

# **Firm-level bargaining and contingent pay: New evidence from Italy**

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[preliminary version]

AIEL, XXVI National Conference  
Università Cattolica del Sacro Cuore, Milano  
15-16 September 2011

## **Abstract**

This paper examines two important institutional aspects closely related: (i) the extent to which collective bargaining has been decentralised at company level; (ii) the extent to which, at this level of bargaining, variable pay systems have been used.

It is performed on the basis of a nationally representative sample of manufacturing and non manufacturing firms, obtained by merging information from two different sources: balance-sheet data from the Bureau Van Dijk AIDA archive and firm-level information on performance-related pay and other workplace practices from the ISFOL Employer and Employee Surveys (RIL) for 2005 and 2007.

This paper points out that the nature of the industrial relations system and their cooperative characteristics provide the flexibility needed to respond to employment volatility and skills specific accumulation. In particular we find that firm level agreements and performance related pay (PRP) contracts are positively related to the importance of training, to the presence of unions, whose attitude to sign company level agreements mitigates risk aversion towards employment uncertainty and favours the adoption of contingent pays. We show that risk bearing, implicit in the employment relationship and training investment, is less beyond workers' control under union governance. In this context, unions play a positive role in finding negotiating responses to changes in economic conditions, and positively influence the diffusion of PRP.

A common trait of whole economy, however, is that male workers benefit more from company PRP agreements and from their employers' ability-to-pay, with respect to women, less covered by the second level of bargaining and by PRP agreements.

**JEL Classification:** J33; J51

**Keywords:** Performance – related pay, unions

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## 1. Introduction

This paper examines two important institutional aspects closely related: (i) the extent to which collective bargaining has been decentralised at company level; (ii) the extent to which, at this level of bargaining, variable pay systems have been used.

As documented by the European Commission, “decentralisation has been an important feature of developments in industrial relations in Europe in recent decades.” One of the scopes of this process has been that of “flexibilising wage setting and linking wages more closely to the competitive position and requirements of individual companies”. (Industrial Relations in Europe 2010, p. 131)

For Italy, however, the evidence on the coverage of firm level agreements and of performance related pay (PRP) is limited and dated. This paper aims at filling this gap. It will be done on the basis of a nationally representative sample of manufacturing and non-manufacturing firms, obtained by merging information from two different sources: balance-sheet data from the Bureau Van Dijk AIDA archive and firm-level information on performance-related pay and other workplace practices from the ISFOL Employer and Employee Surveys (RIL) for 2005 and 2007.

In addition, this paper presents estimates of those factors which favoured or hindered adoption of firm level agreements and PRP schemes. In this kind of analysis a whole set of information will be accounted for: personnel organisation, recruitment strategies, position of employees, training investments, and the presence of unions.

Two main questions motivate our analysis. The first question relates to the position of employees and their representatives and their role in negotiating responses to economic volatility and uncertainty.

Some studies found that in unionised plants, joint decision-making accompanies incentive payments, with better results (Black and Lynch (2001). On empirical grounds, there is new evidence that also in low unionised economies, worker representations are perceived by employers as institutions capable of improving firm performance, as found by Bryson and Forth for the UK (2009). Other studies argue that employees’ representatives may inhibit variable payments, which in principle may reduce wage compression, since their strategy is limiting pay heterogeneities (Addison and Hirsch, 1989). We will test on the basis of the Italian experience whether PRP are implemented at the employer’s discretion or are bargained with unions and their representation bodies which are present at company level (the Italian work councils, RSA and RSU<sup>1</sup>).

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<sup>1</sup>See Note 2 for a brief description of these institutions.

In addition, we also deal with the role of business volatilities represented by employment fluctuations. We investigate whether union strategies in terms of company agreements and PRP are conditioned by economic uncertainty. Indeed, employment fluctuations may have possible (negative) effects on the probability of adoption of contingent pays. However the trade off between employment instability and implementation of PRP agreements may be conditioned by the institutional context for company bargaining and the strategies adopted by employers and trade unions. The involvement of workers' representatives may make it possible for a number of firms to agree on a package of labour measures which include support for variable pays. This 'negotiated' response highlights the positive role of cooperation in collective bargaining, and offers lessons to deal with the actual crisis in the labour market, which has been recorded after the great recession. Our findings for Italy confirm, as recently shown for other countries "the role that collective bargaining has played in Europe during the economic downturn in protecting workers and facilitating enterprise adaptability" (Glassner and Keune, 2010, p.iii).

The second issue addressed in this paper relates to the role of training and innovation. The question is whether the diffusion of decentralisation of pay setting can be seen as part of strategies of firms and more oriented to training efforts of their workforce and with higher propensities to enhancing innovation. It is a relevant question since growth accounting reveals that the problem underlying the structural crisis of the Italian economy is not only one of limited accumulation of physical and human capital. Some of the stagnation is due to an organisational design which penalises the innovative capabilities of Italian firms.

We find evidence that firm level agreements and PRP contracts are positively related to the importance of training and to the presence of unions, whose attitude to sign company level agreements is higher under employment uncertainty and training. The rationale behind is that risk bearing, implicit in the employment relationship and higher when employees acquire firm-specific skills, is less beyond their control under union governance, whose role is insulating their representatives from variability in firm revenue. A common trait of whole economy, however, is that male workers benefit more from company PRP agreements and from their employers' ability-to-pay, with respect to women, less covered by the second level of bargaining and by PRP agreements.

The paper is organised as follows. Section 2 discusses related literature and briefly describes the Italian institutional setting. Section 3 presents the data that has been used, descriptive statistics, estimation strategy and results. Section 4 concludes.

## 2. Related literature

### 2.1 Hypotheses

As well known, a first group of reasons, signalled by the two-tier wage-setting literature, relies on the standard agency framework with asymmetric information, in which a single firm may find it convenient to pay extra wage increases to its workers in order to extract more effort from them.

Local arrangements between workers and the single firm may increase the 'pie' to be shared. In addition, selection and retention - the two other major issues of the incentive wage literature - may be embedded in this variety of two-tier wage regimes: use of performance related bonuses may be adopted to select and retain employees, especially in countries such as Italy, where the first level of bargaining sets basic uniform wages and egalitarian policies tend to compress rewards differentials.

A first set of considerations concerns the role of unions.

A quite unexplored question is the role of unions in dealing uncertainty and volatility. A literature, partially related to this issue, examines economy's dynamism, which can be evidenced by Schumpeter's creative destruction, i.e. by high levels of job creation and destruction, "or what labor economists refer to as *job churn*" (Hirsch, 2010, p.5). This literature, namely based on the US experience, shows that "Increasing economic dynamism, say from rapid technological change or shifting trade patterns, reinforces cost disadvantages for union companies to the extent that union governance slows response to changes in the economic environment" (Hirsch, 2010, p.25). However, no evidence is obtained for the role of unions in promoting contingent pays in dynamic environments, and embedded in other systems of industrial relations and this matter will be investigated for the Italian case with our estimates.

Related literature has in any case examined the role of unions, independently from economic fluctuations, and has shown two opposite effects. On one hand, trade unions have sufficient bargaining power to obtain high wage premia at firm level agreements and favourable conditions from local contracts. One potential result is to strengthen the pay-performance-link, as in rent sharing models (Abowd and Lemieux, 1993; Blanchflower *et al.* 1996). On the other hand, unions' egalitarian policy may lead them to trying to compress the wage distribution to pursue their equalizing aims, thus their presence may reduce the probability of PRP which may produce significant wage differentials. On parallel reasoning, theory and evidence collected in profit sharing literature (Pérotin and Robinson, 2003), show that the adoption of employee financial participation schemes is also seen as an employer strategy which, by increasing employee involvement in company performance, discourages unionisation.

However, union governance may also be beneficial for the firm. Indeed, absent workers 'representatives, PRP schemes which take the form of collective bonuses are not exempt from potential drawbacks. The very fact that they are collective may induce employees to free-ride on the efforts of others and thus cut productivity. A plausible solution to the quelling of free-riding attitudes is easier found under the presence of unions; they may favour the promotion of team culture and employee participation in decision-making, a policy which contributes, to increasing commitment (Blinder, ed., 1990; Kruse et al. 2010). Also, unionisation as well as employee involvement and training may be components of an integrated strategy based on adoption of 'bundles' of human resource practices. It can be expected that PRP are more likely adopted by firms characterized by a style of industrial more participative and where workers representations are more present. The overall expected effect of unions on probability of decentralised bargaining and PRP remains uncertain and will be checked for the Italian economy in next sections.

In addition, some workforce characteristics are expected to be significant. Efficiency wage considerations are more important for employees who have accumulated firm-specific human capital since the incentive for employers to pay above competitive wages in order to reduce turnover and shirking may be higher for trained as well as better educated workers (see for the German case, Gürtzgen, 2009). So far, the specific issues of training and PRP have been mainly analysed by a vast literature, but as separate topics, with only few exceptions (Azfar and Danninger, 2001; Gielen, 2007). In our empirical analysis we attempt to connect these issues by testing whether firms who have invested in training and in the productivity of the 'match' with their employees will be more oriented to share the returns of these investments, thus showing higher propensity to adopt compensation packages linked to company performance.

These rationales may be more important in environments characterized by innovation, i.e. when employers promoting technological and organisational changes pay wages above contractual minima to obtain more cooperative attitudes from their employees. For the same Italian experience, previous evidence showed that firms adopting PRP were on "average good performers in the process of making changes to technology and work organization." (Amisano and Del Boca, 2004, p.464) Recent analyses of innovation call for increasing interest on the relation between firm propensity to innovation and work practices (Michie and Sheehan, 1999, 2003; Laursen and Foss 2003; Vinding 2004). This new literature points out that innovation is positively associated with participative labour relations and workers motivation, as tested for the UK and Denmark, and recently for a

region of the Italian economy (Gritti and Leoni, 2011)<sup>2</sup>. For the latter case, the authors estimate that the combination of work practices that is most conducive to innovation consists in industrial relations of 'participatory' type (p. 22) and, among others, individual or collective bonuses linked to enterprise performance.

We will extend the analysis to the whole Italian economy and test the causality link *from* training and innovative attitudes of manufacturing and services companies *toward* adoption of compensation packages linked to firm performance.

## **2.2. The Italian institutional setting and previous studies**

As mentioned above, Italy is characterized by a two-tier bargaining regime: national contracts at sectoral level, linked to the target inflation rate, should guarantee the purchasing power of wages, whereas decentralised bargaining at firm level should distribute wage premia, linked to productivity or performance company results. This institutional setting, introduced with the July 1993 Agreement, should have provided enough space to wage compensation schemes linked to efficiency gains, thus promoting reorganisation and innovation of productive processes. We will examine in the next section which types of firms and workers were covered by local agreements in 2005 and 2007, more than ten years after the 1993 Agreement, and identify the main factors leading to the adoption of incentive company bonuses.

This kind of analysis may also contribute to the current debate on the reform of industrial relations. Indeed, the need for additional stimulus and new encouragement of PRP has inspired the reform proposals of 22 January 2009, incorporated in the agreement which was signed by the government, national employers' associations and the trade unions, with the exception of CGIL (one of three main national representative organizations of employees). The agreement designs new rules for wage setting in order to amplify the importance of the variable component, and two main points are currently a matter of political debate: promotion of firm level bargaining and position of unions regarding adoption of local agreements and variable remuneration schemes.

For the Italian economy, previous studies have shown that two of the main proposals of the 1993 Agreement - ample coverage of company arrangements and the spread of PRP - were only partially implemented, and not contemporaneously for the same firms. For the mid Nineties, the first official national survey on employee financial participation after the 1993 Agreement was undertaken in 1997 by the Italian Statistical Institute (ISTAT). The inquiry, aimed at verifying the actual implementation of company-level arrangements,

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<sup>2</sup> The analysis of Gritti and Leoni (2011) is based on a database of a sample of 166 manufacturing firms located in the Lombardy region (Italy).

showed the limited diffusion of firm-level agreements, which in 1995-96 involved only 9.9% of companies with at least 10 employees and 38.8% of total employment.

Starting from the end of the 1990s, the availability of the statistical information itself became less frequent and more discontinued. One of the main findings of this sparse and fragmented information was a falling trend in local bargaining along with the compression of bonus elements and PRP schemes.

In November 2007, the CNEL published the results of its last report covering almost 3,000 company-level agreements relative to a representative sample of over 1,000 companies employing more than 100 workers. The most important finding of this research, spanning over a period of nine years from 1998 to 2006, was the marked trend indicating an impressive decline in the implementation of company agreements. This tendency was general, though it was more pronounced in the case of the smallest firms in the CNEL dataset (100-999 workers)<sup>3</sup>.

The Bank of Italy's surveys (Invid), covering companies with more than 20 employees report that less than half of the workers (45% in manufacturing and 40% in services) were paid company premiums. Moreover, from this database, Casadio signalled another weakness, namely the marginal importance of PRP, as it represented only 4% of the total compensation package (Casadio, 2008). Furthermore, there is recent evidence for declining importance of local bargaining and company wage agreements, which over the years 2002-2007 have been recorded for companies of all sizes included in the Bank of Italy survey (Casadio, 2010).

A broader picture is obtained by the ISFOL surveys which contain information on a nationwide sample of firms, representative of the whole Italian economy, and containing a wealth of information on firm and employee characteristics. This dataset, integrated with balance-sheet data obtained by AIDA (see the section below), allows a deeper investigation of a whole set of factors including innovation strategies and styles of industrial relations- which may have favoured or hindered adoption of firm level agreements and PRP schemes.

### **3. Data and descriptive statistics**

Our empirical study is based on a nationally representative sample of manufacturing and non manufacturing firms, obtained by merging information from two different sources: balance-sheet data from the Bureau Van Dijk AIDA archive and firm-level information on

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<sup>3</sup>For example, in the metalworking industry, in periods of complementary agreements renewals, the incidence of bargaining among large companies fell from 51% in 2000 to 37% in 2004, while among the smaller from 50% to 22%.

performance-related pay and other workplace practices from the ISFOL Employer and Employee Surveys (RIL).

The ISFOL-RIL surveys are firm surveys which collected cross-sectional information relative to 2005 and 2007 about personnel organization, recruitment strategies, position of employees, training investments, presence of unions, adoption of PRP schemes and other workplace characteristics. It refers to firms operating in the non-agricultural private sector, and includes both partnership and limited companies.

For what regards our key variables, each sampled firms in RIL survey is asked whether or not a firm level contract is adopted. In case of positive answer each is then asked to indicate whether the firm level contract consists of the adoption of PRP or, alternatively, other not better specified aspects of the second level bargaining. Unfortunately, we do not know whether the different types of schemes are based on firm-, group- or individual-performance. Besides, the dataset does not provide statistics on how many workers in the firm receive PRP or whether these schemes are offered to all or to a selected group of employees (managers, blue- collars, or all workers)<sup>3</sup>

Therefore, both the firm level contract and PRP variable are dummy variables simply indicating the existence or not second level bargaining and in this case, the presence of a PRP scheme of some kind.

As far as unions are concerned, the respondent firm is asked whether there is a form of employee representation of any kind in the firm. We thus have a second dummy variable indicating the presence of unions at firm level. Furthermore, we have information about the workplace characteristics and business strategies of each firm (detailed definitions of all variables are given in the Appendix).

The AIDA database contains the annual accounts for limited companies which had turnovers of over 100,000 Euros in 2004. This database is our source of information for the value added, capital, labour. In particular, to link information concerning workers' characteristics to indicators of firm performance and accounting variables, a sub-sample of the RIL dataset was merged using company tax codes with balance-sheet information from the AIDA archive relative to the period 2005-2007.

Given the characteristics of the RIL-AIDA dataset, the merged sample is representative only in the case of limited companies. Also, we exclude firms with less than ten employees, applying a filter to retain only those characterized by a minimum level of organizational structure"

### **3.1 Descriptive statistics**

In this section we perform a descriptive analysis of the RIL-AIDA merged sample for the year 2005 and 2007.



To begin with, Table 1 reports the incidence of firm level bargaining and PRP. The results show that the spread of company level bargaining is modest, on average in 17% and 15% of firms in 2005 and 2007, respectively. The presence of unions, in one of the two distinct workers representation channels, is slightly higher<sup>4</sup>.

Moreover, in 2005 and 2007, only 59% and 67% of firms with firm level agreements have PRP schemes, thus confirming the limited spread of PRP agreements, which are still not a common practice, since they involve only a minor proportion of the whole population of Italian firms.

Table 1 also reports the mean and standard deviation of firms adopting innovation projects and training of their workforce. Our data show that only half of companies implement innovation projects, whereas training is limited to only 40% of employees. Ten per cent represents the fraction of the workforce with fixed- term contracts.

Table 1 presents these main characteristics for 2005 and 2007.

[INSERT Table 1]

Notice that PRP schemes are bargained with local unions and they are part of a local (usually firm-level) agreement. The next step is then to compare three distinct groups of firms: companies without a firm-level contract; with a firm level contract but *without* PRP, and last with firm-level contract and *with* PRP.

Table 2 presents a summary description of these three groups and allows verifying their different profiles (size, union, sectors, personnel characteristics). Notice also that our analysis is not merely cross sectional as we investigate also some balance sheet variables that represent proxies of the firms' past performances over the period 2002-2007.

[INSERT Table 2]

Table 2 and 3 make immediately apparent that the share of firms with firm level contracts *and* PRP is clearly different from other two groups. What typifies the typical portrait of

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<sup>4</sup> Two distinct channels are present; the plant-level union representation structure- Rappresentanza Sindacale aziendale, RSA- and the unitary workplace union structure (Rappresentanza sindacale unitaria, RSU). In details, the Italian Workplace representation profile may be sketched out as follows. "The Workers' Statute of 1970 gives the workers the right to organise a plant-level union representation structure (Rappresentanza sindacale aziendale, RSA). The tripartite agreement of July 1993 introduced – in addition to the RSA – a so called unitary workplace union structure (Rappresentanza sindacale unitaria, RSU). This body is elected by all employees, but representatives are usually elected through trade union lists. Therefore, it includes features of both works councils (the broad active electorate) and trade union bodies (the almost exclusive inclusion of trade union representatives). In general, it can be associated with trade union bodies" (EIRO, 2009).

PRP firms is that they are more successful in terms of added value levels, more active on grounds of outlays in innovation projects, greater involved in offering training opportunities, not exempt from paying PRP to the more protected (male and unionised) workforce component. In 2005, firms with PRP schemes made more use of trained employees (66%) with respect to other two groups (37% and 56% without FLC and No PRP, respectively) and made less use of fixed-term contracts with respect to firms without FLC (8% versus 11%). Lastly, the female component appears to be more 'segmented' in firms without firm level agreement or without PRP contracts.

Concerning other characteristics of workforce, there are not striking differences between firms *with* and *without* PRP contracts. Workforce composition in terms of job qualifications and tasks performed is not clearly associated with flexible pay policies: the incidence of managerial, supervisory, white-collar and blue-collar workers is similar in all groups of firms.

ISFOL data also confirm some expected results: the existence of ample differentials by region, sector and firm size. A crucial aspect is the higher diffusion of PRP contracts, adopted by larger companies, located in Northern Italian regions and operating in the industrial sector (manufacturing, mechanics, textile), whereas PRP agreements are less present in services. These disparities, already shown by the survey carried out by the national statistics office for the mid-1990s (ISTAT, 1999), are still persistent and reveal heterogeneity in company strategies and in their utilisation of wage flexibility.

It is remarkable an unequal sectoral distribution, ranging, in 2005, from 28% of PRP firms in manufacturing to 2% in Transport and communication.

Last, notice a substantial inertia in firm strategies comparing 2005 and 2007.

[INSERT Table 3]

The different profile of PRP firms, with respect to that of other two groups, is a stimulus to ascertain the actual motivations behind the adoption of company wage variable agreements.

#### 4. Econometric analysis

The empirical analysis of probability of local bargaining and PRP is performed by using the unobserved effect probit model. Then we estimate the following equation:

$$(1) \quad \text{Pr}(y_{it} = 1 | X_{it}, \alpha_i) = \Phi(X_{it}\beta + \alpha_i) \quad \text{with } t=2005, 2007$$

where  $y_{it}$  is the dependent variable indicating whether firm adopt firm level bargaining or PRP,  $\Phi$  is cdf of the normal distribution,  $X_{it}$  contains the workplace characteristics supposed to affect the dependent variable and  $\alpha_i$  is the time invariant unobserved effect.

In particular we use a conditional maximum likelihood approach to estimate a *pooled probit model* of equation (1) by imposing  $\alpha_i = \alpha$  and a *random effect probit model* by assuming  $\alpha_i$  and  $X_{it}$  are independent and that is normally distributed:  $\alpha_i | X_{it} \approx N(0, \sigma_\alpha)$ .

Actually applying fixed effect estimations is not a suitable empirical strategy in our case. This is because fixed effect binary outcomes model in short panel usually leads to inconsistent estimation for the parameters  $\beta$  and  $\sigma_\alpha$  (Wooldridge, 2001). Further we expect that fixed effect estimates are poor efficient as key variables in our sample show a little within variation as compared to between variation over the period 2005-2007.

In this context we use estimates separately the probability of adoption firm level bargaining and PRP by using substantially the same explanatory variables. The aim is to verifying how the similar workplace characteristics and firm performance affect differently the propensity to decentralized the bargaining between firms and workers and, within a decentralized scheme, to adopt PRP.

Further, as main focus is to analyze how the presence of union "filters" the impact of volatility and training on the probability to adopt firm level bargaining and PRP, we estimate the following specification of equation(1):

(1')

$$\Pr(y_{it} = 1 | X_{it}, \alpha_i) = \Phi(\beta_1 vol_{ct} + \beta_2 train_{it} + \beta_3 union_{it} + \beta_4 vol_{ct} * union_{it} + \beta_5 train_{it} * union_{it} + X_{it} \delta + \alpha_i)$$

where  $vol_{ct}$  is the average standard deviation of employees during the period 2002-2005 calculated in each cell  $c$  (defined by firm size and sector) the firm  $i$  belongs to,  $train_{it}$  is a dummy variable indicating whether the firm organizes a training course for their employees and  $union_{it}$  is also a dummy variable which indicates the presence of union at firm level. The vector  $X_{it}$  represents other workplace characteristics that may affect firm level bargaining and PRP (for details see Appendix).

#### 4.1 Results

The main findings of the econometric analysis are shown in Tables 4 and 5, where the estimates of the marginal effects are reported both for *pooled probit* and *random effect probit model*.

In general, comparing Table 4 and 5 we note that many of the variables which are significantly associated with firms' choice of adopting firm level bargaining also increases the probability of PRP agreements.

However, some factors deserve particular attention in explaining the probability of firm level bargaining and PRP: the role of industrial relations and human capital practices, firm' characteristics in terms of productivity and workforce composition and, then, the impact of size, geographical location and sector of activity.

#### *Industrial relations, training and employment volatility*

Firstly, we find that the incidence of training, the presence of union and the volatility of employees in the environment the firms belongs to enhance both firm level bargaining and, particularly, PRP. See columns (a) and (c) of Table 4 and 5.

Of course, some of these results are expected. For example, it is well known that firm level bargaining and PRP are mainly negotiated with unions given the characteristics of the Italian institutional settings while economic theory has traditionally shown that training organized at workplace should enhances workers and firms to bargain over the expected returns of firm specific skills accumulation (Hoshimoto, 1982). The positive relationship between the volatility of employees and PRP may also to be justified by a theoretical (and institutional) point of view. That is, a risky economic environment may push employees to trade part of future wage growth off with more employment stability.

However what it is more interesting is how the presence of union "filters" the training investment and the volatility of employees in affecting firm level bargaining and PRP, that is the role of union in finding negotiated responses to deal with employment volatility and skills specific accumulation.

Actually when the management and the workforce, are involved in the setting up of firm level contract, unions, as worker representations, may play a defensive role. Indeed, decentralised wage-setting rules which envisage a flexible compensation system which links workers' pay to enterprise performance, is not only an incentive mechanism. It is also a sharing tool which shifts the burden of adverse shocks from profit losses to workers' pay contractions.

Then our estimates show that the presence of unions not only enhances more intensive collective actions by employees in signing local agreements and variable bonuses. What is more, their protective role becomes more relevant in conditions of uncertainty, when high employment volatility of the economic environment the firms belong to triggers the security of income of employees. In fact columns (b) and (d) of Table 5 report that probability of adoption of PRP increases when the presence of union allows to negotiate wage response to employment fluctuations.

A similar result also emerges when the interaction between training investment and unions is concerned. Both *pooled* and *random effect* estimates show that unions' attitude to sign PRP agreements is higher under training.

The common rationale behind these results is that risk bearing, implicit in the employment relationship and firm-specific skills accumulation, is less beyond workers' control under union governance, which may play a positive role in insulating representatives from variability in firm revenue and capable of higher degree of adaptability to changes in economic conditions.

#### *Performance and innovation*

PRP, as well firm level local bargaining, are positively conditioned by the performance indicator, as confirmed by the positive statistical significance of the coefficient associated with the level of productivity. Thus it emerges that concession agreements, which include flexible clauses, added to base wage component, are mainly adopted in those firms with higher 'ability to pay'. The findings we obtain show that firms with the highest efficiency are significantly more oriented to adopt incentive schemes, since the performance indicator has a greater impact.

One further result in order is, as expectedly, the positive effect of innovation on the probability of company bargaining, even if without significant effects on adoption of PRP.

#### *Workforce composition*

Findings at odds with other countries' experiences concern workers position: the coefficients associated to the white- and blue-collar components are not significant with respect to the omitted category (managers). Conversely, the German evidence shows that employees' financial participation is more probable for blue-collar jobs (Heywood and Jirjahn 2002), whereas higher involvement by white-collar employees has been found in the UK (Robinson and Wilson, 2001) and Finland (Arranz-Aperte and Heshmati, 2003). These disparities do not appear in Italian enterprises, where neither blue-collars, nor white-collars have eligible conditions in terms of PRP contracts

Workforce composition by gender also plays a significant role, at variance with other country experiences: a higher percentage of female employees lowers the probability of both firm level bargaining and contingent pay. This finding is far from being an obvious and unavoidable result.

A case in point is France, where distributive contents of firm-level agreements, set independently of union influence, benefit women particularly (Fakhfakh and FitzRoy, 2004). Analogous benefits are obtained by the female component in a country such as Germany, where collective bargaining, as in Italy, plays a great role: in the economy, the

wage premium obtained by works councils, around 11%, is also higher for women than for men (Addison *et al.* 2006).

A cautionary interpretation is necessary, since the percentage of women is very likely to be correlated with unobserved (or omitted) firm characteristics. In any case, in Italy, the negative correlation between the percentage of female workers and the spread of integrative bargaining schemes has some points in common with the traditional literature of economic discrimination against women in the labour market (Naticchioni and Ricci, 2009).

### *Size*

As expected, as firm size increases, collective local negotiations are more likely needed to coordinate complex organisational structures, which call for adopting rules tailored to large firm specific needs and not set by sectoral contracts. Notice also that national contracts set the tariff wage, in Italy equivalent to the minimum wage, which varies by sector and qualification, but not by firm size; hence, the local bargaining offers the possibility of creating a wage drift for larger companies.

However, concerning adoption of variable payments, the expected role of size is not clear cut since the efficiency wage literature suggests two opposite effects. On one hand, asymmetric information and monitoring costs increase with firm size and explain the positive correlation. On the other hand, opportunistic behaviour and free-riding arguments are more frequent in large firms, since horizontal mutual monitoring and peer pressure are more difficult, thus generating an opposite, negative correlation. On empirical grounds, international evidence is not conclusive, since the role of firm size is contradictory. For some countries, such as the US, Germany and Canada, some studies find that employees' financial participation is positively related to size, others do not find any statistically significant relationship. Further, for the UK, both positive and negative relationships between firm size have been found, whereas Japan is the only country where profit-sharing schemes are definitely higher in smaller firms (Pérotin and Robinson, 2003). In our case the positive effect prevails: estimates, reported in Table 5, show that the probability of PRP premiums is correlated with company size, variable bonuses being more frequent in large firms.

The role of size, which is still significant when one controls for other covariates, calls for attention to the role of an omitted variable, i.e. ownership and governance structures, which diversify small-family firms from others. As size increases, it is plausible that the fraction of firms run by managers and oriented to governance devices relying on 'performance model' - instead of 'fidelity model'- increases (see Bandiera *et al.* 2008). As recently pointed out by Draghi (2011), this is a relevant issue for the Italian economy

where in manufacturing the share of family firms is 59% of the whole population of the same sector, well beyond the shares of 18% and 22% observed in France and Germany, respectively. One related effect of size increases might be a modernization of the Italian system of industrial relations, also by larger adoption of the 'performance model' and utilisation of contingent schemes which, according to our estimates, are positively affected by firm size.

### *Geographical location*

Our results also show that regional differentials in our sampled period are still significant, even after controlling for an ample set of covariates: firm level agreements and PRP are more likely adopted in Northern regions; in addition these same areas are not fully homogenous since North-Eastern regions show higher probabilities of both firm level agreements and PRP with respect to the North-Western area (the omitted group). These results confirm a substantial stagnation and inertia in regional imbalances since similar differentials for probabilities of local bargaining were found by Checchi and Pagani (2004) on the basis of a data-set surveyed in 1995 by Eurostat.

### *Sectors*

From our database, it is also evident a heterogeneous sectoral diffusion. Sectors which show highest propensities to sign PRP agreements are mining and energy supply (the omitted category).

Conversely, belonging to tertiary industries negatively affects the probability of adoption of local bargaining and PRP: in our sample, three service sector industries – Hotels and Restaurants, Finance, and Personal services (education, health and public services) all have a lower probability of signing firm level agreements and PRP, revealing a sectoral characterization which contrasts with experiences of other countries, examined by Addison et al. (2009). It is remarkable result since service sector is the key industry where productivity increases, obtained through good human resource practices, should be more necessary in the national economy: Italian private services was the only country-sectoral case of negative productivity growth in EU13 (-0.1%), as seen in Inklaar *et al.*, 2008; and Damiani, Pompei and Ricci (2011).

It is also worthwhile to note that manufacturing, the leader sector in the Italian economy, and whose relative importance is only second to that occupied in Germany, shows a lower probability of firm level contracts and not significant differentials in terms of PRP.

One group of covariates which captures the role of performances and business strategies of firms (productivity, innovation and training) is also significant.

[INSERT Table 4]

[INSERT Table 5]

## 4 Conclusions

The analysis performed in the present paper allows a study on national scale for the Italian economy of the correlates of collective bargaining arrangements at company level and of performance related pay.

We obtain that the nature of the industrial relations system and their cooperative characteristics provide the flexibility needed to respond to employment volatilities and uncertainties. In cooperative environments, unions play a positive role in finding negotiating responses to changes in economic conditions, and positively influence the diffusion of performance related pay (PRP).

This result is coherent with our findings for the importance of training and the presence of unions, whose attitude to sign PRP agreements is higher under training. The common rationale behind these results is that risk bearing, implicit in the employment relationship and higher when employees acquire firm-specific skills, is less beyond workers' control under union governance, which may play a positive role in insulating representatives from variability in firm revenue and capable of higher degree of adaptability to changes in economic conditions.

As expected, we find that greater firm size, location in North-Eastern regions, dynamic strategies oriented to training, smaller share of female workers are all factors associated with a higher propensity to resort to firm level agreements and contingent pay. These results, which give a picture of the Italian bargaining system not radically changed much over the past years, must be integrated by the role played by the sectoral dimension, i.e. by low probabilities of adoption of local bargaining and PRP in services, and in descending order in manufacturing.

The main message of this paper is that the adoption of PRP pays is basically triggered by uncertainty on the part of the workforce, captured by standard deviations of employment. In this scenario, we find evidence that firm level agreements and PRP contracts are positively related to the presence of unions, whose defensive attitudes mitigate risk aversion towards uncertainty and help promoting the diffusion of contingent pays.



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**Table 1: Descriptive statistics of the whole sample 2005 and 2007**

	2005		2007		2005-2007	
	mean	std. ev	mean	std. dev	mean	std. dev
Firm level bargaining	0.17	0.37	0.13	0.34	0.15	0.36
PRP	0.10	0.30	0.09	0.29	0.10	0.30
St. dev. employees	0.050	0.05	0.053	0.06	0.051	0.06
Training	0.41	0.49	0.43	0.50	0.42	0.49
Union	0.23	0.42	0.21	0.41	0.22	0.42
% managers	0.07	0.10	0.03	0.06	0.05	0.09
% white collars	0.45	0.31	0.34	0.28	0.39	0.30
% blue collars	0.48	0.31	0.63	0.30	0.56	0.31
% female	0.35	0.26	0.29	0.25	0.32	0.25
% fixed term contracts	0.10	0.14	0.10	0.16	0.10	0.15
Innovation	0.56	0.50	0.62	0.49	0.59	0.49
Ln (value added)	10.56	0.69	10.78	0.51	10.67	0.61
<b>Firm size</b>						
15< employees	0.39	0.49	0.39	0.49	0.39	0.49
14 employees<50	0.47	0.50	0.47	0.50	0.47	0.50
49<employees<250	0.12	0.33	0.12	0.32	0.12	0.32
employees>249	0.02	0.13	0.02	0.14	0.02	0.13
<b>Macro-region</b>						
North-West	0.35	0.48	0.34	0.47	0.34	0.47
North-East	0.27	0.44	0.28	0.45	0.27	0.45
Centre	0.19	0.39	0.21	0.40	0.20	0.40
South	0.19	0.40	0.18	0.38	0.19	0.39
<b>Sector</b>						
Quarrying; gas, water and gas distribution; etc.	0.02	0.13	0.01	0.12	0.02	0.12
textile	0.14	0.35	0.14	0.34	0.14	0.34
Manufacturing	0.18	0.38	0.18	0.39	0.18	0.38
Mechanics	0.15	0.35	0.15	0.36	0.15	0.35
Construction	0.13	0.34	0.15	0.35	0.14	0.35
Trade, hotels and rest.	0.17	0.38	0.19	0.39	0.18	0.38
Transport and comm..	0.04	0.20	0.05	0.22	0.05	0.21
Intermediation and business services	0.07	0.25	0.08	0.28	0.08	0.26
Education, health and public services	0.11	0.32	0.05	0.21	0.08	0.27
<b>N of Observations</b>	3396		3517		6913	

Source: RIL-AIDA ; descriptive statistics with sample weights

**Table 2: Descriptive statistics of firms without and with firm level contracts (FLC), 2005**

	Without FLC		With FLC			
	mean	std dev	PRP firms		no PRP firms	
			mean	std dev	mean	std dev
St. dev. employees	0.044	0.05	0.086	0.07	0.069	0.06
Training	0.37	0.48	0.66	0.47	0.56	0.50
Union	0.13	0.33	0.86	0.34	0.62	0.49
% managers	0.07	0.10	0.06	0.08	0.08	0.10
% white collars	0.45	0.31	0.46	0.29	0.43	0.31
% blue collars	0.48	0.32	0.48	0.29	0.49	0.29
% female	0.36	0.26	0.26	0.21	0.32	0.30
% fixed term contracts	0.11	0.15	0.08	0.10	0.08	0.10
Innovation	0.54	0.50	0.69	0.46	0.65	0.48
ln(value added)	10.53	0.67	10.85	0.60	10.50	0.89
<b>Firm size</b>						
15< employees	0.44	0.50	0.06	0.24	0.25	0.43
14 employees<50	0.48	0.50	0.43	0.49	0.41	0.49
49<employees<250	0.07	0.26	0.42	0.49	0.30	0.46
employees>249	0.01	0.08	0.09	0.29	0.05	0.22
<b>Macro-region</b>						
North-West	0.35	0.48	0.33	0.47	0.39	0.49
North East	0.24	0.43	0.43	0.50	0.34	0.47
Centre	0.20	0.40	0.14	0.35	0.16	0.36
South	0.21	0.41	0.10	0.30	0.11	0.31
<b>Sector</b>						
Quarrying; gas, water and gas distribution, others	0.01	0.11	0.04	0.20	0.02	0.15
Textile	0.14	0.34	0.15	0.35	0.17	0.37
Manufacturing	0.16	0.37	0.28	0.45	0.15	0.36
Mechanics	0.13	0.34	0.27	0.44	0.13	0.33
Construction	0.15	0.35	0.02	0.15	0.11	0.32
Trade, hotels and rest.	0.18	0.39	0.10	0.30	0.14	0.35
Transport and comm.	0.04	0.20	0.02	0.15	0.03	0.17
Intermediation and business services	0.07	0.25	0.08	0.26	0.06	0.24
Education, health and public services	0.11	0.32	0.04	0.20	0.19	0.39
<b>N. of observations</b>	2497		612		287	

Source: RIL-AIDA ; descriptive statistics with sample weights

**Table 3: Descriptive statistics of firms without and with firm level contracts, 2007**

	Firms without FLC		Firms with FLC			
	mean	std dev	PRP		no PRP	
			mean	std dev	mean	std dev
St. dev. employees	0.047	0.05	0.097	0.08	0.076	0.08
Training	0.41	0.49	0.60	0.49	0.45	0.50
Union	0.14	0.34	0.87	0.33	0.41	0.49
% managers	0.03	0.06	0.05	0.06	0.04	0.07
% white collars	0.35	0.29	0.31	0.21	0.33	0.27
% blue collars	0.62	0.30	0.63	0.24	0.62	0.30
% female	0.30	0.25	0.24	0.20	0.33	0.26
% fixed term contracts	0.10	0.16	0.06	0.09	0.13	0.20
Innovation	0.61	0.49	0.73	0.44	0.64	0.48
ln(value added)	10.76	0.51	11.03	0.44	10.79	0.44
<b>Firm size</b>						
15< employees	0.43	0.50	0.03	0.18	0.28	0.45
14 employees<50	0.48	0.50	0.39	0.49	0.48	0.50
49<employees<250	0.08	0.27	0.46	0.50	0.17	0.37
employees>249	0.01	0.08	0.12	0.32	0.07	0.25
<b>Macro-region</b>						
North-West	0.33	0.47	0.42	0.49	0.34	0.47
North East	0.28	0.45	0.34	0.47	0.25	0.43
Centre	0.21	0.40	0.18	0.39	0.28	0.45
South	0.19	0.39	0.06	0.24	0.14	0.35
<b>Sector</b>						
Quarrying; gas, water distribution, others	0.01	0.10	0.04	0.19	0.02	0.14
Textile	0.13	0.33	0.18	0.39	0.20	0.40
Manufacturing	0.18	0.38	0.29	0.45	0.12	0.32
Mechanics	0.14	0.34	0.27	0.45	0.15	0.36
Construction	0.16	0.37	0.02	0.14	0.13	0.34
Trade, hotels and rest.	0.20	0.40	0.07	0.26	0.18	0.38
Transport and comm.	0.05	0.22	0.08	0.27	0.06	0.25
Intermediation and business services	0.09	0.28	0.03	0.18	0.12	0.32
Education, health and public services	0.05	0.22	0.01	0.12	0.03	0.16
<b>N. of observations</b>	2793		512		212	

Source: RIL-AIDA ; descriptive statistics with sample weights

**Table 4: Probability of adoption firm level contracts: probit estimates**

	POOLED PROBIT				RE PROBIT			
	dy/dx	st err	dy/dx	st err	dy/dx	st err	dy/dx	st err
	(a)		(b)		(c)		(d)	
St. dev. employees	0.067	0.089	-0.150	0.157	0.050	0.080	-0.141	0.137
Training (1/0)	0.072 ***	0.011	0.038 **	0.017	0.061 ***	0.010	0.033 **	0.015
Union	0.341 ***	0.015	0.270 ***	0.025	0.343 ***	0.019	0.265 ***	0.029
St. dev. empl*union			0.327 *	0.175			0.285 *	0.154
Training*union			0.067 **	0.026			0.059 **	0.024
ln(value_added)	0.030 ***	0.010	0.030 **	0.010	0.023 **	0.009	0.024 **	0.009
14 employees<50	0.041 **	0.019	0.050 **	0.019	0.037 **	0.016	0.045 **	0.016
49<employees<250	0.181 ***	0.027	0.194 ***	0.028	0.198 ***	0.030	0.215 ***	0.032
employees>249	0.375 ***	0.043	0.382 ***	0.044	0.464 ***	0.060	0.475 ***	0.060
% female	-0.141 ***	0.026	-0.142 ***	0.026	-0.124 ***	0.024	-0.127 ***	0.024
% white collars	-0.064	0.076	-0.066	0.077	-0.062	0.059	-0.065	0.060
% blue collars	-0.057	0.075	-0.061	0.076	-0.056	0.058	-0.060	0.059
% fixed term contracts	-0.028	0.045	-0.027	0.045	-0.040	0.035	-0.040	0.036
Innovation (1/0)	0.028 **	0.011	0.030 **	0.012	0.024 **	0.009	0.026 **	0.009
Seniority	0.002 ***	0.000	0.002 ***	0.000	0.001 ***	0.000	0.001 ***	0.000
North-East	0.030 **	0.014	0.031 **	0.014	0.027 **	0.013	0.028 **	0.014
Centre	-0.015	0.015	-0.014	0.016	-0.013	0.013	-0.013	0.014
South	-0.080 ***	0.015	-0.080 ***	0.015	-0.062 ***	0.011	-0.062 ***	0.011
Textile	-0.059 **	0.025	-0.059 **	0.026	-0.049 **	0.019	-0.049 **	0.019
Manufacturing	-0.055 **	0.025	-0.055 **	0.025	-0.045 **	0.018	-0.045 **	0.019
Mechanics	-0.058 **	0.025	-0.059 **	0.025	-0.050 ***	0.018	-0.050 **	0.019
Construction	-0.098 ***	0.021	-0.098 ***	0.022	-0.074 ***	0.013	-0.074 ***	0.014
Trade, hotels and rest.	-0.081 ***	0.022	-0.082 ***	0.023	-0.062 ***	0.016	-0.063 ***	0.016
Transport and comm.	-0.001	0.034	0.000	0.034	-0.005	0.028	-0.004	0.029
Intermediation and business services	-0.065 **	0.024	-0.066 **	0.025	-0.055 ***	0.016	-0.056 **	0.016
Education, health and public services	-0.114 ***	0.019	-0.116 ***	0.02	-0.080 ***	0.013	-0.082 ***	0.013
Year 2007	-0.083 ***	0.010	-0.083 ***	0.01	-0.074 ***	0.009	-0.075 ***	0.010
sigma_u					0.984	0.074	0.979	0.074
rho					0.492	0.038	0.489	0.038
Wald chi2(25)	1449.07		1505.20		597.56		601.77	
Prob > chi2	0.00		0.00		0.00		0.00	
Pseudo R2	0.35		0.35					
<b>N. of observations</b>		6458				6458		
<b>N. of groups</b>						3920		

Note: Omitted variables: North-West, quarrying, water and gas distribution, ecc % managers, year 2005, firm with less than 15 employees; standard error adjusted for firm clusters; \*\*\* significant at 1%, \*\* at 5%, \* at 10%; regressions performed with no sample weights

**Table 5: Probability of adoption Performance related pay, 2005-2007: probit estimates**

	POOLED PROBIT				RE PROBIT			
	dy/dx	st.er	dy/dx	st. er	dy/dx	st. er	dy/dx	st. er
	(a)		(b)		(c)		(d)	
St. dev, employees	0.154 **	0.054	-0.125	0.115	0.068 **	0.027	-0.053	0.054
Training (1/0)	0.041 ***	0.007	0.023 *	0.013	0.019 ***	0.005	0.011 *	0.006
Union	0.233 ***	0.013	0.165 ***	0.020	0.163 ***	0.018	0.104 ***	0.020
St. dev. empl*union			0.361 **	0.122			0.160 **	0.063
Training*union			0.030 *	0.018			0.014	0.010
ln(value_added)	0.027 ***	0.006	0.028 ***	0.006	0.011 **	0.003	0.012 ***	0.004
14 employees<50	0.020	0.014	0.030 **	0.014	0.009	0.006	0.013 *	0.007
49<employees<250	0.100 ***	0.022	0.118 ***	0.023	0.061 ***	0.017	0.077 ***	0.020
employees>249	0.238 ***	0.043	0.261 ***	0.044	0.210 ***	0.052	0.240 ***	0.056
% female	-0.067 ***	0.016	-0.068 ***	0.016	-0.032 ***	0.009	-0.033 ***	0.009
% white collars	0.016	0.045	0.013	0.046	0.003	0.019	0.002	0.020
% blue collars	0.002	0.045	-0.003	0.046	-0.004	0.019	-0.006	0.020
% fixed-term contracts	-0.005	0.028	-0.001	0.029	-0.004	0.012	-0.002	0.013
Innovation (1/0)	0.007	0.007	0.007	0.007	0.003	0.003	0.003	0.003
Seniority	0.001 **	0.000	0.001 **	0.000	0.000 **	0.000	0.000 **	0.000
North-East	0.035 ***	0.010	0.036 ***	0.010	0.017 **	0.006	0.018 **	0.006
Centre	-0.016 *	0.009	-0.016 *	0.009	-0.008 **	0.004	-0.008 *	0.004
South	-0.051 ***	0.008	-0.051 ***	0.008	-0.019 ***	0.004	-0.020 ***	0.005
Textile	-0.031 **	0.015	-0.030 **	0.015	-0.011 **	0.005	-0.012 **	0.006
Manufacturing	-0.015	0.017	-0.015	0.017	-0.005	0.007	-0.005	0.007
Mechanics	-0.019	0.016	-0.018	0.017	-0.007	0.006	-0.007	0.007
Construction	-0.072 ***	0.008	-0.073 ***	0.009	-0.023 ***	0.005	-0.024 ***	0.005
Trade, hotels and rest.	-0.047 ***	0.012	-0.049 ***	0.012	-0.017 ***	0.005	-0.018 ***	0.005
Transport and comm.	-0.013	0.019	-0.012	0.020	-0.004	0.007	-0.003	0.008
Intermediation and business services	-0.042 **	0.012	-0.042 **	0.012	-0.015 ***	0.004	-0.016 **	0.005
Education, health and public services	-0.067 ***	0.009	-0.070 ***	0.009	-0.021 ***	0.005	-0.022 ***	0.005
Year 2007	-0.024 ***	0.006	-0.025 ***	0.006	-0.011 **	0.003	-0.012 **	0.003
sigma_u					1.037	0.087	1.027	0.086
rho					0.518	0.042	0.513	0.042
Wald chi2(25)	1117.99		1181.44		428.41		436.41	
Prob > chi2	0.00		0.00		0.00		0.00	
Pseudo R2	0.39		0.39					
<b>N. of observations</b>		6395				6395		
<b>N. of groups</b>						3910		

Note: Omitted variables: North West, quarrying, water, gas distribution, % managers, year 2005, firm with less than 15 employees; standard error adjusted for firm clusters; \*\*\* significant at 1%, \*\* at 5%, \* at 10%; regressions performed with no sample weights

## Appendix

**Table A1: variable definition**

Labour productivity	Log of the valued added per employee (source AIDA) and deflated by the value added deflator (source, ISTAT).
Training	Dummy variable that equals 1 if the firm organizes a training course for their employees, 0 otherwise
Firm Size	Number of employees
PRP	Dummy variable that equals 1 if the firm adopts PRP payments of any kind, 0 otherwise.
Unions	Dummy variable that equals 1 if in the firm there is a worker representation on any kind, 0 otherwise
% Female	Proportion of women in the firm
%Managers/Supervisors	Proportion of employees of the firm occupied as managers/supervisors
%White-collars	Proportion of employees of the firm occupied as clerks
%Blue-collars	Proportion of employees of the firm occupied as manual workers
%Fixed-term Contracts	Proportion of employees of the firm with fixed-term contracts
St.dev. employees	average value of standard deviation of employees, calculated by cells (organized for each 2-digit industry and firm size ) over the period 2002-2005
North-West	Dummy variable that equals 1 if the firm is in North-Western regions, 0 otherwise.
North-East	Dummy variable that equals 1 if the firm is in North-Eastern regions, 0 otherwise.
Centre	Dummy variable that equals 1 if the firm is in Central regions, 0 otherwise.
South	Dummy variable that equals 1 if the firm is in Southern regions, 0 otherwise.

Sources: AIDA and ISFOL (RIL Survey for 2005 and 2007).