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Taxation of uncertain business profits, private risk markets and optimal allocation of risk ☆

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Abstract

In this paper we explore what happens if the government bears some of the risk through a profit tax when the risk sharing in the venture capital market is incomplete due to non-observability of effort and moral hazard. If the external equity investors can enforce exclusive contracts with the entrepreneurs, the risk relief through a profit tax will lead to too much insurance and too low effort as compared with a second best optimal solution. Bond and Devereux [Bond, S.R. and Devereux, M.P. (1995). On the design of a neutral business tax under uncertainty. Journal of Public economics, 58, 57–71.] show that a proportional profit tax would be neutral in the absence of moral hazard. In the presence of moral hazard we demonstrate that the tax may affect the risk shifting through the market, in which case the premise for the neutrality result will no longer hold.

JEL classification: D82; G24; H25
Keywords: Public policy; Moral hazard; Venture capital

1. Introduction

Many investment projects, for example within the IT area, are highly risky. Typically, there is a small probability for the project to succeed, in which case it is expected to earn a sizeable profit, and a corresponding high probability of project failure. If the project requires specialized equipment and competence, the investment is not recoverable if the project fails. The intangible nature of investment in specialized knowledge entails that such investment must be financed mainly by

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equity, either in the external equity market by seeking funding from outside equity investors or by resorting to internal equity finance. The latter is limited by the entrepreneur's own resources.

The risk market that we consider in this paper is the market for external equity. It may be difficult or costly for external equity investors to observe the effort that the entrepreneur invests in his project in order to make the project succeed. This problem may be aggravated by the fact that the entrepreneur's own effort may be vital for a successful result. However, as effort is costly, financing by outside equity weakens the incentives for the entrepreneur as the outside equity holders share in the returns due to extraordinarily high efforts and cover part of the losses due to low effort. Thus, providing risk relief to the entrepreneur gives rise to moral hazard which increases the probability that the project will fail. This problem could be overcome if the outside equity investors could deduce the effort from the outcome of the project. In that case the economic terms for outside equity could be conditioned on outcome, which would be equivalent to conditioning on effort. In order to preclude that possibility we assume that entrepreneurial effort only affects the probability of the outcomes and not the outcome size.

The aim of the present paper is to explore to what extent public policy, and in particular tax policy, will affect risk taking and effort choice by an entrepreneur in the presence of moral hazard. Of particular interest will be the resulting risk allocation when a risk absorbing profit tax interacts with risk shifting in the financial market. We demonstrate that if private risk markets coexist with governmental measures for risk relief, implemented through a profit tax, this will generally alter the equilibrium compared with the no tax situation. This result is in contrast to Buchholz and Konrad (2000) and Keuschnigg and Nielsen (2004), confirming the neutrality of a non-redistributive proportional tax. The non-neutrality result in our paper is due to the fact that external equity investors do not fully internalize the moral hazard cost from increased insurance as part of the cost is borne by the government through the tax system. In the present context a profit tax is equivalent to a cash flow tax. Hence, our results also relate to the discussion on the design of a neutral tax on uncertain profits. As shown by Fane (1987) and Bond and Devereux (1995), a cash flow tax will be neutral also in the presence of risky profits if the market allocation of risk is unaffected by the cash flow tax. However, when risk markets are incomplete because of moral hazard, entrepreneurs have to bear some idiosyncratic risk that would otherwise be washed away in complete risk markets.

There is a related literature on the effects from moral hazard in insurance markets with contributions by a.o. Stiglitz (1983), Arnott and Stiglitz (1988), Kaplow (1991) and Kahn and Mookherjee (1998). Except for Kaplow (1991) these papers do not address explicitly the interaction between market and public provision of insurance. Kahn and Mookherjee (1998) show in a setting with non-exclusive contracts between the entrepreneur and the external investor that a profit tax would only crowd out risk relief provided by the private market. We argue in the present paper that a proportional profit tax might alter the equilibrium risk allocation compared to the no tax situation.

The paper is organized as follows. In Section 2 we use a simple model to discuss an entrepreneur's optimal supply of effort in a situation with a private risk market and exclusive risk-sharing contracts. In Section 3 we establish our core result that risk shifting through the tax system in conjunction with a risk market will lead to too much risk relief and too little effort. Section 4 discusses some related results in the literature, while Section 5 concludes.

2. The model

We employ a simple model for discussing these issues. We consider a sector where there is a large number of entrepreneurs facing identical investment opportunities with uncertain returns.