Dynamic production teams with strategic behavior

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Abstract

We analyze if intergenerational teams reveal workers' productivities. Some uncertainty on agents' productivities persists when (i) each agent must work independently, or (ii) technological shocks are agent-specific in compulsory teams. However, when technological shocks are team-specific in compulsory teams, each worker's productivity is revealed. When agents choose to work independently or in teams, that problem falls in the class of dynamic games. Elective teams are preferred by high-productivity young workers when the technological shocks are agent-specific, and maximize the expected utility of a young worker when shocks are team-specific. © 2002 Elsevier Science B.V. All rights reserved.

1. Introduction

In this paper, we study the extent to which intergenerational teams can provide information on the productivity of workers in the long run. To do so, we consider heterogenous agents in a dynamic stochastic environment with information asymmetry between employers and employees. We compare the steady-state wages and expected utility under three possible work arrangements. In the first, each worker must work

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independently. In the second, two workers of different age are forced to work together. Finally, two workers of different age can choose freely between working together or independently. The third scenario requires that we compute the equilibrium work strategies and study how they are affected by a worker's age, reputation, productivity, as well as side payments.

Previous studies have generally assumed that an employer cannot isolate each worker's individual contribution to the team's output. In these models, some employees may shirk and cause moral hazard inefficiencies while the low productivity of others may be undetected.[1] Furthermore, these analysis are often carried out in a static framework while assuming that employees have no choice but to work in an exogenously given team. Our approach differs from the traditional team production literature in two respects. We use a fully dynamic framework to emphasize how persistence arising from intergenerational teams affects steady-state wages and utility. We also endogenize the decision to work or not in teams. This departs from the team literature which usually assumes the ex ante existence of production teams and focuses on the incidence of the ex post inefficiencies caused by asymmetric information between employees and employers.

To motivate our analysis of elective teams, consider as an example the decisions faced by these three co-authors. First, we were neither forced to work, nor prevented from working, together. Second, we are at different stages of our careers. Hence, this paper can be viewed as the output of an elective intergenerational heterogenous production team. Third, in deciding to work or not together, we balanced the costs and benefits of co-authorship. For a less established author, co-authorship may help signal his or her productivity, although there is always the possibility that a favorable outcome may be credited to the other members of the team. As for more established authors, they may use their reputation to earn side payments in exchange for co-authorship. However, their reputation may suffer if the team's output is unfavorable. Although employers may not value team-work per se, they will use the information from the team and its output to evaluate each individual's productivity. As a result, employees, in search of future higher wages and promotions, must choose their teams accordingly. Finally, co-authoring a research project may involve side payments. For instance, the difference in the amount of work done by each co-author may be seen as utility transfers between the co-authors.

The above representation is particularly fitting in the case of academic research. Scholars are seldom forced to work (or prevented from working) in teams. They usually choose with whom they want to work with, and for how long. Moreover, partially informative signals, such as publications, teaching evaluations, and the like, are used by the employer as a basis for promotion. Because individual contributions are harder to single out, high-productivity scholars may prefer to publish on their own leaving co-authorship to low-productivity scholars only. This does not

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[1] See Alchian and Demsetz (1972), Holmstrom (1982), Rasmusen (1987), and Sjöström (1996) on moral hazard inefficiencies, and McAfee and McMillan (1991), Itoh (1991), Meyer (1994) and Vander-Veen (1995) on the identification of low-productivity workers. See also Prat (1998) for related mechanism design issues.