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Human capital investment, new firm creation and venture capital ☆

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ABSTRACT

This paper studies the relation between firm investment in general human capital, new firm creation and financial development for new firm financing, such as the existence of a venture capital industry. On one hand, firm investment in general human capital leads employees to generate new innovative ideas for starting their own firm. Since employees need a venture capitalist to start their new firm, firm investment in general human capital encourages the creation of venture capitalists by increasing the need for their services, such as providing advice and monitoring. On the other hand, as new firm financing becomes available, firms' willingness to invest in general human capital increases, and as a by-product, the creation of employee-founded and venture capital-backed new firms increases in the economy. Hence, our model provides a rational explanation for the emergence of new firms created by employees of established firms, which represents one of the most common type of new firms in many industries.

1. Introduction

There is mounting evidence that established firms represent one of the most important source for the creation of new firms in the economy. For example, Bhide (1994) finds that 71% of entrepreneurs found their start-ups by replicating or modifying an idea they encountered at their previous

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employment. Garvin (1983) documents that firms started by a former employee of an established firm are the most prevalent source of entrepreneurial start-ups especially in high-tech and human capital intensive sectors. In the disk drive industry, for example, many of the start-ups were created by the employees of IBM, including Century Data, Memorex, Pertec and Storage Technology Corporation. This industry experienced a very high rate of entry by start-up firms and an extremely rapid rate of innovation from 1956 to 1997 (Christensen, 1993). Gompers et al. (2005) provide further evidence on the role of established firms in the creation of employee-founded new firms. This paper documents that public firms located in Silicon Valley and Massachusetts contribute to the creation of new firms by training, educating and preparing their employees for entrepreneurship. In addition, the paper finds that 45% of all entrepreneurs in venture capital backed start-ups comes from publicly traded established firms. Similarly, Beckman et al. (2002) argue that most start-ups are founded by people who have spent many years working for established firms.

This evidence raises interesting questions: What explains the emergence of employee-founded firms where employees of established firms depart their current firm to start their own firm? How do established firms benefit from encouraging innovation activity in their organization if it results in the loss of their valuable employees? How do established firms contribute to and benefit from financial development such as the existence of an active venture capital industry? This paper addresses these questions by modeling the relation between firm investment in general human capital, new firm creation and financial development for new firm financing. In the model, firm value depends on employee-generated innovations where the employee exerts costly effort to generate innovative ideas. The employee faces a classic hold-up problem where he shares the payoff from his innovations with his firm ex post, and hence, underinvests in innovation effort ex ante. The firm decides whether or not to invest in general human capital of its employee. Human capital investment provides the employee with the option to leave the firm and to start his own firm, and increases his rent extraction ability from his current firm. Hence, investment in general human capital mitigates the extent of the hold-up problem, and leads to greater employee incentives ex ante to exert effort. The firm benefits from its human capital investment since stronger employee incentives translate into greater probability of firm specific innovations. However, human capital investment is also costly for the firm for two reasons. The first is that it introduces the possibility for the employee to generate general innovations, which fall outside the core business of the firm. The employee with such an innovation leaves his current firm to start his new firm. Hence, the firm bears the cost of losing its employee. The second cost is that since the investment provides the employee with an outside option of leaving his current firm to start his new firm, this outside option lowers the firm's ex post rents from firm specific innovations. When the benefit of the investment in terms of stronger employee incentives outweighs its costs, the firm finds it optimal to invest in general human capital. If the firm chooses not to invest in general human capital, it does not lose its employee, but this comes at the cost of weaker employee incentives and lower firm specific innovation probability.

Our paper also suggests that firm investment in general human capital may have a positive effect on the availability of start-up financing such as an active venture capital industry. Investment in general human capital leads employees to generate new business ideas for starting their own firm. Since employees need a venture capitalist (VC) to start their firm, investment in general human capital increases incentives to become a VC by increasing the supply of employees in need for a VC. Similarly, and perhaps less intuitively, it becomes more desirable for firms to invest in general human capital when the level of financial development for new firm financing increases. The intuition behind this interaction is that having access to new firm financing makes it more desirable for employees to exert effort, generate a new business idea and start their own firm. This increases ex ante incentives (effort level) of the employees, some of whom end up generating firm specific innovations and staying with the firm. As a result, availability of start-up financing has a positive effect on the likelihood of firm specific innovations and on firms' willingness to invest in general human capital. Hence, in our model, financial development in terms of availability of new firm financing and firms' willingness to invest in general human capital are complementary to each other. This result is related to the idea in Hellmann (2007) who discusses how external factors such as obstacles to start a new firm, property right protections and availability of new firm financing affect established firms' policies towards employee innovations. Hellmann (2005) focuses specifically on the relation between the availability of VC