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Uninsured idiosyncratic production risk with borrowing constraints

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Abstract

This paper analyzes a general-equilibrium model of a heterogeneous agents economy in which the agents are subject to borrowing constraints and uninsurable idiosyncratic production risk. In particular, it addresses the impact of these frictions for aggregate capital accumulation. In contrast to other studies, the results suggest that, when entrepreneurs are poorly diversified, the underaccumulation of capital in the entrepreneurial sector of the model economy is less likely to hold, because of a strong precautionary savings motive. Furthermore, the effect of these frictions on entrepreneurial investment exacerbates the overaccumulation of capital in the non-entrepreneurial sector of the economy.

JEL classification: E22; G11; M13

Keywords: Incomplete markets; Precautionary saving; Entrepreneurial investment; Borrowing constraints; Aggregate savings

1. Introduction

This paper investigates the importance of uninsured idiosyncratic production risk and borrowing constraints, by the firm owned by the entrepreneur, for aggregate

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capital accumulation. More specifically, I study the implications of the lack of diversification in entrepreneurs' earnings for aggregate capital accumulation. This is important, in this setting, for the following reasons. First, the volatility of entrepreneurial earnings is substantially larger than that of wages from paid employment (Hamilton, 2000). Second, the portfolio of entrepreneurial households is biased towards their business (Gentry and Hubbard, 2004), which makes their equity return highly correlated with their human capital return (Moskowitz and Vissing-Jørgensen, 2002). This paper shows that, when borrowing constraints exist, and in the presence of uninsurable investment risks with poorly diversified entrepreneurs, I obtain a higher steady-state level of capital in the entrepreneurial and non-entrepreneurial sectors of the economy. The driving force of this result is the lack of diversification in entrepreneurs' earnings, which generates strong precautionary savings, and leads to overaccumulation of capital in the entrepreneurial sector. Because entrepreneurs accumulate a buffer stock of wealth and are relatively wealthy households, they also exert a large influence on the accumulation of capital in the non-entrepreneurial sector. Understanding this mechanism is useful for analyzing important issues in macroeconomics, particularly the implications of incomplete markets for asset pricing and business cycles.

To illustrate this mechanism, I use a general-equilibrium model of entrepreneurial investment in which agents are subject to uninsurable production risk and borrowing constraints. In the model, a large number of entrepreneurs are able to pursue different investment portfolio choices. In particular, entrepreneurial wealth is allocated between a risky and a safe investment. The return on the risky investment is subject to uninsurable idiosyncratic productivity shocks. The return on the safe investment is the equilibrium interest rate. I introduce borrowing constraints as a *short-sales* constraint on the safe investment. Also, the only source of non-stochastic earnings is the return on the safe investment.

In the presence of uninsurable production risk, risk-averse entrepreneurs prefer an investment portfolio biased towards the safe investment. More specifically, in the absence of binding borrowing constraints *and* when the return on the safe investment is not affected by the entrepreneurs' investment decisions, there is underaccumulation of capital in the risky investment. In general equilibrium, however, precautionary savings by all entrepreneurs increase the demand for the safe investment, which lowers its equilibrium return. This, in turn, increases the attractiveness of the risky investment relative to the safe investment, and weakens the underaccumulation result.

Borrowing constraints play a key role in the model: they make it more difficult for the entrepreneur to smooth consumption, which increases the desire to save more in general (precautionary savings). An increase in demand for the safe asset leads to a decrease in the equilibrium interest rate, because the safe asset is in zero net supply. Consequently, the risky investment becomes even more attractive and, in equilibrium, if the precautionary savings effect is strong enough, entrepreneurs accumulate excess capital in the steady state. In almost all cases considered, these two frictions yield a higher steady-state level of entrepreneurial capital than in the