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# **Employer's moral hazard, and wage rigidity and worker cooperatives: A theoretical appraisal.**

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# **Employer's moral hazard, and wage rigidity and worker cooperatives:**

## **A theoretical appraisal**

### **Abstract**

We argue that in a capitalist enterprise the need to fix wages is crucially influenced by the asymmetric distribution of decision-making power, which can entail the use of private information and authority in favour of the strongest contractual party (the employer), and against the weaker contractual party (the employee). The capitalist entrepreneur can take decisions whose negative consequences are borne by workers in terms of lower wages and more intensive work-pace. Excessive wage reductions in the face of negative exogenous shocks, and of too risky investment decision represent the main instances of such opportunistic behaviour.

Fixed wages can be thought as workers' best response to the emerging risk of the employers' moral hazard, but this implies a heightened risk of lay-off since wages and employment levels cannot be fixed at one and the same time. As a counterexample, we observe worker cooperatives, which depart from the framework of the interaction between a principal and an agent in the presence of contrasting interests and private information. Indeed, several empirical studies show greater employment stability and wage flexibility in worker cooperatives *vis à vis* capitalist firms.

**Key words:** employment contract, wage rigidity, risk aversion, moral hazard, worker cooperative

**JEL Classification:** J54, J64, J83.

## 1. Introduction

A usual argument explaining why in capitalist systems wages tend to be fixed while firms adjust the size of the employed workforce relates to workers' risk aversion. The starting point of our arguments is a critique to this approach. We maintain that the theoretical connection usually drawn between workers' risk aversion and wage rigidity is basically flawed or, at the very least, incomplete since it appears to assume risk aversion as a psychological characteristics, while no convincing argument connecting workers' behaviour with the features of the interaction between employers and employees is put forward. This appears as a relevant explanatory shortcoming since different institutional settings are likely to make workers face different risks, therefore inducing them to undertake different choices, even when their subjective attitude to risk is unchanged.

This paper highlights the limitations of the explanations of wage rigidity which are exclusively based on risk aversion, and endeavours to develop a new explanatory framework that bears on a different argument, which instead relate to the risk of employer moral hazard in the determination of wages and on other conditions of work. To put it differently, we will try to explain why it is possible to observe markedly different behavioural responses in terms of managing the risk connected with labour relations even in subjects that show similar subjective attitudes to risk. In our framework the different responses are explained by security-oriented choices related to the institutional features of the employment relation:<sup>1</sup> our claim is that rigid wages are the rational response of employees to the risk of abuse by the employer, since the latter cannot credibly commit not to abuse his authority in reducing labour costs and in undertaking opportunistic or too risky investment (or disinvestment) decisions. The preconditions for the emergence of moral hazard by the employer are found in

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<sup>1</sup> To most prominent authors it implies the renouncement of control by the worker over his/her labour and, conversely, the acquisition by the employer of the authority, explicitly connected with property rights (Hansmann, 1988), to decide on the utilization of labour services about all contingencies that are not explicitly included in signed contracts (Coase, 1937, Simon, 1951, Screpanti, 2001; Ellerman, 2005; Putterman, 1993). In his radical critique of the employment relation Ellerman (2005) follows the perspective of the philosophy of law and identifies in the employment contract an instance of rent contract, or *pactus subjectionis* in the Hobbesian tradition. The employee transfers to the employer an inalienable right (the right to self-determination). This way, to Ellerman, the employment contract can be categorized as self-rent contract and is affected by inherent invalidity, in the same way in which a self-sale contract, or slavery contract, is indeed invalid in contemporary legal systems.

the asymmetric distribution of power in the presence of private information and contrasting interests between the employer and the employee. While private information and contrasting interests can lead to opportunism on both sides of the employment contract, we believe that the negative consequences faced by the employee are potentially more serious than the ones faced by the employer because of the employer's authority, which is founded in the ownership of the firm. The two most evident risks linked to bargaining power imbalances are the attribution of a too low remuneration relative to the output produced by the worker (or, connectedly, the setting of a too high work pace) and the undertaking of too risky investment decisions.

While it is common in the literature to refer to the opportunistic behaviour of the employee in a principal-agent framework (Stiglitz, 1975 is a cornerstone in this approach) and in the incomplete contract literature, it is very unusual that the employer's opportunism is made explicit and explained. In our framework, instead, the idea of the employer's moral hazard and its consequences on wage-rigidity is crucial to a correct determination of the behavioural impact of the employment contract.

In dealing with contractual structures in presence of contrasting interests and asymmetric distribution of contractual power, we neighbour Marxists approaches (Screpanti, 2001) and the Labour Process Literature (Gintis, 1976; Pagano, 1989). In this context, we claim that control rights influence the characteristics and behavioural responses of the resources employed, not the reverse, as often claimed by the New Institutional Literature (Marglin, 1974).<sup>2</sup> We take worker cooperatives as a counterexample, which shows what happens when the agency relation between the employer and the employee is overcome by self-organized collective entrepreneurial action.<sup>2</sup> Given the nature of industrial relations in worker cooperatives, we hypothesize that the absence of the risk of employer moral hazard allows for the relaxation of wage rigidity while, at the same time, for the strengthening employment stability.

We first assess our criticism to the assumption of worker's risk aversion as the most relevant cause explaining wage rigidity (Section 2). We then introduce the moral hazard problem on the employer's side, and argue that this may lead to the need to fix wages ex ante in order to

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<sup>2</sup> Pagano's work focuses on asset specificity, but we can extend it to the attitude towards risk by analysing the exposure to opportunistic behaviour of the different stakeholders of the firm.

avoid post-contractual opportunism (Section 3). We finally illustrate the wage setting process in worker cooperatives as a counterexample (Section 4).

## **2. Wage rigidity and the assumption of workers' risk aversion**

Workers' risk aversion as crucial psychological characteristic of the employed workforce in capitalist companies dates back to the seminal contribution by Knight (1921), while its crucial relevance in explaining rigidity is found in implicit contract theory (Azariadis, 1975, Azariadis and Stiglitz, 1983) and in the principal agent framework (Stiglitz, 1975). In these research streams the reason why workers don't want to be remunerated residually, but instead prefer a fixed wage, is their higher risk aversion compared to investors that, besides being endowed, on average, with much greater financial wealth, are also able to differentiate financial risks by investing in different projects. Furthermore, in some cases, capitalist entrepreneurs are simply considered more venturesome individuals offering wage insurance to other, more risk averse, individuals. The evidence supporting the connection between wage rigidity and workers' risk aversion is found in workers' tendency to prefer fixed rather than fluctuating wages.

In our view, there exist at least two different typologies of empirical evidence supporting the idea that wage rigidity is not properly explained by the idea of workers' risk aversion.<sup>3</sup> First, wages show a relevant degree of variability also in investor owned, for-profit firms. Indeed this variability has been growing overtime. This evidence defeats the idea that risk aversion is an intrinsic characteristic of workers. For example, Lazear and Shaw (2007) evidence that wage variability in the US economy has been steadily growing over the last 30 years. Wages in most occupations are now much more variable than in the past and this pattern is functional

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<sup>3</sup> In recent years also the experimental literature began to deliver important results concerning incentives, productivity, effort, risk aversion, trust and reputation in the employment relation. Among others, Dohmen and Falk (2011), and Bartling, Fehr and Schmidt (2011) deal with such issues. The former study shows that more productive and less risk averse workers prefer piece-rate to fixed wages. In this experiment, for reasonable values of the parameters, about 60 per cent of the experimental subjects prefer piece-rates to fixed wages. Though interesting, these experiment do not consider the existence of contractual power and private information held by the strongest contractual party (the employer) and, because of this reason, may not be able to explain the extent to which, in real economies, employed workers prefer fixed over variable wages (or ask for the presence of a preponderant fixed part in their remuneration relative to the variable part).

to tightened market competition. The two authors explain this evidence by stating that wages can become variable when the output is observable, as it happens, for example, in the case of sale representatives, or executives in investment banks. However, observability runs in both directions in the employment relation. Not only employers can measure more easily worker productivity when the output is easily observable, but also the worker can more easily rely on a wage linked to his/her productivity, since it is relatively easy to demonstrate the existence of productivity increases that accrue to the profit of the employer. Not the same is true when the output or its quality is difficult to observe, or when the relevant temporal horizon over which results are evaluated is found in the long run. In these cases observability becomes impractical or not relevant and the mutual convenience to contractually define a fixed level for the wage increases. A competing explanation of why the degree of wage rigidity has been decreasing and flexible remuneration schemes in capitalist firms have been spreading over the last decades is not connected with observability, but with a loss of workers' bargaining power in tightening labor market competition. The two competing interpretations would require further enquire, but this is not the main aim of our paper. At any rate, it appears that they can be both valid in different specific contexts. Piece rates are often imposed by employers exploiting the presence of a high unemployment rate. The example of the immigrant poor or young workers in search of first employment are clear enough in this case. On the other hand, workers can decide to accept piece rate contracts in the presence of many outside options when conspicuous increases in income or other benefits such as faster career advances are expected.

Second, there exist at least one organisational exception to the dominance of wage rigidity as related to workers' risk aversion, and this exception is the worker cooperative. Many empirical tests demonstrate that wages (or, more generally, labour income) in worker cooperatives show significantly stronger variability than in profit maximizing firms (Craig and Pencavel, 1992, 1994; Pencavel et al., 2006; Burdin and Dean, 2009; Alves et al., 2012). This evidence runs against the idea of risk aversion as an innate feature of workers. However, it also opens up new questions concerning both worker risk aversion and organization behaviour because, in worker cooperatives, the higher dispersion of labour income is coupled by lower employment dispersion. In this sense, worker cooperatives can be hypothesized to manage risk aversion differently than for-profit firms. Still, arguments that explain wage rigidity in terms of risk aversion as a psychological characteristic of workers that moulds the shape of their utility function in a different way with respect to the employer appear

misguided. In our framework, the institutional features of the organization, first and foremost control rights, need to be brought to bear on wage rigidity, while risk aversion is not excluded, but considered as a given feature of workers which each organizational type manages in a different way.

While it has been noted that worker cooperatives accomplish a notable inversion of the employer to employee relation *vis à vis* to capitalistic firms (Dow, 1993; Jossa and Cuomo, 1997), we highlight that this inversion implies also a modification of the wage-to-employment relation: employment becomes rigid in the short run, while labour income tends to fluctuate. Indeed, as early as in 1983 some authors (Myazaki and Neary, 1983) evidenced that “job insurance” instead of “wage insurance” is likely to be the dominant objective in worker cooperative. This way, as it appears, worker cooperatives are able to modify the structure of risk faced by workers (Meade, 1972, Dow, 2003, Miceli and Minkler, 1995), from employment fluctuation to wage fluctuation.

As a corollary to the previous arguments, it has been claimed that “venturesome” workers self-select into cooperatives, since they are readier to accept fluctuating incomes. Hence, it is said, worker-members in cooperatives need to be characterized by a lower degree of risk aversion than employees in profit-maximizing firms (Conte and Jones, 1991). Other evidence, however, shows that worker-members in many cooperatives choose to smooth wages through the accumulation of locked-assets (Navarra 2010): this evidence implies that worker cooperatives modify the structure of risk linked to labour contracts, but are not necessarily found in the presence of different subjective attitudes toward risk. Second, as stated, fluctuating wages represent a relevant phenomenon in profit making firms too, showing that in these firms workers are not necessarily characterised by a high degree of risk aversion<sup>4</sup> Again, instead of being just a matter of selection of individuals with different psychological

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<sup>4</sup> Though this evidence appears to weaken our arguments, it is indeed able to show that flexible wages are functional to increased performance, since they strengthen the incentive to align individual and firm objectives. While wage flexibility is always problematic in capitalist companies given the existence of contrasting interests between employer and employee, it can be considered a dominant course of action, not a sheer exception, in worker cooperatives. One of the main reasons is that, while wage flexibility requires observability in capitalist companies, this is not the case in worker cooperatives, since worker members control the organisation. Economic incentives are, in this case, underpinned by control rights and, in the absence of contrasting interests between the employer and the employee, observability may not be required to guarantee high labour productivity.

characteristics (and thus different utility functions), we claim that it's the interaction with the institutional environment that shapes workers' behavioural responses. <sup>5</sup> Historical records show that workers and their representatives (unions) have often asked the contractual definition of fixed wages not because of the unwillingness to bear wage fluctuations, but because of the risk of work overloads in cases in which the output is not measurable, and the more imbalances in bargaining power between employers and employees were strong.

### **3. Employer's moral hazard and wage rigidity in capitalist firms**

Looking at worker cooperatives, we observe that, since members are paid with a share of the firm residual, net of capital and other costs, they can decide whether the effects of exogenous demand shocks are to be absorbed by wage variability or by employment fluctuation. Evidence shows that worker-members are willing to accept a more fluctuating income than in profit maximizing firms and, this way, they take care in a more thorough way of employment stability. We thus need to ask why the same behavioural patterns are not observed in profit maximizing firms. In our explanatory framework the relevant argument comes from the absence of control rights undergone by employees in profit-maximizing firms. In these cases, the employer's objective implies that he has convenience in imposing on the employee a too high work pace and in misrepresenting the employee merits in order to increase his/her profits by lowering effective wages. Also, and counterfactually, if wages were flexible instead of fixed the employer could undertake too risky investment projects because, in the likely case of negative outcome, the costs of such choices would be borne by workers in terms of lower wages.

Since the very idea of employer moral hazard is widely absent in the contract theory literature, we are aware of the necessity to work out its theoretical foundations and possible drawbacks (Dow, 1987). Indeed, the very existence of employer moral hazard may be questioned, since property rights are understood to guarantee to the employer the internalization of the value of the productive activity in his/her objective function. Hence, it is stated, his/her decisions cannot be questioned within the logic inherent to the analysis of profit maximizing behaviour. All negative effects borne by employees fall then under the label of "negative external effects",<sup>10</sup> which are not explained by the model. In mainstream property rights theory the employer has the possibility to set the organizational objectives and

contractual structures independently of employees' reactions in order to maximise profits. Coherently with these premises, in the writings originating agency theory Alchian and Demsetz (1972) and Jensen and Meckling (1976) do not consider the possibility of employer moral hazard because the objective function of the principal is assumed to have no bearings on the agent's behaviour (that is only influenced by the features of the contract) while the agent's opportunism is hypothesised to endanger the maximisation of the profit.

These theoretical assumptions were already questioned in the "partial gift exchange" literature and in the efficiency wage theory *a la* Akerlof (1982, 1984; Yellen, 1984) since, in this case, greedy and opportunistic behaviours by the employer engender employees' reactions mainly in terms of lower work-effort, while trust and reciprocity between the employer and the employee foster worker productivity and increase the dimension of the surplus. Here it becomes clear that the actions of the employer and of the employee are interrelated in a strategic way. However, it is not clear why, if trust and reciprocity are able to solve most problems in the relations between employer and employees, wage flexibility does not become a common contractual solution. We reckon that wages tend to be fixed even in the presence of positive reciprocity because the employer opportunism in wage settings is not eliminated by reciprocating attitudes. In the presence of severe asymmetric information and when competition among workers is tough due to the existence of non-zero unemployment or in terms of career paths, opportunism can still reduce worker remuneration.<sup>5</sup> Furthermore, entrepreneurial decision cannot be questioned by workers due to the structure of capitalist property rights. Wrong investments decisions would be borne by workers if wages were flexible. All these instances make clear that in many real world circumstances the employed workforce may not be able to react to opportunism on the side of the employer. In the flexible wage case workers could only react to opportunism by lowering effort, but this choice would imply lower productivity and, through this, still lower wages. Consequently, reciprocating behaviours in terms of wage flexibility cannot be implemented.

From a different angle, our arguments can be interpreted as an attempt to translate in terms of economics of information something that has been deeply analysed in Marxist thinkers in terms of class struggle and asymmetric distribution of contractual power, that is to say the willingness of the employer to extract surplus from the labour force beyond the simple

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<sup>5</sup> Wage levels could be kept artificially low because of the fear of unemployment, or because wage increases connected with career paths are granted to some, but not to all deserving workers.

exchange of equivalent values (Gintis, 1976). In a Marxist perspective the behaviour of the capitalist is not driven by efficiency reasons, as claimed by the neoclassical theory of the firm, but by the need to exert control over the workforce. An example provided by Gintis (1976) is the setting of wages higher than the market clearing one in order to keep credible the threat of unemployment, as a workers' discipline device, as developed by Shapiro and Stiglitz (1984). The same author illustrates how wage differentials can be manipulated to bring its wages to a value different from marginal productivity in order to control workers and exert influence on them.

Our framework takes further steps forward in this direction. Taking the employment relation as a specific case of the principal-agent one, the presence of asymmetric information and of employer authority engenders the risk of the employer exploiting opportunistically his/her private information.

As stated by Stiglitz (2009, p. 357),

The problems of exploitation are important, not only when competition is limited but also when there are information asymmetries, in which one party can exploit the other, or asymmetries in bargaining power.

Given the authority conceded by capitalist property rights to the employer, asymmetric information and contractual incompleteness foster his convenience to exploit his/her contractual and information advantages, causing employees' reactions in terms of demand for more stringent contractual guarantees, such as fixed wages and employment protection. In turn, the employer may be willing, or may be forced by industrial action, to concede to workers' demands and increase the degree of wage rigidity when it is possible to lay off the redundant workforce.

### *3.1. Asymmetric information and authority under closer scrutiny*

In the Incomplete Contract Literature, the presence of asymmetric information concerning the ex-ante characteristics and the ex-post behaviours of both contractual parties is straightforward and has been considered in most contractual settings (Grossman and Hart 1986, Hart and Moore 1990). When the employment relation is considered, on one side of the relation the worker has private information concerning his/her effort, ability, and future decisions, as widely acknowledged by both the neoclassical and new-institutionalist literature

(*inter alia* Alchian and Demsetz, 1972, Stiglitz, 1975, Holmstrom, 2000, Srepani, 2001). By the same token, in our perspective it is reasonable to assume that the employer has private information too (Hall, 1980).<sup>7</sup> First of all, we assume that the employer has private information on the probability of future events, such as demand shocks, and on future profits. One reason why the employer has more information on the probability of future states of the world is that he has access to privileged information through entrepreneurial social networks.<sup>6</sup> Second, the employer has private information on his/her own future decisions, which, on the side of the employee, are to be considered exogenous and uncontrollable events. Choices concerning new and competing technologies, or what managers to hire and what organisational models to implement represent obvious examples. The employer may also hide as far as possible strategic choices concerning the closure and/or relocation of the activity. We can say that the future states of the world, that are given for the employee, can be in fact endogenous for the firm, meaning that the very decisions taken by the employer can modify the probability of different states occurring in the future. For example, the decision to distribute more profits may undermine the financial strength of the firm, and increase the probability of future lay-offs.

The existence of private information is likely to impact, through expectations, on workers' choices concerning wage rigidity. In a static context the worker may not be able to detect the true signal concerning wage cuts since he/she does not know whether wage cuts are due to real downward turns in demand (or to a positive probability of a downturn), or if instead they are imposed by the employer in order to increase profits. In a dynamic perspective, wage cuts introduced at a certain point in time because of actual economic difficulties may not be matched by adequate wage increases when economic conditions improve. Both the static and the dynamic instances represent cases of employers behaving opportunistically by exploiting either information advantages (static instance) or decision making power (dynamic instance). In the dynamic setting, flexible wages may be the most rational way to limit the risk of lay-offs caused by negative shocks when workers expect wage cuts to be met by future wage increases. However, the employer cannot commit to increase wages in the future since this increase would reduce his profits. Still more clearly, the sale of the firm to a different employer would imply that any commitment to increase wages in the future is lost. Hence,

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<sup>6</sup> See, for example, Granovetter (1985, 1992), who underlines the importance of the social context in which economic actors are embedded, in order to understand their economic actions.

workers' decision to distrust any commitment to increase wages in the future following wage cuts appears perfectly rational. In more general terms, the incentive to use private information strategically is one of the main sources of the risks connected with state contingent wages in capitalist firms and of the ensuing behavioural responses by workers,

A second fundamental element in the employment relation is the presence of conflicting interests between the employer and the employee. The employer has the possibility to exploit the decision making power attached to control rights, while the employee does not have the same possibility. The literature on agency relations has widely considered the possibility that the presence of contrasting interests between the employer and the employee (or between owners and managers) engenders an incentive to lower work effort or otherwise to behave in ways that are not aligned with the firm's objectives (Prendergast, 1999). The employer authority in the presence of contrasting interests implies that the employer has interest to lower labour costs by misrepresenting work quality and increasing work pace since this is conducive to profit maximization. Insofar as the relevant decisions concerning wage setting are taken by the employer, the misrepresentation of work quality and pace implies declining wage levels. In this respect, flexible wages are more vulnerable to opportunistic decisions by the stronger contractual party than fixed wages.<sup>7</sup>

It is now clear that the introduction of the risk of employer moral hazard in the explanatory frame makes workers' behavioural responses dependent on the institutional framework. Workers may ask for insurance within the employment contract not because of an inherent psychological characteristic, but because they face the threat of opportunistic behaviour from the other contractual party. By the same token, it is possible to argue that the institutional structure of capitalist firms may induce the employer to choose too risky strategies, regardless his/her subjective attitude towards risk, since part of the costs deriving from too risky decisions is borne by workers in terms of lower wages or lay-offs. Again, given the institutional framework, the choice of fixed wages is a conservative one and represents workers' best response to the risk of opportunistic behaviours by the strongest contractual

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<sup>7</sup> Unionised industrial action represents a tool by which employed workers contrast the asymmetric distribution of decision making power. While we will not deepen here the role of unions in limiting employers' contractual power, we note that collective industrial action represent a response to a pre-existing imbalance in the distribution of decision making power, which is built in the institutional structure of the employment contract. Indeed, workers' opportunistic behaviour itself can be an endogenous result of the contractual structure, since it can be triggered by the imposition of work overloads functional to profit maximization.

party. Different organizational structures, such as the worker cooperative, are likely to manage differently the same trade-off between wage and employment fluctuations.

### *3.2. Employer's moral hazard, wage rigidity and contractual structures*

A fundamental question that can be asked is why, in capitalist firms, the employment contract usually implies the rigidity of wages with the possibility for the employer to lay off workers. In principle, if some workers prefer employment to wage stability, and if the expected costs of the two solutions are equal to the employer, the necessity to keep industrial relations quite would lead to observe both outcomes. However, the empirical records concerning contractual relations and disputes (both individual and collective) evidence the dominance of the demands for wage stability over employment stability (Kaufman, 1984; Blinder et al., 1990; Bewley, 2005) even if also the latter appears prominently among workers' objectives (Depedri et al., 2012). Hence, it is necessary to ask why the worker should prefer wage stability over employment stability since, at least in principle, it is possible to choose between the two objectives also within the framework of the employment contract. However, while in case of lay-off the worker can look for a different job, exploitative contractual relations inside the same firm exclude the possibility of compensating wages by other firms. In order to keep the risks of exploitation at bay, workers ask for the fixation of a fair wage, while incurring in the risk of layoff. Rewording the same argument we can hypothesize that workers appear give low importance to employment stability not because they deem employment stability unimportant, but because the employment relation leads them to prioritize wage stability over employment stability, given the risk of opportunistic wage reductions endangering the very source of their livelihood.<sup>8</sup>

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<sup>8</sup> Workers can weigh the risk of exploitative wage reductions against the expected cost of not finding a new job in case of lay-off. This slightly more refined interpretation has to be tested against the evidence of the preference given to wage stability over employment stability. One way to further explain these empirical dilemmas is to resort to explanatory frames in social psychology, as found in the seminal works by Abraham Maslow (1943, 1954), where a hierarchy of needs in all human beings is identified whereby more basic needs are "prepotent" and need to be satisfied before the others. Physiological (survival) needs come first, while the other layers are represented by the need for security, belonging, esteem and self-actualization. In our case, the need for a fair wage would pertain to the first layer (survival) while the need for employment stability would pertain to the second layer (security). Though we will not pursue a social psychology perspective in this paper, this simple argument further explains why workers tend to prefer wage protection over employment protection.

A different perspective that can be followed to explain the extent to which fixed wages spreads *vis à vis* flexible pay in capitalistic firms is to compare fixed wages with piece rates, both of which represent contractual agreements usable by the capitalistic enterprise. Given the highly powered incentive potential of piece rates, it is easy to hypothesize that a large share of employers would be willing to use them. Consequently, their limited diffusion calls for an explanation not only in terms of production efficiency, but also in terms of worker resistance to their utilisation, i.e. in terms of worker preference about contractual agreements and production outcomes. Following the above developed arguments we can state that, in the piece rate setting, the presence of a relevant amount of asymmetric information, contractual incompleteness and the employer contractual power can engender opportunistic behaviours by both the employer and the employee. These factors, on the one hand, make the piece rate agreement rigid in terms of tasks to be performed and, on the other hand, generate workers' resistance. The ensuing contractual equilibrium does not fulfil the stated efficiency gains generated by the economic incentives built-in in piece rate contracts (Lazear, 2000). We explain why.

The implementation of the contractual structure of piece rates can engender workers' resistance since this resistance is functional to the limitation of work pace, alienation, and other negative external contractual effects, such as the risk of injuries. In piece rate settings workers can be expected to to maximize the number of pieces produced and, this way, their wage. However, the maximization of production will push the worker to focus on quantity produced, more than on quality. One important implication is that the piece rate contractual agreement induces the worker to withhold information and to generate a suboptimal amount of production knowledge. The employer best response to workers' behaviour is to maximize the number of pieces produced, but, at the same time, to minimize the price paid for the single piece, because this is functional to profit maximization and because the employer does not expect the worker to reciprocate higher monetary remuneration with higher quality of production. While the former employer response is aligned with workers' objectives, the latter is clearly in contrast with those objectives and is coherent with the existence of morally hazardous behaviour by the employer. Intensification of work pace, alienating working

conditions and low remuneration per unit of production lead to workers' opposition to piece rate contracts.<sup>9</sup>

Indeed workers and their representatives have, as said, repeatedly insisted for the suppression of piece rate agreements. Huberman (1991) finds in unremunerated intensification of work the problem related to piece rate contracts in the case of Manchester cotton spinning in the first half of XIX century, where a labour force with a strong bargaining power managed to obtain stable piece rates from the spinning firm. Very numerous historical episodes exemplify the risk of post-contractual opportunism based on the spread of biased information and decisions.

Historically documented episodes concerning piece rate contracts show that a problem workers faced was the employer's opportunity to revise the rate over time, cutting the unit price paid to workers (Gibbons, 1987, Huberman, 1996).

Almost all employers insisted that they would never cut a price once it was set, yet every employer did cut prices... Unless workers collectively restricted output they were likely to find themselves working much harder, producing much more, and earning only slightly higher wages.

Clawson cited in Gibbons (1987, p. 416)

Another way to explain why contracts that seem inefficient from the effort incentive point of view (fixed wages) can be more efficient than contracts connected to high powered monetary incentives (piece rates) is to look at wage rigidity in the theory of partial gift exchange (Akerlof, 1982, 1984). As shown also by experiments concerning trust and investment games, when trust and reciprocity in the presence of asymmetric information and contractual incompleteness represent a relevant behavioural dimension of the contractual relation, piece rates are likely to become an inferior solution since more stable contractual relations can generate long run mutual benefits in terms of increased and shareable surplus (Fehr and Schmidt, 2004). The dynamic superiority of gift exchange can allow the overcoming of the limitations of piece rate contracts and explain the diffusion fixed wages. This argument doesn't exclude ours: it might be argued that the need to establish trust among parties implies that the employer "ties his hand" with respect to the possibility to exploit asymmetries of

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<sup>9</sup> Another reason for workers' opposition to piece rate contracts has been found in the "non-monetary" disutility of psychological pressure and rivalry.

information and contractual power in wage setting. Still, in the gift exchange framework wages are fixed and employment stability cannot be guaranteed for the above mentioned reasons. The choice of fixed wages is confirmed to be workers' best response to the looming risk of the employer post contractual opportunism.

Putting these different explanatory streams together we can explain why piece rates are usually observed in the production of simple and standardized goods or services, whose quality is readily verifiable. Complex and functionally differentiated production processes require instead continuous exchange of information and advice, and the composition of collective activities, whose quality cannot be easily verified by supervisors. Also, when long term learning patterns and the connected contractual incompleteness are present, piece rates are rarely observed since they do not generate adequate quality improvements and may engender too high contractual costs (Heywood *et al.*, 1998).

A final extension of our arguments is represented by the interpretation of profit sharing schemes within our framework. The sharing of the profit between the employer and the employee falls partially outside our analytical framework since, in this case, the interests of both contractual parties are to be considered aligned. The better alignment between the employer's and the employee's interests is testified by the increased productivity of labour (see the contribution by Kruse, 1993, among the many). Interestingly enough, profit sharing is also reported not to engender perverse effects in terms of motivational crowding out (Frey, 1997; Frey and Osterloh, 2005) and this result is coherent with the presence of increased worker productivity. However, the utilisation of profit sharing undergoes also serious shortcomings which can be connected with our arguments. First, given the imbalance between the share of the profit attributed to the employer and to the employee, the problem of misalignment of interests can never be completely solved by profit sharing. Second, profit sharing as an incentive mechanism is unavoidably limited, since it does not solve the imbalances in the control structure. Consequently, profit sharing does not alleviate the problems linked to asymmetric information and authority since the employer can still use his/her private information to the detriment of workers. For instance, managerial remuneration and other costs can be inflated in order to reduce the part of the profit attributable to workers.

#### **4. A counterexample: worker cooperatives**

To corroborate our claims, we resort to a counterexample: when the conflicting interests linked to the agency relation between the employer and the employee cease to exist, as it is the case in worker cooperatives, we can observe stronger wage flexibility also in the presence of private information. We interpret cooperatives as entrepreneurial actions initiated by groups of self-organized principals<sup>10</sup> seeking common returns and stable labour relations that are obtained through a mutual-benefit organisation of the economic activity (Ellerman, 2005). This interpretation of the cooperative is also suggested by the definition provided by the International Cooperative Alliance. The cooperative is “an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise”.

As stated, in worker cooperatives there is evidence of a modification of the structure of the economic risk faced by workers, allowing increased wage fluctuations and, at the same time, stabilization of employment. Craig and Pencavel (1992) detect a greater effect of price variation on wage fluctuations, rather than on employment variation, in their sample of US plywood cooperatives as compared to similar capitalist companies. Pencavel et al (2006) compare Italian cooperatives and capitalistic firms and find evidence of greater volatility of wages and more stability of employment in cooperatives. Burdin and Dean (2009), observe the entire population of Uruguayan firms, and highlight a greater response of wages and a lower response of employment to idiosyncratic changes in output prices in the case of cooperatives rather than in capitalist firms.

Our explanation of this empirical evidence starts from the process of creation of worker cooperatives. When workers create a cooperative, capital is conferred or hired by members and does not have control rights over the organization. This has two major implications. First, worker-members, as entrepreneurs, participate in the definition of the strategic objectives of the firm and in the development of its governance. Consequently, the relations among members cannot be interpreted in terms of the principal-agent model and of its basic tenets. Second, capital is left with a purely instrumental role in allowing production to be carried out, and in guaranteeing worker members against future risks. It does not set any more the firm’s objectives in terms of profit maximization. These two implications represent two sides of the

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<sup>10</sup> We follow here the literature initiated by Ostrom, 1990 on the management of common resources by self-organized principals.

same coin, since capital becomes instrumental only if the firm is controlled by workers and not by investors.

The institutional and governance structure of worker cooperatives implies a reduction of uncertainty from the viewpoint of workers, integrating their motivations and preferences in the firm objective function. The absence of the risk of employer moral hazard implies that worker members in cooperatives can accept fluctuating wages in order to reduce as much as possible the risk of lay-off. 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).

In worker cooperatives the existence of private information does not translate any more into the demand for increased wage rigidity.<sup>16</sup> This is so because the absence of an employer eliminates also power imbalances in contractual relations. Private information is more easily disclosed and made to circulate within the group of principals that control the organisation. The promise not to reduce wages in an opportunistic way becomes a credible promise because of the absence of contrasting interests between the employer and the employee. Also, the cooperative can credibly commit to match wage reductions imposed by negative economic results with wage increases when outcomes are positive. Consequently, it is possible for worker members to accept flexible wages in exchange for employment stability.<sup>11</sup>

To summarize and complete our arguments, we introduce a synthetic representation of the features of labour contracts that are relevant in our study. They can be represented by means of a diagram that takes into consideration two dimensions: wage uncertainty and employment uncertainty.

TABLE 1 ABOUT HERE

## WAGE, EMPLOYMENT AND DIFFERENT FORMS OF LABOUR CONTRACTS

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<sup>11</sup> Also in the worker cooperative interests can be divergent between different members, and this has been seen as the weakest aspect in their governance (Hansmann, 1996). Furthermore, private information can also be held by managers of cooperatives, and retention of information can generate morally hazardous behaviours. In this latter instance agency costs can be reduced if managers are properly controlled by members and if proper governance solutions are devised (Borzaga and Tortia, 2010). At any rate, we will not deepen here the governance problems faced by worker cooperatives.

Piece rates give the lowest degree of guarantees to workers. Employment is uncertain, but also the wage is not fixed, since it depends on productivity, on market demand, and on the employer's decisions. The employment contract coupled with the fixation of wages represents an initial step forward relative to piece rates since it is able to stabilize worker remuneration. The traditional model of the worker cooperative in the bottom left part of the diagram, the income maximizing labour-managed firm analysed by Ward (1958), has been shown both by theory and empirical tests to be able to guarantee a high degree of employment stability (Meade, 1972, Dow, 2003; Craig and Pencavel, 1992; Pencavel et al., 2006). The last model of the worker cooperative in the bottom right quadrant of the diagram represents a further step forward because, by accumulating collective reserves into locked assets, trusts or other collectively-owned assets, worker members guarantee for themselves both "job insurance" and "wage insurance" (Navarra, 2010). The capitalist employer can only agree with the main demand of the worker, that is to wage rigidity at the cost of renouncing to guarantee employment stability. This is so because the fixation of both the wage and employment levels would require the firm to disinvest its assets during downturn of demand in order to guarantee the stability of employment for the whole workforce. In the worker cooperative, instead, the assets of the firms are owned by worker members who can decide to reduce their value in order to preserve both employment and wage stability in bad economic times. In this specific sense, the assets of worker cooperatives have also an insurance function (Navarra, 2010), which is to be added to their function as collateral guarantee (Tortia, 2006) and as financial basis for investment programs (McCain, 1977).

As final word, something has to be said about the macroeconomic implications of our arguments. Downward wage rigidity is considered to be one of the major following downturns of demand, and negative shocks on costs thereof. Indeed, a significant part of the Keynesian literature, identifies wage rigidity in capitalist economies as a major factor causing of the formation of the business cycle of unemployment thereof, and amplifying the effects of exogenous negative shocks (Jossa, 2005). In this respect, wage flexibility has the potential to substantially reduce the negative impact of the business cycle by means of countercyclical effects built-in organizational behaviours. Worker cooperatives are reported to preserve employment in bad economic conditions by lowering labour income and by redistributing the total amount of hours worked. They also react more weakly to increases in demand for their goods because of the weaker stress put on short term surplus maximization and of the stronger stress put on the long term stability of employment. The countercyclical behaviour of

cooperatives has been evidenced in many works (Craig and Pencavel, 1992, 1994; Jossa, 2005; Pencavel et al., 2006) and confirms the differences in observed behavioural patterns of for-profit and cooperative firms. As a consequence, the institutional structure of worker cooperatives allows for a smoother transition from negative supply and demand shocks to recovery.<sup>12</sup>

## **5. Conclusions.**

In this paper, we entered the debate on the possible forms of labour contract in different firm types. We focussed on the features of the relations between employment and wage fluctuations in worker cooperatives and in capitalistic firm. Our arguments show that wage rigidity is a necessary consequence of the risk of moral hazard by the better informed and stronger contractual party, the employer. Moral hazard can stem from various sources. Among these, the presence of private information held by the employer on market conditions and imbalances in decision making power concerning the strategies of the organization in the presence of contrasting interests between the employer and the employee. These elements imply the risk of opportunistic decisions, whose negative consequences are borne by workers.

In some sense, we reverse the propositions put forward by Stiglitz stated in his 1975 work: “this paper is concerned with the lack of information of the employer and the discretionary actions of the employees”. We are concerned instead with the lack of information of the employees and the discretionary power of the employer. Contractual agreements that are potentially efficient for both the employer and the employee may not be struck at all when there are incentives for the employer to exploit asymmetric information or decision making power in his/her favour. Specifically, we emphasize that labour contracts between capitalistic firms and their employees making the wage contingent on the realization of different states of

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<sup>12</sup> The behaviour of employers in monopsonistic labour markets tends to depress wages and employment in order to increase profits. This has been often considered one of the main causes triggering the creation of worker cooperatives (Hansmann, 1996). Our argument does not exclude this possibility, but treats monopsony as a different case of power concentration on the employers’ side, one cast in terms of failures in the contractual structure due to asymmetric information coupled with ex-post power (lock-in). This power imbalance, however, depends on the structure and on the extent of the market, and not on the features of the employment relation. It can exacerbate the effects of employers’ moral hazard, but the manifestation of moral hazard connected with the employment contract can be present even in competitive settings.

the world engender an incentive for the employer to misrepresent such states because this misrepresentation is functional to profit maximization. Correspondingly, since employees are aware of the fact that state-contingent contractual relations would expose them to the risk of the employer's moral hazard, they may not be willing to accept such kind of contract. Not surprisingly state-contingent wage contracts are observed only in special cases.

A counterexample comes from worker cooperatives, where the agency relation inherent in the employment contract is eliminated, therefore avoiding the risk of the principal's opportunism. Evidence is brought to highlight a greater wage fluctuation and employment stability in worker cooperatives. This evidence is explained by the process of internalization of workers' objectives into the objective function of the firm, which leads to a stronger stress put on employment stability. In a similar fashion and with arguments similar to the ones put forward in this paper, it would be interesting to analyse other forms of workers' collective actions, like trade unions. These represent the main tool at the disposition of workers employed in capitalist firms that can be used to face the risk of morally hazardous behaviours by the employer since they can increase workers' coordination and collective bargaining power, filling also the information gap between the parties.

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**Table 1. Wage, employment and different forms of labour contracts**

|                        | Wage uncertainty |   |   |
|------------------------|------------------|---|---|
| Employment uncertainty |                  | Yes   | No  |
|                        | Yes              | Piece-rate                                      | Employment contract                           |
|                        | No               | Worker cooperative<br>(wage fluctuation choice) | Worker cooperative<br>(wage smoothing choice) |