Numerical Solution of an Uncertain Conspicuous Consumption Model in Periods of Recession

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Abstract: In periods of recession like the credit crunch recession that started in 2007, firms do not only have to cope with a reduction in demand, but the capital markets cease to function as well. This means that they have to self-finance their investments. The characteristic feature of conspicuous consumption goods is that their demand is not only driven by the price of the product, in addition it depends on the good's reputation.

In this setting of conspicuous goods in an economic crisis, particular pricing strategies are necessary, especially since the duration of the recession and its actual strength are not known beforehand to decision makers.

To derive such strategies we formulated and investigated a two-stage economic optimal control problem in [1]. Therein we proposed a structure-exploiting direct method for optimal control to solve this challenging non-standard problem, discretizing the uncertainty of the recession length by using scenario trees.

In this talk we introduce the used methodolgy and present how different measures of risk can be used to regard the uncertainty of the recession strength. We show how traditional worst-case analysis and the methods of robust optimization affect the optimal pricing strategies compared to expectation-based approaches, value at risk, and the sophisticated conditional value at risk.

Throughout this work numerical results illustrate the validity of our approach and demonstrate the impact of uncertainties on optimal economic decisions, as well as the differences caused by the various ideas of incorporating them.

References

[1] T. Huschto, G. Feichtinger, R.F. Hartl, P.M. Kort, S. Sager, and A. Seidl (2011). Numerical Solution of a Conspicuous Consumption Model with Constant Control Delay. *Automatica*, 47(9): 1868–1877

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