

Collective accumulation of capital in Italian worker cooperatives: an empirical investigation on employment stability and income smoothing.

Cecilia Navarra¹

To be presented at AISSEC XVII Conference on "Growth and Development Patterns: the Role of Institutions in a Comparative Perspective", Perugia, Italy, June 2009

Introduction.

A distinguishing feature of Italian worker cooperatives is that members, though owners of the firm, cannot be seen as residual claimants: the distribution of profits on the basis of capital stakes is limited by law; cumulated reserves cannot be shared among members even at the end of the life of the cooperative; the practice of *ristorno* (distribution of part of the net residual to members on the basis of the work relationship) is weakly applied; most of profits are accumulated into indivisible reserves (from this point onwards IR), a completely collective fund, non divisible and non appropriable by individual members: this means that most of profits aren't privately appropriated. This huge reinvestment of profits into IR is the focus of this work.

What is striking from the economist's perspective is that huge accumulation in an indivisible and non-appropriable pool seems to violate the need for a proper incentive scheme, both concerning work effort and investment. On the one hand, theory tells us that a potential problem of moral hazard exists, since the absence of residual claimancy implies the independence of work remuneration from the outcome of production; moreover, a wide literature exists on the positive relationship between profit sharing practices and productivity (e.g. Fitzroy and Kraft 1986, Kruse 1992), both in cooperative and capitalistic firms. On the other hand, there is the well-known Furubotn-Pejovich effect (Furubotn and Pejovich 1970), that is the risk of underinvestment by worker members because of their truncated time horizon within the firm (they cannot appropriate the returns of the investment beyond their employment time horizon). Moreover, it's an interesting phenomenon from the point of view of the theory on the ownership of the enterprise. One of the main approaches within the new-institutional framework (Grossman and Hart 1986, Hart and Moore 1990), indeed, defines the owner of the firm as the individual who has the residual right of control (the right to take decisions over situations not defined *ex ante*); this definition implies that the owner has to be the one who appropriates the residual (and non predicted) benefits of the firm too².

I therefore inquire whether a different aim lays behind this behaviour, that is different from profit-maximization and from the provision of high-powered incentives to members, and is instead a safety-oriented concern.

I investigate this topic by means of empirical analysis carried out in the workers' cooperatives associated with the Lega delle Cooperative e Mutue in the province of Ravenna (Italy). My methodology consists in matching three sources of data: balance-sheets quantitative data at the firm level; qualitative interviews of the cooperative board members; a survey by means of questionnaires to a sample of workers.

In most literature, it's widely recognized that cooperatives protect employment stability by making wages fluctuate. In this work, I propose a possible alternative pattern of employment protection, that involves indivisible reserves as key element: worker members may choose to earn lower

¹ EURICSE (European Research Institute on Cooperative and Social Enterprise), Università di Trento, and Dipartimento di Economia "Cognetti de Martiis", Università di Torino. Contact: cecilia.navarra@unito.it.

² The theoretical foundation of this approach is the Incomplete Contract literature (Hart and Moore 1998).

wages (that is to “tax” themselves in each period), in order to accumulate in a collective pool, that allows to face downturns without making wages fluctuate. This income-smoothing device is built up through indivisible reserves, that work as a risk-sharing device.

There is a wide literature that recognizes a (local) public good component in the objective function of worker cooperatives, that is not a mere by-product of the productive activity. This local public good is often interpreted as the satisfaction of workers’ objectives: in the words of Gui (1994), while in capitalist firms

“the satisfaction of workers’ objectives is an indirect and unintended result, mediated by an imperfect labour market, worker managed firms adopt workers’ objectives as their own objectives.” (Gui 1994, p. 176).

Employment stability and risk-sharing can be seen as part of this bundle of local public goods. The idea that part of the firm’s activity is devoted to the production of collective goods can be seen as a distributive function of the firm (Putterman 1986) different from wage setting and profit-sharing mechanism.

In the first section, I will provide some background elements: the legal framework that rules profit allocation in Italian worker cooperatives and a brief review of the empirical literature on capital accumulation, a criticism to the main arguments usually put forward to explain the huge reinvestment of profits into IR, and a presentation of the case study. I will then introduce my insurance argument in a theoretical perspective. The third section will be devoted to an illustration of the empirical evidence concerning the employment-insurance-*cum*-income-smoothing issue, both using firm level data and individual survey data. I will finally sum up my conclusions in the fourth section.

The context and the case study.

Collective accumulation of capital in Italian worker cooperatives: legal framework and empirical evidence.

The possible destinations of cooperative profits are widely constrained by the law, starting by the limits set by the definition of the so-called *clausola mutualistica* by the *Legge Basevi* (law 1577/1947), that identifies the cooperatives that belong to those *non-lucrative* enterprises that the Italian Fundamental Law protects. These constraints are: a limit to the remuneration of capital stakes, the impossibility to share out the reserves among members during the social life, the allocation of the firm’s patrimony at the end of its life to social purposes, that means that this patrimony is not appropriable by the members even at the end of the life of the cooperative. The cooperatives that respect these constraints are regulated by a peculiar fiscal regime, that I will later analyse.

The regulation of the cooperative firm has changed within the reform of the law on companies (d.lg. 6/2003), whose main innovation is to distinguish the cooperatives *a mutualità prevalente*, that is those coops that mainly deal with members, from the cooperatives that carry out their activities essentially with non members. In the case of worker cooperatives, this means that those to be considered part of the first class are coops where at least the half of the total labour costs are due to the labour activity of worker members. The cooperatives *a mutualità prevalente* have to respect some constraints very similar to what stated by the 1947 law and they can benefit from fiscal advantages³.

On what concerns the destination of net annual profits, the most recent law (that integrates several previous rules) states that 3% of them must be devoted to national solidarity funds, managed by the cooperative federations, in order to promote the cooperative movement; 30% of net profits has

³ I concentrate on these because the most of the cooperatives of my case study belong to this class. Nevertheless, it’s difficult to have a sharp indication on the number of cooperatives that belong to each class, because the coops can pass from the one to the other following a particular accounting procedure. Namely, a cooperative “looses” the label of *prevalente* if it doesn’t comply with the established criteria for two consecutive years.

to be allocated to legal reserves⁴, that isn't only non-available for members, but it's also indivisible -still at the end of the cooperative life- that makes this reserve different from the analogous legal reserve of the capitalistic firm. Cooperatives can distribute dividends on the capital stakes only if the owned capital/debt ratio is greater than $\frac{1}{4}$, and however these dividends cannot be greater than the rate on postal bonds plus 2,5 points.

Net revenues in excess on that paid into solidarity funds and into legal reserves may be distributed to members⁵ in proportion to their work within the coop (*ristorno*): since the law on the position of worker members (l. 142/2001), it is possible to provide extra labour remuneration while distributing the net profits of the year also by increase of capital quotas⁶ and issuing of shares, in order to favour the capitalization of the firm, while providing extra incentives to the members. This innovation thus gives the possibility to worker cooperatives to keep the *ristorno* inside the firm as increase of capital stakes, with no fiscal pressure but on the individual member at the moment of the withdrawal. Moreover, the 2003 reform allows the possibility of introducing divisible reserves, but only for "financial members"⁷: the aim is that these peculiar category of members, that have only financial stakes in the cooperative, may use a part of the reserves in order to increase the value of their financial tools. It's widely recognized (Bonfante 2008, Zevi 2005) that these tools have a very limited application: they are not often used in order to attract external capital as they were supposed to do, but they are usually held by the worker members themselves, or by the retired members.

One of the conclusion we can draw from this picture of the legal framework is the following: if we can say that, until some years ago, indivisible reserves were the only means that the cooperative had in order to accumulate capital, this nowadays has to be mitigated, because of the new tools of a "divisible" way to accumulate, that recent laws allowed.

Nevertheless, there is evidence that Italian worker cooperatives reinvest a huge amount of yearly profits into indivisible reserves: besides the data on my case study that I will soon present, a study of the Centro Studi Legacoop (2006) shows that, in worker cooperatives, on average, 86,8% of net profits is reinvested in the firm and 10,2% is distributed to members (both as profit sharing on the basis of the work done and on the basis of capital stakes).

Zevi (2003) underlines that the cooperatives generally choose to reinvest profits in order to reinforce its patrimony and to invest in the increase in size of the firm (the same is highlighted by Bassi 2003).

The effect of IR accumulation on firm productivity is a controversial issue. First of all, it has to be noted that empirical studies don't identify a lower productivity in worker cooperatives if compared to capitalistic firms (or KMFs, capital-managed firms). On the Italian case, the works by Estrin (1991) and Bartlett et al. (1992) on a matched sample of cooperatives and KMFs in the manufacturing and construction sectors in Toscana and Emilia Romagna, show an upward shift of the production function in worker cooperatives, due to a higher labour productivity, that more than compensate the lower capitalization with respect to KMF. Jones and Svejnar (1985) inquire the determinants of productivity in cooperatives and find out a positive effect of profit sharing and a negative (or not significant) effect of collectively owned reserves. In my opinion it would be interesting to investigate whether there might be an endogeneity problem in this conclusion and the relationship might turn the other way round, that is to say that low performing firms choose to accumulate, rather than distributing, in order to reinforce their stability. On the other hand, if distribution of profits to members has an unambiguous positive effect on productivity, it makes even more interesting the

⁴ Before the reform, the margin of legal reserve was 20%.

⁵ Within the limitation of 30% of the salary (law 142/2001).

⁶ Since 1992 it was possible to use part of net profits to reevaluate individual capital quotas within the limit of the increase in the price level.

⁷ These are *soci sovventori* and those members who own *azioni di partecipazione cooperative*, two peculiar membership typologies introduced by the law 59/1992, with the aim of widening the financing tools of the cooperative enterprise: the first is a transferable bond with some advantageous economic treatment and re-evaluation in case of ceasing coop's activity; the second is again a bond with advantages from the point of view of the economic return, but without voting rights.

issue of understanding why it seems to be so weakly applied in Italian worker cooperatives⁸. Tortia (2002a) conducted a survey on the opinion of cooperative board members on profit distribution: he again found out that the *ristorno* finds little application because it takes away resources from the capitalization of the firm. The core of his survey, still, is to collect the opinions on the possibility to keep the net profits distributed inside the firm until the member leaves (the innovation introduced by the 142/2001 law). Generally the opinion expressed by the coop board members is positive in principle, but they underline three main problems with it: the increased variability of capital (that means insecurity of the possibility to invest), the decreasing of loss sharing, and the risk that members free ride on the investment of their share of profits into the firm (this seems to be highly correlated with the firm's size).

Before introducing the case study, it is worth summarizing the main conclusion we can draw from this picture. Usually, upon leaving the firm, a member gets back his capital stake, re-evaluated on the basis of the inflation rate, and increased of the dividends the coop may have decided (but is not obliged) to distribute, that are however limited by the law. Apart from the cases where coops apply the possibility to distribute *ristorni* as increments of capital stakes, what the member receives is independent from the flow of earnings of the coop. The limited application of profit sharing implies that there is little difference between the overall pay of members and the non-members' one (see also Tortia 2002b, Zevi 2005, Pencavel et al. 2006).

The Lega delle Cooperative e Mutue of Ravenna.

The worker cooperative movement in Romagna begins at the end of the 19th century with the first cooperatives of day landworkers that emerged from the need to hinder the spread of agrarian unemployment and the consequent pressure to lower wages, that was exploited by the intermediaries in public works (Zangheri, Galasso, Castronovo 1987)⁹. As some authors of that time underline, the birth of agrarian cooperatives has been a big step towards the spread of entrepreneurship in the popular classes, while it hadn't been the case with the diffusion of sharecropping together with fixed day-wages contracts (Guzzini 1925).

At the beginning of 20th century, it's the turn of construction cooperatives, that aim to break up with the monopolistic market of construction that manage to hire unskilled workers at extremely low wages (Landi 1999): at the beginning those cooperatives worked as "self-managed employment agencies", their main purpose was to guarantee a job to everybody.

Thus, the cooperative movement developed first in sectors characterized by high unemployment, agriculture and construction. In the early '50s, in the construction cooperatives begins the debate on the opportunity to reduce the attention devoted to employment and increase the stress on efficiency parameters and benefits to the members (this is evident in the debate within the biggest construction coop, the CMC, cited in Sapelli and Zan 1971); at the same time, in agriculture the attention paid to employment remains high, also because in 1951 in the region still 60% of active labour force is employed in agriculture, and moreover it's still unsolved the issue of the high seasonality of labour (Nardi 1998).

The growth of the cooperative movement in the province of Ravenna and in the whole region of Emilia Romagna is closely linked to the support given by the local administration that since the beginning of XX century proposed a local development strategy, based on the idea of "communalism", that is the promotion of the local dimension as main ground for political and productive association of workers (Sapelli 1986, Menzani 2007). After World War II, at the time of the great boost of Italian economy, the regional strategy has been to promote a model of economic

⁸ Here, we consider profit sharing to be represented by the amount of *ristorno* distributed, but this is not the same indicator as used by Jones and Svejnar (1985), that adopt as a proxy the whole amount of profits divided by the number of workers.

⁹ In 1883 the *Associazione Generale dei Braccianti di Ravenna* was found: it enabled the day-worker of the area of Ravenna to avoid the intermediation that was heavily lowering the wages, by taking directly in charge the works, mainly the public ones; the most famous case had been the reclamation of the marshy area of *Agro Romano*, close to Rome. It was 1884 and the President of the cooperative was Nullo Baldini.

development “without social fracture”, and therefore based on the development of small and medium enterprises, of network effects, of citizens’ association, and of cooperatives.

Since the ‘60s new tendencies arise: on one side, a certain degree of de-ideologization of the cooperative movement in its two main branches, the one of socialist and communist (LegaCoop), and the one of catholic inspiration (Confcooperative), and –to some extent- a departure from the close link with the territory, in order to grow in size and to project on a nation-wide market (and, in some cases, at the international level).

My case study is concentrated on the worker cooperatives affiliated to the LegaCoop, whose picture today is quite articulated. The oldest cooperatives are in the agriculture and construction sectors: given the sharp reduction of the weight of agriculture in the Italian and local economy, the number of agricultural coops declined, mainly by mergers among them. The other worker cooperatives, in manufacturing and service sectors, born in the second half of 20th century. In the former, it was often the case of buy-ups of capitalist enterprises that were facing difficulties, while in the latter the picture is more varied: porters’ cooperatives generally started around the ‘70s, to give a structure to previously existing informal groups, but there are also many newly born small cooperatives, mainly in advanced services, tourism and culture.

The cooperative enterprises in the Province of Ravenna are nowadays 447 (including also *sooperative di supporto*, consumers’ cooperatives and *cooperative sociali*), around 11% of the companies registered in the Province, and hire 15% of local labour force, producing 9,5% of total value added (2004 data). In December 2005, the Lega gathers 172 cooperatives, 63 of which are worker coops, that are 36 in the Ravenna area and the others in the surrounding municipalities (9 in Lugo, 10 in Faenza and 8 in Cervia).

The sample and the data.

The case study has been carried by the author in 2007 at the Lega delle Cooperative di Ravenna and inside 20 of the affiliated worker cooperatives.

I don’t consider, in my sample, the *cooperative sociali*, even when they can be considered as worker managed firms, because of homogeneity reasons, mainly in their historical trajectory.

The sources of data are the following:

- 6 consecutive years balance sheet data on the 60 worker cooperatives are members of the provincial Lega from 2000 to 2005¹⁰. This forms a panel dataset at the firm level with N=60 and T=6.
- Qualitative interviews with board members of 20 out of the 60 worker cooperatives.
- Survey data at the individual level carried through questionnaires submitted to workers, both members and non members, in the same 20 cooperatives where I interviewed the board members (415 collected questionnaires).

The 60 cooperatives that compose the panel dataset are divided by sector as follows: 12 in agriculture, 4 in construction, 3 in manufacturing, 9 in transport, 11 in porters’ sector, and 21 in other services. See the appendix (Table 1) for an overview on the descriptive statistics.

The analysed sample provides data on profit distribution and accumulation that are consistent with the evidence shown in the literature I reviewed, that is a strong tendency to accumulate, even a bit greater than in the sample of the Centro Studi Legacoop study (Centro Studi LegaCoop 2006): the average share of yearly profits accumulated into IR is 87,98% (for the share of profits allocated to IR by sector, see Table 8 column (e) in the Appendix). We have also to remark that more than 60% of my observations reinvest between 90% and 100% of profits into the indivisible fund.

The qualitative survey has been carried between September and December 2007 in 20 worker cooperatives out of the previous 60, and has been composed by two phases: a non-structured interview with the president (or vice-president), and an individual questionnaire submitted to workers (both members and non-members). The questionnaire covers 3 sections: individual working and associative trajectory, perceived role of the cooperative and worker’s protection,

¹⁰ I included all the worker cooperatives affiliated to the Lega that has been active between 2000 and 2005, even if they are not active today, while I eliminated those with highly incomplete data.

income distribution and reserves indivisibility. On average, around 30% of the workforce of each firm has been subjected to the anonymous questionnaire.

The collected questionnaires are 415, actually from 18 of the 20 selected firms¹¹. The sector repartition is the following: 87 questionnaires form agriculture, 95 form construction, 52 from manufacturing, 52 also from porters', and 129 form other services.

Around 80% of my sample are worker-members, while 20% are employees; 40% are women; 66% are blue collar.

A critical assessment of the main arguments on indivisible reserves.

One of these arguments is that indivisible reserves are the only way for a cooperative to accumulate capital. While discussing the legal framework of this work, I already argued this is certainly true from an historical perspective and may apply nowadays too, but shall not be considered an exhaustive argument, since other ways to accumulate have been introduced by recent laws.

Two other explanations of the phenomenon are the following.

An usual argument to explain the tendency in Italian cooperatives towards the accumulation in IR is the advantages from the point of view of corporate income tax. The advantageous tax system comes from the idea that the State has to support the worker managed enterprises when they are actually not oriented to profit making, as capitalistic companies are. The non distribution of profits, that are not appropriable by members and not even divisible upon firm dissolution, is interpreted as a sign of this characteristic.

The tax regime of indivisible reserves has nevertheless changed in last years, and this allows me to test whether this change has an impact on cooperatives' behaviour.

I briefly sketch the evolution of the taxation on IR.

Until the financial year 2001 (included) the matter was regulated by the law 904/1977 art.12 that states the non taxation of the whole amount of profits allocated to indivisible and non-appropriable reserves. The first change happens with the law 112/2002 art.6 that decreases the tax free share of profits to 20% that is mandatory to legal reserve , 3% allocated to the solidarity fund, plus 39% of the residual profit. This norm has been applied for the financial years 2002 and 2003 ad has been a huge reduction of the fiscal benefit of cooperatives. The share of profits that the firm is free to allocate and that can be free from corporate income tax if allocated to IR, thus declined from 77% to around 30% (given that 23% is tax free by law because it's constrained to compulsory destinations).

A further reform has been carried out by the law 311/2004 , that distinguishes the case of cooperatives *a mutualità prevalente* from the others: in the first case, that is the most frequent in my case study, the law states that are tax free the shares of profits allocated to the legal reserve (in the meantime increased to the 30% of total profits) and to the solidarity fund (3%); it's taxed, on the contrary, 30% of annual profits, regardless to its allocation; of the remaining 37%, what goes to IR is not taxed. Therefore, now the share of profits that the cooperative is free to allocate and that can be tax free if reinvested into IR is 37%, but with an increase of the tax-free legal reserve (30%+3% solidarity fund)¹².

The fiscal advantage in allocating profits to IR sharply declined. Did the share of profits actually allocated to IR followed?

If I split mi observation following the different tax regimes, I see that the average share of profits allocated to IR is 84,4% in the first, 88,3% in the second, and 86,5% in the third. At first glance, we don't see a decrease in the accumulation into indivisible reserves, and this is confirmed if we perform a t test on the difference of means between the fist group and the two others, that is before and after the huge decrease in fiscal advantages for IR.

¹¹ The discrepancy is due to the fact that 2 cooperatives didn't give back the questionnaires they received.

¹² On what concerns the coops that do not observe the parameters of *mutualità prevalente*, the exemption is limited to the share that goes to the solidarity fund at to the legal reserve if it is declared to be indivisible.

In the test H_0 : mean of $IR_{new} = \text{mean of } IR_{old}$ against H_1 : mean of $IR_{new} < \text{mean of } IR_{old}$, I cannot reject H_0 , that is that there is no significant difference among the two subsamples, so that I can rule out the explanation by the tax benefits, at least as a major factor of accumulation into IR. This seems to be reinforced by the interviews with board members of coops, who only in a single case over 20 stated the importance of the tax exemption to explain their profit allocation.

A second usual argument to explain the huge reinvestment of profits into the cooperative is their difficult access to the credit market, mainly caused by the agency costs of debt, theorized by Jensen and Meckling (1976), that is the monitoring problem faced by the lender, given that he has no control rights on the financed project. A strong opponent to this view is Jossa (2005), who claims that –if we compare a worker cooperative with a joint stock company and not with a classical capitalist firm- there is no reason to think that the coop will be less efficient than the KMF in getting credit on the market because market loans are paid before labour income and members' capital at a certain remuneration, instead of a residual one.

Moreover, reinvestment through a common fund is anyway expected to be limited, because workers should lack incentives to reinvest profits in the firm if these are allocated to a common fund, that doesn't benefit only to those by whom it was created, but also to future generations (Meade1993).

A famous argument on this topic is the one formulated by Furubotn and Pejovich (1970), and used again by Jensen and Meckling (1979), who maintain that workers lack incentives to invest in the firm because they have a truncated time horizon, that is their employment perspective in the firm: they therefore appraise investments with respect to their employment in the cooperative, that means that they maximise near term net cash flows, while they will not take those project whose payoffs occur far in the future. One possible solution to overcome this "horizon problem" is the application of the possibility to distribute profit shares by increasing capital stakes and therefore by introducing a prelude to divisible reserves (Tortia 2007), but this opportunity is seldom applied, and, when it is, it's mainly in big and performing cooperatives, that face comparatively less difficulties in finding capital on the credit market.

The fact that financing depends on workers is indeed a problem for cooperatives' access to capital, but, looking at my case study, it seems that they aren't in need for financial instruments as it's claimed in the literature. First of all, not all the cooperatives have little access to credit market: some of them, usually the most performing and long-lasting ones, have a good reputation enough to have the access to loans they need¹³; often, this is a consequence of the solidity of their self-financed patrimony itself. It may be the case that small cooperatives too are able to effectively access to bank loans, thanks to a strong reputation, when they are "old", or thanks to the guarantee provided by the Lega itself, through its financial institutions¹⁴.

In other cases, even if the access to credit market is feasible, cooperatives choose anyway not to turn to it even for extra-ordinary financing, in downturns or to finance extra investments; they use the tool of "social loan", that is a loan by members, that is remunerated at a little higher rate than on the market.

Moreover, the financial tools that are introduced in 1992 to induce the creation of "financial members" (as similar as possible to simple investors), aren't applied as much as it was expected (see also Bonfante 2008), and, when they are, they are often used to keep the members inside the cooperative even after the end of their employment relationship, as "retired members".

Employment insurance and income smoothing in worker cooperatives: theoretical framework.

Employment stability and the insurance function of cooperatives.

¹³ Source: author's interviews on the field.

¹⁴ Source: author's interviews on the field.

“Explanations for systematic differences between KMFs and LMFs¹⁵ must be grounded upon the asymmetric characteristics of capital and labour as inputs. Perhaps the most fundamental asymmetry of this sort is that ownership of physical assets can be shifted from one person to another while the capacity to supply labour services cannot be. In short, the capacity to supply labour is inalienable, both in a physical sense and also institutionally [...]”.

(G. Dow 2003, p. 11)

Following Gregory Dow, the main difference between worker cooperatives and KMF consists in the asymmetries between labour and capital: labour is “non-alienable” to the person who carries it, that means that it cannot be transferred from one person to another, cannot be in more than one place at a time, has natural bounds, etc. As a consequence of non-alienability, labour suppliers cannot differentiate risk as capital owners can do: capital owners, indeed, can spread risk by differentiating the concerns where to invest, while workers cannot (Meade 1972)¹⁶. Moreover, as Drèze (1976) claims, the risk embodied in human capital is greater than the one embodied in physical capital, that can be transferred simply by outright sale.

The idea that the relationship between the firm and the worker implies an insurance component is grounded in the work of Frank Knight (1921), who argued that workers’ risk aversion is the reason why they lack proper incentives to be managers and why they ask to be insured by the firm. More recently, another argument to explain workers’ need for insurance has been put forward by Bardhan (2005): workers are seldom managers, because it’s reasonable to think that they are less wealthy than capital owners, that leads to a lower risk-bearing capacity.

Moreover, as Meade again points out, worker in cooperatives risk “all their eggs in one basket”, bearing at the same time the financial risk and the employment risk of the same project. Dow (2003) criticizes the widespread idea that the need for risk differentiation can explain the rarity of labour managed firms, but he argues for the possibility that LMF can be itself a form of insurance against the possibility that investors take decisions against workers’ interests (such as layoffs). Moreover, the capitalistic firm may produce an information-related inefficiency, that is the risk of opportunistic behaviour of investors: it’s difficult for them to credibly commit not to fire workers, not to deliver a lower wage than promised, etc. This is considered to be the main reason of the observed higher productivity of labour in LMFs. Going back to our argument, Dow underlines that, indeed, “the way in which risks are divided among input suppliers is highly dependent on the firm’s governance structure” (Dow, 2003, p. 217).

The insurance function of the firm that enters in a long-lasting relationship with its worker is similar to the well-known Japanese firm (Coriat 1991), that can exploit what Aoki (1980) calls the “organizational rent”, the economic gain of the fact that employees- that are in quasi-permanent association with the organization- cooperate with physical capital into an organization (instead of being bought on the market).

The possibility that different patterns of employment and payment system may exist is largely present in the literature: Nuti (1993) identifies the three main features of the “normal” wage employment contracts (fixed wage rate, subjection to the employer’s authority in the workplace, and exposure to unemployment risk), and the corresponding possible alternatives: profit sharing, worker participation in decisions and job security, that are the features of worker cooperatives. I’m now concerned in employment stability, and I inquire whether profit sharing is –as it is often assumed- its reverse of the medal.

It exists a huge literature that highlights the empirical evidence of the greater employment stability in cooperatives with respect to KMF: the most famous one is the work by Craig and Pencavel (1992), that compares worker cooperatives and KMF in the plywood sector in US and identifies a lower volatility of employment in cooperatives, by comparing years of industry expansion and years

¹⁵ Labour managed firms.

¹⁶ “While property owners can spread their risks by putting small bits of their property into a large number of concerns, a worker cannot easily put small bits of his effort into a large number of different jobs. This presumably is a main reason why we find risk-bearing capital hiring labour rather than risk-bearing labour hiring capital.” (Meade, 1972, p.426)

of downturn; moreover, there appears to be a strong difference in behaviour of the two kinds of firm facing changes in output price: in KMF, these produce changes in employment and hours worked, but not in wages, while, in worker cooperatives, employment and hours are stable and wages fluctuate.

Bradley and Gelb (1983), who deeply analyse the case of the cooperative group of Mondragon in the Basque Country, in Spain, argue that it is generally accepted that adjustments to market changes will not be through variations in employment; transfer between coops is usual and, moreover, the cooperative guarantees 80% of wage if unavoidable layoff occurs, that means that the firm's cost of firing is very high.

Concerning the Italian case, I already mentioned the results of the analysis of a matched sample of worker cooperatives and KMF (Estrin 1991, Bartlett et al 1992), that find out a greater stability of employment in the former, and the more recent Pencavel and co-authors' paper (2006), that finds out that, while in KMF employment is a negative function of wages, in cooperatives it is generally insensitive to any variable. Moreover, we know from the historical literature that the worker cooperative movement (and mainly that part that belonged to the Lega) was born and was driven for a long time by the priority to guarantee jobs to the weakest classes of the economic Italian structure (Mazzoli 2005). This is namely true in the case of Ravenna cooperative movement (Sapelli and Zan 1971, Zavattoni, 1976, Nardi 1998). An interesting study has been carried out in the '80s in Emilia Romagna by an anthropologist, Mark Holmstrom (1985): the insight he provides on worker cooperatives is that cooperatives indeed maximise security and employment rather than members' income; he too underlines the historical evidence that cooperatives were set up to create and save jobs: this, nowadays, still induces cooperatives to move people from one firm to another, instead of firing them, and also to promote mergers between coops in order to save jobs. The main conclusion of the work by Holmström is therefore that, in decisions within the worker cooperatives he observed, security concern matters more than profit making.

I therefore formulate the hypothesis that the aim of worker members is to minimize the risk to loose their jobs. The question that arises is "how" this employment concern enters in the behaviour of the cooperative and how the observed greater stability of employment is obtained.

Two possible mechanisms at work.

I thus inquire if cooperatives use profit-sharing practices, that are assumed to reduce downward fluctuations of employment in hard times by quick adjustments in labour remuneration (Kruse 1991, for a review Jones, Kato, Pliskin 1994), or if they rather use some income smoothing with fixed employment device. Summarizing, the two mechanisms that I assume to be potentially at work are the following: on the one hand, what I call "reversed implicit contract", where the cooperative reduces the risk of employment fluctuation by increasing the risk of wage fluctuation; on the other hand, a sort of "risk-pooling network", where coop members "tax" themselves in each period, by accumulating into indivisible reserves, in order to face downturns by means of this common pool (that is, without firing, but also without reducing wages- if not in extreme situations).

To illustrate the first approach, I use the theoretical background of the "implicit contract" literature (Baily 1974, Azariadis 1975, Azariadis and Stiglitz 1983): this starts by the observation that wages fluctuate less than marginal productivity of labour and that, more specifically, business cycles are more likely to produce changes in employment rather than fluctuations in wages. The interpretation these authors give to the phenomenon is that labour contracts involve an insurance component between a risk-neutral firm and a risk-averse worker, that guarantees to the latter the wage to be more stable than the marginal productivity of labour. The firm is thought as to be composed by 3 departments (Azariadis and Stiglitz 1983): the production department, the workers provide their working services to, the accounting department that pays wages, and the insurance department, that provides insurance to workers. Where the marginal productivity (P') is low, insurance is positive and makes wages exceed P' , while, when the P' is high, insurance is negative and the firm pays a wage lower than P' . Baily (1974), in fact, proofs that it's profitable to the firm to adopt an asymmetric strategy toward wages and employment, that is to pay a preannounced non-stochastic wage, but to be free to change the size of the employed workforce.

We can argue that the opposite happens in worker cooperatives.

Meade (1993) claims that the worker cooperative is able to modify the risk structure faced by workers: by allowing for greater fluctuations of wages, it may be able to prevent workers from the risk of unemployment. If it is widely accepted that the capitalist firm relies –among other factors- on the reduced capacity of workers to bear the entrepreneur’s risk with respect to capital owners, it is also true that this makes the workers bear the risk of being fired in case of a decrease in production. Meade claims that the cooperative too implies an insurance contract among the firm and the workers, but here it aims to stabilize employment¹⁷. Another study that goes in the same direction is the one by Miceli and Minkler (1995): their main claim is that worker cooperatives are not necessarily worse than KMF in insurance provision to workers. On one side workers are residual claimants and therefore there is no agent that is able to specialize in risk-bearing and to play the role of the firm in the implicit contract literature; this produces some revenue uncertainty. On the other hand, in KMF, what they call “transfer uncertainty” exists, that is the risk that the capitalist owner decides to delocalize capital where labour costs are lower (in order to favour capital asset specificity), that would produce layoffs in the workforce. The worker cooperative increases the former kind of uncertainty, but widely reduces the latter.

On what concerns the empirical evidence, I have already mentioned the study by Craig and Pencavel (1992), that detects a greater effect of product price on wage fluctuations, rather than on employment in their sample of plywood cooperatives; more important for us is the study by Pencavel et al (2006) on Italian cooperatives and KMF, that finds evidence of greater volatility of wages and higher stability of employment in cooperatives rather than in KMF.

While the previous hypothesis seems to have quite a wide background literature, I think that, at least in the Italian case, it has some limitations: first of all, as we have seen, Italian worker members are not to be considered as full residual claimants, while in the Miceli and Minkler’s model this is a key aspect. Moreover, the cited empirical studies provide a not unambiguous evidence of the “volatility of employment” vs. “volatility of wages” tradeoff: in the first (Craig and Pencavel 1992), we cannot reject the null hypothesis that the difference in wages is zero, while in the second (Pencavel, Pistaferri and Schivardi 2006), the authors find evidence that wages fluctuate in both kinds of firm, and that what changes is just the size of this variation¹⁸.

There is, on the other hand, strong evidence that coops provide a higher employment stability, and that they pay lower wages, on average, with respect to KMF: both these cited studies provide evidence of lower wages paid by cooperatives with respect to their capitalistic counterpart. Pencavel et al (2006) find out an average difference of about 15%. Moreover, I recall the evidence provided by Estrin (1991) in a comparative study of cooperatives and KMFs in Italy, that the higher labour productivity of worker cooperatives doesn’t translate into higher wages. This is confirmed, in the case I’m analyzing, by the comparison between my sample’s average wages by sector and the average wages of the corresponding sectors in the whole region (North-East Italy) provided by Eurostat: besides the construction sector, the other sectors display lower gross wages than the average¹⁹.

I therefore formulate a second hypothesis, that capital accumulation in worker cooperatives is a sort of “risk-pooling network” within what Elinor Ostrom (1990) would define as a “group of principals”, where each member “taxes” himself in each period, therefore accepting a wage that is lower than the market wage, in order to accumulate capital into the firm, so that it will not face downturns by reducing the employment and neither by reducing wages. If this is true, indivisible reserves are the tool to put into action this mechanism to smooth income.

I’m underlying that this pattern is at work within a “group of principals”, because I’m considering a different framework with respect to the one that lies behind the implicit contract theory: it is no more a matter of insurance between a risk-neutral principal and a risk-averse agent, but instead it’s a self insurance mechanism obtained by income smoothing devices. Worker members therefore

¹⁷ He claims also that this effect may countervail the Ward’s (1958) theory that coops will be restrictive in labour.

¹⁸ Even the insurance function of wage in capitalist firms is questioned in some works. See the recent Guiso et al (2005).

¹⁹ Source: Eurostat, 2004, y_worker per employee per year, total labour costs. Cfr. Navarra (2008).

prefer to fix a lower, but certain wage and incorporate the residuals in the collective fund²⁰: this allows both to ensure employment and to smooth income.

My argument, here, is not very far from the criticism that has been made to the incomplete contract approach by the “wage bill argument” (Akerlof and Miyazaki 1980): this claims that both the firm and the worker prefer a lower wage with guaranteed employment, to a contract in which a worker gambles on being employed only with probability less than one, albeit at a higher wage rate. I would nevertheless add that this is hardly enforceable in a capital-managed firm, for the following reasons: first of all, it may be hardly possible to find an equilibrium wage that is low enough not to exceed the marginal productivity of labour in any state of nature and that at the same time is accepted by the worker; then, the firm has to find a way to credibly commit not to fire workers after having provided them low salaries, reminding that the firm keeps having private information on product market conditions. It may be possible, on the contrary, that a worker cooperative makes this kind of agreement binding.

The historical evidence on indivisible reserve seems to confirm the role that these have been playing in building up the strength of the Italian cooperative movement, and therefore allowing it to play the role of stabilizing employment, *vis-à-vis* a context of chronically high unemployment. The reinvestment of profits into indivisible reserves has been one of the key factors of the growing in size of the Italian cooperatives, that interestingly had in the last decades a greater tendency to size growth compared with the KMF counterpart (Zevi 2005); indeed, Estrin (1991) finds out that the usual negative relationship between size and growth rate of a firm is lower in cooperatives than in capitalist firms. Moreover, following Zevi (2003), the size growth of worker cooperatives has been a choice directed to the stabilization of employment. The use of collective non-divisible reserves as a means to grow in size seems to be confirmed by the evidence provided by the Centro Studi Legacoop (2006), that tells us that, on average, small and medium firms tend to reinvest into indivisible reserves a greater share of profits than the bigger ones. This leads us to a possibly interesting remark: if size can be reasonably considered as a proxy for the degree of “managerialization”, we have the intriguing conclusion that, when members directly decide on the rate of profit reinvestment, they will not have a strong preference for today earnings at the expenses of the growth rate. This observation seems to contradict what usually expected, that is the managers to be in favour of reinvestment and members not (e.g. Atkinson 1973, where members have a dividend-maximising objective function *à la* Ward, while managers want to maximise the firm’s rate of growth).

Employment insurance and the income smoothing role of indivisible reserves: empirical evidence.

The question I will try to answer in this section –by means of the data analysis of my case study- is first of all whether there is employment stability, that is if employment is rigid or not to the fluctuations of the firm performance. Then, if employment shows to be quite stable, I will inquire if this is obtained through wage fluctuations (that means that members are at least partly remunerated in a residual way), or through collective accumulation and income smoothing over time.

Employment variability and the possible tradeoff with wage fluctuation.

I first of all look at the determinants of the variability of employment, that is measured by its coefficient of variation, that is σ/μ for every observation across time (as a consequence, I use a between estimation).

$$cvar_L_i = \alpha_i + \beta (cvar_RTi)_i + \gamma (\text{sector dummy})_i + \delta (\text{worker members/L})_i + \zeta (\text{members})_i + \eta (\text{cumulated IR/L})_i + \theta (\text{member share capital})_i + \lambda (\text{investment})_i + \varepsilon_i$$

²⁰ Despite what claimed by the incomplete contract theory, that those who have control rights will be willing to be remunerated residually.

(See table 2 in the Appendix).

Interestingly, the variability of employment seems to be rigid to most of the independent variables and, what is more important to my argument, I don't find a significantly positive effect of the variation of firm revenues²¹. The only explanatory variable that displays a coefficient significantly different from zero at 99% confidence level is the ratio between worker members and total workers, that tells us that an increase in the share of members in the workforce reduces the variability of the size of the workforce itself. This is coherent with what emerges from interviews: variations of employment in my sample are very limited and are mainly due to non-members' quits.

Looking at the dataset at the individual level, we get the same evidence from the answer to the question on how the cooperative dealt with crisis, the case occurring²². By looking at the table 7 in the Appendix, column (a), we see that less than 5% indicate employment as the adjusted variable, while 54% say that the firm used its reserves, and 23% declare that wages had been reduced. This evidence is consistent with the information gathered in a number of interviews with board members. I will discuss just below the two more frequent mechanisms to face downturns.

The questionnaire contains a section on risk perception: respondents are asked to evaluate –in a range between 0 and 5- a number of risks, among which the risk of losing their jobs and the risk of having their wage reduced when facing downturns. 77,6% of respondents judge “low”²³ the risk of being fired: 27,2 % don't consider of being exposed to the unemployment risk, but consider high the risk of wage fluctuations, while 50,4% feel insured from both risks. This is an argument in favour of the idea that wage fluctuations can be a tool to face hard times, but that, more frequently, the cooperative provides, together with employment stabilization, also income smoothing over time, that is my second theoretical hypothesis.

This pattern of risk perception displays some interesting differences by sector, that is summarized by table 8 in Appendix. Agriculture, construction and services show a pattern that is similar to the average one mentioned above. This is itself an interesting observation, because these are sectors that followed different paths: construction and agriculture cooperatives generally are more than one-century old and were born to protect employment for low-skilled workers, while the service sector includes mainly newly born cooperatives, that may have also high-skilled workforce. The main deviations from this pattern are in the manufacturing sector and in the porters' one. In the former, the proportion of workers who don't feel safe, neither from the employment point of view, nor from the wage stability, is greater than in the other sectors. Even if board members declared that they never fired workers for redundancy reasons, this can mean that the internal working relationships keep being similar to a capitalistic firm²⁴, at least on what is perceived by workers. The case of porters' cooperatives is even more interesting: the proportion of workers feeling insured on both hands is remarkably lower than elsewhere, while the proportion of those perceiving a low risk of losing their job, but a high risk of having their wage reduced in case of a downturn is sharply higher. Indeed, the porters' sector clearly displays the pattern that I called “reversed implicit contract”: when facing downturns, they tend to reduce the overall pay, not by reducing the hourly wage, but by reducing the number of hours worked (“if there is less work, we distribute less work to our members”). Interestingly, porters' cooperatives are the overall less inclined to accumulate profits into indivisible reserves, that suggests that these play a role in income stabilization. This is the issue I'm going to address, by looking at the determinants of wage variability.

Wage variability and the role of indivisible reserves.

²¹ Total revenues instead of profits are used because of the inherent problem of the profit indicator, that is a balance sheet entry that strongly depends on accounting choices;

²² Here the respondents were less than the total, because the question was addressed only to those who were informed about the occurring of hardships for the firm they work in. They could moreover provide a multiple answer.

²³ I consider to be “low” an evaluation that is < 3.

²⁴ These cooperatives usually are the outcome of workers' buyouts of previous capitalistic firms.

I now look at the determinants of the coefficient of variation of the wage mass of the i^{th} cooperative. I use the whole mass of wages because I want to detect whether there is an effect of the fluctuation of revenues on the capacity of the firm to pay its amount of labour costs; I already ruled out a possible effect on the variation of the size of the workforce.

I'm interested in looking whether

- a) the amount of wages fluctuates tracking the firm's revenue fluctuations;
- b) the indivisible reserves the firm cumulated in his life work as an insurance pool, that limit wage fluctuations.

$$\text{cvar_}W_i = \alpha_i + \beta (\text{cvar_}RT)_i + \gamma (\text{cumulated IR /L})_i + \delta (\text{members})_i + \zeta (\text{interaction members_cum IR})_i + \eta (\text{investment/L})_i + \varepsilon_i$$

where:

- $\text{cvar_}W$ is the coefficient of variation of the wage mass (σ/μ);
- $\text{cvar_}RT$ is the coefficient of variation of total revenues (for the choice of this indicator, cfr. footnote 21);
- cumulated IR/L is the amount of cumulated indivisible reserves per worker at the initial t of my panel dataset²⁵; I choose to use the cumulated reserves instead of the current share of profits accumulated in order to measure the insurance capacity of the cooperative; the reason of it to be a per capita measure is to capture the effect of cumulated reserves as a "potential wage" for workers that has been accumulated in good times as an insurance pool for bad times. I use the initial value in order to avoid endogeneity problems;
- number of members of the cooperative, as a proxy of its size (in order not to use the workforce); I again use the value at the beginning of my time span;
- the interaction term (number of initial members * initial amount of cumulated IR) indicates the role of reserves in big cooperatives;
- average per capita investments of the firm.

(See Table 3 in the Appendix)

This regression is run with standard errors robust to heteroskedasticity and giving a zero weight to observations identified as outliers. Moreover, it's worth noticing that the obtained R^2 is almost 0,61²⁶ and therefore my model explains quite well the variations of my dependent variable.

These results confirm the intuition that the wage fluctuations track the revenue fluctuations, with a highly significant positive β coefficient: the more revenue fluctuates, the more the wages do.

The second interesting result is that the more the cooperative have cumulated reserves relative to its workforce, the less the wages fluctuate ($\gamma < 0$). I therefore argue for a wage smoothing role of indivisible reserves: wages normally fluctuate following the firm's performance; the more the firm cumulated indivisible reserves, the less this happens. Cumulated reserves work as an insurance fund that fills in the wage reductions that would have otherwise happened in hard times. As reserves are cumulated mainly in good times, also the positive fluctuations are smoothed: the mechanism is therefore similar to a collective saving deposit in order to smooth income over time.

From the computation of the elasticities, we can see that a doubling of the stock of reserves produces a 19% reduction in the wage fluctuations.

Going back to the regression results, while size in itself doesn't seem to play a role (δ isn't significantly different from 0), the wage smoothing effect of reserves is cancelled out in large cooperatives. This can be due to different reasons: it can reveal a collective action problem in pooling risk in larger groups, or it can be due to the existence of alternative risk-coping strategies, such as external income support mechanisms²⁷; it may also be ascribed to a greater internal wage diversification, that allows for the possibility to make some wages vary while others not.

²⁵ It is usually year 2000, but it may be later if the coop was born in one of the years included in my dataset.

²⁶ The variance explained by this regression is the 61% of total variance.

²⁷ They may for example use the *cassa integrazione guadagni* (CIG), as often declared in large construction and manufacturing cooperatives.

Some control variables are not shown up in the table because they have not proven to be significant; these are the sector dummies, the worker members over total workers ratio, the coefficient of variation of profits, the current reserves as a share of profits, the average share of members' share capital.

I will spend some word on this last variable: the capital stock of the cooperative is composed by members' share capital -that is formed by capital contribution by members at their entry in the firm, and that they will get back upon leaving or retirement- and reinvested profits, that in our case are entirely accumulated into indivisible reserves. We can therefore say that share capital is the divisible part of the capital stock, while reinvested profits are the indivisible one. What we see here is that only the indivisible component of the cooperative capital stock plays an insurance role, therefore underlying the collective risk-pooling aspect of this income smoothing device.

If we test the same model using the average wage as dependent variable, we obtain the same signs of the coefficients, but with lower significance and with a lower R^2 . On the other hand, performing the same regression with mean values (averages for each observation across time) doesn't change anything, but that we obtain a little lower R^2 (0,55).

Another piece of evidence that goes in the same direction is provided by an interquartile regression of average wage on the share of profits reinvested into indivisible reserves each year.

Instead of looking for the expected value of Y conditional on X , I look for the $[Q_{75}(y) - Q_{25}(y)]/X$: I thus express the interquartile range of the conditional distribution of Y as function of a number of covariates (Koenker and Hallock 2001).

Here, my dependent variable is the conditional interquartile range of average wage, that is the difference between $Q_{75}(avg_w) - Q_{25}(avg_w)$, that is a measure of the conditional spread of the distribution of avg_w :

$$[Q_{75}(avg_w) - Q_{25}(avg_w)]_{it} = \alpha_i + (\beta_{75} - \beta_{25})IR\%pr_{it} + \gamma \text{ (year dummy)} + \varepsilon_{it}$$

Where $IR\%pr$ is the share of profits allocated to indivisible reserves.

Each coefficient is the difference of the corresponding ones in the following quartile regressions:

$$Q_{75}(avg_w)_{it} = \alpha_i + \beta_{75}(IR\%pr)_{it} + \gamma_{75} \text{ (year dummy)} + \varepsilon_{it}$$

And

$$Q_{25}(avg_w)_{it} = \alpha_i + \beta_{25}(IR\%pr)_{it} + \gamma_{25} \text{ (year dummy)} + \varepsilon_{it}$$

That is, that $\beta = \beta_{75} - \beta_{25}$.

The two quartile regressions are estimated on observations that belong to the 1st and 4th quartiles of the dependent variable. While the coefficients depend on the quartile, α is a pure location shift and depends only on the individual: it is estimated by controlling for individual dummies and makes this model similar to a fixed effect model. (Koenker 2004). After having controlled for the individual heterogeneity among firms (through the location shift α_i), I look at the effect of the current share of profits allocated to IR on the spread in the distribution of the average wage. What I obtain is a negative coefficient, that confirms our previous result; interestingly, the result is confirmed by using the average wage as dependent variable and the current IR instead of the cumulated reserves as explanatory variable. The result is acceptably stable²⁸ (See Table 4 in the Appendix).

Specification for share of profits allocated into IR.

Another point I want to make is to provide a clarification of the determinants of the share of profits that each cooperative decides to accumulate into indivisible reserves.

I first of all provide further evidence of the irrelevance of the tax system, by regressing the share of profits allocated to reserves on time and sector dummies. I use a fixed effect model, in order to show what influences the share of profits allocated to IR, controlling for individual heterogeneity by estimating data in deviations from the mean.

²⁸ The variance-covariance matrix is estimated by bootstrapping, that is by repeated calculations of errors by random samples repeatedly drawn by the original distribution.

$$IR\%pr_{it} = \alpha_{it} + \beta (\text{year dummy})_{it} + \gamma(\text{avg_w})_{it} + \delta (VAL)_{it} + \zeta (\text{control variables})_{it} + \varepsilon_{it}$$

(See Table 5 in the Appendix)

The benchmark for time dummies is 2000, and for sectors is agriculture.

It's important to notice that the within R^2 is very small: this means that the explanatory power of this specification is very limited. Therefore, up to now we don't know a lot of what explains the choice of current accumulation into IR²⁹. This is one of the reasons why in the next section I will use qualitative data in order to investigate the subjective perception of IR by workers.

Nevertheless, we can use this specification in order to capture some interesting hints.

First of all, no time dummy is significant, apart from 2002 and 2003 (10% level) with positive coefficient, thus meaning an increase in the share of reinvested profits, contrary to what we should expect if we followed the tax argument.

This regression adds a piece of evidence to our insurance argument, since both average wage and value added per worker display significant coefficients, but $\gamma < 0$ and $\delta > 0$. Given that $\gamma < 0$, we may infer that when a firm pays higher wages, it accumulates a lower share into reserves. This would mean that there is a tradeoff between paying higher wages today and accumulating to smooth income between today and tomorrow. Moreover, the positive coefficient of the value added per worker ($\delta > 0$) indicates that, when a cooperative attains higher productivity, it tends to allocate a higher share of profits into reserves, that is a way to accumulate in good times in sight of possible hardships.

The positive relationship between productivity and share of profits cumulated into IR is interesting for another reason too: it rules out the possibility that the indivisible reserves play the role of the "budget breaker" *à la* Holmström (1982). The interesting hypothesis that IR work as a discipline device, in order to elicit effort from workers, as a third party that appropriates of the product when this is below a threshold level has been formulated by Sacconi and Seppi (2006), in order to illustrate the rationale of the investment in IR in one-shot framework, thus without taking into account expectations for future interactions. For this to be true, we should observe a negative relationship between productivity and share of profits accumulated to IR; the fact that we observe the opposite, makes the insurance argument more likely to be at work.

Individual perception of risk and of the role of the cooperative.

I now look at the individual survey conducted among workers, inquiring whether there are differences in answers between workers of cooperatives that have highly reinvested profits into indivisible reserves (cumulated IR per worker above the median), and coops that didn't (cumulated IR per worker below the median).

I first of all go back to workers' point of view on how crisis have been dealt with, the case occurring. While I previously presented the overall results, I'm now splitting the observations in the two mentioned groups (table 7 in the Appendix, column (b) and (c)).

While both groups almost don't fire workers in downturns, they differ because in the first group more than 35% of respondents indicated the wage reduction as a tool, while this share reduces to 14% in the second group. The cooperative using its own funds to recover is a highly chosen reply in both groups, but quite higher in the second. Also the intervention of the coop federation is higher in coops that have a larger reserve stock, but there may be the omitted factor of the age of the coop that can imply a stronger relationship with the local federation.

The more striking result is nevertheless the sharp decline in the use of the wage reduction strategy, that goes in the same direction of my preceding argument.

This evidence is confirmed by the pattern of the answers to the question where they are asked to provide an evaluation from 0 to 5 to a number of risks. We concentrate on the risk of losing their job and of having their wage reduced because of hardships: while the former isn't influenced by the amount of cumulated reserves, the second is. (see graph 1 and 2, Appendix). We see that in the first group around 50% of respondents evaluate the risk lower (or equal) than 2, while in the

²⁹ One of the possible reasons is the little variation we observe in the current share of profits allocated to IR.

second the percentage rise to 67%; in the first, only 17% of people give zero weight to it, while in the second they are about 35%. The fact that cumulated reserves seems to influence the perception of wage fluctuation risk and not the perception of unemployment risk can reinforce the claim that all cooperatives insure employment, but those of them who opt for a strong IR accumulation, are also able to smooth income.

When workers are asked to identify which are the advantages of being in a cooperative (if any), (see table 9 Appendix) again we remark a difference between what happens in high-reserves cooperatives and low-reserve coops. Going from the first group to the second, the concern for employment stability and for workers' rights protection increases; on the other hand, the number of respondents who think that the cooperative provides higher wages decreases –and this is consistent with the observed tradeoff between reinvestment of profits and wages. This observation suggests that cooperatives that choose the high accumulation pattern display at the workers' level some kind of safety-oriented attitude, that makes them willing to individually sacrifice part of their benefits.

Turning to risk perception, I try now to better understand the determinants of the probability for the workers to feel fully insured, by including both firm and individual characteristics.

I therefore construct a PROBIT model, where the dependent variable is the dummy “insured” (1= low evaluation both of the employment risk and of the wage reduction risk)³⁰:

$$(\text{insured})_i = \alpha_i + \beta(\text{sector dummy})_i + \gamma(\text{cum IR per capita})_i + \delta(\text{share of IR on profits})_i + \zeta(L)_i + \eta(\text{VA/L})_i + \theta(\text{age})_i + \lambda(\text{member dummy})_i + \mu(\text{education})_i + \chi(\text{woman})_i + \psi(\text{blue collar})_i + \varepsilon_i$$

(See Table 6 in the Appendix)

The first 5 regressors are at the firm level, while the following are at the individual level. I then compute the marginal effects, that measure the effect of a small change in each regressor on the probability that the dependent variable “insured” takes the value of 1 (in the case of dummy explanatory variables, we measure the effect of its shift from 0 to 1 on the probability of $y_i=1$).

The first element to notice is the positive and significant effect of the share of profits currently allocated to IR: that the perception workers have of the insurance function of the firm depends more on the its current behaviour that on its cumulated stock of reserves.

Interestingly, the introduction of the IR variable erases the effect of sector 6 (porters), that showed a sharply lower proportion of fully insured workers: this can mean that risk perception isn't affected by the fact of being in a porter cooperative *per se*, and instead is affected by the fact that porters' cooperative are used to accumulate a small proportion of profits into firm's reserves.

Another striking aspect is the negative effect of education: the more a worker is educated (measured by schooling level), the less likely he is to feel safe both with respect to employment and to wage stability. It may be a consequence of the fact that cooperatives – for an historical legacy- are mainly concerned with the protection of unskilled workers³¹, mainly when they provide some kind of unemployment insurance. Thus, it can be that cooperatives that have an insurance purpose may be those that employ mainly unskilled workers (e.g. agriculture). The puzzling evidence, in this respect, is the absence of effect of the “blue collar” dummy, that means that it's not the role inside the firm that matters, but it's really the schooling level attained. I think that another component is the sector bias: a lot of highly educated workers concentrate in the service sector (culture, tourism, new technologies, environment, ...), where there are the younger and weaker cooperatives, namely from the point of view of accumulation of insurance capacity. Another possibility is that it captures some sort of higher expectations of more educated workers (Cfr. Borzaga and Depedri 2005 find a negative correlation between job satisfaction and education).

³⁰ Low evaluation of risk means a ranking < 3 (over 5 points).

³¹ The acceptance of white collars as members in worker cooperatives –even if introduced and nowadays considered normal- has been a huge issue of debate in the '60s.

Conclusions.

My starting point is the remark of a feature of Italian worker cooperatives, where members, though owners of the firm, cannot be fully seen as residual claimants of its revenues, since they show a huge propensity to reinvest firm's yearly profits into indivisible reserves, a collective fund they will not appropriate, neither upon quitting or retiring.

This contradicts both the need for "well-behaved" work incentives and the "horizon problem", that predicts that worker-members will have a strong preference for today earnings at the expenses of the long-run investments (and the firm's growth rate).

I thus turn to analysing the choice of accumulating profits into IR within my case study.

I first of all claim that the main arguments –the tax system and the credit constraint- usually provided to explain this phenomenon don't apply, at least in the case I'm studying.

I then propose an alternative argument, that is to interpret IR as an instrument for workers to insure from the risk of loosing their job and to smooth income over time.

I rely on a strong evidence of a greater employment stability in worker cooperatives and I argue that this can be provided in two ways. One possible way, that has quite a strong background literature, is that cooperatives search the stabilization of employment by making the wages fluctuate ("reversed implicit contract"). The other is that members choose to earn lower wages, to allow the firm to accumulate capital, in order to face downturns without reducing neither workforce, neither wages; this –closer to some kind of "risk-pooling institution" works through IR used as an income smoothing device.

When turning to the data, we see that there is a reversed implicit contract mechanism at work, but that it declines in cooperatives that have higher cumulated reserves per worker (in the between effect specification the wage fluctuations are positively related with firm revenue fluctuations and negatively related to the stock of reserves per worker). Moreover, the share of reserves a firm allocates to IR is negatively related with the average wage it pays and positively related with value added per worker. IR can thus be interpreted as a common pool where profits are cumulated in good times and that allows to smooth wages over time. This suggests that the insurance capacity is exchanged with lower wages, and that IR don't work as discipline device to enhance workers' productivity.

The insurance and income smoothing effect due to high IR accumulation is also confirmed by the survey data on workers' risk perception, disentangled by firm's accumulation strategy. Even if there are sector-specific issues, we can say that workers in coops that follow a policy of high IR accumulation feel more insured with respect to wage fluctuations. On the contrary, workers generally feel insured against the unemployment risk regardless the accumulation pattern of the firm.

In the words of an anthropologist,

"The co-ops were set up first of all to create or save jobs: that is, to replace the old capitalistic rule that labour is a commodity that employer continues to buy only for as long as he needs it. The opposite would be to guarantee everyone a job for life. The co-ops have done their best to achieve this, within individual co-ops if possible, otherwise within the main federation, the Lega. In decision making, security always comes before profits."

(M Holmström 1985, p.10)

Many further development can be done starting from this work. One issue that can be raised is the potential free rider problem that may arise, as long as we consider the public good component of the objective function of the cooperative firm. If, at least partially, we interpret the cooperative as a group of people contributing to a local public good, the risk of "collective action failure" may arise (Olson 1965). In another work (Navarra 2008), I've tried to investigate two possible ways out the free riding *impasse*. First of all, I inquire whether the long term relationship in which workers enter with the cooperative plays a role in increasing their willingness to contribute to the public good provision by pooling the firm profits into IR; concerning this argument, I take inspiration from Elinor Ostrom (1990), who argues that the time dimension is what allows for the establishing of binding norms and for the activation of reputation effects among members of a group.

I then inquire the possibility to interpret collective and indivisible accumulation of capital as an expression of we-rationality, or team-thinking (Hollis and Sugden 1993), that is by allowing people to act as collective agents: what is rational for the individual is to behave consistently with their belonging to the group. This may imply some sort of “normative expectations” (Sugden 1998): cooperative members may expect each other to follow a norm and disapprove to breach it, regardless to the payoff it has for them individually.

The subjective individual data provide interesting evidence for these two arguments.

Moreover, both arguments enter into a wider issue, that has been mostly inquired by historians, that is the capacity of cohesion and solidarity as the strength of the cooperative movement at its beginning (Zangheri et al., 1987). In this sense, the spreading of the socialist ideas at the end of XIX century played a major role. The aim was to develop labour as an element of social cohesion, rather than simply a factor of production (Nardi 1998), in a context of great unemployment pressure. The need to be economically efficient was the way to provide more social services and to employ a greater number of workers: the first cooperatives worked mainly as solidarity mechanism to fight unemployment. For a long time (this choice began to be questioned in the 60s), the extent of the employment concern was so important that most cooperatives were used to undertake unprofitable works, in order to absorb as more labour force as possible. This meant, of course, lowering the salaries, and this indeed was a wide accepted practice among worker members; the ideological component of “working class solidarity” has clearly played an important part in this choice (Menzani 2007).

Bibliography.

- Akerlof G., Miyazaki H., (1980) *The Implicit Contract Theory Meets the Wage Bill Argument*, Review of Economic Studies, 47(2), 321-338.
- Aoki M., (1980) *A model of the firm as a stockholder-employee cooperative game*, American Economic Review, 70(4), pp 600-610.
- Aoki M., (1990) *Toward an Economic Model of the Japanese Firm*, Journal of Economic Literature, 28(1), pp.1-27.
- Atkinson A.B., (1973) *Worker Management and the Modern Industrial Enterprise*, Quarterly Journal of Economics, 87(3), pp 375-392.
- Azariadis C., (1975) *Implicit Contracts and Underemployment Equilibria*, in Journal of Political Economy, 83(6), pp. 1183-1202.
- Azariadis C. Stiglitz J., (1983) *Implicit Contracts and Fixed Price Equilibria*, Quarterly Journal of Economics, vol. 98 supplement, pp 1-22.
- Baily M.N., (1974) *Wages and employment under uncertain demand*, Review of Economic Studies, 41(1), pp. 37-50.
- Bassi A., (2003) *Le cooperative tra dimensioni dell'impresa e guadagni dei soci: il problema dei ristorni nel pensiero degli economisti moderni*, in Jossa B., Buonocore V., *Le organizzazioni economiche non capitalistiche: economia e diritto*, il Mulino, Bologna.
- Bardhan P., (2005) *Scarcity, Conflicts and Cooperation, Essays in the Political and Institutional Economics of Development*, MIT Press.
- Bartlett W., Cable J., Estrin S., Jones D., Smith S., (1992) *Labor-Managed Cooperatives and Private Firms in North-Central Italy: an Empirical Comparison*, Industrial and Labor Relations Review, 46(1), pp. 103-118.
- Bonfante G., (2008) *Società cooperativa*, voce in *Il Diritto, Enciclopedia Giuridica del Sole 24 Ore*, Milano.
- Bonin J.P., Putterman L. (1987), *Economics of Cooperation and the Labour-Managed Economy*, Harwood Academic Publishers.
- Bonin J.P., Jones D., Putterman L. (1993), *Theoretical and Empirical Studies of Producer Cooperatives: Will Ever the Twain Meet?*, Journal of Economic Literature, 31(3), pp. 1290-1320.
- Borzaga C., Depedri S., (2005) *Interpersonal Relations and Job Satisfaction: Some Empirical Results in Social and Community Care Services*, in Gui B., Sugden R. (ed.), *Economic and Social Interaction: Accounting for Interpersonal Relations*, Cambridge University Press.

- Bradley K., Gelb A., (1983) *Cooperation at work: the Mondragon Experience*, Heineman Educational Books, London.
- Centro Studi Legacoop, (2006), *Distribuzione del valore aggiunto: cooperative e loro stakeholders*, in *Attività e Ricerche del Centro Studi LegaCoop*, directed by Zevi A. and Petrucci P., www.cslegacoop.coop.
- Coriat B., (1991) *Penser à l'envers : travail et organisation dans l'entreprise Japonaise*, Christian Bourgeois Editeur, Paris.
- Craig B., Pencavel J., (1992) *The Behaviour of Worker Cooperatives, the Plywood Companies of the Pacific North-East*, *American Economic Review*, 82(5) pp.1083-1105.
- Dow G., (2003) *Governing the Firm*, Cambridge University Press, Cambridge.
- Drèze J., (1976) *Some Theory of Labor Management and Participation*, *Econometrica*, 44 (6), Nov, pp. 1125-1139.
- Estrin S., Jones D., Svejnar J., (1987) *The Productivity Effects of Workers' Participation*, *Journal of Comparative Economics*, vol.11.
- Estrin S., (1991) *Some Reflections on Self-Management: Social Choice and Reform in Eastern Europe*, *Journal of Comparative Economics*, 15(2), pp. 349-366.
- Fitzroy F.R., Kraft, K., (1986) *Profitability and Profit-sharing*, *Journal of Industrial Economics*, 35(2), Dec.
- Furubotn E., Pejovich S., (1970) *Property Rights and the Behaviour of the Firm in a Socialist State*, *Journal of Economics*, 30(3-4), Sept. pp. 431-454.
- Grossman S., Hart O., (1986) *The Costs and Benefits of Ownership: a Theory of Vertical and Lateral Integration*, in *Journal of Political Economy*, Aug. pp. 691-719
- Gui B., (1994) *Is There a Chance for the Worker-Managed Form of Organization?*, in Pagano U., Rawthorn R. (ed.), *Democracy and Efficiency in the Economic Enterprise*, Routledge and UNU/WIDER.
- Guiso L., Pistaferri L., Schivardi F., (2005) *Insurance Within the Firm*, *Journal of Political Economy*, 113(5), pp. 1054-1087.
- Guzzini D., (1925) *Le imprese agricole cooperative nell'economia ravennate*, Società Cooperativa Editrice Lombarda, Milano.
- Hansmann H., (1996) *The Ownership of Enterprise*, The Belknap Press of Harvard University Press, Cambridge/London.
- Hart O., Moore J., (1990) *Property Rights and the Nature of the Firm*, *Journal of Political Economy*, Dec, 96(6), pp.1119-1158.
- Hart O., Moore J., (1998) *Foundations of Incomplete Contracts*, NBER Working Papers.
- Hollis M., Sugden R., (1993) *Rationality in Action*, *Mind, New Series*, 102(405), pp.1-35.
- Holmström B., (1982) *Moral Hazard in Teams*, *The Bell Journal of Economics*,13(2), pp. 324-340
- Holmstrom M., (1985) *How the Managed Manage the Managers: Workers Co-ops in Italy*, *Anthropology Today*, 1(6), dec., pp.7-13.
- Jensen M., Meckling W., (1976) *Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure*, *Journal of Financial Economics*, 3(4), pp. 305-360.
- Jensen M., Meckling W., (1979) *Rights and production functions: an application to labor-managed firms and codetermination*, *Journal of Business*, 52(4), oct., pp 469-506.
- Jones D., Svejnar J., (1985) *Participation, Profit Sharing, Worker Ownership and Efficiency in Italian Producer Cooperatives*, *Economica*, vol. 52, pp.449-465.
- Jones D., Kato T., Pliskin J., (1994) *Profit Sharing and Gainsharing. A Review of Theory, Incidence and Effects*, Working Paper n.125, Hamilton College.
- Jossa B., (2005) *La teoria economica delle cooperative di produzione e la possibile fine del capitalismo*, Giappichelli, Torino.
- Knight F.H., (1921) *Risk, Uncertainty and Profit*, London School of Economics and Political Science, Boston.
- Koenker R., (2004) *Quantile Regression for Longitudinal Data*, in *Journal of Multivariate Analysis*, 91, pp. 74-89.
- Koenker R., Hallock K.F., (2001) *Quantile Regression*, *Journal of Economic Perspectives*, 15(4), pp. 143-156.

- Kruse D., (1991) *Profit-Sharing and Employment Variability: Microeconomic Evidence on the Weitzman Theory*, *Industrial and Labor Relation Review*, 44(3), pp. 437-453.
- Landi F., (1999) *Un secolo di cooperazione edile: i muratori del ravennate dagli albori del '900 alla nascita della ITER*, Longo, Ravenna.
- Meade, J.E. (1972), *The Theory of Labour-managed Firms and of Profit-sharing*, *Economic Journal* (82) pp. 402-428.
- Meade J.E., (1993) *Politica economica e mercato*, il Mulino, Bologna.
- Mazzoli E., (2005) *La cooperazione vista da uno dei suoi protagonisti*, in Mazzoli E. , Zamagni S., *Verso una nuova teoria della cooperazione*, il Mulino, Bologna.
- Menzani T., (2007) *La cooperazione in Emilia Romagna. Dalla Resistenza alla svolta degli anni '70*, Il Mulino, Bologna.
- Miceli T.J., Minkler A.P., (1995) *Transfer uncertainty and organizational choice*, in Jones D., Svejnar J., *Advances in the Economic Analysis of Participatory and Labour-Managed firms*, vol. 5, pp. 121-137.
- Nardi S., (1998) *Il lavoro. Alcune considerazioni*, in Circolo Cooperatori Ravennati, *La memoria ritrovata. Fonti orali e storia della cooperazione ravennate*, atti dell'incontro di studio 9 maggio 1998, Longo Editore, Ravenna.
- Navarra C., (2008) *Collective Action, Employment Insurance, We-rationality: an Empirical Investigation on Italian Worker Cooperatives*, PhD thesis, University of Turin, Italy.
- Nuti D.M., (1993) *Alternative Employment and Payment Systems*, in Bowles S., Gintis H. Gustafsson B., *Markets and Democracy: participation, Accountability and Efficiency*, Cambridge University Press.
- Olson M., (1965) *the Logic of Collective Action. Public Goods and the Theory of the Groups*, Harvard University Press, Cambridge Mass.
- Ostrom E., (1990) *Governing the Commons. The evolution of institutions for collective action*, Cambridge University Press.
- Pencavel J, Pistaferri L, Schivardi F, (2006) *Wages, Employment and Capital in Capitalist and Worker-Owned Firms*, *Industrial and Labor Relation Review*, 60 (1).
- Putterman L., (1986) *Peasants, Collectives, and Choice: Economic Theory and Tanzania's Villages*, JAI Press.
- Sacconi L., Seppi M., (2006) *Le basi etiche e economiche della promozione cooperativa, classica e non classica*, in Bulgarelli, Viviani, *La promozione cooperativa*, il Mulino, Bologna.
- Sapelli G., Zan A., (1971) *Costruire l'impresa: la CMC di Ravenna dal 1945 al 1972*, il Mulino, Bologna.
- Sapelli G., (1986) *Comunità e mercato. Socialisti, cattolici e "governo economico municipale" agli inizi del XX secolo*, il Mulino, Bologna.
- Sugden R., (1998) *Normative Expectations: the Simultaneous Evolution of Institutions and Norms*, in Ben-Ner A., Putterman L., *Values and Organizations*, Cambridge University Press.
- Tortia E., (2002a) *The internal organisation of labour managed firms: the problem of value added distribution and of capital accumulation*, PhD thesis, Università di Ferrara e Bologna.
- Tortia E., (2002b) *Accumulazione e riserve divisibili nelle imprese controllate dai lavoratori*, *Rivista della Cooperazione*, n.1.
- Tortia E., (2007) *Self-financing in labor-managed firms: individual capital accounts and bonds*, in Jones D., Svejnar J., *Advances in the Economic Analysis of Participatory and Labour-Managed firms*, vol. 10, pp.243-272.
- Ward B., (1958) *The Firm in Illyria, Market Syndicalism*, *The American Economic Review*,. Vol. 48(4), pp.566-589.
- Zangheri R., Galasso G., Castronovo V. (1987) *Storia del movimento cooperativo in Italia 1886-1986*, Einaudi, Torino.
- Zavattoni, (1976) *L'associazione generale degli operai braccianti del comune di Ravenna*, in Fabbri F., *Il movimento cooperativo nella storia d'Italia*, Feltrinelli.
- Zevi A., (2003) *Il fenomeno cooperativo e le modifiche in corso nell'ordinamento italiano*, in Jossa B., Buonocore V., *Le organizzazioni economiche non capitalistiche: economia e diritto*, il Mulino, Bologna.
- Zevi A., (2005) *Il finanziamento delle cooperative*, in Mazzoli E. , Zamagni S., *Verso una nuova teoria della cooperazione*, il Mulino, Bologna.

Appendix.

Table1. Panel data: descriptive statistics (standard deviations in parenthesis)

| | |
|---|-------------------|
| Number of workers | 104,25 (153,40) |
| Number of members | 134,87 (227,34) |
| Number of worker members | 78,80 (128,87) |
| Woker members/workers ratio | 0,74 (0,21) |
| Yearly profits ^a | 210.672 (655.303) |
| Total revenues per worker ^a | 108.841 (160.453) |
| Value added per worker ^a | 29 454 (23787) |
| Average wage ^a | 21 817 (16412) |
| Average share of profits accumulated into IR | 87,98 (16,36) |
| Average share of profits distributed to members | 9,27 (16,27) |

^a in euros.

Table 2. Between regression: y = Coefficient of variation of employment:

| | |
|--------------------------------------|---------------------------------|
| Coeff of variation of employment = y | |
| | |
| Coeff of variation of total revenues | 0,152 (n.s.) |
| Sector dummy construction | 0,207 (n.s.) |
| Sector dummy manufacturing | - 0,125 (n.s.) |
| Sector dummy services | - 0,053 (n.s.) |
| Sector dummy transports | -0,141 (n.s.) |
| Sector dummy porters | -0,145 (n.s.) |
| Members/L | -0,313 *** |
| Members | -0,000 (n.s.) |
| Cumulated IR/L | - 1,60 e ^{-0,6} (n.s.) |
| Members' share capital | -7.76 e ⁻⁰⁸ ** |
| Investments | 5.04 e ⁻⁰⁸ * |
| | |
| Const | 0,534248 |
| R ² | 0,41 |

* = significant at the 90% level, ** = significant at the 95% level, *** = significant at the 99% level, n.s. = not significantly different from zero.

Table 3. Between regression: y = Coefficient of variation of wage mass.

| Coeff of variation of wage mass = y | Coefficient | Elasticity |
|--------------------------------------|----------------------------|----------------|
| | | |
| Coeff of variation of total revenues | 0,5430 *** | 0,6570 *** |
| Cumulated IR/L | -8,76 e ⁻⁰⁷ *** | -0,192 *** |
| Members | -0,00011 (n.s.) | -0,1138 (n.s.) |
| Interaction members*IR | 4,51 e ⁻⁰⁹ *** | 0,1920 *** |
| Investments/L | 2,79 e ⁻⁰⁶ *** | 0,1342 *** |
| | | |
| Const | 0,041 | |
| R ² | 0,61 | |

* = significant at the 90% level, ** = significant at the 95% level, *** = significant at the 99% level, n.s. = not significantly different from zero.

Table 4. Interquartile regression of average wage on share of profits allocated to IR.

| | |
|---|------------------|
| Interquartile range of average wage = y | |
| Share of profits to IR | -1083,182 *** |
| Year dummy 2001 | -24,95696 (n.s.) |
| Year dummy 2002 | -473,3452 (n.s.) |
| Year dummy 2003 | 41033,22 *** |
| Year dummy 2004 | -493,6321 (n.s.) |
| Year dummy 2005 | -373,5435 (n.s.) |
| Const | 106742 |
| 0,25 pseudo-R ² | 0,7457 |
| 0,75 pseudo- R ² | 0,7253 |

* = significant at the 90% level, ** = significant at the 95% level, *** = significant at the 99% level, n.s. = not significantly different from zero.

Firm dummies not reported.

Table 5. Specification for the share of IR on yearly profits. Fixed effect.

| | |
|----------------------------|-------------------|
| Share of profits to IR = y | |
| Year dummy 2001 | 2,986332 (n.s.) |
| Year dummy 2002 | 5,79855 * |
| Year dummy 2003 | 6,112308 * |
| Year dummy 2004 | 4,92225 (n.s.) |
| Year dummy 2005 | 4,586891 (n.s.) |
| Average wage | -0,0004163 ** |
| Value added per capita | 0,0003046 * |
| Workers | 0,0727952 (n.s.) |
| Revenues per capita | 0,0000253 (n.s.) |
| Members | -0,0155937 (n.s.) |
| Investments | -1,85e-07 (n.s.) |
| Cumulated IR per capita | -0,0000788 (n.s.) |
| Const | 74,96755 |
| Within R ² | 0,0585 |

* = significant at the 90% level, ** = significant at the 95% level, *** = significant at the 99% level, n.s. = not significantly different from zero.

Table 6. Probit estimates, marginal effects. Y = insured.

| | |
|----------------------------|------------------|
| Dummy "insured" = y | Marginal effects |
| Sector dummy construction | 0,580 *** |
| Sector dummy manufacturing | -0,096 (n.s.) |
| Sector dummy services | 0,381 ** |
| Sector dummy porters | 0,299 (n.s.) |

| | |
|--|------------------|
| Workers (mean over t) | -0,0005 ** |
| Cumulated IR per capita (mean over t) | 0,0005 (n.s.) |
| Share of profits to IR (mean over t) | 0,008 *** |
| Vale added per capita (mean over t) | -2,57e-06 (n.s.) |
| Age of respondent | -0,001 (n.s.) |
| Is the respondent worker member? (dummy) | -0,112 (n.s.) |
| Education of respondent | -0,110 *** |
| Is the respondent a woman? (dummy) | -0,097 (n.s.) |
| Is the respondent a blue collar? (dummy) | -0,026 (n.s.) |
| | |
| Pseudo-R ² | 0,0711 |

* = significant at the 90% level, ** = significant at the 95% level, *** = significant at the 99% level, n.s. = not significantly different from zero.

Table 7. Frequency table of the answers to the question: “how did the cooperative face a downturn, if the case occurred, to your knowledge?”: a) whole sample of respondents, b) respondents who belong to cooperatives that reinvest into IR a share of profits below the median; c) respondents who belong to cooperatives that reinvest into IR a share of profits above the median.

| Tool to face crisis | Relative frequency in the whole sample (a) | Relative frequency in the coops that reinvest into IR a share of profits < the median (b) | Relative frequency in the coops that reinvest into IR a share of profits > the median (c) |
|--|--|---|---|
| workers have been fired, including members | 3,03% | 1,43% | 4,21% |
| workers have been fired, but only among non members | 1,82% | 2,86% | 1,05% |
| wages have been reduced | 23,03% | 35,71% | 13,68% |
| the cooperative federation has been involved | 17,58% | 10% | 23,16% |
| money has been withdrawn by the accumulated reserves | 54,55% | 50% | 57,98% |

Table 8. Share of respondents that perceive a) low risk of losing job and low risk of wage reduction, b) low risk of losing job but high risk of wage reduction, c) high risk of losing job, but low risk of wage reduction, d) high risk of losing job and high risk of wage reduction, by sector.

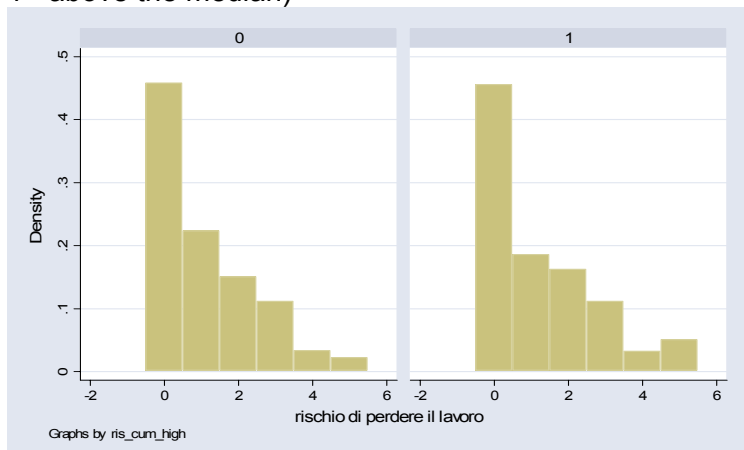
| | Fully insured (a) | Insured on employment, not on wages (b) | Insured on wages, not on employment (c) | Not insured (d) | Share of profits to IR (e) |
|-------------|-------------------|---|---|-----------------|----------------------------|
| Agriculture | 57,47% | 22,99% | 6,90% | 12,64% | 91,36% |

| | | | | | |
|---------------|--------|--------|-------|--------|-------|
| Construction | 52,63% | 25,26% | 6,32% | 15,79% | 73,8% |
| Manufacturing | 51,92% | 15,38% | 9,62% | 23,08% | 93,4% |
| Services | 51,94% | 25,58% | 6,20% | 16,28% | 92,1% |
| Porters | 28,85% | 53,85% | 1,92% | 15,38% | 68,1% |

Table 9. Frequency table of the answers to the question: "which is the main advantage of working in a cooperative, if any?": a) respondents who belong to cooperatives that reinvest into IR a share of profits below the median; b) respondents who belong to cooperatives that reinvest into IR a share of profits above the median.

| Advantage of working in a cooperative, if any: | Relative frequency in the coops that reinvest into IR a share of profits < the median (a) | Relative frequency in the coops that reinvest into IR a share of profits > the median (b) |
|--|---|---|
| higher wages | 10,34% | 8,33% |
| better quality of the working place | 22,76% | 21,79% |
| lower risk of loosing one's job | 26,90% | 35,90% |
| the possibility to work for oneself rather that for a boss | 22,07% | 8,33% |
| greater protection of workers' right | 17,93% | 25,64% |

Graph 1. Risk perception of loosing job, by cumulated reserves per worker (0=below the median; 1= above the median)



Graph 2. Risk perception of wage reductions, by cumulated reserves per worker (0=below the median; 1= above the median)

