

# Indifference pricing under the strong and weak information

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## Abstract

In this talk, we will discuss the interplay between strong and weak information approaches, as defined by Baudoin in [Bau03], in the context of indifference pricing.

In the first part of the talk, we will discuss indifference pricing as a way to estimate the value of the weak information, which is based on a change of probability measure that mimics, in some sense, enlargements of the underlying filtration, which, in turn, is a classical way to model additional information. Our framework allows for tractability, quantifying the amount of additional information, and permits the description of the smallness and the stability with respect to small perturbations of the weak information. We provide sharp conditions for the stability with counterexamples. The results rely on a theorem of independent interest on the stability of the optimal investment problem with respect to small changes in the physical probability measure. We also investigate contingent claims that are indifference price invariant with respect to changes in weak information. We show that, in incomplete models, the class of information-invariant claims includes the replicable claims, and it can be strictly bigger. In particular, in complete models, all contingent claims are information invariant. We augment the results with examples and counterexamples.

In the second part of the talk, we investigate the indifference pricing rule for streams of income or contingent claim liabilities and study how this rule changes under additional insider-type information that an investor might obtain. Considering a model where the risky asset might have jumps, we obtain an explicit form of the associated state price density for the three different types of agents: one who has no information about the jumps, one who knows in advance exactly when the each jump will occur, and one who has no information about the size of the jumps but has partial information about the size of each jump. For each of these agents, we provide characterizations of the pricing rule and establish a representation formula, allowing us to quantify

the value of partial information for streams of labor income or contingent claim liabilities. Our work is motivated by finding and characterizing a pricing rule that, both with or without partial information about jumps, assigns different values of information for different income streams or contingent claim liabilities.

This talk is based on joint papers, both in the second rounds of revision in the *Journal of Optimization Theory and Applications* and *Mathematics of Operations Research*, respectively, with Fabrice Baudoin (Aarhus University), [MB25], and Philip Ernst (Imperial College London), [ME26].

**Keywords:** indifference pricing, weak information, insider trading, the value of the signal, jump diffusion, acceptable processes.

## References

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