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MALE-FEMALE DISCRIMINATION: AN ANALYSIS OF GENDER GAP AND ITS DETERMINANTS

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1. INTRODUCTION

In recent years, the occupational dynamics have brought in significant innovations in Italy, as the increased participation of women in the labour market.

At the same time, many factors both endogenous, such as the increasing unemployment due to the deep economic crisis that involved all the world, and exogenous, such as the changes in the interpersonal relationships within families, have focused the attention on the gap in labor remuneration related to the gender of the worker, even if nowadays women often reach the highest levels in the labour careers. Following Mincer (1974), wages depend strongly by some well known factors, such as productivity and other personal characteristics. Besides these, whose dynamics have been widely studied and proven, other causes, for which it is harder to find a rational explanation in the economic theory, seem to exert a strong influence.

In this work we try to measure the discriminatory part of wage gap and analyze the effect of each component to the entire gap, with the aim to identify personnel and background characteristics and, especially, the causes of discriminatory part in Italy. Since the labor market presents very different dynamics in the Italian macro-areas, an important step of our analysis is to evaluate the extent of gender wage gap and its decomposition separately for these ones (ISTAT, 2007, 2009a).

The reference is to the gender gap decomposition proposed by Oaxaca (1973) and Blinder (1973), aiming to separate the part due to individual characteristics (endowment effect) by that related to the different returns on the same characteristics concerning male and female workers.

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Therefore, after an introduction to this concern in Italian labour market (Section 2), in Section 3 we present the Oaxaca and Blinder technique of wage gender gap decomposition. Section 4 shows the results referred to the full Italian labour market while in Section 5 those obtained considering separately markets of North, Centre and South Italy are reported, with the aim to highlight the specific characteristics of these territories. Finally, in Section 6 some concluding remarks are reported.

2. THE LABOUR MARKET IN ITALY: GENDER CHARACTERISTICS

In these latest decades in Italy the participation rate to labor market for women increased of more than 10%, even if it still remains remarkably lower than for men (in 2006 the employment gap was of 24%) (ISTAT, 2007). The analysis of these dynamics must take into account the remarkably differences existing at regional level.

As it is well known, Italian economy and specifically the labor market are characterized by a historical dualism between the richer and more developed Northern Regions and the Southern ones, where unemployment and in general a lack of economic opportunities tend to persist. These facts produce different patterns also on the wage gender gap dynamics (Olivetti, 2008).

Thus, the analysis of gender gap requires to take into account a complex set of factors that lead to a significant and systematic, already well documented, less pay received by women. The wage gender gap, resulting from the comparison of male and female retribution estimated through econometrical models, origins above all from a complex combination of choices taken by workers since one's early youth, that include the choice of the course of studies, the types of careers that they try to enter upon and the conditionings deriving from their own family condition (Hansen and Wahlberg, 2000; Fortin, 2005).

Because qualitative information allowing to analyze in depth the causes are lacking[2], we can only, ex post, verify the consequences deriving from these choices (Hansen and Björklund, 2001; Usui, 2008).

Then, we start to analyze the *horizontal and vertical gender segregation,* that concerns the tendency for men and women to be employed in different occupations from each other across the entire spectrum of occupations under analysis. In particular, *horizontal segregation* affects the different distribution of men and women among the professional sectors and then it is not directly connected with inequality but it can be considered as the result of a different propensity of workers respect to specific types of jobs (Baker and Fortin, 1999; Centra and Cutillo, 2009). Often, this is the result of career choices taken upstream, leading, especially female workers, to prefer selected occupations considered more appropriate with the

[2] In some recent works, Fernández and Fogli (2005), Fortin (2005, 2006) and Usui (2008) emphasize the role of "soft variables", such as cultural beliefs about gender roles and family values and individual attitudes toward ambition as important determinants of women's employment decisions as well as of gender differentials.

needs of reconciling work and family responsibilities, due to the asymmetric division of domestic labour still to women great disadvantage[3].

In Table 1 we report, for a descriptive analysis, some indices of occupational horizontal segregation.

TABLE 1

Rates of occupational segregation by sector of economic activity. Employees and self-employees

Indicators / Sectors	Rate of feminization divided by total occupation[(1)]	Rate of feminization divided by male occupation[(2)]	Coefficient of female representation[(3)]
Agriculture	30.41126	43.70140	0.770584
Industry	27.87242	38.64323	0.706253
Construction	5.268542	5.561555	0.133498
Trade	41.06185	69.66938	1.040457
Tourism	48.74241	95.09306	1.235074
Transport and communications	23.21145	30.22774	0.588150
Credit and Insurance	40.51205	68.10127	1.026526
Business services	44.12112	78.95848	1.117976
Public Administration	33.19444	49.68815	0.841107
Education, health and other services	68.06472	213.13330	1.724678
Total	39.46519	65.1942	

Legend: [(1)] [female workers /(female + male workers)]x100; [(2)] (female workers/male workers)x100; [(3)] rate of feminization in the specific sector / rate of feminization in all the sectors.
Source: ISTAT, Continuous Labour Force Survey, mean values 2007.

Data refer to ISTAT sample Continuous Labour Force Survey, the most important source of information on Italian labour market.

Women are less than the 40% of total population of workers and they are not equally distributed in the economic sectors. They prevail in Education, health and other services sector and their presence is more than the mean in the Tourist and Business services sectors.

The incidence of female workers in Construction, Transport and Communication and Industry sectors is very low while their presence in the sectors of Credit and Insurance and Trade is near to the average.

To summarize in a single indicator male and female distributions in the various economic sectors, we have used the following dissimilarity index (White, 1986):

$$ID = \frac{1}{2}\sum_i \left|(F_i/F \cdot 100) - (M_i/M \cdot 100)\right| \quad (1)$$

that shows how many women would change the professional sector so that there was no segregation, under the hypothesis of a stable male employment (Varese Province, 2004).

A very different scenario concerns the *vertical segregation,* which is connected to the lower presence of women in the highest professional levels (Blackburn and Jarman, 2005; Arulompalam *et al.*, 2005). In other words, vertical occupational

[3] One way to include in the gender wage gap analysis directly the different distribution of male and female workers among the economic sectors and occupation consists to apply a multilevel model controlling for otherwise segregation, through an occupation-level model, and personal specific effects, through and individual-level model (de Ruijter and Huffman, 2003; England *et al.,* 1988).

segregation exists when men and women both work *in the same job categories*, but men commonly do the more skilled, responsible or better paid work. Obviously, it doesn't derive, unless very specific situation, by voluntary choices of career renunciation and, even if it happened, would still weigh heavy influences of social and family life (Kaiser, 2005). With the aim to analyze the vertical segregation in Italian labour market, we have considered exclusively employers, the only ones for which a hierarchy in the professions can be considered (Table 2).

TABLE 2

Rates of occupational segregation by professional level. Employees

Professional level	Rate of feminization divided by total occupation(1)	Rate of feminization divided by male occupation(2)	Coefficient of female representation(3)
Factory Worker	32.78179	48.76920	0.830651
Apprentice	38.84615	63.52201	0.984314
Homeworker	81.81818	450.00000	2.073174
Employee	55.60689	125.26020	1.409011
Executive cadre	40.08130	66.89281	1.015612
Director	25.41322	34.07202	0.643940
Total	42.71816	74.57541	

Legend:
(1) [female workers /(female + male workers)]x100; (2) (female workers/male workers)x100; (3) rate of feminization in the specific professional level / rate of feminization in all the professional levels; (4) % female workers in the professional level – % male workers in the same professional level.
Source: ISTAT, Continuous Labour Force Survey, mean values 2007.

On the entire sample of employeers, women represent the 43%, but they are over the 83% in the sub-sample of workers from home and their presence is greater than the mean in the group of clericals. They have the lowest incidence in the ruling class.

3. THE ESTIMATION STRATEGY AND THE DECOMPOSITION OF THE GENDER PAY GAP

The analysis of the wage gender gap takes account of various elements connected with the human capital quantifications and other occupational and personal characteristics of employee.

The model proposed by Oaxaca (1973) and Blinder (1973) assumes that the same characteristics observed on men and women receive different remunerations and, after the gap quantification, it proceeds decomposing it in the part due to the difference in the characteristics and in the part deriving from the different returns reserved to male and female workers. This latter component is then considered to be caused by discrimination.

This model, based on a linear multiple regression, allows to capture gender differences in terms of average values, without however being able to distinguish the phenomenon for different levels of income[4].

Two identical and separated wage regression models are estimated, one for female workers and the other for male workers (Oaxaca, 1973; Blinder, 1973):

[4] Another useful technique of analysis is the quantile regression, which, being based on the quantile concept rather than on the mean, makes possible to do differentiated analyses for various levels of income (Buchinsky, 1998; Koenker and Hallock, 2001).

$$Y_i^F = \beta^F X_i^F + \varepsilon_i^F$$
$$Y_i^M = \beta^M X_i^M + \varepsilon_i^M \tag{2}$$

Then, we proceed quantifying and decomposing the gap according to the following model:

$$\bar{Y}^M - \bar{Y}^F = \beta^M(\bar{X}^M - \bar{X}^F) + (\beta^M - \beta^F)\bar{X}^F \tag{3}$$

where in the second member the first term represents the difference in the mean characteristics for male and female, valued at the return rate of male characteristics (*endowment effect*, E, including however the pre-market discrimination), and the second term describes the part of gap due to the different evaluation received by the same characteristics into the two models (*coefficients effect*, D), defined by the differences in the regression coefficients estimated in the two models and multiplied by the average female characteristics. The coefficients effect is then the part of gap connected with the female discrimination (Centra and Cutillo, 2009).

Many authors have highlighted how this type of analysis to the gender wage gap is affected by sample selection, due to the necessity to take into account the selection of women into the labor market because working women aren't a casual sub-sample of the entire women population, especially in countries as Italy, where the female participation to labour market is very low (de la Rica *et al.*, 2008; ISTAT, 2009a, 2009b; OECD, 2009). Given that non-random selection is relevant only for women, we haven't estimated the participation equation for men (see de la Rica *et al.*, 2008; p. 762). In literature various correction methods have been proposed[5]. The most used is the Heckman correction, even if it often requires arbitrary exclusion assumptions (Olivetti and Petrongolo, 2008; p. 624) and introduces some fundamental ambiguities in the context of wage decomposition[6] and in its interpretation (Neuman and Oaxaca, 2004). Regardless, in this work, we have applied the Heckman correction to take into account non-random selection that produces low labor female rates with the aim to identify the sign of selection bias. In fact, with the introduction in the model of the correction term λ, equal to the inverse of Mill's ratio, computed through the two stages Heckman procedure (1979), we estimate the labour propensity through a probit model that includes some personal women's characteristics considered related to propensity to work and measured on female workers and housewives:

selection mechanism: $z_{if}^* = Y_i^F \gamma + u_i^F$ with $u_i^F \sim \mathrm{N}(0, \sigma_u^2)$

where the selection variable is not observed and we know only if the woman is occupied or not. From this variable we derive the following dichotomous variable:

[5] For an overview on this matter, see Heckman (1979), Olivetti and Petrongolo (2008) and de la Rica *et al.* (2008).

[6] We refer, in particular, on the quantification of how group differences in the Heckman parameters may be interpreted in terms of structural differences and endowment effects (Neuman and Oaxaca, 2004; p. 3; Pena-Boquete *et al.*, 2010; p. 121).

$$z_{if} = 1 \text{ if } z_{if}^{*} > 0$$
$$z_{if} = 0 \text{ if } z_{if}^{*} \leq 0$$
$$\text{Prob}(z_{if}=1)=\phi(Y_i^F \gamma)$$
$$\text{Prob}(z_{if}=0)=1-\phi(Y_i^F \gamma) \quad (4)$$

where Y_i^F is observed only for women that are occupied, that is for $z_{if} = 1$.

The function estimate for female workers is then corrected for the occupational selection in the following manner:

$$E[Y_i^F \mid X_i^F, z_{if} = 1] = X_i^F \beta^F + E[\varepsilon_i^F \mid u_i^F > -Y_i^F \gamma] = X_i^F \beta^F + \theta\lambda_i \quad (5)$$

where $\lambda_i^F = \dfrac{\phi(Y_i^F \gamma)}{\Phi(Y_i^F \gamma)}$

is the inverse of Mill's rate, with $\phi(.)$ and $\Phi(.)$, respectively, probability density and cumulative standard normal distribution functions.

The lambda coefficient θ represents an estimate of the parameter identified as the product of the standard deviation of the errors in the wage equation and the correlation between the wage equation error and the selection equation error (Neuman and Oaxaca, 2004). Thus, a negative value of θ shows for nonemployed women higher earning potentials than for working women while a positive value of it reflects an opposite tendency (Olivetti and Petrongolo, 2008; p. 626).

Given the ambiguities concerning the quantification of how the group differences in the Heckman parameters may be interpreted in terms of structural differences and endowment effects, in this work Heckman correction is applied only with the aim to verify the dynamics that lead the women decisions about employment, especially when we analyze Italian marco-areas, whose dynamics and labor characteristics are very different each others (ISTAT, 2007, 2009a). Thus, decompositive and interpretative aspects about this component were nearly neglected in the Heckman correction application.

4. THE ANALYSIS OF THE GENDER GAP CAUSES

Following the most common approach in literature, for the analysis of gender gap and of its causes, we have regressed the hourly labour income[7] respect to the following types of indicators:

[7] In the case we had wanted to analyze generically the standard of living, which is connected to labor market conditions, we should have considered annual income as dependent variable (Raitano, 2009). Here, the entity of time and care devoted to work has been taken into account including in the regression model the working time typologies. Furthermore, to correct for hourly labour income asymmetrical distribution, we have chosen as dependent variable its logarithm.

- human capital: work experience and level of education (in years);
- type of profession: professional qualification (*low*, medium, high qualification), firm size (*small*, medium, large enterprise), type of working time (*till 20 hour work week*, between 21 and 40 hours, more than 40 hours)[8], sector of economic activity (*Agriculture*, Industry, Public Administration, Private services), type of contract (*temporary contract*, permanent contract);
- context: area *(South and Islands,* Central-North), married (*not married*, married)[9].

The gap estimate is based on the data of the Survey on Household's Income and Wealth (SHIW), a biennal split-panel survey carried out by the Bank of Italy. It provides detailed information on socio-economic topics both at household and individual level.

In particular, the regression model has been estimated separately on a subsample of 3,271 men and 2,425 women, employees drawn by the 2006 SHIW sample. Table 3 reports the uncorrected and corrected parameter estimates of wage equations for women and the uncorrected one for men.

TABLE 3

Parameter estimates of multiple regression models of labour participation.
For women the parameter estimates of the model with the Heckman correction are also reported

	Women				Men	
	OLS without Heckman correction		OLS with Heckman correction		OLS	
N	2,425		2,425		3,271	
F	130.28		123.74		211.90	
Adjusted R^2	0.4275		0.4317		0.4745	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Intercept	1.37192**	0.05522	1.27654**	0.05927	1.84869**	0.04570
Experience	0.00828**	0.00074	0.00735**	0.00077	0.00604**	0.00062
Medium_qual	0.17013**	0.01895	0.16717**	0.01889	0.15071**	0.01575
High_qual	0.38606**	0.03202	0.37674**	0.03197	0.43705**	0.02354
Area	0.06683**	0.01773	0.09340**	0.01870	0.11431**	0.01268
Education	0.03001**	0.00264	0.03426**	0.00281	0.02235**	0.00215
Medium_enterprises	0.09191**	0.01938	0.09387**	0.01932	0.04216**	0.01474
Large_enterprises	0.15808**	0.01991	0.15889**	0.01984	0.15282**	0.01517
Medium_working time	–0.28674**	0.02207	–0.28325**	0.02200	–0.65682**	0.03105
Long_working time	–0.46131**	0.03103	–0.45697**	0.03093	–0.74719**	0.03251
Public Administration	0.09579*	0.04401	0.09030*	0.04386	0.05965	0.02861
Industry	0.02007	0.04295	0.01694	0.04280	0.12198**	0.02489
Private services	–0.01306	0.04203	–0.01565	0.04188	0.09979**	0.02629
Married	0.02097	0.01481	0.03812*	0.01528	0.12767**	0.01385
Permanent contract	0.15107**	0.02110	0.15082**	0.02103	0.14635**	0.01822
Lambda			0.09050**	0.02093		

Source: Authors' ad hoc elaborations on Bank of Italy (2008).

(*) Individual characteristics of reference: low professional qualification, agricultural sector, small enterprise, reduced working time, living in the South, not married and with a temporary job contract.

* 5% significance. ** 1% significance.

[8] Working time inclusion in the regression model avoids to overestimate the less work hours employees returns connected with the use of hour income work as dependent variable (Nicodemo, 2009; Raitano, 2009).

[9] We have written in italics indicators' categories used as reference categories in the dummy variables construction. Other information about women familiar characteristics have been used to estimate the work propensity in the probit model construction.

The estimated model for women evidences more complex dynamics for this kind of workers. The working time coefficients highlight an hourly penalization that increases with the number of weekly hours worked, because of the progressive rate of taxation. While the economic activity sector doesn't influence significantly women income, it produces a significant increase on income for men moving from a work in agriculture to a work in another sector. To be married has a significant positive impact on male wage while for women it does not seem to be determinant.

The other regression coefficients are all positive and significant. In particular, the statistical significance of the area variable coefficient shows the importance of the macro-area in which people live on the earnings: to live in the Centre or in the North of Italy produces a significant increase in the labor income both for men and women. Moreover, the lower dependence of women income on the highest qualifications indicates a penalty for women leaders. The smaller intercept of women regression model shows a smaller income for women also with respect to the other factors not included in the model and for null values of the considered variables.

Finally, the inclusion in the model for women of λ coefficient, estimated through a probit model (see Table 4), shows an improvement of model's fitting and an increase in the influence of educational level and residential area on income.

TABLE 4

Basic Model of Labour Force Participation: Probit Parameter Estimates for the 2,425 female employees and housewives (total 4,175)

Variable	Estimate	Standard error
Intercept	–0.8063**	1.1389
Ratio (Number of wage earners– 1)/(Number of components)	4.1504**	0.1395
(Center-North = 1 / *South-Isles* = 0)	0.4631**	0.0530
Education (years of study)	0.1548**	0.0073
Age (years)	–0.0334**	0.0029
Child3 (presence of children aged <3 years)	–0.4526**	0.0909
Child3_10 (presence of children aged between 3 and 10)	–0.2789**	0.0628
Child11_17 (presence of children aged between 11 and 17)	0.0948	0.0570
Son (presence of children with more than 17 years not employed)	–0.5717**	0.0604

Source: Authors' ad hoc elaborations on Bank of Italy (2008).
* 5% significance. ** 1% significance.

All the variables included in the probit model, except the presence of children aged between 11 and 17 years, significantly influence the women's decision to work or not to work. The factors that negatively affect the woman's work probability are her age, because it is only in these latest years that women's labour participation is increased, and the other variables that indicate the presence of children, especially of those less than 3 years old and those with more than 17 years that still do not work.

Coherenty with the evidences arising from other studies (Addabbo and Favaro, 2009; Albrecht *et al.*, 2004; Centra and Cutillo, 2009) in the wage equation the lambda coefficient is positive, showing concordance between the selection equation and wage equation errors. This implies an higher likelihood to work for women with, on average, higher wage characteristics but also with, on average, higher non-observable characteristics (Albrecht *et al.*, 2004; pp. 15-16)[10].

Because of the ambiguities that could derive from the Heckman correction in the wage gender gap interpretation, the only decomposition without the correction term model is reported (Table 5), even if the model with the correction term has been calculated.

TABLE 5

Mean values of variables and regression coefficients of wage equations for men and women employees models. Endowment effect and discrimination effect of Oaxaca's decomposition

Variable	Mean for men	Parameter estimate for men	Mean for women	Parameter estimate for women(*)	Endowment effect $\beta^M(\bar{X}^M - \bar{X}^F)$	Discrimination effect $(\beta^M - \beta^F)\bar{X}^F$
Ln_income	2.11755		2.05949			
Experience	20.61089	0.00604	18.75979	0.00828	0.01118	–0.04202
Medium_qual	0.34444	0.15071	0.53569	0.17013	–0.02882	–0.01040
High_qual	0.09621	0.43705	0.07252	0.38606	0.01035	0.00370
Area	0.69683	0.11431	0.79092	0.06683	–0.01075	0.03755
Education	10.95860	0.02235	11.96494	0.03001	–0.02249	–0.09165
Medium_enter.	0.25598	0.04216	0.21983	0.09191	0.00152	–0.01094
Large_enterpr.	0.41062	0.15282	0.43930	0.15808	–0.00438	–0.00231
Medium_working time	0.72644	–0.65682	0.78891	–0.28674	0.04103	–0.29196
Long_working time	0.23956	–0.74719	0.09115	–0.46131	–0.11089	–0.02606
Public Administration	0.23658	0.05965	0.38373	0.09579	–0.00878	–0.01387
Industry	0.45317	0.12198	0.22838	0.02007	0.02742	0.02327
Private services	0.25319	0.09979	0.35728	–0.01306	–0.01039	0.04032
Married	0.66113	0.12767	0.60097	0.02097	0.00768	0.06412
Permanent contract	0.88350	0.14635	0.86372	0.15107	0.00289	–0.00408
Intercept		1.84869		1.37192		
Total					-0.09443	–0.32432

Source: Authors' ad hoc elaborations on Bank of Italy (2008).
(*) Parameter estimates for women are without Heckman correction.

The gender gap decomposition based on Oaxaca's equation (1) highlights as on a gap of 5% measured in logarithmic and mean terms, the part due to differences in returns for otherwise equivalent characteristics is of 0.15245. Similar results are highlighted in other studies (Addabbo and Favaro, 2009; Pissarides *et al.*, 2005).

Analyzing the contribution to the gap of its components, with reference to the variables included in the model, a high professional qualification, to work in a sector different from agriculture and to live in the Centre-North of Italy have a larger return for men while education and to work in a medium or large enterprise have a major return for women, which, on average, are also more educated.

[10] Many studies, comparing the gender wage gap in a cross-national perspective, have highlighted as in Countries like Italy or Spain, with low female employment rates, women who are employed are in general better educated and have also higher unobservable characteristics. Thus, in line with their presumed higher commitment, their wages will be similar to those of men with similar characteristics, showing the reason for which countries with lower female employment rates have usually also lower gender pay gaps than the other Countries with opposed characteristics (de la Rica *et al.*, 2008).

$$\text{Gap} = \log \overline{Y}^M - \log \overline{Y}^F = \beta^M(\overline{X}^M - \overline{X}^F) + (\beta^M - \beta^F)\overline{X}^F - \theta\overline{\lambda}_f \qquad (6)$$

Gap = 0.05806 = 2.11755–2.05949 = –0.09443 + 0.15245

Because in compact notation:

$$\log \overline{Y}^M = \beta^M \overline{X}^M \quad \text{and} \quad \log \overline{Y}^F = \beta^F \overline{X}^F$$

$$\log \overline{Y}^M - \log \overline{Y}^F = \beta^M \overline{X}^M - \beta^F \overline{X}^F = \beta^M(\overline{X}^M - \overline{X}^F) + (\beta^M - \beta^F)\overline{X}^F \qquad (7)$$

and: $\beta^M \overline{X}^M$ =1.84869+0.26879; $\beta^F \overline{X}^F$ = 1.37192+0.68754

2.11755–2.05949=0.47677+0.26879–0.68754=–0.09443+(0.47677–0.32432)

where:

Endowment effect (*E*) = $\beta^M(\overline{X}^M - \overline{X}^F)$ = –0.09443;

Discrim. effect (*D*)= (*U*+*C*)= $(\beta_0^M - \beta_0^F) + (\beta^M - \beta^F)\overline{X}^F$ = 0.47677 – 0.32432 = 0.15245

Working in the Center-North of Italy increases labour income in general, but especially for men.

The high value on the gap of the component connected with the intercept highlights (Jones, 1983) that the gap is higher when the regressors are null (that is for a worker without labour experience and education, with a low professional qualification, working a few hours per week in a small business of agriculture, living in the South, not married and without a permanent contract).

5. A TERRITORIAL FOCUS OF GENDER GAP ANALYSIS

With the aim to focus attention on territory, whose economic characteristics are very diversified, we have repeated the analysis considering separately the macroareas of North, Center and South Italy, so favouring their peculiarities to emerge. The results, reported in detail in Appendix, are as follows:

North Italy: $\log \overline{Y}^M - \log \overline{Y}^F = \beta^M(\overline{X}^M - \overline{X}^F) + (\beta^M - \beta^F)\overline{X}^F$
2.15146–2.05523 = –0.054975 + 0.15115 = 0.09623

Central Italy: $\log \overline{Y}^M - \log \overline{Y}^F = \beta^M(\overline{X}^M - \overline{X}^F) + (\beta^M - \beta^F)\overline{X}^F$
2.19306– 2.12981= –0.09679+ 0.15997 = 0.06325

South Italy: $\log \overline{Y}^M - \log \overline{Y}^F = \beta^M(\overline{X}^M - \overline{X}^F) + (\beta^M - \beta^F)\overline{X}^F$
2.01425–2.00231=–0.12375+ 0.13562 = 0.01187

At a first view, they may seem rather surprising.

Against a gap of 5%, referred to Italy on the whole, rather similar to those obtained by other Authors (Centra and Cutillo, 2009; p. 26), the consideration of the three Italian macroareas highlights very different situations. The wage gender gap appears to be minimal in the South and it increases in the Center and, even, in the North.

With reference to the single gap's components, the biggest one is the intercepts' difference, which represents the discrimination part unexplained also after the model application. It is very high in the Center and in the South, with, respectively, 0.70937 and 0.64844.

The part of gap that represents the endowment effect, given by the sum of the differences between the mean values of variables surveyed on men and women and multiplied by the male returns, is in all cases negative and maximum in the South, highlighting that female mean values prevail on the male ones. Thus, women have a greater endowment than men.

More specifically, men have on average more working experience, due to the fact that the female increased participation to labour market is a relatively recent phenomenon, and they are more numerous in the highest professional qualifications, in the medium enterprises and in Industry.

No exception is highlighted also at partition level. On the contrary, women have, on average, a higher education. With reference to the discrimination component that, as showed by Blinder (1973) and Jones (1983), can be decomposed in the effect due to the coefficients and in the effect due to the unexplained component, given by the intercepts' difference, it is equal to 0.48 for the entire nation, but in Central and South Italy it is higher than 0.64. Analyzing its components, we find the highest values of both the unexplained component and the return of factors included in the model at Center and at South, with very similar results (Table 6).

TABLE 6

Gender wage gap, its components and decomposition of discrimination component for Italy and its macroareas. Absolute data expressed in mean logarithmic terms

Territory	Gap = $D + E$	$D = C + U$	E	U	C
North	0.09623	0.15115	-0.05497	0.38587	-0.23472
Center	0.06325	0.15997	-0.09679	0.70937	-0.54940
South	0.01194	0.13562	-0.12375	0.64844	-0.51282
Italy	0.05806	0.15245	-0.09443	0.47677	-0.32432

Source: Authors' ad hoc elaborations on Bank of Italy (2008).

Legend:

D = Discriminant effect = $(\beta^M - \beta^F)\bar{X}^F = C + U$ = Coefficients effect + Intercepts effect== $(\beta^M - \beta^F)\bar{X}^F + (\beta_0^M - \beta_0^F)$

E = Endowment effect = $\beta^M(\bar{X}^M - \bar{X}^F)$

Furthermore, even if for the ambiguities arising from the Heckman correction interpretation we have not reported the gender wage decomposition including the Heckman related component, we have calculated also the model including the lambda correction with the only aim to verify how the selection mechanism acts. As we can see from Table 14 reported in the Appendix, for South and Central Italy the corrections related to the self-selection component obtained through the Heckmann factor are higher than that estimated for North Italy. Lambda coefficient is always positive, as expected in literature (Nicodemo, 2009). The lacking in significance of lambda coefficient for North could be interpreted as a limited sample selection effect in this area.

Then, the territorial focussing of gender gap and its decomposition analysis highlights a particular situation especially for the South of Italy. In this context, even if the gender gap is the lowest one, with 1%, against a national value greater than 5%, women present a very high gap respect to men with reference to productivity (endowment effect) and, at the same time, the highest discriminatory component.

Thus, comparing wage returns, the picture drawn is very adverse for southern women but especially for southern men. Labour incomes are lower in all at South but the gap respect to Italian that live in the other parts of the nation is higher for men than for women.

Southern employees seldom reach high qualifications and work most of all in Public Administration rather than in the most profitable sectors of Industry and Private Sectors. In fact, the lack of a lively market and productive sector in the South produces only few profitable opportunities of work. The dominance of Public Administration employers at South is surely one of the causes of the lowest gender wage gap at South, because in public sector it is well known that wage gap is very small[11].

Also part-time, as previous studies have shown, represent for southern Italian workers a makeshift solution rather than a conciliation means between work and familiar engagements (Quintano *et al.*, 2007).

6. CONCLUSIONS

Even if it is still very problematic to interpret the wage gender gap, due to the models' difficult of considering simultaneously various complex factors, it has long received attention by institutions, sociologists and economists, because it represents only the tip of the iceberg, made by missed or conditioned opportunities since the adolescence of an employee. Some of these can be voluntary choices, even if they often depend on social influences, as the careers of (especially less educated) women may suffer from frequent interruptions, due to societal discrimination in family duties, lack of family aid policies, and so on (Pena-Boquet *et al.*, 2010). Other causes are due to differences in the entry jobs and lower female wages. Italy is first on the list of European Countries for these circumstances (Bonino *et al.*, 2009).

Besides, the well known horizontal segregation is also connected with the most women's propensity to choose type of jobs and economic sectors, as Public Sec-

[11] In fact, in the analysis of gender wage gap it would be better to separate public and private sector employers. In this case, the necessity to preserve the sample representativeness at macro-areas level and the reduced sample size when we consider only employers have suggested to include the information about the Public Sector only as a dummy variable in the wage equation (Gupta *et al.*, 1998).

tor, where friendly policies would be better implemented but with flatter wage profile. Vertical segregation is instead often due to career breaks for child rearing reasons which imposes a penalty on career especially in Italy. To summarise, men and women are not perfect substitute and this gender heterogeneity affects the wage gap, especially for the unexplained part (Chevalier, 2004).

In this paper, we have attended to show if there is a *macro-area effect* when comparing gender wage discrimination. In fact, the wage gender gap estimated in this work is similar to those obtained for other Countries (Olivetti, 2008; OECD, 2002), but when we focus the attention at Italian macroareas, we note the existence of very diversified situations. Clearly, the entity of the gap and of its specific components is influenced by other factors such as the labour market characteristics, that in the South damage very much women but also men.

Even if in North Italy there is the highest gap in absolute values, here both the endowment effect component, always favouring the women, and the discriminatory part, which measures the difference in the endowment returns, are the lowest ones.

In the South of Italy, even if we have the lowest gap, its decomposition highlights the strong influence of discriminatory component.

Therefore, the results of this analysis stimulates further remarks and other researches, aimed to investigate more in detail the causes of the wage gender gap and the contribution of the various components, trying to capture more information and to increase the knowledge of dynamics that regulate this complex phenomenon.

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APPENDIX

TABLE 7

Parameter estimates of multiple regression models of labour participation. Territorial macroarea: North

	Men		Women	
N	1,588		1,338	
F	90.09		56.04	
Adjusted R^2	0.4219		0.3486	
	Estimate	Standard error	Estimate	Standard error
Intercept	1.89650**	0.07203	1.51063**	0.08408
Experience	0.00742**	0.00091	0.00632**	0.00097
Medium_qual	0.15483**	0.02232	0.17142**	0.02322
High_qual	0.41954**	0.03202	0.37936**	0.04007
Education	0.01941**	0.00315	0.02469**	0.00346
Medium_enterprise	0.04024	0.02060	0.08992**	0.02396
Large_enterprise	0.14553**	0.02114	0.12769**	0.02446
Medium_working time	-0.49653**	0.04417	-0.25075**	0.02974
Long_working time	-0.50513**	0.04618	-0.43744**	0.04215
Public Administration	0.04123	0.04738	0.09168	0.06685
Industry	0.08455*	0.04126	0.01275	0.06553
Private services	0.07183	0.04326	0.01152	0.06535
Married	0.10743**	0.01891	0.01929	0.01920
Permanent contract	0.08026**	0.02894	0.14678**	0.02869

Source: Authors' ad hoc elaborations on Bank of Italy (2008).

(*) Individual characteristics of reference: low professional qualification, agricultural sector, small enterprise, reduced working time, living in the South, not married and with a temporary job contract.

* 5% significance. ** 1% significance.

TABLE 8

Parameter estimates of multiple regression models of labour participation. Territorial macroarea: Center

	Men		Women	
N	632		517	
F	55.26		39.88	
Adjusted R^2	0.5278		0.4948	
	Estimate	Standard error	Estimate	Standard error
Intercept	1.92674**	0.10553	1.21737**	0.12746
Experience	0.00495**	0.00139	0.01095**	0.00152
Medium_qual	0.16073**	0.03246	0.20855**	0.04217
High_qual	0.47118**	0.05038	0.42645**	0.06408
Education	0.03073**	0.00456	0.03489**	0.00580
Medium_enterprise	0.01577	0.03315	0.11764**	0.03976
Large_enterprise	0.18159**	0.03382	0.23304**	0.04369
Medium_working time	-0.80579**	0.06971	-0.27687**	0.04603
Long_working time	-0.91717**	0.07259	-0.28780**	0.06207
Public Administration	0.08797	0.06926	0.21695*	0.09455
Industry	0.18119**	0.06502	0.23301*	0.09619
Private services	0.16604*	0.06513	0.12520	0.09150
Married	0.14733**	0.02976	-0.00592	0.03036
Permanent contract	0.19675**	0.04546	0.06874	0.04924

Source: Authors' ad hoc elaborations on Bank of Italy (2008).

(*) Individual characteristics of reference: low professional qualification, agricultural sector, small enterprise, reduced working time, living in the South, not married and with a temporary job contract.

* 5% significance. ** 1% significance.

TABLE 9

Parameter estimates of multiple regression models of labour participation. Territorial macroarea: South

	Men		Women	
N	1,051		570	
F	88.11		49.62	
Adjusted R^2	0.5189		0.5262	
	Estimate	Standard error	Estimate	Standard error
Intercept	2.07819**	0.07607	1.42975**	0.10230
Experience	0.00458**	0.00108	0.00920**	0.00168
Medium_qual	0.15700**	0.03028	0.10528*	0.05132
High_qual	0.45553**	0.04795	0.33762**	0.08878
Education	0.01907**	0.00376	0.03315**	0.00566
Medium_enterprise	0.08713**	0.02797	0.05807	0.05421
Large_enterprise	0.15584**	0.02865	0.17794**	0.05209
Medium_working time	-0.83593**	0.05486	-0.36433**	0.04578
Long_working time	-1.06008**	0.05793	-0.67337**	0.06697
Public Administration	0.03590	0.04544	0.06054	0.08945
Industry	0.11219**	0.03684	-0.11789	0.08509
Private services	0.08049*	0.03990	-0.11010	0.07506
Married	0.14407**	0.02752	0.08016*	0.03464
Permanent contract	0.18120**	0.02787	0.19590**	0.04155

Source: Authors' ad hoc elaborations on Bank of Italy (2008).

(*) Individual characteristics of reference: low professional qualification, agricultural sector, small enterprise, reduced working time, living in the South, not married and with a temporary job contract.

* 5% significance. ** 1% significance.

TABLE 10

Basic Model of Labour Force Participation: Probit Parameter Estimates for the 2,425 employees and housewives women (total 4,175) in the territorial macroareas: North, Center and South

Variable	North (1,888)		Center (797)		South (1,490)	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Intercept	0.9512**	0.2715	-0.6542**	0.3650	-2.1180**	0.2722
Ratio (N. wage earners–1)/(N. components)	4.3783**	0.2213	3.8814**	0.2867	4.2525**	0.2448
Education (years of study)	0.1543**	0.0119	0.1343**	0.0156	0.1773**	0.0121
Age (years)	-0.0577**	0.0052	-0.0279**	0.0060	-0.0124**	0.0047
Child3 (presence of children aged <3 years)	-0.6894**	0.1388	-0.2105**	0.2109	-0.3101**	0.1639
Child3_10 (presence of children aged between 3 and 10)	-0.4158**	0.0927	-0.1954	0.1409	-0.2370	0.1187
Child11_17 (presence of children aged between 11 and 17)	-0.0376**	0.0897	0.2817	0.1285	0.1650*	0.0944
Sons (presence of children with more than 17 years not employed)	-0.7688	0.0957	-0.4896*	0.1300	-0.3329	0.1009

Source: Authors' ad hoc elaborations on Bank of Italy (2008).

* 5% significance. ** 1% significance.

TABLE 11

Mean values of variables and regression coefficients of wage equations for men and women employees models. Endowment effect and discrimination effect of Oaxaca's decomposition. Territorial macroarea: North

Variable	Mean for Men	Parameter estimates for Men	Mean for women	Parameter estimates for women	Endowment effect $\beta^M(\bar{X}^M - \bar{X}^F)$	Discrimination effect $(\beta^M - \beta^F)\bar{X}^F$
Ln_income	2.15145		2.05523			
Experience	19.85093	0.00742	19.37476	0.00632	0.00353	0.02131
Medium_qual	0.31072	0.15483	0.50868	0.17142	-0.03065	-0.00844
High_qual	0.10684	0.41954	0.07215	0.37936	0.01456	0.00290
Education	11.13396	0.01941	11.75774	0.02469	-0.01211	-0.06208
Medium_enterpr.	0.29070	0.04024	0.24453	0.08992	0.00186	-0.01215
Large_enterprise	0.39613	0.14553	0.42146	0.12769	-0.00369	0.00752
Medium_working time	0.71158	-0.49653	0.81410	-0.25075	0.05091	-0.20009
Long_working time	0.25420	-0.50513	0.07962	-0.43744	-0.08819	-0.00539
Public Administration	0.15871	0.04123	0.33168	0.09168	-0.00713	-0.01673
Industry	0.56114	0.08455	0.29676	0.01275	0.02235	0.02131
Private services	0.24210	0.07183	0.35222	0.01152	-0.00791	0.02124
Married	0.61770	0.10743	0.62289	0.01929	-0.00056	0.05490
Permanent contract	0.91283	0.08026	0.88731	0.14678	0.00205	-0.05902
Total					-0.05497	-0.23472
Intercept		1.89650		1.51063		

Source: Authors' ad hoc elaborations on Bank of Italy (2008).

TABLE 12

Mean values of variables and regression coefficients of wage equations for men and women employees models. Endowment effect and discrimination effect of Oaxaca's decomposition. Territorial macroarea: Center

Variable	Mean for Men	Parameter estimates for Men	Mean for women	Parameter estimates for women	Endowment effect $\beta^M(\bar{X}^M - \bar{X}^F)$	Discrimination effect $(\beta^M - \beta^F)\bar{X}^F$
Ln_income	2.19306		2.12981			
Experience	21.06142	0.00495	19.29950	0.01095	0.00872	-0.11580
Medium_qual	0.38033	0.16073	0.53922	0.20855	-0.02554	-0.02579
High_qual	0.11298	0.47118	0.09773	0.42645	0.00719	0.00437
Education	11.51835	0.03073	12.25798	0.03489	-0.02273	-0.05099
Medium_enterpr.	0.26389	0.01577	0.25029	0.11764	0.00021	-0.02550
Large_enterprise	0.40774	0.18159	0.42403	0.23304	-0.00296	-0.02182
Medium_working time	0.73336	-0.80579	0.76381	-0.27687	0.02454	-0.40399
Long_working time	0.23302	-0.91717	0.11061	-0.28780	-0.11227	-0.06961
Public Administration	0.26151	0.08797	0.40353	0.21695	-0.01249	-0.05205
Industry	0.35294	0.18119	0.15873	0.23301	0.03519	-0.00823
Private services	0.34503	0.16604	0.41130	0.12520	-0.01100	0.01680
Married	0.65985	0.14733	0.57515	-0.00592	0.01248	0.08814
Permanent contract	0.90839	0.19675	0.89884	0.06874	0.00188	0.11506
Total					-0.09679	-0.54940
Intercept		1.92674		1.21737		

Source: Authors' ad hoc elaborations on Bank of Italy (2008).

TABLE 13

Mean values of variables and regression coefficients of wage equations for men and women employees models. Endowment effect and discrimination effect of Oaxaca's decomposition. Territorial macroarea: South

Variable	Mean for Men	Parameter estimates for Men	Mean for women	Parameter estimates for women	Endowment effect $\beta^M(\bar{X}^M - \bar{X}^F)$	Discrimination effect $(\beta^M - \beta^F)\bar{X}^F$
Ln_income	2.01425		2.00231			
Experience	21.61997	0.00458	16.50742	0.00920	0.02342	-0.07626
Medium_qual	0.37952	0.15700	0.60784	0.10528	-0.03585	0.03144
High_qual	0.06802	0.45553	0.04879	0.33762	0.00876	0.00575
Education	10.32120	0.01907	12.25970	0.03315	-0.03697	-0.17262
Medium_enterpr.	0.19251	0.08713	0.12072	0.05807	0.00626	0.00351
Large_enterprise	0.43684	0.15584	0.50424	0.17794	-0.01050	-0.01114
Medium_working time	0.74734	-0.83593	0.74303	-0.36433	-0.00360	-0.35041
Long_working time	0.21880	-1.06008	0.10427	-0.67337	-0.12141	-0.04032
Public Administration	0.35293	0.03590	0.50999	0.06054	-0.00564	-0.01257
Industry	0.33187	0.11219	0.10537	-0.11789	0.02541	0.02424
Private services	0.21596	0.08049	0.31835	-0.11010	-0.00824	0.06067
Married	0.73527	0.14407	0.56494	0.08016	0.02454	0.03611
Permanent contract	0.81879	0.18120	0.76317	0.19590	0.01008	-0.01122
Total					-0.12375	-0.51282
Intercept		2.07819		1.42975		

Source: Authors' ad hoc elaborations on Bank of Italy (2008).

TABLE 14

Mean of the Inverse of Mill's rate variable, its coefficient in the linear regression model, standard error, significance and correction component of gender wage gap for Italy and its macro-areas

Territory	λ coefficient	s.e.	Pr > | t |	$\bar{\lambda}$	$\theta\lambda$
North	0.05517	0.03159	0.0810	0.26759	0.01476
Center	0.15986	0.04506	0.0004	0.38278	0.06119
South	0.08690	0.03938	0.0278	0.55215	0.04798
Italy	0.09050	0.02093	<0.0001	0.36338	0.03288

Source: Authors' ad hoc elaborations on Bank of Italy (2008).

SUMMMARY

Male-female discrimination: an analysis of gender gap and its determinants

In recent years, the occupational dynamics have brought in significant innovations in Italy, as the increased participation of women in the labour market, that have stimulated studies about the gender wage gap, concerning the different remuneration reserved to male and female workers. In this work the Authors, following Oaxaca and Blinder approach, estimate the gap for Italian employers and proceed to its decomposition, one part due to differences in individual characteristics (endowment effect) and another part due to the different returns on the same characteristics (coefficient effect), related to discrimination. Then, the gender wage gap and its decomposition is analyzed with reference to Italian macro-areas considered separately with the aim to highlight the different fundamental dynamics.

The model has also been modified using the Heckmann correction to eliminate the bias due to self-selection; i.e. the different propensity to work for men and women.