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An Asset Pricing Model with Production under Limited Liability, focus on Effects of Aggregate Risk and Wealth Distribution

Master's Thesis

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Executive Summary

In this thesis I study a model and its competitive equilibria of an infinite-horizon production economy extended from the endowment economy model of Chien and Lustig (2010). I extend their model by introducing endogenous production sector and a central financial intermediary, while keeping other parts mostly unchanged. The model considers an economy with a continuum of ex ante identical agents who have CRRA utility with risk aversion coefficient γ, a large number of competitive firms and a central financial intermediary. There is a single perishable consumption good and a perfectly durable Lucas tree in this economy. All factor markets are competitive. Firms face only aggregate risk that affects production output. Agents face both aggregate and idiosyncratic income risk, thus they are ex post heterogeneous in the sense of idiosyncratic risk. The financial market is complete and agents have access to a complete menu of contingent claims. These agents can declare themselves bankrupt and walk away from their debts, their holdings of Lucas tree serve as collateral and it is paid back to the lender in case that the borrower defaults. Due to this limited-liability technology a new risk factor beyond the aggregate risk — liquidity risk — appears, which is created by binding solvency constraints. Chien and Lustig (2010) provide a computational algorithm to solve the equilibrium of their endowment model, nested on their model and algorithm I develop an algorithm for solving the equilibrium of the production economy model and the calibration results are comparable to those of Chien and Lustig (2010).