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Evolutionary efficacy of a Pay for Performance scheme with motivated agents

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ABSTRACT

The paper studies the short-run and long-run effects of the introduction of a team-oriented Pay-for-Performance, P4P, payment scheme when agents may differ in their degree of intrinsic motivation toward the job. Suppose that new potential employees were able to assess the expected pay-offs of current workers. Then they may modify their approach to work in order to follow the employee type that earned the highest expected pay-off. We show that the definition of the scheme needs to take into consideration the effects produced on the evolution of the motivation of new generations. In particular the desirability and success of a P4P scheme strongly depend on the way incentives are allocated to the members of a team, on the power of the quality-related financial incentive and on the economic and social context in which the scheme is introduced. The analysis is in part motivated by the introduction in UK in 2004 of a P4P scheme for family practitioners in the UK (Quality and Outcomes Framework, QOF) and of a new system of assessing the quality of academic research completed in 2014 (Research Excellence Framework, REF).

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1. Introduction

The use of incentive schemes and in particular Pay for Performance (P4P) has been growing worldwide in the last two decades. Even more so recently due to the global economic downturn and the increased financial pressure created by austerity programs. Understanding the effects of the introduction of such a type of payment schemes is particularly important in light of the recent trend in public administrations,¹ universities worldwide² and health care sector³ to hire new employees on *temporary contracts* (or directly outsource some production processes). This tendency is creating a change in the way new generations of workers are hired and financially treated within the same organization compared to colleagues in previous

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¹ The uncertain and precarious condition of the jobs of younger generations is a recurring topic of spirited debate in Italy. http://www.ansa.it/web/notizie/collection/rubriche_english/10/18/Letta-vows-govt-give-hope-young-generations_9482975.html.

² In describing the temporary (and sometimes financial disadvantageous) nature of some academic contracts, the media have forged the term “disposable academic”. See <http://www.economist.com/node/17723223>, <http://www.theguardian.com/education/2013/sep/16/zero-hours-contracts-at-universities>, <http://www.aaup.org/report/heres-news-annual-report-economic-status-profession-2012-13>.

³ For example a General Practice in UK can be operated by salaried doctors and partners. See <http://careers.bmj.com/careers/advice/view-article.html%3Fid=20001005>.

generations. Nonetheless the economic literature has still to find a general consensus over the efficacy, the applicability and optimal implementation of such schemes. The recent and growing literature⁴ that studies the effects and desirability of the introduction of a P4P payment scheme on sectors that provide public services offers the following lessons (i) the introduction of a quality/performance-dependent payment scheme in general tends to have positive effects on the provision of quality; (ii) there is still room to improve the current P4P schemes (that in some cases might even produce negative effects in terms of quality provision,⁵ financial costs for the society⁶ and increase in geographic disparities⁷); (iii) more detailed theoretical and empirical studies of P4P schemes are still required.

When considering the effects of the introduction of a payment scheme, the literature in general focuses on static analysis. Most contributions describe how the contract defined by a Principal (the payer) may affect the behavior of an Agent (the provider of the service), usually in an environment of asymmetric information. We believe that to improve our understanding of the effects of the introduction of a P4P scheme, it is essential to consider also the dynamic effects that such a scheme may have on the different attitudes that agents may have toward their job and in particular their vocation.⁸ It is also critical to take into consideration how the effects may propagate within an organization given different contractual forms.

The market for health care and higher education may be good examples to make our point. In UK (be more precise) primary care is provided in General Practices usually operated by more than one doctor. In 2004 a P4P scheme for family practitioners (Quality and Outcomes Framework, QOF⁹) has been introduced. The performance (and consequently the QOF payment) of a *practice* depends on the aggregate effort invested by *all* doctors employed in the practice. Similarly Higher Education Departments in UK are evaluated (and funded) according to the research output of *all* their members.¹⁰ The agents that belong to such organizations may have different vocation, different concern toward the quality of the service that they provide or even different sensitivity toward the reputational effects produced by the organization's performance. For example, from the same population of doctors (i.e. same degree and ability), there might be doctors with a concern for the quality of the service provided (i.e. they may gain additional utility increasing in the quality their practice) and others who are in the market only for the financial pay. If agents who belonged to the two different types were randomly matched to work in the same practice, for example, it should be expected that they would employ different levels of effort in visiting patients and obtain in equilibrium different levels of utility for a given payment scheme that rewards organizations and not individuals. The difference in utility achieved by the two doctors would be common knowledge for young doctors who just graduated and are entering the market. Possibly their preferences (i.e. their vocational approach to the job) may be updated according to the indirect experience of their predecessors via, for example, some process of social/professional learning. Think alternatively of a Ph.D. student who has observed for 3/4 years the utility obtained by the members of staff in her academic department. If the non-vocational professors had consistently obtained higher payoffs than the altruistic colleagues, should the newly graduated student pursue a vocational approach in that department? If the introduction of a P4P scheme affected the payoffs and behavior of agents in one generation, it may also indirectly affect the approach to work of the future generations. Consequently we believe that to correctly assess and design an effective scheme it may be essential to consider also the dynamic effects that the introduction of payment scheme may produce. In other words a scheme may produce *positive* effects in the short run (when for example the quality of the service provided by a generation of workers could increase due to performance-dependent financial incentives), but *negative* effects in the long run (when new generations have re-assessed their approach to the job based on the payoffs obtained by the colleagues of the previous generations).

The paper is related to two strands of economic literature. The first focuses on issues related to the multi-agent Principal-Agent model and in particular to the desirability of the implementation of team-oriented Vs individual financial incentives. [Che and Yoo \(2001\)](#) consider repeated interaction between agents and the possibility that peer sanctions may work as implicit incentives within the organization. In their framework low powered (i.e. team oriented) incentives may perform better than relative performance incentives. [Dur and Sol \(2010\)](#) consider the role played by social interactions in fostering altruism between co-workers and show that both team-based and individual incentives may be desirable. [Kvaløy and Olsen](#)

⁴ The American experience is studied, among others, in [Dudley \(2005\)](#), [Rosenthal et al. \(2005\)](#), [Rosenthal and Dudley \(2007\)](#). The UK recent introduction of a pay-for-performance system for General Practices is described in [Roland \(2004\)](#), [Doran et al. \(2006\)](#), [Doran et al. \(2008\)](#) and [Maynard \(2012\)](#).

⁵ See for example [Bénabou and Tirole \(2006\)](#) and [Siciliani \(2009\)](#). If a P4P scheme introduced some form a reputational stigma, i.e. the improvement in medical quality were explained by the society only by the introduction of the financial incentives and not by any form of altruistic behavior or motivation from the doctors, then it might induce some physicians to reduce their efforts.

⁶ In particular when providers may find ways to *game* the system. See for example [Doran et al. \(2006\)](#) and [Doran et al. \(2008\)](#), [Gravelle et al. \(2010\)](#), [Kontopantelis et al. \(2012\)](#).

⁷ This may be the case when P4P schemes reward only the top performers and not the quality improvements of providers operating in more deprived areas.

⁸ We are not giving a precise definition of "vocation" on purpose in our setting. In the rest of the paper an agent with vocation will be concerned about the quality of the service that she provides. It may be for altruistic reasons (she enjoys to contribute to the welfare of consumers); it may be for motivational reasons (she is committed to the mission of the organization) and enjoys just doing her job; it may be for reputational reasons (she enjoys to work in an organization that it is recognized to performed well) and indirectly related financial reasons (she may obtain a better job in the future if being currently employed in a good organization). In the rest of the paper we are going to use the terms "vocation", "altruism" and "(intrinsic) motivation" interchangeably.

⁹ <http://www.hscic.gov.uk/qof>.

¹⁰ <http://www.ref.ac.uk/>.

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