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How to share it out: The value of information in teams ☆

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Abstract

We study the role of information exchange, leadership, and coordination in team and partnership structures. For this purpose, we view individuals jointly engaging in productive processes—a "team"—as endowed with individual and privately held information on the joint production process. Once each team member decides on whether or not to share his private information truthfully, he chooses which effort to exert in the joint production process. This effort, however, is not contractible: only the realized output (or profit) of the team can be observed. Our central question is whether or not incentives can be provided to a team in this environment such that team members communicate their private information and exert efficient productive efforts on the basis of this communication. Our main result shows that there exists a simple ranking-based contract that implements both desiderata in a wide set of situations.

JEL classification: C7; D7; D8; L2

Keywords: Moral hazard; Adverse selection; Leadership; Teams

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"Forming a business partnership is the next best thing to getting married."

[*The Manufacturing Jeweler*, March 1897]

1. Introduction

This paper analyzes combined moral hazard and adverse selection problems in teams and, synonymously throughout the paper, partnerships. Team members exert unobservable effort and the generated output is entirely allocated among the members of the team. Created output depends not only on the chosen efforts but also on an underlying productivity parameter. The source of adverse selection is that the information about this parameter may be privately known to some team members. Therefore, an efficient mechanism must generate the right incentives for both information revelation and the appropriate effort exertion. We ask the following question: is there a mechanism that can accomplish both goals if some additional information on performance (e.g., a noisy ranking of the team members' efforts) is available?[1]

The presence of asymmetric, private information enables informed team members to hide potentially inefficient effort choices with their private information. Intuitively, a privately informed player can pair a biased report of private information with a suitably chosen effort to manipulate the outcome.[2] In order for such behavior to be preventable, remuneration must be based on both the realized output and all privately informed team members' reports. Since the extended model also allows players to be ex-ante asymmetric, an efficient incentive scheme must be capable of personalizing incentives for every team member according to their role in the team. This applies to both effort exertion and reporting incentives but, again, the main problem is the added possibility of a concerted, combined deviation from efficiency along both dimensions.

The principal elements of our model are private information, unobservable efforts, and team structure.[3] As organizations and teams can be seen to exist precisely in order to resolve or process informational problems (Coase, 1937; Radner, 1962; Marschak and Radner, 1972), the introduction of asymmetric information into what is otherwise a standard team production problem seems to be natural. To fix ideas, consider a situation in which only one of the otherwise identical team members—whom we call the "team leader"—receives a private signal that affects the outcome of team production. This informed team member may not find it in her best interest to reveal this information truthfully to others. Our main result—which may be surprising given the classic inefficiency results of Holmström (1982) for moral hazard in teams and Hermalin (1998) for the adverse selection leadership case—shows that a team remuneration scheme exists that can overcome this "communications dilemma" and implement both efficient information sharing and subsequent efficient efforts even though efforts are not contractible. Apart from observed output and the leader's report, the derived sharing rule also depends on some statistic of exerted efforts,

[1] In the words of Groves (1973, p. 618) the problem is to induce players "to behave as a team, i.e., to send optimal information and make optimal decisions from the point of view of the organization objective." It is well known that the answer to our research question in the absence of additional information on team member efforts is negative. In particular, Holmström (1982) shows in a complete information framework that moral hazard is incompatible with efficiency if efforts cannot be observed.

[2] A privately informed player may, for example, be able to misrepresent her private information about joint productivity in order to deceive other team members into providing inefficiently high (or low) efforts while planning to capitalize on this response through a low (or high) effort herself.

[3] In team or partnership structures, partners share the profit among themselves. Thus, any incentive mechanism is subject to the constraint to balance the team's budget. Many other bilateral or multilateral contractual situations are also subject to similar implicit budget restrictions (Spulber, 2009, p. 57, p. 97).