Variable pay systems: collective bargaining and wage inequality in six different European countries

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1 Introduction[1]

The aim of this paper is to analyze the impact of Variable Pay Systems in wage determination and in wage inequality, in the case of six European countries: Finland, Spain, Portugal, France, Romania and Poland. We use data from SES (Structure of Earning Survey) to carry out our econometric analysis, which offers a cross-sectional dataset and includes matched employer-employee microdata.

According to literature, Variable Pay or Pay for performance, supposes additional components to regular wages in order to improve productivity or motivation workers. But our first conclusions indicate that, in some cases, these remuneration systems could be a variable which worsens the wage distribution and which contributes to grow wage inequality.

1.2 Motivation

European Company Survey (2013) (Eurofound, 2015) showed that the 63% of European analyzed establishments used some kind of Variable pay systems. These schemes of variable remuneration have had a growing importance over last years, as different papers show us (Pendleton A., Whitfield K. Bryson A., 2009).

[1]This Research Project is part of the Department of Economic Policy and World Economic Structure research project of UB called "Analysis and evaluation of public policies" ECO2012-38004 from Spanish Ministry of Economy and Finance. Eurostat-Research Proposal 53/2015-SES)

Table 1. Percentage establisments with Variable Pay Systems by classification

Payment results		PRP-Individual		PRP-Team		Profit-sharing		Share-ownership	
LT	72.2	CZ	74.3	EE	49.1	SI	55.4	FI	12.5
CZ	57.9	SI	72.5	ME	48.3	ME	53.7	LT	12.8
EE	56.9	ME	70.2	LT	47.6	LT	53.1	LU	12
AT	53	LT	67.2	SI	47.9	FI	50.8	MK	9.3
ME	51.9	MK	56.4	BG	41.3	AT	45.8	SE	9.2
SK	50	AT	56.4	SK	40.1	EE	41.8	FR	8.1
MT	46.3	SK	55.2	PL	39.7	FR	40.9	UK	8.6
FI	45.6	PL	54.6	LV	31.8	SE	37.6	TR	7.3
IS	43.1	DK	53.4	RO	29.2	DK	35.2	EE	7.9
RO	40.2	LV	48.4	TR	28.4	NL	34.2	AT	6.6
SI	40.2	NL	47.8	FR	26.3	BG	33.9	CY	6.0
PL	39.1	RO	45.3	PT	25.3	IS	31.7	IE	6.5
FR	38.5	DE	44.2	**EU**	**25.2**	**EU**	**30.1**	ME	5.6
NL	38.7	FI	44.5	UK	25.1	LU	28.8	**EU**	**5.2**
LU	37.7	IS	43.5	NL	24.2	UK	26.1	BE	4.9
DK	36.4	MT	43.4	ES	23.2	ES	25.1	ES	4.7
UK	36	**EU**	**43**	IE	22.5	TR	24.0	BG	4.5
HR	35.2	UK	41	EL	20.6	IE	23.5	CZ	4.4
BG	34.5	HR	40.3	HR	20.7	LV	22.6	PT	3.6
EU	**34**	BG	39.7	DE	18.3	CY	21.9	DE	3.0
ES	33.9	EL	39.3	BE	17.8	BE	19.4	RO	2.8
DE	31.2	ES	35.1	IT	17.7	EL	17.3	EL	2.4
EL	31.8	IT	35.2	IS	15.5	HU	16.6	LV	1.7
IT	18.4	BE	31.6	HU	15.3	MT	13.4	MT	0.2

Source: Own elaboration from ECS 2013 (Eurofound, 2015)

Payment results		PRP-Individual		PRP-Team		Profit-sharing		Share-ownership	
Intermediate + Rather Decentralized CB						***Intermediate CB***			
Finland	45,6	Poland	54,6	Poland	39,7	Finland	50,8	Finland	12,5
Romania	40,2	Romania	45,3	Finland	33,6	France	40,9	France	8,1
Poland	39,1	Finland	44,5	Romania	29,2				
Intermediate + Rather Centralized CB						***Intermediate+Rather Centralized+Rather Decentral.CB***			
France	38,5	EU	43	France	26,3	Poland	34,3	EU	5,2
EU	34	France	39,7	Portugal	25,3	Romania	31,7	Spain	4,7
Spain	33,9	Spain	35,1	EU	25,2	EU	30,1	Poland	3,3
Portugal	27,1	Portugal	34,7	Spain	23,2	Spain	25,1	Portugal	3,6
						Portugal	21,7	Romania	2,8
Total 63%	34%		43%		25%		30%		5%

Payment by results, Performance Related Pay, Profit Sharing and Share ownership are forms of variable remuneration which are important for different reasons. On the one hand, because their growing importance in the collective agreements. On the other hand, because, although they could be considered as a type of labor demand factor, connected for example with the evolution of the firm objectives, some of them are connected with the evolution of the individual features and productivity. Some literature justifies the introduction of Variable Pay Systems with the improvement in productivity, because of their connection with motivation workers. But the purpose of this paper is to analyze if this supposed effect on productivity goes with an increase in wage inequality in some European countries. Following some papers (2010, Bryson, Freeman, Lucifora et al) in which in the case of Italian metal engineering firms the introduction of pay for performance increase wage inequality by around 3%.

So our research question is: using variable pay or pay for performance implies more or less wage inequality?

1.3 Literature review and contribution

1.3.1 Contribution

There are some literature that analyzes which factors are most relevant in wage determination like Palacio and Simón, 2002. And other literature which focuses on the analysis of the wage inequality through, for example, decomposition of individual variance (Palacio and Simón, 2004), or Fields decomposition (Simón, 2009). Lemieux, 2007 introduce Variable Pay System into the analysis of wage inequality, taking data from Panel Study of Income Dinamics. The main contribution of this chapter is to introduce Variable Pay System to all theses previous analysis, using three last waves of SES.

1.3.2 Wage determination

Wages determination is a recurrent issue in Labour Economics (Katz y Autor, 1999). From neoclassical competitive model of labor market, wages are determined by worker productivity level (marginal productivity labor). This statement would have connection with the neoclassical theory of distribution which tells us that the remuneration of production factors is equal to its marginal productivity. So, in the determination of wage levels labor supply factors should be predominant, while labor demand factors would play a

minor role or no role (Reder, 1962). Moreover, following this model, workers with similar productivity levels should receive the same wages, regardless of where they work. (Palacio y Simón, 2004).

This approach is connected with human capital theory (Becker, G, 1964) (Schultz T., 1960) (Mincer, J.1958)[2] and, according to which, wages depend on education level, experience or seniority, for example (labor supply factors). Also, age or gender can be included.

We could find this individual point o view of the wage determination in Industrial Relations field. Here, wages would be "pay for the person" = base pay ex ante productivity + additional pay-worker's productivity (Lemieux et al, 2007) and we have to talk about an individual variable pay, connected with individual level of productivity, results or individual performance (merit pay).

However, we can find a lot of examples about the difficulty of companies to pay people according to their marginal production (Kerr S., 1975).[3]

And different empirical evidence shows that labor demand factors offer us a better explanation of wage inequality in developed countries than labor supply factors: in the case of inter-industry wage differences, Groshen (1991b) or Jaumandreu (1994)[4]. These labor demand factors are connected with establishment features like: size, ownership, market, industry, etc. So, wages determination will be influenced by other components different from individuals (Palacio J.I., Simón H., 2004).

On the one hand, wages are "attached to jobs", because compensation is determined by the characteristics of the job or workplace (Lemieux, T. et al. 2007), like type of workday or responsibility level. Here variable pay would be a collective performance pay connected with collective productivity or performance or with team work. On the other hand, wages would be "attached to company or factory features", like ownership, company size, industry, market, industrial relation regulations (labor demand factors). In this case we are in front of a collective performance pay, linked to company productivity, company results or company performance (profit related pay or bonuses, share ownership schemes).

[2] See Laroche M, Mérette M., Ruggeri GC (1998-01)
[3] See Lemieux, T, Bentley MacLeod W., Parent D. (2007)
[4] See Palacio y Simón (2004)

So, theories and authors explain that the wage determination goes further market supply factors and market demand factors from labor market. Institutional aspects and social actors, like trade unions and employer organizations, have to be taken into account, because wage determination is done through collective bargaining but no in a competitive market. This is the point of view of the Industrial Relations (Pendleton A. et al, 2009) analysis and the some authors of Labor Economics (Pérez Trujillo M., Ruesga S. et al, 2009).

1.3.3. Wage Inequality

One dimension of inequality is income inequality and it refers to the inequality of the distribution of individuals, household or some per capita measure of income[5]. Lorenz Curve measures level of inequality and poverty and divergence of a Lorenz Curve for perfect equality and the Lorenz Curve of a given income Distribution is measured by some index of inequality like Gini index (Heshmati, 2004).

Analyze and understand the wage inequality is a very important issue in labor market because this is a key determinant of differences in living standards (Simón H, EES2002) and of income distribution.

Some factors which could become an explanation of wage inequality could be: individual characteristics (labor market supply point of view), workplace and establishment characteristics (labor market demand point of view) and labour market institutions. (Simón H, EES2002).

In order to assess the level of wage inequality we can find different tools. We focus in variance of logarithms and Gini Index. Moreover, if we want to determine which are the most important factors have influenced in wage inequality, we have to use some kind of inequality decomposition.

There are several approaches to inequality decomposition. Traditional methods or "a priori" methods (Cowell and Fiorio, 2010) include the decomposition by income sources (Shorrocks, 1982) and by population

[5] The 1990s signified a shift in research previously focused on economic growth, its determinants. This change supposed focusing in issues of convergence or divergence of per capita incomes to the long-term equalization or polarization of incomes across regions and countries. (Heshmati, 2004).

subgroups (Shorrocks, 1984). First method estimates the contribution of individual income components to the observed inequality and second method measure inequality both within and between subgroups of the population (Manna R. and Regoli A., 2012). Regression-based approaches go further including any factor (economic, social, etc) that may drive the observed inequality and can manage problems of endogeneity due to reverse causality. Regression-based decomposition methodology was introduced in 1970's (Blinder, 1973; Oaxaca, 1973). Thirty years after, Fields (Fields, 2003a) introduced a regression-based decomposition by income determinants through the extension of the decomposition by income sources (Manna R. and Regoli A., 2012).

Fields decomposition (Fields, 2003)[6]

We start from an income or wage (in our case) generating function

$$\ln w = \sum_{j=1}^{k} b_j \quad X_j + \varepsilon \qquad (1)$$

Where w denotes wages, X_j the j-th explanatory variable, b_j its coefficient and ε the error term. The Fields method estimates the share of the log-variance of income that is attributable to the j-th explanatory factor (relative factor inequality weight) as:

$$\sum_{j=1}^{k} S_{j\ FIELDS} = \frac{\hat{b}_j \cdot cov(X_j, \ln w)}{\sigma^2(\ln w)} \qquad (2)$$

Where $\hat{b}_j$ is the coefficient of the j-th explanatory factor estimated from an OLS multiple regression, σ^2 (ln w) is the variance of the dependent variable and cov (X_j, ln w) is the covariance between the j-th factor and the dependent variable. (Manna R. and Regoli A., 2012)

In the Fields decomposition, $S_{j\ FIELDS}$ represents the contribution of each factor to total inequality.

1.3.4. Collective bargaining regimes

Due to absence of EU harmonisation and that country-specific institutions continued to exist, we could group EU's 27 members states into five clusters industrial relations regimes. (ETUI, 2012) (European Commission, 2009):

[6] See Simón, H (2009)

1)North European: Denmark, Finland and Sweden

2)Central-West European: Austria, Belgium Germany, Luxembourg, Netherlands and Slovenia

3)South European: France, Greece, Italy, Portugal and Spain

4)Liberal-West European or Anglo-Saxon: Cyprus, Ireland, Malta and the UK

5)Central-East European: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia

These five groups are differenciated from each other in terms of some elements. (ETUI, 2012)

-For the North, South and Central-West, multi-employer bargaining is observed, between unions and employer associations (sector level bargaining). For Anglo-Saxon and Central-East European states, single-employer bargaining, between individuals employers and unions, is the norm (company-level bargaining)

-In the North and Central-West European countries there are a relationship between political actors and trade unions and employer associations. In Anglo-saxon countries, social partners voice is not always reflected in policy outcomes. In Southern Europe, the participation of social partners in policy depends on governments' willingness. In Central-Eastern Europe, politicisation of social partners limits their influence in policy making.

-In Northern, Anglo-Saxon and Central-Western Europe, the state involvement is not common. In Southern Europe, state influences collective bargaining otucomes indirectly. (ETUI, 2012)

Looking to all the five different collective regimes, anyone could ask that belonging to one or to other regime has any kind of influence in the implementation of Variable Pay System.

1.4 Methodology and data

1.4.1 Database

In this chapter, as above, the source of information is microdata from the Structure of Earnings Survey (SES) because it would be the dataset that comes closest to our needs. SES is four year survey (1995, 2002, 2006 and 2010) which offers independent cross-sectional datasets and includes matched employer-employee microdata (observations for various workers employed in each establishment). (Ramos R., Sanromà E., Simon H., 2014). We've obtained the access to the microdata SES from Eurostat for different waves (2002, 2006 and 2010) and for all European countries[7].

The EES offers microeconomic information about wages of an important number of workers, about their characteristics, about workplace characteristics and about establishment characteristics.

1.4.2 Countries and Collective bargaining regimes

From the SES database, we have chosen six different European countries, according to available information for the breakdown "Annual bonuses" in order to obtain one country, at least, for every bargaining regime. That way, for Finland, Spain, Portugal, France, Romania and Poland the SES 2002 offers separate information about different types of bonuses: regular bonuses, productivity bonuses and profit sharing bonuses. This breakdown of "Annual bonuses" is only available for the SES 2002.[8] But we decided to keep the same selection of six countries to be able to do comparative analysis between SES 2002, SES 2006 and SES 2010.

Moreover, these six countries account for different bargaining regimes in line with the ICTWSS-Eurofound classification.

In order to take information about bargaining regimes, information from variable "Collective pay agreement" from Structure of Earnings Survey (SES)

[7] Eurostat-Research Proposal 53/2015-SES)

[8] This breakdown of "Annual bonuses" in SES 2002 is based on the former version of the EU Regulation (1916/2000). From the SES 2006 onwards the EU Regulation (1738/2005) is implemented and this breakdown is no longer available.

data set is used. This variable indentifies the type of agreement covering at least 50% of the employees in the local unit. The different options that are offered by this variable are:

-National level or interconfederal agreement

-Industry agreement

-Agreement for individual industries in individual regions

-Enterprise or single employer agreement

-Agreement applying only to workers in the local unit

-Any other type of agreement

-No collective agreement exists

ICTWSS 4.0 is a time series dataset drawn up by J.Visser and hosted by the Amsterdam Institute for Advanced Labour Studies (AIAS) which shows a large collection of variables and indicators in Industrial Relations for EU and OECD members (Eurofound, 2014).

We can combine this CA (collective agreement) SES classification with ICTWSS 4.0 database (Visser J., 2013) and Eurofound classification (Eurofound,2014) in Table 2:

Table 2. Bargaining regimes

*ICTWSS code and description** *SESclassification*	*Eurofound classification*	
5 = bargaining predominantly takes place at central or cross-industry level	rather **centralized** **FINLAND-2002** **FINLAND-2006**	National CA level
4 = alternating between central and industry bargaining	rather **centralized** **SPAIN-2002** **SPAIN-2006** **SPAIN-2010**	
3 = bargaining predominantly takes place at the sector or industry level	**Intermediate** **PORTUGAL-2002** **PORTUGAL-2006** **PORTUGAL-2010** **FINLAND-2010** **ROMANIA-2010**	Industry CA level /Individual industries in individual regions CA level
2 = alternating between sector and company bargaining	**Intermediate** **FRANCE-2002** **FRANCE-2006** **FRANCE-2010** **ROMANIA-2002** **ROMANIA-2006**	
1 = bargaining predominantly takes place at the local or company level	rather **decentralized** **POLAND-2002** **POLAND-2006** **POLAND-2010**	Enterprise or single employer CA/ Local unit CA level

Source: Own elaboration from Visser (2013), Data Base on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts, 1960-2011 (ICTWSS) and SES (2006) Coding for categorical (or alphanumeric) variables.
*We use the variable "level" which means the predominant level at which wage bargaining takes place. A bargaining level is "predominant" if it accounts for at least two-thirds of the total bargaining coverage rate in a given year and country. If it accounts for less, but for more than one-third of the coverage rate, there is a mixed or intermediate situation, between two levels. (Visser, 2013).

If we take the definition from Third European Company Survey, "Variable Pay" refers to different components of pay which can vary over time in their amount. In this way, a distinction is made between performance-related pay which is linked to the performance of worker or group or workers and financial participation which is linked to the company results (profit-sharing schemes or employee share ownership schemes) (Eurofound, 2015).

1.4.3 Model wage determination

Our starting point is a Mincerian semilogarithmic wage equation (Mincer, 1974), where wages are determined by variables connected with human capital (HC).

$$W_{ij} = \alpha + HC_i\ \beta + \varepsilon_i \qquad (3)$$

Where W_i is the natural logarithm of the gross hourly wage of worker i. HCi is a vector of individual and capital human variables of worker i, including dummies variables. So, HCi will be collecting labor supply factors.

But, in an extended way, we can include other variables (Palacio J.I, Simón H, 2004) (Lemieux, T. 2007) much more connected with labor demand factors. For example: workplace factors (WP), establishment factors (ES), fixed effects for every establishment (FE) and a proxy variable for Variable Pay schemes (VP) . And taking into account all these aspects, we can obtain the following equation (Simón H, 2009) (Marsden D, 1999):

$$W_{ij} = \alpha + HC_i\ \beta + WP_i\ \gamma + ES_i\ \delta + \theta_j + VP_i\ \varphi + \varepsilon_{ij} \qquad (4)$$

W_{ij}: natural logarithm of the gross hourly wage for each worker i

HC_i: vector of human capital variables for each worker i. Dummy variables.

ES_i: vector of variables describing establishment for every worker i . Dummy variables

WP_i: vector of variables describing workplace for each worker i . Dummy variables

θ_j: fixed effects for every establishment j

VP_i : natural logarithm of the hourly bonuses for each worker i. This is a proxy variable describing Variable Pay or Pay for Performance schemes

α:intercep

β,δ, γ, φ: vectors of parametres to be estimated

ε_{ij}: random disturbance term

The wage equation (1) shows that we are in front of a multiple regression analysis (several independent variables), with linear relationship among parameters, where coefficients gives information about the change in dependent variable for a 1 unit change in the predictor, holding other factors

fixed (ceteris paribus). As a regression methodology we've used OLS (ordinary least squares) in order to analyze which are the main variables influencing wage determination.

Our dependent variable is Gross Hourly Wage (natural logarithm). It is calculated dividing the gross annual wage by annual agreed working hours (both variables are from SES dataset).

Gross Hourly Wage =Gross Annual Wage[9] / agreed annual workday
(lnhlyearning)

Independent variables:

*Individual factors (dummy variables with the exception of seniority): gender, education, age, seniority.

*Workplace factors (dummy variables): occupation[10], workday, contract, supervisory

*Establishment factors (dummy variables): NACE[11] classification, size, control, market, collective agreement

And, as an additional independent variable we take into account a proxy variable for Variable Pay or Pay for performance schemes and their breakdowns. Hourly Annual Bonuses (natural logarithm):

For SES2002, SES2006 and SES2010
Hourly Annual Bonuses = Annual Bonuses[12] / agreed annual workday
(lnhlybonuses)

Only for SES2002

Hourly Regular Bonuses = Regular Bonuses[13] / agreed annual workday
(lnhlyregulbon)

[9] Gross Annual Wage:total monetary remuneration received by workers during 2002,2006 and 2010 respectively
Gross Anuual Wage includes = base pay + complements wage + withholding taxes + Special Variables Bonuses
[10] Following ISCO-88 (COM).
[11] Following NACE rev.1.1.
[12] Includes any periodic, irregular, ad-hoc and exceptional bonuses and other payments that
[13] Holiday bonuses, 13th and 14th month payment, allowances not taken and occasional commissions

Hourly Productivity Bonuses = Productivity Bonuses[14] / agreed annual workday
(lnhlyproductbon)

Hourly Profit sharing = Profit Sharing premiums[15] / agreed annual workday
(lnhlyprofitsbon)

In order to analyze the influence of different factors and bonuses in wages, we used a technique based on decomposition of the variance of individual wages. This technique implies the estimation of different wage equation specifications and the quantification of the variability in individual wages attributed to different factors, through changes in determination coefficient. Marginal contribution of each factor in the explanation of individual wage variability measures associated effect of this factor. (Palacio J.I., Simón H., 2004). And we applied this scheme to quantify the variability in individual wages attributed to bonuses.[16]

We've called the different specifications as model A, model B and model C.

In model A, we analyze which are the most important factors determining wages, controlling for human capital variables (gender, age, studies, seniority, occupation) and for variable pay schemes variable.

In model B, we analyzed which are the most important factors determining wages, controlling for human capital variables, workplace variables (occupation, workplace, contract, responsibility), establishment variables (Nace, size, market, regulation, ownership) and variable pay schemes variable.

In model C, we analyzed which are the most important factors determining wages controlling for human capital variables, workplace variables and fixed effects for establishments.

Effects establishments are not common in wage determination standard models and were used as a novelty by Palacio J.I. and Simon H (Palacio and Simon, 2004). These effects capture the impact on wages of the factors related

[14] Bonuses linked to individual performance or piecework
[15] Bonuses linked to the overall performance to the enterprise, under incentive schemes
[16] An alternative approach to the influence of factors (especially demand factors) in the wage determination, could be the standard deviation of the establishment fixed effects, estimated from the full specification wage equation. This deviation is a measure of wage differentiation between establishments for workers with the same observable productive characteristics (Palacio J.I., Simón H., 2004).

to demand and they are used to control the heterogeneity[17] between establishments in wage determination. They could be analyzed through fixed effects or through random effects. (Palacio and Simon, 2004). Hausman test for 3 different SES waves and for 6 different countries indicates that these effects are correlated with other explanatory variables. (Hausman, 1978). For this reason, we've used fixed effects, because inappropriate use of random effects supposes inconsistent estimation of the equation parameters (Hsiao, 1985). These effects must be considered representative of the sample but not the entire population. (Greene, 1997).

As we explained before, in our dataset, we got information for 3 different SES waves for each country: 2002, 2006 and 2010. So we've got 3 cross-section independent datasets[18] but not any panel data with the observations for the same individuals through the time (Wooldridge, 2002). In this way is not possible to separate the part of establishment effects due to unobserved individual heterogeneity of obeying unobserved heterogeneity between the establishments (Palacio JI and Simon H., 2004): we can only estimate global effects. However, although control for unobservable individual fixed effects tends to reduce the magnitude of wage differentials between establishments, they persist significantly (Goux and Maurin, 1999) (Abowd et al, 1999) (Abowd et al, 2001).1.5 Results

1.5.1 Wage determination results and explanation of wage variance through R^2 analysis

Through OLS regression, we analyzed wage determination for every of the 6 countries and for every SES wave, following 3 different models or specifications:

ModelA: OLS regression. HC variables

ModelB: OLS regression. HC+WP+ES variables

ModelC: Fixed effect regression. HC+WP+fixed effects establishment

[17] Differences across studied units

[18] We could go further and analyze our data set as a pooled of independent cross sections, introducing a dummy variable for every year (2002, 2006 and 2010).

The R-squared or R^2 (coefficent of determination) gives us information about level of regression fit to the data. But also, it gives us information about the proportion of variance in the dependent variables which can be explained by the independents variables (Wooldridge, 2002a).

In our case, we've used decomposition of wage variance through difference of the R^2 coefficient to see which part of this wage variance is explained by bonuses. (Palacio J.I., Simón H. , 2004).

Difference R^2-R^2wab (without all bonuses) = contribution of bonuses to wage variance

Difference R^2-R^2wrb (without regular bonuses) = contribution of regular bonuses to wage variance

Difference R^2wrb (without regular bonuses)-R^2wab (without all bonuses) = contribution of productivity bonuses and profit sharing premiums to wage variance

1.5.1.1 Results for the SES 2002

Table 3. SES 2002 Annual Bonuses Model A, Model B and Model C

COEFFICIENTS	FINLAND	SPAIN	PORTUGAL	FRANCE	ROMANIA	POLAND
ANNUAL BONUSES						
VARIABLE PAY SCHEMES						
lnhlybonuses MODEL A	0.271***	0.396***	**0.677*** **	0.271***	0.276***	**0.521*** **
	(0.00201)	*(0.00172)*	*(0.00215)*	*(0.00182)*	*(0.00259)*	*(0.00308)*
R^2	0.489	0.689	**0.892**	0.640	0.585	**0.743**
R^2 wab[19]	0.25	0.47	0.48	0.39	0.31	0.40
Difference R2- R2 wab	0.239	0.219	**0.412**	0.25	0.275	**0.343**
lnhlybonuses MODEL B	0.242***	**0.336*** **	**0.637*** **	0.229***	0.224***	**0.452*** **
	(0.00233)	*(0.00183)*	*(0.00267)*	*(0.00199)*	*(0.00259)*	*(0.00274)*
R^2	0.568	0.750	0.906[20]	0.715	0.661	0.839
R^2 wab	0.41	0.62	0.62[21]	0.56	0.46	0.58
Difference R2- R2 wab	0.158	0.13	**0.286**	0.155	0.201	**0.259**
lnhlybonuses MODEL C		**0.356*** **	**0.662*** **	0.285***	0.257***	**0.462*** **
		(0.00364)	*(0.00711)*	*(0.00356)*	*(0.0107)*	*(0.00827)*
R^2		0.643	0.843[22]	0.681	0.608	0.875
R^2 wab		0.45	0.32[23]	0.48	0.40	**0.56**
Difference R2- R2 wab		0.193	**0.523**	0.201	0.208	**0.315**

Source: own elaboration from SES dataset

[19] R^2 calculated without all bonuses
[20] Without occupation
[21] Without occupation
[22] Without occupation
[23] Without occupation

Table 4. SES 2002 Regular Bonuses, Productivity Bonuses and Profit Sharing Premium Model A

COEFFICIENTS	FINLAND	SPAIN	PORTUGAL	FRANCE	ROMANIA	POLAND
REGULAR BONUSES PRODUCTIVITY BONUSES PROFIT SHARING PREMIUMS MODEL A						
lnhlyregulbon MODEL A	0.308***	**0.357*** **	**0.742*** **	0.200***	0.181***	
	(0.00415)	*(0.00413)*	*(0.0182)*	*(0.00533)*	*(0.0180)*	
lnhlyproductbon MODEL A	0.0899***	**0.100*** **	0.0468***	**0.152*** **	**0.201*** **	
	(0.00125)	*(0.00145)*	*(0.00530)*	*(0.00258)*	*(0.0215)*	
lnhlyprofitsbon MODEL A			0.0807***	0.0741***	**0.145*** **	
			(0.00953)	*(0.00291)*	*(0.0150)*	
R^2	0.645	0.741	0.953	0.720	0.871	
R^2 wrb	0.46	0.60	0.68[24]	0.679	0.79	
R^2 wab	0.25	0.47	0.48[25]	0.39	0.31	
Difference R2- R2 wrb	**0.185**	0.141	**0.273**	0.041	0.081	
Difference R2wrb- R2 wab	0.21	0.13	0.2	**0.289**	**0.48**	
			(0.0178)	*(0.0110)*	*(0.0429)*	

Table 5. SES 2002 Regular Bonuses, Productivity Bonuses and Profit Sharing Premium Model B

COEFFICIENTS	FINLAND	SPAIN	PORTUGAL	FRANCE	ROMANIA	POLAND
REGULAR BONUSES PRODUCTIVITY BONUSES PROFIT SHARING PREMIUMS MODEL B						
lnhlyregulbon MODEL B	**0.295*** **	**0.303*** **	**0.745*** **	0.177***	0.173***	
	(0.00496)	(0.00463)	(0.0174)	(0.00551)	(0.0190)	
lnhlyproductbon MODEL B	**0.0725*** **	**0.0964** ** *	**0.0450*** **	0.126***	0.190***	
	(0.00131)	(0.00141)	(0.00489)	(0.00275)	(0.0233)	
lnhlyprofitsbon MODEL B			**0.0808*** **	**0.0947*** **	**0.136*** **	
			(0.0107)	(0.00301)	(0.0143)	
R^2	0.714	0.797	0.955[26]	0.785	0.886[27]	

[24] Without NACE and without occupation
[25] Without NACE and without occupation
[26] Without NACE and without occupation
[27] Without NACE and without occupation

R^2 wrb[28]	0.51[29]	0.72	0.73[30]	0.70[31]	0.84[32]	
R^2 wab[33]	0.41	0.62	0.58[34]	0.55	0.46	
Difference R2- R2 wrb	0.204	0.077	0.225	0.085	0.046	
Difference R2wrb- R2 wab	0.1	0.1	**0.15**	**0.15**	**0.38**	

Table 6. SES 2002 Regular Bonuses, Productivity Bonuses and Profit Sharing Premium Model C

COEFFICIENTS	FINLAND	SPAIN	PORTUGAL	FRANCE	ROMANIA	POLAND
REGULAR BONUSES PRODUCTIVITY BONUSES PROFIT SHARING PREMIUMS MODEL C						
lnhlyregulbon MODEL C		**0.339*** **	**0.711*** **	**0.325*** **	**0.223*** **	
		(0.0102)	*(0.0476)*	*(0.0193)*	*(0.0612)*	
lnhlyproductbon MODEL C		**0.123*** **	**0.0363*** **	**0.118*** **	**0.219*** **	
		(0.00255)	*(0.00629)*	*(0.00483)*	*(0.0412)*	
lnhlyprofitsbon MODEL C			**0.106*** **	**0.219*** **	**0.180*** **	
			(0.0178)	*(0.0110)*	*(0.0429)*	
R^2		0.704[35]	0.933[36]	0.800	0.823[37]	
R^2 wrb[38]		0.61	0.63[39]	0.70[40]	0.80[41]	
R^2 wab[42]		0.45	0.32[43]	0.479	0.40	
Difference R2- R2 wrb		0.094	0.303	0.1	0.023	
Difference R2wrb- R2 wab		0.16	**0.31**	**0.221**	**0.4**	

[28] Without regular bonuses
[29] Without occupation
[30] Without NACE and without occupation
[31] Without occupation
[32] Without occupation and NACE
[33] Without all bonuses
[34] Without NACE and without occupation
[35] Without seniority
[36] Without occupation
[37] Without age, occupation, workday, contract and supervisory
[38] Without regular bonuses
[39] Without occupation
[40] Without occupation
[41] Without occupation
[42] Without all bonuses
[43] Without occupation

Tables 3, 4, 5 and 6 summarize the main results about the incidence of bonuses in wage determination, from OLS regression using SES 2002 dataset. Through three different models, in six European countries, we've analyzed the incidence of annual bonuses and the incidence of his breakdown in regular bonuses, productivity bonuses and profit sharing.

In the case of annual bonuses for model A (taking to account only individual factors and variable pay), we can explain that Portugal and Poland have higher incidence in wage determination in comparison with the rest of countries. These two countries have intermediate and decentralized collective bargaining, respectively. They show that for every increase of 1% in annual bonuses wage increases is 0.67% in the case of Portugal and is 0.52% in the case of Poland. Also, we can say that in these 2 countries the proportion of wage variance explained by individual factors and variable pay are higher than the rest of countries: 89.2% and 74.3%. And if we analyze the incidence in wage variance of bonuses, comparing R2 with bonuses with R2 without bonuses, we can say that in Portugal and Poland bonuses explain the main part of wage variance respect to the rest of countries: 41.2% in the case of Portugal and 34.3% in the case of Poland. For the rest of countries, bonuses explain about 20% of wage variance.

In the case of model B, (taking to account all factors: individual factors, workplace factors, establishment factors and variable pay), again in Portugal and Poland annual bonuses have higher incidence in wage determination: for every increase of 1% in annual bonuses, wage increases is 0.63% in the case of Portugal and is 0.45% in the case of Poland. And in these 2 countries, bonuses explain respectively 28.6% of wage variance and 25.9% of wage variance. Same explanation can be used for model C (including individual factors, workplace factors and fixed effects for establishments), where Portugal explains 52.3% of wage variance and Poland explains 31.5% of wage variance.

In these 2 countries, bonuses are so important that in Portugal and with model C, they are explaining more than 50% of wage variance and in Poland, with model A, they are explaining 34.3%.

Now, if we have a look to the breakdown of annual bonuses, in model A and in the case of regular bonuses, we can say that Portugal and Spain are countries with higher incidence in wage determination: for every increase of 1% in regular bonuses, wage increases are 0.74% and 0.35% respectively. In the case of productivity bonuses, Romania and France have the first and

second position, respectively: for every increase of 1% in productivity bonuses, wage increases are 0.20% and 0.15%. And finally, Romania is the country with higher incidence of profit sharing in wage determination: for every increase of 1% in profit sharing, wage increases are 0.14%.

Regular bonuses explain 27.3% of wage variance for Portugal and 18.5% of wage variance for Finland, as the second country with a higher explanation. Spain is the third country with an explanation of 14.1% of wage variance. This percentage is lower for France (4.1%) and for Romania (8.1%). So, countries with more centralized collective bargaining have higher percentage of explanation of wage variance by regular bonuses and countries with more decentralized collective bargaining have lower percentage. And, on the opposite side, countries with more centralized collective bargaining have lower percentage of explanation of wage variance by productivity bonuses and profit sharing and countries with more decentralized collective bargaining have higher percentage: 48% for Romania and 28.9% for France.

In model B, Portugal and Spain are countries with higher incidence of regular bonuses in wage determination (0.74% and 0.30%, respectively). Poland and Romania are countries with bigger incidence of productivity bonuses in wage determination (0.19% and 0.12% respectively) and with bigger incidence of profit sharing in wage determination (0.13% and 0.09%, respectively).

Regular bonuses explain 22% and 20% of wage variance for Portugal and Finland. And productivity bonuses and profit sharing explain 38% of wage variance for Poland and the 15% for Romania and Portugal. So, as with model A, countries with more centralized collective bargaining have higher percentage of wage variance explanation by regular bonuses and countries with more decentralized collective bargaining have higher percentage of explanations of wage variance by productivity bonuses and profit sharing.-

In model C, Portugal and Spain again are countries with higher incidence of regular bonuses in wage determination (0.71% and 0.33% respectively). Poland and Spain are countries with bigger incidence of productivity bonuses in wage determination (0.21% and 0.12% respectively). And Romania and Poland are countries with bigger incidence of profit sharing in wage determination (0.21% and 0.18%) respectively. Regular bonuses explain 30% and 10% for Portugal and France respectively. Productivity bonuses and profit sharing explain 40% of wage variance for Poland and 31% of wage variance for Portugal. Unlike model A and in model B, countries with more decentralized collective

bargaining have higher percentage of wage variance explanation by regular bonuses and by productivity bonuses and profit sharing.

1.5.1.2 Results for the SES 2006

Table 7. SES 2006 Model A Model B and Model C

COEFFICIENTS	FINLAND	SPAIN	PORTUGAL	FRANCE	ROMANIA	POLAND
ANNUAL BONUSES						
VARIABLE PAY SCHEMES						
lnhlybonuses MODEL A	**0.171*** **	**0.378*** **		**0.127*** **	**0.244*** **	**0.876*** **
	(0.00121)	*(0.00178)*		*(0.00129)*	*(0.00131)*	*(0.00241)*
R^2	0.452	0.678		0.508	0.580	0.921
R^2 wab[44]	0.31	0.43		0.359	0.37	0.33
Difference R2- R2 wab	0.142	**0.248**		0.149	0.21	**0.591**
lnhlybonuses MODEL B	**0.140*** **	**0.328*** **		**0.118*** **	**0.212*** **	**0.834*** **
	(0.00127)	*(0.00185)*		*(0.00141)*	*(0.00127)*	*(0.00327)*
R^2	0.575	0.737		0.591	0.659[45]	0.945
R^2 wab[46]	0.49	**0.57**		**0.51**	**0.51**	**0.50**
Difference R2- R2 wab	0.085	**0.167**		0.081	0.149	**0.445**
lnhlybonuses MODEL C		**0.344*** **		**0.151*** **	**0.264*** **	**0.920*** **
		(0.00368)		*(0.00326)*	*(0.00500)*	*(0.00513)*
R^2		0.642		0.549	0.674[47]	0.971
R^2 wab[48]		0.41		0.44	0.488[49]	0.41
Difference R2- R2 wab		**0.232**		0.109	0.186	**0.561**

Source: own elaboration from SES dataset

In table 7, we analyzed same results schemes like tables 3, 4, 5 and 6, but for the SES 2006 dataset. In this case, we don't have any breakdown about annual bonuses. Poland and Spain show the highest level of incidence in wage determination in model A: for every increase of 1% in bonuses, wages increase 0.87% for Poland and 0.37% for Spain. Bonuses would explain 59% of wage variance in the case of Poland and the 24.8% for Spain.

[44] R^2 calculated without all bonuses
[45] Without contract
[46] R^2 calculated without all bonuses
[47] Without contract
[48] R^2 calculated without all bonuses
[49] Without contract

In model B and C, Poland and Spain show highest incidence in wage determination: 0.83% and 0.92% for Poland and 0.32% and 0.34% for Spain. In model B, bonuses would explain 44.5% of wage variance for Poland and 16.7% of wage variance for Spain. In model C, bonuses would explain 56.1% of wage variance for Poland and 23.2% of wage variance for Spain.

1.5.1.3 Results for the SES 2010

Table 8. SES 2010 Model A Model B and Model C

COEFFICIENTS	FINLAND	**SPAIN**	PORTUGAL	FRANCE	**ROMANIA**	POLAND
ANNUAL BONUSES						
VARIABLE PAY SCHEMES						
lnhlybonuses MODEL A	**0.0722*** **	**0.561*** **		**0.164*** **	**0.283*** **	**0.172*** **
	(0.00124)	*(0.00240)*		*(0.00117)*	*(0.00154)*	*(0.000680)*
R^2	0.169	0.741		0.494	0.532	0.570
R^2 wab[50]	0.15	0.25		0.34	0.35	0.43
Difference R2- R2 wab	0.019	**0.491**		0.154	**0.182**	0.14
lnhlybonuses MODEL B	0.0530***	**0.470*** **		**0.141*** **	**0.251*** **	**0.144*** **
	(0.00122)	*(0.00260)*		*(0.00118)*	*(0.00138)*	*(0.000625)*
R^2	0.259	0.789		0.637	0.635[51]	0.724
R^2 wab[52]	0.253	0.37		0.54	0.517	0.63
Difference R2- R2 wab	0.006	**0.419**		0.097	**0.118**	0.094
lnhlybonuses MODEL C		**0.578*** **		**0.191*** **	**0.292*** **	**0.207*** **
		(0.00498)		*(0.00301)*	*(0.00534)*	*(0.00658)*
R^2		0.771		0.624	0.636[53]	0.752
R^2 wab[54]		0.295		0.50	0.462[55]	0.372[56]
Difference R2- R2 wab		**0.476**		0.124	**0.174**	0.38

Source: own elaboration

In table 8, we analyzed same results schemes like table 3 and table 7 but for the SES 2010 dataset. As above, we don't have any breakdown about annual bonuses. Spain and Romania show the highest level of incidence in wage

[50] R^2 calculated without all bonuses
[51] No occupation
[52] R^2 calculated without all bonuses
[53] No occupation
[54] R^2 calculated without all bonuses
[55] No occupation
[56] No occupation

determination in model A: for every increase of 1% in bonuses, wages increase 0.56% for Spain and 0.28% for Romania. Bonuses would explain 49% of wage variance in the case of Spain and the 18.2% for Romania. Same results could be got from model B and model C. In model B, bonuses would explain 41% of wage variance for Spain and 11.8% for Romania. In model C, bonuses would explain 47.6% of wage variance for Spain and 17.4% for Romania.

Table 9. Summary SES 2002, 2006 and 2010 Model A, B and C

COEFFICIENTS	FINLAND	**SPAIN**	PORTUGAL	FRANCE	ROMANIA	POLAND
ANNUAL BONUSES						
VARIABLE PAY SCHEMES						
SES 2002						
Difference R2- R2 wab MODEL A	0.239	0.219	**0.412**	0.25	0.275	**0.343**
Difference R2- R2 wab MODEL B	0.158	0.13	**0.286**	0.155	0.201	**0.259**
Difference R2- R2 wab MODEL C		0.193	**0.523**	0.201	0.208	**0.315**
SES 2006						
Difference R2- R2 wab MODEL A	0.142	**0.248**		0.149	0.21	**0.591**
Difference R2- R2 wab MODEL B	0.085	**0.167**		0.081	0.149	**0.445**
Difference R2- R2 wab MODEL C		**0.232**		0.109	0.186	**0.561**
SES 2010						
Difference R2- R2 wab MODEL A	0.019	**0.491**		0.154	**0.182**	0.14
Difference R2- R2 wab MODEL B	0.006	**0.419**		0.097	**0.118**	0.094
Difference R2- R2 wab MODEL C		**0.476**		0.124	**0.174**	0.38

Source: own elaboration from SES data set

Looking the evolution of explanation of wage variance by bonuses from 2002 SES dataset to 2010 SES data set (table 9), we can say that in most of six countries its percentage has been decreasing. The exception is Spain where this percentage has been increasing close to 50%. In other countries, like Romania this percentage has been reduced.

The explanation of this evolution could be that some countries are witnessing a decentralization process in their collective bargaining. This could means that the part of regular bonuses from total annual bonuses is decreasing in front of the part of productivity bonuses and profit sharing premiums.

As we found in previous chapter, due to Finland change it collective bargaining level becoming less decentralized, Spain is the country with higher level of collective bargaining. And Romania, which had a decentralized level of collective bargaining, from 2010 it become much more centralized. So, in spite of this evolution, the final results in SES 2010 show that in countries with higher level of centralization in collective bargaining are those countries with higher percentage in wage variance explanation by bonuses. This could mean that, in those countries, weight of regular bonuses in total annual bonuses is higher than in the rest of countries. But to go further in this conclusion we would need breakdown of bonuses in SES 2006 and in SES 2010.

1.5.2 More inequality analysis: Gini Index and Fields decomposition

1.5.2.1 Gini Index and variance of logarithms

If we want to evaluate one dimension of inequality like income inequality applied to wages, we could use the evolution of Gini Index and variance logarithms, as dispersion measures. With our dataset, we compared results for the SES wave 2002, SES wave 2006 and the SES wave 2010.

In tables 10, 11 and 12, we analyzed Gini Index and Variance log of gross annual salary, bonuses and of a proxy of base pay[57], which is calculated subtracting bonuses for gross annual salary. Because could be interesting to understand the dispersion level taking to account bonuses and without taking to account in whole annual salary.

[57] SES not offers base pay information for every country. We have to remind that all bonuses includes regular bonuses, productivity bonuses and profit sharing premiums

Table 10. SES 2002 Gini Index and Variance log

2002 year		FINLAND	SPAIN	PORTUGAL	FRANCE	ROMANIA	POLAND
Proxy Base Pay							
	Gini index	0.22	0.3	0.35	0.35	0.4	0.34
	Variance log	0.14	0.26	0.32	0.38	0.42	0.32
Gross Annual Salary							
	Gini index	0.23	0.31	0.36	0.37	0.42	0.34
	Variance log	0.14	0.27	0.35	0.38	0.41	0.34
All Bonuses							
	Gini index	0.43	0.43	0.46	0.61	0.62	0.33
	Variance log	0.62	0.55	0.56	1.39	1.35	0.40
Regular bonuses							
	Gini index	0.32	0.37	0.38	0.44	0.58	0.3
	Variance log	0.41	0.45	0.40	0.79	1.17	0.32
Productivity bonuses							
	Gini index	0.58	0.63	0.61	0.75	0.71	
	Variance log	1.39	1.82	1.61	2.25	1.56	
Profit Sharing premiums							
	Gini index			0,49		0.76	0.43
	Variance log			1,04		2.02	0.66

Source: own elaboration from SES dataset

From table 10, we can say that Finland is the country with more equal distribution in its gross annual salary and its proxy of base pay, according to a Gini Index closer to 0 (0.22 in the case of proxy base pay and 0.23 in the case of gross annual salary). On the contrary, Romania would become the country with less equal distribution, according to a Gini Index of 0.4 for proxy base pay and 0.42 for gross annual salary. The same scheme could be found in the case of variance of logarithms.

Looking into bonuses, we can observe, in general, higher Gini Index and higher variance of logarithms in all countries in comparison with base pay and gross annual salary. In the case of all bonuses and regular bonuses, Romania is again the country with higher Gini Index, with levels of 0.62 and 0.58, respectively. And Poland is the country with lower Gini Index, with levels of 0.3 and 0.33 respectively. For Productivity bonuses, Finland has lowest Gini Index (0.58) and France has highest Gini Index (0.75). And finally, in the case of profit sharing premium, again Romania has highest Gini Index (0.76) and Poland lowest Gini Index (0.43).

That is our departure situation and we are going to compare these results with situation in 2006 and 2010.

Table 11. SES 2006 Gini Index and Variance log

2006 year		**FINLAND**	**SPAIN**	**PORTUGAL**	**FRANCE**	**ROMANIA**	**POLAND**
Proxy Base Pay							
	Gini index	0.24	0.29	0.38	0.28	0.41	0.41
	Variance log	0.16	0.2401	0.4225	0.2209	0.4624	0.4225
Gross Annual Salary							
	Gini index	0.24	0.3	0.38	0.3	0.42	0.41
	Variance log	0.16	0.2601	0.4356	0.2401	0.49	0.4225
All Bonuses							
	Gini index	0.46	0.43	0.43	0.69	0.61	0.42
	Variance log	0.7744	0.5929	0.5329	2.3409	1.5625	0.5041

Source: own elaboration from SES dataset

Table 11, shows that in 2006, in the case of proxy base pay and gross annual salary, Finland continues being the country with more equal distribution, because it has lower Gini Index in comparison with the rest of countries. In the same way, Romania continues being the country with less equal distribution. But the main differences with 2002 results are that both Finland and Romania don't highlight in the same way. For example, close to Finland, other countries like Spain of France also show not very high Gini Index. And close to Romania, Poland shows a high Gini Index. So, in the case of proxy of base pay and in the case of gross annual salary, we can find 2 groups of

countries. One group with higher Gini Index level and inequality (Romania, Poland and Portugal) and other group with lower Gini Index level (Finland, France and Spain).

If we have a look to bonuses (without breakdown), as in 2002, Poland has lower Gini Index (0.42) and France has higher Gini Index (0.69). Poland is not alone in its position, because it is followed very close by Spain and Portugal.

Table 12. SES 2010 Gini Index and Variance log

2010 year		FINLAND	SPAIN	PORTUGAL	FRANCE	ROMANIA	POLAND
Proxy Base Pay							
	Gini index	0.24	0.4	0.38	0.27	0.4	0.33
	Variance log	0.1681	0.5776	0.3969	0.2025	0.4356	0.3136
Gross Annual Salary							
	Gini index	0.4	0.4	0.39	0.29	0.41	0.33
	Variance log	0.7056	0.5776	0.4096	0.2209	0.4489	0.3249
All Bonuses							
	Gini index	0.6	0.52	0.48	0.59	0.6	0.49
	Variance log	2.3409	0.9801	0.6241	1.3689	1.3225	1.2769

Source: own elaboration from SES dataset

In Table 12 results from the SES 2010 could be found. Here, we have to mention some relevant changes respect to previous tables. In the case for proxy of base pay, Finland is the most equal country, yet. But, Spain, has worsened its situation, because from a Gini Index of 0.3 in 2002 and of 0.29 in 2006, it show a higher Gini Index of 0.4 in 2010, reaching the level of Romania. But if we compare the situation in proxy of base pay with the situation in gross annual salary, we can see that, apart from Spain, surprisingly, Finland has deteriorated its position, reaching also Romania level. France remained as the country with more equal distribution of its gross annual salary.

This explanation is connected with the fact that, in the case of bonuses, Finland and Spain are showing a higher Gini Index of 0.4 close to Romania level. So, one of the reasons that could give an explanation to the deterioration of the Finland position in gross annual salary is its deterioration in bonuses equality level. And this fact, like the changes in Spain, could be caused by the

effects of the international economic crisis. But, in the case of Finland, this situation could be related to the change in collective bargaining regime, which has been analyzed in previous chapter: as much more decentralized bargaining more inequality in gross annual salary. Nevertheless, if this argument was true, we have to expect that Romania will improve its position, because their collective bargaining regime changed, becoming more centralized and that is not the case, because its position it is rather similar through in 2002, 2006 and 2010 dataset. We can say that changes in collective bargaining regime were higher in Finland than in Romania: Finland changes from rather centralized (level 5) to intermediate (level 3) bargaining regime and Romania changes from intermediate (level 2) to intermediate (level 3). But, it is difficult to find a clear pattern.

1.5.2.2. Fields decomposition

Going further, if we want to know which are the weight of different factors in wage inequality, we can use Fields decomposition[58] Following this procedure, the dispersion of dependent variable measured by variance, for example, is broken down into a number of components such the whole is equal to the sum of its parts. (Fields, 2003b).

We calculated Fields decomposition for all factors[59] but we presented summarized results pooled in different groups: factors connected with human capital (HC), connected with workplace (WP), connected with establishment (ES) and bonuses.

In every table, we can observe Fields decomposition with information from SES dataset, using proxy of base pay, total gross annual salary and total gross annual salary plus bonuses. We are aware that in last case, as bonuses are included in gross annual salary, in this decomposition reversal causation[60] could be found. Because we are analyzing inequality of gross annual salary with factorial Fields decomposition and bonuses is one factor which is inside gross annual salary at the same time. So, when we are analyzing inequality of

[58] We've used ineqrbd stata instruction designed by Fioro and Jenkins (2007)

[59] We could go further and also have done the same calculations taking to account only human capital factors, human capital plus workplace factors and plus fixed effects of establishment. Like in (Simon H., 2009)

[60] In this sense, inequality in gross annual salary are determining inequality in bonuses or inequality in bonuses are determining inequality in gross annual salary.

gross annual salary, we are analyzing inequality in bonuses, too. But, we are interested in look into which part of inequality of gross annual salary is explained by different factors and by bonuses. For this reason, we've decided calculate the same decomposition for gross annual salary without bonuses (proxy Base pay), gross annual salary (with bonuses) and gross annual salary with breakdown for bonuses and we compare all the results.

Table 13. SES 2002 Fields decomposition

FIELDS DECOMPOSITION YEAR 2002	Proxy BASE PAY	GROSS ANNUAL SALARY	GROSS ANNUAL SALARY + BONUSES	Proxy BASE PAY	GROSS ANNUAL SALARY	GROSS ANNUAL SALARY + BONUSES	Proxy BASE PAY	GROSS ANNUAL SALARY	GROSS ANNUAL SALARY + BONUSES
	FINLAND	**FINLAND**	**FINLAND**	**SPAIN**	**SPAIN**	**SPAIN**	**PORTUGAL**	**PORTUGAL**	**PORTUGAL**
HC factors	14.06	15.04	8.82	21.59	22.56	13.52	18.53	18.77	5.01
WP factors	21.01	21.47	14.20	26.60	27.27	16.98	25.45	25.71	7.16
ES factors	4.12	4.88	1.69	11.74	12.71	7.82	24.78	25.09	6.57
Bonuses			32.12			36.63			72.35
Total	39.18	41.38	56.83	59.93	62.55	74.96	**68.76**	**69.57**	91.09
Total-bonuses			24.71			38.32			18.73
Residual	60.82	58.62	43.17	40.07	37.45	25.04	31.24	30.43	8.91
	FRANCE	**FRANCE**	**FRANCE**	**ROMANIA**	**ROMANIA**	**ROMANIA**	**POLAND**	**POLAND**	**POLAND**
HC factors	16.62	17.70	13.46	21.28	17.14	14.84	18.61	18.78	11.06
WP factors	31.39	34.42	25.00	19.08	16.10	15.25	31.08	31.39	29.64
ES factors	2.28	3.79	1.08	12.77	13.36	7.15	8.01	8.08	0.73
Bonuses			31.92			28.87			42.45
Total	50.28	55.91	71.46	53.13	46.60	66.11	57.71	58.25	83.87
Total-bonuses			39.54			37.24			41.42
residual	49.72	44.09	28.54	47.05	53.51	33.90	42.29	41.75	16.13

Source: own elaboration

In table 13, results of Fields decomposition with the SES 2002 dataset[61] are showed. In general, we can say that important factors which are playing an important role in inequality are gender (especially in the case of Finland and Spain), some levels of education (Romania, Poland, Portugal and France), seniority (Spain), some kinds of occupation (France, Poland, Portugal, Spain), some kinds of sectors (Portugal), companies with more than 250 workers (Spain, Portugal and Romania) and collective agreement at enterprise level (Spain and Portugal).

If we compare the situation for proxy base pay, we can say that in most of all of six countries workplace factors are determining the higher percentage of inequality. The exception would be Romania, where education has a bigger importance in inequality in comparison with the rest of countries.

All the considered factors are explaining the 68.76% of inequality in proxy of base pay in Portugal and 59.93% of inequality in proxy of base pay in Spain. If we would take into account fixed effects of establishments we could observe probably that establishment factors would have higher incidence in some countries. Nevertheless, establishment factors have biggest influence for Spain, Romania and especially for Portugal, explaining between 24% and 25% of inequality. The importance of workplace elements is bigger in France and Poland due to the role of some kind of occupations.

If we observe the Fields decomposition considering gross annual salary plus bonuses, we can say that in the case of Portugal, Poland and Finland the contribution of bonuses are higher than the sum of other factors. In Portugal, bonuses would explain 72.35% of total inequality and the 18.73% the remaining factors. In the case of Poland, bonuses would explain 42.45% of the total inequality (83.87%) and the remaining factors the 41.42%, reaching 2 percentages almost to the same level. In Finland, bonuses would explain 32.12% of 56.83% total inequality and the rest of factors the 24.71% remaining. So, taking into account that a part of the total inequality of gross annual salary includes inequality of bonuses, we can say that in the case of Portugal, Poland (with only a difference of 1 percentual point) and Finland bonuses have high incidence in gross annual salary inequality in comparison

[61] In appendices all details about Fields decomposition could be found

with the rest of factors[62] . These results are consistent with the previous section in which we have said that in Portugal and Poland bonuses explain the main part of wage variance respect to the rest of countries and that in Finland regular bonuses explain the main part of wage variance respect to the rest of countries.

In the rest of countries, the contribution of bonuses to total gross annual salary inequality is lower than the rest of elements, especially in the case of France and Romania (in the case of Spain the quantities are very similar). So, we can conclude that in these three countries, bonuses have highest (Portugal and Poland) and high (Finland) level of incidence in inequality level and all bonuses (Portugal and Poland) and regular bonuses (Finland) explain the main part of wage variance.

[62] If we have to talk about countries with highest incidence of bonuses in gross annual salary inequality we have to refer to Portugal, Poland and Spain. But in the case of last country, the incidence of bonuses is not higher than the rest of factors.

Table 14. SES 2006 Fields decomposition

FIELDS DECOMPOSITION YEAR 2006	Proxy BASE PAY	GROSS ANNUAL SALARY	GROSS ANNUAL SALARY + BONUSES	Proxy BASE PAY	GROSS ANNUAL SALARY	GROSS ANNUAL SALARY + BONUSES	Proxy BASE PAY	GROSS ANNUAL SALARY	GROSS ANNUAL SALARY + BONUSES
	FINLAND	**FINLAND**	**FINLAND**	**SPAIN**	**SPAIN**	**SPAIN**	**PORTUGAL**	**PORTUGAL**	**PORTUGAL**
HC factors	16.85	18.46	15.18	21.76	22.99	13.86	28.73	28.86	6.66
WP factors	24.32	23.86	19.68	23.33	23.86	15.02	32.86	33.03	8.04
ES factors	4.76	7.38	5.92	9.96	10.91	6.94	12.26	11.95	4.77
Bonuses			16.77			37.84			74.64
Total	45.93	49.70	57.54	**55.05**	57.76	**73.66**	**73.84**	73.84	94.10
Total-bonuses			40.77			35.82			19.46
residual	54.07	50.30	42.46	44.95	42.24	26.34	26.16	26.16	5.90
	FRANCE	**FRANCE**	**FRANCE**	**ROMANIA**	**ROMANIA**	**ROMANIA**	**POLAND**	**POLAND**	**POLAND**
HC factors	22.20	21.30	18.83	16.39	16.19	14.29	14.23	14.33	2.25
WP factors	26.67	24.80	19.90	24.84	24.51	22.84	31.62	32.06	9.60
ES factors	3.16	5.17	1.47	9.08	10.41	2.35	3.63	4.00	-1.06
Bonuses			18.93			26.47			83.76
Total	52.03	51.27	59.13	50.31	51.11	65.95	49.48	50.39	**94.55**
Total-bonuses			40.20			39.48			10.79
residual	47.97	48.73	40.87	49.71	48.91	34.08	50.52	49.61	5.45

Source: own elaboration

Table 14 shows a summary of the main results of Fields decomposition from SES 2006 dataset. The most important elements, in this case, which have a higher incidence on inequality are gender (Finland and Spain), some high levels of education, seniority (Spain and Portugal), some kinds of occupation and some kinds of sectors. Like in results from SES 2002 dataset, workplace factors are which have biggest influence in inequality of Proxy base pay and in inequality of annual gross salary.

Considering all factors together, we can remark that they are explaining 55% of Spain Proxy base pay and 73.84% of Portugal Proxy base pay. And we can say that all factors are explaining 73.66% of gross annual salary plus bonuses inequality in Spain, 94.10% in Portugal and 94.55% in Poland.

Analyzing Fields decomposition, if we consider gross annual salary plus bonuses, we can say that in the case of Portugal, Poland and Spain the contribution of bonuses are higher than the sum of other factors. In Portugal, bonuses would explain 74.64% of total inequality and the 19.46% the remaining factors. In the case of Poland, bonuses would explain 83.76% of the total inequality (94.55%) and the remaining factors the 10.79%. In Spain case, bonuses would explain 37.84% of 73.66% total inequality and the rest of the factors would explain the 35.82% remaining. In this way, we can say that in the case of Portugal, Poland and Spain bonuses have biggest incidence in gross annual salary inequality in comparison with the rest of factors. These results are coherent with the previous section in which we have said that, using SES 2006 dataset, in Poland and Spain bonuses explain the main part of wage variance respect to the rest of countries[63].

[63] We don't have results for Portugal regression

Table 15. SES 2010 Fields decomposition

FIELDS DECOMPOSITION YEAR 2010	Proxy BASE PAY	GROSS ANNUAL SALARY	GROSS ANNUAL SALARY + BONUSES	Proxy BASE PAY	GROSS ANNUAL SALARY	GROSS ANNUAL SALARY + BONUSES	Proxy BASE PAY	GROSS ANNUAL SALARY	GROSS ANNUAL SALARY + BONUSES
	FINLAND	**FINLAND**	**FINLAND**	**SPAIN**	**SPAIN**	**SPAIN**	**PORTUGAL**	**PORTUGAL**	**PORTUGAL**
HC factors	15.98	8.35	7.63	9.80	11.61	6.93	29.71	30.11	14.18
WP factors	26.57	12.81	12.27	21.20	23.32	18.53	27.67	28.02	14.00
ES factors	5.50	4.14	3.93	2.13	2.95	2.36	10.32	10.50	4.74
Bonuses			2,08			51,03			51,50
Total	48.05	25.30	25.91	33.13	37.89	78.86	67.70	68.63	84.42
Total-bonuses			23.83			27.82			32.92
Residual	51.95	74.70	74.09	66.87	62.11	21.14	32.30	31.37	15.58
	FRANCE	**FRANCE**	**FRANCE**	**ROMANIA**	**ROMANIA**	**ROMANIA**	**POLAND**	**POLAND**	**POLAND**
HC factors	18.17	18.31	14.42	16.48	16.42	11.73	17.04	17.16	14.94
WP factors	29.96	28.61	24.64	27.33	26.93	21.38	42.25	41.42	41.32
ES factors	6.21	7.60	6.39	7.90	8.44	6.40	2.81	4.21	-1.05
Bonuses			18.26			26.55			17.03
Total	54.34	54.53	63.71	51.71	51.79	66.05	62.10	62.79	72.24
Total-bonuses			45.45			39.51			55.21
Residual	45.66	45.47	36.29	48.29	48.21	33.95	37.69	36.99	27.57

Source: own elaboration

Finally, in table 15 we included the main results from Fields decomposition using SES 2010 dataset. Like in previous table, in most of countries, workplace factors are those which have highest contribution to inequality. Portugal is the exception with bigger percentages relevance of human capital factors respect to workplace factors and establishment factors. The main reason for this pattern is the higher weight of some education level (bachelor and master) respect to the rest of countries.

Other important aspects to highlight are that gender is not as important element in inequality as in previous years (for Finland and Spain). Moreover, education is not as important as in 2002 and 2006 dataset; the exception is Romania, Poland and Portugal (as we've just explained). Seniority is important, not only for Spain, but for Portugal and Poland. Some kinds of occupations have big importance in inequality, partial workday is outstanding for Spain and supervisory for France. Size of companies with more than 250 workers is an important element for Romania and Portugal. And finally, collective agreement at enterprise level is important for Portugal.

Again, low weight of establishment factors could be connected with the fact that we are not taking into account fixed effects.

Taking to account gross annual salary plus bonuses, we can say that in the case of Portugal, Spain and Romania the contribution of bonuses are higher than the sum of other factors. In Portugal, bonuses would explain 51.5% of total inequality and the 32.92% the remaining factors. In the case of Spain, bonuses would explain 51% of the total inequality (78.8%) and the remaining factors the 27.8%. In Romania, bonuses would explain 26.5% of 66% total inequality and the rest of factors the 39.5% remaining. In this way, we can say that in the case of Spain and Portugal bonuses have biggest incidence in gross annual salary inequality in comparison with the rest of factors. In the case of Romania bonuses have one the highest incidence in gross annual salary inequality but this percentage in not superior to the incidence of the rest of factors. Again, these results are connected with the results in previous section in which we have said that, using SES 2010 dataset, in Spain and Romania, bonuses are explaining the main part of wage variance respect to the rest of countries[64].

Finally, we'd like to remark the low incidence of bonuses in inequality of Finland of only 2% in comparison with the rest of countries and in comparison with previous years. One possible explanation of this fact could be that as Finland changes its collective bargaining regimes, from more centralized to more decentralized, regular

[64] We don't have results for Portugal regression

bonuses would be losing important in front of the other types of bonuses. We have to remind that in Finland regular bonuses were important factors explaining the main part of wage variance.

1.6. Conclusions

The main objective of this paper is to show if the introduction and use of Variable pay systems implies much more wage inequality. Using data from three waves of SES (2002, 2006 and 2010), comparing six selected countries, and considering bonuses as a proxy of Variable pay systems, we can say that there is some relationship between bonuses and wage inequality.

Our results show that in five countries of our analyzed group, Portugal, Poland, Spain, Romania and Finland (only in the case of regular bonuses), bonuses are explaining the most important part of wage variance. And in these same five countries bonuses would have highest incidence in gross annual salary inequality, following Fields decomposition. With 2002 dataset relevant countries of these five are Portugal, Poland and Finland. With 2006 dataset are Portugal, Poland and Spain. And with 2010 dataset are Portugal, Spain and Romania. So, France would be the only country which wouldn't be affected by the wage inequality with the introduction of bonuses.

If we analyze the evolution of bonuses contribution to wage variance, we can say that this hasn't been clearly increasing from 2002 to 2010, except for the case of Spain. Despite this evolution, the final result is that countries with much more centralized collective bargaining have higher contribution of bonuses in wage variance, those countries with a less centralized collective bargaining and with less weight of regular bonuses in total bonuses. This would be a good explanation for the evolution of Finland, which has a much more decentralized collective bargaining. But this would be true only in the case of regular bonuses. It would be necessary the breakdown of bonuses for the SES 2006 and SES 2010, to get much consistent results with literature.

Obviously, apart from bonuses, other factors could be influencing in wage inequality of this countries. For example, structural factors or their starting point. If we compare situation with the SES 2002 dataset with the situation with SES 2010 dataset, we can say that France as Poland (only slightly) have improved their situation in terms of Gini Index, meanwhile Spain, Portugal have worsened their situation. Romania has remained at highest level of Gini Index, between 2002 and 2010. Finland is a special case because it has worsened their situation only in the case of gross annual salary Gini Index, but not for the case of proxy base pay Gini Index.

So, we can conclude that Variable pay systems can imply a bigger deterioration of wage inequality especially in countries with general wage inequality problems. This could be the case for countries with Gini Index up 0.35 like Spain, Portugal and Romania.

For some authors (Lemieux et al, 2007) if variable pay or pay for performance can explain an important part of wages variance, it could happen that complementarities in production may be less important than individual's contribution to output.

But some other literature link wage inequality with skill-biased technical change (Acemoglu, 2002). And in this case we have to analyze deeper complementarities in production. However, variable forms of compensation can be understood as a form of "technology" to adapt to new circumstances (Lemieux et al, 2007).

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