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# The interaction of explicit and implicit contracts: A signaling approach<sup>☆</sup>



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## ABSTRACT

We analyze the interaction of explicit and implicit contracts in a model with selfish and fair principals. Fair principals are willing to honor implicit agreements, selfish principals are not. We investigate a separating equilibrium in which principals reveal their type through the contract offer to the agent. Explicit and implicit contracts are shown to be substitutes. Since the agent learns the principal's type, a selfish principal must rely on explicit incentives. A fair principal, by contrast, can effectively induce implicit incentives and does not need to use explicit incentives. We also find a strategic complementarity between explicit and implicit incentives.

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## 1. Introduction

Explicit (or formal) contracts are based on verifiable information and thus can be enforced by a court. Implicit (or informal) contracts instead rely on observable but nonverifiable information. Therefore, they cannot be enforced by a court and must be self-enforcing. There are two possibilities to model implicit contracts. First, an infinitely repeated game could be considered, in which implicit contracts are sustained by supergame strategies that involve some type of punishment if the contract is renege<sup>2</sup>. Second, in a static game it could be assumed that players have some form of other-regarding preference and therefore find it in their interest not to betray their co-player.<sup>3</sup>

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<sup>2</sup> See, among many others, MacLeod and Malcolmson (1989), Baker et al. (1994, 1999, 2002), Che and Yoo (2001) and Levin (2002, 2003).

<sup>3</sup> See, for example, Fehr and Schmidt (1999) and Bolton and Ockenfels (2000) for models on other-regarding preferences and James (2002) and Gürtler (2008) for how models on other-regarding preferences could be applied to the study of implicit contracts. Furthermore, note that there exist approaches to the study of implicit contracts that allow for other-regarding preferences in the context of an infinitely-repeated game (Kragl and Schmid, 2009; Dur and Tichem, 2014). Finally, notice that implicit incentives may result from a player's career concerns as well. In corresponding models, the player has an

Both explicit and implicit contracts are prevalent in practice. For instance, firms often tie employee compensation to objective measures of performance (such as total sales or the number of items produced) but also evaluate (and reward) employee performance subjectively. Competing firms may enter a formal contract to govern a research cooperation and, at the same time, use implicit contracts to sustain high prices for their products. Because of the prevalence of the two types of contract, it is important to understand whether the existence of formal contracts simplifies the sustainment of implicit contracts or, in other words, whether formal and informal contracts are complements or substitutes. Several papers have addressed this question. [Baker et al. \(1994\)](#) and [Schmidt and Schnitzer \(1995\)](#), for example, demonstrate that, depending on the economic environment, both types of relationship are feasible and that the existence of explicit contracts may make implicit contracts easier or more difficult to sustain. Papers analyzing the interaction of explicit and implicit contracts typically belong to the first class of models, in which implicit contracts are sustained within the framework of an infinitely repeated game. Instead, the current paper addresses the problem by considering a model with players who honor implicit contracts because of other-regarding preferences. In this way, we aim to highlight different effects and obtain new insights into the functioning of implicit contracts and their relation to explicit ones. This approach is also relevant because many experimental results suggest that other-regarding preferences are an important driver of individual behavior.<sup>4</sup>

In our model there is a principal and an agent. The agent chooses effort to produce output that accrues to the principal. Output is nonverifiable and can only be used in an implicit contract. The principal can, however, monitor the agent, in which case the latter must choose a certain minimum level of effort that is enforceable by a court. There are two types of principal. One type is selfish and would not keep any promise to pay the agent an output-dependent reward. The second type also cares for the agent's wellbeing. This type of principal is called fair and is willing to reward the agent for high output. Initially, the agent does not know the principal's type. Therefore, implicit incentives based on output are not very effective, because the agent encounters the risk of facing a selfish principal and not being rewarded for good performance. Under certain circumstances, however, there exists a separating equilibrium, in which both types of principal offer different contracts to the agent so that the agent learns the principal's type from the contract offer. We study this type of equilibrium in detail and find that explicit and implicit contracts are substitutes. Since the agent learns the principal's type, a selfish principal cannot credibly promise to honor an implicit contract. Instead, he has to rely on monitoring (i.e., on using explicit incentives). A fair principal, by contrast, can effectively induce implicit incentives and hence does not need to monitor the agent. Interestingly, if a selfish principal can rely on more effective explicit incentives, it becomes more likely that a fair principal can be separated from the selfish type. This means that the possibility of offering better explicit incentives for one type of principal allows the other type of principal to offer more effective implicit incentives. In this sense, there is a strategic complementarity between explicit and implicit incentives ([Bulow et al., 1985](#)). Note that the possibility of signaling the own type through the contract offer is crucial for explicit and implicit incentives to be substitutes, but strategic complements in our model. This observation highlights that our paper provides insights that go beyond those of infinitely repeated models, which assume player types to be commonly known and implicit contracts sustained through the threat of retaliation.

The remainder of the paper is organized as follows. The next section discusses related literature on this topic. In [Section 3](#), the model is presented and in [Section 4](#) it is solved. [Section 5](#) concludes. All formal proofs can be found in [Appendix A](#).

## 2. Related literature

Closely related to the current paper is the study by [Sliwka \(2007\)](#), who considers a principal–agent model with three types of agent: selfish agents who want to maximize their payoff, fair agents who take the principal's payoff into account besides their own payoff, and conformist agents who are either selfish or fair, depending on what they believe most other agents to be. It is assumed that the principal privately knows the proportion of each agent type. [Sliwka \(2007\)](#) shows that under certain conditions there exists a separating equilibrium in which the principal does not offer a performance contract if and only if the majority of the agents are fair. By not offering a performance contract, the principal thus “turns” the conformists into fair agents. By offering a performance contract, the principal instead signals that the majority of agents are selfish and that he distrusts the agents.<sup>5</sup> If, in the current paper, the principal decides to monitor the agent, he signals that he himself is selfish and cannot be trusted to fulfill an implicit contract. In this sense, the result is exactly opposite to that in [Sliwka \(2007\)](#).<sup>6</sup> Since implicit contracts cannot be sustained, there is a cost for monitoring the agent. Therefore, the paper is also related to the study by [Falk and Kosfeld \(2006\)](#), who use experimental data to show that there is a cost of control. However, they also argue that control signals distrust of the co-player and not of the player himself.

A micro-foundation for the experimental results presented in [Falk and Kosfeld \(2006\)](#) is provided by [Ellingsen and Johannesson \(2008\)](#). [Ellingsen and Johannesson \(2008\)](#) consider a principal–agent setting and assume that players have

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incentive to choose a certain action to favorably affect the market perception regarding his characteristics ([Holmström, 1982](#); [Dewatripont et al., 1999a,b](#); [Irlenbusch and Sliwka, 2006](#)). A contract is not needed to incentivize the player so that the problem of contract enforcement does not arise.

<sup>4</sup> See [Fehr and Schmidt \(1999\)](#) and references therein.

<sup>5</sup> In a multitask principal–agent model [Herold \(2010\)](#) obtains a similar result. He finds that offering a contract to induce incentives on one task signals distrust to the agent so that the agent reduces effort on the other task.

<sup>6</sup> Note furthermore that in the [Sliwka \(2007\)](#) model the existence of conformist players is crucial to the results. In the current paper, we confine our attention to fair and selfish players and still are able to demonstrate the existence of a separating equilibrium with different principal types offering different contracts.

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