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ABSTRACT

I propose a new channel of spinoff (firm formed when an employee leaves to set up his own firm) formation in which the returns from spinning off are determined endogenously. If high ability workers are scarce, then despite the principal's ability to offer contracts (endogenous cost of signaling), there exists a separating equilibrium where the high type worker signals his ability by forming a spinoff. This result provides theoretical support to the empirical findings of Skogstrøm (2012). When moral hazard is introduced in the baseline model of adverse selection, I show that the spinoff equilibrium can generate the strongest incentives to work. This has policy implications for non-compete clauses.

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1. Introduction

Employees often leave their firm to form a rival firm of their own. Firms formed in this manner are called intra-industry spinoffs and the firms from which they spawn are called parent firms². Such firms have been observed in industries ranging from semiconductors (National, AMD, Intel are all spinoffs) to automobiles (Klepper, 2007) to law firms (Phillips, 2002). The recent literature on spinoffs has focused on the explanation that most spinoffs come about when an employee gets a new idea privately, and then forms the spinoff because of asymmetric information about the idea's profitability (the employee knows more than the employer) - (Anton and Yao, 1995; Chatterjee and Rossi-Hansberg, 2012; Klepper and Thompson, 2010). The intuition here is that asymmetric information about the quality of the idea implies that ideas with above av-

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² There is some disagreement in the literature about the definition of spinoffs. In this paper, I do not consider "sponsored spin-offs" (Cooper, 1971) in which a parent firm voluntarily establishes and holds stocks in a newly formed company intended to perform some of the business of the parent company. Also, for convenience, I will be dropping the words 'intra-industry' for the rest of this article.

erage returns are implemented in spinoffs since the employer/market will not pay more than the expected return for an idea.

To the best of my knowledge, all papers in the spinoff literature assume that the benefit from forming a spinoff is exogenously given³. This assumes that customer *perception* about the new firm's quality does not matter. However, this may not be true when the profitability of the idea is privately known to the worker only. Even if a worker has a good idea, if the market believes that the idea is likely to be bad then the worker will not be able to get high profits when he forms the spinoff⁴. In this paper, I will present a model in which market perception about the quality of the new firm matters, and therefore, signaling plays a big role in determining the profits that can be earned from forming a new firm.

This paper makes three contributions to the literature. One, I suggest a different channel of spinoff formation based on signaling and reputation concerns. In particular, I demonstrate a new reason for firm formation amongst under-signalled workers (those who are high ability but are perceived to be low type). Thus, this paper does not endeavour to explain spinoffs by workers who are already known to be high ability (like scientists or engineers). Instead, I look at workers who are (incorrectly) *perceived* as low ability, like those high ability workers who are not highly educated. This leads to the primary question of this paper - if the worker type is known only to the worker, under what conditions can high ability workers signal their type to the market by forming their own firms? It is important to answer this question for the following reasons. One, asymmetric information about the worker's type and contracting limitations⁵ may lead to the high ability worker receiving wages which are much lower than his marginal product. Not only does this reduce the welfare of the high type worker, it could also hamper the regional economy by encouraging brain drain⁶.

The second contribution of this paper is to demonstrate a new effort inefficiency which may be inherent in non-compete clauses. If good workers get low wages because they are believed to be low ability, then they may not find it incentive compatible to exert high effort. I introduce moral hazard in my baseline model of adverse selection and show that the equilibrium with the spinoff outcome can generate the highest incentives to work. This has implications for policy on covenants not to compete since they restrict signaling behaviour by disallowing the worker from forming a competing firm.

Finally, my model of firm formation may be able to explain some empirical observations better than other models⁷. Skogström (2012) uses Norwegian data to show that entrepreneurship rates are particularly high among workers with low education and high ability⁸. This is consistent with my results because high ability workers with low education may be perceived as low ability workers. In this case, as Proposition 1 points out, the high ability-low education worker can improve his payoff by becoming an entrepreneur. I further discuss the relation between my results and the Norwegian data in Section 6.7.

I consider a two period principal-worker model (how the results may extend to an infinite horizon model is discussed in Section 6.3). The worker may be good or bad. The type is known only to the worker. The worker needs to perform a job, and while the good type worker always succeeds⁹ at the job, the bad type worker succeeds with a lower probability. The outcome of the job is publicly observed after each period. At the beginning of each period, the worker may accept a one period contract from the principal or form his own firm. Setting up a firm is costly and requires a one time investment¹⁰. If the worker forms his own firm he has to incur a one time fixed cost of R_w (interpret this as the cost of acquiring permissions) whereas if the worker accepts the contract offered by the principal, the principal incurs a fixed one time cost of R_p ¹¹. I assume that the principal is better suited to form the firm i.e. $R_w > R_p$ ¹².

³ At least the mean payoff from spinning off is known to the worker in these papers. In the literature section, I will talk about dynamic signaling papers like Bar-Isaac (2003) where the value of the seller's output depends upon signaling and reputation.

⁴ The worker who forms the spinoff may earn high profits in the long run as the market will update its belief about the quality of the idea/service after they see a series of good outcomes. However, short run payoffs will be strongly affected by customer perception about the quality of the new firm, and these could be crucial if the worker-entrepreneur is not infinitely patient.

⁵ A contract cannot ask a worker to pay to work, or charge the worker for failing. Also, the principal may not be able to commit to long term outcome contingent contracts.

⁶ It is not hard to imagine that if high ability workers are paid low wages because they are thought to be low type then they might leave to try their luck elsewhere. In India for example, numerous stories abound of low caste people moving away from their village (where they were known to be low caste and therefore believed to be worthy of only lowly jobs). Obviously, escape from oppression was their primary aim. However, it must be a factor that they could earn better in another place where the belief about their ability was not so biased.

⁷ A caveat here. Identification of the cause of entrepreneurship is extremely difficult owing to the many possible explanations. In particular, unless explicitly asked in the survey, it is not easy to distinguish between entrepreneurship because the worker wanted to be his/her own boss, and any other reason. This will be especially true if 'wanting to be your own boss' is correlated with ability.

⁸ Ability is measured by an armed forces test every male has to take in Norway.

⁹ This particular formulation is not essential for the qualitative results - see Section 6.4.

¹⁰ In general, a model of spinoffs has a principal and a worker where the worker works for the principal's firm. However, since the worker may have some fixed costs of firm formation and the principal may also have some fixed costs of operations (like getting/renewing licenses), I have simplified this environment and assumed that the principal is trying to recruit a worker and both have a fixed (but different) cost of firm formation.

¹¹ It may be asked - If the worker was working for the principal, why did he not form his firm before? The opportunity to form a firm comes very rarely. For example, Blanchflower and Oswald (1998) point out that people who get inheritances are more likely to be entrepreneurs. Obviously, these are somewhat random events. In terms of the model, the cost of firm formation may be prohibitive for the worker in most periods until that one period when it becomes feasible for the worker to incur this cost. I start my analysis at this period.

¹² This can be interpreted as a difference in networks, that is, the principal may know the right people which would guarantee that the principal can form his firm more easily.

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