International Journal of
Information
and
Management
Sciences

International Journal of Information and Management Sciences
27 (2016), 217-235. DOI:10.6186/IJIMS.2016.27.3.1

Bank Lending with Capped Credit Risk, Hedging Efficiency, and Government Capital Injection

Jyh-Jiuan Lin[1], *Shi Chen*[2] *and Rosemary Jou*[1]

[1]Tamkang University and [2]Southwestern University of Finance and Economics

Abstract

This paper examines bank efficiency gain/loss from loan swap diversification under government capital injection when the borrowing firm's risk exposure in the product market is explicitly considered. The lending function of the bank creates specific risk characteristics of the borrowing firm and the necessity to model the equity of the bank as a capped call option. Using a contingent claim model of a bank-borrowing firm structure with capped call valuation, we find that loan swap diversification leads to higher efficiency gain for the bank. We also show that the bank increases interest margin, decreases equity risk, and increases efficiency gain as a reaction to an increase in the government's capital injection. Bank efficiency which ignores the capped credit risk from the borrowing firm leads to loss from loan swap diversification. In the case where the cap is ignored, an increase in the government's capital injection increases bank efficiency loss.

Keywords: Bank efficiency, government capital injection, capped call option, bank interest margin.

1. Introduction

The recent tremendous development in credit risk transfer (CRT) markets has received the attention of investors and policy makers worldwide. Literature, for example, Wagner and Marsh [26] and Duffie [13], emphasizes that CRT brings about benefits, in particular diversification gains. However, CRT may cause problems for stability of the financial sector, for example, by destabilizing the institutions which buy credit risk [20]. Chava and Purnanandam [9] argue that the U.S. subprime mortgage crisis and the associated losses to the banking system reemphasize the need to understand the impact of shocks to providers of capital on their borrowers. The authors provide evidence that adverse capital shocks to banks affect their borrowers' performance negatively. Most of the arguments, however, are made on an informal basis, which is due to a lack of theoretical work on these issues [26].

This paper is a step towards filling this gap. Its first objective is to provide a framework of a bank-borrowing firm situation which allows an analysis of the impact of