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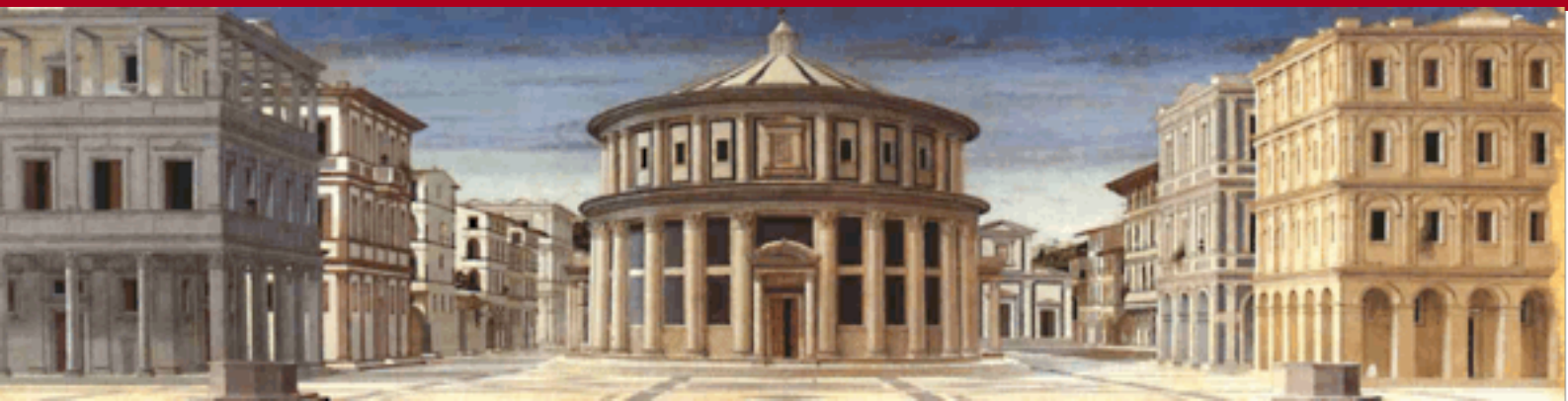
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Productivity, wages
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Abstract

In our empirical analysis of wage differentials in a sample of workers in the cooperative not for profit sector we find that, consistently with the donative-labor hypothesis, more intrinsically motivated workers “donate more work” (unpaid overtime, arrear holidays) but are also more productive and earn significantly higher wages. Our results are robust to several measures of workers’ remuneration and controlled for endogeneity. We interpret these findings by arguing that the hypothesis of the static negative correlation between intrinsic motivations and wages (where intrinsic motivations work as a compensating differential) is dominated by the effect by which intrinsic motivations cause or are a signal of higher productivity.

1.Introduction

The influential theory of the donative-labour hypothesis (Hansmann, 1980; Preston, 1989; Rose-Ackerman, 1996 and Frank, 1996)¹ forecasts a negative relationship between intrinsic motivations and workers’ pay. The common rationale, consistent with the principle of compensating wage differentials, states that wage earners accept a lower pay if they find an intrinsic (non monetary) value in their jobs. This implies that intrinsically motivated workers, who find their motivations satisfied in their occupation and in the mission of their productive organisations, are willing to donate labour for it.

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¹ Following Preston (1989), the acceptance of a lower pay on behalf of intrinsically motivated workers is equivalent to a monetary donation to an organization producing social benefits. In this sense such workers reveal a strong willingness to pay for public goods. Frank (1996) emphasizes that intrinsic motivations are a component of job amenities and therefore interprets the difference in wages as a compensating differential. Rose-Ackerman (1996) emphasizes the role of the alignment between worker ideals and corporate goals which leads the former to accept lower pay. Finally, Hansmann (1980) interprets the differential as a sorting mechanism by which workers giving relatively lower weight to pecuniary compensations and relatively higher weight to contribution to public goods are hired in the no profit industry. All these rationales have in common the capacity of explaining why the differential persists and is not bridged by a migration of workers from the no profit to the profit sector.

Stated differently, such workers exchange monetary incentives with intrinsic, relational, and social incentives, which have a positive impact on their well-being even when they do not increase or reduce their income (Borzaga and Tortia, 2006). The extreme bound of the donative labour hypothesis is volunteer work where individuals enjoy so much non monetary compensations for their activity to be willing to “work for nothing” (Freeman, 1997).

Several empirical papers looking at the profit/no profit wage differentials find evidence consistent with the donative labour hypothesis. Weisbrod (1983) studies the difference between lawyers working in the profit and in the no profit sector and documents a significant non profit wage gap. Preston (1989) finds a similar result for different types of white collar pays (managers, professionals, clerical and sales workers) compared across the two sectors. Evidence from Europe seems to go in the same direction (see Mosca et al., 2007, for Italy and [Narcy, 2009](#), for France).

However, in a thorough empirical analysis on US Census data, Leete (2001) demonstrates that, when finer controls at industry and occupation level are introduced in the analysis, the non profit negative wage gap persists only in a few cases. To account for the puzzle Leete (2001) arguably comments that “*the pattern of nonprofit wage differentials across disaggregated occupations and industries is suggestive of a number of forces affecting nonprofit wages simultaneously*” (p. 138).

The main point implicitly raised here is that, in absence of explicit data on workers’ intrinsic motivations, the effect of the latter on wages has been tested by looking at the profit/non profit differential, with the maintained hypothesis that the factor driving this differential was i) the higher satisfaction of intrinsic motivations in the no profit industry (under the assumption of workers homogeneity in intrinsic motivations); ii) the difference in workers’ intrinsic motivations in the two sectors (under the assumption of workers heterogeneity in intrinsic motivations).² In essence, in the impossibility of testing directly the *intrinsic motivation - job donation - wage* nexus, affiliation to the non profit industry has been considered a good proxy of higher satisfaction of (in case i) or relatively higher intrinsic motivations (in case ii).³

This approach is not without problems. First, intrinsic motivations may vary significantly within industries and profit and non profit sectors. Second, following Leete (2001), the profit/non profit wage differential may depend from a series of other omitted variables and cannot be uniquely attributed to a

² This conclusion is explained by the fact that, below a given threshold of intrinsic motivations workers would not accept a lower pay in the no profit industry.

³ As it will be shown in what follows, since we can measure the degree of intrinsic motivations of individual respondents we definitely are in a framework of heterogeneity of intrinsic motivation (case ii).

presumed difference in intrinsic motivations.⁴ For instance, in an era of increasing government debt, the differential may be caused, among other factors, by the higher dependence of non profit organisation revenues from government contracts won with strong rebates in public procurement auctions. Alternatively, Preston (1988) finds that the same dependence from the public sector has determined in the past a differential in the opposite direction. Her result of a positive non profit/profit wage differential when the non profit industry is highly subsidised is interpreted by arguing that non profit managers have lower cost constraints. Third, the negative wage gap may be determined by quality differences between workers in the two sectors (Preston, 1989).

The central argument of our paper is that the picture may change if we consider the dynamic aspects of the relationship between intrinsic motivations and wages. Intrinsically motivated individuals may be more productive and, for this reason, if part of their higher productivity is remunerated by employers, they may end up having higher and not lower wages than their non intrinsically motivated colleagues. What must be tested from the empirical point of view is therefore whether the *static compensating differential hypothesis* (the labour supply schedule of intrinsically motivated workers is shifted to the right with respect to the standard labour supply curve and therefore their equilibrium wage is lower) is stronger or weaker than the dynamic hypothesis (intrinsically motivated workers are more productive and therefore end up gaining more).

The contribution of our paper goes in this direction. We test the effect of intrinsic motivations on wage differentials within the cooperative⁵ sector in Italy. Having different proxies of intrinsic motivations and working within one sector (and not on the comparison between profit and non profit) we can test directly the intrinsic motivation-wage nexus. The obvious limit of our analysis is that what we find works for the specific case of the cooperative not for profit industry. Even though the average level of intrinsic motivations in this industry may be higher than in the profit industry, we however believe that our results are likely to work also in the latter where we expect the same static and dynamic wage setting mechanisms at work, under the highly plausible assumption of an heterogeneous distribution of

⁴ Consider that non pecuniary motivations must be one of the causes of a profit/non profit wage gap if workers can move without frictions from one sector to the other. Frictions may however arise due to unemployment and mismatch between demand and supply of labour.

⁵ We will use cooperative and not for profit as synonyms in the paper. We explain how the cooperative may be defined as a not for profit in section 2.1. We will also use the term *not for profit* instead of *no profit* since very few productive organizations have a rigid statutory constraint which prevent them from having revenues higher than costs. The main characteristics of these organizations is, on our opinion, the constraint on the destination of such budgetary difference and the goal which is not profit maximization but the satisfaction of some social or multi-stakeholder goal. In this perspective not for profit means that the activity is not oriented as a first goal to profit maximization and that differences between revenues and costs must not predominantly remunerate shareholders.

intrinsic motivations for workers in the profit industry.⁶ This last point is however left to future research.

2. Data

The data used (ICSI 2007) were collected by a pool of six universities⁷ in 2006 through questionnaires submitted to a representative sample of 4,134 employees and 338 managers of 411 Italian cooperatives. The survey encloses a large set of questions ranging from socio-demographic controls (age, gender, education, etc.) to economic variables (e.g. wage), job characteristics (tasks, working hours, overtime) and job satisfaction with respect to a number of possible domains (with colleagues, wage, type of job). The result is an extremely rich database which allows to study the conditions and motivations of people employed in the Italian not-for-profit enterprises.

The initial sample was extracted from the ISTAT⁸ 2003 census on social cooperatives, which recorded 6,168 active cooperatives (with at least one employee) at the national level (Carpita, 2009, pp. 1-32). Representativeness at the national level was guaranteed by stratification on the basis of three parameters: typology of cooperative (Type A and Type B)⁹, geographic representativeness by province (the Italian state is made of 20 regions and 107 provinces); by size considering three classes (under 15, between 15 and 50, and over 50 employees). The final sample is made by 411 organisations. Of this initial stratified sample 186 organisations (45,3% of the total) accepted to participate in the study, while 164 did not accept to collaborate (39,9%), and 61 organisations (14,8%) did not answer. In firms below 15 employee who accepted to participate all workers were interviewed. In larger organisations the sample of respondents was extracted randomly. The distribution of 2,883 questionnaires to paid employees was programmed in the 186 organisations that accepted to participate, even if a partial loss of participants reduced the final amount to 2,419 compiled questionnaires.

In order to guarantee the representativeness of the data for all of the three stratification criteria 134 organisations were added to the initial sample. These were chosen through internet and personal contacts on the basis of the similarity with the non-participating cooperatives on the three criteria. The

⁶ The International Social Survey Programme on work orientations reports that more than 25% of workers consider as the most important characteristic the fact that their job “allows to help other people” and “is useful to society”. This share is equal in magnitude to that of workers valuing “high income” as the most important characteristics (see Clark, 2009). This evidence on the relevance of non pecuniary motivations is sharp. It implies that, when deciding on job offers, a significant fraction of the workers is driven more by moral and other-regarding considerations more than by personal interest.

⁷ Trento, Bergamo, Brescia, Milano Bicocca, Napoli and Reggio Calabria.

⁸ Italian National Agency for Statistics.

⁹ For details on characteristics of the two different types of cooperatives see section 2.1.

same procedures were followed also for the extraction of the sample of paid employees in each organisation. The final sample, which will be named ICSI 2007 hereafter, is made of 320 organisations and 4,134 questionnaires filled by paid employees.¹⁰

Four different questionnaires were distributed to the selected sample concerning respectively cooperatives, managers, paid and volunteer workers. In this article only data coming from the questionnaire distributed to paid workers and to the cooperative will be used. In such questionnaire the rate of individual nonresponses is extremely low since 85% of involved workers answered on average 90% of the 87 questions (56 single choice questions and 31 multiple choice questions).

2.1 Cooperative features and the not for profit industry

Cooperatives differ from traditional for profit firms for their goal of “*prevalente mutualità*”. This means that, differently from for profit firms, cooperatives create benefits *not under the prevailing form of profits* for some of their stakeholders. The two main types of traditional cooperatives are *workers cooperatives* (where workers are the dominant stakeholders and attribute to them benefits under the form of safer working conditions and/or participation to profits) and *consumers’ cooperatives* (where consumers are the dominant stakeholders and attribute to them benefits under the form of lower prices and higher quality of goods). Differently from traditional workers’ or consumers’ cooperatives, a new third cooperative type, *social cooperatives (cooperative sociali)*, pursues the goal of providing a social service to beneficiaries different from their shareholders. According to the Italian law 381/1991, the goal of social cooperatives is social work integration of disadvantaged subjects, community wellbeing and promotion of the human being. Social cooperatives are of two types: *type A social cooperatives* manage health and education services, while *type B social cooperatives* (also called work integration social enterprises) operate in industry, agriculture, trade or service sectors with the goal of inclusion of “disadvantaged” (disabled, ex prisoners, ex-drug addicted) workers (who must be at least 30 percent of the workforce).

All Italian cooperatives, are forced by law to accumulate at least 30% of their net surpluses in indivisible reserves of capital (*riserva legale*).¹¹ Beyond this obligation cooperatives can, but they need not to,

¹⁰ The distortion of the ICSI sample relative to the ISTAT sample is limited, since it amounts to an increased presence of cooperatives located in Northern Italy relative to the cooperatives located in Southern Italy, and a stronger presence of bigger cooperatives than in the initial sample. For a more precise account of the differences between the ISTAT 2005 sample and the ICSI 2007 sample the reader can refer to Carpita (2009, pp. 1-32).

¹¹ This percentage can be variable under different cooperative laws. For example, cooperative banks (Banche di Credito Cooperativo) must reinvest at least 70% of their net surpluses into indivisible reserves given the necessity to reinforce patrimonial stability and since their main aim is community development. These

distribute only a limited part of their surpluses in the form either of remuneration and re-evaluation of members' capital shares or in return for members' contributions (*ristorni*).¹² All remaining non-distributed net residuals are mandatorily accumulated in indivisible reserves of capital, which enjoy a privileged tax regime. Most cooperatives reinvest most of the times all the realised net surpluses in indivisible reserves in order to strengthen their assets and in order to build insurance funds against future risks (Navarra, 2009). Given the impossibility to have access to stock markets (the firm is not controlled by investors), internal funds made of reinvested net residual represent their main source of internal finance. Because of these reasons Italian cooperatives (and especially so social cooperatives which are object of our scrutiny) can be considered (almost completely) not-for-profit firms.

The third cooperative type (social cooperatives) shares with the two traditional types the same characteristics with two exceptions. First, social cooperatives have to declare in their statutes the public-benefit aim for which they have been created. Second, law 381/1991 regulated the possibility that they implement a multi-stakeholder governance, since more than one group of patrons (e.g. volunteer workers, paid workers, users, and other institutions) can be entitled the formal right to elect the board of directors.¹³ Their not-for-profit aim, coupled with social aim of their operation and the multi-stakeholder governance, justify the inclusion of social cooperatives among social enterprises.

3. Intrinsic motivations: descriptive findings

Intrinsic motivations are described in the specialised literature as attitudes or drivers of human behaviour that go beyond the satisfaction of mere physiological and security needs which require a monetary or, in any event, material remuneration. In the Maslow scale (1943, 1974) higher level needs are linked to non-material, or psychological aspects of human activity. Though their satiation is not necessary for physiological survival, they have a central role in defining psychological health.¹⁴ The well

reserves cannot be appropriated by members not even if the firm shuts down its operation. In this case the residual value of the reserves is to be conferred to a common national fund used to finance the start-up of new cooperatives, following the principle of enlarged mutuality.

¹² In worker cooperatives the *ristorni* are represented by end-of-the-year increases in labour remuneration calculated as a percentage of the wages distributed during the accounting year (up to 30%). In consumer cooperatives the *ristorni* are usually represented by end-of-the-year bonuses usable to buy the products of the cooperatives and calculated as percent of the total amount of products bought during the accounting year.

¹³ The multi-stakeholder governance is not compulsory as it happens, for example, in French *coopératives de solidarité sociale*. However, recent data (Borzaga et al., 2009) reveal that most social cooperatives do indeed include among their active stakeholders more than one group of patrons.

¹⁴ The pyramid of needs designed by Maslow (1974) identifies five categories: physiological needs (or prime needs), needs of security (included stability, and protection), needs of identification and involvement (both in a society, and in groups), needs of esteem (as self-esteem and other rewards), and needs of self-fulfilment (as implementation of personal and professional abilities).

known original definition of intrinsic motivation (Deci, 1975) states that: *‘one is said to be intrinsically motivated to perform an activity when he receives no apparent reward except the activity itself’*. Hence, such definition is linked to the non-material aspects of the job and psychological or intellectual satisfaction. The crucial aspect here is that, since higher level needs do not require (though they do not exclude either) monetary remuneration, workers may look for their satisfaction irrespective of the level of pay. Hence, even if the monetary remuneration is kept to a minimum, workers may be fully satisfied with their job when immaterial needs are satiated. From another perspective, some workers may decide to skip jobs that poorly satisfy intrinsic motivations, even when wages are higher. Intrinsic motivations include the interest in the activity performed, good relationships with other colleagues and with superiors, and involvement and autonomy in decision making at the operational and strategic level. These aspects are conclusively linked to work as defined by Locke (1969). The intrinsic nature is specific to the task and directed to the flow of activity, to goals that are self-defined, and the obligation of personal and social norms—benevolence, identity, fairness—for their own sake (Frey, 1997). Intrinsic motivations can both imply self-regarding preferences, as in the case of professional growth, as well as other-regarding preferences, as in the case of attention paid to the needs of the community (Ben-Ner and Putterman, 1998). Both these aspects can be included in the procedural and distributive fairness and in decision making.¹⁵ Hence, complementarity more than substitution can be expected of the different kinds of motivations stemming out of intrinsic motivations.

As for the ICSI 2007 survey data, in Table 1a we provide descriptive statistics for variables used in our econometric analysis. The average after tax monthly wage (net of bonus and premia) is 867 euros. Workers are for a large share women and young (average age is 37) reproducing a characteristics of the universe of cooperative workers. They are in the current job place since 6.2 years on average. Average education is close to 13 years and therefore coincides with high school degree (only 29 percent has university degree). Seventy five percent of respondents are also members of the cooperative in which they work.

In order to measure intrinsic motivations we start by considering question 8 in the workers survey where individuals are asked to give their degree of consensus (on a 1 to 7 Likert scale) to the following definitions of their job in the cooperative (see Table 2a).

- i) *a mere contractual relationship where job is exchanged for pay (d8.1);*
- ii) *a contribution which helps the cooperative to reach its goals (d8.2);*

¹⁵ The complementarity of self-regarding and other regarding preferences has already been noted since a long time in studies of social psychology, and it has been taken to signal more integrated personalities and psychologically healthy individuals (Maslow, 1954).

- iii) *a mix between professional growth in personal development (d8.3);*
- iv) *a set of relationships which goes beyond a mere contractual relation (d8.4);*
- v) *a social engagement common to the respondent and the cooperative (d8.5).*

We retain that high consent to the first definition of the current job (d8.1) is negatively correlated, while that with the other definitions (d8.2 to d8.5) is positively correlated with intrinsic motivations. As it is clear from the selected definitions our choice includes both self-regarding (d8.3) and other-regarding (d8.2 but especially d8.5) intrinsic motivations. More in general, we argue that consensus with d8.2 to d8.5 indicates that workers find an interest (formation, identification in cooperative goals, community and relational elements in the job, social engagement) and an utility in the job which goes beyond the mere remuneration and other contractual entitlements.

We also include other two items measuring whether, before finding the current job in the cooperative, the respondent was looking for a job

- i) *allowing him/her to be helpful for other people (d52.2).*
- ii) *promoting his self-fulfilment (d52.3)*

These items focus more on the other-regarding than on the self-regarding component of intrinsic motivations. Here again we consider high points given to these two statements as a signal that the individual does not look for monetary compensation only but also pursues her self-fulfilment and the satisfaction of his/her intrinsic motivations.

From a descriptive point of view the level of intrinsic motivation seems to be generally high (Table 2b). This is shown by the fact that the average degree of consensus to statement d8.1 (inversely correlated with intrinsic motivations) (2.55) is under the central value of four and far lower than that (around and above 5) to the statements which we consider as positively correlated with intrinsic motivations (d8.2 to d8.5, d55.2 and d55.3). This high average reflects that the share of respondents attaching the two highest scores (6 and 7) to the items whose score is positively correlated with intrinsic motivations are always above 50 percent (with the exception of question d8.4) (Table 2b).

5. Econometric findings

In this section we start our econometric analysis by verifying the existence of a significant nexus between wages and intrinsic motivations. The discussions about direction of causality and robustness, will follow in the next sections.

In order to estimate the impact of intrinsic motivations on wage setting in cooperative firms we adopt the following standard reduced form specification used in cross-sectional estimates of wage differentials

$$Y = \beta_0 + \beta_1 Male_i + \beta_2 Age_i + \beta_3 Education_i + \beta_4 Italian_i + \beta_5 Member_i + \beta_6 Yearcoop_i + \beta_7 Permanent_i + \beta_8 Fulltime_i + \beta_9 Medium_i + \beta_{10} Large_i + \beta_{11} AType_i + \beta_{12} NorthEast_i + \beta_{13} NorthWest_i + \beta_{14} Center_i + \varepsilon_i$$

where the dependent variable (Y) is regressed on a set of independent variables which include a gender dummy ($Male$), respondent's age (Age), education years ($Education$), a dummy for Italian nationality ($Italian$), a dummy which takes value of one if the respondent is also member of the cooperative ($Member$), the number of years of work in the cooperative ($Yearcoop$), two dummies for permanent and fulltime job status ($Permanent$ and $Fulltime$ respectively), two dummies for medium and large size ($Medium$ and $Large$), a dummy which takes value of one if the respondent works in the A-Type cooperative (A-Type) and three macroarea dummies ($NorthEast$, $NorthWest$ and $Center$).

Among controls we include not only industry classification for the two different (A and B) types of cooperatives but also additional dummies based on types of customers served (for A-types) and integrated employee category (for B-types) which, on our opinion, give (combined with the above mentioned industry classification) a finer taxonomy of the cooperatives under scrutiny.¹⁶

As dependent variables we consider alternatively: i) the level of monthly after tax wage; ii) the previous variable plus bonus and premia and iii) the hourly wage. The corresponding regressions are estimated with dependent variables in levels and logs. As it is well known the log-linear specification with wage as dependent variable corresponds to the Mincerian (1974) equation whose coefficients can be interpreted as regressors' rate of returns in terms of worker's earnings.

¹⁶ The type A cooperative industry classification includes: social assistance; health and rehabilitation; education, culture, recreation. Type A cooperative customers include: elderly people, children or adolescents, mentally disabled, psychically disabled, victims of addiction, unemployed, homeless, immigrants.

The type B cooperative industry classification includes: agriculture; green maintenance; garbage collection and other environmental services; manufacturing (leather, paper, wood); retail; bar and restaurants; laundries; housing and housing maintenance; housemaid services; informatics, printing and call centres. Work integration employee categories are: physically disabled and psychically disabled, victims of addiction, ex-convicted, immigrants, young unemployed, long-term unemployed.

Econometric results yield clear cut evidence on the role of intrinsic motivations. In the simpler specification with the level of monthly wage (net of bonus and premia) as dependent variable we find that consensus to statement d8.1 (*work as a mere contractual relationship where job is exchanged for pay*) has negative and significant effects on wages (Table 3, column 1). From a quantitative point of view (under the restrictive assumption that the regressor is continuous) a unit point rise in consensus to this statement from the sample average degree of consensus (2.59) reduces the wage by 8.6 euros. This implies that those declaring the highest degree of consensus to this statement may earn up to 5 percent less than average.

All other intrinsic motivation proxies are significant in the expected direction, with the exception of agreement with statement d8.2 (not significant, column 3) and d52.2 (weakly significant, column 8).

About standard controls we observe a significant and strong gender differential (females earn around between 58 and 64 euros less than average according to different specifications), a positive effect of seniority (around 10 euros more for any additional year in the current job place) and macroregional wage differentials which compensate existing imbalances in the purchasing power parities among Italian macroregions.¹⁷ The insignificant effect of education confirms that types of activities in social cooperatives do not remunerate skill premia, while the positive and significant effect of the type-A cooperative dummy is consistent with the hypothesis that work integration in type-B cooperatives has extra costs in terms of average productivity.

As a robustness check of our findings we slightly change our dependent variable by considering the net after tax monthly wage plus bonus and premia (Table 4). The rationale for looking at this indicator is that bonuses and premia are not necessarily unexpected surprises. As a consequence, rational workers should already incorporate expectations about these extraordinary items in the total expected after tax remuneration. Results presented in Table 4 show that our findings do not change much. The last two intrinsic motivation proxies looking at workers desires before getting the last job (d52.2 and d52.3) become insignificant, while the other variables remain significant (even though some of them weakly significant).

An interesting finding is that, by adding bonuses and premia to the wage in the dependent variable the effect of variables measuring self-regarding intrinsic motivations (d8.1, d8.2 and d8.3) is enhanced, while that of a variable measuring other-regarding intrinsic motivations (d52.2) is weakened. This is

¹⁷ Cannari and Iuzzolino (2009) calculate the cost of living by integrating the information provided by the Italian National Institute of Statistics (ISTAT) with data from other official sources on other services (e.g. energy, public services, transportation etc.) and on real estate prices and rents. On this basis they show that PPP correction raises the value of real wages in the South with respect to the Center and (even more) to the North East and NorthWest.

consistent with two hypotheses: i) self regarding intrinsic motivations cause higher productivity and wages; ii) premia are used to stimulate the productivity component depending from self-regarding or relational intrinsic motivations.

A third dependent variable considered in our analysis is the hourly wage. How to define it is not an easy question. Our data measure contractual hours but also, separately, extra hours (overtime) which can be remunerated or not.¹⁸ Intrinsically motivated workers are expected to give extra effort (and part of it is probably not going to be paid), which should translate into more extra hours. Hence, by including also extra hours we expect a lower (positive) impact of intrinsic motivations on wages.

Results presented in Table 4 (second line) confirm our expectations showing that indeed only two indicators (d8.2 and d8.4) remain positive and significant when we include extra hours in the calculation of hourly wage. To check whether the conjecture that intrinsically motivated workers have higher overtime hours is correct we recalculate hourly wage by excluding from the denominator extra hours. In such case we have three significant indicators.¹⁹

5.1. An intrinsic motivation principal component

Each of the six proxies considered so far capture only some limited and specific aspects of self or other-regarding intrinsic motivations (lack of non monetary motivations, presence of intrinsic motivations related to formation, identification in cooperative goals, community and relational elements in the job, social engagement, non monetary motivations measured before entering the cooperative). Needless to say, each of these items taken individually are very imperfect proxies of the focus of our investigation and it is highly likely from the pairwise correlation of answers (Table 5a) that workers can have more than one intrinsic motivation. Hence, it is convenient to transform the larger number of correlated variables into a smaller number of uncorrelated ones revealing the internal structure of the data in a way which may capture better and more parsimoniously their variability.

This is the reason why we apply the principal component analysis to the vector of the seven considered proxies. This solution appears superior to: i) the inclusion of single indicators given the inadequacy of

¹⁸ Unfortunately the partition between remunerated and not remunerated overtime hours is not available in the database (questions d9 and d10).

¹⁹ A more direct check is obtained by estimating a regression where the number of extra hours is directly considered as dependent variable. In such case we have three significant and positive indicators. Results are omitted for reasons of space and available upon request.

each of them taken individually to give a complete picture of the phenomenon and ii) the inclusion of all the indicators in the same specification given the redundancy of information.

Table 5b documents the relevance of the first component which captures 39 percent of the variability. Such component is negatively correlated with the first item and positively correlated with all the others, with correlation coefficients which never fall below 26 percent (Table 5c). The Kaiser-Meyer-Olkin measure of sampling adequacy (.76) (Kaiser and Rice, 1974) excludes that the selected variables have too little in common to warrant a factor analysis.

We therefore repeat all previously described econometric estimates by replacing the first principal component to the individual items proxying intrinsic motivations. Our results show now unequivocally positive and significant effects in all cases (including that of the hourly wage which includes overtime at the denominator) (Table 6).²⁰

5.2 Intrinsic motivations, productivity and job donation

The previous sections identified a significant positive correlation between intrinsic motivations and wages, which seems to contradict the standard donative-labour hypothesis. With some additional empirical analysis we now try to verify closely the correspondence between the two (static and dynamic) theoretical frameworks and our data. To do so we decompose the donative-labour hypothesis in two parts: i) intrinsically motivated workers donate more worked hours; ii) the wage of intrinsically motivated workers is significantly lower than that of non intrinsically motivated workers.

The first part of the hypothesis (intrinsically motivated workers donate more job) seems confirmed by our results on the significant effect of some of our proxies and of the principal component on extra hours (Table 6, last column). To provide an additional check for this result we consider as dependent variable the amount of arrear holidays and regress them over the usual battery of socio-demographic and industry controls. The impact of proxies of intrinsic motivations is positive and significant in four out of seven cases. Hence, it seems that more intrinsically motivated workers donate time to their

²⁰ Note that the second principal component has a much lower explanatory power (13 percent) but still a higher than one eigenvalue. Since it is negatively correlated with consensus to d8.1, d52.2 and d52.3 questions, while positively correlated with d8.2 to d8.5 questions, it could capture individuals who had high ex ante intrinsic motivations (consensus to d52.2 and d52.3 questions) which where frustrated ex post (high consensus to the d8.1 question). When we include it in the estimate however its effect is not significant and the impact of all other regressors is unchanged. Results are omitted for reasons of space and available upon request.

employers by working more extra hours (some of them unpaid)²¹ and accumulating more arrear holidays (postponing vacation is also a donation for individuals with positive discount rates and utility from leisure) (Table 7).

However, the second part of the static donative-labour hypothesis is not confirmed by our data: intrinsically motivated workers end up with higher (or not significantly different) and not lower wages than their non intrinsically motivated counterparts as the labour donation theory predicts.

We therefore check whether our findings are consistent with our dynamic theoretical hypothesis (intrinsically motivated workers donate more job but they are also significantly more productive given their intrinsic motivations and therefore end up having higher wages when the second effect dominates the first).

Our empirical findings seem to support this assumption with the positive correlation between intrinsic motivations and wages but what needs to be demonstrated is the plausibility of the maintained assumption, that is, *intrinsically motivated workers are paid more because they are more productive*.

Do we have a measure of the link between productivity and intrinsic motivations which is independent from wages ?

We already got signals of this higher productivity by finding that intrinsic motivations lead to higher overtime and arrear holidays. We find additional evidence by looking at answers to a question in which workers are asked to judge their effort relative to: i) what required by the cooperative; ii) needs of beneficiaries of the cooperative services; iii) the effort of other workers in the cooperative; iv) their pay.

In all of these cases proxies of intrinsic motivation (and their principal components) are strongly significant and positive, net of the impact of other standard controls (Table 8).²² This implies that, according to respondents self-evaluation, intrinsically motivated workers attribute to themselves a higher level of effort with respect to i) their pay, ii) co-workers, iii) what required by the cooperative and iv) needed by beneficiaries. Under the reasonable assumption that effort is positively related to productivity, more intrinsically motivated workers are more productive if we believe to these answers.

It is not unreasonable to suspect here that intrinsically motivated workers may have reasons for providing biased answers to these questions in order to provide a consistent picture of their “diligent

²¹ Unfortunately the question does not allow to assess the exact amount of paid and unpaid extra hours but only whether some extra hours were unpaid (questions d9 and d10).

²² The impact of individual proxies of intrinsic motivations is positive and significant for all of the four relative efforts considered for two indicators (d52.2 and d52.3) , while significant for all proxies of intrinsic motivations when the level of effort with respect to one’s own pay is considered.

worker” image. Since however we are confronting here their answers with those of non intrinsically motivated workers there are no particular reasons why also the latter shouldn’t try to overrate their effort.

To conclude with, if we define productivity as the ratio between contribution to the cooperative output and wage, we can say that intrinsically motivated workers are more productive for at least two reasons: i) they are willing to postpone holidays and work more hours even if some of them are not paid; ii) the ratio between effort, at the nominator, and pay, cooperative needs or other workers effort, at the denominator, is positively related to intrinsic motivations.

It is remarkable to observe then that, in spite of the higher amount of extra hours (some of which unpaid) which may have negative effects on hourly wages, intrinsically motivated workers get higher pay even when measured in terms of hourly wage. A reasonable explanation for this finding is that *intrinsic motivations create extra productivity which compensates the amount of job donated and leads to a higher pay.*

5.3 Quantile regressions

We so far measured effects of our regressors on sample means of our dependent variables. As a robustness check we may verify whether the documented effects work also on other relevant moments of the dependent variable distribution. To this purpose we estimate quantile regressions (Koenker and Basset, 1978), in a robustness check adopted in several wage differential studies (see for example the set of studies collected in Fitzenbergen, Koenker and Machado, 2002, and the application to the Italian labour market by Naticchioni, Ricci and Rustichelli, 2007).

More specifically we estimate the impact of our controls on the 25th, median and 75th value of the dependent value cumulative distribution.

Our principal component has a significant impact on all of the three considered levels of the distribution.. confirming that the effect of intrinsic motivation is not limited to the mean wage (see Table 9).

5.4 Causality and IV estimates

The observed positive link among intrinsic motivations, productivity and wages does not allow per se to establish a clear cut direction in the causality nexus. If it is plausible that higher intrinsic motivations

lead to higher productivity and wages, we must convince the reader that the reverse link does not nullify our interpretation of results. It is indeed possible to imagine, at least in principle, that individuals who are relatively better remunerated express for this reason (and having satisfied monetary needs first) stronger nonpecuniary desires or view their work in the cooperative in a more positive way. From this point of view the main suspects of reverse causality are questions d8.1 and d8.2 to d8.5. Less so the last two items asking about goals and preferences before the last employment. In addition to it, it is possible that the observed correlation depend from a third factor omitted from the analysis. Diagnostics confirm the suspicion of endogeneity and the need of IV estimates in almost all cases: in the Davidson – McKinnon (1993) test of exogeneity (where the null hypothesis states that an ordinary least squares (OLS) estimator of the same equation would yield consistent estimates) the null of exogeneity is not rejected for the d8.1 indicator, rejected at 5 but not at 1 percent for d8.2, d8.3, d8.4 and d8.5 indicators, rejected at 1 percent for d52.2 and d52.3 indicators (Table 10).

When looking for a plausible instrument we consider information on the volunteering activities done in the respondents' life up to the moment in which they got the current job. More specifically, individuals asked about this issue have the possibility of answering that they have never volunteered in their life. We expect this instrument to be relevant since an affirmative answer to this question should be inversely correlated with declarations of intrinsic motivations.

We therefore start from this result considering it as an indication of the relevance of the voluntary dummy when used to instrument the intrinsic motivation proxy. As a consequence, we estimate an instrumental variable regression where the endogenous variable is exactly specified. A limit of our approach is that, as it is well known with a just identified model, it is impossible to test for validity, that is, lack of correlation of the instrumental variable with the structural equation error. We must therefore proceed with intuition on this point as we did arguing about the intuitive absence of reverse causality when using information on volunteering activities done in the past. What cannot be ruled out here is a second cause of endogeneity, that is, an omitted variable which correlates with both the instrumented and the dependent variable.

From a statistical point of view our instrument is relevant since the F test of the excluded instrument in the first stage regression always rejects the null confirming that the instrument has a significant impact on the instrumented variables, net of the effect of other regressors.

To assess more in depth the properties of our instrument we report a series of other tests.

The Stock and Yogo (2005) statistics allows us to test whether our instrument is weak. In essence, we test the null of a distortion of a given percentage (5, 10, 15 percent) with a Wald test on the TSLS

estimator due to a downward bias of the estimated variance. In case of the d52.3 indicator the test value falls between the 15 percent and the 10 percent threshold so that we have to reject the null that the size of the bias is at most 10 percent but we do not reject that it is at maximum 15 percent. In the case of the d52.2, d8.1 and d8.2 indicators the bias is smaller since we do not reject that it is at maximum 10 percent. For indicators d8.4 and d8.5 it is instead larger and since we reject the 15 percent but not the 20 percent one. For question d8.3 the size of the bias is maximum since we cannot reject that it is at most 25 percent.

Due to the presence of these biases, we perform the **Anderson – Rubin (1949)** Wald test, robust to the presence of weak instruments when the sample size is large, where the null hypothesis is that the coefficient of the endogenous regressor in the structural equation is equal to zero. We reject the null that the coefficient on the intrinsic motivation indicator is zero at 1 percent for questions d52.2 and d52.3, at 5 percent but not at 1 percent for indicators d8.3 to d8.5 and at 10 percent only for indicators d8.1 and d8.2.

After all these checks on our instruments we find that intrinsic motivations continue to be significant in the IV estimates since in the second stage IV estimate the instrumented variable is significant at 5 percent (d8.1) at 10 percent (d8.3) when we consider our seven different proxies.

The conclusion after IV estimates and the battery of tests is that: i) the d8.1 variable effect measured in non instrumented estimates can be considered valid since not affected by endogeneity; ii) the d52.2 and d52.3 indicators are still valid and significantly different from zero when the latter are instrumented; iii) the instrumented indicators d8.2, d8.4 and d8.5 have an effect significantly different from zero only if we consider the 5 percent significant level.

Finally, we perform the exogeneity test on our principal component and find that the null is not rejected (p -value = .18). This is a very encouraging result since most of our strongest results in the non instrumented estimates are based on the use of the principal component and do not suffer from endogeneity. Consider however that the Davidson – McKinnon exogeneity test is relative to the selected set of considered instruments. We would therefore need to evaluate that the result found is robust to the modification of our set of instrumental variables.

In order to overcome the limits of exactly specified models, and to test the robustness of exogeneity of the d8.1 and of the principal component variable to a different set of instruments, we identify an additional instrument in the degree of consent to the question in which respondents are asked whether they have been initially attracted toward the cooperative by wage and economic incentives (D55.11). We consider the two variables as inversely related to intrinsic motivations and not suspect of reverse

causality as it refers to opinions before being hired in the actual job. We cannot however completely exclude that a third unobserved factor affect both this and the dependent variable. The advantage however is that we can now test validity together with relevance of our instruments.

Results on the new IV specification are encouraging (Table 11). The instrumented regressor is significant in the second stage estimate in all of the eight cases (individual indicators and principal component) considered. The Shea test on the first stage equation documents that new set of instrument is always relevant and the Hansen test on overidentifying restrictions never reject the null of validity. Results from the endogeneity test parallel those from the exactly specified model. Exogeneity is not rejected for variable d8.1 and the principal component confirming the robustness of the finding that estimated coefficients are not significantly different under OLS and IV estimates under different set of proper instruments.

To conclude with we found some evidence that our results may be robust to endogeneity. Robustness to reverse causation is first argued on logical grounds in the exact specification (even though we cannot exclude a third driving factor correlated with both the instrument and the dependent variable). Instrument validity is successfully tested when we use two instruments. Finally, the most important indicator of intrinsic motivation (the first principal component) does not reject the null of exogeneity. We are aware that these findings are not definitive since both the Hansen and the Davidson McKinnon tests are sensitive to the specific set of instruments considered. However, the robustness of results from these two tests to changes in the set of plausible instruments give us more confidence on the reliability of our findings .

6. Conclusions

Findings on the profit/no profit differentials from several empirical studies in the literature have been interpreted as evidence documenting the relationship between intrinsic motivations and wages. In many of these studies non profit workers have been shown to earn significantly less than their counterparts working in the profit industry. This finding has been interpreted as evidence consistent with the labor donative hypothesis: intrinsically motivated workers find superior non pecuniary compensations when working in the no profit industry and therefore accept to sacrifice part of their wages for it. The different satisfaction of intrinsic motivations acts therefore as a compensating differential of the profit/no profit wage difference.

However, there are some important limits in what the profit/no profit differential can tell about the relationship between wages and intrinsic motivation.

It is true that, in absence of frictions between the two sectors, workers from the no profit sector could move to the for profit one and therefore intrinsic motivations must matter. In presence of frictions however the story may be less convincing. In addition, the literature has found many other factors affecting the profit/non profit wage gap (softer budget constraints in the no profit industry when the latter is highly subsidised, self selection and differences in quality between workers in the two sectors, etc.) which prevent us to interpret the observed differential as the effect of intrinsic motivations only. The above mentioned limits could not however be overcome so far in the literature due to the impossibility of measuring directly intrinsic motivations.

In this paper we can shed more light on the issue by looking at the relationship between intrinsic motivations and wage within the cooperative (not for profit) sector and exploiting the advantage of measuring directly intrinsic motivations, by means of subjective data on the self-evaluations concerning 4134 paid workers employed by 320 Italian social enterprises.

Our findings are not in contrast with the labour donative hypothesis (more intrinsically motivated workers have indeed more accrued holidays and hours of unpaid overtime) but highlight also a dynamic effect which could not be identified by the previous approach. More intrinsically motivated workers are more productive and earn higher wages than their less motivated counterparts.

Our results have relevant consequences in terms of policies and industrial relations. They reveal that intrinsic motivations are a very important (and still only partially explored) driver of productivity. They suggest that a reduced distance between corporate goals and employees intrinsic motivations may generate significant productivity gains. Such distance may help to explain part of the variability of corporate outcomes not accounted for after controlling for contribution of traditional productive inputs. Without concealing the limitations in the representativeness of our results, which do not necessarily represent also the profit sector, we believe that future research on more representative samples of employees economy-wide can confirm many of the hypotheses that have informed the development of this work.

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Table 1. Descriptive statistics on socio-economic variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Wage	3,744	867.45	298.85	100	6,453
Ln of wage	3,744	6.70	0.37	4.61	8.77
Hourly wage	2,698	6.70	2.29	1.46	50
Ln of hourly wage	2,698	3.25	0.25	1.76	5.30
Bonus	4,134	77.20	285.34	0	6,000
Hours	3,740	31.31	8.66	2	50
Hours extra	3,092	1.79	3.30	0	30
Holidays in arrears	4,073	6.80	12.42	0	189
Male	4,082	0.26	0.44	0	1
Age	3,986	37.38	9.02	17	73
Education	3,759	12.93	3.35	0	21
Italian	4,134	0.95	0.22	0	1
Member	4,134	0.76	0.43	0	1
Years in Coop	3,905	6.21	4.89	0	36
Permanent	4,134	0.80	0.40	0	1
Full-time	4,063	0.56	0.50	0	1
Medium Coop	4,134	0.32	0.46	0	1
Large Coop	4,134	0.43	0.50	0	1
Type A	4,134	0.78	0.41	0	1
North-West	4,134	0.40	0.49	0	1
North East	4,134	0.22	0.41	0	1
Centre	4,134	0.22	0.41	0	1

Table 2a. Description of the questions concerning the intrinsic motivations

Variable	
<i>Relationship with the social enterprise *</i>	
D8.1: Pure contract	You consider your relation with the social enterprise as a pure mere labor contract
D8.2: Contribution to the social enterprise	You consider your relation with the social enterprise as contribution to achieve the social enterprise's targets
D8.3: Mix (job and personal growth)	You consider your relation with the social enterprise as mix of job and personal growth
D8.4: Mix (beyond mere job)	You consider your relation with the social enterprise as a set of relationships which go beyond the mere work relationship
D8.5: Social commitment	You consider your relation with the social enterprise as joint social commitment from you and your institution
D55.2: Useful job for the people	You were looking for a job which could be useful to other people
D55.3: Personal accomplishment in job	You were looking for personal accomplishment also in the job
<i>Effort at work **</i>	
D34.1: social enterprise needs	What is your effort with respect to the SE's needs?
D34.2: clients' needs	What is your effort with respect to the clients' needs?
D34.3: colleagues' effort	What is your effort with respect to your colleagues' effort?
D34.4: wage	What is your effort with respect to your wage?

* Values range from 1 to 7, where 1 stands for "I fully disagree" and 7 for "I fully agree"

** Values range from 1 to 7, where 1 stands for "Much less than required" and 7 "Much more than required"

Table 2b. Summary statistics of the questions concerning the intrinsic motivations

Variable	Obs.	Mean	Std.Dev.	Min	Max	Percentage of respondents for each declared value						
						1	2	3	4	5	6	7
D8.1: Pure contract	3,457	2.55	1.91	1	7	47.53	14.03	9.55	11.48	6.25	4.8	6.36
D8.2: Contribution to the social enterprise	3,564	5.20	1.57	1	7	2.95	3.28	7.01	18.52	20.17	21.91	26.15
D8.3: Mix (job and personal growth)	3,554	5.45	1.48	1	7	2.08	2.95	4.25	15.17	19.3	26.17	30.08
D8.4: Mix (beyond mere job)	3,494	4.91	1.75	1	7	5.35	6.44	8.44	17.43	18.83	20.78	22.72
D8.5: Social commitment	3,556	5.31	1.61	1	7	3.49	3.68	5.65	15.94	16.96	24.97	29.3
D55.2: Useful job for the people	3,865	5.31	1.68	1	7	3.36	4.81	6.39	15.83	15.01	22.04	32.55
D55.3: Personal accomplishment in job	3,877	5.68	1.43	1	7	1.93	2.09	3.82	11.63	16.02	27.6	36.91
D34.1: social enterprise needs	4,020	5.39	1.13	1	7	0.22	0.22	0.92	26.09	23.03	30.22	19.28
D34.2: clients' needs	4,031	5.32	1.36	1	7	1.74	2.94	3.41	26.45	21.50	28.50	15.46
D34.3: colleagues' effort	3,858	4.77	1.07	1	7	0.54	0.52	1.97	49.07	21.49	18.61	7.80
D34.4: wage	3,907	5.45	1.36	1	7	1.13	1.33	2.46	24.37	17.71	23.57	29.43

Table 3. Regressions of net monthly wage, without bonuses

Variable	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Male	61.89 (6.71)	64.33 (6.47)	58.38 (5.99)	58.43 (5.93)	59.54 (6.01)	57.89 (5.90)	64.34 (6.80)	64.12 (6.78)
Age	-0.10 (-0.20)	0.09 (0.15)	0.27 (0.48)	0.26 (0.45)	0.24 (0.41)	0.09 (0.15)	0.27 (0.50)	0.06 (0.11)
Education	0.03 (0.02)	-0.14 (-0.12)	0.03 (0.03)	0.00 (0.00)	0.11 (0.09)	0.17 (0.14)	0.27 (0.24)	0.20 (0.18)
Italian	-59.40 (-2.31)	-85.88 (-3.13)	-77.85 (-2.74)	-74.67 (-2.68)	-78.66 (-2.78)	-71.30 (-2.55)	-66.05 (-2.41)	-68.29 (-2.46)
Member	1.92 (0.20)	-4.96 (-0.49)	-0.68 (-0.07)	3.71 (0.36)	-0.66 (-0.06)	0.07 (0.01)	6.56 (0.67)	3.71 (0.38)
Years in Coop	9.93 (8.51)	10.86 (8.08)	9.87 (7.66)	10.57 (7.92)	10.44 (7.79)	10.56 (8.15)	9.84 (8.04)	10.28 (8.47)
Permanent	52.39 (4.49)	44.18 (3.45)	42.70 (3.41)	41.26 (3.20)	39.24 (3.09)	41.74 (3.29)	47.19 (3.94)	47.79 (3.99)
Full-time	282.01 (31.80)	285.16 (28.90)	288.00 (30.15)	282.58 (28.92)	285.12 (29.25)	287.44 (29.19)	281.03 (30.75)	281.36 (30.80)
Internship	-31.76 (-1.21)	-37.94 (-1.33)	-38.62 (-1.39)	-39.72 (-1.42)	-37.54 (-1.31)	-34.96 (-1.27)	-27.48 (-0.99)	-36.40 (-1.29)
Medium	-1.39 (-0.12)	-0.22 (-0.02)	-1.69 (-0.14)	2.54 (0.21)	-3.40 (-0.28)	-0.75 (-0.06)	2.87 (0.25)	0.46 (0.04)
Large	-16.60 (-1.33)	-7.85 (-0.58)	-9.15 (-0.70)	-11.29 (-0.84)	-10.05 (-0.74)	-13.22 (-0.98)	-10.98 (-0.86)	-11.95 (-0.93)
Type A	121.95 (4.86)	116.26 (4.36)	117.93 (4.53)	127.08 (4.65)	122.16 (4.49)	127.09 (4.70)	123.97 (4.79)	122.12 (4.58)
North-West	128.54 (9.58)	120.19 (8.18)	125.55 (8.80)	123.69 (8.45)	128.11 (8.67)	125.43 (8.59)	126.38 (9.13)	124.87 (9.00)
North-East	126.01 (9.04)	111.17 (7.19)	121.07 (8.15)	119.23 (7.81)	122.87 (7.95)	118.71 (7.78)	126.32 (8.80)	122.74 (8.45)
Centre	90.81 (6.18)	84.87 (5.21)	89.52 (5.67)	89.62 (5.51)	88.41 (5.48)	89.43 (5.50)	87.10 (5.75)	87.71 (5.75)
D8.1		-8.62 (-4.21)						
D8.2			3.94 (1.47)					
D8.3				6.57 (2.24)				
D8.4					5.03 (2.01)			
D8.5						6.81 (2.52)		
D55.2							7.21 (2.80)	
D55.3								4.15 (1.70)
Constant	473.19 (10.52)	529.41 (10.90)	473.97 (9.14)	444.70 (8.51)	466.43 (8.71)	442.44 (8.64)	419.11 (8.27)	452.82 (9.17)
N. of obs.	3,121	2,700	2,758	2,738	2,710	2,756	2,976	2,968
R²	0.44	0.44	0.45	0.44	0.44	0.44	0.44	0.45

Notes: All regressions include dummy variables for the type of client served and sector of activity of the social enterprise. T-stats are in round brackets.

Table 4. Effects of intrinsic motivations on wages and extra hours

Dep. variable	Regressor						
	D8.1	D8.2	D8.3	D8.4	D8.5	D55.2	D55.3
Wage plus bonus	-15.57 (-4.26)	10.07 (2.22)	10.53 (2.06)	6.77 (1.64)	7.77 (1.71)	0.33 (0.07)	5.75 (0.92)
Hourly wage	-0.15 (-1.35)	0.13 (1.17)	0.38 (3.04)	0.04 (0.33)	0.26 (2.12)	0.15 (1.40)	0.18 (1.37)
Hourly wage without extra hours	-0.22 (-2.06)	0.13 (1.03)	0.43 (3.23)	0.17 (1.54)	0.20 (1.51)	0.10 (0.76)	0.31 (2.57)
Extra hours	-0.03 (-0.78)	-0.01 (-0.16)	0.05 (1.04)	0.10 (2.52)	0.02 (0.53)	0.13 (3.12)	0.12 (2.50)
Ln of wage	-0.01 (-3.81)	0.00 (0.91)	0.01 (1.99)	0.01 (1.91)	0.01 (2.23)	0.00 (1.46)	0.01 (2.75)
Ln of (wage plus bonus)	-0.02 (-4.69)	0.00 (1.03)	0.01 (1.53)	0.01 (1.42)	0.01 (1.47)	0.00 (0.39)	0.01 (2.27)
Ln of hourly wage	0.00 (-1.58)	0.00 (0.98)	0.01 (2.15)	0.00 (0.49)	0.01 (2.49)	0.00 (0.91)	0.00 (0.94)

T-stats are in round brackets.

Table 5a. Pairwise correlation coefficients among intrinsic motivation variables

	D8.1	D8.2	D8.3	D8.4	D8.5	D52.2	D52.3
D8.1	1	-0.209	-0.345	-0.368	-0.344	-0.083	-0.081
D8.2		1	0.359	0.316	0.391	0.114	0.111
D8.3			1	0.493	0.417	0.130	0.163
D8.4				1	0.447	0.102	0.096
D8.5					1	0.223	0.124
D52.2						1	0.309
D52.3							1

Table 5b. Principal Component Analysis (PCA)

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp. 1	2.73	1.41	0.39	0.39
Comp. 2	1.32	0.55	0.19	0.58
Comp. 3	0.77	0.14	0.11	0.69
Comp. 4	0.63	0.04	0.09	0.78
Comp. 5	0.59	0.10	0.08	0.86
Comp. 6	0.49	0.03	0.07	0.93
Comp. 7	0.46	.	0.07	1.00

Table 5c. Principal components

Variable	Comp. 1	Comp. 2	Comp. 3	Comp. 4	Comp. 5	Comp. 6	Comp. 7	Unexplained
D8.1	-0.37	0.16	0.66	0.55	0.30	0.00	0.07	0
D8.2	0.37	-0.20	0.72	-0.35	-0.36	0.21	-0.14	0
D8.3	0.45	-0.14	0.00	0.52	-0.32	-0.64	-0.04	0
D8.4	0.44	-0.22	-0.17	0.49	0.19	0.66	-0.16	0
D8.5	0.44	-0.14	0.12	-0.24	0.71	-0.24	0.38	0
D55.2	0.26	0.66	0.02	-0.09	0.24	-0.12	-0.65	0
D55.3	0.27	0.65	0.00	0.07	-0.27	0.21	0.62	0

Table 6. Regression results with principal component

Regressor	<i>Dependent variable</i>					
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Wage+bonus	Wage	Ln of wage	Hourly wage	Ln of h. wage	Hol. in arrears
Male	73.22 (3.75)	61.91 (6.06)	0.07 (5.94)	1.26 (2.02)	0.03 (2.22)	0.03 (0.05)
Age	0.93 (0.87)	0.39 (0.62)	0.00 (1.04)	0.05 (1.56)	0.00 (1.91)	-0.02 (-0.56)
Education	1.66 (0.82)	0.18 (0.15)	0.00 (0.53)	-0.03 (-0.57)	0.00 (-0.88)	0.03 (0.40)
Italian	-90.71 (-2.13)	-89.48 (-2.99)	-0.10 (-3.23)	0.05 (0.07)	0.00 (-0.10)	-1.55 (-0.82)
Member	24.46 (1.50)	0.10 (0.01)	0.01 (0.39)	-1.52 (-2.46)	-0.05 (-3.07)	0.76 (1.28)
Years in Coop	18.39 (6.75)	10.68 (7.52)	0.01 (8.45)	0.27 (5.04)	0.01 (6.35)	0.20 (2.99)
Permanent	77.11 (4.63)	39.36 (3.03)	0.06 (3.40)	-1.42 (-1.55)	-0.01 (-0.34)	4.81 (8.53)
Full-time	307.98 (18.86)	286.57 (27.94)	0.39 (31.25)	-2.44 (-5.09)	-0.06 (-5.42)	1.64 (3.18)
Medium	22.16 (1.14)	0.25 (0.02)	0.02 (1.02)	-0.15 (-0.25)	-0.01 (-0.53)	0.36 (0.48)
Large	35.07 (1.62)	-4.82 (-0.34)	0.00 (0.15)	0.19 (0.27)	-0.01 (-0.38)	0.94 (1.29)
Type A	162.50 (3.71)	121.82 (4.22)	0.18 (4.04)	5.04 (4.44)	0.19 (4.55)	-2.06 (-1.38)
North-West	187.29 (7.70)	128.22 (8.31)	0.17 (8.40)	1.90 (3.22)	0.08 (4.13)	4.42 (6.45)
North-East	132.73 (5.26)	121.31 (7.45)	0.18 (8.24)	1.56 (2.12)	0.06 (2.80)	2.55 (3.16)
Centre	98.99 (3.66)	90.68 (5.30)	0.13 (6.24)	2.00 (2.16)	0.05 (2.53)	2.89 (3.71)
PCfirst	12.37 (2.48)	8.83 (3.35)	0.01 (2.88)	0.29 (2.82)	0.01 (2.43)	0.44 (2.79)
Constant	313.63 (3.67)	488.64 (9.23)	6.12 (88.49)	22.03 (12.81)	3.02 (48.68)	-0.36 (-0.14)
N. of obs.	2,516	2,516	2,516	1,959	1,959	2,672
R²	0.33	0.44	0.47	0.06	0.11	0.11

Notes: All regressions include dummy variables for the type of client served and sector of activity of the social enterprise.

PCfirst= first principal component (see Table 5b)

Table 7. Regression analysis of holidays in arrears

Variable	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Male	-0.23 (-0.49)	0.00 (-0.01)	-0.13 (-0.26)	-0.04 (-0.08)	-0.15 (-0.29)	-0.26 (-0.51)	-0.29 (-0.60)	-0.22 (-0.45)
Age	0.00 (0.07)	-0.01 (-0.40)	-0.01 (-0.39)	0.00 (0.01)	-0.01 (-0.44)	0.00 (0.12)	0.01 (0.20)	0.00 (0.11)
Education	-0.01 (-0.13)	0.03 (0.39)	0.01 (0.18)	0.01 (0.16)	0.00 (0.04)	0.00 (0.06)	0.00 (0.02)	-0.01 (-0.20)
Italian	-1.02 (-0.65)	-1.25 (-0.72)	-1.17 (-0.65)	-0.88 (-0.52)	-1.51 (-0.83)	-1.35 (-0.75)	-1.51 (-0.89)	-1.53 (-0.93)
Member	1.03 (2.04)	0.87 (1.55)	0.85 (1.51)	0.90 (1.62)	0.88 (1.57)	0.93 (1.68)	1.11 (2.12)	1.19 (2.25)
Years in Coop	0.13 (2.42)	0.21 (3.30)	0.16 (2.75)	0.17 (2.89)	0.17 (2.74)	0.14 (2.25)	0.14 (2.35)	0.15 (2.53)
Permanent	4.24 (8.62)	4.53 (8.17)	4.52 (8.38)	4.67 (8.80)	4.78 (8.96)	4.72 (8.94)	4.29 (8.37)	4.34 (8.53)
Full-time	1.41 (3.03)	1.47 (2.96)	1.45 (2.99)	1.42 (2.92)	1.48 (3.06)	1.51 (2.91)	1.58 (3.33)	1.47 (3.06)
Medium	0.81 (1.24)	0.48 (0.66)	0.30 (0.43)	0.45 (0.64)	0.32 (0.45)	0.40 (0.58)	0.88 (1.31)	0.56 (0.83)
Large	1.09 (1.66)	0.78 (1.10)	0.91 (1.29)	0.81 (1.17)	0.80 (1.14)	1.04 (1.47)	1.26 (1.89)	0.95 (1.40)
Type A	-0.84 (-0.69)	-0.43 (-0.32)	-1.49 (-1.12)	-1.08 (-0.80)	-0.72 (-0.539)	-0.83 (-0.63)	-2.03 (-1.62)	-1.89 (-1.45)
North-West	4.05 (6.92)	4.30 (6.62)	4.50 (7.04)	4.31 (6.76)	4.26 (6.54)	4.08 (6.28)	3.88 (6.46)	4.06 (6.68)
North-East	3.01 (4.18)	2.66 (3.45)	2.82 (3.81)	2.65 (3.55)	2.79 (3.719)	2.90 (3.62)	2.63 (3.50)	2.87 (3.75)
Centre	2.63 (4.03)	2.42 (3.29)	3.01 (4.14)	2.73 (3.76)	2.65 (3.59)	2.79 (3.85)	2.57 (3.78)	2.82 (4.12)
D8.1		-0.18 (-1.49)						
D8.2			0.32 (2.02)					
D8.3				0.35 (2.44)				
D8.4					0.20 (1.50)			
D8.5						0.13 (0.79)		
D55.2							0.33 (2.07)	
D55.3								0.44 (3.35)
Constant	-1.50 (-0.68)	-1.62 (-0.66)	-2.61 (-1.02)	-3.93 (-1.52)	-2.05 (-0.80)	-2.39 (-0.92)	-2.36 (-0.91)	-2.49 (-1.03)
N. of obs.	3,345	2,874	2,934	2,927	2,887	2,934	3,183	3,174
R²	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10

Notes: All regressions include dummy variables for the type of client served and sector of activity of the social enterprise. T-stat are in round brackets

Table 8. Effect of intrinsic motivations on effort levels

Dep. Variable	Regressor							
	Rel. 1	Rel. 2	Rel. 3	Rel. 4	Rel. 5	Rel. 6	Rel. 7	S1
Eff. 1	-0.03 (-2.57)	0.06 (4.67)	0.06 (4.43)	0.02 (1.64)	0.04 (3.28)	0.08 (5.49)	0.09 (6.89)	0.08 (6.03)
Eff. 2	0.00 (-0.23)	0.04 (3.05)	0.05 (3.39)	0.01 (1.20)	0.03 (2.15)	0.10 (6.93)	0.11 (8.37)	0.06 (4.51)
Eff. 3	-0.01 (-0.78)	0.05 (3.53)	0.05 (3.19)	0.01 (1.23)	0.02 (1.52)	0.07 (4.72)	0.03 (2.26)	0.05 (3.96)
Eff. 4	0.01 (0.51)	0.02 (1.71)	0.02 (1.75)	0.00 (-0.24)	-0.02 (-1.23)	0.08 (5.70)	0.06 (4.64)	0.03 (2.23)

T-stat are in round brackets

Table 9. Coefficient of S1 from quantile regressions for selected variables

Dependent variable	q25	q50	q75
Wage	7.90 (3.14)	9.47 (3.78)	6.53 (1.96)
Hourly wage	0.08 (0.84)	0.15 (1.74)	0.21 (2.52)
Ln of wage	0.01 (4.25)	0.01 (3.79)	0.01 (2.80)
Ln of hourly wage	0.00 (1.07)	0.01 (1.89)	0.01 (2.67)

Table 10. Exactly specified IV estimates

Regressors	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Male	71.36 (6.14)	76.46 (4.06)	62.35 (4.96)	56.05 (4.33)	75.75 (4.70)	71.26 (6.05)	90.23 (5.16)	67.78 (5.87)
Age	0.46 (0.73)	1.49 (1.34)	-0.58 (-0.73)	-0.72 (-0.83)	-2.10 (-1.52)	-0.70 (-1.07)	2.07 (1.96)	0.37 (0.63)
Education	0.07 (0.05)	0.36 (0.19)	0.57 (0.37)	-0.26 (-0.16)	1.04 (0.62)	0.33 (0.24)	0.60 (0.38)	0.32 (0.24)
Italian	-112.93 (-3.86)	-85.70 (-2.59)	-61.62 (-2.14)	-69.97 (-2.44)	-66.53 (-2.39)	-51.80 (-2.03)	-48.90 (-1.71)	-91.16 (-3.85)
Member	-15.97 (-1.20)	-18.23 (-0.87)	-27.75 (-1.47)	-14.43 (-0.93)	-25.03 (-1.30)	-9.08 (-0.73)	8.13 (0.59)	-6.92 (-0.56)
Years in Coop	10.10 (8.06)	11.23 (6.77)	7.13 (3.75)	9.90 (7.06)	10.43 (7.72)	9.65 (8.25)	8.56 (5.91)	10.55 (9.00)
Permanent	45.10 (3.42)	81.95 (2.59)	49.49 (3.12)	44.83 (2.74)	41.68 (2.60)	50.89 (3.63)	46.67 (2.96)	39.39 (2.91)
Full-time	281.82 (29.10)	261.03 (13.76)	265.54 (16.85)	264.13 (16.34)	268.84 (17.62)	278.01 (27.52)	246.99 (13.28)	280.37 (26.97)
Medium	10.13 (0.68)	13.85 (0.69)	26.91 (1.28)	28.15 (1.19)	12.58 (0.71)	-18.21 (-1.18)	-10.96 (-0.67)	6.09 (0.42)
Large	1.83 (0.12)	-17.91 (-0.92)	19.60 (0.92)	19.91 (0.86)	3.61 (0.19)	-15.03 (-1.05)	-6.81 (-0.41)	-0.99 (-0.07)
Type A	88.77 (2.68)	18.23 (0.23)	93.58 (2.73)	105.48 (3.03)	74.42 (1.69)	92.39 (2.92)	14.11 (0.24)	98.69 (2.92)
North-West	122.55 (8.30)	169.12 (4.78)	159.93 (6.59)	179.81 (5.39)	191.02 (4.76)	172.51 (7.60)	157.34 (7.28)	143.35 (7.69)
North-East	106.97 (6.20)	118.51 (4.94)	126.49 (6.36)	167.53 (5.26)	166.96 (4.99)	155.61 (7.26)	143.73 (6.73)	128.88 (7.00)
Centre	81.10 (5.03)	144.24 (3.51)	133.45 (4.63)	140.88 (4.08)	142.32 (4.09)	112.27 (6.01)	105.92 (5.27)	104.34 (5.53)
Internship	-44.96 (-1.48)	-76.41 (-1.59)	-64.10 (-1.71)	-46.31 (-1.25)	-22.13 (-0.61)	-16.55 (-0.51)	-32.89 (-0.90)	-31.96 (-1.04)
D8.1	-42.66 (-1.87)							
D8.2		168.79 (1.65)						
D8.3			107.46 (2.06)					
D8.4				101.80 (1.93)				
D8.5					114.34 (1.94)			
D55.2						88.93 (2.74)		
D55.3							134.28 (2.34)	
PCfirst								34.78 (1.78)
Constant	649.38 (7.05)	-428.79 (-0.77)	-36.62 (-0.14)	-2.69 (-0.01)	-47.14 (-0.17)	32.26 (0.19)	-245.18 (-0.80)	504.29 (10.59)
N	2,700	2,738	2,758	2,710	2,756	3,018	2,993	2,516
P-value (overall goodness of fit)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table 10. Exactly specified IV estimates (follows)

Regressors	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Test for relevance of instrument								
<i>Shea F-test</i>	27.32	4.54	11.09	8.81	8.56	28.89	11.88	48.66
<i>P-value</i>	0.0000	0.0333	0.0009	0.0030	0.0035	0.0000	0.0006	0.0000
Test for endogeneity								
<i>Durbin-Wu-Hausman χ^2</i>	2.43	5.57	6.12	5.37	5.39	11.20	8.55	1.87
<i>P-value</i>	0.12	0.02	0.01	0.02	0.02	0.00	0.00	0.17
Tests for weak identification								
<i>Weak identification test (Cragg-Donald): F-stat</i>	27.32	4.54	11.09	8.81	8.56	28.89	11.88	48.66
<i>Weak-Instrument-Robust inference (Anderson-Rubin)</i>								
χ^2	3.77	6.02	6.58	5.93	6.07	10.38	9.38	3.28
<i>P-value</i>	0.05	0.01	0.01	0.01	0.01	0.00	0.00	0.07

Notes: Instrument: dummy taking value of one if individuals have never volunteered in their life. All regressions include dummy variables for the type of client served and sector of activity of the social enterprise. T-stats in round brackets

Table 11. IV regression for the wage

Regressors	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Male	67.58 (5.96)	64.5 (4.85)	70.94 (5.05)	60.21 (5.11)	77.28 (5.14)	68.13 (5.85)	90.23 (5.16)	71.3 (6.09)
Age	0.4 (0.66)	-0.3 (-0.39)	1.47 (1.75)	-0.06 (-0.09)	-1.68 (-1.45)	-0.52 (-0.81)	2.07 (1.96)	0.57 (0.94)
Education	0.02 (0.01)	0.66 (0.4)	0.49 (0.3)	-0.03 (-0.02)	1.12 (0.68)	0.39 (0.28)	0.6 (0.38)	0.43 (0.32)
Italian	-95.57 (-3.45)	-58.06 (-1.91)	-78.07 (-2.76)	-71.99 (-2.74)	-66.72 (-2.35)	-48.67 (-1.88)	-48.9 (-1.71)	-90.21 (-3.68)
Member	-9.08 (-0.71)	-32.28 (-1.68)	-13.7 (-0.88)	-12.98 (-0.97)	-24.12 (-1.35)	-9.65 (-0.77)	8.13 (0.59)	-9.67 (-0.76)
Years in Coop	10.36 (8.61)	6.76 (3.47)	10.78 (7.61)	9.61 (7.46)	9.93 (7.17)	9.88 (8.25)	8.56 (5.91)	10.21 (8.46)
Permanent	46.05 (3.55)	50.31 (3.05)	70.61 (3.48)	45.18 (3.05)	41.23 (2.54)	51.6 (3.61)	46.67 (2.96)	42.37 (3.06)
Full-time	281.93 (29.52)	264.9 (17.82)	268.86 (21.16)	271.04 (23.47)	269.32 (19.98)	279.53 (27.36)	246.99 (13.28)	277.21 (26.63)
Medium	5.52 (0.38)	29.6 (1.42)	8.57 (0.51)	20.94 (1.21)	16.58 (0.94)	-19.28 (-1.25)	-10.96 (-0.67)	9.65 (0.66)
Large	-2.44 (-0.17)	24.45 (1.14)	-17.54 (-1.04)	13.62 (0.79)	8.78 (0.48)	-13.95 (-0.96)	-68.14 (-0.41)	1.32 (0.09)
Type A	112.32 (3.65)	92.32 (2.52)	44.19 (0.88)	109.29 (3.44)	75.37 (1.79)	92.2 (2.89)	141.12 (0.24)	88.3 (2.59)
North-West	118.83 (8.22)	160.85 (6.7)	152.52 (6.81)	162.78 (7.33)	184.22 (5.6)	170.95 (7.73)	157.34 (7.28)	148.03 (8.04)
North-East	108.72 (6.36)	125.7 (5.96)	119.322 (5.67)	156.65 (6.77)	166.3 (5.61)	159.12 (7.37)	143.73 (6.73)	132.51 (7.1)
Centre	80.18 (5.06)	134.33 (4.85)	123.86 (4.88)	125.88 (5.33)	138.06 (4.67)	111.41 (5.97)	105.92 (5.27)	108.91 (5.81)
Internship	-42 (-1.42)	-69.83 (-1.78)	-69.7 (-1.82)	-49.7 (-1.46)	-17.97 (-0.48)	-8.37 (-0.24)	-32.89 (-0.9)	-34.59 (-1.1)
D8.1	-22.54 (-1.15)							
D8.2		118.71 (2.47)						
D8.3			121.74 (2.45)					
D8.4				74.2 (2.65)				
D8.5					112.86 (2.39)			
D55.2						88.81 (2.94)		
D55.3							134.28 (2.34)	
PCfirst								44.69 (2.42)
Constant	565.51 (7.01)	-102.59 (-0.42)	-182.54 (-0.67)	118.58 (0.81)	-50.94 (-0.23)	24.65 (0.16)	-245.18 (-0.8)	501.18 (10.3)
N	2,632	2,685	2,655	2,642	2,672	2,941	2,993	2,486
P-value (overall goodness of fit)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table 11. IV regression for the wage (follows)

Regressors	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Test for relevance of instrument								
<i>Shea F-test</i>	17.70	7.08	7.03	13.05	6.68	16.91	11.88	28.28
<i>P-value</i>	0.0000	0.0009	0.0009	0.0000	0.0013	0.0000	0.0006	0.0000
Hansen test on overidentifying restrictions								
	1.67	0.055	0.162	0.230	0.009	0.185	0.34	0.39
	0.18	0.81	0.69	0.63	0.92	0.66	0.47	0.40
Test for endogeneity								
<i>Durbin-Wu-Hausman χ^2</i>	0.50	9.45	8.58	8.03	8.08	13.06	8.55	4.11
<i>P-value</i>	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Tests for weak identification								
<i>Weak identification test (Cragg-Donald): F-stat</i>	17.70	7.08	7.03	13.05	6.68	16.91	11.88	28.28
<i>Weak-Instrument-Robust inference (Anderson-Rubin)</i>								
χ^2	7.03	10.21	9.86	9.46	9.15	12.23	9.38	7.63
<i>P-value</i>	0.03	0.01	0.01	0.01	0.01	0.00	0.00	0.02

Notes: Instruments: i) dummy taking value of one if individuals have never volunteered in their life; ii) degree of consent to the question in which respondents are asked whether they have been initially attracted toward the cooperative by wage and economic incentives. All regressions include dummy variables for the type of client served and sector of activity of the social enterprise. T-stats in round brackets.