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CREATION AND ACTIVITY OF
FIRMS:
EARLY EVIDENCE FOR
COOPERATIVES IN THE ITALIAN
CASE**

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UHBS2006:11

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ABSTRACT

This paper investigates whether local differences in banking competition impact on the creation and activity of firms, with a special focus on cooperatives. The econometric analysis, implemented on a sample of firms operating in the Italian provinces during the years 1998-2003, reveals non-monotonic effects of bank market power on both firm creation and activity. With regard to the former, a bell-shaped relationship is found for both cooperative and non-cooperative firms, suggesting that a moderately concentrated banking market tends to favour firms' creation, regardless of their legal structure. A less homogeneous pattern emerges for firms' activity rate. Indeed, the relationship between bank market power and firm activity rate continues to assume a bell-shaped form in the case of non-cooperative firms. By contrast, a U-shaped parabola is found for cooperatives, showing that active coops in the market benefit from a relatively more intense banking competition.

JEL classification: B 52; G 21; L26; L30.

Keywords: cooperatives; local banking competition; institutional complementarity.

1. INTRODUCTION[§]

The cooperative firm has been analysed in the economic literature, on both theoretical and empirical grounds, with respect to a number of different, but related issues. Regarding the aspect of creation, the role of external finance – and especially of bank credit – has often been considered a critical factor for the birth of cooperatives. Given their atypical structure of property rights, these firms face more difficulties in raising the required external capital, due to the problem of guarantees offered to third parties financing the firm (Jossa and Cuomo, 1997). Indeed, workers' typical limited wealth - and consequent risk aversion and liquidity constraints - bounds the personal collateral available for obtaining loans (Ben-Ner, 1988). Moreover, the so-called cooperatives' "vaguely defined property rights" (Cook, 1995) create a commitment problem of members (Schlicht *et al*, 1977), which makes agency problems in credit markets more severe for these firms than for other enterprises, thus hindering not only the formation but also the functioning and survival of cooperatives (Vitaliano, 1983; Ben-Ner, 1988; Drèze, 1993; Putterman, 1993; Dow, 2003). Therefore, although bank credit represents also for other firms an important channel of resources acquisition, it seems reasonable to argue that the structure of the banking market can have especially relevant implications in the case of cooperatives, as it may contribute to cater their financing requirement, thus stimulating their creation and activity.

This work tests this proposition by empirically assessing whether local banking competition, an important feature of the institutional environment embedding entrepreneurship, impacts on the creation and activity of Italian cooperative firms, as compared to the effects produced for other business types. This is not a trivial issue, since the economic literature analysing the effects of bank market power has not provided a unique answer to the question of how competition among banks affects the availability of credit to firms, hence indirectly their formation and functioning. On one hand, the mainstream view - also known as *structure-conduct-performance hypothesis* - claims that in the banking industry, as in every

[§] I am grateful to Mariarosaria Agostino, Hulya Dagdeviren, Avinash K. Dixit, Giovanni Dosi, Elena Granaglia, Geoffrey M. Hodgson, Rosanna Nisticò, Douglass C. North, Francesco Trivieri, Ya Ping Yin, and the participants to the Centre for Research in Institutional Economics Workshop held at the University of Hertfordshire on 23-24 January 2007 for their valuable comments and suggestions on earlier versions of this paper. Of course, all remaining errors are mine.

other economic sector, lower competition leads unequivocally to welfare losses (Pagano, 1993; Guzman, 2000, among others). On the other hand, studies belonging to the so-called *information-based hypothesis* show that, due to asymmetric information problems occurring in lending relationships, credit rationing can occur also in (imperfectly) competitive lending markets (e.g. Stiglitz and Weiss, 1981; Petersen and Rajan, 1995; Bonaccorsi di Patti *et al*, 2004).

Given the mixed results existing in the literature as to the economic effects of competition among banks, it is of great interest to analyse in which direction local banking competition might influence the financing of cooperative firms, hence, indirectly, their creation and activity. Under the *structure-conduct-performance hypothesis*, this relationship should be positive: more banking competition would have a positive effect on firms financing, hence - *ceteris paribus* - on their formation and activity. On the other hand, under the *information-based hypothesis*, cooperatives would receive more credit and at better conditions (lower interest rates) in local markets characterised by a higher banks' monopoly power; thus, in such markets, cooperative firms should display higher rates of birth and activity. To take the analysis a step further, the empirical investigation, as already mentioned, is implemented also on non-cooperative firms so as to verify if bank market power displays different effects on the creation and activity of different typologies of enterprises.

By discerning between creation and activity, and also among cooperative firms and other business structures, this paper enriches the existing literature in several respects. Indeed, the issue of bank competition has not been previously addressed with regard to cooperatives. Moreover, although contributions as Bonaccorsi di Patti *et al*. (2004) studied the effects of bank market power on firm creation, they neglected to analyse its impact on firm activity, and did not account for possible differences among business types.

In evaluating the results of the econometric investigation, a novel interpretative framework, recently proposed in the new institutionalist literature, is adopted: the institutional complementarities approach. In perhaps the most extensive treatment so far existing on this issue, Aoki (2001) claims that the relationships among various market governance mechanisms prevailing in one economy, at any particular point in time, may be complementary in the sense that the effectiveness (or the presence) of one exchange governance mechanism can be reinforced - either directly or indirectly - by the presence of a particular mechanism in the same or embedding domain. Paraphrasing the *structure-conduct-performance*

hypothesis and the *information-based hypothesis* in terms of the concept *à la* Aoki (2001), the interest is in assessing whether the institutional counterpart complementary to different typologies of enterprises is a local banking market characterised by a higher or lower degree of competition.

To carry out the investigation, the research uses data on firms operating in 28 industries in the Italian provinces during the period 1998-2003. The administrative province is the relevant local market in the Italian case. Since the structure of the banking industry differs substantially across local markets, this provides sufficient cross-sectional variability within a single institutional framework, so that, given this regulatory uniformity, there is no need to control for different regimes (Bonaccorsi di Patti *et al*, 2004). Building upon several other studies on competition in the banking industry, local banking competition is measured by using the Herfindahl-Hirschman index on deposits. Two models are then estimated: one for firm birth, the other for firm activity.

The remainder of the paper is organised as follows: Section 2 presents a review of the major literature on the determinants of firm birth; Section 3 specifies the measures of firm birth and activity, and the indicator of bank competition used, as well as the empirical strategy employed; Section 4 describes the data; Section 5 comments on the results obtained and the robustness checks performed; finally, Section 6 concludes.

2. FIRM BIRTH: A BRIEF REVIEW OF THE LITERATURE

In recent years newly created firms have received considerable attention in the economic literature, especially as regards small and medium sized ones. It has indeed been argued that since a significant proportion of employment is created by new firms, which often bring productive innovation, it is essential to understand the factors promoting or mitigating entrepreneurial activity (Lee *et al*, 2004).

A first line of research focuses on the personal characteristics of entrepreneurs (Blanchflower *et al*, 1990; Chell *et al*, 1991), whereas a second line of study explains firm start-up and activity by considering environmental and institutional characteristics. With respect to this latter strand of analysis, the availability of capital has been considered an important issue. Indeed, since firm creation and activity

may be limited by liquidity constraints (Evans and Jovanovic, 1989), the financial resources that potential entrepreneurs have to finance their business are expected to influence firms' birth and activity rate.

In this line of studies focusing on the role of capital availability, a rather interesting contribution has been offered by Bonaccorsi di Patti *et al.* (2004). This work forms part of the wider strand of inquiry on the issue of banking competition that has lately attracted the attention of many scholars. The conclusions so far reached on the effects of banking competition are not univocal, both on theoretical and empirical grounds. The conventional wisdom argues that restraining competitive forces in the banking industry produces welfare losses, since banks with monopoly power can extract rents by charging higher interest rates on loans - thus producing adverse effects on entrepreneurial activities - and paying lower rates on depositors (Cetorelli, 2001). In a model of economic growth, Pagano (1993) shows that bank market power does produce a negative effect on the growth prospect of an economy. This same negative impact of market power is claimed by Guzman (2000): in a model of capital accumulation, the author shows that a monopolistic bank - compared to a competitive banking sector - produces a depressing effect on capital accumulation. Empirical support to this approach is provided by Black and Strahan (2002), Deidda and Fattouh (2002), Beck *et al.* (2004), and Claessens and Laeven (2005), only to quote a few.

As opposed to these conclusions, more recent theoretical studies have raised doubts on the overall beneficial welfare impact of bank competition on the economy. These contributions emphasise the role of asymmetric information problems in the relationships between lenders and borrowers, and show that credit rationing can occur also in (imperfectly) competitive lending markets (see, for instance, Petersen and Rajan, 1995 and Dell'Ariscia, 2000). Empirical evidence supporting this approach is offered by Petersen and Rajan (1995), Bonaccorsi di Patti and Gobbi (2001), and by the previously mentioned study by Bonaccorsi di Patti *et al.* (2004). These latter authors use Italian provincial data on 22 industrial sectors (manufacturing industries and constructions) for the period 1996-1999 and find evidence of a bell-shaped relationship between bank market power and firm creation, suggesting that market power in the banking industry is beneficial to firm birth only up to a certain point, after which it exerts a negative impact. This result suggests that - especially in countries where banks are the main source of financing for entrepreneurs - the degree of competition in the banking industry affects the availability of credit, which is in turn a precondition for the creation and development of firms.

In between the two lines of research just discussed, there are some studies showing that banking market structure may have both positive and negative effects on the economy, making it difficult to establish which one predominates (De Young *et al*, 1999; Cetorelli, 2001; Cetorelli and Gambera, 2001, Zarutskie, 2004). Given the mixed conclusions reached by the extant literature, it is of great interest to investigate the effects of local banking competition on credit availability to firms, and thus, indirectly, on their creation and activity.

To capture capital availability, working on Italian data, Guiso *et al.* (2004a) build a local indicator of how much more likely an individual is to obtain credit in a region, rather than in another one. They find that that in more regions where there is easier to access bank credit, there are higher rates of firm creation and firms grow more. Other studies focused on factors explaining the distribution of wealth at the local level, such as the percentage of homes owned by their occupants (Storey, 1982; Whittington, 1984; Ashcroft *et al*, 1991; Garofoli, 1994; Guesnier, 1994; Keeble and Walker, 1994), and the amount of deposits in the banking system (Fotopoulos and Spence, 1999; Gaygisiz *et al*, 2003). The underlying hypothesis is that proxies of wealth distribution at the spatial level may be indicative of the local availability of individual financial resources needed to establish and run new firms (Fotopoulos and Spence, 1999). These works find diffused evidence that where more financial resources are available, more firms are created and these perform better.

Of course, beside credit availability, a number of other contextual factors have been accounted for by the relevant economic literature, ranging from the importance of networks in entrepreneurship (Stuart and Sorenson, 2003), to the positive impact of local economic performance (Acs and Audretsch, 1989). Considering the focus of the present paper, only the main factors will be discussed in what follows, and most of these will be included in the empirical models as control variables. Early studies focused on transportation costs and transport development, showing their importance for the spatial pattern of economic activity (e.g. Bartik, 1989 and, more recently, Holl, 2004). Other contributions analysed the structure of local production by focusing on productive specialisation and urbanisation economies. On this regard, some argued that industry specialisation leads to localisation economies, which generate external economies beneficial to firms (e.g. Garofoli, 1994). In an opposite view, others claimed that in diversified regions there are more variegated capacities, hence a greater attitude towards entrepreneurship

(Beesley and Hamilton, 1994). As far as urbanisation economies are concerned, several authors showed that agglomeration economies existing in core metropolitan regions are linked to the strategic inputs required by firms (Vernon, 1960; Leone and Struyk, 1976). The converse view is that entrepreneurship tends to be more favoured in less urbanised regions, towards which individuals move in order to obtain the lifestyle benefits of a rural location (Mason, 1982; Garofoli, 1994).

Regarding the local composition of human capital, most studies show that areas with high proportions of skilled and specialised individuals have more entrepreneurs (Acs and Armington, 2004), whilst others find that individuals having a university degree are not willing to assume the risks associated to starting a business (Hart and Gudgin 1994).

As far as the economic performance of the local economy is concerned, several studies show that since new firms tend to depend heavily on the local market, differences in GDP growth rates influence entrepreneurship (Khemani and Shapiro, 1986; Acs and Audretsch, 1989; Keeble *et al.*, 1993).

Passing to the characteristics of the local labour market, some studies find that unemployment has a positive effect on entrepreneurship (Highfield and Smiley, 1987; Beesley and Hamilton, 1994), whilst others show that new businesses are less likely to be formed when unemployment is increasing (Audretsch and Fritsch, 1994; Garofoli, 1994).

3. RESEARCH QUESTION AND EMPIRICAL METHODOLOGY

This paper forms part of the literature on firm formation; in particular, it refers to Bonaccorsi di Patti *et al.* (2004) in that it focuses on banking competition as the main explanatory variable. However, several features distinguish this study from that of the just quoted authors. Firstly, beside the impact of bank competition on firm birth, its influence is assessed also with respect to firm activity. Secondly, in order to evaluate whether local differences in banking competition impact differently on the formation and activity of diverse business types, this research confronts cooperatives and enterprises operating under other legal structures (namely, partnerships and corporations, non-cooperative firms henceforth). Finally, the investigation is carried out by considering all sectors of economic activity, while Bonaccorsi di Patti *et al.* (2004) focus on only some of them.

The following sub-sections present the measures of firm birth and activity, the indicator of local banking competition, the models employed and the other variables included in the empirical specification.

3.1 Measuring firm birth and activity

The annual firms' birth rate in industry i , province p and year t is given by the flow of newly registered firms in year t divided by the stock of firms registered at the end of year $t-1$:

$$birth_{ipt} = \frac{newreg_{ipt}}{reg_{ipt-1}}, \text{ where } i=1,\dots,28; p=1,\dots,103; t=1998,\dots,2003. \quad (1)$$

Following Bonaccorsi di Patti *et al.* (2004), the average firms' birth rate is then employed in the estimations, so as to smooth the effect of temporary shocks. Moreover, by following the same authors, the mean of firms' birth rate is calculated on the period 1999-2003 - since some of the market level variables used are measured at the beginning of the period under analysis (see sub-section 3.3.2).

Beside firms' birth rate, attention is devoted also to inquiry on their activity rate. For each province p and sector i , this is computed as the flow of active firms in year t divided by the stock of firms registered at the end of the same year:

$$activity_{ipt} = \frac{active_{ipt}}{reg_{ipt}}, \text{ where } i=1,\dots,28; p=1,\dots,103; t=1998,\dots,2003. \quad (2)$$

Then, as for the birth rate, the average value of the activity rate is calculated over the years 1999-2003. The activity rate is here interpreted as a rough measure of firms "good health", since - as indicated by InfoCamere¹ - the stock of firms registered at the end of each year includes, beside the active ones, also those inactive, suspended, in liquidation and bankrupted. Thus, the activity rate gives the proportion of firms which are not in a declared state of difficulty.

It is worth mentioning that, besides smoothing the effect of temporary shocks, there is at least another important reason for which average values are used in the estimations. After computing annual birth and

¹ InfoCamere is the source from which data on firms demographics have been obtained. This organisation coordinates, at national level, the network of provincial Chambers of Commerce.

activity rates, and before taking their average values, it comes out that both these variables take on the value of zero for a considerable range of observations. In these cases, a Tobit model represents the most suitable econometric technique. Now, as argued by Wooldridge (2002), applying a Tobit model to a panel data structure entails some problems. Firstly, one of the main assumptions underlying the unobserved effects (both random and fixed) Tobit model, is the strict exogeneity of regressors. However, as argued in sub-section 5.1, there is reason to suspect that the indicator of local banking competition may be endogenous. Secondly, a fixed effects Tobit model would bring about - as the main doctrine argues - a further shortcoming, since estimating limited dependent variable models with fixed effects entails an incidental parameters problem,² which leads to inconsistent estimation of β with T fixed and $N \rightarrow \infty$ (Wooldridge 2002, page 484).

Taking, instead, for each province the mean values of birth and activity rates at industry level if, on one hand, implies losing the time dimension of data, on the other hand allows to avoid the above drawbacks, and leaves the opportunity to include in the analysis both industry-specific effects and the heterogeneity across markets.

3.2 Measuring bank competition

Local banking competition is measured at provincial level by using the Herfindahl-Hirschman Index (HHI).³ Since in Italy (like in most European countries) data at local banking office level are not publicly available, by following Carbò Valverde *et al.* (2003), and Agostino and Trivieri (forthcoming), each variable x needed in the computation of the HHI indicator is drawn as:

$$x_{ipt} = X_{it} * \left(\frac{BR_{ipt}}{BR_{it}} \right), \quad (3)$$

² The incidental parameters problem of the maximum likelihood estimator in the presence of fixed effects was first analysed by Neyman and Scott (1948) in the context of the linear regression model.

³ This is the indicator used in the majority of existing studies on banking concentration. For a critical review on this measure and on the other structural indicators of banks market power see Guzman (2000).

where $i=1,\dots,N$; $p=1,\dots,103$; $t=1998,\dots,2003$; x_{ipt} is a variable of interest for each branch office of bank i in province p in year t ; X_{it} is the same variable of interest as it is provided by the balance sheet of bank i in year t ; BR_{ipt} is the number of branch offices of bank i in province p in year t ; finally, BR_{it} is the total number of branch offices of bank i in year t . Then, for each year considered in the analysis, the indicator of local banking competition is computed as:

$$HHI_p = \sum (ms_{ip})^2, \quad (4)$$

where

$ms_{ip} = \left(\frac{D_{ip}}{D_p} \right)$ is the market share on deposits⁴ for each branch office of bank i in province p , and

$$D_p = \sum_i D_{ip}.$$

In the *structure-conduct-performance* paradigm, the HHI index is viewed as an inverse measure of bank competition: higher values of HHI are associated with a higher concentration of the banking market, hence with lower competition. Conversely, lower values of HHI indicate a less concentrated credit market, and thus more banking competition.

3.3 The econometric models

The empirical analysis is implemented by estimating two models. In the first one, the dependent variable is firms' average birth rate; it takes on the value of zero for a considerable range of observations in both samples (i.e. cooperatives and non-cooperative firms). In the second model, the dependent variable is firms' average activity rate and it assumes zero values for a non-trivial proportion of data only in the case of cooperatives. Given these features of the distribution of the dependent variables, for both models the Tobit technique is applied for cooperatives. In contrast, for the sample of non-cooperative firms the Tobit model is implemented when investigating firm birth, while OLS regressions are run when consid-

⁴ The HHI is computed on deposits (and not on loans) given that depositors typically have less market power than borrowers.

ering firm activity. The next sub-section offers a brief description of the Tobit model, while leaving aside the discussion on the traditional regression model.

3.3.1 *The Tobit model*

The standard censored Tobit model is usually used when dealing with a continuous variable having positive probability mass point at zero; it has first been applied by Tobin (1956) and, following Amemiya's (1985) taxonomy, is also known as type I Tobit model. The general formulation of the Tobit model is given in terms of the following index function:

$$y_{it}^* = \mathbf{x}_{it}\boldsymbol{\beta} + \varepsilon_{it} \quad i=1,\dots,N; t=1,\dots,T \quad (5)$$

$$y_{it} = 0 \quad \text{if } y_{it}^* \leq 0$$

$$y_{it} = y_{it}^* \quad \text{if } y_{it}^* > 0,$$

where $\varepsilon_{it} \sim N(0, \sigma^2)$. This is a standard regression model, where observations are censored at zero from below. In (5), when the model for firm birth is estimated, y_{it} is first the average birth rate of non-cooperative firms and then the average birth rate of cooperatives (both computed over the period 1999-2003); nonetheless, y_{it} is also the average activity rate of cooperatives when considering the model for firm activity; \mathbf{x}_{it} is a $(1 \times k)$ vector of explanatory variables and includes an intercept; finally, $\boldsymbol{\beta}$ is a $(k \times 1)$ vector of unknown parameters. The parameters in $\boldsymbol{\beta}$ have a double interpretation: one as the impact of a change in \mathbf{x}_{it} on the probability of observing a non-zero rate of birth (in the first model) and of activity (in the second one); the other interpretation as the impact of a change in \mathbf{x}_{it} on the level of these rates. The interest is in computing $E(y_{it} | \mathbf{x}_{it})$, $E(y_{it} | \mathbf{x}_{it}, y_{it} > 0)$ and $P(y_{it} > 0 | \mathbf{x}_{it})$; these depend on $\boldsymbol{\beta}$ but in a non-linear fashion.

The model is estimated by maximum likelihood. The contribution to the likelihood function of an observation equals the probability mass at the observed point $y_{it} = 0$ times the probability mass of observing $y_{it} > 0$. Therefore, the sample log-likelihood function is given by

$$\log L = \sum_{i \in I_0} \sum_{t=1}^T \log P(y_{it} = 0) + \sum_{i \in I_1} \sum_{t=1}^T \left[\log f(y_{it} | y_{it} > 0) + \log P(y_{it} > 0) \right], \quad t=1, \dots, T \quad (6)$$

which is equivalent to:

$$\log L = \sum_{i \in I_0} \sum_{t=1}^T \log P(y_{it} = 0) + \sum_{i \in I_1} \sum_{t=1}^T \log f(y_{it}), \quad (7)$$

where the sets I_0 and I_1 are the sets of indices corresponding to the zero and positive observations, respectively, and $f(\cdot)$ is a density function.

3.3.2 The econometric specifications

As already mentioned, a Tobit model is estimated for the average birth and activity rates of cooperatives, and also for the average birth rate of non-cooperative firms. Linear regressions are, instead, carried out when the average activity rate is the dependent variables in the equation estimated for the sample of non-cooperative firms.

In the econometric specification of the model concerning firm birth (BIRTH),⁵ the following explanatory variables are included: the average rate of firms' cancellation in the years 1999-2003 (DEATH),⁶ expected to be positively correlated to firm birth since, due to firms' turnover, relatively more firms should be created where a relatively larger proportion of existing firms disappear (Bonaccorsi di Patti *et al*, 2004);⁷ the initial industry share in each province (INDUSHARE), accounting for the fact that new firms are less likely to be formed in relatively densely populated markets; the indicator of local banking competition (HHI), described in sub-section 3.2; the (log of) average provincial population (POP) as a

⁵ This variable is labelled BIRTH_OF when computed for non-cooperative firms and BIRTH_COOP when referred to cooperatives.

⁶ DEATH is obtained by averaging over the years 1999-2003 the annual cancellation rates, computed for sector i and province p as the ratio of firms cancelled in year t over the stock of firms registered at the end of year $t-1$. This variable is labelled similarly to BIRTH, depending on which group of firms it refers to.

⁷ The regressions having BIRTH_COOP as dependent variable include also the birth and death rates of other firms (BIRTH_OF and DEATH_OF).

measure of local market size; the share of provincial population with a high school diploma or higher degree in 1997 (EDUC) is included as a proxy of human capital endowment, which could exert either a positive or negative effect on firm birth (see Section 2); a proxy for the strength of community ties (STIES) - or, as some authors claim, a proxy for civiness, hence for social capital⁸ - obtained by averaging data on electoral participation,⁹ so as to account for the possible impact of differences in social structure on firm birth;¹⁰ the crimes committed against the economy normalised by population and averaged over the years 1999-2003 (CRIMEECO), as a proxy for adherence to corporate law;¹¹ a dummy variable (CEN-NORTH), which takes on the value of 1 for Centre Northern provinces and 0 otherwise; the share of municipalities having less than 30,000 residents in 1996 (SMALLTOWN), to account for the presence of external and agglomeration economies; a proxy for the level of local infrastructures

⁸ Starting from Putnam's (1993) seminal study, various indexes proxying for social capital have been used in the literature. It is, however, still debated which is the most appropriate indicator. The electoral participation to referenda and elections has been used by studies as Helliwell and Putnam (1995), Forni and Paba (2000), Guiso *et al.* (2004a, 2004b) and Benfratello *et al.* (2006), only to quote a few.

⁹ The rounds of voting included in STIES are: the 1995 referenda (on twenty referendary questions), the 1999 European elections and the 2001 referenda (on a law concerning federalism, approved by the Italian parliament in order to bring some changes to the title V- part II of the Constitution). The choice of these rounds has been driven by data availability. Indeed, participation to the general elections has not been included because this piece of information is not available at provincial level, but only for constituencies. Moreover, regional elections do not always take place for all regions in the same year, so that data on voters turnout are not evenly available.

¹⁰ Bonaccorsi di Patti *et al.* (2004) use an inverse measure of social ties, given by the number of suicides normalised by population. They explain that this variable should have a negative coefficient for two reasons. Firstly, where social ties are stronger, the extended family is more likely to be involved in family owned businesses; secondly, this variable may also capture people's attitude towards the future and so, more pessimistic views should be negatively correlated with entrepreneurship. The present research, instead, uses the proxy afore illustrated because taking suicides as a measure for social ties could be a misleading choice. In fact, as Durkheim (1951) argues, too tight social ties can also lead to commit suicide. However, in the robustness analysis STIES is replaced with the variable used by Bonaccorsi di Patti *et al.* (2004).

¹¹ The crimes this variable includes are: falsity in acts and persons; counterfeit, alteration or use of trademarks; other crimes against the safety, the economy and the public trust.

(ROADS), measured as kilometres of non urban roads at the end of 1996 normalised by province area, and expected to have a positive effect on economic activity, hence on firm creation; the provincial real per capita income in 1998 (RPI) as a proxy for local wealth controlling for the fact that if convergence effects are at work, economies with low initial incomes should grow faster (Barro, 1991; Mankiw *et al*, 1992), hence should display higher rates of firm creation; finally, to account for sectoral specific effects, industry dummies are included (INDUSTRY). Using variables defined in a period preceding the one considered in the empirical investigation, underlies the assumption that some provincial characteristics take time to display their impact on firm creation (Bonaccorsi di Patti *et al*, 2004).

Turning to the specification for the regressions on firms' activity rate (ACTV),¹² this differs from the one so far described for the inclusion among the regressors firms' average birth rates. Moreover, in the equation estimated for cooperatives, the average activity rate of other firms (ACTV_OF) is also employed. For a more detailed description of the variables included in the empirical models and for their main summary statistics see tables 1 and 2, respectively.¹³

4. DATA

The data used in this study come from several sources. Information on firms has been obtained from Movimprese, a database compiled by InfoCamere containing data on firms demographics collected from local firm registries. In particular, gross flows of newly created, active and cancelled firms are present in this dataset, as well as end of year stocks of registered firms. This piece of information is available for 103 provinces, 29 industrial sectors and for firm legal structure (i.e. sole traders, partnerships, corporations, cooperatives, and other legal forms). The dataset for the period 1998-2003 is, therefore, initially made up of 17,922 observations. From it, are dropped observations regarding firms operating in the fi-

¹² As for BIRTH and DEATH, also this variable is labelled differently depending on which group of firms is taken into account. It is identified as ACTV_COOP in the estimations for cooperatives and as ACTV_OF for the regressions carried out on the sample of non-cooperative firms.

¹³ The correlation matrix for the variables presented in this section (not reported, but available from the author upon request) has not revealed strong correlations between any of the regressors.

nancial sector, since the great part of financial firms are banks. This leads to 17,304 observations. Then, since the intention is to focus on enterprises, sole traders are excluded. The category labelled “other firms” is also deleted because it groups a heterogeneous class, comprising a great number of typologies, in many cases representative of only a small number of firms. Finally, after taking the average values for the period 1999-2003 and checking for the presence of outliers, the sample is made up of 2,220 observations.¹⁴

A second dataset employed is BILBANK, edited by the Italian Banking Association (ABI) and containing balance sheet data on nearly all Italian banks for each year in the period 1998-2003. A third piece of information comes from the Bank of Italy and regards the provincial distribution of branches for each Italian bank over the period 1998-2003; this is used to disaggregate banking balance sheet data at provincial level, as illustrated in section 3.2.

A fourth data source is the Italian National Statistical Institute (ISTAT): figures on provincial income, population, voters’ turnout, and crimes against the economy are drawn from here. It is worth mentioning that since information on this latter variable was accessible only for the years 2000-2003, the 2000 figures have been imputed to the year 1999, so as to compute the mean value over the period 1999-2003. Finally, data on human capital, municipal distribution of population and infrastructural endowment are drawn from the Bonaccorsi di Patti *et al.* (2004) database.

5. RESULTS

Estimation results are reported in tables 3-12. All the estimations have been carried out using robust standard errors.¹⁵ Table 3 reports the figures obtained for the model on firm creation. To begin with the

¹⁴ Following Servèn (2003), the criterion used to operate this correction is to consider as outliers the observations for which any of the variables lies beyond 10 standard deviation away from the mean.

¹⁵ A way to compute robust standard errors for the Tobit model is to resort to interval regression. To do so, it is first necessary to reconfigure the data by assigning two values of the response variable for each observation. When the response variable is left-censored, as in the case under exam, the first value is set to missing and the other to zero. Of course, the point estimates obtained with the interval regression are exactly the same as those of the Tobit regression. Therefore, to avoid cluttering, only the interval regression estimates are reported.

comment on the significant variables controlling for local market characteristics, column BIRTH_OF shows that non-cooperative firms are more likely to be created where their turnover is higher (DEATH_OF), in less populated but, as found also by Hart and Gudgin (1994), wealthier areas, where there is a stronger adherence to corporate law (CRIMEECO), and in the presence of agglomeration and external economies (SMALLTOWN). As far as estimation results for the sample of cooperatives are concerned, figures in column BIRTH_COOP of table 3 suggest that cooperatives' average birth probability is positively influenced by the rate of creation of other firms (BIRTH_OF), by industries population density (INDUSHARE), larger local population and higher human capital endowment (EDUC).

Passing to the main variable of the empirical analysis, that is the measure of local banking competition (HHI), the results show that this indicator is positively (albeit not statistically significantly) related with BIRTH when estimates are carried out on the sample of non-cooperative firms, while this sign is reversed for the sample of cooperatives.

Turning to the results for the model of firm activity, these are reported in table 4. As already mentioned, this rate can be interpreted as a coarse measure of firms "strength", or at least as an indicator that firms are not in a declared state of difficulty (see sub-section 3.1). Column ACTV_OF shows that the activity rate of non-cooperative firms is higher where their birth rate is lower. Moreover, human capital and a larger local population negatively impact on ACTV_OF, whilst this is higher in the Centre Northern area of the country and benefits from stronger social ties (STIES). This latter result is reversed for cooperatives (column ACTV_OF), whose activity rate is negatively influenced also by their average death rate and by industries population density, whereas it is positively impacted by ACTV_OF and local wealth. Regarding the results obtained for the HHI measure, the relationship between bank concentration and firms' activity rate is always positive, even though not statistically significant for cooperatives.

To take the analysis a step further, following Bonaccorsi di Patti *et al.* (2004), the average value of the square of HHI (HHI2) is included in all regressions, in order to test for non-monotonic effects of local banking concentration on firm creation and activity. Results obtained from these estimations are reported in tables 5 and 6, respectively. Figures in these tables do not show any remarkable change (neither qualitative nor quantitative) for the control variables. With regard to the results obtained for HHI and HHI2, the regressions on firms' creation lead to a clear conclusion: non-monotonic effects of bank

market power emerge for both samples. In fact, the estimated coefficients of HHI and HHI2 are statistically significant in both columns BIRTH_OF and BIRTH_COOP of table 5. In particular, the bell-shaped pattern of the concentration indicator suggests that some market power in the local credit market is beneficial to the creation of enterprises - regardless of their legal form - whilst it has a detrimental impact after it reaches a threshold.

A less homogeneous conclusion is reached when looking at the results on the quadratic functional form of HHI in the estimations on firms' activity rate (table 6). Indeed, the evidence shows a U-shaped relationship between bank market power and cooperatives' activity rate (column ACTV_COOP), suggesting that active cooperatives benefit from more intense banking competition, even though this latter has negative effects when too exasperated. By contrast, for the sample of non-cooperative firms, the empirical evidence shows a positive linear relationship between their activity rate and bank market power (column ACTV_OF). Overall, the empirical evidence so far obtained reveals, in line with the relevant literature in the field, how complex the effects of banking competition are for firms.

5.1 Robustness

A major criticism that could be advanced to the analysis so far presented is that the indicator of local banking competition may be endogenous, if banks tend to enter local markets where the rates of firm creation and activity are higher for exogenous reasons. To deal with this potential objection, all regressions are re-estimated by testing for endogeneity. To do so, the Wald test is carried out for the Tobit regressions and the Hausman test is run for the OLS regressions.¹⁶ When only HHI is used, the instruments employed to implement this check are the HHI indicator and DENSITY (provincial population over province area), both taken at their 1995 values. To these instruments is then added MUN (number

¹⁶ The Wald test of exogeneity is a test of joint correlation between the error terms in the structural equation and those in the reduced-form equations for the endogenous variables. In the two-step estimator, in the second stage the residuals from the first stage are included as regressors. Then, the Wald statistics is a test of significance of those residuals.

of provincial municipalities in logarithm terms) when both HHI and HHI2 are included. Figures obtained from these further estimations are reported in tables from 7 to 10.¹⁷

Results are firstly discussed for the sample of cooperative firms when only HHI is included. In the model for firm birth, figures in column BIRTH_COOP of table 7 show evidence of endogeneity of HHI. The indicator of bank concentration is now positive but not statistically significant and a few marginal changes are registered for some control variables. With regard to the model for firm activity, the Wald test in column ACTV_COOP of table 8 shows no evidence of endogeneity of HHI; thus for this model conclusions are those drawn from table 4.

Passing to the estimates carried out on the sample of cooperative firms when also HHI2 is included, they do not reveal presence of endogeneity of HHI and HHI2 for both BIRTH_COOP and ACTV_COOP (see tables 9 and 10, respectively). Therefore, figures shown in tables 5 and 6 are the relevant ones for these models.

Turning to the results obtained for the sample of non-cooperative firms when only HHI is used, the Wald test reported in column BIRTH_OF of table 7 fails to reject the null hypothesis of exogeneity of the concentration indicator in the model for birth. Figures in the same table show that, as for BIRTH_COOP, also BIRTH_OF tends to be favoured by bank market power; nonetheless, some differences as regards control variables can be noticed. As far as the model for firm activity is concerned, the Hausman test in column ACTV_OF of table 8 shows no evidence of endogeneity of HHI. Therefore, results reported in table 4 are the relevant ones for this model.

Finally, considering the estimates obtained for non-cooperative firms when both HHI and HHI2 are included, column BIRTH_OF in table 9 shows that these variables are endogenous in the model for firm creation. Figures in this table confirm the non-monotonic bell-shaped effect of bank market power on the birth rate of these firms. Moreover, compared to the results presented in table 5, human capital is

¹⁷ Results for the Hansen-Sargan test are reported only for the OLS regressions. This is because, to my knowledge, econometric software do not allow to carry out such a test for the Tobit model. However, in order to have at least a feeling about the validity of the instruments used, the Tobit specifications have been estimated by OLS, so as to obtain the Hansen-Sargan statistic. The outcomes of the Hansen-Sargan test never rejected the null that the instruments were valid.

now statistically significant and still inversely related with BIRTH_OF, whereas POP and CRIMEECO are no longer significant.

As regards the model for firm activity, also in this case the Hausman test reveals evidence of endogeneity of HHI and HHI2 (table 10, column ACTV_OF). As opposed to the evidence obtained for the sample of cooperatives, the non-linear pattern followed by these variables shows that for the activity of non-cooperative firms some market power in the local credit market is beneficial, while it has negative effects after it goes beyond a threshold. By comparing figures in table 10 with those in table 6, it emerges that CRIMEECO is now found to have a positive impact on ACTV_OF, as well as SMALLTOWN and RPI; by contrast, ROADS and CEN-NORTH seem to be inversely related with ACTV_OF.

To sum up, the results obtained once the endogeneity issue has been addressed give a rather mixed picture: regardless of firm legal structure, the empirical evidence suggests the existence of a bell-shaped relationship between bank market power and firms' birth rate; this pattern continues to hold for the activity of partnerships and corporations, whilst the relationship assumes a U-shaped form when considering cooperatives' activity rate. These findings can be interpreted by means of the institutional complementarity approach *à la* Aoki (2001): the empirical evidence suggests that the relationship between firms and banking institutions can be considered complementary in the sense that the presence of firms (i.e. their birth rate) and their effectiveness (evaluated in terms of their activity rate) is reinforced by the institutionalised presence of specific features characterising the governance mechanisms operating in the financial domain. More precisely, a relatively more concentrated banking system seems to be complementary to both the creation and activity of non-cooperative firms. On the other hand, while banks enjoying some market power appear to favour also the creation of cooperatives, it is a relatively more competitive banking system the institutional counterpart that strengthens cooperatives in their activity.

As a second robustness check, following Bonaccorsi di Patti *et al.* (2004), an alternative indicator of the structure and degree of competition characterising the banking industry is employed. This is given by the absolute value of the change of HHI between the beginning and the end of the period examined (Δ HHI). This is an inverse measure of banks market power, under the assumption that significant changes in industry structure affect banks' expectations of extracting future rents from borrowers. Thus,

to make this indicator positively correlated with market power, its linear transformation is taken ($1-\Delta\text{HHI}$). Then, all regressions are re-run by including $1-\Delta\text{HHI}$ and its squared ($1-\Delta\text{HHI}^2$), and the results - not reported to avoid cluttering - remain basically unchanged.

A further sensitivity check is to include sole traders in the sample of non-cooperative firms. Regressions are then re-run and the results, not reported, do not register any remarkable change, neither qualitative nor quantitative. Conclusions hold also when the proxy used to measure the strength of communities (STIES) is replaced with NOTIES, the indicator used by Bonaccorsi di Patti *et al.* (2004).¹⁸

Finally, to account for market specific effects, the models are re-estimated by including market dummy variables. Implementing this check presents two main advantages. Firstly, this specification is robust with respect to the existence of market specific omitted variables. Secondly, as stressed by Bonaccorsi di Patti *et al.* (2004), accounting for market fixed effects largely reduces the concern for the endogeneity of the bank market power index. Results obtained from running these estimations, presented in table 11, fully confirm the conclusions previously drawn. Table 12 reports the marginal effects and threshold values of HHI for the estimates in tables 9, 10 and 11.

6. CONCLUSIONS

This paper has investigated the relationship between banking market structure and the creation and activity of cooperative firms. Moreover, in order to test for differences between cooperatives and other business types, the empirical analysis has been implemented also for corporations and partnerships.

The econometric investigation, carried out on a sample of Italian firms operating in 28 industries during the period 1998-2003, leads to some major conclusions. The first one is that the impact of bank market power on the creation of cooperatives does not seem to be different from that exerted on non-cooperative firms operating in the same local market. In fact, for all typologies of enterprises, the empirical analysis finds a bell-shaped relationship between bank market power and firms' birth rate, suggesting that firm creation is favoured by a moderate bank market power, which is instead detrimental

¹⁸ See footnote 10 for a brief discussion on this variable.

after it reaches a threshold. This finding is in line with the conclusions reached, for instance, by Petersen and Rajan (1995) and Bonaccorsi di Patti *et al.* (2004).

A less homogeneous pattern, and this is a second main conclusion, is found with respect firms' activity rate. On this regard, the empirical evidence still finds a bell-shaped parabola for non-cooperative firms. By contrast, a U-shaped relationship emerges for cooperatives: this seems to indicate that active cooperatives in the market benefit from more intense banking competition, even though it produces negative effects when too exasperated. This result is in accordance with those studies, such as Black and Strahan (2002), which present evidence in favour to the beneficial economic effects that firms can enjoy from bank competition.

Overall, the evidence obtained in this work can be considered coherent with the result of Petersen and Rajan (1995): banks enjoying market power are willing to grant more credit to newly formed firms, thus favouring the creation of other firms, so as to establish lending relationships with them, and extract future rents from these borrowers. It could be, therefore, for this reason that, after the birth phase has passed, cooperatives would be better off in markets characterised by a more intense banking competition. Furthermore, the divergent results obtained with respect to the effects of bank market power for the creation and activity of cooperative firms, are in line with those studies showing that banking market structure may have multiple effects on the economy - both positive and negative - making it difficult to establish which one ultimately dominates (De Young *et al.*, 1999; Cetorelli, 2001; Cetorelli and Gambera, 2001; Zarutskie, 2004).

Evaluating these findings by means of the institutional complementarity approach, it is possible to argue that, in the Italian case, the relationship between firms and banking institutions can be considered complementary in the sense that the presence, and the effectiveness, of firms is reinforced by the institutionalised presence of specific features characterising the market governance mechanism operating in the financial domain. More precisely, a relatively more concentrated banking system is complementary to both the birth and activity of non-cooperative firms. Moreover, while banks enjoying some market power tend to favour also the creation of cooperatives, it is a relatively more competitive banking system the institutional counterpart that strengthens their activity.

Since the conclusion reached for firms' creation holds regardless of their legal form, this seems to have a rather interesting implication as regards the "evaluation" of the cooperative firm. A still open debate in the literature is relative on how this type of firm should be considered relative to other businesses. Without going into details, positions range from some claiming an intrinsic inferiority of cooperatives, which manifests itself in all the phases of their life-cycle (Ward, 1958; Williamson, 1980; Porter and Scully, 1987; Hart and Moore, 1996), to others treating cooperative firms on equal terms respect to the other enterprises (Staber, 1989; Bartlett *et al*, 1992; Bonin *et al*, 1993; Stiglitz, 2004). The general picture emerging from this study is that, with regard to the phase of creation of their life cycle, cooperatives are not different from other firms, at least for how they tend to be perceived by banking institutions and to respond to bank market power. It is, however, during their activity that cooperative firms appear to manifest a behaviour different from that of other enterprises and, in this respect, further research is called for to inquiry on the sources and consequences of this diversity.

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