THE MONEY MARKET UNDER INFORMATION ASYMMETRIES AND IMPERFECTLY COMPETITIVE LOAN AND DEPOSIT MARKETS

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FUNDACIÓN DE LAS CAJAS DE AHORROS
DOCUMENTO DE TRABAJO
Nº 606/2011

De conformidad con la base quinta de la convocatoria del Programa de Estímulo a la Investigación, este trabajo ha sido sometido a evaluación externa anónima de especialistas cualificados a fin de contrastar su nivel técnico.

ISSN: 1988-8767

La serie **DOCUMENTOS DE TRABAJO** incluye avances y resultados de investigaciones dentro de los programas de la Fundación de las Cajas de Ahorros.
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Abstract

Information asymmetries and market structure has been widely discussed in the current financial crisis. It is suggested that the asymmetries of information could lead to a collapse of the interbank market. We propose a microeconomic model with Cournot competition in the various regional loan and deposit markets that interact with a perfect competitive interbank market. There exist risky and safe banks that differ in the probability of solvency and there also exist divergences in the supply of deposits be- tween regions. It is proved that, with private information, a situation of collapse of the interbank market emerges, and market structure plays no role in this result.

Key words: Financial crisis, market structure, asymmetric and private information.
JEL classification: D82, G01, L13.

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Acknowledgements: I thank Javier Suarez, Gerard Llobet, rest of CEMFIís faculties and Joan Calzada for their suggestions and comments.

1.- Introduction

The world suffered a deep financial crisis in which the role of money markets and the lack of confidence between agents have been widely discussed, see Ivashina and Scharfstein (2008), Reinhart and Rogoff (2008) and (2009) and Taylor (2009). Given the importance of these issues and the resulting credit crunch, we study the impact of asymmetries of information on an interbank market in the presence of imperfect competitive loan and deposit market. We find that information is essential to explain a collapse of interbank market and the market structure has no effects on the result. Our model provides a framework to assess policies that contribute to reduce the possibilities of freezing of money market.

The collapse of the interbank market has traditionally worried governments and as a consequence they have tried to control it. Rescue packages, deposit insurance and regulations in terms of capital requirements have tried to reduce the risk of banks with the objective of avoiding distrust between lenders and borrowers in the interbank market, Demirgüc-Kuny et al. (2009) and Schich (2008). Credit risk associated with interbank lending may lead to domino effects (Acemoglu, (2009)) where the failure of a bank results in the failure of other banks even if the latter are not directly affected by the initial shock. Recent work in economic theory shows that this risk of contagion depends on the precise pattern of interbank linkages. For example, in the model of Allen and Gale (2000) banks hold deposits with banks of other regions in order to insure against liquidity shocks in their own region. If a bank is hit by a shock, it tries to meet its liquidity need by drawing on its deposits at other banks before liquidating long-term assets.

The main novelty and contribution of the paper is to explore the role of information asymmetries and under imperfect competition in retail bank markets and perfect competition in the interbank market. Therefore, our main goal is to theoretically explore the case of imperfect competition in the loan and deposit markets and the kind of information problems that led to the collapse of interbank market. This is interesting because banks are not typically price takers in retail markets and the existence of some product differentiation or non-perfectly competitive behaviour in this industry is expected (Bikker and Haaf (2002), Beck et al. (2006), Claessens and Leaven (2004), Kissan and Opiela (2000)). Therefore, the analysis of policies directed to avoid the credit crunch and to improve the efficiency of the allocation of resources should be considered under this approach. In this sense, we find that probability of solvency, our measure of risk of default, must be increased to reduce the likelihood of a credit crunch. To achieve this goal, insurance in case of default or rescue packages is an indirect way of guaranteeing trade in the interbank market because they reduce probabilities of systemic default.

Considering the same issue, Bruche and Suarez (2009) explore the freeze the money market under perfect competition with a general equilibrium model while Boyd and Nicoló (2005) relate the level of competition of banks and the attitude that they take with respect to the risk. In terms of policy implications Heider et al (2008) study the possible breakdown of

interbank market due to asymmetric information on counterparty risk; banks trade in an interbank market to accommodate retail deposits withdrawals, which are modelled like in Diamond Dybvig (1983).

The model presented in this paper analyses the effects of uncertainty and information asymmetries regarding bank solvency on the working of interbank and loan markets and the efficiency of the resulting allocation.

The setup of this paper is as follows: Section 2 presents the description of the model and its elements. Section 3 develops the partial equilibrium analysis to show how spreads and retail markets behave. Section 4 analyses the interbank market under perfect and im- perfect information and Section 5 is devoted to the comparative statics and possible policy implications. Finally, Section 6 concludes the paper.

2.- The Model

Consider a model with two dates (t=0,1) and risk neutral agents. The economy consists of I regional markets for loans and deposits. There exist safe (*S*) and risky (*R*) markets. The difference comes from the quality of loans that regional banks attract. In the safe markets, loans never default, while in risky markets loans default with probability $1-p>0$. For simplicity, banks recovery in case of default is assumed to be zero. To focus on the systemic component of default risk, we assume that defaults within a region *i = 1, 2,…, I* are perfectly correlated events. So in a risky region, there is a probability $1-p>0$ that all loans default at the same time. Types of market belong to the set $\theta_i \varepsilon \{S, R\}$. The proportion of safe (risky) markets is $1-\varepsilon(\varepsilon)$.

J banks involved in Cournot competition in the regional loan and deposit markets compose each market what allows us to explore strategic behaviours associated with imperfect competition. Therefore, the number of banks in our economy is $I \times J$.

Deposits are completely insured by an external agent what avoids the possibility of bank runs and prevents that depositors internalize the possibility of default of banks.

All markets feature linear inverse demand for loans L_{ij} and linear inverse supply of deposits D_{ij} given by:

$$1+r_{Li} = a - b\sum_{j=1}^{J}\left(L_{ij}\right)$$

$$1+r_{Di} = C_i + d\sum_{j=1}^{J}\left(D_{ij}\right)$$

, where r_{Li} and r_{Di} are interest rate of loans and deposits respectively.

Notice that all parameters are equal across regions except C_i, which takes value C^H in a proportion μ of the regions and C^L in a proportion $1-\mu$. The value of C_i in each region is assumed to be observable. In practice, it will determine regional differences between banks, the cost of getting funds in the local deposit markets.

Banks have access to a perfectly competitive interbank market where they borrow from and lend to other banks. The position of each bank in this market is determined by the comparison between their decided supply of loans and the deposits that they decide to attract in the region.

In the model, depending on the information, two scenarios are explicitly explored. First, types of banks are observable, so the interest charged in the interbank market can be different for safe and risky banks. Actually, they would pay different expected return for a same promised interest rate r_f; this fact comes from the difference between the expected payment of borrowers: safe borrowers will pay in expectation $(1+r_S)$ and risky borrowers will pay $p(1+r_R)$ in expectation. In a second scenario, types of banks are privately observed; under this assumption, the interest rate of interbank market is denoted by $\overline{r}$ that it is equal for both types. Hence, the expected repayment to lenders under adverse selection is $(1+\varepsilon)(1+\overline{r})+\varepsilon p(1+\overline{r})$.

It is also assumed that θ_i and C_i are independently distributed which has important implications on the analysis of spreads as we explain carefully in the following section. Thus, the proportions of regions in each of the possible states is summarized in the following table:

	$\theta = S$	$\theta = R$
$C = C^H$	$\rho_{11} = (1-\mu)(1-\varepsilon)$	$\rho_{12} = (1-\mu)\varepsilon$
$C = C^L$	$\rho_{12} = (1-\mu)\varepsilon$	$\rho_{22} = \mu\varepsilon$

It is observed that there exist four possible regions; there are regions with $C_i = C^L$ in which banks presumably will have deposits in excess of these needed to fund their loans and regions with $C_i = C^H$ where banks will typically have loans in excess of deposits forcing them

to get funds in the interbank market. Moreover and independently of C_i, we have risky and safe regions what makes richer the possibilities of interaction between regions.

3.- Partial equilibrium analysis

In this section, we undertake the partial equilibrium analysis of the situation in which banks choose their optimal levels of deposits, loans and the position in the interbank market for a given value of the expected rate of return required by interbank lenders r_f, and the actually charged rates that correspond to it, depending on the informational setup.

3.1.- Spreads

In this subsection, we focus on the analysis of the spreads that interbank lenders will charge, in excess of r_f, so as to guarantee that these spreads will compensate exactly for the risk of borrowers associated with each situation. Under imperfect information when types are not observable spreads will be charged to all borrowers and will depend crucially on the proportion of risky borrowers in the interbank market.

Before characterizing spread, let define r_f as the expected rate of return of lenders and r_θ the promised interest rates of the borrowers of type θ.

Under perfect information, in equilibrium is required that expected payoffs of risky and safe interbank lending are identical. Hence,

$$p\left(1+r_R\right)=1+r_S=1+r_f$$

that is $r_S=r_f$ and

$$r_R=\left(1+r_f\right)/p-1 \tag{1}$$

so the spread that banks of risky markets have to pay in the interbank market is

$$r_R-r_f=\phi=\left[\left(1+p\right)/p\right]\left(1+r_f\right)$$

Under adverse selection, interbank lenders do not observe the type of the borrowing banks risk and the interest rate is $1+\overline{r}$ for each bank independently of the nature of the risk profile that they have. A condition for equilibrium is.

$$\left[(1-\varepsilon)+\varepsilon p\right](1+\overline{r})=1+r_f \qquad (2)$$

At this point, it is when the assumption of independence between μ and ε has relevance because it allows us to simplify posterior analysis considering that proportion of risky markets is independent of the proportion of C^H and C^L that there is in the economy. From (2), we have

$$\overline{r}=(1+r_f)/\left[1-\varepsilon(1-p)\right]-1 \qquad (3)$$

so the spread is

$$\overline{r}-r_f=\overline{\phi}=\left[\varepsilon(1-p)/\left[1-\varepsilon(1-p)\right]\right](1+r_f)$$

It is easy to see that, for a given r_f and $\varepsilon<1$, we have $\phi>\overline{\phi}$ as one would expect.

3.2.- Retail Markets

Consider Cournot competition in a given region *i* characterized by a solvency probability $q_i=q$ and deposit supply parameter $C_i=C$. Then, dropping the region subscript, for simplicity, the objective function of each bank *j* in the region can be compactly written as follows:

$$\Pi_j=q\left[(1+r_L)L_j+(1+r_f)(D_j-L_j)^+-(1+r_\theta)(L_j-D_j)^+-(1+r_D)D_j\right]$$

where

$$q=\begin{cases}1 & \text{if the region is safe } \theta=S\\ p & \text{if the region is risky } \theta=R\end{cases}$$

and

$$r_\theta=\begin{cases}r_S & \text{if there is no adverse selection and } \theta=S\\ r_R & \text{if there is no adverse selection and } \theta=R\\ \overline{r} & \text{if there is adverse selection}\end{cases}$$

In the above notation, X^+ stands for max$\{x,0\}$

Notice that we are implicitly assuming that under adverse selection, the only possible equilibrium that will emerge in the interbank market is the pooling equilibrium because there are no signals that banks can use in order to differentiate from each other and the pure choice of

D_j and L_j will not reveal type of the bank. This last fact is partly due to the multiplicative effect of the probability of non-default in the proffit function $\prod_j$, in turn determined by the fact that loan defaults are perfectly correlated and banks profits are zero, by limited liability, in the default event.

We will try to find a Nash equilibrium in a game where banks use their loans and deposit levels as strategies. So, in this Cournot equilibrium, each bank chooses simultaneously its levels of loans, deposits and residual position in the interbank market.

Solving the maximization problem for one of the (symmetric) banks, say *j = 1*, taking $\sum_{j=2}^{J} L_j$ and $\sum_{j=2}^{J} D_j$ as given, yields the best-response function for banks *j = 1*.

$$L_1 = a/2 - 0.5\sum_{j=2}^{J} L_j + 0.5\left[\left(1+r_f\right)1\left\{D_1 > L_1\right\} + (1+r_\theta)1\left\{L_1 > D_1\right\}\right] \tag{4}$$

$$D_1 = -C_i/2d - 0.5\sum_{j=2}^{J} D_j - (1/2d)\left[\left(1+r_f\right)1\left\{D_1 > L_1\right\} + (1+r_\theta)1\left\{L_1 > D_1\right\}\right] \tag{5}$$

A Nash equilibrium in pure strategies emerges at each possible intersection of the best-response functions of the *j = 1,…, J* banks in a given market. We will focus on the symmetric equilibrium, which happens to be unique. This is due to the values L^* and D^* such that $L_j = L^*$ and $D_j = D^*$ for all *j*, solving (4) and (5).

Assuming $L_j = L^* > D_j = D^*$ for all *j*, solving (4) and (5) yields:

$$L^* = (a - (1+r_\theta))/(J+1) \text{ and } D^* = ((1+r_\theta) - C_i)/(J+1)\,d$$

and it is immediate to check that $L^* > D^*$ if and only if,

$$C_i > (1+r_\theta)(1+d) - da \tag{6}$$

Similarly, assuming $L_j = L^* < D_j = D^*$ for all *j*, we find:

$$L^* = (a - (1+r_f)) / (J+1) \text{ and } D^* = ((1+r_f) - C_i) / (J+1)d$$

and it is immediate to check that $L^* < D^*$ if and only if

$$C_i < (1+r_f)(1+d) - da \tag{7}$$

Finally, considering $L_j = D_j = X^*$ for all *j*, we find that the candidate equilibrium with no trade in the interbank market (autarchic) will have:

$$X^* = \left(a - C_i\right) / \left(J + 1\right)(1 + d)$$

In the Appendix, we prove that $L_j = D_j = X^*$ is a Cournot equilibrium if and only if:

$$\left(1 + r_{fi}\right)\left(1 + d\right) - da \leq C_i \leq \left(1 + r_\theta\right)\left(1 + d\right) - da \tag{8}$$

<u>Lemma 1</u> Putting together (6), (7) and (8), we can conclude that there are three possible (non-overlapping) types of equilibrium depending on the size of C_i relative to previous thresholds. Notice that the thresholds depend on r_f and r_θ. In the case without adverse selection and $\theta = S$, the autarchy range vanishes and becomes only one point.

After having characterized the symmetric Cournot equilibrium in each regional market for given r_f and r_θ, the following section determines the equilibrium in the inter-regional interbank market, which will yield the endogenous equilibrium values of r_f and r_θ.

3.3.- Marginal decision of a bank

In order to be more illustrative, in this section, we consider the case when *J = 1*. We focus on the behaviour of a bank from a risky region with C^H region. We present two figures; first, the situation in which a bank is net borrower and second, a situation when the bank is in autarchy.

Figure 1. Marginal decision for a net borrower

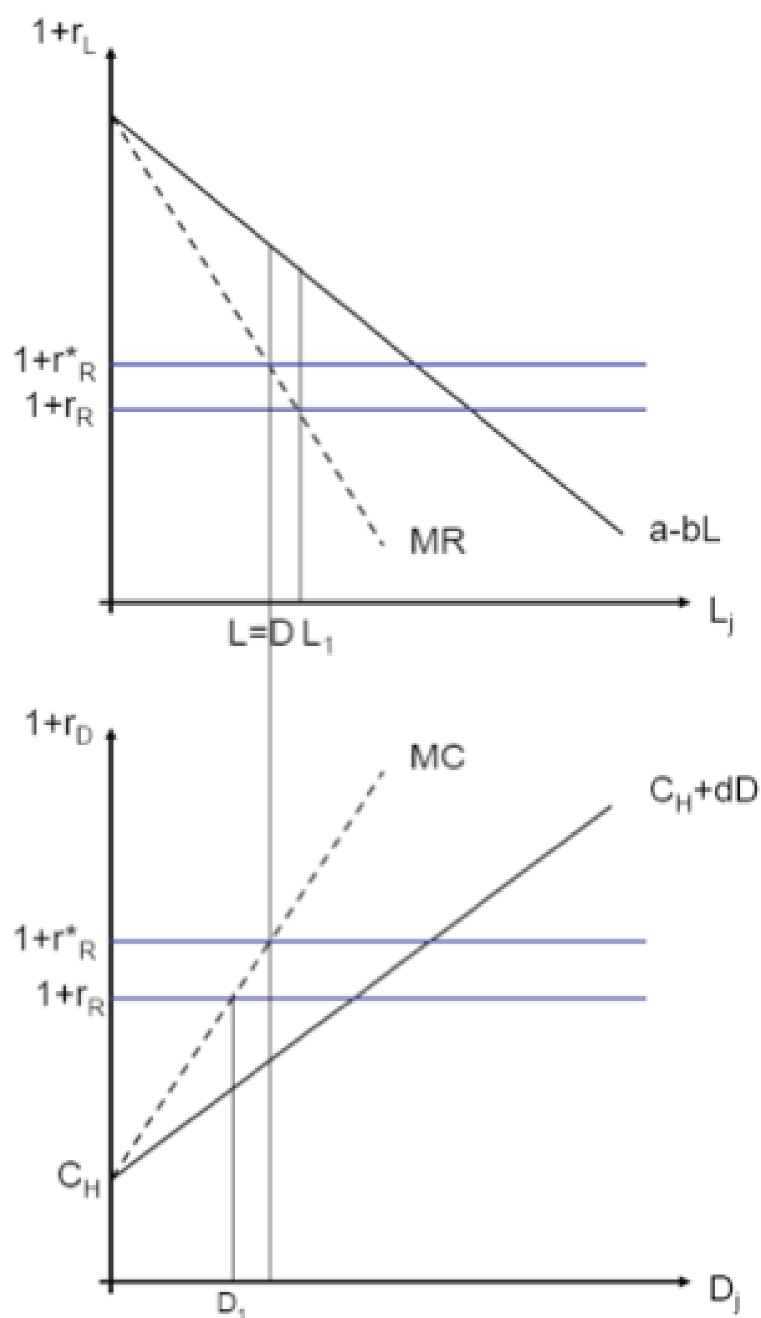


Figure 1 considers the case when the bank is a net borrower $L_1 > D_1$ and the interest rate of equilibrium is $1+r_R$. Then, let consider an increase in the interest rate, this fact produces a decrease in the level of loans that banks give and an increase in the level of deposit that banks attract in local markets. If this change is infinitesimal, there is no possibility of being out of this type of equilibrium. But, in case of suffering a shock sufficiently high, then we have the

possibility of achieving $1+r_R^*$; which is the interest rate up to which there is no equilibrium under the assumption of $L_1 > D_1$. It emerges a situation of autarchy completely different.

Figure 2. Marginal decision in autarchy

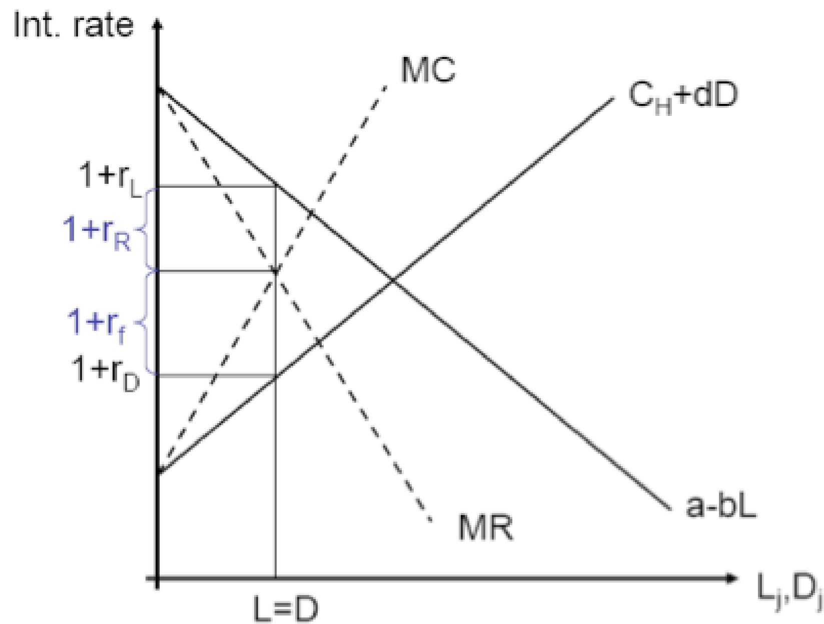


Figure 2 shows an autarchy situation. It has to hold some important relations between different interest rates of our model. In this context, the marginal cost and the marginal income coincides. For that, it is required that the cost of attracting funds in the interbank market $1+r_R$ is greater than marginal cost of getting local deposits and the marginal income has to be greater than the interest rate that is paid in case of being a borrower in the interbank market $1+r_f$. Hence, given these conditions there are no incentives to go to the interbank market.

4.- Interbank Market

In order to obtain an equilibrium interest rate in the market for interbank funds, interbank market has to clear in terms of excess demand for funds because of perfect competition assumption. Such condition requires that the sum of the excess demand for funds of each bank equals zero, therefore the market clearing condition is:

$$\sum_{\theta=H,L}\sum_{\mathrm{K}=R,S}\rho_{\kappa\theta}\left[D_{ij}-L_{ij}\right]=0$$

4.1.- Perfect information

In this subsection, the equilibrium in the interbank market is characterized under the assumption of perfect information. We need to take into account how banks of different regions go to this market to borrow or to lend depending on the position of r_f and r_θ relative to C_i, described in the previous section. The main goal is to aggregate the excess demand of interbank funds for each region to determine the equilibrium interest rate in the interbank market, r_f. We analyse two different cases depending on the range of C^H; first we see how interest rate is determined when all banks go to the interbank market; second, we study the case that emerges when banks from risky regions with high cost of getting deposits in the local retail market prefer autarchy and the rest of regions trade in the interbank market.

4.1.1.- No autarchy.

A situation at which all banks go to the interbank market requires

$$C^L \varepsilon \left[0,\left(1+r_f\right)\left(1+d\right)-da\right] \tag{9}$$

so that banks from the regions with high deposit supply are net lenders and

$$C^H \varepsilon \left[\left(\left(1+r_f\right)/p\right)\left(1+d\right)-da,\infty\right) \tag{10}$$

so that banks from regions with low deposits supply are net borrowers.

The equilibrium of every bank at loans and deposits markets was solved in the previous section and it is associated with Cournot competition. Under perfect information, market clearing in the interbank market requires;

$$\begin{aligned}&\left(\rho_{21}+\rho_{22}\right)\left[\left(\left(1+r_f\right)-C^L\right)/\left(J+1\right)d-\left(a-\left(1+r_f\right)\right)/\left(J+1\right)d-\left(a-\left(1+r_f\right)\right)/\left(J+1\right)\right]+\\&+\rho_{12}\left[\left(\left(1+r_R\right)-C^H\right)/\left(J+1\right)d-\left(a-\left(1+r_R\right)\right)/\left(J+1\right)\right]=0\end{aligned}$$

Using (1) to express $1+r_R$ in terms of $1+r_f$ and solving for $1+r_f$, we find that this candidate equilibrium will be:

$$\left(1+r_f\right)=p\left[da+C^H\left(\rho_{11}+\rho_{12}\right)+C^L\left(\rho_{21}+\rho_{22}\right)\right]/\left[p\left(1-\rho_{12}\right)+\rho_{12}\right]\left(1+d\right) \tag{11}$$

Once this candidate equilibrium interest rate is obtained, we want to rewrite the ranges of C^H and C^L above in terms of exogenous parameters. The strategy that we will follow is to substitute the previous expression of the interest rate in the upper value and lower value of C^H

and C^L respectively. Once we have done it, we will try to express C^L in terms of C^H with the objective of characterizing the area where the equilibrium interest rate exists.

Let define $g_1\left(C^L\right) \equiv g_{10} + g_{11}C^L$ as the function resulting from the upper bound to C^L in (9):

$$C^H > \left[\left(p\rho_{11}+\rho_{12}\right)/p\left(\rho_{11}+\rho_{12}\right)\right]C^L + \left[da\rho_{12}(1-p)/\left(p\rho_{11}+\rho_{12}\right)\right] \equiv g_1(C^L) \qquad (12)$$

Similarly define, $g_2\left(C^L\right) \equiv g_{20} + g_{21}C^L$ as the function resulting from the inferior limit to C^H in (10):

$$C^H > \left[\left(\rho_{21}+\rho_{22}\right)/p\left(1-\rho_{12}\right)-\rho_{11}\right]C^L + da\left[(1-p)\left(1-\rho_{12}\right)\right]/\left[p\left(1-\rho_{12}\right)-\rho_{11}\right] \equiv g_2(C^L) \; (13)$$

So for values of C^L and C^H that satisfy (9) and (10) the equilibrium is non-autarchic and the equilibrium in the interbank market is given by (11)

<u>Lemma 2</u>. *Let us assume $g_2\left(C^L\right)$ is positive then we state that (12) is trivially satisfied if (13) is. In case of negative $g_2\left(C^L\right)$, we find the equilibrium area is determined by $g_1\left(C^L\right)$:*

To prove it, it is required to compare the intercepts and slope of both functions. In the first case, let us evaluate both functions assuming that the denominator of fractions that appear in $g_2\left(C^L\right)$ is positive, we find that $g_2(0) > g_1(0) > 0$ because $(1-p)\left(1-\rho_{12}\right)\rho_{12} + \rho_{11}\left(\rho_{12} + p\left(1-\rho_{12}\right)\right) > 0$ is always satisfied and $g_{21} > g_{11}$ if and only if 1 > p that is trivially satisfied.

This fact allows us to focus on $g_2\left(C^L\right)$ to determine the area where the equilibrium interest rate exists. In addition to these restrictions, it is required to avoid the possibility of having negative levels of loans and deposits what limits the maximum possible values of C^H and C^L that cannot be greater than a.

4.1.2.- Autarchy for risky banks with high cost of getting local deposits.

In this case, we describe a situation at which risky banks with high cost of getting local funds prefer to be in autarchy while rest of banks go to the interbank market.

As before, having that the banks from deposit-rich regions are net lenders in the interbank market requires:

$$C^{L}\varepsilon\left[0,\left(1+r_{f}\right)\left(1+d\right)-da\right] \tag{14}$$

while having that only the safe banks from deposit-poor regions are net borrowers requires:

$$C^{H}\varepsilon\left[\left(1+r_{f}\right)\left(1+d\right)-da,\left(\left(1+r_{f}\right)/p\right)\left(1+d\right)-da\right] \tag{15}$$

Similar to the previous case, the optimal decision of every bank at their regional loans and deposit markets was solved in previous section based on Cournot competition. Using the relevant expressions, the market clearing condition will require:

$$\rho_{11}\left[\left(\left(1+r_{f}\right)-C^{H}\right)/\left(J+1\right)d\right]-\left(a-\left(1+r_{f}\right)\right)/\left(J+1\right)+$$
$$+\left(\rho_{21}+\rho_{22}\right)\left[\left(\left(1+r_{f}\right)-C^{H}\right)/\left(J+1\right)d\right]-\left(a-\left(1+r_{f}\right)\right)/\left(J+1\right)=0$$

Isolating $1+r_{f}$ in previous expression, the candidate equilibrium interest rate for this case is:

$$\left(1+r_{f}\right)=1/\left(1+d\right)\left[da+\left(1/\left(1-\rho_{12}\right)\right)\left[C^{H}\rho_{11}+C^{L}\left(\rho_{21}+\rho_{22}\right)\right]\right]$$

As before, we will substitute this candidate interest rate in the ranges of C^{H} and C^{L} to characterize in terms of exogenous parameters the area where this equilibrium exists.

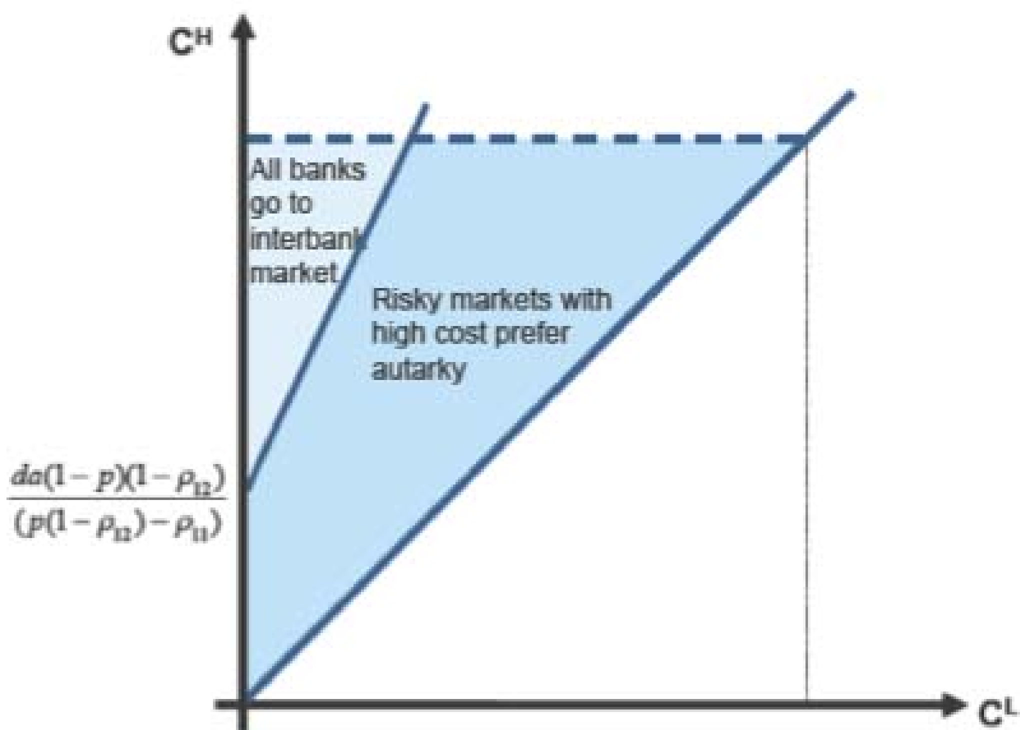
Let define $g_{3}\left(C^{L}\right)\equiv g_{30}+g_{31}C^{L}$ as the function resulting in the upper limit of C^{H} such that

$$C^{H}<\left[\left(\rho_{11}+\rho_{12}\right)/\left(p\left(1-\rho_{12}\right)-\rho_{11}\right)\right]C^{L}+\left[da(1-p)\left(1-\rho_{12}\right)\right]/\left[p\left(1-\rho_{12}\right)-\rho_{11}\right]\equiv g_{3}(C^{L}) \tag{16}$$

<u>Lemma 3</u> Considering that $g_{3}\left(C^{L}\right)$ is positive, we find (16) is the only relevant restriction and it represents an upper limit for C^{H}. In case of negative $g_{3}\left(C^{L}\right)$, $C^{H}>C^{L}$ is the condition that has to be trivially satisfied.

The only relevant restriction is (16) that represents an upper limit for C^{H} that also coincides with the lower limit for C^{H} in (13) of the previous scenario. As before, we guarantee that the intercept g_{30} and the slope g_{30} are always positive. Notice that this relation between upper and lower limit of each region allows us to state that there exists continuity in the equilibrium interest rate areas.

Figure 3. Scenarios and areas of equilibrium under perfect competition.



It is observed in the figure that the area where risky markets with high cost of attracting local funds makes bigger with increases of C^H and C^L because of the slope of the function that separates both areas that is greater than 1. To understand the implications of this analysis, we will make a comparative static of parameters of interest to determine the behaviour of the model and extract policy implications.

First, let analyse the effects of changes in the probability of solvency *p* (Appendix) and we see that an increase has positive effects on the area where all banks go to the interbank market. It means that reduction in the risk of the whole system produces a reduction of the spread tat is charged to risky banks. Therefore, their marginal cost is lower and they have more incentives to borrow money in the interbank market to offer deposits in regional markets. Moreover, it is important to remark that in case of equilibrium of the interbank market with the absence of risky and high cost banks, there is no role for p in the equilibrium interest rate.

Second, an increase in the size in the loan markets implies that banks have to give more loans what leads to a competition for the resources of local depositors that are not enough to satisfy loan needs and this fact makes the resulting interbank interest rate higher. But then, the cost of going to the interbank market increases, which raises the size of the area where the less efficient banks (high cost and high risk) prefer autarchy.

Finally, we should take into account possible changes in the proportions of risky markets or how a change in the proportion of markets with high cost of getting local funds affect the relation between these areas and the interest rate of equilibrium at each situation. Changes in ε, it produces a reduction in the area where all banks go to the interbank market while changes in the proportion of banks with high cost of getting funds has an ambiguous effect because it is not clear the relation with respect to the risk profile that is the only variable that unambiguously affect the size of the area.

4.2.- Interbank Market Imperfect information.

This subsection aggregates the excess demand of interbank funds for each region to determine the equilibrium interest rate under the assumption of imperfect information. As before, we analyse two different cases depending on the range of C^H; first we show how interest rate is determined when all banks go to the interbank market. Second, we study the case when there is collapse of the interbank market and banks prefer autarchy.

4.2.1.- Trade in the interbank market.

Imagine that all banks go to the interbank market. In this case, it must be satisfied that

$$C^L \varepsilon \left[0, \left(1+r_f\right)\left(1+d\right)-da\right] \tag{17}$$

so that banks from those regions with high supply of deposits are net lenders and

$$C^H \varepsilon \left[\left(\left(1+r_f\right) / \left(1-\varepsilon\left(1-p\right)\right)\right)\left(1+d\right)-da, \infty\right) \tag{18}$$

so that banks from regions where there is a low supply of deposits are net borrowers. In other words, the size of deposit side is such that under imperfect information a decrease in the cost of getting funds in the interbank market for risky agents $\left(\overline{r} < r_R\right)$ with $D_{i1} > L_{i1}$ changes the optimal choice of risky agents that prefer to go to the interbank market in comparison with the situation under perfect information.

Under imperfect information, the market clearing condition of the interbank market requires:

$$\begin{aligned}
&\left(\rho_{11}+\rho_{12}\right)\left[\left(\left(1+\overline{r}\right)-C^H\right)/\left(J+1\right)d-\left(a-\left(1+\overline{r}\right)\right)/\left(J+1\right)\right]+\\
&\left(\rho_{21}+\rho_{22}\right)\left[\left(\left(1+r_f\right)-C^L\right)/\left(J+1\right)d-\left(a-\left(1+r_f\right)\right)/\left(J+1\right)\right]=0
\end{aligned}$$

Using (3) to express $1+\bar{r}$ in terms of $1+r_f$ and solving for $1+r_f$, we find that this candidate equilibrium interest rate is determined by:

$$\left(1+r_f\right)=\left[1-\varepsilon(1-p)\right]\left[da+C^H\left(\rho_{11}+\rho_{12}\right)+C^L\left(\rho_{21}+\rho_{22}\right)\right]\Big/\left[1-\varepsilon(1-p)\left(1-\left(\rho_{11}+\rho_{12}\right)\right)\right](1+d) \tag{19}$$

Let define $g_4(C^L)\equiv g_{40}+g_{41}C^L$ as the function resulting from the upper bound to C^L obtained because of the substitution of the interest rate, such that

$$C^H>1\big/\left(1-\varepsilon(1-p)\right)C^L-da/b\equiv g_4\left(C^L\right) \tag{20}$$

Similarly, $g_5(C^L)\equiv g_{50}+g_{51}C^L$ is the function defined for the inferior limit of C^H, such that

$$\begin{aligned}C^H&>\left(\rho_{21}+\rho_{22}\right)\big/\left[\left(1-\varepsilon(1-p)\right)\left(\rho_{22}+\rho_{21}\right)-\left(\rho_{11}+\rho_{12}\right)\right]C^L+da\left[\left(\rho_{11}+\rho_{12}\right)-\right.\\&\left.\varepsilon(1-p)\left(\rho_{22}+\rho_{21}\right)\right]\big/\left[1-\varepsilon(1-p)\left(\rho_{22}+\rho_{21}\right)-\left(\rho_{11}+\rho_{12}\right)\right]\equiv g_5\left(C^L\right)\end{aligned} \tag{21}$$

So for values of C^L and C^H that satisfy (20) and (21) the equilibrium is non-autarchic and the equilibrium of the interbank market is given by (19).

<u>Lemma 4</u> Let us state that (20) is satisfied if (21) is, if and only if $g_5(C^L)$ is positive. In case of negative $g_5(C^L)$, we find that (20) is the only condition to satisfy. If it is the case and the proportion of regions with high cost of getting local deposits is high enough, we can guarantee the existence of both areas.

This fact allows us to focus on $g_5(C^L)$ to determine the area where the equilibrium interest rate exists. As we explained before, it is required to avoid the possibility of having negative levels of loans and deposits which conditions the maximum possible values of C^H and C^L that cannot be greater than a.

4.2.2.- Collapse of the interbank market.

Consider now the case where there is no trade in the interbank market. As before, banks with low cost of attracting funds in the local markets are net lenders in the interbank market if

$$C^L\varepsilon\left[0,\left(1+r_f\right)(1+d)-da\right]$$

and high cost banks in this context prefer autarky if and only if

$$C^H \varepsilon \left[(1+r_f)(1+d) - da, \left((1+r_f) / (1-\varepsilon(1-p)) \right)(1+d) - da \right]$$

where the interest rate of equilibrium is such that there is no trade in the interbank market. There is no trade because with these ranges of cost there are no banks with excess of loans. This result is easily proved as follows.

The interbank market condition of equilibrium is:

$$\left[\left((1+r_f) - C^L \right) / (J+1) d - \left(a - (1+r_f) \right) / (J+1) \right] = 0$$

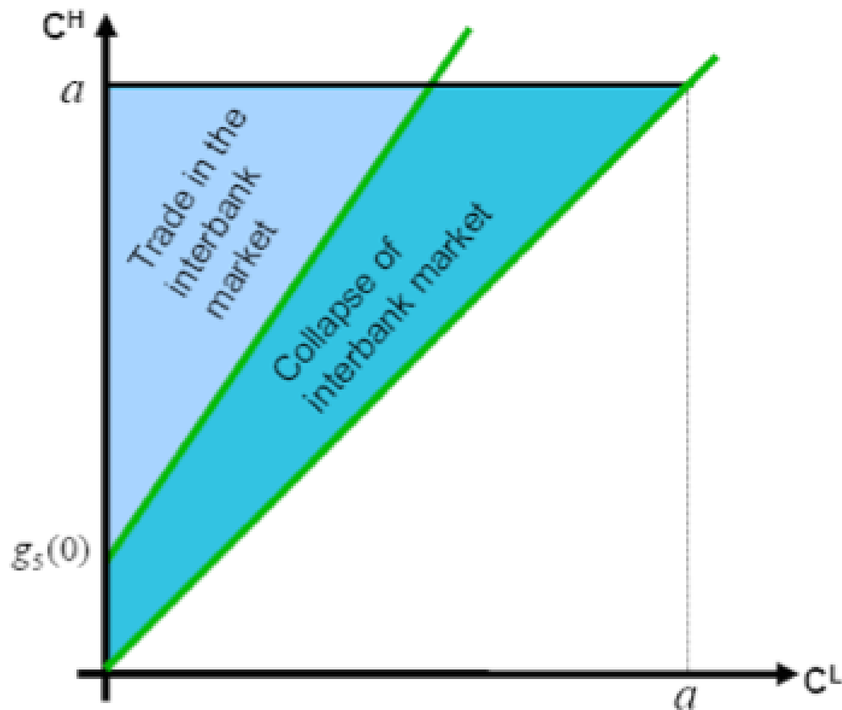
Lemma 5 In case of no trade in the interbank market, equilibrium interest rate is

$$(1+r_f) = (C^L + da) / (1+d)$$

and optimal levels of loans and deposits in the autarchic situation are

$$L^{**} = D^{**} = (a - C^L) / (3(1+d))$$

Figure 4. Interbank market under imperfect competition.



It is observed in the figure that the area where there is a collapse of the interbank market increases with C^H and C^L because the slope of the function that separates both areas is greater than *1*.

Collapse of the interbank market is negatively affected by increases of the solvency in the system *p* and this result has direct implications in terms of policies. Rescue packages or insurance mechanism that extract the uncertainty of default of the system could have similar positive effects on collapse. Sign and implications of changes of parameters are identical to the previous case with perfect information.

Notice that in case of imperfect information, changes in the proportion of agents are more important because it also affects spreads that banks have to pay in the interbank market. Marginal positive changes in the proportion of net lenders in the economy, the proportion of regions with low cost of getting local funds, produces a reduction of the area where the collapse can exist.

5.- Cross-sectional effects.

In this section, we study how quantities of loans and deposits behave when there are changes in the parameters. The goal is to analyse the different responses of the regions when there exists a shock in some of the parameters of interest. It is interesting to infer how under imperfect information effects in the interbank market are transferred to regional markets.

5.1.- Loans

The response of loans levels is identical in terms of sign independently of the possible equilibrium that we are analysing. Given the expression of loans choice we can distinguish two kind of parameters; those that affect directly to the expression of choice such as the size of the loan market, the slope of the demand function in this market or the probability of solvency and others that have only effect through the changes in the interest rate, such as cost of attracting deposits in the local market, the characteristics of the linear supply of deposits or the importance of each region in the interbank market.

First, let consider indirect effects that will always have an opposite sign to the one that affects the interest rate of equilibrium because the interest rate affects negatively to the loans choice for a particular bank. On the one hand, increases in the slope of supply for deposits and in the cost of getting deposits in the local markets affects negatively the level of loans $\left(dL_j / dd < 0 : dL_j / dC < 0 \right)$. On the other hand, changes in the composition of the interbank market has ambiguous that comes directly from changes in the interest rate.

Second, let focus on those parameters that affect directly through the structure of the loan market and indirectly through changes in the interest rate. Let consider a change in the size of loans market a; that affects positively to the level of loans because the positive direct

effect of higher demand for loans compensates the rise of the interest rate as we explained previously. Therefore, the higher a is, the more loans banks give in local markets $dL_j / da > 0$.

Finally, let consider the case of changes in the probability of solvency because it affects in an opposite way to banks of risky regions in comparison with banks of safe regions. Safe banks are affected exclusively by the change that the parameter *p* introduces in the interest rate given that they do not have to pay the spread of risk independently of being borrower or lender in the interbank market $dL_j / dp < 0$. Risky banks are directly affected in case of being borrowers in the interbank market because they have to pay the spread what is more they are also affected by the effect on the interest rate producing that the final effect is $dL_j / dp > 0$ what implies that the direct effect compensates the indirect effect. Hence, the less risky banks are, the higher the level of loans is that they choose because the spread to pay in the interbank market in case of borrowing money decreases.

5.2.- Deposits

Identically to the case of loans, we can distinguish two kind of parameters that condition the deposits levels; there exists parameters that affect directly to the expression of choice such as the slope of supply of deposits, the cost of attracting deposits in local markets or the probability of solvency and there are parameters that has only effect through the changes in the interest rate, such as size of loan markets, the slope of the demand for loans or the distribution of importance of each region in the interbank market.

First, let consider indirect effects that will always have the same sign that the effect on the interest rate because there is a positive and direct relation between interest rate and deposits. Hence, an increase in the size of loans produces a positive effect on deposit so $dD_j / da > 0$.

Second, let focus on those parameters that affect directly through the structure of the deposit markets and indirectly through changes in the interest rate. Let consider a change in the slope of the supply of loans *d*; that affects negatively to the level of deposits because the negative direct effect of higher sensitiveness to the competition in this side of the market compensates the positive effect that this parameter has on the interest rate, so that $dD_j / dd < 0$. Moreover, we should be interested in how deposits change when there is a positive shock in the probability of solvency; in this case, an increase in *p* affects differently to risky and safe banks. Deposits in safe regions are only distorted through changes in the interest rate, for this reason, the effect is positive such that $dD_j / dp > 0$ while deposits in risky regions are affected through two different channels; the indirect effect of the interest rate that produces

a positive effect and the direct effect of the change in the spread that risky banks have to pay when they are borrowers in the interbank market that cause a decrease in the levels of deposits that compensate the previous positive effect. Therefore, risky banks have $dD_j / dp < 0$.

Finally, let consider the case of changes in the cost of attracting deposits. When there exists a shock in the cost, it only distorts directly the market in which is relevant, such that for a high cost region a shock in the region of low cost and viceversa affects its deposits choice as far as affects to the interest rate of the interbank market. In these cases, the effect is that $dD_j / dC > 0$. However, a change in the cost of a high cost region has a double effect for its own region (the same happens with low cost regions) such that the distortion is determined by the changes in the interest rate and direct changes in the deposit choice. The final effect is determined by the direct effect that compensates the indirect effect and therefore, the final result is that $dD_j / dC > 0$.

6.- Conclusions

This paper presents a model with imperfect competition in the loan and deposit markets; those banks have access to a perfectly competitive interbank market where they can borrow to or lend from. A main result emerges under this context; the role of the information in the interbank market that is crucial because problems of information lead to the collapse of the interbank market under certain circumstances that are characterized in the model; independently of the degree of competition in the retail markets.

The model presented considers that the number of banks in the local markets has no effects on the expressions of the interbank market under the assumptions of identical number of banks in each market. This fact is due to the assumption of correlated default events characterized by the multiplicative effect of the probability of non-default. Clearly, this assumption has important implications because the number of banks has a multiplicative effect on all the expressions. An alternative would be to consider different number of banks in each market, however, the analysis of comparative statics; changes in the proportion of banks in terms of the parameter *C* and the profile of risk is capturing a similar effect. Asymmetries in the number of banks that compete in a given region could have a similar effect in the interbank market to changes in the proportion of regions. A higher proportion of risky region could increase the size of the area where there exists collapse in the interbank market.

The model that is presented in this paper, is characterized under two scenarios of information; perfect and imperfect information. We observe that under imperfect information, it is possible to find a collapse of the interbank market where the interest rate of equilibrium is such that no banks want to go to the interbank market as borrowers and therefore, there is no trade.

The framework can be used in further researches to explore the effects of non-insuranced deposits or the consideration of international banks that operate in several retail markets at the same time.

Finally, it is important to remark the importance of the probability of solvency p because of its policy implications. An increase in the probability of solvency implies a reduction in the risk that there exists in the economy, reducing the area where the collapse of the interbank market is produced what could improve the allocation of resources in the economy and it could be a desirable policy from this perspective.

7.- Appendix 1

Considering $L_2 = D_2 = X^{***}$ with $X^{***} = X^{*}$ we want to prove that

$$\prod\left(X^{***}, X^{**} : X^{**}, X^{**}\right) > \prod\left(L_1, D_1, X^{**}, X^{**}\right) \qquad \forall L_1, D_1$$

Clearly, $L_1 = D_1 = X^{***}$ is optimal among the class of decisions with $L_1 = D_1$. It will be proved by contradiction.

We need to check that $\nexists \varepsilon, \mu$ with $\varepsilon \neq \mu$ such that

$$\prod\left(X^{***} + \varepsilon, X^{**} + \mu : X^{**}, X^{**}\right) > \prod\left(X^{**}, X^{**}, X^{**}, X^{**}\right) \qquad \forall L_1, D_1$$

There exist two possibilities

1) $\varepsilon > \mu \Rightarrow (L_1 - D_1) > 0$

2) $\varepsilon < \mu \Rightarrow (L_1 - D_1) < 0$

1. Let consider the case with $\varepsilon > \mu \Rightarrow (L_1 - D_1) > 0$. Without loss of generality, let us look at $\mu = 0$ and $\varepsilon > 0$ where

$$\partial \prod / \partial \varepsilon = \partial \prod / \partial L\left(L_1 = D_1 = X^{**} : L_2 = D_2 = X^{**}\right) = a - 3bX^{**} - \left(1 + r_\theta\right) < 0$$

This condition holds if and only if

$$C \leq \left(1 + r_\theta\right)\left(1 + d\right) - da$$

2. Let consider the case with $\varepsilon < \mu \Rightarrow (L_1 - D_1) < 0$. Without loss of generality, let us look at $\mu = 0$ and $\varepsilon > 0$ where

$$\partial \prod / \partial \varepsilon = \partial \prod / \partial L\left(L_1 = D_1 = X^{**} : L_2 = D_2 = X^{**}\right) = a - 3bX^{**} - \left(1 + r_\theta\right) < 0$$

By symmetry with prior derivation, it will happen that this condition holds if and only if

$$C \geq \left(1 + r_f\right)\left(1 + d\right) - da$$

The autarchic candidate is the conjectured solution for

$$C \in \left[\left(1 + r_f\right)\left(1 + d\right) - da, \left(1 + r_\theta\right)\left(1 + d\right) - da\right]$$

Given (1) and (2), there is no space for the existence of profitable deviations in the autarchic range. The same scheme of the proof can be used for deviations in deposit side but symmetries between problems guarantee the existence of the same result. Therefore, this proof allows to state that the unique symmetric pure strategy Cournot equilibrium in autarky is the conjectured range.

8.- Appendix 2

In this appendix, we derive carefully the derivative and total differential that are presented in the comparative static section.

8.1.- Perfect information.

First, let analyse changes in the probability of solvency, then:

$$\partial g_{20}/\partial p = -da\left(1-\rho_{12}\right)\left[\rho_{21}+\rho_{22}\right]/\left(p\left(1-\rho_{12}\right)-\rho_{11}\right)^{2} < 0$$
$$\partial g_{21}/\partial p = -\left(1-\rho_{12}\right)\left[\rho_{21}+\rho_{22}\right]/\left(p\left(1-\rho_{12}\right)-\rho_{11}\right)^{2} < 0$$

the sign is the same for the slope and the intercept in this analysis.

Now, let consider changes in the size of the demand for loans a :

$$\partial g_{20}/\partial a = d\left[\left(1-\rho_{12}\right)\left(1-p\right)\right]/\left[p\left(1-\rho_{12}\right)-\rho_{11}\right] > 0 : \partial g_{21}/\partial a = 0$$

the effect comes only from changes in the intercept so there exists parallel shifts of the function.

As we have done previously, let see changes in the parameter *d* that represents the changes in the slope of the supply of deposits.

$$\partial g_{20}/\partial d = a\left[\left(1-\rho_{12}\right)\left(1-p\right)\right]/\left[p\left(1-\rho_{12}\right)-\rho_{11}\right] > 0 : \partial g_{21}/\partial d = 0$$

we find the same effect that we found with changes in a, there is a parallel shift in the function.

Finally, we should consider changes in ε and μ. First, assuming $\mu = 1-\mu = 0.5$ changes in ε have a positive effect on the slope and the intercept of the function

$$\partial g_{20}/\partial \varepsilon = da\left(1-p\right)\left[\left(1-\rho_{12}\right)\left(2-p\right)+\rho_{11}\right]/\left(p\left(1-\rho_{12}\right)-\rho_{11}\right)^{2} > 0$$
$$\partial g_{21}/\partial \varepsilon = \left[\rho_{21}+\rho_{22}\right]/\left(p\left(1-\rho_{12}\right)-\rho_{11}\right)^{2}\left(1-p\right) > 0$$

in the case of μ, considering $\varepsilon = 1-\varepsilon$

$$\partial g_{20}/\partial \mu = da\left(1-p\right)\left[\rho_{11}-\left(2p-\rho_{11}\right)\left(1-\rho_{12}\right)-p\left(1-\rho_{12}\right)^{2}\right]/\left(p\left(1-\rho_{12}\right)-\rho_{11}\right)^{2} = ?$$
$$\partial g_{21}/\partial \mu = \left[\rho_{21}+\rho_{22}\right]/\left(p\left(1-\rho_{12}\right)-\rho_{11}\right)^{2}\left(1-p\right) > 0$$

in this case the final effect is ambiguous because we cannot characterize the effect on the intercept of the area.

8.2.- Imperfect information.

First, let analyse changes in the probability of solvency, then:

$$\partial g_{50}/\partial p = da\varepsilon(\rho_{21}+\rho_{22})[(\rho_{21}+\rho_{22})-2(\rho_{11}+\rho_{12})]/[(1-\varepsilon(1-p))(\rho_{21}+\rho_{22})-(\rho_{11}+\rho_{12})]<0$$
$$\partial g_{51}/\partial p = -\varepsilon(\rho_{21}+\rho_{22})^2/(1-\varepsilon(1-p)(\rho_{12}+\rho_{22})-(\rho_{11}+\rho_{12}))^2<0$$

the sign is the same for the slope and the intercept in this analysis.

Now, let consider changes in the size of the demand for loans a :

$$\partial g_{50}/\partial a = d[(\rho_{11}+\rho_{12})-\varepsilon(1-p)(\rho_{21}+\rho_{22})]/[(1-\varepsilon(1-p))(\rho_{21}+\rho_{22})-(\rho_{11}+\rho_{12})]>0 ;$$
$$\partial g_{51}/\partial a = 0$$

the effect comes only from changes in the intercept so there exists parallel shifts of the function.

As we have done previously, let see changes in the parameter d that represents the changes in the slope of the supply of deposits.

$$\partial g_{50}/\partial d = [(\rho_{11}+\rho_{12})-\varepsilon(1-p)(\rho_{21}+\rho_{22})]/[(1-\varepsilon(1-p))(\rho_{21}+\rho_{22})-(\rho_{11}+\rho_{12})]>0$$
$$\partial g_{51}/\partial d = 0$$

we find the same effect that we found with changes in a , there is a parallel shift in the function.

Finally, we should consider changes in ε and μ. First, changes in ε have a positive effect on the slope and the intercept of the function

$$\partial g_{50}/\partial\varepsilon = (1-\mu)(\partial g_{51}/\partial\rho_{12}-\partial g_{51}/\partial\rho_{11})+\mu(\partial g_{51}/\partial\rho_{22}-\partial g_{51}/\partial\rho_{21})=0$$
$$\partial g_{51}/\partial\varepsilon = (\rho_{21}+\rho_{22})/[(1-\varepsilon(1-p)(\rho_{21}+\rho_{22}))]$$

in case of μ , we have

$$\partial g_{50}/\partial\mu = -da[(1-\varepsilon(1-p))(\rho_{21}+\rho_{22})-(\rho_{11}+\rho_{12})](1+\varepsilon(1-p))/\left[(1-\varepsilon(1-p))(\rho_{21}+\rho_{22})-(\rho_{11}+\rho_{12})^2\right]+$$
$$+da[(\rho_{11}+\rho_{12})-\varepsilon(1-p)(\rho_{21}+\rho_{22})](1-\varepsilon(1-p))/[(1-\varepsilon(1-p))(\rho_{21}+\rho_{22})-(\rho_{11}+\rho_{12})]^2>0$$
$$\partial g_{51}/\partial\mu = -1/[(1-\varepsilon(1-p)(\rho_{21}+\rho_{22}))-(\rho_{11}+\rho_{12})]^2<0$$

in this case the final effect is that there exists a reduction in the slope and in the intercept in the equation (21).

8.3.- Interest rate, loans and deposits

The effect of changes in the parameters is identical in sign in all the scenarios that we consider. To save space, the results will be presented in a table:

In the case of interest rate

	Perfect information sign
sign$\left(\frac{\partial(1+r_f)}{\partial z}\right)$	**All banks go to the I.M.**
a	$\frac{pd}{[p(1-\rho_{12})+\rho_{12}](1+d)} > 0$
d	$\frac{[p(1-\rho_{12})+\rho_{12}]pd[a-C^H(\rho_{11}+\rho_{12})-C^L(\rho_{21}+\rho_{22})]}{([p(1-\rho_{12})+\rho_{12}](1+d))^2} > 0$
p	$\frac{\rho_{12}[da+(C^H(\rho_{11}+\rho_{12})+C^L(\rho_{21}+\rho_{22})]}{([p(1-\rho_{12})+\rho_{12}](1+d))^2} > 0$
C^L	$\frac{p(\rho_{21}+\rho_{22})}{(1+d)[p(1-\rho_{12})+\rho_{12}]} > 0$
C^H	$\frac{p(\rho_{11}+\rho_{12})}{(1+d)[p(1-\rho_{12})+\rho_{12}]} > 0$
μ	$\frac{p(C^L-C^H)}{(1+d)[p(1-\rho_{12})+\rho_{12}]} - \varepsilon\frac{p(1+d)[(1-p)da+1(C^H(\rho_{11}+\rho_{12})+C^L(\rho_{21}+\rho_{22}))]}{((1+d)[p(1-\rho_{12})+\rho_{12}])^2} < 0$
ε	$\mu\frac{p1(C^H-C^L)}{(1+d)[p(1-\rho_{12})+\rho_{12}]} - (1-\mu)\frac{p(1+d)[(1-p)da+(C^H(\rho_{11}+\rho_{12})+C^L(\rho_{21}+\rho_{22}))]}{((1+d)[p(1-\rho_{12})+\rho_{12}])^2} \lesseqgtr 0$
	Risky banks with C^H prefer autarchy
a	$\frac{d}{1+d} > 0$
d	$\frac{(a-C^H\rho_{11}-C^L(\rho_{21}+\rho_{22}))}{(1-\rho_{12})(1+d)} > 0$
p	0
C^L	$\frac{(\rho_{21}+\rho_{22})}{(1+d)(1-\rho_{12})} > 0$
C^H	$\frac{b\rho_{11}}{(b+d)(1-\rho_{12})} > 0$
μ	$\frac{(C^L(1+\varepsilon(\rho_{21}+\rho_{22}))-C^H(1-\varepsilon(1+\rho_{11}))}{(1+d)(1-\rho_{12})} \lesseqgtr 0$
ε	$-(1-\mu)\frac{C^H+[2da+(C^H\rho_{11}+C^L(\rho_{21}+\rho_{22}))]}{(1+d)(1-\rho_{12})} < 0$

Considering the case of

$\text{sign}\left(\frac{\partial L_{ij}}{\partial z}\right)$	**Perfect information**
	All banks go to the I.M.
a	$1 - pd/[p(1-\rho_{12}) + \rho_{12}](1+d) > 0$
d	$-\partial(1+r_f)/\partial d < 0$
p for risky banks	$(1+r_f)/p^2 - \partial(1+r_f)/\partial p > 0$
p for safe banks	$-\partial(1+r_f)/\partial p < 0$
C	$-\partial(1+r_f)/\partial C < 0$
μ	$-\partial(1+r_f)/\partial \mu > 0$
ε	$-\partial(1+r_f)/\partial \varepsilon \lesseqgtr 0$
	Risky banks with C^H prefer autarchy
a	$1 - \frac{d}{1+d} > 0$
d	$-\partial(1+r_f)/\partial d < 0$
p for risky banks	0
p for safe banks	0
C	$-\partial(1+r_f)/\partial C < 0$
μ	$-\partial(1+r_f)/\partial \mu \lesseqgtr 0$
ε	$-\partial(1+r_f)/\partial \varepsilon > 0$

loans:

$\text{sign}\left(\frac{\partial L_{ij}}{\partial z}\right)$	**Imperfect information**
	All banks go to the I.M.
a	$1 - d(1-\varepsilon(1-p))/[1-\varepsilon(1-p)(1-(\rho_{11}+\rho_{12}))](b+d) > 0$
d	$-\partial(1+r_f)/\partial d < 0$
p for risky banks	$(1+r_f)/p^2 - \partial(1+r_f)/\partial p > 0$
p for safe banks	$-\partial(1+r_f)/\partial p < 0$
C	$-\partial(1+r_f)/\partial C^L < 0$
μ	$-\partial(1+r_f)/\partial \mu \lesseqgtr 0$
ε	0
	Collapse of the I.M.
a	$1 - d/(b+d) > 0$
d	$-\partial(1+r_f)/\partial d < 0$
p for risky banks	0
p for safe banks	0
C	$-\partial(1+r_f)/\partial C^L < 0$
μ	0
ε	0

In the case of deposits:

	Perfect information	Imperfect information
$\text{sign}\left(\frac{\partial D_{ij}}{\partial z}\right)$	**All banks go to the I.M.**	
a	$\partial(1+r_f)/\partial a > 0$	$\partial(1+r_f)/\partial a > 0$
d	$3((1+r_f)-C)-\partial(1+r_f)/\partial d \lesseqgtr 0$	$3((1+r_f)-C)-\partial(1+r_f)/\partial d \lesseqgtr 0$
p for risky regions	$-(1+r_f)/p^2+\partial(1+r_f)/\partial p < 0$	$-(1+r_f)/p^2+\partial(1+r_f)/\partial p < 0$
p for safe regions	$\partial(1+r_f)/\partial p > 0$	$\partial(1+r_f)/\partial p > 0$
C^H for C^H regions	$\partial(1+r_f)/\partial C^H - 1 < 0$	$\partial(1+r_f)/\partial C^H - 1 < 0$
C^H for C^L regions	$\partial(1+r_f)/\partial C^H > 0$	$\partial(1+r_f)/\partial C^H > 0$
C^L for C^H regions	$\partial(1+r_f)/\partial C^L > 0$	$\partial(1+r_f)/\partial C^L > 0$
C^L for C^L regions	$\partial(1+r_f)/\partial C^L - 1 < 0$	$\partial(1+r_f)/\partial C^L - 1 < 0$
μ	$\partial(1+r_f)/\partial \mu < 0$	$\partial(1+r_f)/\partial \mu \lesseqgtr 0$
ε	$\partial(1+r_f)/\partial \varepsilon \lesseqgtr 0$	0
	Risky banks with C^H prefer autarchy	**Collapse of the I.M.**
a	$\partial(1+r_f)/\partial a > 0$	$\partial(1+r_f)/\partial a > 0$
d	$3((1+r_f)-C)-\partial(1+r_f)/\partial d \lesseqgtr 0$	$3((1+r_f)-C)-\partial(1+r_f)/\partial d \lesseqgtr 0$
p for risky regions	0	0
p for safe regions	0	0
C^H for C^H regions	$\partial(1+r_f)/\partial C^H - 1 < 0$	$\partial(1+r_f)/\partial C^H - 1 < 0$
C^H for C^L regions	$\partial(1+r_f)/\partial C^H > 0$	$\partial(1+r_f)/\partial C^H > 0$
C^L for C^H regions	$\partial(1+r_f)/\partial C^L > 0$	$\partial(1+r_f)/\partial C^L > 0$
C^L for C^L regions	$\partial(1+r_f)/\partial C^L - 1 < 0$	$\partial(1+r_f)/\partial C^L - 1 < 0$
μ	$\partial(1+r_f)/\partial \mu \lesseqgtr 0$	0
ε	$\partial(1+r_f)/\partial \varepsilon < 0$	0

References

Acemoglu, D. 2009: The Crisis of 2008: structural lesson for and from economics*, CEPR Policy Insight.*

Allen, F. and Galle, D. (2000): Comparing Financial Systems. MIT Press, Cambridge, Massachusets.

Bikker, J.A. and Haaf, J., (2002): Measures of competition and concentration in the banking industry. *Economic & Financial Modelling, 2002.*

Boyd, J.H. and Nicoló, G. (2005): The theory of bank risk taking and competition revisited. *Journal of Finance, Vol. 60, No. 3, pp. 1329-1343*

Bruche, M. and Suarez, J. (2009): The macroeconomics of Money Market Freezes, *CEPR, DP 7304, May 2009.*

Claessens, S. and Leaven, L. (2004): What drives bank competition? Some international evidence. *Journal of Money, Credit and Banking, Vol. 36, No. 3, pp. 563-584.*

Demirgüc-Kunt, A., Kane, E. J. and Laeven, L. (2008): Determinants of deposit-insurance adoption and design. *Journal of Financial Intermediation, Vol. 17, No. 3, pp. 407-438*

Diamond, D. W., and Dybvig, P. H. (1983): Bank Runs, Deposit Insurance and Liquidity. *Journal of Political Economy Vol. 91: 401-419.*

Heider, F., Hoerova, M. and Holthausen, C. (2008): Liquidity Hoarding and Interbank Market Spreads: The Role of Counterparty Risk. *Working Paper Series SSRN.*

Ivashina, V., and Scharfstein, D., (2008): Bank Lending During the Financial Crisis of 2008. *Working Paper Series.*

Kishan, R.P. and Opiela, T.P., (2000): Bank size, bank capital and the bank lending channel. *Journal of Money, Credit and Banking, Vol. 32, No. 1, pp. 121-141.*

Reinhart, C. M. and Rogoff, K.S., (2008): Is the 2007 US sub-prime financial crisis so different? An international historical comparison, *American Economic Review, Vol. 98, No. 2, pp.339-344.*

Reinhart, C. M. and Rogoff, K.S., (2009): The Aftermath of financial crises, *American Economic Review, Vol. 99, No. 2, pp. 466-472.*

Schich, S. (2008): Financial Crisis: Deposit Insurance and Related Financial Safety Net Aspects, *Financial Market Trends, Vol. 28, No.2, pp.76-121.*

Taylor, J. B., (2009): The Financial Crisis and the Policy Responses: An empirical analysis of what went wrong, *NBER Working Paper, No. w14631.*

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