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*Climate Risk, Securitization, and Equilibrium Bond Pricing*

We propose a method of pricing financial securities written on non-tradable underlyings such as temperature or precipitation levels. To this end, we analyze a financial market where agents are exposed to financial and non-financial risk factors. The agents hedge their financial risk in the stock market and trade a risk bond issued by an insurance company. From the issuer's point of view, the bond's primary purpose is to shift insurance risks related to non-catastrophic weather events to financial markets. As such its terminal payoff and yield curve depend on an underlying climate or temperature process whose dynamics is independent of the randomness driving stock prices. We prove that if the bond's payoff function is monotone in the external risk process, it can be priced by an equilibrium approach. The equilibrium market price of climate risk and the equilibrium price process are characterized as solution of non-linear backward stochastic differential equations. Transferring the BSDEs into PDEs, we represent the bond prices as smooth functions of the underlying risk factors.

The talk is based on joint work with Matthias Muller.