

Severity of financing constraints and firms' investments[☆]

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Abstract

According to standard investment theory, the current investments of more financially constrained firms should be smaller than those of less constrained firms with similar investment opportunities. In this paper, I develop a dynamic investment model in which the project value and the severity of financing constraints can vary over time. My results contradict standard theory. To preempt further financing risk in the future, severely constrained firms may engage in more active investment behavior even if they face relatively high additional financing costs at the time. My numerical example demonstrates that a relatively low probability of future risk is sufficient to cause such preemptive behavior.

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1. Introduction

In a frictionless financial market, funds flow efficiently to firms with profitable investment opportunities. This proposition implies that in such an ideal financial market, firms with the same investment opportunities can undertake the same number of investment projects and on average will grow

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at the same rate. However, in actual financial markets, some serious imperfections, such as informational asymmetries and contractual incompleteness, can arise. Recent investment theories argue that, given such imperfections, the current investments of firms could be constrained by firm-specific financial variables or characteristics other than their investment opportunities that would be irrelevant in a world of perfect and complete financial markets (*e.g.*, Bermanke & Gertler, 1989; Fazzari, Hubbard, & Petersen, 1988; Kiyotaki & Moore, 1997; Tirole, 2005).¹

According to recent standard investment theories, therefore, if there are serious imperfections in the financial markets and they face different degrees of financing constraints, then even two firms with the same investment opportunities do not necessarily grow at the same rate. Rather, because of its poorer financial status, the current investment level of a more constrained firm is expected to be invariably lower than that of a less constrained one. More generally, standard investment theory predicts that depending on the severity of their financing constraints, there is a monotonic ordering of firms' investment levels. Such a theoretical prediction seems entirely plausible, because in general, the more severely a firm is financially constrained (either in the form of credit availability constraints or in the form of additional financing costs), the fewer are the states in which the firm is willing or able to invest.²

The purpose of this paper is to reexamine the theoretical robustness of the monotonic order hypothesis in standard investment theory. In particular, I examine whether it is conceivable for a more severely constrained firm to grow faster (*i.e.*, invest more or earlier) than a less constrained one; I also consider under what, if any, condition such a possibility may arise. For this purpose, I develop a dynamic investment model in which differently constrained firms determine when to undertake irreversible investment projects while at the same time considering their current and future financial status. In this model, I allow not only the project value, but also the severity of firms' financing constraints, to vary over time. Through model analysis and by developing a numerical example, in this paper, I show that it is possible that more severely constrained firms decide to undertake a risky investment project earlier than do less constrained firms with similar investment opportunities.

To examine the possibility of a nonmonotonic ordering of investments, I consider the investment behavior of three different types of firm: a financially unconstrained firm (UC firm); a financially constrained firm (C firm); and a severely constrained firm (SC firm). The UC firm in my model is defined as a firm that is not affected by financial market imperfections. The C firm and the SC firm do experience financial market imperfection problems. Both C and SC types of firm have insufficient internal funds of their own and thus incur additional costs of raising external funds. The main difference between the C firm and the SC firm relates to the stability of their financial status: the SC firm not only experiences current higher financing costs, but it also faces the risk of not being able to obtain financing in the future; by contrast, the C firm does not face such a risk. I assume that once such a no-financing constraint occurs, the investment financing costs of the SC firm jump so significantly, becoming virtually infinite, that the firm can no longer implement its investment project.

¹ Hubbard (1998) presents a useful survey of the literature that analyzes the effects of capital market imperfections on firms' investments.

² Such monotonicity would also arise in a firm's investment activity over time. In fact, a number of recent empirical studies that investigate the effects of financing constraints on firms' investments by examining differences in investment—cash flow sensitivities incorporate the assumption that there is a monotonically negative relationship between a firm's current investments and the severity of its contemporaneous financing constraints (*e.g.*, Fazzari et al., 1988; Fazzari, Hubbard, & Petersen, 2000; Hoshi, Kashyap, & Scharfstein, 1991; Hubbard, 1998; Schaller, 1993).

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