A Numeraire-Independent Version of the Fundamental Theorem of Asset Pricing

Johannes Ruf

University College London

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The Fundamental Theorems of Asset Pricing are aptly-named results that show the relationship between absence of arbitrage and the martingale property. These theorems are fundamental to mathematical finance in that they provide the bridge between the mathematics and the finance: on the one side, the mathematical objects of stochastic processes and martingale measures; on the other the financial ideas of trading strategies and arbitrage. We aim to widen the bridge to cover cleanly the case when there are multiple financial assets, any of which may potentially lose all value relative to the others. To do this we shift away from having a pre-determined numeraire to a more symmetrical point of view where all assets have equal priority.

Joint work with Travis Fisher and Sergio Pulido.