

On the Market Risk Involved in the Public Financial System in Japan: A Theoretical and Numerical Investigation^{*}

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Abstract

Treating the postal savings system and the fiscal investments and loans program in Japan as an integrated financial institution, this paper pays particular attention to options embedded in both assets and liabilities, and presents theoretical models for analyzing the market risk involved in this system. In particular, it investigates two essential issues: whether economic options are priced properly and whether the risks incurred by delivering such options are well managed. Based on intensive numerical examination, this paper obtains the following results. The postal savings account charges depositors realistically for put option fees. Although little attention is paid to option value in pricing callable loans, the value of call options is modest. In sum, the public financial system is doing a reasonable job in pricing options. In terms of risk management, however, the system entails potentially large market risks due to its offering flexible options to both depositors and borrowers. In whichever direction spot rates move, the public financial system displays a serious mismatch in duration between assets and liabilities. In particular, as spot rates go up, the duration of liabilities becomes extremely short with anticipation of early withdrawal. Because of heavy restrictions on the use of financial instruments, the public financial system is not able to hedge such large market risks effectively.

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