Endogenous market incompleteness
with investment risks

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Abstract

This paper studies a general equilibrium economy in which agents have the ability to invest in a risky technology. The investment risk cannot be fully insured with optimal contracts because shocks are private information. We show that the presence of investment risks lead to under-accumulation of capital relative to an economy where idiosyncratic shocks can be fully insured. We also show that the availability of state-contingent (optimal) contracts – compared to simple debt contracts – brings the aggregate stock of capital close to the complete markets level. Institutional reforms that make possible the use of these contracts have important welfare consequences.
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1. Introduction

A large body of literature that studies the saving behavior in the presence of uninsurable idiosyncratic risks assumes that these risks are not associated with

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investment. As in Bewley (1986), the most common assumption is that earnings or endowments are subject to shocks that cannot be insured away. This is the assumption in papers such as Aiyagari (1994, 1995), Hansen and Imrohoroğlu (1992), Huggett (1993, 1996), Imrohoroğlu (1989), Ríos-Rull (1994). In this class of models, the inability to fully insure the idiosyncratic risk implies that the equilibrium interest rate is lower than in the complete markets economy, whether market incompleteness is taken as given or modeled endogenously. Because the interest rate is equal to the marginal productivity of capital, this also implies that the stock of capital is higher than in the complete markets economy (over-accumulation).

Although earnings or labor income uncertainty is an important source of idiosyncratic risk, investment activities are also subject to uninsurable risks. For instance, entrepreneurs invest heavily in their own business[1] and managers of corporations hold a large number of the company's shares.[2] Even the return from investing in education is highly uncertain and cannot be insured away. What differentiates investment risks from earnings or endowment risks is that the agent can avoid these risks by choosing safer allocations of savings. On the contrary, earnings or endowment risks in the class of Bewley's economies are beyond the control of the agent. The agent can only use the available markets to (incompletely) insure them.

The goal of this paper is to model explicitly investment risks. We consider three environments. In the first environment – the 'Optimal Contract Economy' – agents can sign optimal state-contingent contracts. These contracts, however, cannot provide full insurance because there are agency problems in the form of asymmetric information. Therefore, in this economy market incompleteness is endogenous. In the second environment – the 'Bond Economy' – agents cannot sign state-contingent contracts. Only non-contingent contracts (borrowing and lending) are available. In the third environment – the 'Complete Markets Economy' – there are no agency problems, and therefore, full insurance against investment risks is possible.

By comparing these three economies we show that:

1. In the two economies with incomplete markets (the Bond Economy and the Optimal Contract Economy) the equilibrium risk-free interest rate is smaller than in the Complete Markets Economy. However, the aggregate stock of capital is smaller than in the Complete Markets Economy, i.e., there is under-accumulation.

2. Even with very large agency problems, the availability of optimal contracts brings the aggregate stock of capital and the equilibrium interest rate very close to the corresponding levels in the Complete Markets Economy. As a result, the feasibility of optimal contracts increases welfare significantly.

The model studied in this paper has some similarities with the model studied by Khan and Ravikumar (2001). There are two important differences. The first

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[1]See Cagetti and DeNardi (2002), Carroll (2002), Gentry and Hubbard (2000), Hurst and Lusardi (2004) and Quadrini (1999).

[2]See Mikkelson et al. (1997) and Himmelberg et al. (2000).