

# Generalised Sharpe Ratios and Asset Pricing in Incomplete Markets

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## Abstract

The paper presents an incomplete market pricing methodology generating asset price bounds conditional on the absence of attractive investment opportunities in equilibrium. The paper extends and generalises the seminal article of Cochrane and Saá-Requejo who pioneered option pricing based on the absence of arbitrage and high Sharpe Ratios. Our contribution is threefold:

We base the equilibrium restrictions on an arbitrary utility function, obtaining the Cochrane and Saá-Requejo analysis as a special case with truncated quadratic utility. We extend the definition of Sharpe Ratio from quadratic utility to the entire family of CRRA utility functions and restate the equilibrium restrictions in terms of Generalised Sharpe Ratios which, unlike the standard Sharpe Ratio, provide a consistent ranking of investment opportunities even when asset returns are highly non-normal. Last but not least, we demonstrate that for Itô processes the Cochrane and Saá-Requejo price bounds are invariant to the choice of the utility function, and that in the limit they tend to a unique price determined by the minimal martingale measure. JEL classification codes: G12, D40, C61

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