motivate and reinforce team members.

b) Peer Pressure

P*eer pressure* on a salesperson within a sales team might well affect his/her performance. A positive relationship between peer pressure and an individual's effort contributed toward his/her assigned team tasks is presupposed in this paper. If a team has a high level of interaction, peer pressure may influence an individual salesperson's performance, as it is easier to observe co-workers' efforts. Indeed, peer pressure can be healthy in the sense that it could augment both the team outcome and each member's utility (e.g., Hollander, 1990; Kandel and Lazear, 1992; Bernheim, 1994)—thus influencing the team incentive pay plan.

c) Membership Stability

M*embership stability* within the selling team may affect the team's incentive pay system. If a selling team is organized for just one specific transaction (i.e., there is little likelihood that team members will work together after the conclusion of that transaction), team members' efforts will likely be different from those of permanent team members (Moon and Armstrong, 1994). In the former condition, team members essentially work as "freelancers" or "utility players," seeking to conclude their work and move on to their next assignment. The time spent with the team does not necessarily foster bonding among members. Thus, such individuals seemingly have little to lose by focusing on their own results irrespective of the team's outcomes. In the latter situation, however, team membership tends to be enduring, thus leading to a need to maintain solid working relationships among team members. As such, the team is likely focus on overall team outcomes rather than pursuing each member's own personal agenda. Accordingly, team permanence could affect the team incentive compensation plan.

d) Uncertainty about Co-Workers' Efforts

U*ncertainty regarding co-workers' effort levels* could be considered in sales team incentive pay systems. If a salesperson feels uncertain about co-workers' effort levels, such in certitude is likely to influence his/her contribution to the team ('a la "free-riding").Partnering with team members could help reduce free-riding of team members (Kandel and Lazear, 1992). Indeed, Itoh (1991) illustrated how a compensation structure may induce team members to engage in helping behaviors. Furthermore, he demonstrated (Itoh, 1993) that a team-based incentive system can conduce to cooperation among team members. Subsequent discussion will reveal why uncertainty among team members might affect the team incentive pay structure.

e) Size of Team

S*ize of the selling team* is included in the model. As the size of the selling team increases, there is likely to be a higher chance of sales team member free-riding. After all, team members might not be intimately familiar with each member's efforts owing to the large size of the team. As such, members may well feel uncertain about the sales team effort-sales response function. Moon and Gupta (1997) averred that team size is positively associated with team conflict. Thus, team size likely affects sales team incentive pay structure.

III. Compensation Aspects of Team Selling

Total compensation for each team member is modeled in this paper as in equation (1), where R_i is the total monetary reward for a team member ,, F_i is the fixed salary, B is the team incentive rate for the team selling outcome X(e.g., unit sales, gross sales, gross margin), and p_i is *i's* contribution to the outcome:

$$R_i = F_i + B \times X \times p_i \qquad (1)$$

where, $\sum_{i=1}^{n} p_i = 1$. For instance, a technician in a team whose salary is $100,000 will be compensated $101,000[1] if his/her team achieves $50,000 gross margin, the incentive pay rate for the team is 10%, and his/her contribution to the team selling is assessed as 20%.

The model captures two major problems firms might face when they design a team compensation plan: (a) how much should incentive pay be based on, and (b) how the proportional contribution of individual effort to the team outcome should be decided. Extant research does not provide an appropriate rule to resolve the first issue. Seemingly, practitioners follow company

[1] $101,000 = $100,000 + .1*$50,000*.2

and/or industry conventions of the labor market (Albers, 2002). The second problem ideally pertains to the "golden rule" of team compensation—"as much as is possible, tie the reward to the salesperson's actual contribution." In practice, however, finding each individual's precise contribution is difficult owing to information asymmetry (Menguc and Barker, 2005). Some firms might find an approximation for ρ_i by directly monitoring individual effort, examining peer evaluations, or perusing merit evaluations. Other firms, though, may use the same ρ_i for all team members (if it is impossible to measure the exact contribution of each team member).

IV. Understanding Sales Force Motivation in Team Selling

Members in a selling team interact with each other to achieve enhanced levels of performance (Hair et al., 2009). Through repeated experience in team selling, team members are likely to ascertain the relationship between their own efforts and sales outcomes (e.g., the effort-sales response function). Calculating the sales response from their efforts and rewards for their sales outcome, team members pursue their own effort level. Expectancy theory (Locke, 1975; Vroom, 1964) explains this mechanism in terms of motivational force. Expectancy theory asserts that effort level[2] depends on an individual's beliefs pertaining to three elements: "expectancy," "instrumentally," and "valence."

Expectancy. Expectancy is the strength of a person's belief about whether a particular outcome is possible given one's level of effort expended. In this paper's model, expectancy is the salesperson's belief about the sales response (the outcome) vis-à-vis his/her effort to the team. Suppose that the sales response function is $X = f(h, E_1, E_2)$, where E_1 and E_2 are effort level of team member[3] 1 and 2; h represents other factors (such as price, advertising, etc.) that are believed to influence the sales level beyond efforts of team members. As expectancy theory implies, an individual team member's beliefs about this function has a positive impact on his/her effort level.

For instance, suppose sales team members have the following sales response function in mind:

$$X = h + k \times E_1 \times E_2 \qquad (2)$$

As such, they believe that they interact with each other and that their efforts *together* (through joint interaction) contribute to team selling outcomes. Job design, group norms, and team members' repeated experience allow team members to develop this belief and reinforce it.[4] For instance, in industrial selling, frequently a salesperson and a technician work together. In this team selling context, a technician's sole effort alone is unlikely to lead to the final sale. In the same way, the salesperson cannot finalize a transaction without the technician's support. An alternative to the foregoing situation would be a pooling of *independent* efforts of team members; accordingly, team members perceive their outcome response function as $X = h + \gamma_1 \times E_1 + \gamma_2 \times E_2$. That is, they believe that they contribute to the team outcome together, but *separately*. This is the case when two salespeople's outcomes are pooled, but they do not believe that they interact with each other to increase the outcome. Although there is free-rider problem in pooled teamwork, its problem is less severe than in the interactive teamwork in (2). (This point will be illustrated in subsequent sections of the paper.)

Instrumentality. Instrumentality is the belief linking one's outcome to his/her payoff (the reward). Bonus pay that is distributed randomly or poorly communicated would lead to low instrumentality perceptions. Alternatively, commission pay schemes that tie compensation directly to performance afford sales personnel to recognize that their performance is positively instrumental for the acquisition of their reward (money) (Pinder, 1991). In this regard, the incentive pay rate, B, in total compensation should be meaningful enough to maintain high instrumentality. In other words, if management wants high performance levels, it must tie positive reward outcomes to high performance, X, and ensure through clear communication that team members understand this connection.

Valence. Vroom uses the term valence to refer to the affect people hold with regard to outcomes. The important feature of valence for work-related outcomes is the level of satisfaction the salesperson expects to receive from the outcome (Pinder, 1991). Individuals attribute either positive or negative preferences to outcomes according to the satisfaction or dissatisfaction that they expect to receive from them. To integrate expectancy theory with economic theories of team compensation, valence can be defined as the utility that a person receives from his/her monetary reward less the cost of his/her effort. The cost of effort may include mental, physical, and opportunity cost of effort, which typically follows a marginally increasing disutility (cost of effort) function with respect to his/her effort level. Assume a marginally increasing disutility function such as $c(E_i) = d_i \times E_i^2$. then team member I will likely perceive that his/her utility (valence), V_i, as a function of his/her total reward less the cost of his/her effort:

[2] Vroom (1964) considers this as the psychological force to perform.

[3] Here we assume two persons in a team. This assumption will be relaxed in a later section of the paper.

[4] For more detailed explanation, see Feldman (1984) and Bettenhausen and Murnighan (1985). Feldman explains that group norms are developed through explicit statements of supervisors, critical events in the group's history, primacy, or carry-over behaviors from past situations. Bettenhausern and Murnighan empirically test how group norms are developed.

$$V_i = F_i + BXp_i - d_i E_i^2.$$

Because the outcome is a function of the focal member's effort as well as the other member's effort shown in (2), the focal team member *i* will choose his/her effort level, E_i that maximizes his/her utility, V_i:

$$\max_{E_i} F_i + B\left(h + kE_iE_j\right)p_i - d_iE_i^2 \qquad (3)$$

Note that this utility maximization is consistent with the logic of expectancy theory in that an individual's effort depends on the magnitude of expectancy, instrumentality, and valence. That is, (a) a firm should effectively communicate with its sales team members about the compensation system shown in (1) to increase *instrumentality*; (b) it should have team members believe that the nature of the sales response function is represented in (2) in order to increase *expectancy*; and (c) it should take into account the cost of sales team member effort and undertake efforts to improve total utility—*valence*—effectively and efficiently.

Maximizing one's total utility based on his/her belief about the sales response function given the compensation plan characteristics, the sales team member should perceive the optimal effort level, E_i^*, which maximizes his/her utility:

$$E_i^* = \frac{B \times p_i \times k}{2d_i} E_j, \qquad (4)$$

where i, j=1,2, $i \neq j$.That is, the individual will perceive that he/she should exert more effort as the firm sets a higher *p* and *B*, because he/she will increase his/her total compensation as he/she works harder. As the interaction coefficient *k* increases, the sales team member exerts more effort because he/she perceives a higher expectancy of his/her effort. The marginal expense of disutility, *d,* negatively affects the effort level. These results are consistent with the sales force compensation literature (e.g., Lal and Srinivasan, 1993). The distinct finding is that the interaction coefficient, *k,* and the effort level of the other member in team selling, E_j, are positively related to the optimal effort level of the focal sales team member. The foregoing analysis and discussion lead to the following propositions:

Proposition 1.a: If a firm effectively has communicated with its sales team employees about the nature of the compensation system shown in (1) and if sales team employees believe that the nature of sales response function is expressed in (2), then as the incentive rate increases, a team member will exert more effort.

Proposition 1.b: If a firm effectively has communicated with its sales team employees about the nature of the compensation system as shown in (1) and if sales team employees believe that the nature of sales response function is expressed in (2), then as the firm's recognition of individual contribution to the team outcome increases, a team member will exert more effort.

Proposition 1.c: If a firm effectively has communicated with its sales team employees about the nature of the compensation system shown in (1) and if sales team employees believe that the nature of the sales response function is expressed in (2), then as the intensity of team interaction increases, a team member will exert more effort.

Proposition 1.d: If a firm effectively has communicated with its sales team employees about the compensation system shown in (1) and if sales team employees believe the nature of sales response function is expressed in (2), then as the team members exerts more effort, a team member will exert more effort.

Proposition 1.e[5]: If a firm effectively has communicated with its sales team employees about the compensation system shown in (1) and if sales team employees believe the nature of sales response function is expressed in (2), then as the disutility coefficient increases, a team member will exert less effort.

a) Sales Team Incentive Compensation vis-à-vis the Five Sales Team Dimensions

Propositions 1a-1e addressed how sales team employees will be motivated. In this section of the paper, the analytical model is extended by building on our understanding of sales force motivation and team selling incentive pay vis-à-vis the five key sales team dimensions addressed earlier.

b) Interaction in Team Selling and Its Impact on Team Incentive Pay

As defined earlier, in a pooled team members' efforts contribute to the outcome independently and separately (i.e., outcome response function is $X = h + \gamma_1 \times E_1 + \gamma_2 \times E_2$). So, utility-maximizing in a pooled team will affect a team member's effort as $E_i^* = \frac{B \times p_i \times \gamma_i}{2d_i}$. Note that the optimal effort level does not depend on other team members' efforts in a pooled team.

However, in interactive team selling, a focal member's optimal effort level depends on a co-worker's effort level. Thus, a game theoretic nature exists between two members in an interactive team, but not in a pooled teamwork. If a co-worker increases his/her effort level, the focal player has an incentive for working

[5] Propositions 1.a to 1.eseem to ignore salary payment. This is because uncertainty in the sales response function or the risk-averse individual has not been taken into account. The salesforce compensation literature shows that the optimal compensation plan for risk-averse salespeople confronting uncertainty includes a substantial portion of salary (e.g., Coughlan and Sen, 1989). It is also true in team selling because team members are still likely risk aversepartly owing to uncertainty. Thus, 100% incentive pay for team selling is unlikely to be optimal.

hard, as his/her marginal productivity increases. However, when the co-worker decreases his/her effort level, the focal player reduces his/her effort level owing to decreased marginal productivity. Essentially, this situation can be viewed as a simultaneous Cournot game between players 1 and 2. (See Dixit [1986], Fisher [1961], Hahn [1962], Seade[1980], or Thorlund-Petersen [1990] for detailed technical and conceptual accounts of the simultaneously Cournot game.) In each period, players simultaneously decide their effort levels by considering the average value of their co-worker's past effort level. Consider the following dynamic process:

$$\boldsymbol{E}^t = (E_1^t, E_2^t) = \left(g_1 \sum_{\gamma=0}^{t-1} E_2^\tau , g_2 \sum_{\gamma=0}^{t-1} E_1^\tau \right)$$

where $g_i = \frac{B \times p_i \times k}{2d_i}$, i,j=1,2, $\mathrm{i} \neq \mathrm{j}$. If the process converges, then the steady state is asymptotically stable—a Nash equilibrium. Also, when the process converges to a Nash equilibrium from every starting point, Nash equilibrium is globally stable. Assuming symmetric players without loss of generality— i.e., $E_i = E_j = E, d_i = d_j = d$, $p_i = p_j = p$=0.5, and, $F_i = F_j = F$—the process converges to "best,best" effort when g is greater than one. It converges to "minimum" effort when g is less than one. These Nash equilibriums are globally stable because the process converges from every starting point. Thus, in order to induce "best, best" efforts, a firm should find the optimal incentive rate, B^*, which satisfies $g > 1$. Specifically, in the interactive team selling, the optimal team incentive rate for risk neutral team members should be

$$B^* > \frac{4d}{k}. \qquad (5)$$

A firm can induce "best,best" effort from risk-neutral members in interactive team selling by setting a team incentive rate that satisfies (5).This is because in each period each team player has an incentive to exert his/her effort more than the co-worker's effort level when condition (5) holds. However, if a firm could not satisfy (5) and used interactive team selling, each team player in the team would likely exert minimum effort in the long run.

Sales managers need to ascertain *initially* whether there is a need for lowor high interaction among sales team members. If there is a need, then they should ask if the firm is able to achieve condition (5). Overall, as interaction intensity reflected in k decreases, the team incentive rate, B, should be higher to induce the best efforts in team selling.

If a firm could not offer team incentive payment that satisfies condition (5), the team might collapse. To discern the magnitude of the team incentive rate, condition (5) can be modified to $B^* > \frac{4dE^2}{kEE}$. In this condition, the team incentive rate should be greater than the ratio of four times of the disutility to outcome from team member interaction. Notice that B has an upper-level limit. For instance, B should be less than one to secure a positive profit when X is defined as gross profit. Thus, conceivably a firm may not satisfy condition (5) with any team incentive payment. Analytical results indicate that the feasibility of the team incentive rate—which induces the best efforts among team members—widens as the interaction intensity among team selling members increases. If a firm cannot find the feasible team incentive rate, the firm should redesign team work to reduce disutility coefficients or increase the interaction intensity, k, for team productivity. The previous discussion can be summarized as follows:

Proposition 2. a: As interaction intensity among team selling employees increases, the feasibility of team incentive rates that induce the best efforts among team members increases.

Proposition 2.b: If sales outcomes rely on interaction among sales team employees, increased incentive pay is more effective to induce the best efforts when interaction among team member employees is low.

c) Peer Pressure and Its Impact on Team Incentive Pay

High interaction among team members might create peer pressure, as members' behaviors tend to be visible to each other (Chan, Li, and Pierce, 2009). What would a team member do if a co-worker reduces his/her effort but still enjoys the benefit from the team outcome? Are team members saints or suckers so that they still exert their best efforts? Kerr (1983) offered reasons that people do not want to be suckers. First, the sucker role is inimical because it is inequitable (Adams, 1965). Second, it violates a norm of social responsibility—every member of the group is obligated to contribute to the group.

Third, it violates a norm of reciprocity: namely, "if I contribute to the group, and hence indirectly to your benefit, then you are obligated to reciprocate." Kerr (1983) also averred that playing the sucker role may invite further attempts at exploitation by others in the work team. Therefore, a team player might be reluctant to reduce his/her effort level because he/she is concerned about possible adverse responses from his/her co-workers in subsequent periods.

Applying the concept of the "repeated prisoner's" dilemma" (Kreps, Milgrom, Roberts, and Wilson, 1982) illustrated the foregoing behavior. Suppose two members in a selling team play the repeated game. Deviation from the best effort of one player brings a better pay off to him/her. But if *both* deviate from the best effort level, both receive a *lower* payoff than under the cooperative best efforts. Accordingly, *peer pressure* can be defined as a focal

player's *belief that "if I deviate from the best effort, my co-worker will also deviate*."

Kandel and Lazear (1992) introduced a "peer pressure" function in teamwork and showed that with peer pressure equilibrium, effort is higher than it would be without peer pressure. Other researchers have also discovered that peer pressure can enhance the effectiveness of lower-powered incentives (Barron and Gierde, 1997; Che and Yoo, 2001), increase productivity by reducing free-rider problems (Knez and Simester, 2001), and interact with team size (Backes-Gellner, Mohnen, and Werner, 2006). Empirical evidence revealed that a positive impact of peer pressure on an individual's effort contributed to assigned tasks (e.g., Falk and Ichino, 2006; Sausgruber, 2005). To extend the above ideas, the degree of peer pressure can be manipulated. Also, note that peer pressure introduced is healthy in a sense that peer pressure increases both team outcomes and each player's utility.

Suppose that if two symmetric players exert their best effort,$\bar{E}$, then each player's payoff is *O, "cooperative payoff."* When one player exerts the best effort, and his/her co-worker deviates from the best effort to $\bar{E}-\varepsilon$(where ε is any small number between 0 and $(\bar{E}-E^*)$.), the player's payoff will be *S,* and the co-worker's payoff will be *T.* When both players deviate from their best efforts, each player's utility will be *P, "competitive payoff."*

Figure 1 : The Structure of a Basic Prisoner's Dilemma

		Player 2	
		$\bar{E}_2$	$\bar{E}_2-\varepsilon$
Player 1	$\bar{E}_1$	O_1, O_2	S_1, T_2
	$\bar{E}_1-\varepsilon$	T_1, S_2	P_1, P_2

Shown in Figure1 is the pay off matrix of two members working in a selling team where the payoffs are as follows:

$$O = F + .5B \times f(\bar{E},\bar{E}) - c(\bar{E}),$$
$$T = F + .5B \times f(\bar{E}-\varepsilon,\bar{E}) - c(\bar{E}-\varepsilon),$$
$$S = F + .5B \times f(\bar{E},\bar{E}-\varepsilon) - c(\bar{E}), \text{ and}$$
$$P = F + .5B \times f(\bar{E}-\varepsilon,\bar{E}-\varepsilon) - c(\bar{E}-\varepsilon),$$

where *f(.)* and *c(.)* are the sales response function and disutility function, respectively. If *T<O*, each team member does not have any incentive to reduce his/her effort level from the best effort level.

$$O>T, \text{ or } B^* > \frac{2[c(\bar{E})-c(\bar{E}-\varepsilon)]}{f(\bar{E},\bar{E})-f(\bar{E},\bar{E}-\varepsilon)} \qquad (6)$$

This condition can be written as *B*>4d/k*[6] in the interactive team for very small ε.In the pooled team structure, (6) can be expressed as $B^* > 4d\bar{E}/\gamma_i$ for very smallε. In either team structure, each member does not have any incentive to reduce team effort from the "best" effort.

If *T >O*, each team member has an economic incentive to reduce his/her effort level from the best effort level so that in interactive team selling each member will reduce his/her effort in each period and end up with the "minimum, minimum" effort. However, if a focal team member feels peer pressure—"If I defect, my co-worker will also defect"—his/her behavior will likely likely be different. That is, the salesperson will compare cooperative payoff *O* with competitive payoff *P,* and if *O* is greater than *P*, the player will sustain his/her best effort.

$$O>P, \text{ or } B^* > \frac{2[c(\bar{E})-c(\bar{E}-\varepsilon)]}{f(\bar{E},\bar{E})-f(\bar{E}-\varepsilon,\bar{E}-\varepsilon)} \qquad (7)$$

This can be rewritten as *B*>2d/k* and $B^* > 4d\bar{E}/(\gamma_1+\gamma_2)$ for the interdependent and pooled team, respectively. Observe that if there is peer pressure on deviation from the best effort, the optimal team incentive rate, *B**, which sustains "best,best" efforts, is feasible—although team members likely have an incentive to shirk. That is, they do not shirk owing to peer pressure. Note, however, that peer pressure does not work if condition (7) is not satisfied. For instance, if *B<2d/k,* in interactive team selling even with peer pressure people will likely shirk. This might happen because (a) a firm offers a very small team incentive payment or (b) team members have extremely high marginal disutility or very low marginal team productivity. The foregoing analyses lead to the following research propositions:

Proposition 3.a: As peer pressure—a belief that "if I deviate from the best effort, my co-worker will also deviate"—among sales team employees increases, the feasibility of team incentive rates that induce the best efforts among sales team employees increases.

Proposition 3.b: If the cooperative payoff is greater than the competitive payoff, a sales team employee—owing to peer pressure—will not deviate

[6] $B > \frac{2[d\bar{E}^2-d(\bar{E}-\varepsilon)^2]}{k\bar{E}\bar{E}-k\bar{E}(\bar{E}-\varepsilon)}$ or $B > \frac{2d(2\bar{E}-\varepsilon)}{k\bar{E}}$. Taking $lim_{\varepsilon\to 0}$ on the equation, we get $B > 4d/k$.

from the best effort even if a sales team employee deviates from the best effort.

Summarizing key differences between *B** in this repeated prisoners' dilemma game and the optimal range (5) in the Cournot game seems beneficial. The major difference between the two models is that the optimal team incentive in the Cournot game is globally stable, whereas the optimal *B* in the repeated prisoners' dilemma game is not globally stable. That is, in the Cournot game the motivation factor *g* pushes up the effort level to the "best" effort in every starting point in an interactive team. The optimal team incentive range in the repeated prisoners' dilemma game, however, is sufficient only when the game starts with the "best, best" efforts. The second difference is that team members in the Cournot game maximize their present utility; in the repeated prisoners' game, though, they maximize not only their current utility but also their future utility. (This point will be further demonstrated in the following section.)The third difference between the two models is the assumption of the presence of peer pressure in the repeated prisoners' dilemma game.

d) Membership Stability and Its Impact on Team Incentive Pay

An implicit assumption implied in previous sections is that team membership is sufficiently stable. In the Cournot game two players work together for a sufficiently long time so that they become the "best" effort players. Similarly, in the repeated prisoners' dilemma game, the assumption is made that team members typically work together so that they consider the responses of their co-worker in subsequent periods. However, membership in team selling is not always stable but can sometimes be fluid. Moon and Armstrong (1994) reviewed both academic and practitioner-oriented literature about sales teams and conceptualized the selling team as a continuum between a "core selling team" and "selling center."In this section of the paper, the effect of membership stability on optimal team incentive rate is analyzed.

The optimal team incentive found in the Cournot game is valid even for fluid teams, but the adjustment process up to "best, best" effort slows down as team membership becomes fluid. The speed of the adjustment process depends mainly on the magnitude of *g* and the periods for which two members work together. Reduced chances of working together in team selling will slow down the adjustment process up to the "best, best" effort.

In the repeated prisoners' dilemma game, the effect of team stability interacts with peer pressure. Let δ represent a probability of the two team members' continuing to work in the same team. Then, the expected payoff for each player when both play their best effort based on the repeated prisoners' dilemma is

$$O\,[1/(1-\delta)]. \qquad (8)$$

When the focal player deviates at time *t,* he/she knows that he/she will get *T* but also knows that *the co-worker will punish him/her by reducing effort from time t+1*; as such, the expected payoff to the focal player is

$$O[(1-\delta^{t-1})/(1-\delta)] + T + P[\delta^{t+1}/(1-\delta)] \qquad (9)$$

If (8) is always greater than (9), the team player will not deviate from the best effort. Theδ that satisfies (8) >(9) can easily be foundas the following:

$$\delta > \frac{T-O}{T-P} \text{or} \qquad (10)$$

$$B > \frac{2[c(\bar{E}) - c(\bar{E}-\varepsilon)]}{f(\bar{E},\bar{E}) - (1-\delta)f(\bar{E}-\varepsilon,\bar{E}) - \delta f(\bar{E}-\varepsilon,\bar{E}-\varepsilon)}$$

Assume that the selling team is permanent. In this case, one can assume that δ is equal to one. Therefore, when team membership is permanent, 1> (*T-O)/(T-P)* is the condition for the team members not to deviate from their best efforts. After rearranging 1> (*T-O)/ (T-P), O> P*s obtained, which is same as equation (7).

To ascertain the impact of membership stability on the optimal team incentive, deriving the optimal team incentive rate for a fluid team is necessary. As the membership becomes fluid, the probability to continue working in the same team, δ, approaches "zero." For instance, if a firm selects randomly one salesperson from six salespeople and one from two technicians for each sales opportunity, each sales rep has a 50% chance of working with any technician. In this case, the behavior responding to the team incentive would be different. Assume that $\delta = 0.5$, then equation (10) becomes. 5> (*T-O)/ (T-P)*.

If we set $\delta = 0$, then it becomes a temporal sales team. Members work together only once. In this temporal team selling situation, the optimal team incentive range becomes *O>T,* which is the same as (6). By comparing the cases of temporal, fluid, and permanent selling teams, observe that *as the membership becomes stable, the effectiveness of peer pressure increases*. A managerial implication of this result is that a firm should design its selling team to be as stable as possible to make peer pressure work effectively. The equation implies that, as the probability to continue working in the same team increases, team selling members will cooperate (they will do their best.). Thus, the following propositions are offered:

Proposition 4.a: As the membership in a sales team becomes more stable, the feasibility of team incentive rates that induces the best efforts among sales team members increases.

Proposition 4.b: The incentive pay for sales team employees is more effective when the membership is stable than when the membership is fluid.

e) Uncertainty over Co-Workers' Efforts and Its Impact on Team Incentive Pay

A sales person often confronts several sources of uncertainty, such as various customer needs, macroeconomic factors, and market competition. As discussed earlier, a sales person in a selling team has another source of uncertainty—co-workers' effort levels. To capture the effects of uncertainty on optimal effort level, consider the following:

$$X_i = f(\hat{h}, E_i, \hat{E}_j),$$

where i, j=1,2, $i \neq j$; $\hat{h}$ and $\hat{E}_j$ are focal player *i's* estimates of *h* and E_j, which are random variables with variances σ^2 and σ_j^2 respectively. If one assumes interactive team selling, total uncertainty can be found by calculating total variances, per the following:

$$var(h + kE_i\hat{E}_j) = var(h) + var(kE_iE_j) + 2cov(h, kE_iE_j) = \sigma^2 + k^2E_i^2\sigma_j^2$$

Note that the covariances between *h* and E_j are assumed to be trivial and to be zero. Assume that each team member is constantly risk averse. Then, the following certainty equivalents in interactive team selling can be determined:

$$F_i + .5B(h + kE_iE_j) - dE_i^2 - \frac{r}{2}(.25)B^2(\sigma^2 + k^2E_i^2\sigma_j^2)$$

Note that *r* indicates the degree of risk aversion. Maximizing one's certainty equivalent, a focal member finds

$$E_i^* = \frac{B \times k}{4d + r \times (.5)B^2 \times k^2 \times \sigma_j^2} E_j, \qquad (11)$$

where i, j=1,2, $i \neq j$.The optimal effort level depends on the uncertainty about a team member's effort level. That is, the optimal effort level decreases as the degree of uncertainty about the co-worker's effort level increases, in corporating risk-averse, team incentive, and team productivity coefficients. This is because team members care only about uncertainties that are related to their efforts. Note, however, that all kind so fun certainty reduce the perceived utility of the risk-averse agent, so that if a firm extracts all the surplus utility from team members by choosing a given team incentive rate, any kind of uncertainty will influence the optimal effort level of a risk-averse agent through the team incentive rate (Basu et al., 1985; Lal and Srinivasan, 1993).

Deriving the team incentive rate that induces the "best,best" effort in an interactive selling team, a firm should find *B* such that

$$\left[\frac{Bk}{4d + r(.5)B^2k^2\sigma_j^2}\right] > 1$$

Solving for *B*, the range of *B* that induces the "best, best" effort is as follows:

$$B^* \in \left(\frac{1-\sqrt{1-8dr\sigma_j^2}}{rk\sigma_j^2}, \frac{1+\sqrt{1-8dr\sigma_j^2}}{rk\sigma_j^2}\right) \qquad (12)$$

Here, the team incentive rate that induces the "best,best" effort exists if *B* satisfies equation 12 and the feasibility condition as follows:

$$1 - 8dr\sigma_j^2 \geq 0 \text{or} dr\sigma_j^2 \leq \frac{1}{8} \qquad (13)$$

There is a key difference in an optimal team incentive rate between the case of assumed risk neutral and risk averse. For a risk-averse team member, as the team incentive rate increases, the variance of the utility also augments and the increased variance reduces the utility of the member. For a risk-neutral member, though, the increased variance does not reduce his/her utility. Therefore, when agents are risk averse, if condition (13) does not hold, a firm cannot find any team incentive rate that induces a "best,best" effort. The disutility coefficient, risk averseness, and uncertainty about a co-worker's effort should be managed as low as possible for a firm to find a team incentive rate that induces the "best,best" effort. The preceding discussion leads to the following:

Proposition 5.a: For risk-averse sales team employees, as uncertainty about a co-worker's effort level increases, the feasibility of team incentive rates that induces the best efforts among team members decreases.

If the team incentive rate that induces a "best,best" effort is feasible ,the mean of *B** is most effective because it makes the motivation factor, *g*, the highest. It is most effective because the higher motivation factor shortens the adjustment period toward a "best,best" effort. Thus, by looking at the mean *B*,* the optimal team incentive rate can be found as follows*:*

$$\bar{B}^* = 1/rk\sigma_j^2, \text{ where } \bar{B}^* \text{ is mean of } B^*. \qquad (14)$$

As risk aversion, team productivity, or uncertainty about a co-worker's effort decreases, the optimal team incentive rate, $\bar{B}^*$, rises. When the team incentive rate is high, a risk-averse team member feels less utility for his/her effort than a risk-neutral individual, because a high team incentive rate augments the variation in income. Increased variation makes the risk-averse player perceive lower utility. Thus, a firm should set a lower team incentive rate for risk-averse team players. For instance, if technicians are highly risk averse compared with sales personnel, the firm would

more aptly apply a lower team incentive rate for the technicians than for the salespeople.

A high level of team productivity with a high team incentive rate increases the expected team reward and thus motivates team players. Nevertheless, this condition can also increase variation in income. The analysis here presumes that when team productivity is high, a lower team incentive is preferred. In other words, when team productivity is high, even a low team incentive rate is sufficient to obtain motivation factor $g>1$, so that team players increase their effort up to the best effort. When uncertainty about a co-worker's effort is high, an increased team incentive can reduce motivation in the focal team member because high uncertainty with a high team incentive can generate a larger variation of his/her rewardhan with a low team incentive. When uncertainty about a co-worker's effort is high (e.g., initial periods of team selling), a lower team incentive rate is better; but as the uncertainty decreases, a higher team incentive is better to induce the best effort. Accordingly, the following proposition is offered:

Proposition 5.b: When uncertainty about a co-worker's effort level is high, a lower team incentive rate will be more effective with risk-averse sales team employees than with risk-neutral members.

f) Size of Team and Its Impact on Team Incentive Pay

So far, two-person teams have been assumed. In this section, the assumption is relaxed, and the effect of team size on incentive pay is explored. As the complexity of product and/or sophistication of customer needs increases, team selling often requires an increasing number of team members (Hair et al., 2009). When they work together, each member feels more uncertainty than when he/she sells alone. This is because the sales outcome depends not only on his/her effort but also on others' efforts. Theoretical models for sales force compensation (e.g., Basu, Lal, Srinivasan, and Staelin, 1985; Lal and Srinivasan, 1993) have proposed that as uncertainty increases, the proportion of incentive pay to salary decreases. In fact, empirical studies have supported this relationship (Joseph and Kalwani, 1995; Lal, Outland, and Staelin, 1994).

There are several effects of increased team size. At first, it is easy to see that as team size increases, a moral hazard problem increases. Assume N members in a sales team and their sales response function is given by $f(\mathbf{E})$, where $\mathbf{E}$ is an N-dimensional vector of team members' effort levels. Further assume that p_i is $1/N$ for all team members, and the disutiltiy associated with effort is given by $c(E_i)$, where c'>0, and c">0. The focal team member wants to maximize $\max_{E_i} F_i + \frac{1}{N} Bf(\boldsymbol{E}) - c(E_i)$ with first-order conditions

$$\frac{1}{N} Bf_i(\boldsymbol{E}) - c'(E_i) = 0. \qquad (15)$$

Efficiency requires that total surplus be maximized or that $\max_{E_i} \sum_{i=1}^{N} F_i + Bf(\boldsymbol{E}) - \sum_{i=1}^{N} c(E_i)$ with first-order conditions

$$Bf_i(\boldsymbol{E}) - c'(E_i) = 0 \qquad (16)$$

Because $c'' > 0$, $\bar{\boldsymbol{E}}$, is defined as the solution to (15), exceeds $\mathbf{E}^*$, defined as the solution to (16) for $N>2$, and the moral hazard problem is getting severe as N increases.

Another point is that as the number of team members increases, each team player will feel more uncertainty about the outcome response to his/her effort. For instance, suppose three people, *i, j,* and *k*, work together, then *I* will encounter various possibilities of an outcome response to his/her effort like $X=h+k_1E_i+k_2E_j+k_3E_k+k_4E_iE_j+k_5E_iE_k+k_6E_jE_k+k_7E_iE_jE_k$, where $\mathbf{k}$ is either zero or some positive numbers. A focal player *i* will perceive increased uncertainly because he/she will be uncertain about two co-workers' efforts, and these two will interact with each other, thus increasing uncertainty. The model here predicts that the increased uncertainty owing to an augmented number in sales team members will decrease optimal effort level; moreover, increased uncertainty tends to lower the optimal team incentive rate, which is found in the previous section.

Two predictions can be made regarding the *size effect on peer pressure*. At first, one might say that peer pressure will increase as team size increases, because of increased sources of peer pressure. When a focal player *i* is thinking about shirking, he/she will consider the averse response of *two* team members rather than *one* player. A focal player would perceive more disutility, not only because of two players' shirking responding to the focal player's defection, but also because of isolation from team workers or active punishment from peers. Based on increased peer pressure, as team size increases, peer pressure will likely go up and, as a result, effort will rise and feasibility for optimal team incentive will also increase. Furthermore, the effect of peer pressure is maximized when the team is designed to be as stable as possible.

However, there is a counter argument, too. As team size increases, peer pressure could be reduced. This is because detection of an individual member's shirking will be more difficult for team players in a large team than in a small team. A player might reduce his/her effort and hide in the crowd. Thus, one cannot unambiguously conclude the impact of peer pressure as team size increases. One could speculate, though, that peer pressure will increase for small teams (such as with five to seven members), but peer pressure will go down as team size increases.

In sum, increasing team size (a) magnifies free-rider problem, (b) increases uncertainties, and (c) may

increase peer pressure for small numbers. Thus, the following propositions are proffered:

Proposition 6.a: As the size of the selling team increases, the feasibility of team incentive rates that induces the best efforts among team members increases.

Proposition 6. b: As the size of the selling team increases, the optimal portion of the incentive pay for team selling decreases.

V. Discussion

In this paper, systematically observed have been the effects of sales team dimensions on team incentive pay. The interaction among team members, peer pressure, uncertainty, membership stability, and team size effects on incentive pay for team selling were analyzed. A set of propositions was presented

Most findings from germane sales compensation literature about individual selling compensation can be applied to team selling compensation. However, additional understanding is needed to design effective team selling compensation. An appropriate incentive pay system is necessary but not sufficient to guarantee the success of team selling. Successful team compensation issues should be integrated into other team management issues.

a) Managerial Implications

Team Selling vs. Individual Selling. The sales force compensation literature offers many important insights for team selling. In his early pioneering article, Farley (1964) showed that commission rates should be a function of gross margin rather than sales revenue to induce profit-maximizing effort of salespersons. This finding should be applied to a team incentive pay system. As such, sales managers may well consider tying the incentive rate for team selling to gross margin.

Farley's research has been extended (e.g., Basu et al, 1985; Davis and Farley, 1971; Srinivasan, 1981; Lal and Srinivasan, 1993; Zhang and Mahajan, 1995). In general, that work has found that as uncertainty, risk aversion, or disutility increases, the portion of commission vis-à-vis total compensation should decrease. These findings might conceivably be applied to team selling compensation.

For instance, as a team confronts more environmental *uncertainty,* the team incentive rate should be lower. A sales person in a team faces more uncertainty owing to another source of uncertainty—incertitude from the level of other team members' efforts. From industry practice, a lower portion of incentive pay for team selling compares with individual selling. Similarly, the optional incentive pay for team selling is lower than in individual selling. Different levels of *risk aversion* among team selling members should be considered. If salespeople are less risk averse than technicians in the team, the optimal incentive pay rate should be different. That is, salespersons will work harder when a higher incentive rate is applied, but technicians will likely prefer a higher degree of fixed compensation. Also, different levels of *disutility* for effort should be considered when designing incentive pay for team selling. For instance, for a technician who has a higher coefficient of disutility for his/her effort, the firm should apply a lower portion of team incentive for him/her.

Incentive Pay and Sales Team Management. The arguments set forth in this paper rely on several assumptions about team selling management. It is assumed that a firm has built a team structure for selling and has constructed a team compensation plan. Also presupposed is that a firm has effectively communicated with its team members about its compensation plan and that team members believe in the effect of team interaction on their team outcome. An effective incentive pay structure (based on the paper's propositions) is a necessary, but not sufficient condition for team success, however. A firm needs a team that functions effectively before designing an appropriate incentive pay system.

b) Limitations and Future Research

Although the incentive pay problem for team selling was examined in a systematic analysis, several limitations of the work should be noticed. First, this paper was developed in a deterministic setting. Beliefs about sales response functions might be even more complex than in the two types of sales response functions in this paper. Not all uncertainties were integrated into the model. Thus, a challenge remains concerning further development of the model. Second, only team compensation issues were examined. The success of team activity depends not only on compensation reinforcement but also on other team management techniques. The gap between a reinforcing pay structure and team culture might be a major concern. Inefficient communication might also frustrate team work, even if the firm offers an appropriate team incentive system.

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