Incentive-Compatible Financial Instruments for Co-Operative Firms: a Few Policy Considerations

by

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ABSTRACT

This paper deals with the problem of identifying incentive compatible financial instruments for co-operative firms in rapid growth and expansion, in the light of the literature that associates the design of financial instruments with the organisational structure and incentive mechanisms operating among the various individual involved in the production process. The analysis, which also includes an econometric study on the financial costs for producers co-operatives based on a sample of Tuscanian co-operatives operating in the metal and mechanic industry, suggests that bonds with a remuneration indexed to typical managerial targets seems to be the more appropriate financial instrument allowing the co-operatives to raise funds in the spot financial markets without affecting the peculiar participatory mechanism and property rights structure that characterises co-operative firms.

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INCENTIVE-COMPATIBLE FINANCIAL INSTRUMENTS FOR CO-OPERATIVE FIRMS: A FEW POLICY CONSIDERATIONS

1. Introduction

The particular ownership structure that characterise the co-operative firms (summarized by the principle "one head one vote") and the institutional and legal constraints concerning the non divisibility of the non-distributed profits have been historically motivated by solidarity principles, but are also regarded as a strategic handicap for large co-operatives in expansion, to the extent that they might cause rationing on the capital market.

This paper, mainly concerned with the European and Italian institutional contexts, discusses the main features of some financial instruments for co-operatives in the light of the literature that associates the design of financial instruments with the organisational structure and incentive mechanisms operating among the various individual involved in the production process. In particular, it is argued here that bonds and debt contracts with an appropriate mechanism of indexation are a better solution than the special shares with multiple vote, introduced in Italy by the law 59/92 and further extended in the project of reform of the commercial law proposed by the Commission Mirone. In fact, while an extended literature suggests that the former may be consistent with the incentive mechanisms operating inside a co-operative firms, the latter not only are likely to modify the peculiar property right structure that characterise co-operatives, but also put into serious danger the few informational advantages that these firms could enjoy due to their participatory nature and organisation.

Sections 2 and 3 analyse the implications of the recent theoretical literature concerned with the incentive problems affecting co-operative and participatory firms and their financial contracts.

Section 6 briefly introduces some of the main characteristics of the negotiable financial instruments that co-operative firms can issue, in the Italian legal and institutional

framework

Section 7 contains a few considerations on the actual feasibility of bonds issues for co-operatives of different sizes, by analysing data from a industrially homogeneous district: Tuscany. Finally, section 9 contains a few concluding remarks and policy considerations.

2. Co-operative firms' internal organisation and financial markets

How efficient are co-operative firms with respect to conventional "capitalistic" firms? As we know it, Alchian and Demsetz [1972] contribution had very destructive implications for labor-managed (and, more generally, for co-operative) firms. However the extent of these implications has been recently questioned by a number of studies stressing the existence of various elements of informational of comparative advantage in participatory firms, mainly determined by the repeated and continuous interaction among the individuals involved in the production process and by the incentives for the managers to optimise the use of information that workers and employees can provide. A further limitation in the implications of Alchian and Demsetz criticism is given by the obvious point that production efficiency of a labour-managed firm may be simply interpreted as an application of the *folk theorem* to the case of an indefinitely long interaction among the workers involved in the production process[1], while other (and more rigorous) studies, based on the analytical tool of evolutionary games and on the descriptive tool of numerical simulations, have reproduced the diffusion (or extinction) process of co-operative behaviour among subjects involved in a production process[2].

Aoki [1993] points out that the participatory firm enjoys a particular informational advantage, given by the fact that workers themselves generate information (which would be costly within a conventional monitoring mechanism) through their collective participation to the process of data collecting and processing within the firm. Aoki introduces then the concept of *"P-Network"* (or internal participatory information

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[1] Mazzoli (1998b) uses this interpretation in a study on financial instruments for Italian co-operative firms
[2] See, for instance, Sacco (1998).

network), as a tool to enhance the efficiency of the firm. As a feasible example of organisational design in the spirit of P-Network, Aoki quotes the solution proposed by Holmstrom [1982], consisting of the following incentive mechanism: if the output produced by a team of workers exceeds a certain threshold, the workers could exhaust among the whole output (minus a fixed amount); if, on the contrary, the output falls below a certain threshold, some (*ex ante* specified) penalties should be imposed to all the workers of the team, so that the payout of the team be less that the output (net of a fixed sum). This would mean that only in the case of a bad production performance could an external agent (supervising the organisational process) appropriate a relevant portion of output. A suitable choice of the threshold output value that triggers the penalty could allow to approach the first best theoretical behaviour of a profit-maximising capitalistic firm .

For what concerns the organisational comparative advantage, Bartlett *et al.* [1992] points out (also by supporting his theoretical statements with some empirical evidence) that co-operative firms may enjoy advantages in terms of technical efficiency, generated by a stronger workers' identification in the firms targets.

These points suggest that the well-known comparative disadvantage for co-operative firms in raising financial capital might be compensated (although only very partially) by those informational advantages associated to their participatory organisational structure. This also means that the few organisational comparative advantages given by the participatory nature of the co-operative firms might be put into danger by any financial instruments (like shares with multiple votes) that are likely to determine stable controlling groups composed by coalitions of suppliers of external funds. In the Italian context, this danger might be increased by extending the feasibility of the financial instrument introduced by the above-mentioned law 59/92, which, in addition, have (predictably) failed to enable producers co-operatives to raise substantial amount of financial funds, as shown by the scarce number of firms who have actually issued these special kinds of securities.[3]

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[3] A few rare but significant exceptions are given by the interventions of co-operative firms and institutions of the co-operative movement, who have purchased a relatively large amount of these financial instruments, in order to support other co-operatives in temporary financial difficulties (like in the case of "Cooperativa Muratori e Cementisti di

In might be interesting to note in this regard an historical paradox: while the need for raising external finance has transformed the old-fashion capitalistic firm into "public companies"[4], the same need for external finance (which motivated the law 59/92) is leading the Italian co-operative firms to a potentially concentrated configuration, since the shares with multiple votes introduced by the law 59/92 can represent up to 1/3 of the total votes in the company general meeting.

Ognedal [1993] has analysed the problems resulting from ownership structure instability in a firm where the workers hold a relevant portion of shares, close to the level allowing to control the firm. This situation typically presents incentive problems associated to the fact that the workers-shareholders have the interest and the theoretical opportunity to avoid profit distribution on equal bases with the other shareholders and tend therefore to allocate the cash-flow into higher wages and fringe benefits, rather than distribute it as dividends. This kind of conflict can be solved with the recourse to the share market as a market for the control of the firm. Ognedal points out that restrictions on share negotiations might be necessary if one aims at a stable ownership structure for the firm[5]. In fact, the initial majority group would not have any interest in giving up control unless they receive a suitable compensation value, but still a conflict between individual rationality and collective rationality could emerge: if any of the co-operative promoters is free to buy or sell any share, she could be paid or given incentives in the form of material advantages, in order to sell her shares. A similar situation could be determined in the case of a co-operative with special shares with multiple votes: in this case the incentives to an ordinary member of the co-operative would not aim at convincing her to sell her shares, but rather to support a coalition composed by shareholders with multiple vote intended to control the firm.

Before discussing the role of bonds as a possible instrument for co-operative firms to raise financial capital we are going to introduce in detail a suitable theoretical framework to describe the interaction between financial strategies and incentives acting

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Ravenna").
[4] See again, on this point, Pagano, Panetta and Zingales [1994]
[5] In this sense the fact that the Italian law n. 59/92 esteblish a maximum number of votes that may be expressed by the shareholders with multiple votes could be interpreted as a restriction on share negotiations.

among the different subjects inside the firm. This is done in the next section, on the basis of Ben-Ner [1993] contribution.

3 Financial liabilities as an organisational tool

The optimal organisational design of a complex organisation consists of specifying incentive-compatible contracts involving the various categories of agents that take part into the production process. Ben-Ner framework is founded on the results of an extended game-theoretical and "transaction costs economics" literature, concerned with the problems of interest conflicts emerging among the various subjects involved in a complex organisation. It is a detailed theory of organisational structure focused on the interrelation between cooperation, conflict and reciprocal control mechanisms existing among the various groups of individuals. The main points of this theory may be summarised as follows: control mechanism in an organisation emerges as an optimal response to cooperation and conflict among the various subjects involved, it is implemented through organisation design and is held by those participants who obtain the greatest net value from its implementation.

Following Ben-Ner definitions, an *organisational structure* is a set of rules that determine what positions exist inside an organisation, what is their formal function, what subjects will implement them and when. A *position* inside the organisational structure is identified by the set of actions that may be undertaken and is composed by three important *dimensions*: its role in determining inputs supply and output demand, location in the structure and role in the division of labour. In a structure one may find resources providers (defined as *"supply-side participants"*, i.e., for instance, workers, managers, shareholders and providers of finance, banks, or even the state) and *"demand-side participants"*, i.e., the final users of the output, like, for instance, customers, sponsors, or, again, the state. We can also define the *"hybrid participants"*, i.e. those who offer several kinds of inputs (like, in the case of the producers co-operatives analysed in the econometric investigation of sections 4 and 5, the workers-owners) or interact both on the demand and on the supply side. The second dimension of a position defines the location of participants in the organisational structure, like, for instance, their participation in teams, firm's divisions, managerial bodies or trade unions. The third

dimension is given by the role of the participants in the division of labour, i.e. their tasks (for instance, planning, administration, monitoring, risk taking, data processing). The complexity and multiplicity of each single position determine simultaneously divergence or unity of interests.

The definitions of *cooperation, conflict* and *control* are based on the actions of the participants. In particular, *cooperation* and conflict imply actions that may improve or damage the interests of other participants into the organisation. The ability to implement *control* depends on the position occupied by the participant in the organisation. The three dimensions of a position determine which actions are feasible and incorporate the determinants of *control*, like the ownership of the organisation or crucial inputs (such as information or particular specialised professional tools), the fact of being given decision power, access to organisational tools that might subtract the *control* from other participants, and, finally, the contractual power to negotiate further control.

In general, the degree of *control* can only be partial, although Ben-Ner identifies a sort of ranking in the level of control, which can be distinguished between *ultimate control* and *attenuated control*. Each organisational position is characterised by one or more classes of *tools* that participants are enabled to implement:

a) work;

b) planning, coordination and administration of activities;

c) assignments of tasks and determination of promotion ladders;

d) monitoring of actions;

e) price determination (both external prices and internal compensation schemes);

f) collusion and the formation of coalitions;

g) communication and negotiation;

h) unilateral action;

i) sharing, hiding and manipulation of information;

j) manipulation of participants' targets;

k) fulfilment of agreements;

l) making of investments;

m) shirking of responsibilities ;

n) consent;

o) technology.

Many of these tools can be used both for cooperation and conflict, although tools a), b), g), n) mainly contain elements of cooperation, while h) and m) mainly contain elements of conflict. In addition there are "*non observable*" tools, which entail costly monitoring.

A combination of *control tools* is defined *control mechanism*. In this regard, Ben-Ner defines three main categories of control mechanism: *market, trust* and *authority*. Control through *market* implies the use of various prices in order to give the participants incentives to act in a given way. Prices inside the organisation (for instance wages, salary scales, transfer prices) are typically set by participants through the control mechanism of authority, although these prices implement a form of control of the actions through market-type incentives.

The control mechanism of *trust* implies actions inducing the participants to act inconsistently with their short run interest and consistently the controllers' wishes. This kind of behaviour is sometimes formalised with repeated games. In particular, the interaction among two or more subjects could be described as a *repeated prisoner dilemma*, and the *Folk Theorem* shows that cooperative equilibria can be sustained, provided that the participants are not "too impatient" (or are not impatient beyond a certain critical value). In this context, the existence of organisational tools enhancing the credibility of cooperative behaviour is crucial: for the sake of our analysis, we want to identify the financial instruments defined by a contract where the managers can credibly commit themselves to pursue targets shared with the owners-workers.

Other crucial organisational elements for the sustainability of a cooperative equilibrium are the feasibility of communication and the repeated interaction (i.e. some of the conditions of validity of the *Folk Theorem*) among participants.

The choice of the organisational structure and combination of the three mechanisms of control constitutes the *organisational design*. Its determination is not unilateral, but it is the result of the joint actions carried out by the participants into the organisation, among which, the control holders are the most powerful.

Trust may be generated through training or processes of social assimilation

affecting the psychological predisposition of the participants. Participants' specialisation, which reduces the degree of subjectivity in the assignments of tasks and determination of promotion ladders may constitute another important element.

In the case of co-operatives issuing special shares with multiple votes (which, in the case of the Italian law n.59/92 can reach up to 1/3 of the total votes that may be expressed in the company meetings), there is a strong incentive for the creation of controlling groups constituted by coalitions of shareholders with multiple votes, since many "capitalistic" medium sized firms can be controlled even just with 20 or 25% of the shares. In terms of Ben-Ner theoretical framework, the managers of the co-operative firm (expressed by a controlling coalition of shareholders with multiple votes) would significantly expand their ability to implement tool "h" ("unilateral action") with respect to workers and ordinary promoters of the co-operative, who would see (on the contrary) a strong reduction of the relevance of tool "n" ("consent"). All this would obviously cause the firm to switch from a control mechanism based on *trust* toward a control mechanism based on *authority*, reducing in this way the incentive for the workers to implement all the actions that (as suggested by Aoki, 1993) "generate information" through their collective participation into the internal process of data collecting and processing[6]. Therefore, a first point to be made is that the introduction of a financial contract that contrasts with the incentive mechanism operating in a successful participatory firm is not advisable. A second obvious point is that in order to raise financial capital on large spot financial markets one has to implement financial contracts that minimize the extent of any moral hazard problem, i.e. where the remuneration of the external investor is linked to the targets of the subjects who actually hold the control of the firm.

The question is now *who actually holds the control in a co-operative firm interested in raising funds on large spot financial markets (i.e. in a large co-operative in expansion)*. A frequent parallel is made between large co-operative firms and public companies, because of the highly dispersed ownership of the latter and the absence of a

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[6] It is a common opinion that a participatory mechanism like the one described by Aoki has played an important role in the success of the co-operative firms in important Italian industrial districts, like Emilia Romagna and Tuscany

controlling group of shareholders, which creates a collective decision process that reproduces many features of the "one head one vote" principle of co-operative firms. At the same time, a certain consent has been reached in the literature on the fact that (due to the relatively small amount of capital invested by each shareholder in the firm, to the small probability for each shareholder to affect the decision process and, finally, to a certain degree of information asymmetry between managers and shareholders) the actual control of the public company is held by the managers rather than the shareholders. In this regard, a suitable theoretical framework is given by the managerial economics tradition à la Baumol-Marris-Williamson (henceforth BMW), which points out that the preferences of the managers do not necessarily coincide with the conventional target of profit maximization and are more strictly affected by the target of defending their status, their degree of discretionality and, as a consequence, by some measure of firm growth (for instance Baumol, 1959 seminal contribution introduces the firm's sales). In this context, the value of the firm's share and their remuneration would only constitute an external constraint in the discretionality of the management, and not a target in itself.

The relevance of BMW view is even stronger for large co-operatives in expansion: in that case profit maximization might not be a target even for the owners, because of the regulation (similar in most European countries) setting a relatively low ceiling for owners remuneration and stating that the net worth of the firm (i.e. profits accumulated in the past) may not be distributed among the owners. These regulations are, as we know it, a consequence of a "principle or mutuality " characterising the property rights system of co-operative firms, and are usually compensated by some tax advantages for the firms. Furthermore, the owners are often compensated for their low remuneration by some limited forms of output distribution[7] at lower-than-market prices[8]: yet another incentive for the owners to aim at the firm's growth and ability to produce output and services.

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[7] Like in the case of allowance ("ristorno") for Italian consumer co-operatives.

[8] This was actually one of the main historical reasons why co-operatives were originally constituted. For this reason, and since ownership is obviously better remunerated in a conventional capitalistic firm with perfect financial, labour and goods markets, the existence of co-operatives might be theoretically motivated by some form of market failure or market imperfection in one or more of these markets.

Finally, another implication of BMW view is that, under the constraint that the financial leverage does not reach a critical and pathological threshold, debt is a credible commitment for risk-averse managers to reduce their level of discrtetionality.

Two important points have to be considered here. The first (empirical) question is whether the actual financial structure of the Italian representative co-operative leaves any room at the moment for a financial policy based on bonds issue, i.e. *how big is in now the impact of leverage on the co-operatives financial costs*. This is precisely the object of the empirical analysis presented in sections 4 and 5. The second question is *what is the best way to link the remuneration of the external investor to the targets of the managers*. The answer here depends on how one models the managers' preferences, or, in other words, which particular piece of literature one refers to.

If one refers to the managerial economics tradition, a promising solution would be to issue financial contracts wich constitute a credible pre-commitement for the management to reduce their level of discretionality and which contain a mechanism of remuneration linked to an indicator (or a set of indicators) of the growth of the firm. A requisite for such a financial contract to be a credible commitment is that the indicator must be easily observable, in order to avoid moral hazard and monitoring problems.

In Baumol (1959) seminal contribution the managers' preferences and target were summarized by the firm's sales. In a dynamic context, the sales's growth, are probably the simplest and easiest to observe measure of the firm's growth (provided that reliable banalce sheets are available within a reasonable lenght of time).

Therefore, if one assumes that the managers' preferences can be represented according to the managerial economics tradition à la BMW, a financial contract which does not modify the control and participatory mechanism operating inside a co-operative firm is given by bonds with a remuneration indexed to a portion of the sales rate of growth.

A parallel solution to this problem, provided by Waldmann and Smith [1999], consists of bonds with a remuneration indexed to a measure of industry conditions. They show that this kind of financial instrument would reduce underinvestments and "Illyrian" supply effects. The specific kind of indexation they propose is derived form the literature on utility regulation with principal-agent problems (in particular, Holmstrom, 1979,

1982, Green and Stokey, 1983, Lazear and Rosen, 1981)[9] and certainly presents some advantages in terms of observability, since official statistical surveys on business conditions in many industries are easier to obtain than balance sheets, but would not allow the external suppliers of funds to take advantage of "better-than-average" performances.

To the extent that firm's growth is a valid representation of the managers' preferences, bonds with a remuneration indexed to a portion of the rate of growth of sales would have the following clear advantages:

a) they would constitute a credible commitment for the management to share with the external investors the benefits deriving from pursuing their specific target;

b) they could allow financial strategies enhancing the identification of the workers with the firm's targets, for instance, by allocating the bonds among the workers themselves (or the owners-workers in the case of producers co-operatives);

c) differently from the special shares with multiple votes (recently introduced in the Italian legislation and debated in most European countries), they would not introduce any modification in the control and property-right structure of the co-operative firm and therefore would not affect the virtuous participatory mechanism identified by Aoki [1993].

The validity of this kind of financial instrument is also consistent with the implications of Ben-Ner contribution. In fact, first of all the *value of control* is higher the stronger the ability of its holders to promote internal cooperation instead of conflict. In this regard, the position of participants that hold the control is fundamental, since it determines the multiplicity of incentives involved: control (even when indirect) on the working conditions assumes a much higher value for the workers than for any other participant. Secondly, *the costs of control* are correlated with the ability of the participants to actually implement the various control tools, which, in their turn, depend on the experience and organisational position of the participants.

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[9] We are very grateful to Stephen Smith for making this point to us in some comments to a previous version of this paper.

4. An empirical analysis based on a sample of Tuscanian producers co-operatives operating in the metal and mechanic industry

This section and the next one describe an econometric analysis performed with data from producers co-operatives operating in Tuscany in the metal and mechanic industry: the organisational structure of this kinds of co-operatives is the one that more closely approaches the theoretical model of labour-managed firm, and this is the main reason for choosing this specific dataset, which contains therefore homogenous firms both for what concerns their industry and their geographical district.

The sample has been created on the basis of the accountancy data from all the Tuscanian producers co-operatives members of "*Lega Nazionale delle Cooperative e Mutue*" operating in the metal and mechanic sector, whose data are available with continuity in the period 1995-1998.

The use of accountancy data from individual firms, on the one hand avoids any methodological problem associated with the data aggregation, on the other hand raise the old controversy on the use of accounting data for econometric estimates. In this regard, we share the point of view of Martin [1993], who, objecting to Benston's [1982] criticism on the reliability of accounting data, argues that refusing to use accountancy data for econometric analyses would amount to give up any empirical research in industrial economics and would also mean that a wide spectrum of government publications describing economic activity should be disregarded, since they are based on what is, originally, accounting data.

As we know it, several accountancy indicators and methodologies concerning financial costs, remuneration of own capital, size and actual cost of debt normally used for conventional firms cannot be employed in the same way for the co-operative firms, due to their peculiarity and to the anomalous meaning of some accounting items (for instance, as we will see in sections 6 and 7, the call loan granted by co-operative promoters and its remuneration).

5. The relation between financial costs, firm-specific risk and firm size

This section introduces some econometric estimates on the incidence of financial costs on the budget of co-operative firms, by using dynamic panel data techniques. (Arellano and Bond, 1988, 1998).

Two crucial variables for the determination of the incidence of financial costs on the budget of co-operative firms are the financial leverage (a proxy for the firm-specific risk) and the size of the firm, which is also captured here by a (commonly used) proxy: the number of employees in each co-operative. In particular, on the basis of a consolidated literature in financial economics, we would expect a positive relation between the financial leverage and the incidence of financial costs (measured as the ratio between financial costs and sales), due to the risk premium that the firm has to pay to lenders. The negative relation between firm size and incidence of financial costs derives from two orders of considerations: on the one hand, a larger firm is able to better diversify its investments, on the other hand, a larger firm might enjoy higher market power on the credit market[10]. We should actually add that also bureaucratic and organisational costs grow with the size of the firm, but we may expect the magnitude of this second mechanism to be relevant only beyond some (very large) critical size of the firm, which might be reached by a very small number of co-operative firms only. For these reasons, we expect (in our sample of Tuscanian producers co-operatives) the firms size to be negatively correlated with the incidence of financial costs.

On the basis of the points made before, we assume that the ratio between firm's financial costs and sales can be described by the following function:

$$cr^* = f(lev, add)$$

where cr^*_{ti} is the optimal ratio between firm's financial costs and sales for firm "i" at time "t". The choice of this variable instead of the ratio between financial costs and debt is due to the accountancy controversy on how to treat the call loans of the co-

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[10] For a formalization of this statement within a theoretical model of oligopsony in the credit market, see Mazzoli (1998a) ch.4.

operative promoters and their remuneration: this kind of liability is sometimes not regarded as a simple debt for the co-operative firm, because of the particular relation between the associates and the firm management. In the case of producers co-operatives, using Ben-Ner (1993) framework, we could say that the deposits of the associates might be regarded as one of the multiple instruments that the *participants* have in their hands in order to implement dome form of indirect control on the management.

The variable "*lev*" represents the financial leverage, and is employed here as a proxy for the firm-specific risk. It is a rather common choice in empirical literature: its theoretical justification might be based on Jensen and Meckling (1976) contribution, actually referred tot he public companies, which present in any case some similarities with the co-operative firms, at least for what concerns the situation of highly dispersed ownership, and its associated incentive problems.

The variable "*add*" represents the number of employees and is a proxy for the firm size. As we said this variable is expected to be negatively correlated with $cr*$.

For our estimates, we assume a linear form of this kind:

$$cr* = c_0 + c_1 \, lev + c_2 \, add \qquad (1$$

We assume in addition that, due to adjustment costs, for each observation the agents' observable behaviour is consistent with the partial adjustment model. In other words, the agents minimize a quadratic cost function which includes the cost of "being out of the equilibrium" and the cost of modifying the previous value of the target, i.e.:

$$min \; C = \gamma_0 (cr_{tj} - cr*_{tj})^2 + \gamma_1 (cr_{tj} - cr_{t-1,j})^2 \qquad (2$$

Assuming that the S.O.C. are satisfied, we get the following first order conditions:

$$\partial C / \partial cr_{tj} = 2\gamma_0 (cr_{tj} - cr*_{tj}) + 2\gamma_1 (cr_{tj} - cr_{t-1,j}) = 0$$

hence

$$cr_{tj} = [\gamma_0 / (\gamma_0 + \gamma_1)] \, cr*_{tj} + [\gamma_1 (\gamma_0 + \gamma_1)] \, cr_{t-1,j} = \mu \, cr*_{tj} + (1-\mu) \, cr_{t-1,j} \qquad (3$$

which may be rewritten as follows:

$$cr_{tj} = a_0 + a_1 cr_{t-1,j} + a_2 lev_{tj} + a_3 add_{,tj} + \varepsilon_{tj} \qquad (4$$

where

$a_0 = \mu\, c_0$; $a_1 = 1 - \mu$; $a_2 = \mu\, c_1$; $a_3 = \mu\, c_2$, and ε_t is a white noise.

In (4) some dummy variables for the various years have been introduced in order to capture the fixed effects given by the industry-specific shocks in the various years.

The regressions have been ran with the software DPD, elaborated by Arellano and Bond [1988] for dynamic panel data.

The results of the estimates are reported in the following table. $(ut/cap)_{t-1}$, is the ratio between profits and invested physical capital: it has been employed as an instrument for the lagged value of cr.

Finally, White (1980, 1984) methodology has been followed, in order to estimate "robust" to heteroskedasticity parameters and tests. The remaining variables included in the table are the following:

D96 = *Dummy* for 1996;
D97 = *Dummy* for 1997;
D98 = *Dummy* for 1998.

TABLE 1

Estimates based on a sample of production co-operatives members of "Lega Nazionale delle Cooperative e Mutue" and operating in the Tuscanian metal and mechanic industry

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D.P.D. RESULTS

LEVELS   IV

Number of firms: 16   Sample period is 1995 to 1998
Observations: 52   Degrees of freedom: 45

Dependent variable is: cr

Instruments used are:

CONST $(ut/cap)_{t-1}$ lev_{t-1} add_{t-1} TIM DUMS

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

Wald test of joint significance: 11.932914   df = 3
Wald test - jt sig of time dums: 5.338308   df = 3

Var	Coef	Std. Error	T-Stat	P-Value
CONST	0.004493	0.012507	0.359229	0.719424
cr_{t-1}	0.883121	0.357557	2.469873	0.013516
lev	0.000076	0.000101	0.753783	0.450980
add	-0.000267	0.000249	-1.073508	0.283043
D96	0.018325	0.009512	1.926487	0.054044
D97	0.001717	0.008246	0.208273	0.835016
D98	-0.000252	0.006856	-0.036741	0.970691

Robust test for first-order serial correlation: -1.147 [15]
Robust test for second-order serial correlation: 0.648 [12]

The sign and magnitude of all the estimated parameters are consistent with the economic theory implications, although their degree of significance is not very high: the financial leverage (*lev*) is only significant at the level of confidence of 54%, the number of employees (*add*) is only significant at the level of confidence of 71%, while, on the other hand, the *dummy* for 1996 is significant at the level of confidence of 94%.

The data provide empirical evidence for the fact that the incidence of financial costs depends positively on the value of the leverage and negatively on the firm size. However, in our sample the latter effect is more than three times as strong as the effect of the leverage. As we said, this is probably due to the fact that the larger the firm size, the better diversified are its investments, and to the fact that larger firms might enjoy higher market power in the credit market. In addition, the weaker impact of the leverage is also very likely to be affected by the Italian regulations which establish relatively low limits in the remuneration of the own capital and states that the non distributed profits cannot be allocated to the co-operative promoters: since all these elements have contributed to determine a situation of relatively low financial risk, this suggests that there seems to be room for a financial strategy based on issuing negotiable bonds, and the need of raising external capital in the form of "shares" or "quasi-shares" might not be so stringent.

Next section deals with the possibility for co-operative firms to issue bonds in order to collect capital in the spot financial markets.

6. Bonds issue and cost of finance for the co-operative firms

The need for some large co-operatives in expansion to raise capital in the large and international financial markets has been the object of a lively debate for many years. Entering these markets as a borrower, constitutes a strategic element *per se* for many firms, and, in addition might activate (as shown by some theoretical[11] and empirical[12]

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[11] See in this regard Anderson (1994)

[12] See, for instance Pagano, Panetta and Zingales (1994).

contributions in finance) a sort of "virtuous circle" of information spreading that potentially enable the firms to reduce also the cost of bank credit[13].

For the Italian institutional context, some of the feasible financial strategies for co-operative firms have been analysed in Mazzoli (1998b) and in Mazzoli and Rocchi (1996). Both contributions, after pointing out that the special shares with multiple vote introduced in '92 in the Italian legislation do not seem to offer satisfactory incentives to external institutional investors because they are less convenient (in terms of negotiability and potential capital gains, associated with their variability) than stocks traded in the stock market, suggested a modification (which actually took place in 1998) in the Italian law of that time, in order to allow co-operative firms to issue negotiable bonds. The financial instrument suggested in these contributions for large co-operative firms in expansion were bonds indexed to some typical target of the management.

Among the various possible mechanisms of indexation, in section 3 we proposed a solution consistent with the *managerial economics* tradition of BMW (consisting of bonds with a remuneration indexed to some measure of the growth of the firm, like the rate of growth of the sales) and we referred to the parallel solution proposed by Waldmann and Smith (consisting of bonds with a remuneration linked to a measure of industry condition).

Both solutions could identify incentive-compatible financial contracts which would signal a credible commitment from the management to share (at least to some extent) with the external investors the results of their performances[14] and, at the same time, would give the co-operative promoters more guarantees on the allocation of the cash flow generated by the firm[15]. One could point out that issuing bonds might be

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[13] This happens because the negotiations that determine the security prices contribute to spread in the market all the existing information on firm risk and profitability, reducing in this way the banks'monitoring costs.

[14] The fact that in a co-operative firm some of the conventional incentive policies for the management (like the distribution of firm shares, in order to introduce capital gains in the management target function) are not feasible strengthens this point.

[15] In the Italian context this last point could even give the co-operative some slight

feasible and convenient only for those companies showing a relatively low financial leverage, but, on the other hand, the econometric estimates discussed in the previous section show that in our sample the effect of the financial leverage on the incidence of financial costs is three times as small as the effect of the firm size. This means that "there is room" for this kind of financial instrument, at least in those institutional contexts where the legislation puts some limits to the distributions of dividends, determining in this way a relatively high net worth for a large number of co-operative firms. In addition, the partly negative effect on the firm's gearing ration caused by issuing bonds could be mitigated by many possible financial policies: for instance, by allocating them among the traditional co-operative promoters and by introducing some clauses allowing, at the maturity date, bond holders to transform the bonds into call loans: this point is particularly relevant in the Italian context, since some of the Italian accountancy literature dealing with co-operative firms, tends to regard the call loans held by the co-operative promoters as internal funds.

In the next session we discuss about the actual feasibility of bonds issues for co-operative firms.

7. Which co-operatives could actually issue bonds?

We consider here a beg dataset, given by all the co-operative form Tuscany that are members of "Lega Nazionale delle Cooperative e Mutue". As shown in table 2, according to the data from[16], the net worth of the sum of all the co-operatives included in

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comparative advantage with respect to traditional corporations, since the Italian stock market is still characterized by a very small number of public companies and by a large number of companies with a very concentrated ownership, which does not always provides the small external investors strog guarantees against management discretionality. While this point would be completely irrelevant with perfect financial markets, it might still keep some relevance to the extent that the behaviour of financial investors is characterized by some degree of "home bias".

[16] The actual number of co-operatives members of "Lega Nazionale delle Cooperative e

the sample amounted to over 2,600 billions lira in 1998. This value had increased by 10.6% with respect to the previous year and by 28. 2% with respect to 1996.

Table 2 Data on Tuscanian co-operatives members of "Lega Nazionale delle Cooperative e Mutue", 1996 - 1998

Year	1996	1997	1998
Number of Co-operatives	882	894	895
Associates	1,177,304	1,253,222	1,354,716
Employees	24,674	27,383	29,194
Sales	6.490.733.448.627	7.443.190.740.385	8.116.295.909.687
Share Capital	183.905.859.396	219.005.627.365	244.436.956.873
Net worth	2.030.501.769.796	2.352.069.608.325	2.602.481.957.005
Value added	1.255.425.426.780	1.372.068.250.551	1.528.005.561.214
Loans form associates	4.131.431.210.667	4.878.392.896.109	5.496.657.334.971
No.of associates holding call loans with their co-operatives	269.262	312.784	337.810
No, of Co-operative with call loans form associates	131	133	132

Sourcee: Centrale Bilanci Legacoop Toscana, 1999

As shown in graphic 1, the co-operatives with net worth larger than 5 billion lira only constitute about 4% of the sample, while the sum of their net worth amounts to almost 84% of the sum of the net worth of all the companies in the sample.

Mutue" in 1998 was over 930, while the table reports a lower number. This is due to the fact that not all the balance sheets and profit and losses accounts for these firms were available at that date. However the data reported in the table may be regarded as highly representative.

Graphic n.1 Percentage of cooperatives by classes of own capital, 1998.
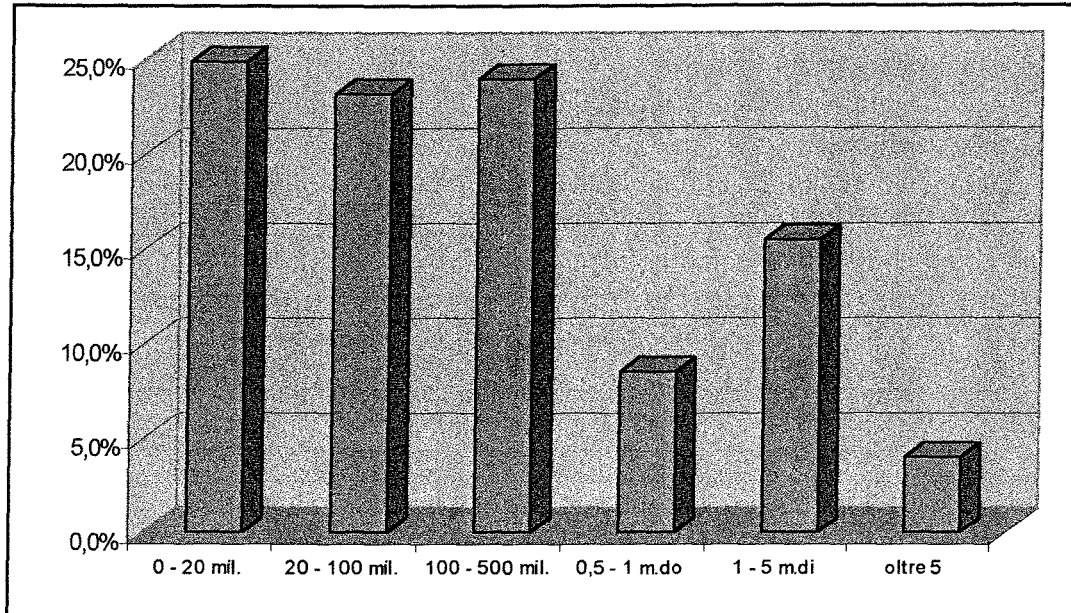
A net worth of 5 billions lira might be regarded as an interesting reference point, since a study by Bulgarelli (1999) has estimated that the costs of issuing bonds in the spot financial markets (which include rating, advertising, administrative, legal and auditing costs) would amount to approximately 500 millions lira. Since they are mainly fixed costs, they would represent 10% of the value of an issue of bonds for 5 billion Italian lira. However the data we have just commented reflect a situation characterised by a large number of small sized firms with low net worth and a small group of co-operative with high net worth: the ones potentially interested in issuing negotiable financial instruments. Within the second group, if we exclude three large consumption co-operatives, none of the remaining has a net worth reaching 100 billion liras, and among them there are significant differences in cash-flow and cash-flow seasonality. For instance, we have co-operatives operating in the building construction industry (characterised by a long time interval between output production and revenues cashing), and other firms operating in industries with much shorter time interval between output

delivery and payment. The financial leverage of most of these co-operatives reveals a situation of low risk and their sales has grown in the recent years at a yearly rate higher that 10%: this shows a significant expansionary trend for the whole sector, confirmed by the data on the employees for most of these firms. In addition, the situation of low risk implied by the value of their leverage suggest that there seems to be room for a financial strategy based on issuing negotiable debt.

In order to cover the fixed cost of issuing bonds, medium sized co-operatives could create some form of coalition, that might distribute the above-mentioned fixed costs among the participants and allocate part of the bonds among the social environment of co-operative promoters. or among other partner co-operatives that might enjoy a lower degree of information asymmetry.

8. Concluding remarks

The purpose of this paper was to deal with negotiable financial instruments that may be issued by co-operatives, without modifying the very peculiar property right structure that characterises this kind of firms and, at the same time, satisfying some elementary requisites of incentive-compatibility. In this regard, we based our analysis, at least in spirit, on Ben-Ner [1993] contribution.

Our paper also contains an econometric analysis based on a sample of producers co-operative with homogeneous features and localised in the same industrial district (Tuscanian producers co-operatives operating in the metal and mechanic industry). The empirical results show that the firm size affects the incidence of financial costs on the firm budget much more significantly than the financial leverage. This result (probably also determined by the Italian law that makes unavailable to the co-operative promoters the non distributed profits) suggests that financial leverage does not seem to impose a stringent constraint for the co-operatives of our sample and there seems to be room for a financial strategy based on the expansion of negotiable debt. A possible example of this kind of strategy is issuing bonds with a remuneration indexed to a managerial target.

The theoretical survey contained in this paper suggests, on the other hand, that the few comparative advantages that co-operative firms might enjoy with respect to conventional capitalistic firms lie in their participatory nature and in its positive impact on the internal flow of information. In this regard our analysis suggests that any project of law (like the one presented in Italy by "Commissione Mirone") meant to extend the feasibility of multiple votes shares for co-operatives (an exception to the principle "one-head-one-vote") is not advisable, since these kinds of financial instrument, by potentially creating controlling groups inside the firm, might remove any possible comparative advantage associated to the participatory nature of the co-operative firms, their property right structure and incentive mechanisms.

On the other hand, negotiable bonds with interest rate indexed to some kind of typical management targets would not modify in any way the property right structure of the co-operative firms and, at the same time, could guarantee a potentially satisfactory remuneration to external financial investors. Issuing bonds is immediately feasible for large co-operatives in expansions (i.e. for those subjects who are more interested in raising capital on institutional "spot" financial markets) and could become potentially feasible to coalitions of medium-sized co-operatives.

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APPENDIX

The econometric anlysis of section 5 is based on data from the balance sheets from "Centrale Bilanci" of "Lega Nazionale delle Cooperative e Mutue" of Tuscany. The data include all the production co-operatives operating in the metal and mechanical industry from Tuscany which are members of the "Lega Nazionale delle Cooperative e Mutue" and for which al least three years of continuous and homogeneous observations are available.

The comments contained in section 8 are based on the data referred to all the co-operatives of all industries from Tuscany which are members of the "Lega Nazionale delle Cooperative e Mutue". In this case too the data are based on the balance sheets from "Centrale Bilanci" of "Lega Nazionale delle Cooperative e Mutue" of Tuscany.

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