



Shadow-banking entrusted loan management, deposit insurance premium, and capital regulation



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ABSTRACT

This paper studies bank interest margin, i.e., the spread between the loan rate and the deposit rate of a bank, when the bank conducts regular lending and shadow-banking entrusted lending activities under capital regulation. We show that an increase in the entrusted loans increases the bank's interest margin, equity risk, and the liability of deposit insurer. Entrusted loans can help spur bank equity return, but there is a trade-off in terms of reduced banking stability. We also find that the reduced margin and the increased equity risk by capital regulation are reinforced when the bank additionally conducts entrusted lending activities. Relaxing regulatory capital requirements may produce superior return performance and greater safety for the bank carrying on shadow-banking entrusted loans.

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1. Introduction

Credit funded through the shadow banking activities, whether nonbank loans funded with uninsured debt or directly issued paper typically bought by money funds, has become more significant over time (Duca, 2014). Being outside the regular banking sector generally means shadow banks lack a strong safety net, such as publicly guaranteed deposit insurance or lender of last resort facilities from central banks, and operate with a less level of regulatory oversight (Elliott, Kroeber, & Qiao, 2015). These characteristics increase the risks for financial stability, which is one of the primary reasons there is a focus on shadow banking activities (Adrian & Shin, 2010; Gorton & Metrick, 2012; Lu, Guo, Kao, & Fung, 2015). Gorton and Metrick (2010), and Pozsar, Adrian, Ashcraft, and Boesky (2010) document that the growth of shadow banking has been largely driven by regulatory arbitrage. Plantin (2015) argues that tightening capital requirements may increase shadow banking activities and make banks that not willing to incur adverse selection costs very safe; alternatively, relaxing capital requirements may bring shadow banking activities back in the spotlight of regulation. However, Pozsar et al. (2010) and Jeffers and Baicu (2013) indicate that the interconnections between regular banking and shadow banking activities have negative consequences on financial stability. Against this background, both researchers and regulators are interested in a better understanding of these interconnections in particular between regular commercial lending and shadow-banking entrusted lending activities in order to assess individual bank performance under capital regulation that this interaction raised.¹

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¹ As pointed out by Elliott et al. (2015), shadow banking is not a new phenomenon, but the term only recently came into widespread use, and there is no single agreed definition. The composition of China's shadow banking includes entrusted loans, trust loans, banker acceptances, interbank entrusted loan payments, financial leasing, and small loan companies according to Elliott et al. (2015).

One important category of shadow-banking financial products that stands out is called entrusted loans, which are made on behalf of large corporations, using banks or finance companies as intermediaries. For example, the entrusted loan is a form of agency service where the Agricultural Bank of China acts as the trustee to lend out money on behalf of the trustor such as the “principal”. The Agricultural Bank of China only collects the handing charges and will not undertake any loan risk. [McMahon and Wei \(2014\)](#) report “A Partial Primer to China’s Biggest Shadow: Entrusted Loans”. [Elliott et al. \(2015\)](#) point out the significantly changing scales of entrusted loans at RMB 328 billion of 2003, 3421 billion of 2010, and 8551 billion of 2013. In addition to trusted loans, the bank interest margin, i.e., the spread between the loan rate and the deposit rate, is one of the key elements of bank net cash flows and after-tax earnings ([Chen & Chang, 2015](#)), and is often used in the literature as a proxy for the efficiency of financial intermediation in the regular banking ([Saunders & Schumacher, 2000](#)). Applying [Finn and Frederick \(1992\)](#), we argue that in practice of regular and shadow banking operations, bank spread management can be done through a “cost of goods sold” approach in which deposits and trustor funds are the “materials” and bank loans and entrusted loans are the “work in processes”. The purpose of this paper is to follow the “cost of goods sold” approach by providing a capped call option model of bank behavior to study the determination of bank interest margin under capital regulation in the commercial lending and entrusted lending activities. The principal advantage of the capped call option valuation is the explicit treatment of borrower credit risk which has played a prominent role in discussions of intermediary behavior ([Dermine & Lajeri, 2001](#)).²

Our main results are as follows. We find that an increase in the amount of entrusted loans increases the bank’s interest margin, equity risk, and the liability of the deposit insurer. We also show that an increase in the capital-to-deposits ratio decreases the bank’s interest margin and increases the bank’s equity risk when the bank conducts only the commercial lending activities. The reduced margin and the increased equity risk are reinforced when the bank additionally conducts entrusted lending activities. Overall, we may conclude that shadow-banking entrusted loans lead to superior equity performance, but increase equity risk for the bank. Capital regulation makes the bank less prudent and more prone to commercial risk-taking, thereby adversely affecting the stability in the banking environment.

This paper’s contribution to the literature is twofold. First, we examine the bank interest margin with shadow-banking entrusted lending activities, while most of the extant research analyzes the interest margin issue remaining largely silent on shadow banking activities.³ As pointed out by [Pozsar et al. \(2010\)](#), both regular banks and shadow banks perform very similar credit intermediation. But while in regular banking intermediation occurs under “the same roof”, in shadow banking intermediation occurs through a chain of entities. Operations are more complex in the shadow-banking entrusted loans than in the regular-banking commercial loans. Specifically, we argue that the risks taken by the shadow banking activities can spread to the regular banking operations via an indirect channel of bank interest margin that could cause the decreased equity return and the increased equity risk for the bank.

Second, we consider capital regulation in the regular and shadow banking environment, while the vast majority of existing studies focus on only the regular banking environment. [Jeffers and Baicu \(2013\)](#) indicate that a notable difference between the regular and the shadow banking systems refers to regulation. Unlike shadow banks that are unregulated or little regulated, regular banks are strictly regulated and supervised. Our paper focuses on the impacts on bank interest margin and equity risk from changes in capital regulation considering when the bank conducts bank loans and entrusted loans. Our findings demonstrate that an increase in the capital-to-deposits ratio decreases the bank interest margin, and further increases the equity risk of the bank. The decreased margin is more significant but the increased equity is less significant when the bank conducts entrusted lending activities than when the bank does not. Accordingly, the risks taken by entrusted lending can spread to commercial lending not only via bank interest margin but also via capital regulation.

The rest of the paper is organized as follows. [Section 2](#) discusses related literature. [Section 3](#) develops the basic valuation framework. [Section 4](#) derives the solution of the model and the comparative static results. [Section 5](#) presents a numerical analysis to explain the intuition of the comparative static results. The final section concludes the paper.

2. Related literature

Our theory of shadow-banking entrusted loan management is related to three strands of the literature. The first is the literature on bank interest margin, in which [Ho and Saunders \(1981\)](#); [Wong \(1997\)](#); [Maudos and de Guevara \(2004\)](#), and [Kasman, Tunc, Vardar, and Berna \(2010\)](#) are major contributors. The pioneering study of the dealership model originated by [Ho and Saunders \(1981\)](#) has been the reference framework for many of the contemporary studies of determinants of bank interest margins. The authors find that bank interest margins are positively related to operating expenses and inversely related to bank size. [Wong \(1997\)](#) explores the determinants of optimal bank interest margins under multiple sources of uncertainty. The author finds that the bank interest margin is positively related to the operating costs, to the degree of credit risk, and to the degree of interest rate risk. Moreover, an increase in the bank’s equity risk has a negative effect on the margin when the bank faces little interest rate risk. [Maudos and de Guevara \(2004\)](#) find that operating cost, interest rate risk, credit risk, and management quality are positively related to bank interest margin. [Kasman et al. \(2010\)](#) find that bank interest margin is positively related to operating cost, credit risk, capital adequacy, and default risk. While we also examine bank interest margin, our focus on the shadow banking aspects of entrusted loan management under capital regulation takes our analysis in a different direction.

² [Dermine and Lajeri \(2001\)](#) calculate loan-risk sensitive insurance premiums where the lending function of bank creates specific risk characteristics and the necessary to model the equity of a bank as a capped call option in the regular banking system.

³ See, for example, [Ho and Saunders \(1981\)](#), [Maudos and Guevara \(2004\)](#), and [Kasman et al. \(2010\)](#).

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