

# Valuation of stochastic cash flows subject to capital requirements

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Banks and insurance companies have contracted obligations to make future payments. For insurance companies these payments are to a large extent economic compensation for accidents suffered by current and past customers. In order to safeguard that these payments can be made, capital requirements are imposed. On the one hand, a capital requirement at a given time depends on the value of the liability cash flow at a later time. On the other hand, a value at a given time of the liability cash flow depends on future unknown capital requirements. I will present the basic ingredients of mathematical frameworks for valuing stochastic cash flows subject to capital requirements, including dynamic risk measurement and properties and computational aspects of the backward recursions that appear and define the stochastic process of cash flow values.

Capital requirements are imposed at a predefined set of times leading to discrete-time value processes defined on this time grid. If the distance between these times is small, then we may study continuous-time value processes that appear when considering a sequence of partitions of the entire time period whose meshes tend to 0. Existence, properties and interpretations of continuous-time limits of discrete-time value processes will be discussed.

The talk is primarily based on [1], [2], [3].

## References

- [1] Engsner, H., Lindholm, M., Lindskog, F. (2017). Insurance valuation: A multi-period cost-of-capital approach. *Insurance: Mathematics and Economics* **72**, 250–264.
- [2] Engsner, H., Lindensjö, K., Lindskog, F. (2017). The value of a liability cash flow in discrete time subject to capital requirements. *Submitted*
- [3] Engsner, H., Lindskog, F. (2018). Continuous-time limits of multi-period cost-of-capital valuations. *Submitted*