COMPETITION IN FRENCH AND ITALIAN BANKING MARKETS: A COMPARISON

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ABSTRACT.

This paper addresses the empirical question of measuring competition in the banking sector. The question is relevant both from a positive and a normative perspective. Banking industries in Europe, specifically in France and Italy, are quickly changing their structure after deregulation, and it is interesting to find out which direction competition among banks has been following in the past few years. It is also interesting to be able to measure and forecast the change in degree of competition due to mergers among banks in an antitrust perspective.
The analysis is not however entirely data based. The quantitative results are derived from a well founded theoretical model that allows to infer information about benefits and costs by bank and by market from banks' entry and branching decisions. The estimated benefits and costs are then used to compute measures of degree of competition.
It results that the structures of the French and Italian banking industries differ, with a strong evidence that the Italian banking sector is still far from an equilibrium state, mostly because economies of scale in branching have still to be exploited and local market power niches are still allowed to exist. Both measures of competitive behaviour presented in the paper indicate, on average, tougher competition in France than in Italy.
There is also some evidence that mergers do not induce lesser competition. Rather the opposite, in some cases.

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Introduction

Banking industry and concentration: tons of paper have been used to describe, analyse, predict the effects on the overall welfare of an economy, or on the welfare of single types of bank customers, of changes in the structure of the banking sector in advanced industrialized countries, after deregulation, and after the waves of M&A within borders and, lately, across borders. Did deregulation make the banking industry more competitive? More efficient? Did the subsequent M&As reduce competition or the access to credit for some categories of customers?

This paper, a follow up of Cerasi, Chizzolini, Ivaldi 2000 and 2002, enters this flow of contributions with the aim to measure the degree of competition and compare the structure of the Italian and French banking industries after most of the impact effects of the deregulation implemented in the first years of the 1990's have been exhausted, and while a new wave of M&A within and across borders is in full swing.

The literature that underlies this paper may be divided into two segments, one on bank competition, more specifically on measures of the effects of consolidation on banks' market power and on competitive behaviour among banks; the second based on the literature that looks at firms' observed decisions about entry and own size to infer something about their profits and strategic behaviour.

One main concern of the first type of literature is to find a unit free index of competition to be computed for any industry of interest and to be used to compare the degree of competitiveness across industries or, within an industry, across regions or time. Such indexes were suggested within the industrial organisation field, they include the Herfindahl, the Lerner, the Rosse-Panzar indexes among others, and have been applied to the banking sector quite a few times, without any substantial modification due to the peculiar characteristics of this industry. (See Sapienza, 2002, Goddard, 2007 and references therein). It must be stressed that this literature is an important benchmark for any result on degree of competition obtained with alternative approaches.

Similarly, the literature on firms' entry into non competitive markets and its empirical applications deals with all kinds of industries , but has very rarely been applied to the banking sector. To my knowledge only Pedro Pita Barros, 1995, Cabral and Majure, 1994, with empirical applications on the Portuguese banking industry and Cerasi, et al., have contributed to this specific branch of the literature.

Steve Berry with Elie Tamer in a recent critical survey of the empirical literature on entry models write: "*The idea of these models is that firms enter into a market only when they expect to operate profitably, and therefore entry decisions can be used as an indicator of a latent profit function*". More formally a game theoretic approach to entry decisions is the base of most of these published empirical works.

Static two stage games are usually set up, where firms decide to enter in the first stage, and compete with other firms in the second stage according to some predefined rules in either price or quantity. Solving backwards, if there exists an equilibrium solution to the second stage game, firms will decide to enter the market if the expected profit is larger or equal to entry costs. The models may get extremely complicated when strategic behaviour and oligopoly, or incomplete information enter the rules of the second stage game, so that the equilibrium solution may not be unique: see the pioneer work by Bresnahan and Reiss (1987,1990, 1991). The model may also get more complicated with the introduction of dynamic entry/exit games. (Berry, Tamer, 2006)

The work presented in this paper also relies on a simple static two stages game, where there exists a non-cooperative symmetric solution to the second stage competition on interest rates among banks, and banks decide in the first stage whether to enter and with which branching size. The finer points of the model, namely the characterisation of the profit and cost functions, will be discussed in section 1. What is of interest now is to point out that the empirical counterpart of this model, (see section 2) as well as of all the other models in this branch of literature, does not need to use the actual prices or profits of the firms involved in the game, because each bank's profit derived from the solution to the second stage of the game is actually a (reduced form) function of the observable size of the market, of the number of competitors and of the size of the bank, as well as of some structural parameters linked to the rules of the competition game and to the characteristics of the industry under analysis. Which means that the burden of collecting firm level data , some of it from not always reliable accounting sources, is minimized. It also implies that the technique used in this paper retrieves, from mostly market data, information on the non observable costs and benefits at bank level. Two indices of degree of competition based on these estimates are presented: the first one is strictly related to one of the structural parameters in the profit function, the estimated marginal profitability of bank branching by market. It measures degree of competition under the assumption that in markets where competition is fiercer, expanding operations is less profitable at the margin. The second one measures the distance between the estimated latent marginal benefits and costs either by bank or by market: for profit maximising banks operating in a monopolistic competitive regime, marginal costs should equate marginal benefits in equilibrium. If they do not, the banks are either operating in disequilibrium or they are colluding .

The data that have been used are described in section 3, while comments on the estimation results are in section 4. Very briefly, it results that the structure of the Italian and French banking industries are quite different: competition is apparently tougher in French local markets, but in both countries banks operate under non competitive conditions, with marginal benefits larger than marginal costs in most cases. Conclusions will close the paper.

1. The model

The following simplified model of bank behaviour is based on different theoretical articles (Cerasi 1996, Cerasi et al., 2002 and Ivaldi, 2006). The model posits that the potential entrants into a banking market do not follow any collusive strategy, while, to maximize their profits, they compete both on interest rates (the prices of the services they supply) and on penetration rates into the market, that is on the number and location of branches they open in the reference market.

A bank enters and stays in the market only if profits π are larger or equal than sunk entry costs, *s,* that include all fixed and partly irrecoverable costs needed to ensure bank production at the chosen branching network size, and that are sunk before any service can be supplied. So the condition

$$\pi \geq s \qquad [1]$$

must hold. In equilibrium, when all profits are competed away by new entry, π must be equal to *s*.

To further simplify matters, assume profits of a bank may be approximated by the following function:

$$\pi \equiv \pi(k; S, c, N) = S\frac{k^c}{\sqrt{N}} = S\sqrt{\frac{k}{N}} \times k^{c-0.5}, \qquad [2]$$

where *S* is the size of the market, measured as total deposits, *k* is the bank branching network size, that is the number of bank's operating branches, and *N* is the total number of branches in that market, that is $N = k + \sum_{j \neq i} k_j$ the sum of *k* plus rivals banks' branches. The profit function in [2] is an approximation of bank profits in terms of observable information[2]. We discuss now each element in the formula in turn.

First of all, consider the role of S. The profit function [2] relies on the fact that both revenues and costs depend positively on the size of the market for deposits. Net interest revenues are strictly linked to the amount of deposits the bank is able to gather, itself a proportion of the overall available deposits in the market. Similarly commissions earned on other services supplied by the bank depend on the number of clients of the bank, or more precisely on the number and amount of deposits. Hence it is natural to consider that profits are proportional to S as in Equation [2].

Second, consider the role of k/N. As the number of branches of each bank in the market increases, profits increase but at a decreasing pace: the positive effect is due to the <u>expansive effect</u> in the market of attracting new clients; the slow pace is due to the crowding effect in the market of adding a new branch. Hence, in formula [2], profits are directly proportional to the square root of the share of branches of a specific bank in the market.

Third, consider the role of $k^{c-0.5}$. Profits increase further, in addition to the effect of k/N discussed above, when the branching network size increases, if c is large. The parameter c captures the inverse of the degree of competition in the market for deposits. When competition is tough, small c, adding a new branch implies cannibalizing some of the previous clients of the same bank, with thus a negative additional effect on per-branch profits. The strength of this <u>competitive effect</u> is measured by the parameter c, the exponent of k. The lower is c, the less profitable a new branch will be.

Given the profit function in [2] and the entry condition [1], for a bank that enters a market with k branches, it must be:

$$\pi(k;S,c,N) = \frac{Sk^c}{\sqrt{N}} \geq s \qquad [3]$$

where

$$s = a + \varepsilon(k-1).^3 \qquad [4]$$

[2] In other published models of entry, the reduced form profit function is usually specified as a combination without restriction on the parameters of the variables that we call S, N, and S/N, sometimes $(S/N)^2$. (See Berry, Tamer, 2006). The difference with the profit function in this paper is that we fix some of the parameters, but the underlying interpretation is the same.

[3] The notation ε for the marginal branching cost coefficient will become clear presently, when its stochastic nature is revealed.

Equation [4] provides a simplified model of sunk entry costs where *a* is the cost of entry with one branch and $\varepsilon(k-1)$ is the part of sunk cost that varies proportionally with branching size. It implies economies of scale for *a* larger than ε, and constant marginal branching cost for a bank in a market. It is a general enough formula that allows both *a* and ε to be a function of a set of variables such as labor and capital costs in that market, as well as bank specific unobservable characteristics, such as managers' ability and bank reputation, that may affect the costs of setting up a new branch. Considering entry condition [3], an upper bound for *a* of banks that entered the market may be computed as $\pi(1;S,c,N)=\frac{S1^c}{\sqrt{N}}=\frac{S}{\sqrt{N}}$.

From equation [2] the change in profits when the bank decides to add a new branch is given by

$$MB=\frac{d\pi(k)}{dk}=\frac{Sck^{c-1}}{\sqrt{N}}-\frac{Sk^c}{2N^{3/2}}=\frac{Sk^{c-1}}{\sqrt{N}}\left(c-\frac{k}{2N}\right) \qquad [5]$$

Remember that $N=k+\sum_{i\neq j}k_j$, thus when computing the derivative of profits, we have to account for the change in *N* due to an additional branch in the market.

The profits from the branching network increase when $c\geq\frac{k}{2N}$. More in particular, the expansive effect dominates the competitive effect the greater the value of *c*, since then each branch is more profitable. To conclude *small values of c indicate greater degree of competition.*

From equation [5], it is possible to derive that:

$$c=\frac{d\ln\pi(k)}{d\ln k}+\frac{k}{2N}.$$

In other words, when *N* is large, the parameter *c* captures approximately the elasticity of profits with respect to branching size.

The profit maximizing bank decides to expand its branching network, *k*, up to the point where the marginal benefit of opening a new branch, given by equation [5], equates the marginal branching cost ε, that is

$$MB\equiv\frac{d\pi(k)}{dk}=\frac{Sk^{c-1}}{\sqrt{N}}\left(c-\frac{k}{2N}\right)=\varepsilon=\frac{ds}{dk}\equiv MC \qquad [6]$$

Note that for unit banks, banks that enter and stay in the market with just one branch, condition [6] cannot be satisfied, as the cost of opening even one additional branch must be larger than its marginal benefit.

2. The econometric test

To get to the econometric test, let us define bank *i* operating in market *j* at time *t* as an observation *(ijt)*. For all the banks in the market, branching decisions are taken according to the profit maximising condition (FOC) in equation [6]:

$$MB_{ijt} = \frac{S_{jt} k_{ijt}^{c_{jt}-1}}{\sqrt{N_{jt}}} \left(c_{jt} - \frac{k_{ijt}}{2N_{jt}} \right) = \varepsilon_{ijt} = MC_{ijt} \qquad [6']$$

The following threshold can then be defined:

$$A_{ijt} = \frac{S_{jt} k_{ijt}^{c_{jt}-1}}{\sqrt{N_{jt}}} \left(c_{jt} - \frac{k_{ij,t-1}}{2N_{jt}} \right) \qquad [7]$$

From the FOC in [6], we have that in equilibrium one of these inequalities must be true:

$$\begin{aligned} &8.1 \quad \Delta k_{ijt} \geq 0, k_{ijt} > 1 \Leftrightarrow A_{ijt} \geq MB_{ijt}(k_{ijt}) = \varepsilon_{ijt} \\ &8.2 \quad \Delta k_{ijt} < 0, k_{ijt} > 1 \Leftrightarrow A_{ijt} < MB_{ijt}(k_{ijt}) = \varepsilon_{ijt} \\ &\text{and, for unit banks:} \\ &8.3 \quad \Delta k_{ijt} = 0, k_{ijt} = 1 \Leftrightarrow A_{ijt} = MB_{ijt}(k_{ijt}) < \varepsilon_{ijt} \end{aligned} \qquad [8]$$

where $\Delta k_{ijt}.=k_{ijt}-k_{ij,t-1}$. Conditions in [8] can be restated as follows: for all expanding multi-branch banks the marginal branching cost must be smaller than the threshold in [7]; for all shrinking multi-branch banks the marginal branching cost must be larger than the threshold; finally, for all unit banks the marginal branching cost must be larger than the threshold value for any number of branches larger than 1.

Assume now that in each period *t*, market *j*, bank *i* draws the branching cost, ε_{ijt}, a random variable with density function f_ε, and cumulative function F_ε. This variable, conditionally on some firm, market and time specific variables W_{ijt}, is identically and independently distributed across markets and banks. Given these assumptions the set of inequalities, given by conditions [8], can be cast in probabilistic terms as follows:

$$
\begin{array}{ll}
9.1 & Pr(k_{ijt} > 1, \Delta k_{ijt} \geq 0) = \Pr(\varepsilon_{ijt} \leq A_{ijt}) \\
9.2 & Pr(k_{ijt} > 1, \Delta k_{ijt} < 0) = \Pr(\varepsilon_{ijt} > A_{ijt}) \\
9.3 & Pr(k_{ijt} = 1) = \Pr(\varepsilon_{ijt} > A_{ijt})
\end{array} \qquad [9]
$$

Conditions [9] state that the network size of each bank depends on the probability that its marginal branching costs be larger (respectively smaller or equal) than the threshold value. Note however that conditions [9.2] and [9.3], the probabilities associated with shrinking multi-branch banks and unit banks, are identical. Note further that the assumption of independence of ε_{ijt} across markets and banks implies that, in probabilistic terms, each observation is an independent unit.

Given the assumption on the distribution function of ε_{ijt}, [9] can be rewritten as:

$$
\begin{array}{l}
\mathrm{E}_1 : Pr(k_{ijt} > 1, \Delta k_{ijt} \geq 0) = \Pr(\varepsilon_{ijt} \leq A_{ijt}) = F_{\varepsilon}(A_{ijt}) \\
\mathrm{E}_2 : Pr(k_{ijt} > 1, \Delta k_{ijt} < 0) \bigcup Pr(k_{ijt} = 1) = \Pr(\varepsilon_{ijt} > A_{ijt}) = 1 - F_{\varepsilon}(A_{ijt})
\end{array} \qquad [10]
$$

The econometric test consists in estimating the probabilities in [10] conditionally on the variables affecting the threshold and the branching costs. Given [10] and the assumption of conditional independence across markets and banks of the branching costs, we can write the log-likelihood function for the whole sample as:

$$
ln\, L = \sum_{ijt \in E_1} lnF_{\varepsilon}(A_{ijt}) + \sum_{ijt \in E_2} ln\left(1 - F_{\varepsilon}(A_{ijt})\right) \qquad [11]
$$

We estimate it with a maximum likelihood procedure. To implement the test, however, we need to specify the density function f_{ε} together with the form in which the observable variables enter in relation to the parameters to be estimated.

Assume that ε_{ijt} is a stochastic lognormal variable :

$$
\varepsilon_{ijt} = MC_{ijt}\upsilon_{ijt} \therefore \ln(\varepsilon_{ijt}) = \ln(MC_{ijt}) + \ln(\upsilon_{ijt}) = mc_{ijt} + v_{ijt}, \text{and } v_{ijt} = \ln(\varepsilon_{ijt}) - mc_{ijt} \approx N(0,1) \qquad [12]
$$

Then:

$$
\begin{aligned}
\Pr(A_{ijt} \geq \varepsilon_{ijt}) &= \Pr(\ln(A_{ijt}) \geq \ln(\varepsilon_{ijt})) = \Pr(\ln(A_{ijt}) - mc_{ijt} \geq \ln(\varepsilon_{ijt}) - mc_{ijt}) \\
&= \Pr(v_{ijt} \leq \ln(A_{ijt}) - mc_{ijt}) = \Phi(\ln(A_{ijt}) - mc_{ijt})
\end{aligned} \qquad [13]
$$

and:

$$
\Pr(A_{ijt} < \varepsilon_{ijt}) = 1 - \Pr(v_{ijt} \leq \ln(A_{ijt}) - mc_{ijt}) = 1 - \Phi(\ln(A_{ijt}) - mc_{ijt})
$$

where $\Phi(.)$ is the standard normal distribution function.

This reduces to a (binary) probit model of entry/branching in banking markets, where the parameters to be estimated conditional on the set of explanatory variables W_{ijt} are c_{jt}, the degree of competition index that depends on the characteristics of the market and enters A_{ijt}, and mc_{ijt}, the mean of the logarithm of marginal branching costs that bank i faces in market j at time t. The likelihood function takes on the form:

$$\ln L = \sum_{ijt \in E_1} \ln \Phi\left(\ln(A_{ijt}) - mc_{ijt}\right) + \sum_{ijt \in E_2} \ln\left(1 - \Phi\left(\ln\left(A_{ijt}\right) - mc_{ijt}\right)\right) \qquad [14]$$

After estimation, A_{ijt} is substituted by MB_{ijt} and the exponential of the argument of the normal distribution function becomes $\exp\left(\ln\left(MB_{ijt}\right) - mc_{ijt}\right) = MB_{ijt} / MC_{ijt}$, the ratio of marginal branching benefits on marginal branching costs, an indicator of how far bank i in market j at time t is from competitive equilibrium. A similar competition indicator that can be computed is a Lerner-type index (Lerner from now on) with estimated MB instead of prices: (MB-MC)/MB. This indicator may be an index of collusion, given that under competitive behavior banks should expand their branching networks up to where MB equates MC and Lerner becomes 0. MB larger than MC and lerner positive, instead, means collusion, as well as disequilibrium in the market. Note that the last two indicators are pure numbers, unit free, and may be used to compare competitive conditions across markets.

3. The data and the specifications for MB and MC

The profit in [2], the marginal branching benefits in [6], and the threshold value A_{ijt} in [7] are functions of the market specific variables S_{jt}, and N_{jt}, and of the bank and market specific number of branches at time t, k_{ijt}, and at time t-1, k_{ijt-1}, as well as of the parameter c.

S_{jt} is a measure of the size of the banking market and Deposits are taken to be a good indicator of size for the reasons given above. It is less straightforward to justify the choice of counties (provinces in Italy, departments in France), as local banking markets: from a strictly economic point of view other definitions of local markets might be more appropriate, such as those defined by industrial districts for example. Data, however are very easily available disaggregated according to the administrative definitions of counties, while almost non existent according to other geographical classifications.

Data were collected for 2003 and 2004 for France, and for 1999, 2004 and 2006 for Italy. For France, this allows to set up a cross-section sample of the relevant variables for all banks and all markets for 2004, where k_{ijt-1} are bank branches by département in 2003 and Δk_{ijt} is the variation of each bank's branches between 2003 and 2004. For Italy it is possible to obtain all relevant information for both 2004 and 2006, where in the 2004 cross-section k_{ijt-1} refers to bank branches by province in 1999, and in the 2006 cross-section it refers to bank branches in 2004.

For Italy, Deposits, Loans and total number of bank branches, N_{jt}, by province are collected and made publicly available by Bank of Italy.[4] On the Bank of Italy site the number of branches by bank, k_{ij}, are also available by province (actually by "comune", a more refined administrative classification). For France data on these variables were collected and made available by Crédit Agricole and Caisses d'Epargne.

For each country, the major established groups have been defined as banks, while small banks that do not belong to any group have been aggregated into one bank called "Others". There are 95 départements in France and 103 provinces in Italy.

Table 3.1 - Banks and their frequency in the 2004 sample.

France			*Italy*		
Name	Code	Frequency	Name	Code	Frequency
Crédit Agricole	1	95	BNL	1005	103
B.N.P.	2	95	SANPAOLO	1025	102
Crédit Lyonnais	3	95	MPS	1030	102
B. POP.	4	95	INTESA	3069	103
S.G. + C.	5	95	UNICREDITO	3135	100
CREDIT M.	6	95	CAPITALIA	3207	101
C.I.C.	7	94	POP.UNITE	5026	62
CAISSES	8	95	ANTONVENETA	5040	88
OTHERS	9	95	BIPIELLE	5164	64
LA POSTE	10	95	POP.NO-VR	5188	67
			POP. E.R.	5387	59
			BPM	5584	39
			OTHERS	9999	103

While in France all banks have branches in all départements, apart from C.I.C. that does not operate in one departement in Corse, in Italy there are six national banks that have branches almost everywhere, but the remaining do not. They only operate in some areas of Italy, and have not attempted as yet to enter the rest of them.

Figures 1-2 summarize the relevant variables for the analysis for year 2004. Market size divided by the square root of the total number of branches, the market dependent component of the profit function, is on average larger in France, (figure 1) as is the number of branches by bank by market (figure 2). Also the ratio of the two measures, branches by bank relative to

[4] See www.bancaditalia.it

market size discounted by the square root of total branches, is on average larger in France, and the distributions of the variable in the two countries is quite different[5], which is an indication that branching networks are locally less developed in Italy where, in turn, each bank branch is potentially more profitable.

Figure 1. Market component of the profit function

France – 2004: $S_j \big/ \sqrt{N_j}$ Italy – 2004: $S_j \big/ \sqrt{N_j}$

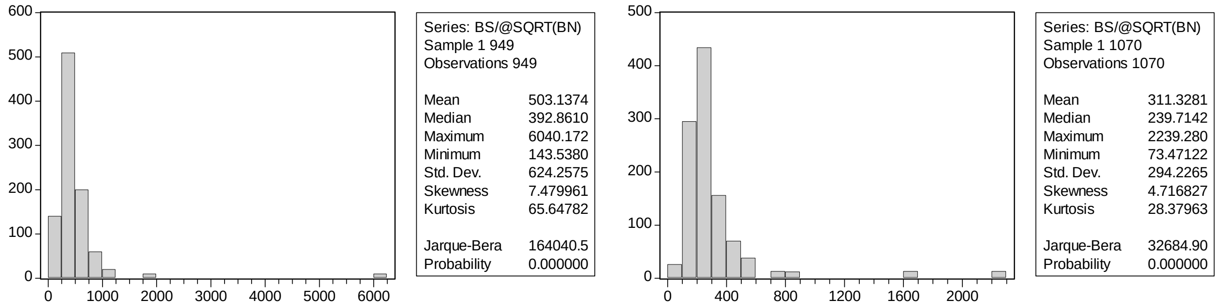
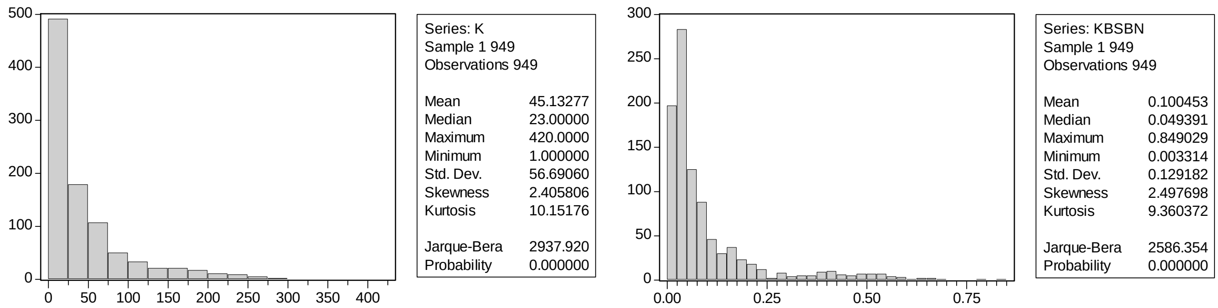


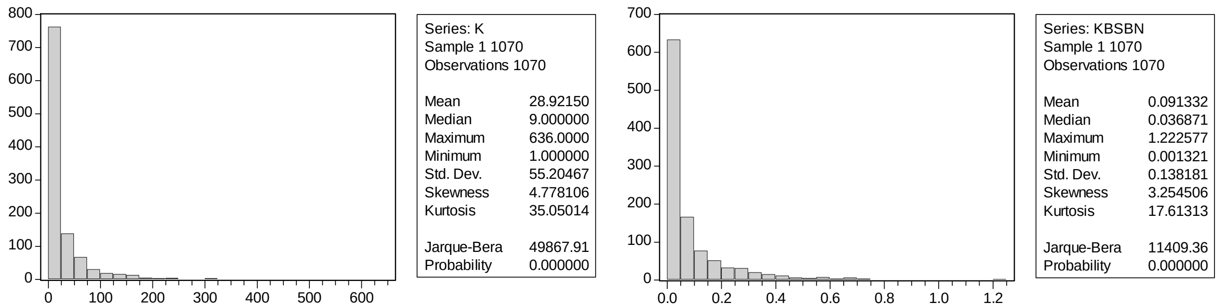
Figure 2. Branches by bank by county, and relative to the market component of the profit function

k_{ij} $k_{ij} / (S_j \big/ \sqrt{N_j})$

France 2004



Italy 2004



[5] See Guiso et al. 2006, for some exlanation of why Italian banks are characterized by underdeveloped branching networks

The set of conditioning variables W_{ijt}, at this stage, consists mainly of market data, such as population and geographical surface, as well as the already mentioned loans by county: for both France and Italy the sources are the Central Statistical Offices, INSEE and ISTAT. There are as yet no bank specific variables in the dataset: bank dummies are used to capture banks' unobserved characteristics, especially insofar as they affect their costs.

4. RESULTS

4.1. Comparisons between France and Italy, 2004

In the appendix, tables A.4.1.1 and A.4.1.2 show the results of estimates done on data for France and Italy in 2004. The specification process was subject to data availability constraints and the need to estimate similar base models for France and Italy. The main specification assumption, however, is that both market and bank specific variables may affect costs[6], while the competition parameter, c, only depends on market variables.

The specified model allows for marginal costs to be different across banks (thanks to bank dummies for all banks in each country). In turn, c, the competition parameter, depends on loans per capita and is different across provinces because of socio-geographical characteristics: in Italy between very urban areas an the others, in France according to the share of rural surface in the department. Loans per capita are assumed to affect competition in each local market: banks will compete more fiercely to get the marginal client where activity levels and potential demand for loans are high.

There is room for improvement in the specification, but all estimated coefficients are significant and of the expected sign.

The results for France and Italy are very similar for the estimated coefficients of the variables that determine c: rural areas in France are characterized by lower competition among branches while, symmetrically, c is lower in urban areas in Italy, which indicates a tougher competition among banks in those provinces. In both countries banks compete fiercely where loans per capita are larger.

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[6] In the model presented in this paper, mc only depends on bank specific variables.

However, the constants in the specification of *c* are very different between France and Italy (lower for France): this becomes even more evident when the average values of *c* for Italy and France are compared. The average *c* for Italy is 1.26 while it is 0.6 for France: the French banking markets seem to be much more competitive than Italian local markets.

The same indication is given by the overall average of the Lerner index: 0.25 for France against 0.43 for Italy. The medians of this index in the two countries are however very similar: 0.6 in both cases.

The structure of the two industries is different enough to be puzzling and unexpected. The main result is the very high marginal profitability of branching in Italy: a *c* lager than 1 implies that the banks' profit function is not concave or, in other terms that there exist economies of scale to branching still to be exploited. Branching networks by bank are underdeveloped in most provinces, with the exceptions given by the most financially active provinces such as Rome, Milan, Naples, Turin. Guiso et al., 2006, argue that this situation is a consequence of historical bank regulations starting from the beginning of 1900. The alternative interpretation of such an high *c*, suggested by the theoretical model in this paper, is of course a higher degree of collusion among banks in Italy than in France.

Looking at table A.4.1.2 "Statistics by bank" , see that in France MC, marginal branching costs, are significantly higher for Crédit Agricole, La Poste and Other banks. The first two are characterized by big branching networks and their branches are located all over the territory, even the less densely populated areas. Banks in "Others" are county level banks that probably defy competition by keeping their local market niches.

In Italy, Banca Intesa, BPM and Others are characterized by high MC. In 2004, Banca Intesa was emerging from the restructuring period following its creation from the merger of Banca Commerciale Italiana and CARIPLO, both of them national banks. Many branches had been closed in the previous years so that the branching network of Banca Intesa was actually smaller than the sum of those of the merging banks . Moreover there is some evidence that the two original networks were very similar in terms of geographical location. Capitalia, another bank with high MC was experiencing a similar situation as it was the outcome of the merger between Banco di Roma and Banco di Santo Spirito.

BPM, Banca Popolare di Milano, instead, was and still is a "local" bank that operates mainly in the North west of Italy, with some branches in Rome and in few other relevant provinces in the Center and South of Italy. For Others the same argument as for France holds. Most of them are local banks with an established market niche.

A few comments on table A.4.1.2 “Statistics by département” and “Statistics by province”. The parameter *c* varies across counties, and the results strongly support the interpretation of *c* as a measure of competition. Very low values of the parameter mean tougher competition: see Paris, Hauts-de-Seine, Bas-Rhin in France; Milano, Roma, in Italy. High values of c mean sluggish competition: in France see Creuse, Alpes Haute Provence, but *c* stays between 0.57 and 0.61 for all other provinces, not a large range of values. In Italy the variability of c is more pronounced and it shows a definite pattern: it varies between 1.25 in most northern provinces to the high value of 1.31 in most southern provinces. These results confirm both anecdotic and empirical evidence, especially for Italy (Cerasi et al. 2000, Guiso et al. 2006 among others).

There is another interesting information in the results by département or province: in some markets, four cases in France, many more in Italy, the average estimated marginal costs, MC, are larger than the estimated marginal benefits, MB. The one explanation that comes to mind is that banks are willing to cross-subsidize their branching operations or, in other words, are willing to locate in costly markets for strategic reasons and as long as they are able to shift funds from one market to another.

4.2. Entry costs by market

A side result from the specification of the profit function in the model, is the possibility to compute the upper bounds of entry costs with one branch into each local market, the *a* in formula [4] above. From theory, entry costs may be retrieved from profits of existing banks, under the assumption that if a bank operates in a market then its profits must be larger or equal to sunk entry costs (see formula [3] above). Total sunk costs may be separated into the cost of entry with one branch and the costs of operating the branching network that varies with network size. This latter component has already been discussed while commenting the results relative to branching marginal costs, MC. It may be at least equally interesting to extract *a* from the data, the component of entry costs that is independent of bank size. One way to compute this measure is to compute unit profits by market as $a = \frac{S_{jt}}{\sqrt{N_{jt}}}$, that is by putting $k_{ijt} = 1$ into the profit formula. A second way is to compute the profits of those banks that are actually operating with one branch in some markets .

Table A.4.1.2 includes a column (UNITPROFIT, for both France 2004 and Italy 2004) for unit profits computed in the first of the two suggested ways, and a column that reports the percentage of unit profit on total profits. It results that unit profits, interpreted as upper bounds of sunk entry costs for incumbent banks, vary widely across Départements and across Provinces, with some local markets such as Lozères, Creuse, Juras for France or Enna, Isernia, Vibo Valentia for Italy that are apparently very cheap to enter. Other (where in fact competition as measured by *c* is fiercer) where entry costs are impressively high: Paris, Bas Rhin, Hauts de Seine in France; Milano, Roma, Napoli in Italy. However, if the percentage of entry costs relative to average total profits by county is considered, the picture changes dramatically and it results that the "cheapest" counties are exactly those where entry costs reach up to more than 20% of total profits against an average of 5.9% for Italy and 6.07% for France. This same result is obtained by analysing profits of actual unit banks within each local market. In 2004, there are 109 such banks in Italy, but only 19 in France. Here are some results for both countries.

Table 4.2.1 – Unit banks and fixed entry costs

	France-2004 PROFIT UNIT BANKS	*France-2004* UNITPROFIT (% *a* / PROFIT)	*Italy-2004* PROFIT UNIT BANKS	*Italy-2004* UNITPROFIT (% *a* / PROFIT)
Mean	202.43	502.89 (*6.07*)	240.83	292.24 (*5.90*)
Observations	19	949	109	1070

Both in France and in Italy the evidence shows that banks enter with just one branch in markets that are not extremely profitable so that entry costs are a large percentage of expected profits and become a relevant barrier to entry. It is quite informative to see that in Italy, the highest frequency of unit banks (5 out of potentially 13) fall in the northern but very peripheric provinces Asti and Sondrio. In France, of the 19 cases, 4 fall in Lozère and 3 in Lot, departments with very low population density, where potential profitability is low, not enough to cover the sunk costs of operating larger branching networks.

4.3 Comparisons in time: Italy 2004 versus Italy 2006

Table 4.3.1 summarizes the values of the most relevant indicators for Italy in 2004 and in 2006, estimated using the same base specification:

Table 4.3.1 – Results for Italy 2004 and 2006

	MC	*c*	MB/MC	MB	LERNER	PROFIT
Mean - 2004	281.84	1.26	3.66	654.87	0.42	9105.75
Mean - 2006	233.92	1.30	5.09	794.79	0.55	10288.15

Estimated marginal costs decrease in time while *c* and marginal benefits increase. The industry seems to be reorganizing and moving towards an altogether more efficient and profitable condition.

Table A.4.2.1 shows in detail all the results of the estimation of the base model in 2006, and the statistics by bank and by province. Suffices here to say that the distribution of marginal costs across banks changes quite drastically between 2004 and 2006, with in particular Banca Intesa switching from being among the more costly to being among the less costly. The opposite appears to be happening to Unicredito.

4.4. Experiments on Mergers

Since 2004 the structure in both French and Italian banking industries has been changing further, thanks to new merger and acquisition operations involving existing banks, within and across borders.

Most relevant in France the mergers between Crédit Agricole, (CA), and Crédit Lyonnais, (CL), and between Banques Populaires, (B.Pop), and Caisses d'Epargne, (Caisses). In Italy, the acquisition of BNL (Banca Nazionale del Lavoro) by the Group BNP Paribas, of Antonveneta by ABN-AMRO, the merger between Banca Intesa and Sanpaolo, most recently and not yet implemented, between Unicredito and Capitalia, and between Banca Popolare di Lodi, (BPL), and Popolare di Novara e Verona, (NO.VR.). Last but not least the acquisition of Antonveneta by Monte Paschi Siena from ABN-AMRO.

What can the model presented in this paper say about within borders mergers and their consequences on the degree of competitions in each industry?

Let's take the 2004 data and conduct the following experiment: sum the branching networks by county of the banks involved in the mergers and reestimate the model. Check if and in which direction the competition indicators produced by the model change relative to the base model. It is a very rough experiment, and we know that in general a merged bank is "smaller" than the sum of the merging banks. Still this trick allows to embed in the model the changed market shares following a merger and compute the effects of such changes.

Table 4.4.1. The French mergers.

	MC	c	MB/MC	MB	LERNER
Mean – Base	33.77	0.59	3.15	67.59	0.25
Mean – C.A. + C.L.	30.32	0.57	3.01	57.26	0.19

The table above summarizes the mean of the relevant indicators of MC, MB and of competition, c, MB/MC and Lerner for the base model and for the estimated model on 2004 data where the branching networks of CA and CL have been added together.

The result of the experiment is quite clear: the merger does not cause a loss in competitiveness within the French banking industry. Rather the opposite. All indicators change, even if little, in the direction of an increase in toughness of competition

Table 4.4.2. The French mergers, (continue).

	MC	*c*	MB/MC	MB	LERNER
Mean C.A.-C.L.+B.Pop-Caisses	38.07	0.60	2.36	64.63	0.13

The result obtained by adding the Banques Populaires-Caisses d'Epargne merger to the first one is more ambiguous. *c* increases slightly but the lerner index decreases quite a lot thanks to an increase in marginal costs that is larger than the increase in marginal benefits induced by *c*. It is not easy to interpret these results. The Caisses-B.Pop merger would create a new bank with a distribution of branches across départements both more profitable and more costly, that is with a larger concentration of branches in counties characterized by less competition, but more difficult and costly to enter.

4.4.2. The Italian mergers.

The same type of experiments were done for Italy using both the 2004 and the 2006 data. Table 4.4.2.1 summarizes the evolution of the main indicators as concentration increases in the industry in 2004, while table 4.4.2.2 does the same for 2006

Table 4.4.2.1 – Evolution of the estimated indicators as concentration increases in Italy 2004

	MC	*C*	MB/MC	MB	LERNER	PROFIT
Mean 2004 – base model	281.85	1.26	3.66	654.87	0.42	9105.75
Mean 2004 - Intesa+Sanpaolo	309.93	1.31	3.60	791.69	0.47	18106.65

Table 4.4.2.2 – Evolution of the estimated indicators as concentration increases in Italy 2006

	MC	*c*	MB/MC	MB	LERNER
Mean 2006 – base model	233.92	1.30	5.09	794.79	0.55
Mean 2006 -Intesa+Sanpaolo	246.73	1.31	5.14	831.79	0.54
Mean 2006 – Int-SanPa.+ UNIC-CAP	312.52	1.39	5.78	1210.85	0.54
Mean 2006 – Int-SanPa.+ UNIC-CAP +BPL-NO.VR.	291.98	1.38	6.06	1146.09	0.56

In Italy, mergers among national banks invariably increase c, especially the just implemented merger between Intesa-Sanpaolo, (Int-SanPa) and between Unicredito and Capitalia, (UNIC-CAP). The effects of the mergers on the lerner index are not so evident. Using the 2006 data, nothing much changes . In 2004 all indicators, lerner index included, would suggest that the Intesa-Sanpaolo merger would/will lower competition among banks. In 2004, however, the base model results show that banca Intesa was operating with very high out of the norm costs: any merger in that situation would only make the picture muddier.

The announced merger between Banca Popolare di Lodi (BPL) and Banca popolare di Verona e Novara, involves two banks whose branching networks are quite widespread but do not cover all Italian provinces (64 the former, 67 the latter). Their merger creates a bank that is present in 85 out of 103 provinces. The estimated *c*, slighty lower than in the previous merger experiment, indicates that this new bank will erase some of the potential branching profitability in at least some of the markets. The lerner index suggests however that collusion among banks remains the same.

The last merger experiment is a pure hypothetical merger between BPM and Banca Popolare dell'Emilia Romagna, (POPER), added to the Intesa-Sanpaolo merger. The two "Banche Popolari" operate only in a subset of Italian provinces and have branching networks that do not entirely overlap. BPM has already been mentioned (it operates in 39 provinces). POPER mainly operates in the North East and Center but it also acquired a Sardinian bank and it is strongly present in Sardinia: 59 provinces in all. The merged bank operates in 75 provinces. Table 4.4.2.3. summarizes the results.

Table 4.4.2.3 – Hypothetical BPM-POPER merger

	MC	*C*	MB/MC	MB	LERNER
Mean 2006 – Int-SanPa + BPM-POPER	202.16	1.26	5.04	686.80	0.58

The competition parameter *c* decreases relative to the model that includes the Intesa-Sanpaolo merger, where it was 1.31 (see table 4.3.2.2) but the lerner index increases, mainly thanks to the reduction in MC relative to MB. The merged bank would induce a reduction in average branching costs (a more efficient distribution of branches over Italy) that would only partially be transferred into tougher competition (lower marginal profitability) among banks.

5. Conclusions

This paper addresses the empirical question of measuring competition in the banking sector. The question is relevant both from a positive and a normative perspective. Banking industries in Europe, specifically in France and Italy, are quickly changing their structure after deregulation, and it is interesting to find out which direction competition among banks has been following in the past few years. It is also interesting to be able to measure and forecast the change in degree of competition due to mergers among banks in an antitrust perspective.

The analysis is not however entirely data based. The quantitative results are derived from a well founded theoretical model that allows to infer information about benefits and costs by bank and by market from banks' entry and branching decisions. The estimated benefits and costs are then used to compute the desired measures of competition.

It results that the structures of the French and Italian banking industries in the first years of the twenty first century differ quite a lot, with a strong evidence that the Italian banking sector is still far from an equilibrium state, mostly because economies of scale have still to be exploited and local market power niches are still allowed to exist. In France all major banks compete among each other on all markets in the country: there is some evidence of collusion (or noncompetitive behaviour) in some local markets, where, for example, entry costs represent a high percentage (up to 20%) of potential profits hence may be considered relevant entry barriers, but both measures of competitive behaviour presented in the paper indicate, on average, tougher competition in France than in Italy.

The results for Italy confirm some already published findings, that stress how the present situation derives from historical banking regulation policies.

This paper, however, goes one step further by performing experiments to analyse the effects of mergers in both countries. It results that the SCP (structure conduct performance) statement that higher market concentration and larger market power for some firm will induce a reduction of competition in the industry does not necessarily hold true. There is some evidence that, on the contrary, mergers may enhance competition rather than the opposite, certainly in France but also in Italy especially if the merger creates a bank that is able to compete with incumbent banks in all local markets, hence erase some of the local niches of market power.

The findings in this paper are based on a static model of bank behaviour: they must be considered as still pictures of the structure of the banking industries and may be used to perform comparative static analyses. The study of evolution of competition in a banking industry could be better tackled both by a more careful specification of banks costs and benefits and by the use of a dynamic model of bank behaviour. It is in this direction that the research is proceeding.

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Appendix

Table A.4.1.1 – Comparison of the estimates of the base model: France 2004 vs Italy 2004

	France 2004 – Base Model			Italy 2004 - Base Model		
	Included observations: 949			Included observations: 1070		
		Coefficient	P-value		Coefficient	P-value
	CREDIT AGRICOLE	3.424	0.000	BNL	5.026	0.000
	CREDIT LYONNAIS	2.920	0.000	SAN PAOLO	4.662	0.000
	B.N.P.	2.992	0.000	MPS	4.841	0.000
	BANQUES POPULAIRES	2.103	0.000	INTESA	6.680	0.000
	S.G. + C.	3.089	0.000	UNICRED	4.328	0.000
	CREDIT M.	3.436	0.000	CAPITAL	5.973	0.000
mc	C.I.C.	3.084	0.000	BANCHE POP UNITE	5.245	0.000
	CAISSES D'EPARGNE	3.358	0.000	ANTON VENETA	5.197	0.000
	OTHERS	4.624	0.000	BIPIELLE	5.159	0.000
	LA POSTE	4.003	0.000	POP NO + VR	5.244	0.000
				POP EMILIA ROMAGNA	5.451	0.000
				BPM	6.087	0.000
				OTHERS	6.298	0.000
	_cons	0.603	0.000	_cons	1.336	0.000
c	shrur **	0.082	0.043	dbigpro *	-0.323	0.000
	lpc	-0.004	0.000	lpc	-0.004	0.003

France 2004				Italy 2004			
Log likelihood	-396.302	Akaike info criterion	0.863	Log likelihood	-491.682	Akaike info criterion	0.949
Avg. log likelihood	-0.418	Schwarz criterion	0.929	Avg. log likelihood	-0.460	Schwarz criterion	1.023

*: dbigpro = 1 if province is Turin, Milan, Rome, Naples; **: shrur = share of rural surface; lpc = loans per capita.

Table A.4.1.2 – Descriptive statistics, base model: France 2004 vs Italy 2004

France 2004 – Overall statistics

	MC	c	MB/MC	MB	LERNER	PROFIT
Mean	33.768	0.595	3.154	67.586	0.253	24956.410
Median	28.725	0.606	2.901	68.417	0.655	5587.367
Maximum	101.862	0.645	14.927	188.073	0.933	2536872.000
Minimum	8.190	0.260	0.082	8.368	-11.173	143.538
Std. Dev.	25.478	0.046	2.453	29.537	0.960	116091.900
Skewness	1.810	-4.599	1.292	0.386	-3.703	14.458
Kurtosis	5.298	31.387	5.006	3.388	28.108	264.663
Jarque-Bera	726.945	35209.610	423.176	29.532	27096.470	2740391.000
Probability	0.000	0.000	0.000	0.000	0.000	0.000

Italy 2004 – Overall statistics

	MC	c	MB/MC	MB	LERNER	PROFIT
Mean	282.275	1.266	3.674	656.267	0.428	9105.758
Median	180.816	1.286	2.593	552.126	0.614	2085.298
Maximum	796.418	1.328	25.048	2852.955	0.960	249954.400
Minimum	75.779	0.764	0.164	95.991	-5.080	73.471
Std. Dev.	217.389	0.090	3.498	396.869	0.592	20197.520
Skewness	1.246	-3.880	2.413	1.479	-3.289	5.329
Kurtosis	3.371	18.895	10.666	5.587	20.349	42.683
Jarque-Bera	283.105	13948.650	3658.912	688.317	15347.940	75270.230
Probability	0.000	0.000	0.000	0.000	0.000	0.000

France 2004 – Statistics by bank

	MC	c	MB/MC	MB	LERNER	PROFIT	TOT_BR
CREDIT AGRICOLE	30.68	0.59	1.34	41.21	0.18	23554.03	6428
CREDIT LYONNAIS	18.53	0.59	4.48	83.00	0.76	22119.87	1907
B.N.P.	19.93	0.59	3.94	78.50	0.73	21984.55	2093
BANQUES POPULAIRES	8.19	0.59	8.50	69.57	0.88	16657.98	2323
S.G. + C.	21.96	0.59	3.61	79.39	0.71	21215.07	2122
CREDIT M.	31.06	0.59	2.68	83.37	0.53	13929.26	3057
C.I.C.	21.84	0.59	4.06	88.59	0.73	13246.26	1611
CAISSES D'EPARGNE	28.73	0.59	1.76	50.70	0.41	21624.46	4364
OTHERS	101.86	0.59	0.79	80.33	-0.49	39569.83	2910
LA POSTE	54.76	0.59	0.39	21.43	-1.91	55539.55	16016

Italy 2004 – Statistics by bank

	MC	c	MB/MC	MB	LERNER	PROFIT	TOT_BR
BNL	152.34	1.27	3.29	500.92	0.58	2486	729
SAN PAOLO	105.87	1.27	6.73	712.69	0.80	9482	3127
MPS	126.56	1.27	4.87	616.25	0.72	5796	1812
INTESA	796.42	1.27	0.86	686.21	-0.60	8746	2931
UNICRED	75.78	1.27	9.20	697.31	0.85	9872	3151
CAPITAL	392.50	1.27	1.55	608.58	0.11	5859	1926
BANCHE POP UNITE	189.67	1.26	3.47	657.85	0.61	7179	1223
ANTONVENETA	180.82	1.27	3.25	587.36	0.57	4432	1050
BIPIELLE	174.03	1.26	3.16	550.57	0.58	3279	524
POP NO + VR	189.48	1.26	3.39	642.92	0.61	6300	1167
POP EMILIA ROMAGNA	232.90	1.26	2.69	626.56	0.50	6481	1107
BPM	440.21	1.23	1.40	615.35	0.07	6685	690
OTHERS	543.40	1.27	1.71	928.81	0.22	33753	11509

Table A.4.1.2 – Descriptive statistics, base model: France 2004 vs Italy 2004 (continue)

France 2004 – Statistics by Département

DEPARTEMENT	MC	c	MB/MC	MB	LERNER	PROFIT	% a / PROFIT	UNITPR. (a)
Ain	33.76	0.59	2.89	63.40	0.24	10617.32	3.7	397.0
Aisne	33.76	0.60	3.26	63.18	0.20	7410.74	4.7	345.2
Allier	33.76	0.62	3.20	71.04	0.31	4612.69	7.1	328.4
Alpes-haute-Provence	33.76	0.64	2.70	56.97	0.05	1294.54	13.8	178.8
Hautes-Alpes	33.76	0.63	2.84	62.69	0.08	1271.83	14.5	184.5
Alpes-Maritimes	33.76	0.59	3.83	82.80	0.49	28542.50	2.7	760.3
Ardèche	33.76	0.63	3.18	64.26	0.16	3893.23	7.2	278.6
Ardennes	33.76	0.62	3.07	61.60	0.20	2986.41	8.5	254.2
Ariège	33.76	0.63	2.52	56.11	0.02	1309.90	13.7	178.9
Aube	33.76	0.61	2.92	65.60	0.31	3372.58	9.1	307.2
Aude	33.76	0.61	2.69	58.33	-0.08	4057.16	6.3	256.8
Aveyron	33.76	0.61	3.05	72.03	0.24	4153.02	7.9	329.8
Bouches-du-Rhône	33.76	0.57	3.75	76.38	0.44	73754.39	1.3	936.6
Calvados	33.76	0.59	3.00	58.93	0.24	11745.89	3.6	428.1
Cantal	33.76	0.63	3.25	74.64	0.15	1544.91	13.8	213.7
Charente	33.76	0.61	2.70	56.10	0.09	3880.00	7.2	278.5
Charente-Maritime	33.76	0.61	2.86	59.05	0.17	8600.85	4.6	392.1
Cher	33.76	0.62	2.81	57.81	0.09	3874.70	7.1	275.9
Corrèze	33.76	0.62	3.25	70.73	0.16	3243.45	8.3	267.8
Corse	35.08	0.64	3.13	69.05	0.11	2990.70	8.9	266.7
Côte-d'Or	33.76	0.60	2.89	60.59	0.25	7925.40	5.1	403.3
Côtes d'Armor	33.76	0.60	3.73	75.46	0.29	8711.77	5.0	439.8
Creuse	33.76	0.65	2.61	56.86	0.01	1187.99	14.2	169.2
Dordogne	33.76	0.63	3.34	69.85	0.17	4162.52	7.2	298.7
Doubs	33.76	0.59	2.82	61.45	0.25	7376.38	5.3	392.9
Drôme	33.76	0.61	3.59	74.90	0.38	6380.32	6.5	412.4
Eure	33.76	0.59	2.84	56.65	0.20	8243.54	4.2	348.0
Eure-et-Loir	33.76	0.59	3.08	66.76	0.32	8025.98	4.7	378.8
Finistère	33.76	0.59	4.14	82.61	0.42	23964.97	2.9	697.7

Italy 2004 – Statistics by Province

PROVINCE	MC	c	MB/MC	MB	LERNER	PROFIT	% a / PROFIT	UNITPR. (a)
Alessandria	280.59	1.28	3.61	658.27	0.58	5884.35	4.1	243.5
Asti	280.59	1.29	1.78	306.62	-0.06	1971.36	8.0	157.7
Cuneo	290.28	1.28	4.09	696.56	0.50	12175.25	2.3	277.3
Novara	290.28	1.28	3.52	636.48	0.54	4505.95	5.6	252.9
Torino	280.59	0.95	3.29	605.77	0.53	16538.90	4.9	810.9
Vercelli	290.28	1.30	1.80	328.45	0.11	1758.94	8.3	145.5
Biella	275.28	1.26	2.32	415.63	0.36	2662.69	7.8	208.0
Verb-Cus-Ossola	285.78	1.29	1.69	297.53	0.03	1310.01	11.2	147.4
Aosta	284.80	1.30	2.11	327.53	0.01	1598.07	9.4	149.8
Lecco	280.59	1.27	2.76	540.84	0.50	4332.36	5.6	244.1
Lodi	284.21	1.26	2.46	463.71	0.39	2656.83	9.0	239.7
Bergamo	280.59	1.25	7.66	1404.93	0.79	27615.43	1.9	512.2
Brescia	290.28	1.23	7.33	1349.85	0.78	37389.04	1.3	497.9
Como	280.59	1.28	4.60	860.72	0.68	9185.42	3.6	328.1
Cremona	284.93	1.27	2.54	483.13	0.41	4593.93	4.7	214.5
Mantova	271.43	1.25	3.44	592.56	0.54	6659.19	3.5	236.3
Milano	276.92	0.76	3.07	544.11	0.37	78007.77	2.9	2239.3
Pavia	280.59	1.29	4.61	857.55	0.68	7642.79	3.8	292.1
Sondrio	320.05	1.25	1.97	382.21	0.21	3966.75	5.8	229.5
Varese	280.59	1.28	7.10	1330.97	0.79	16336.41	2.7	444.5
Genova	276.92	1.28	7.78	1418.32	0.79	18428.03	2.6	481.1
Imperia	290.07	1.31	2.03	366.76	0.23	1947.58	8.2	159.3
La Spezia	284.04	1.30	2.06	367.55	0.26	2354.61	6.9	163.0
Savona	288.85	1.29	2.44	441.08	0.31	2967.68	6.2	185.5
Bolzano-Bozen	313.27	1.22	3.95	713.95	0.60	21145.96	1.7	363.7
Trento	270.01	1.24	3.55	627.08	0.57	14101.26	2.1	302.4
Belluno	290.07	1.29	1.84	311.38	0.04	2722.25	4.7	127.6
Padova	280.59	1.24	6.72	1155.14	0.73	23148.14	2.1	479.8
Rovigo	270.01	1.29	2.45	411.46	0.29	2873.22	6.4	182.7

Gard	33.76	0.61	3.50	74.92	0.32	8747.07	4.9	428.7	Treviso	288.85	1.26	5.92	1022.33	0.68	20478.30	1.8	363.3
Haute-Garonne	33.76	0.58	3.32	72.19	0.43	29164.89	2.4	700.1	Venezia	284.19	1.28	6.29	1094.08	0.69	14902.97	2.5	378.1
Gers	33.76	0.63	3.22	74.68	0.27	1581.35	13.9	219.1	Verona	276.92	1.26	6.30	1077.81	0.70	18933.53	2.0	387.0
Gironde	33.76	0.59	3.07	63.16	0.28	31819.70	2.1	654.9	Vicenza	280.59	1.26	5.64	976.62	0.67	18671.43	2.0	370.3
Hérault	33.76	0.61	3.47	72.79	0.30	15841.09	3.3	525.0	Gorizia	321.02	1.29	1.79	302.45	-0.09	1898.43	6.5	124.2
Ille-et-Vilaine	33.76	0.57	3.04	62.91	0.25	22333.06	2.6	583.3	Trieste	284.80	1.29	5.57	925.36	0.69	5545.85	6.6	364.3
Indre	33.76	0.62	3.11	64.10	0.16	2776.95	9.4	260.0	Udine	300.34	1.26	4.29	747.88	0.55	13236.52	2.2	291.6
Indre-et-Loire	33.76	0.60	3.00	66.45	0.29	7881.76	5.1	402.2	Pordenone	284.80	1.28	3.02	509.63	0.45	4736.35	4.2	197.3
Isère	33.76	0.59	3.33	69.66	0.36	24788.38	2.5	624.3	Bologna	276.92	1.23	8.11	1419.27	0.80	30350.09	1.7	518.5
Jura	33.76	0.61	2.52	59.88	0.19	3029.77	8.4	254.3	Ferrara	276.92	1.29	2.97	539.30	0.45	3952.27	6.2	243.5
Landes	33.76	0.63	2.91	61.25	0.20	3670.56	8.1	298.7	Forli'-Cesena	276.92	1.25	3.04	533.09	0.43	6318.36	4.2	264.1
Loir-et-Cher	33.76	0.61	3.30	72.52	0.31	4453.45	7.3	327.2	Modena	276.92	1.24	5.43	950.65	0.67	14016.00	2.8	390.2
Loire	33.76	0.59	3.23	69.97	0.40	16526.08	3.2	529.4	Parma	276.92	1.24	3.95	733.21	0.61	8046.86	4.0	321.9
Haute-Loire	33.76	0.63	3.44	76.89	0.30	2371.53	10.8	256.3	Piacenza	263.31	1.27	3.01	550.47	0.55	4231.31	5.8	244.1
Loire-Atlantique	33.76	0.57	3.20	68.44	0.39	33624.40	2.1	720.0	Ravenna	284.19	1.26	3.09	536.78	0.39	6076.91	3.8	232.2
Loiret	33.76	0.57	3.10	64.40	0.33	15011.37	3.5	526.4	Reggio Emilia	276.92	1.25	3.93	716.20	0.57	8669.41	3.5	305.4
Lot	33.76	0.62	3.39	83.68	0.31	1692.30	13.9	235.5	Rimini	270.02	1.25	2.81	482.04	0.42	5372.92	4.4	234.5
Lot-et-Garonne	33.76	0.62	2.73	61.20	0.18	3856.72	7.3	283.4	Arezzo	273.72	1.28	2.97	513.09	0.46	4934.94	4.8	236.1
Lozère	33.76	0.63	2.61	58.17	-0.04	747.51	19.2	143.5	Firenze	276.92	1.22	6.32	1138.21	0.75	24647.84	2.1	511.9
Maine-et-Loire	33.76	0.61	3.30	69.69	0.29	10803.13	4.1	438.7	Grosseto	307.16	1.29	1.94	367.11	0.10	2778.05	5.9	163.4
Manche	33.76	0.61	3.09	65.54	0.33	6094.74	6.0	368.1	Livorno	290.58	1.29	2.74	472.84	0.34	4077.37	4.9	201.6
Marne	33.76	0.57	4.21	88.49	0.46	11632.69	5.3	617.2	Lucca	279.61	1.27	2.96	523.61	0.45	5849.72	4.0	234.9
Haute-Marne	33.76	0.63	2.66	60.36	0.08	1522.68	12.3	187.8	Massa Carrara	297.79	1.30	1.77	312.15	0.03	1942.36	8.0	155.4
Mayenne	33.76	0.60	3.38	77.18	0.23	4079.70	7.4	301.8	Pisa	284.04	1.27	3.29	567.42	0.48	6881.72	3.6	246.8
Meurthe-et-Moselle	33.76	0.57	2.67	55.89	0.23	17519.93	2.7	468.4	Pistoia	284.80	1.28	2.57	444.25	0.32	4005.30	5.3	210.8
Meuse	33.76	0.63	2.81	64.62	0.11	1606.59	12.4	199.0	Siena	283.08	1.21	2.69	454.45	0.34	5777.45	4.5	260.0
Morbihan	33.76	0.60	3.53	71.98	0.35	11382.59	4.4	501.8	Prato	300.34	1.25	2.80	494.38	0.37	3583.68	7.5	269.4
Moselle	33.76	0.57	2.88	63.20	0.30	30945.84	1.9	577.1	Perugia	284.06	1.28	5.25	885.08	0.68	13251.21	2.2	291.6
Nièvre	33.76	0.63	2.72	59.96	0.14	2193.57	10.3	226.9	Terni	275.28	1.30	1.96	358.77	0.27	1989.11	8.3	164.4
Nord	33.76	0.57	3.91	77.34	0.44	111747.80	0.9	1059.0	Ancona	275.28	1.26	4.08	686.85	0.58	8920.74	3.0	268.7
Oise	33.76	0.57	2.83	56.30	0.13	16605.05	2.6	425.5	Ascoli Piceno	284.82	1.29	3.41	613.95	0.56	5763.93	3.8	218.9
Orne	33.76	0.62	3.27	68.08	0.32	3303.89	9.0	296.3	Macerata	275.28	1.27	3.12	546.58	0.50	5130.16	4.6	235.3

Pas-de-Calais	33.76	0.59	3.68	70.98	0.34	28316.18	2.1	587.0	Pesaro e Urbino	276.92	1.26	2.98	510.88	0.35	5239.85	4.6	239.0
Puy-de-Dôme	33.76	0.61	3.61	75.75	0.33	10667.21	4.4	465.9	Frosinone	273.72	1.32	2.66	502.16	0.46	3382.36	5.8	195.5
Pyrénées-Atlantiques	33.76	0.61	3.85	80.62	0.45	11295.18	4.8	546.8	Latina	270.01	1.32	3.56	653.00	0.56	3953.67	6.6	260.4
Hautes-Pyrénées	33.76	0.63	2.92	67.26	0.31	2167.36	11.7	253.7	Rieti	323.97	1.31	1.27	252.50	-0.18	1254.55	8.6	108.4
Pyrénées-Orientales	33.76	0.62	3.64	83.57	0.39	5816.59	6.8	397.5	Roma	276.92	0.88	4.56	826.30	0.64	49983.75	3.4	1682.1
Bas-Rhin	33.76	0.54	4.42	93.60	0.51	73364.51	1.5	1124.0	Viterbo	296.71	1.30	2.14	430.35	0.39	3781.65	4.2	158.4
Haut-Rhin	33.76	0.55	2.52	54.93	0.13	23599.35	2.0	480.7	Chieti	279.62	1.31	3.36	597.70	0.51	3851.34	6.0	229.2
Rhône	33.76	0.56	3.34	69.37	0.42	59203.06	1.5	911.8	L'Aquila	303.22	1.31	2.96	517.65	0.34	3404.68	5.5	187.8
Haute-Saône	33.76	0.60	2.27	51.91	-0.05	2731.35	7.7	209.9	Pescara	294.22	1.28	2.70	487.78	0.35	3086.37	7.2	223.4
Saône-et-Loire	33.76	0.61	3.12	67.33	0.32	8709.39	4.6	403.1	Teramo	279.62	1.30	2.79	491.41	0.43	3302.10	6.3	206.4
Sarthe	33.76	0.60	3.17	68.40	0.29	8993.90	4.4	398.1	Campobasso	284.21	1.31	1.72	299.40	-0.09	1163.19	11.2	130.5
Savoie	33.76	0.61	3.26	67.61	0.24	5501.23	6.6	365.2	Isernia	221.45	1.32	0.87	134.02	-0.69	269.39	27.3	73.5
Haute-Savoie	33.76	0.55	2.56	54.71	0.17	19953.51	2.7	541.6	Avellino	270.81	1.32	2.69	482.30	0.38	2337.12	8.9	207.3
Paris	33.76	0.26	2.05	46.53	-0.85	913274.10	0.7	6040.2	Benevento	270.81	1.32	1.69	317.61	0.05	1125.20	13.3	149.1
Seine-Maritime	33.76	0.58	3.09	60.91	0.28	30154.03	2.0	593.9	Caserta	270.81	1.32	4.36	784.18	0.65	5058.00	5.6	283.9
Seine-et-Marne	33.76	0.56	2.70	60.44	0.30	37714.62	1.6	590.4	Napoli	276.92	0.99	3.79	697.73	0.60	12169.77	6.2	757.0
Yvelines	33.76	0.55	3.11	69.98	0.42	58150.72	1.4	801.0	Salerno	263.31	1.32	6.27	1108.31	0.75	9904.16	3.5	345.5
Deux-Sèvres	33.76	0.61	3.33	72.84	0.36	4297.06	8.0	344.4	Bari	285.49	1.31	10.00	1812.50	0.83	24026.11	2.1	495.4
Somme	33.76	0.61	3.92	73.05	0.27	6526.88	5.8	381.2	Brindisi	284.82	1.32	2.93	502.06	0.41	2492.67	7.6	190.1
Tarn	33.76	0.62	3.61	81.07	0.44	4573.26	8.2	372.9	Foggia	285.49	1.32	4.22	786.50	0.62	5232.78	5.0	261.6
Tarn-et-Garonne	33.76	0.62	3.07	70.07	0.25	2046.04	11.6	237.6	Lecce	275.28	1.32	5.28	877.87	0.67	7242.12	4.0	288.5
Var	33.76	0.60	3.40	72.07	0.40	20074.05	2.9	572.3	Taranto	279.62	1.32	4.16	706.55	0.58	3941.34	6.1	241.8
Vaucluse	33.76	0.59	3.27	65.74	0.23	9613.27	4.2	406.3	Catanzaro	279.62	1.32	1.83	324.34	0.01	1218.27	12.0	146.8
Vendée	33.76	0.60	3.57	71.57	0.27	8850.26	4.8	422.7	Cosenza	270.02	1.33	2.17	387.92	0.23	2191.91	6.9	151.6
Vienne	33.76	0.61	2.92	60.54	0.16	5380.07	5.9	316.7	Matera	279.62	1.30	2.56	449.63	0.35	1958.46	9.8	192.0
Haute-Vienne	33.76	0.61	3.39	70.38	0.25	5374.62	6.5	351.1	Potenza	270.02	1.31	3.48	625.71	0.55	4234.01	5.7	241.3
Vosges	33.76	0.62	2.94	61.96	0.30	4553.80	7.2	326.6	Reggio Calabria	270.02	1.32	3.21	554.37	0.48	2580.37	8.0	207.2
Yonne	33.76	0.61	2.48	53.70	0.04	4751.12	5.8	275.6	Crotone	277.87	1.32	1.33	233.62	-0.20	585.52	21.1	123.3
Territoire de Belfort	33.76	0.56	2.42	52.00	0.10	1910.04	10.8	205.4	Vibo Valentia	302.27	1.33	0.94	187.01	-0.83	453.98	22.0	99.7
Essonne	33.76	0.56	3.26	73.74	0.49	38360.43	1.9	730.7	Agrigento	283.08	1.32	2.86	522.02	0.47	3433.35	5.4	183.9
Hauts-de-Seine	33.76	0.41	2.88	65.70	0.33	131253.30	1.4	1883.1	Caltanissetta	308.99	1.32	1.98	426.72	0.29	2086.72	8.3	173.9
Seine-Saint-Denis	33.76	0.57	4.44	99.22	0.59	37177.66	2.3	839.2	Catania	273.72	1.31	6.38	1174.63	0.78	11732.70	2.8	333.3

Val-de-Marne	33.76	0.57	3.61	81.54	0.52	39650.69	1.9	772.9
Val-d'Oise	33.76	0.57	3.19	70.01	0.41	26165.98	2.2	585.4

Enna	308.99	1.32	0.94	193.67	-0.69	725.09	12.1	87.9
Messina	283.08	1.32	4.16	734.43	0.61	5638.22	4.0	223.5
Palermo	273.74	1.31	7.81	1439.35	0.81	16780.24	2.6	430.3
Ragusa	283.08	1.31	2.09	410.04	0.35	2204.38	8.1	178.7
Siracusa	273.72	1.32	2.61	473.52	0.43	2267.38	8.5	193.8
Trapani	283.08	1.31	2.66	503.94	0.48	3518.25	5.0	176.9
Cagliari	303.22	1.30	6.34	1103.24	0.72	11738.31	2.9	345.2
Nuoro	317.78	1.32	1.94	346.93	0.06	2938.85	5.0	146.9
Sassari	288.86	1.30	3.25	569.86	0.48	5158.21	4.5	229.8
Oristano	303.22	1.32	1.12	205.53	-0.50	1074.20	9.6	103.5

Table A.4.2.1 – Estimates of the base model: Italy 2006

		Coefficient	P_value
BNL	MC(1)	0.63	0.17
SAN PAOLO	MC(2)	0.50	0.27
MPS	MC(3)	0.87	0.04
INTESA	MC(4)	0.99	0.02
UNICRED	MC(5)	2.11	0.00
CAPITAL	MC(6)	0.74	0.08
BANCHE POP UNITE	MC(7)	1.16	0.01
ANTONVENETA	MC(8)	1.74	0.00
BIPIELLE	MC(9)	0.78	0.09
POP NO + VR	MC(10)	1.14	0.01
POP EMILIA ROMAGNA	MC(11)	1.33	0.00
BPM	MC(12)	1.94	0.00
OTHERS	MC(13)	4.27	0.00
_cons	COM(1)	1.38	0.00
dbigpro *	COM(2)	-0.37	0.00
lpc	COM(3)	0.00	0.00

Log likelihood	-432.63	AIC	0.82
Avg. log likelihood	-0.40	SIC	0.89

Descriptive statistics – Overall

	MC	*c*	MB/MC	MB	LERNER	PROFIT
Mean	233.92	1.30	5.10	794.79	0.56	10288.15
Median	170.55	1.32	3.30	636.78	0.70	2257.709
Maximum	593.91	1.37	55.84	4003.19	0.98	292394.9
Minimum	71.69	0.73	0.29	93.59	-2.50	69.14749
Std. Dev.	152.02	0.10	5.76	529.17	0.43	23657.35

Descriptive statistics – By bank

	MC	*c*	MB/MC	MB	LERNER	PROFIT	# Branches
BNL	134.38	1.31	4.29	577.08	0.67	2743.94	733
SANPAOLO	118.18	1.31	7.58	895.50	0.81	11377.62	3650
MPS	170.55	1.31	4.30	733.66	0.66	6282.24	1919
INTESA	192.24	1.31	4.33	832.30	0.66	9533.19	2992
UNICREDITO	593.91	1.31	1.43	849.53	0.01	10521.23	3100
CAPITALIA	150.46	1.31	4.93	741.25	0.70	6857.62	2038
POP.UNITE	229.16	1.29	3.39	777.48	0.58	7780.03	1266
ANTONVENETA	408.48	1.30	1.64	668.26	0.11	4401.13	1010
BIPIELLE	156.45	1.29	4.16	650.17	0.67	3621.68	544
POP.NO-VR	224.37	1.29	3.46	775.89	0.60	7255.46	1243
POP. E.R.	270.66	1.30	2.64	715.10	0.44	6360.63	1209
BPM	498.64	1.26	1.44	719.80	0.06	7719.88	715
OTHERS	71.69	1.31	17.16	1229.88	0.92	40489.71	13059