



Inefficiency of bilateral bargaining in interbank markets

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Abstract

Many countries have interbank markets that are over the counter (OTC) instead of exchange mediated. In OTC systems, bilateral bargaining takes place over the rate of interest on the (interbank) loan. This article characterizes such bilateral bargaining for loans between banks under asymmetric information and shows that bargaining outcomes may be inefficient. The article suggests two sources of inefficiency. In a one-period model, bargaining between two banks may fail due to incomplete information even if gains to trade exist. Intertemporal issues examined in this article reveal that repeated interaction could create distorting effects through reciprocal contracts. Both cases are shown to require active liquidity management by the regulatory authority to restore the first best allocation.

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1. Introduction

The interbank money market is a risk-sharing arrangement between individual banks that face uncertain liquidity needs. Under such a risk-sharing arrangement, banks that face liquidity shortage are assured of help from banks with surplus funds. The theoretical literature on the interbank market discusses the potential problems in such risk sharing. Problems like moral hazard (see [Bhattacharya & Gale, 1987](#)), contagion (see [Allen & Gale, 2000](#); [Frexias & Parigi, 1996](#)), and systemic risk (see [Rochet & Tirole, 1996a,b](#)) have been analyzed. Problems in risk-sharing arrangements tend to distort allocative efficiency and require careful study and regulatory intervention. However, while the extant literature (see in particular [Bhattacharya & Gale, 1987](#)) treats the risk sharing in interbank markets in an ex ante sense,

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in practice, the risk sharing in interbank markets is typically an ex post phenomena. Ex ante, there are no contracts between banks but instead the market relies on ex post incentives for trade between banks that have shortage and those that have surplus. In this article, I focus on mechanisms that distort such incentives and generate inefficient trade in the interbank market.

Most countries have over-the-counter (OTC) interbank markets where bilateral bargaining takes place over the rate of interest on the (interbank) loan. This article identifies two problems in such markets. The first problem is that when bargaining takes place under asymmetric or incomplete information, bargaining may fail although there are gains from trade. The second problem is that bargaining may succeed due to future considerations in an intertemporal setup where the inefficient bank gets more liquidity than it should at the optimum.

The first problem is generic to any bilateral bargaining situation with incomplete information but arises naturally and is particularly relevant for OTC interbank markets. The theoretical literature on bargaining that are relevant here are those by [Chatterjee and Samuelson \(1983\)](#) and [Myerson and Satterthwaite \(1983\)](#). Chatterjee and Samuelson have shown that too little trading can take place in a simple double-auction game under two-sided incomplete information. Myerson and Satterthwaite show that bargaining failure can result under two sided incomplete information, even if gains to trade exist and also show that whenever gains from trade are possible but not certain, there is no ex post efficient social choice function that is both Bayesian incentive compatible and satisfies participation constraints. [Laffont and Maskin \(1979\)](#) obtain a similar inefficiency result in more general framework. This article shows that the problem arises very naturally in the interbank markets. The opacity of bank assets under relationship banking generates the incomplete information. In addition it has the feature of client switching possibility that increases the probability of bargaining failure.

The second problem reflects the fact that intertemporal considerations may increase the probability of trade taking place. What is important here is that if the intertemporal considerations are irrelevant in the determination of optimality but are important in the bargaining game, then they can create distortions. Similar arguments can be found in game theoretic analysis of cartels.

The article proceeds as follows: first, a one-period bargaining game is analyzed in Section 2. Section 2.1 characterizes the optimal regulatory mechanism. Section 3 considers a two-period bargaining game. Section 4 concludes.

2. The one-period bargaining problem

To illustrate the basic problem in the simplest setting, let us start with two banks and one period. Initially, in state 0 (the beginning of the period), two clients are matched to each bank where each client needs θ units of liquidity for project finance. The clients are matched with banks in a way such that the value of the relationship to the client is maximized. Let the (maximum) value to each client be V . If clients are compelled to switch their projects across banks because of liquidity constraints faced by banks to which they are originally matched, then the value for the client falls to v where V is greater than v .

Return to bank 1 from the client project it is originally matched with is R_1 . It is private information to bank 1 only. Bank 2 only knows that return to bank 1 has a cumulative distribution function $F_1(R_1)$ over the interval $[R_{1 \min}, R_{1 \max}]$. Similarly, Return to bank 2 from its client is R_2 . It is private information to bank 2 only. Bank 1 only knows that return to bank 2 has a distribution $F_2(R_2)$ over the interval $[R_{2 \min}, R_{2 \max}]$. It is assumed that F_i is twice continuously differentiable ($i=1-2$). The assumption of private

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