



Stochastic optimal control, international finance and debt

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This paper is dedicated to the memory of James Tobin (1918–2002), teacher and friend

Abstract

We use stochastic optimal control–dynamic programming (DP) to derive the optimal debt/net worth, consumption/net worth, current account/net worth, and endogenous growth rate in an economy – which could be a country, region or sector within a country. Unlike the literature that uses an intertemporal budget constraint or the Maximum Principle, the DP approach does not require perfect foresight or certainty equivalence. Our results are generalizations of the Merton model, and are explained graphically within a mean–variance context. Two examples are provided to illustrate the usefulness of our technique in predicting debt crises.

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1. Different approaches to intertemporal optimization in open economies

Several noteworthy debt crises have occurred in recent years. In the case of South East Asia in 1997, data on the credit rating of bonds issued in the first half of the 1990s suggest that investors in emerging market securities paid little attention to credit risk, or that they were comfortable with the high level of credit risk that they

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