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# Heterogeneous Risk Preferences in Financial Markets

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## Abstract

This paper builds a continuous time model of  $N$  heterogeneous agents whose CRRA preferences differ in their level of risk aversion and considers the Mean Field Game (MFG) in the limit as  $N$  becomes large. The model represents a natural extension of other work on heterogeneous risk preferences (e.g. Cvitanic, et. al., (2011) "Financial Markets Equilibrium with Heterogeneous Agents". *Review of Finance*, 16, 285-321) to a continuum of types. I add to the previous literature by characterizing the limit in  $N$  and by studying the short run dynamics of the distribution of asset holdings. I find that agents dynamically self select into one of three groups depending on their preferences: leveraged investors, diversified investors, and saving divestors, driven by a wedge between the market price of risk and the risk free rate. The solution is characterized by dependence on individual holdings of the risky asset, which in the limit converge to a stochastic flow of measures. In this way, the mean field is not dependent on the state, but on the control, making the model unique in the literature on MFG and providing a convenient approach for simulation. I simulate by path monte carlo both the finite types and continuous types economies and find that both models match qualitative features of real world financial markets. However, the continuous types economy is more robust to the definition of the support of the distribution of preferences and computationally less costly than the finite types economy.

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