

A Debt Management Problem with Bankruptcy Risk and Currency Devaluation

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A debt repayment strategy is modeled as an interaction between a sovereign state and a pool of risk-neutral investors. The problem of optimal debt management introduced expands on the models derived in [2, 3, 1] and [4]. At each time, the government decides which fraction of the gross domestic product must be used to repay the debt, and how much to devalue its currency. The total yearly income (GDP) of the borrower is governed by a stochastic process. When the debt-to-income ratio $x(t)$ reaches a threshold x^* , bankruptcy instantly occurs. Moreover, we assume that the borrower may go bankrupt at a random time before the debt reaches x^* . We explore the derivation and analysis of the model through the lens of optimal control in infinite time horizon with exponential discount. The resulting stochastic control system depends not only on the present time t but on all future times. For a given bankruptcy threshold x^* , existence of an equilibrium solution is obtained by a topological argument. Our results show that the optimal control strategy does not use currency devaluation for debt values below a threshold.

Keywords: debt modeling, (stochastic) optimal control, elliptic PDEs.

References

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