SUSTAINABLE OPTIMAL INVESTMENT & SUSTAINABLE TAXATION

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Joint work with Ralf Korn

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Keywords— Sustainable investment, Sustainable taxation, Constrained portfolio problems, ESG ratings

We consider the optimal investment problem under sustainability requirements stated in [1], but solve it explicitly for the wider class of power utility functions. Further, we introduce an equilibrium framework that consists of modifications of the market coefficients such that the unconstrained optimal portfolio process already satisfies the sustainability constraint. In this way, investors can be steered towards holding ecologically responsible portfolios without requiring them to explicitly incorporate sustainability criteria into their utility maximization process. Thus, the sustainability demand can be interpreted as a constraint imposed by regulators or large institutional investors, which requires portfolios to meet certain sustainability criteria. Our framework allows us to quantify how much drift coefficients need to be modified, essentially taxing or subsidizing specific assets, to ensure compliance with these demands. This mirrors real-world fiscal tools like the UK's Climate Change Levy environmental tax and Costa Rica's carbon tax which, once collected, are used for supporting sustainable behaviour [3, 2].

Our contributions are twofold: we solve the constrained portfolio optimization problem for power utilities and derive explicit expressions for the adjusted drift coefficients $\tilde{b}$. Sensitivity analyses reveal complex and sometimes counterintuitive dependencies of $\tilde{b}_i$ on the utility parameter γ, demand D, and asset ratings R_i, particularly when comparing riskless and risky assets. Portfolios violating the "max offer" condition often lead to excessive short positions in sustainable assets, underscoring the need for regulatory safeguards.

These insights highlight the nuanced impact of sustainability constraints and the policy potential of indirect fiscal instruments in guiding responsible investment behavior.

References

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