

Firm Level Bargaining and Volatility in Italian Firms

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The aim of the present paper is to address the wage flexibility debate by focusing on evidence for the Italian economy on two related aspects: decentralized bargaining—at company or district level, and implementation of contingent pay introduced at this level of bargaining. The paper also deals with the role of volatility represented by employment fluctuations, which may condition adoption of variable pay systems. These objectives are carried out on the basis of information on a nationally representative sample of manufacturing and non-manufacturing firms. This dataset is obtained by merging two different sources: the Bureau Van Dijk AIDA archive, which provides balance-sheet data, and the ISFOL Employer and Employee Survey (RIL) for 2005 and 2007, containing firm-level information on workplace practices. In this kind of analysis, a whole set of information are accounted for: personnel organization, recruitment strategies, position of employees, training investments, and the presence of unions. Evidence and estimates offered in this paper show that firm level negotiations and contingent pay contracts are positively related to the presence of unions. Their role enhances the probability of decentralized agreements which typically enhance flexibility in work organization and pay. In addition, it has been found that unions may play a role in negotiating responses to economic volatility and uncertainty.

Keywords: collective bargaining, contingent pay, unions

Introduction

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. (European Commission, 2011, p. 131)

However, for Italy, the evidence on the coverage of firm level agreements and of contingent pay (CP) 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 (the Italian Institute for the Development

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of Vocational Training for Workers) Employer and Employee Surveys (RIL) for 2005 and 2007.

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

Two main questions motivate our analysis.

The first issue addressed in this paper relates to the role of training and innovation. The question is whether the diffusion of decentralization 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.

This paper finds that firm level agreements and CP 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 rational 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.

The second question relates to the position of employees and their representatives and their role in negotiating responses to economic volatility and uncertainty. This paper investigates whether union strategies in terms of company agreements and CP are conditioned by economic uncertainty. 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 & Keune, 2010, p. iii).

The paper is organized 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.

Related Literature

Hypotheses

As well known, a first group of reasons, signaled 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. Related literature has examined the role of unions, and has shown two opposite effects. On one hand, trade unions have sufficient bargaining power to obtain high wage premiums at firm level agreements and favorable conditions from local contracts. One potential result is to strengthen the pay-performance-link, as in rent sharing models (Abowd & Lemieux, 1993; Blanchflower, Oswald, & Sanfey 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 CP which may produce significant wage differentials. On parallel reasoning, theory and evidence collected in profit sharing

literature (Pérotin & 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 unionization.

However, union governance may also be beneficial for the firm. Indeed, absent workers' representatives, CP 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 to be found under the presence of unions; they may favor the promotion of team culture and employee participation in decision-making, a policy which contributes to increasing commitment (Kruse, Freeman, & Blasi, 2010).

Also, unionization 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 CP are more likely adopted by firms characterized by a style of industrial relations more participative and where workers' representations are more present. The overall expected effect of unions on probability of decentralized bargaining and CP 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 (Gürtzgen, 2009).

In this paper the causality link will be tested, for the whole Italian economy, from training and innovative attitudes of manufacturing and services companies toward adoption of compensation packages linked to firm performance.

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 decentralized bargaining at firm level should distribute wage premiums, 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 reorganization and innovation of productive processes. It will be examined in the next section which types of firms and workers were covered by local agreements in 2005 and 2007, more than 10 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 CP has inspired the reform proposals of January 22, 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 CP—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, showed the limited diffusion of firm-level agreements, which in 1995-1996 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 CP 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)¹.

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. Furthermore, there is recent evidence for declining importance of local bargaining and company wage agreements, which over the years of 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 favored or hindered adoption of firm level agreements and CP schemes.

Estimates

Data

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 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 CP 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

¹ 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%.

contract is adopted. In case of positive answer each is then asked to indicate whether the firm level contract consists of the adoption of CP or, alternatively, other not better specified aspects of the second level bargaining. Unfortunately, it is unknown 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 CP or whether these schemes are offered to all or to a selected group of employees (managers, blue-collars, or all workers).

Therefore, both the firm level contract and CP variable are dummy variables simply indicating the existence or not of a second level bargaining and in this case, the presence of a CP 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. Thus a second dummy variable indicating the presence of unions at firm level is introduced; furthermore, information about the workplace characteristics and business strategies of each firm are taken into account.

The standard deviation of employees is calculated by cells (organized for each 2-digit industry and firm size) over the period 2002-2005.

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, labor. 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, firms with less than 10 employees are excluded, applying a filter to retain only those characterized by a minimum level of organizational structure.

Descriptive Statistics

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

To begin with, Table 1 reports the incidence of firm level bargaining and CP. 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 is slightly higher.

Moreover, in 2005 and 2007, only 59% and 67% of firms with firm level agreements have CP schemes, thus confirming the limited spread of CP 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 percent represents the fraction of the workforce with fixed-term contracts.

Notice that CP 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 CP, and last with firm-level contract and with CP.

Table 1 presents these main characteristics for 2005 and 2007.

Table 1

Descriptive Statistics of the Whole Sample, 2005 and 2007

	2005		2007		2005-2007	
	Mean	Std. dev.	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
Std. dev. employees	0.05	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
Firm size						
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
> 249 employees	0.02	0.13	0.02	0.14	0.02	0.13
Macro-region						
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
Center	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
Sector						
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
Ed. health and publ. serv.	0.11	0.32	0.05	0.21	0.08	0.27
No. of observations	3,396		3,517		6,913	

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; indeed, also some balance-sheet variables that represent proxies of the firms' past performances over the period 2002-2007 are examined.

The different profile of CP 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.

Econometric Analysis

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

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

where y_{it} is the dependent variable indicating whether firm adopt firm level bargaining or CP, Φ is *cdf* of the normal distribution, X_{it} contains the workplace characteristics supposed to affect the dependent variable and α_i is the time invariant unobserved effect.

In particular a conditional maximum likelihood approach is used to estimate a pooled probit model of equation (1) by imposing $\alpha_i = \alpha$ and a random effect probit model by assuming α_i and X_{it} are independent and that α_i 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 β and σ_α (Wooldridge, 2001). Further it can be expected that fixed effect estimates are poorly efficient since key variables in our sample show a little within variation as compared to between variation over the period 2005-2007.

Table 2

Descriptive Statistics of the Firms Without and With Firm Level Contracts (FLC) 2005

	Firms without FLC		Firms with FLC			
	Mean	Std. dev.	PRP firms		Non-PRP firms	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Std. 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)	0.53	0.67	0.85	0.60	0.50	0.89
Firm size						
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
> 249 employees	0.01	0.08	0.09	0.29	0.05	0.22
Macro-region						
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
Center	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
Sector						
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
No. of observations	2,497		612		287	

Note. Source: RIL-AIDA; descriptive statistics with sample weights.

Table 3

Descriptive Statistics of the Firms Without and With Firm Level Contracts (FLC) 2007

	Firms without FLC		Firms with FLC			
			PRP firms		Non-PRP firms	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Std. 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)	0.76	0.51	1.03	0.44	0.79	0.44
Firm size						
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
> 249 employees	0.01	0.08	0.12	0.32	0.07	0.25
Macro-region						
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
Center	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
Sector						
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
No. of observations	2,793		512		212	

Note. Source: RIL-AIDA; descriptive statistics with sample weights.

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

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 CP, the following specification of equation (1') is estimated:

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

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 CP.

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.

Table 4

Probability of Adoption of Firm Level Contracts, Probit Estimates

	Pooled probit				Random effect probit			
	dy/dx	std. err.	dy/dx	std. err.	dy/dx	std. err.	dy/dx	std. err.
	(a)		(b)		(c)		(d)	
Std. 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
Std. 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
Center	-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)	1,449.07		1,505.20		597.56		601.77	
Prob > chi2	0.00		0.00		0.00		0.00	
Pseudo R ²	0.35		0.35					
No. of observations	6,458				6,458			
No. of groups					3,920			

Notes. 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 *** means $p < 0.001$.

Table 5

Probability of Adoption of Contingent Pay, Probit Estimates

	Pooled probit				Random effect probit			
	dy/dx	std. err.	dy/dx	std. err.	dy/dx	std. er	dy/dx	std. err.
	(a)		(b)		(c)		(d)	
Std. 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
Center	-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)	1,117.99		1,181.44		428.41		436.41	
Prob > chi2	0.00		0.00		0.00		0.00	
Pseudo R ²	0.39		0.39					
No. of observations	6,395				6,395			
No. of groups					3,910			

Notes. 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 *** means $p < 0.001$.

In general, comparing Tables 4 and 5, it must be noticed that many of the variables which are significantly associated with firms' choice of adopting firm level bargaining also increase the probability of CP agreements.

However, some factors deserve particular attention in explaining the probability of firm level bargaining and CP: 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.

Firstly, it has been found 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, CP (see columns (a) and (c) of Tables 4 and 5).

Of course, some of these results are expected. For example, it is well known that firm level bargaining and CP 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 enhance workers and firms to bargain over the expected returns of firm specific skills accumulation. The positive relationship between the volatility of employees and CP 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 CP, 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, decentralized wage-setting rules, which envisage a flexible compensation system which links workers’ pay to enterprise performance, is not only an incentive mechanism, but 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, the results reported in the third and fourth columns of Table 5 suggest that the probability of adoption of CP increases when the presence of union allows negotiated wage responses to employment fluctuations.

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

The common rational 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 favor higher degree of adaptability to changes in economic conditions.

CP, 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 obtained 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 CP.

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 & Jirjahn, 2002), whereas higher involvement by white-collar employees has been found in the UK (Robinson & Wilson, 2001) and Finland (Arranz-Aperte & Heshmati, 2003). These disparities do not appear in Italian enterprises, where neither blue-collars, nor white-collars have eligible conditions in terms of CP 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 & 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, Teixeira, & Zwick, 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 labor market.

As expected, as firm size increases, collective local negotiations are more likely needed to coordinate complex organizational 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 behavior 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 with firm size have been found, whereas Japan is the only country where profit-sharing schemes are definitely higher in smaller firms (Pérotin & Robinson, 2003).

In our case the positive effect prevails: estimates, reported in Table 5, show that the probability of CP 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 (Bandiera, Guiso, Prat, & Sadun, 2008). 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 utilization of contingent schemes which, according to our estimates, are positively affected by firm size.

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 CP 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 CP 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 the EUROSTAT survey for 1995.

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

Conversely, belonging to tertiary industries negatively affects the probability of adoption of local bargaining and CP: 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 CP, revealing a sectoral characterization which contrasts with experiences of other countries, examined by Addison et al. (2009). It is a 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 EU-13 (-0.1%), as it can be seen in Inklaar, Timmer, and van Ark. (2008); and Damiani and Pompei (2010); 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 CP.

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

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 contingent pay.

It is obtained 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 contingent pay (CP).

This result is coherent with our findings for the importance of training and the presence of unions, whose attitude to sign CP 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.

As expected, it is found 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 CP in services, and in descending order in manufacturing.

The main message of this paper is that the adoption of CP pays is basically triggered by uncertainty on the part of the workforce, captured by standard deviations of employment. In this scenario, it has been found evidence that firm level agreements and CP 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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