A Decision Theory Approach to the Determination of Optimal Compensation Plan Structures

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Sales force compensation research has received much attention over the last few years. One of the major problems being addressed is the design of optimal sales force compensation plan structures, and especially determining the relative importance to be given to salary versus incentive pay (see for instance John and Weitz 1989). Starting with the pioneering article by Basu, Lal, Srinivasan, and Staelin (1985), agency theory has become the leading paradigm for analyzing this complex management issue. Unlike previous sales force compensation work, agency theory has allowed researchers to take risky situations into account. Because of a lack of information, or of unforeseen erratic events, selling situations are typically stochastic. Including risk into the sales force compensation problem was therefore warranted. According to the agency theoretic framework, management (the principal) devises an expected profit maximizing compensation plan, based on some knowledge of (1) salespersons' utilities, (2) salespersons' attitudes toward risk, and (3) the (stochastic) sales response functions to a salesperson's selling efforts. As a result, salespeople (the agents) make decisions on their effort level and allocations, given their understanding of (1) the compensation plan imposed by management and (2) the (stochastic) territory sales response functions to their own selling efforts.

The original paper by Basu *et al.* (BLSS 1985) relies on a series of assumptions, some of which have been relaxed or changed in subsequent work (see Albers 1996; Coughlan 1993 for reviews). All these papers, however, share a common characteristic: They all refer to risky rather than uncertain selling situations. Although most of these studies refer to "uncertainty," from a decision theory point of view, they are in fact considering "risky" situations. According to decision theory (Luce and Raiffa 1957), risky situations are characterized by salespersons' or management's knowledge of the probabilities of occurrence of different sales levels, given some level of a salesperson's activity. This is referred to as the sales probability distribution in the agency theoretic sales force compensation literature.

Although this assumption is seldom challenged, it may be restrictive. This is the reason why, in contrast with previous research studies, it may be worthwhile to investigate the problem of the optimal sales force compensation plan structure as a problem of decision under "true" uncertainty rather than under risk. In such cases, salespersons and managers have complete ignorance of the likelihood of a given sales level (state of nature), within a range, actually occurring when a salesperson displays a certain effort level.

Another limitation of past agency theory applications to the sales force compensation problem is that they provide strictly analytical solutions. Although these solutions are rigorous (given the set of assumptions on which they rely), they can only be derived for continuous functions. In practice, however, one can observe many remuneration functions displaying discontinuities. For instance, a frequent occurrence is when a certain remuneration amount (or bonus) is earned after a performance benchmark (a quota) is reached or overpassed (Wilson and Bennett 1986). For investigating discontinuous remuneration functions, a graphical approach should prove superior to a strictly analytical procedure.

This paper investigates how sensitive the prescriptions of agency theory concerning sales force compensation plan structures are to the assumption of decisions under risk. In this study, the assumption of decision under risk is replaced by the weaker assumption of decisions under "true" uncertainty, according to which no sales probability distribution can be safely assumed and certainly not specified in terms of shape and parameters. In addition, the analysis relies on an economic theory-type of graphical approach.

This analysis leads to essentially the same conclusions as those reached through agency theory, although using quite different routes. In addition, it highlights a conclusion that has not been specifically drawn in the literature so far: The optimal remuneration function derived through agency theory is only one special case of a whole range of optimal compensation plan structures. All these structures share three common characteristics: (1) they include the same equilibrium point to be achieved by the salesperson; (2) they do not provide salespersons with a more desirable alternative than this equilibrium position; and (3) they are "close" to the theoretical compensation function. Such plans include not only the linear approximations proposed in the literature, but many more plan structures that include discontinuities (such as bonus-quota plans).

References

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