Women's care responsibilities, employment and health: a two countries' tale

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Abstract

Gender gaps in employment opportunities and outcomes are widespread across countries. According to the prevailing social and cultural norms, women are expected to shoulder the primary burdens of housework, childcare, and family responsibilities. The unequal share of care responsibilities further deteriorates the disadvantages of women in balancing public and private life, with also an impact on their health.

We simultaneously analyse employment and health outcomes by gender in Italy and France before and after the economic downturn. We find interesting results supporting the fact that gender gaps in the share of responsibilities roles in the public and private sphere may further hamper the overall economic growth of countries.

JEL classification: C33, D13, I10, J13, J21
Keywords: employment gender gap; family burdens; health; economic development

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1.Introduction

Tackling gender gaps and discussing the concerns about existing gender inequalities have become a customary topic among labour economists for the past decades and a recurrent research strand also in the debate on economic growth.

Several international organizations and institutions have recently published studies and reports showing the enormous potential that the closing of gender gaps could deploy in the short and the long run in both high and low income countries. There have been numerous efforts in assessing the efficiency waste of persisting gender gaps and in estimating the potential gain in terms of Gross Domestic Product (GDP) by assuming that women eventually worked at the same conditions of their male colleagues.

According to the International Labour Office report (ILO, 2017), achieving the G20 agenda target, i.e. reducing the gender gap by 25% by 2025, would increase global employment by 5.3%. In developed countries, this increase would be 3.3%. In total, world GDP could rise by 3.9% in 2025. And so it continues, *inter alia*, with studies by World Economic Forum (WEF, 2017), United Nations (UN, 2017) and estimates by European Institute for Gender Equality (EIGE, 2016), European Foundation for the Improvement of Living and Working Conditions (Eurofound, 2016). Compared with labour market and education policies, gender equality policies have a stronger impact on GDP (DG EAC, 2016).

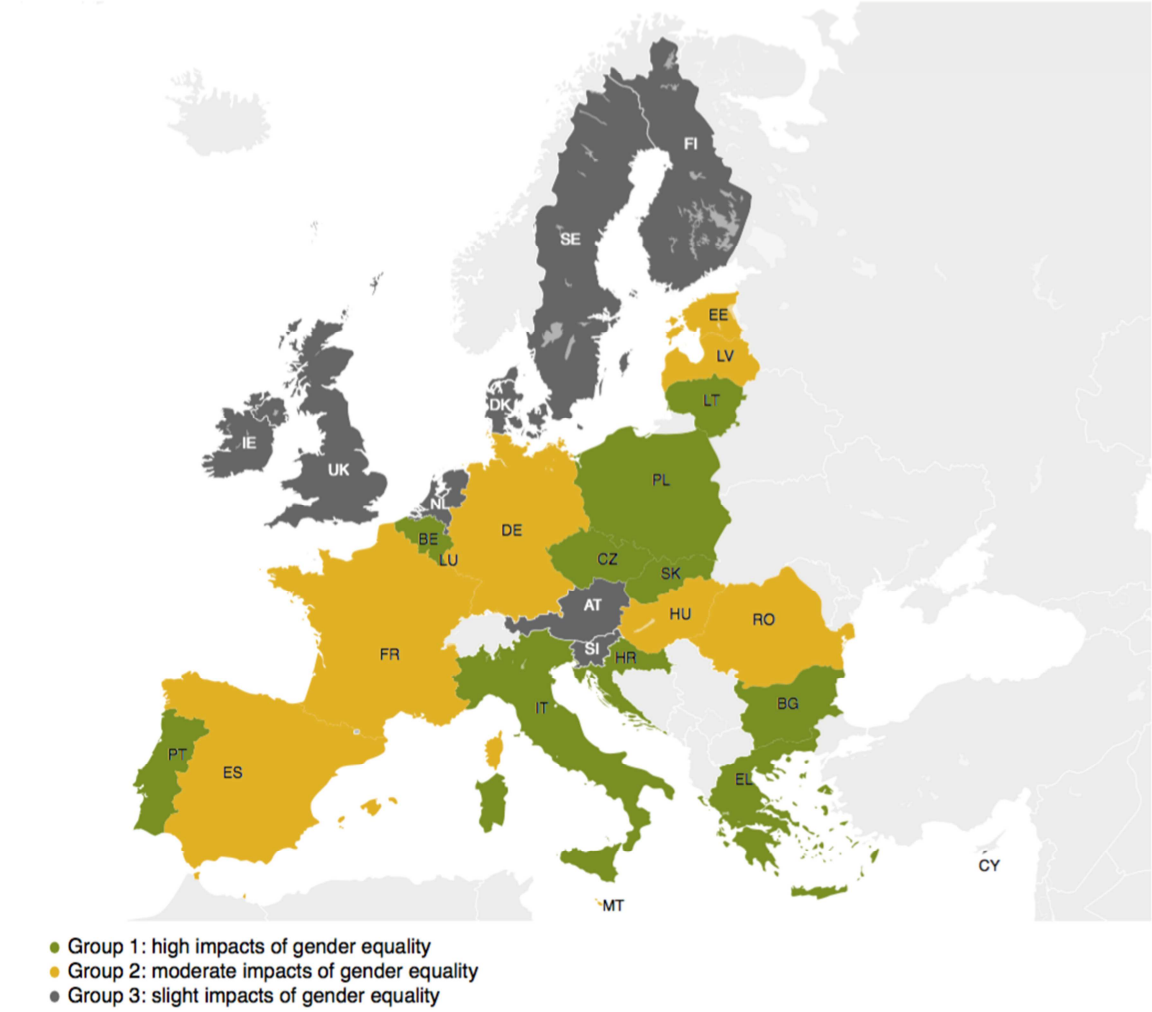
The estimated GDP impacts of increased gender equality though differ considerably across EU countries (EIGE, 2016)[3], depending on the starting levels of development and gender equality, and on the time horizon considered.

Figure 1 shows the different levels of impact of gender equality attainment in the EU in the medium term horizon (2030). The best performing countries, such as the Scandinavian countries plus the UK, Austria and the Netherlands, have already achieved good levels of gender equality and therefore already enjoy some of the associated economic benefits.

However, further improvements in gender equality can generate additional economic gains even in these Member States, often reaching around 4% of GDP.

[3] This report calculates efficiency gains in income and employment from gender inequalities reduction in the medium term (2030) and long term (2050).

Figure 1: Impact of gender equality: differences across Member States in GDP in 2030



Source: EIGE (2016)

As for the long run impacts, improving gender equality would lead to an overall average increase in EU GDP per capita up to 9.6% in 2050. Countries which initially fare low on gender equality performance (i.e. Italy, Greece, Poland, Hungary) have much more to gain. On average, improved gender equality in these countries is expected to lead to an increase in GDP of about 12% by 2050.

Improvements in gender equality would lead to an additional 10.5 million jobs in 2050, which would benefit all population, although about 70% of these jobs would be taken by women. However, female and male employment rates are estimated to meet in the long run, reaching an 80% employment rate by 2050. The efforts put on women's empowerment and improvements are usually believed to act as economic multipliers: they induce positive effects on consumption, increase in demand for services, investments and innovation (generating further employment).

It is not, therefore, simply the question of covering feminist or gender friendly/neutral issues. It is more the case of understanding, *coeteris paribus*, what has allowed some countries to have reached and kept high levels of gender equality with respect to (same income level) countries which still show high gaps on gender indicators and indexes.

Additionally, these gender gaps make the burden of total work unbalanced for women, affecting their health. Therefore, women work more than men with subsequent effect on health status but are not paid for a large part of their efforts.

Health is well renown to be an important determinant of economic growth: thus, the additional negative effect induced by labour related gender gaps on women's health further deteriorates the capacity of women to contribute to economic growth at micro and macroeconomic levels. More women at work have attracted the attention on their health outcome and its indirect effect on next generation. As well as it happens with more educated women, healthier women are a vehicle of positive spillover on the future generation's health and education level, and by so doing also on dynamics and level of economic growth.

Employment and health conditions of women are therefore crucial to the economic growth and overall development of countries, which, in turn, can maintain and guarantee further improved employment and health conditions for the whole population.

In our study, we have chosen to analyse the case of Italy and France, based upon their recent policy choices and the outcomes of their relevant measures, as pinpointed by existing literature, and reported in the international statistical database and international organisation reports.

There are analogies and differences among the two countries that make them appealing to a possible comparison. Italy, for example, in 2017 has recorded an employment rate of around 52% (Eurostat data available at http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsq_ergan&lang=en), but when counting female employment rate at full-time equivalent level (OECD data available at https://data.oecd.org/emp/employment-rate.htm) it still remain below 40%. France, on the other hand, has a full-time equivalent female employment rate of 52% and an employment rate of 67%. The worse part of the story is that the gender gap is more than twofold: 8 points for France 20 for Italy, with a EU28 gap of 11.5. Moreover, according to OECD survey data on time use (OECD, 2017)[4], women work more hours per day than men with an even stronger disadvantage for Italian women. Actually, they also work more than French women, totalling only 2.2 hours on paid work but

[4] http://stats.oecd.org/index.aspx?queryid=54757#.

5.1 hours in unpaid work, in contrast with 2.9 paid work hours and 3.7 unpaid work hours for French women. The gender gaps in total work exists in both countries but the greater involvement of French men in unpaid work makes the total gender gap in France a third of the Italian one (0.5 and 1.4, respectively).

This study adds up to existing literature by analysing micro data of two similar countries but with different gender gaps closing paths, trying to understand what role is played by existing differences in employment and health status in shaping the future scenario of economic development.

The paper proceeds as follows. Section 2 describes the most important literature on employment and health and their link to employment growth. Section 3 describes the microdata used and the empirical strategy to simultaneously estimate employment and health. Section 4 discusses the main results, and Section 5 concludes.

2.Literature review

Gaps in employment are considered to distort the economic equilibrium by reducing the set of human capital from which the choice of employers is made (Esteve-Volart, 2004). There is also a demographic argument for which gaps in employment between men and women are proven to reduce economic growth, and that deals mainly with low female participation in labour market and low fertility rates for some (Mediterranean) countries of the advanced world (Del Boca, 2015), in contrast or delay with a target of a more modern cultural environment in labour markets and society as a whole (Blau et al. 2013, Fogli and Fernandez, 2009).

Gender inequalities in employment help to explain different attainment in income levels, but gender inequalities in employment are also deeply affected by inequalities in education and health opportunities, reiterating the initial equalities. In fact, the causality works in both directions: gender gaps in education attainment may lead to gender gaps in employment, since employers would normally select workers with higher education (Kabeer and Natali, 2013) while rational individuals (i.e. young women) might decide that the education is not a lucrative investment (Klasen and Lamanna, 2009) because of employment expectations.

There has been a large number of theoretical and empirical studies finding that reducing gender gaps in employment/labour market outcomes may boost economic growth or finding that the existing gender inequality hampers economic growth.

In the OECD area, for example, it is estimated that income would increase by 12% if the female participation rates would reach male levels in 2030 (OECD, 2012). Increasing gender equality in labour market participation has been found to give 13 % higher GDP in the euro area, with the elimination of the gender employment gap (Daly, 2007). Another study (Löfström, 2009) calculated 27-29% higher GDP for EU average with full gender balance on the labour market. Aguirre et al. (2012) find higher GDP ranging from +3 % in Sweden to +19 % in Italy following an increase in women's employment rate. Woetzel et al. (2015) report that even in France, where there has already been substantial progress in issues of gender equality, the gain of the full-potential scenario is 10 % to 12 % by year 2025. They also remark the unbalanced share of unpaid work in the family: while in France is unequally split in 63% for women and 37% for men, in Italy it is even more unequal with 75% left under the responsibility of women and 25% under that of men.

Another way to look at this negative relation, as explained above, is calculating the loss in output due to gender inequality in labour market participation differentials: Cuberes and Teignier (2014) find a loss of -40% when all women are excluded from labour market. A positive effect on the annual rate of GDP growth due to the growth in women's share of the labour force (magnitude depending on the econometric specification used) is found by Klasen and Lamanna (2009).

Another important gender biased determinant of economic growth is given by the role of social institutions. These institutions build the surrounding context within which men and women interact, make their choices and in so doing differentiated, also unconsciously, their behaviours. We know from the literature that social institutions are a major factor influencing development outcomes (Morrison and Jütting, 2005; Branisa, Klasen and Ziegler, 2013): their evolution and transformations make decisions, choices or behaviours acceptable or not in a society and therefore shape and determine the roles and relations between men and women (Ferrant and Kolev, 2016). The distribution of power between men and women in the private sphere of the family, in the economic sphere and in public life is deeply influenced by social institutions, which, if they become too discriminatory, may constrain or hamper the women's economic opportunities. This implies that women have restricted access to labour market with considerable negative consequences on economic growth, through the reduction of factor accumulation and their productivity (Klasen, 2002; Klasen and Lamanna, 2009).

Direct and indirect health impacts have also to be taken into consideration. In particular, the psycho-physical stress facing women in their multiple burden has been linked to adverse effects on physical and mental health (Henretta, Grundy and Harris, 2002; Do et al., 2014),

and associated with higher economic costs (Henretta et al., 2002; Pierret, 2006; Wiemers and Bianchi, 2015; Suh, 2016), at individual and collective level. Women's greater hours of unpaid work contribute to women experiencing more stress than men (see, for instance, the study on time use data from Canada, McDonald et al., 2005). The unbalanced share of family care and responsibilities increases the negative effect on health and employment, thus implying a negative effect on an economic growth basis: equalising gender roles and sharing activities would improve women's health (McDonald et al., 2005). Paternity leave is correlated with shorter career breaks, longer working hours, fewer penalties in terms of promotions and wages and improved labour market positions for mothers (Pylkkänen and Smith, 2004; Keck and Saraceno, 2013). Fathers' involvement in childcare is positively associated with children's social, emotional, physical and cognitive development (Tamis-LeMonda and Cabrera, 2002; Allen and Daly, 2007; Lamb, 2010) which can be seen in a perspective of future generation population and labour force well-being and quality.

3. Empirical Strategy and Data

3.1 Empirical strategy

We are interested in estimating the impact of health on the employment opportunities by gender Italy and France before and after the economic crisis. Because the health status possibly guide employment decisions, an endogeneity problem due to simultaneity possibly arises.

In order to take this endogeneity issue into account, we estimated a structural two-equation model. One equation modelled the employment (probability) choice suspected of being endogenous, this is our main equation,[5] while the other modelled the health status, and included the employment indicator on its right side. This resulted in a structural equation model (see Altonji et al., 2005 for a similar application) that could be consistently and efficiently estimated by full information maximum likelihood.

We simultaneously estimate the probability of being employed and the health status by gender in Italy and France for individuals aged between 25 and 64 years using pooled probit regression models for the time windows 2007-2010 and 2011-2014. The choice of binary pooled regression models reflects on the one hand the need to obtain a simplified representation of both labour market participation of both women and men to employment

[5] The employment equation is our main equation of interest. The aim of this paper indeed, as explained above, is to estimate the impact of health on employment probabilities.

and their health. With a binary representation we can split our samples in a more convenient and simple manner. In terms of employment, our dependent variable is one if the individual is employed and zero otherwise. For the health status analysis, our dependent variable is one for good health and zero for chronic disease.

The probit model used to estimate the employment equation was derived from a latent continuous variable (y_1*) related to a set of explanatory variables x[6] according to a standard linear model that can be represented as follows:

$$y_{1i}^{*} = \beta x_i + \nu_i, \tag{1}$$

where β is a vector of associated parameters to x and υ is an error term drawn from a standardized normal distribution.

While y_1* is unobserved, y_1 would be observed, and related to y_1* by the following relationship:

$$y_{1i} = \begin{cases} 1 \text{ if } y_{1i}^{*} > 0 \\ 0 \text{ otherwise} \end{cases} \tag{2}$$

The probit model for the health status equation also derived from a latent continuous variable y_2* related to a set of explanatory variables z according to a standard linear model as follows:

$$y_{2i}^{*} = \alpha y_{1i} + \gamma z_i + u_i, \tag{3}$$

where α is the coefficient associated with the endogenous employment variable, γ is a vector of associated parameters to z, including some x-variables, and u is an error term drawn from a standardized normal distribution.

The structural equation model allowed the error terms of both equations to be correlated. Accordingly, we also estimated a correlation term $\rho_{\upsilon u}$ measuring the correlation between residuals related to health with that of the employment equation. In particular, a positive correlation would be indicative that an unobserved term increased both the health and employment outcomes, and *vice versa* in the case of negative correlation. Finally, for

[6] The vector x includes a variable, the regional unemployment rate, introduced for identification purposes.

identification purposes, we use a variable (see Section 3.2) which explain employment but not health.

3.2 Data and Sample

Our data are from the EU-SILC panel. It is a panel survey based on harmonized methodology and definitions across most members of the European Union.[7] The topics covered by the survey are living conditions, income, social exclusion, housing, work, demography, health and education. We select data for Italy and France by gender in the time periods 2007-2010 and 2011-2014, before and after the economic downturn.

Our samples include people aged between 25 and 64 years. In order to avoid to get mixed up with education enrolment and early retirement issues, we exclude from our analysis individuals under the age of 25 years and over the age of 64 years.

We also drop individuals with missing values for some variables used in the econometric analysis. Considering both the non-employed and the employed in the age range examined, in Italy 9,373 (7,688) female and 9,000 (6,893) male observations, and in France 12,592 (12,123) female and 11,172 (11,000) male observations remain over the period 2007-2010 (2011-2014). Tables 1 and 2 report summary statistics of the variables used in the econometric analysis computed on the samples of women and men disaggregated by time period for Italy and France, respectively.

The dependent variable of our main equation (see Section 3.1) is the probability of being employed. Italian women suffer of a double penalization, as they show the lowest employment rates, with respect to both Italian men and French women. We find that 56.4% (57.9%) of the active women in Italy are employed in 2007-2010 (2011-2014), with respect to 84.1% of active men in the first period and 78% in the second period. Interestingly, French women show relatively high employment rate (73.1% in 2007-2010 and 72.3% in 2011-2014) and low gender gap compared to Italy. The definitions of employment and non-employment do not match the ILO definition. In the EU-SILC questionnaire, the respondents are indeed asked to self-define the main economic status in the current year.[8]

However the magnitude of the employment gender gaps is well represented. According to the official statistics (see Eurostat data available at http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsq_ergan&lang=en), in Italy the employment gender gap varies

[7] See Eurostat (2010) for further and technical details about the EU-SILC data.

[8] The variable PL031 contains information on the self-defined economic status. People are asked whether they are working, unemployed, students, in retirement, disabled, in military service, or fulfilling domestic task.

between a peak of 25.1 p.p. in 2007-2011 and 21.9 p.p. in 2011-2014. In France the gender gap is lower compared to Italy, and reduces from 10 p.p. in the first period to 8.8 after the economic downturn.

The dependent variable for the health equation is the perceived health status (variable PH020 in the EU-SILC code). It is a dummy indicator which equals one for good health or absence of chronic (long-standing) illness condition, 0 for chronic disease.

Table 1. Descriptive statistics of individuals and households' characteristics for health and employment equations by gender in Italy for the periods 2007-2010 and 2011-2014

	Women 2007-2010		Men 2007-2010		Women 2011-2014		Men 2011-2014	
	Mean	S. D.	Mean	S. D.	Mean	S. D.	Mean	S. D.
Employment equation								
Employed	56.4	49.6	84.1	36.5	57.9	49.4	78.0	41.4
Age	44,9	10.1	45,2	10.1	46,3	9.9	45,9	10.2
Primary education	44.2	49.7	47.3	49.9	34.1	47.4	35.6	47.9
Secondary education	35.7	47.9	35.0	47.7	42.1	49.4	45.2	49.8
Tertiary education	20.1	40.1	17.7	38.2	23.8	42.6	19.2	39.4
Married	71.8	45.0	67.2	47.0	66.0	47.4	64.1	48.0
Densely populated area	33.8	47.3	33.1	47.1	37.6	48.5	35.7	47.9
Experience in paid work	13,8	10,7	20,7	10,9	15,4	11,2	21,1	11,3
Kids [0, 6]	19.7	47.0	19.8	47.9	16.9	44.9	17.7	45.9
No disabled in household	77.4	41.8	77.5	41.8	75.2	43.2	74.8	43.4
Disabled in household	15.4	36.1	15.8	36.5	18.2	38.6	18.9	39.1
Strongly disabled in household	7.2	25.8	6.7	25.0	6.6	24.8	6.4	24.5
Household components	2,0	5.2	1,9	5.5	3,2	7.3	3,2	1.2
Equivalised household income	18,405	12.9	19,017	12.4	18,770	13.1	19,458	13.2
Regional unemployment rate	7.44	3.49	7.28	3.44	11.14	4.78	11.1	4.74
2007/2011	25.0	43.3	25.0	43.3	25.0	43.3	25.0	43.3
2008/2012	25.0	43.3	25.0	43.3	25.0	43.3	25.0	43.3
2009/2013	25.0	43.3	25.0	43.3	25.0	43.3	25.0	43.3
2010/2014	25.0	43.3	25.0	43.3	25.0	43.3	25.0	43.3
Health equation[(a)]								
Good health	84.3	36.4	85.9	34.8	81.0	39.2	83.3	37.3
Employed	56.4	49.6	84.1	36.5	57.9	49.4	78.0	41.4
North	42.1	49.4	43.7	49.6	47.6	49.9	47.6	49.9
Centre	22.0	41.4	22.7	41.9	21.7	41.3	22.6	41.8
South	35.9	48.0	33.6	47.2	30.7	46.1	29.8	45.8
Observations	9,373		9,000		7,688		6,893	

Notes: [(a)] For the health equation we only report the descriptive statistics of the variable not included in the employment equation. Figures are in percentage, apart from age in years, household components in units, mean equivalized household income in Euro, and experience in paid work in years.
Source: Authors' calculations on 2007-2010 and 2011-2014 EU SILC data.

Table 2. Descriptive statistics of individuals and households' characteristics for health and employment equations by gender in France for the periods 2007-2010 and 2011-2014

	Women 2007-2010		Men 2007-2010		Women 2011-2014		Men 2011-2014	
	Mean	S. D.	Mean	S. D.	Mean	S. D.	Mean	S. D.
Employment equation								
Employed	73.1	44.3	82.5	38.0	72.3	44.7	80.8	39.4
Age	45,8	10.3	45,9	10.3	46,0	10.2	45,9	10.3
Primary education	27.9	44.8	22.1	41.5	21.0	40.7	16.7	37.3
Secondary education	41.1	49.2	50.1	50.0	32.2	46.7	39.0	48.8
Tertiary education	30.9	46.2	27.8	44.8	35.9	48.0	31.6	46.5
Married	62.2	48.5	63.4	48.2	58.2	49.3	57.8	49.4
Densely populated area	44.5	49.7	41.8	49.3	40.4	49.1	39.4	48.9
Experience in paid work	18,5	11,8	23,5	11,8	19,7	11,7	23,8	11.6
Kids [0, 6]	21.0	50.2	22.3	51.8	21.7	51.5	22.6	52.4
No disabled in household	82.6	37.9	82.8	37.8	82.1	38.3	81.1	39.2
Disabled in household	11.5	31.9	11.8	32.2	11.4	31.8	12.6	33.2
Strongly disabled in household	5.9	23.4	5.5	22.7	6.4	24.5	6.3	24.3
Household components	1.9	0.5	1,9	0.6	3,0	1.3	3,0	1.3
Equivalised household income	22,327	15.7	22,964	15.9	23,762	14.8	24,569	15.3
Regional unemployment rate	8,35	2,53	8,31	2,47	9,74	0,85	9.74	0.85
2007/2011	25.0	43.3	25.0	43.3	25.0	43.3	25.0	43.3
2008/2012	25.0	43.3	25.0	43.3	25.0	43.3	25.0	43.3
2009/2013	25.0	43.3	25.0	43.3	25.0	43.3	25.0	43.3
2010/2014	25.0	43.3	25.0	43.3	25.0	43.3	25.0	43.3
Health equation[(a)]								
Good health	68.0	46.7	69.8	45.9	66.4	47.2	68.7	46.4
Employed	73.1	44.3	82.5	38.0	72.3	44.7	80.8	39.4
North	59.2	49.2	58.9	49.2	56.0	49.6	55.2	49.7
Centre	20.9	40.6	23.0	42.1	24.5	43.0	25.6	43.6
South	19.8	39.9	18.0	38.4	19.4	39.5	19.2	39.4
Observations	12,592		11,172		12,123		11,000	

Notes: [(a)] For the health equation we only report the descriptive statistics of the variable not included in the employment equation.
Figures are in percentage, apart from age in years, household components in units, mean equivalized household income in Euro, and experience in paid work in years.
Source: Authors' calculations on 2007-2010 and 2011-2014 EU -SILC data.

Educational variables are defined according to UNESCO's International Standard Classification of Education (ISCED). The EU-SILC distinguishes between education completed in the lower secondary stage (ISCED 0–2), upper secondary education (ISCED 3), and post-secondary or tertiary education (ISCED 5–7). In our samples we find an increasing levels of education especially for women between the two time periods. This might partly reflect the fact that the economic crisis increased the number of job opportunities in highly skilled professions which has contributed to modifying the composition of employee workers by educational level both within and between the countries examined (see, for instance, van der Ende et al., 2014). There is a reduction of women with primary education (from 44.2% in 2007-2011 to 34.1% in 2011-2014 for Italy, and from 27.9% to 21% for France), and an increase of secondary (from 35.7% (41.1%) in 2007-2010 to 42.1% (32.2%) in 2011-2014 for Italy (France)) and tertiary educational attainment rates (from 20.1% in 2007-2011 to 23.8% in 2011-2014 for Italy, and from 30.9% to 35.9% for France).

Three dummy variables for the geographical area of residence (North, Centre, and South) are included in the model specification for health. More than forty percent of the samples live in the North of Italy, followed by the South (more than 30%) and the Centre (more than 20%). In France, we find that more than 55 percent of the samples live in the North, around 25 percent in the Centre, and the remaining 20 percent in the South. In the employment equation we include regional unemployment rate which, as it will be explained later, is used for identification purposes. Indicators for we included an indicator for densely populated area. marital status and experience in paid work (measured in years) are included in the model, as likely to affect job opportunities.[9]

The focus of this work is on the effects of caring activities on women employment (and perceived health status). First, caring activities refer to the presence of children in the household. Second, we account for possible caring due to the presence of disabled household members with different degrees of activity limitations (some activity limitations and strong activity limitations). Finally, the household composition, i.e., number of household components, and household wealth, i.e. equivalized household income, also offer important insights. We examine the impact of such caring activities also on the men employment probabilities to pinpoint differences/gaps and rooms for improvements and implementing specific policy actions.

A set of covariates are used to capture the effects of some very important caring activities (pertaining to the three main categories just described) on employment opportunities and perceived health. We included an indicator for the presence and number of kids aged between 0 and 6 in our analyses. The data offered the opportunity to distinguish between different age classes of children and we choose the [0, 6] range because this age class (likely) implies the highest intensity of caring activities. We account for the presence of disabled household members with different degrees of disability. The EU-SILC defines disability as activity limitations in daily activity of different degrees (variable PH030 in the EU-SILC code). We used indicators for the presence of household members with both some activity limitations and strong activity limitations. Similarly to what happens with kids, different degrees of disability presumably entail different intensity of caring duties.

We also offer information on the household size measured by the number of household components and on the equivalized household (mean) income as these might affect both the decision to work and the (perceived) health status of women. The equivalized-household

[9] Work experience is not included in the equation for perceived health status.

income derives from the ration between total disposable household income (variable HY020 in the EU-SILC code), and the equalized-household size, which gives each household member a specific weight.[10] Income level is then deflated with the Consumer Price Index (CPI), gathered by Eurostat.

In the employment equation we added an indicator to approximate the demand-side effect, that is, the annual regional unemployment rate (available from http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tps00203). The unemployment rate was used for identification purposes. The estimates of the health equation, as explained above, could be problematic because of the potential endogeneity of the employment decision. To deal with this problem we estimated a structural two-equation model. Our identification strategy relies on the effects of labour market conditions on the employment decisions on women. The regional unemployment rate is used for identification because it affects the labour market outcomes/employment probabilities but not the individual health. Variations in local labour market conditions have been used as an identification strategy in a number of works on labour market outcomes, education and training choices, and skill acquisition including, among others, Campolieti et al. (2010), Parent (2006), and Riddell and Riddell (2014).

Finally, because we are using panel data, we included yearly dummy variables in our set of covariates.

4.Results

We adopted a structural equation model to estimate the impact of health on women employment probability, accounting for endogeneity of employment. Tables 3 and 4 report the average marginal effects (AME) related to the main equation on employment in the two periods examined for Italy and France, respectively. Tables 5 and 6 show the AME for the health equation. The use of the AME allows an interpretation of the effects in percentage terms. For dummy variables, the AME give the impact (in percentage terms) of a change from zero to one of the dummy variable on the dependent variable. For continuous variables, such as age, household components, and equivalised household income, marginal effects give

[10] To reflect differences in household's size and composition, the total net household income is divided by the number of 'equivalent adults', using a standard equivalence scale, i.e., the modified OECD scale. In detail, this scale gives a weight to all members of the household (and then adds these up to arrive at the equivalized household size): 1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; 0.3 to each child under 14.
For additional details, see http://ec.europa.eu/eurostat/statistics-explained/index.php /Glossary:Equivalised_ disposable_income.

the impact (in percentage terms) of an infinitesimal change of these variables on the dependent variable. In the next subsections we report and comment on the impact of the regressors described in Section 3.2 (and in Tables 1 and 2) on employment probability (Section 4.1) and health status (Section 4.2).

4.1 Employment equation

Tables 3 and 4 report the AME for female employment equation before and after the economic crisis for Italy and France, respectively. Employment probabilities are positively associated to education in both countries. Interestingly, in Italy we find that female employment is more importantly affected by education with respect to male employment. The positive role of education for women is confirmed by similar studies on Italian female labour force participation (Di Tommaso, 1996; Del Boca et al., 2004; Bratti and Staffolani, 2012).

The employment probability of women with secondary educational attainment levels are on average 12% higher with respect with those with primary education and the percentage increase to around 20% for tertiary educated ones (+20.7% in 2007-2010 and +19.7% in 2011-2014). The difference across gender with respect to the positive role of education is higher in Italy compared to France. There is evidence therefore that women (especially in Italy) are overall and strongly more positively selected into employment: women who stayed out of employment were those who would have earned the lowest returns from the market work with a higher probability than that of men (see Table 3). This is in line with the existing literature showing that female participation rates in Catholic countries, such as Italy and Spain, and Greece are low and concentrated among high-wage women (Blau and Kahn, 2003).

Employment opportunities are also higher for people with experience in paid work. The employment probability is instead negatively associated with age and the magnitude of this negative effect is similar across genders and countries (on average slightly below 2% in Italy, and slightly above 2% in France).

Italy and France show an interesting similarity across gender for the impact of marriage. In both countries we find married status to have opposite effects on work participation between men and women. Employment probabilities for women are negatively associated to marriage (-5.3% in 2007-2010 and -3.2% in 2011-2014 in Italy, and -1.3% in 2007-2011 in France),

while probabilities for men are positively associated to marriage (9.5% in 2007-2010 and 11.8% in 2011-2014 in Italy, 2.4% in 2007-2010 and 2.3% in 2011-2014 in France).

The degree of urbanization does not exert a role on employment probabilities before the crisis, while it slightly increases its effect after the economic recession (see Tables 3 and 4).

Moving to caring responsibilities, having kids aged between 0 and 6 years reduces women's employment probability especially before the economic downturn and in France (-9.4 % and 17.3% in 2007-2010, and -4.1 % and 12.8% in 2011-2014 in Italy and France, respectively). Men employment probabilities are instead positively associated to the presence of kids in Italy, while the impact is negative in France. This finding of a different sign of the impact of kids on men employment probabilities in Italy and France is partly due to the fact that these countries differ widely in terms of their cultural norms as well as social, economic and institutional characteristics. Studies have pinpointed the impact of cultural norms regarding gender roles as major determinants of female employment (e.g., Nordenmark, 2004; Pfau-Effinger, 2004) as well as the countries' labour market (Thévenon, 2013).

For instance, the lack of employment opportunities in some Southern European countries, such as Italy, has been shown to have undeniable negative consequences on female employment and especially on women's return to work after childbirth (Haas et al., 2006). Similarly, a rigid labour market has been argued to reduce women's opportunities to return to the labour market (Del Boca, Pasqua, and Pronzato, 2004).

In the welfare state and family policy literature, Western European countries, such as France, belong to the Corporatist welfare state regime and are usually characterized as providing relatively high financial support for families but more limited support to working parents, with young children (Korpi, 2000; Leitner, 2003; Thévenon, 2011). Italy's welfare system, instead, corresponds to the Mediterranean model (Sapir, 2006; Torrisi, 2011), traditionally characterised by strong job protection for the head of the household, and a low level of transfers among the working age population (Kuitto, 2011; Fabrizi et al., 2014), as well as a conservative and protectionist role of the family (Bambra and Eikemo, 2009, Saraceno, 2017). The presence of disabled, both with some activity limitations and strong limitations, negatively affects the employment probabilities of both gender in both countries. Estimates of our main model suggest that caring activities negatively and significantly affect the employment probability, especially of women, and the effect only slightly changes with the economic downturn. Our findings are in line with similar previous works examining the effect of caring activities on labour force participation and employment both in Italy and

France (for Italy see, for instance, Marenzi and Pagani, 2005, and Bratti and Staffolani, 2012; for France, see Kocourková, 2002, and Robila, 2012).

Individuals with low equivalised household mean income have reduced employment opportunities. As regards demand-side factors, a high (regional) unemployment rate (used for identification purposes, see Section 3.2) reduces employment probabilities, and this is in line with expectations.

Table 3. Employment equation for Italian women and men: average marginal effects, 2007/2011; 2011/2014

	AME	S. E.		AME	S. E.		AME	S. E.		AME	S. E.	
	Women 2007/2010			Men 2007/2010			Women 2011/2014			Men 2011/2014		
Dependent variable: employment probability												
Age	-.022	.000	***	-.017	.001	***	-.020	.001	***	-.018	.001	***
Education: Reference - Primary												
Secondary education	.131	.009	***	.038	.008	***	.112	.011	***	.063	.010	***
Tertiary education	.207	.011	***	.068	.011	***	.197	.013	***	.120	.014	***
Married	-.053	.010	***	.095	.009	***	-.032	.011	***	.118	.012	***
Densely populated area	.001	.009		.010	.007		.011	.010	*	-.004	.010	
Experience in paid work	.020	.000	***	.007	.001	***	.022	.000	***	.012	.001	***
Caring activities: children, disabled, household composition												
Kids [0, 6]	-.094	.009	***	.017	.010	*	-.041	.011	***	.046	.013	***
Disabled in household	-.041	.012	***	-.061	.009	***	-.060	.012	***	-.063	.011	***
Strongly disabled in household	-.071	.016	***	-.043	.013	***	-.008	.019		-.081	.017	***
Household components	.001	.009		-.013	.007	*	-.007	.004		.005	.004	
Equivalized household income	.003	.000	***	.002	.000	***	.003	.000	***	.004	.000	***
Regional unemployment rate	-.004	.001	***	-.001	.001	**	-.003	.001	**	-.004	.001	***
Yearly dummies												
2008/2012	.007	.012		.013	.011		-.007	.013		-.009	.013	
2009/2013	-.081	.012	***	-.081	.010	***	-.002	.014		.002	.014	
2010/2014	-.072	.012	***	-.077	.010	***	.000	.014		.014	.014	
Observations	9,373			9,000			7,688			6,893		

*Note: Average marginal effects, Standard errors, and significance levels: § p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.*

Source: Authors' calculations on 2007-2010 and 2011-2014 EU SILC data.

Table 4. Employment equation for French women and men: average marginal effects, 2007/2011; 2011/2014

	AME	S. E.		AME	S. E.		AME	S. E.		AME	S. E.	
	Women 2007/2010			Men 2007/2010			Women 2011/2014			Men 2011/2014		
Dependent variable: employment probability												
Age	-.022	.000	***	-.021	.001	***	-.023	.000	***	-.023	.001	***
Education: Reference - Primary												
Secondary education	.054	.008	***	.038	.007	***	.073	.010	***	.031	.009	***
Tertiary education	.160	.010	***	.123	.009	***	.146	.010	***	.137	.010	***
Married	-.013	.008	*	.024	.007	***	-.004	.008		.023	.008	***
Densely populated area	-.011	.007		.006	.006		-.004	.007	*	.013	.007	*
Experience in paid work	.013	.000	***	.008	.000	***	.016	.000	***	.014	.001	***
Caring activities: children, disabled, household composition												
Kids [0, 6]	-.173	.007	***	-.014	.009	*	-.128	.008	***	-.008	.009	
Disabled in household	.000	.011		-.029	.009	***	-.006	.011		-.048	.010	***
Strongly disabled in household	.015	.014		-.018	.012		-.034	.014	*	-.061	.012	***
Household components	.025	.007	***	.064	.006	*	.010	.003	***	.033	.003	***
Equivalized household income	.001	.000	***	.001	.000	***	.002	.000	***	.002	.000	***
Regional unemployment rate	-.003	.001	*	-.004	.001	***	-.003	.005		-.012	.005	*
Yearly dummies												
2008/2012	-.009	.010		-.014	.010		-.003	.011		.009	.010	
2009/2013	-.076	.010	***	-.083	.009	***	-.012	.012		.012	.011	
2010/2014	-.070	.010	***	-.084	.009	***	.029	.013	*	.033	.013	***
Observations	12,592			11,172			12,123			11,000		

*Note: Average marginal effects, Standard errors, and significance levels: § p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.*
Source: Authors' calculations on 2007/2010 and 2011/2014 EU SILC data.

4.2 Health equation

The AME of the probit model for the health status of Italian and French women and men are reported in Tables 5 and 6. The results suggest that employment exerts a significant role on perceived health status, in that employment positively affects the subjective health status of both genders. We note similarity across countries for the individual/household characteristics positively affecting health status of women and men. Being young, (secondary) high educated, married, and living in larger (household components) and wealthier (equivalised household income) households positively affects the health status. The relevance and sign are maintained after the crisis. In Italy we find that health status is positively associated to residing in the South, while in France we do not find a clear role for the macro region of residence.

As far as caring activities are concerned, the presence of kids aged from 0 to 6 years exerts a negative impact on women health after the economic recession in Italy (-2% in 2011-2014), while the impact is positive for French women both before and after the crisis (+4.6 before and +8.2% after the recession). There is no association instead between the presence of kids

in the household and men's health. Caring of disabled, both with some and strong activity limitations, negatively affects the health of women and men in both time periods (see Tables 5 and 6). According to our findings from the employment equation and to those of health status analysis, caregiving activity negatively affects not only employment probability but also (and significantly) perceived health status especially of women.

Our estimation results also reveal that employment is endogenous in the health equation. The estimated *rho* parameters are negative and significant for both countries and the time periods analysed. A negative sign of the *rho* parameters suggests that confounding factors increasing the employment probability decrease the (perceived or subjective) health status. It is therefore essential to take endogeneity into account.

Table 5. Health equation for Italian women and men: average marginal effects, 2007/2011; 2011/2014

	AME	S. E.		AME	S. E.		AME	S. E.		AME	S. E.	
	Women 2007/2010			Men 2007/2010			Women 2011/2014			Men 2011/2014		
Dependent variable: health status												
Employed	.055	.018	***	.200	.028	***	.062	.019	***	.132	.037	***
Age	-.004	.000	***	-.003	.001	***	-.007	.001	***	-.006	.001	***
Education: Reference - Primary												
Secondary education	.018	.010	*	.028	.008	***	.031	.011	***	.022	.010	*
Tertiary education	-.008	.012		.005	.011		.006	.014		-.011	.013	
Married	.034	.009	***	.013	.009		.015	.010		-.002	.013	
Geographical area of residence: Reference - South												
North	-.057	.009	***	-.022	.008	***	-.063	.011	***	-.056	.011	***
Centre	-.016	.011		.022	.010	*	-.045	.013	***	-.018	.013	
Caring activities: children, disabled, household composition												
Kids [. 6]	.004	.009		-.005	.009		-.020	.012	*	.002	.012	
Disabled in household	-.068	.010	***	-.039	.010	***	-.105	.011	***	-.088	.011	***
Strongly disabled in household	-.105	.013	***	-.087	.013	***	-.101	.017	***	-.032	.018	*
Household components	.030	.008	***	.020	.007		.029	.004	***	.019	.004	***
Equivalized household income	.000	.000		.000	.000		.001	.000	***	.001	.000	*
Yearly dummies												
2008/2012	.001	.011		-.014	.010		.042	.012	***	.041	.012	***
2009/2013	.007	.011		.002	.010		.046	.012	***	.033	.012	***
2010/2014	-.003	.011		.005	.010		.066	.012	***	.038	.012	***
Rho	-.086	.052	**	-.315	.077		-.091	.050	**	-.156	.097	*
Observations	9,373			9,000			7,688			6,893		

*Note: Average marginal effects, Standard errors, and significance levels: § p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.*

Source: Authors' calculations on 2007/2010 and 2011/2014 EU SILC data.

Table 6. *Health equation for French women and men: average marginal effects*, 2007/2011; 2011/2014

	AME	S. E.		AME	S. E.		AME	S. E.		AME	S. E.	
	Women 2007/2010			Men 2007/2010			Women 2011/2014			Men 2011/2014		
Dependent variable: health status												
Employed	.104	.022	***	.164	.030	***	.189	.022	***	.196	.029	***
Age	-.005	.001	***	-.005	.001	***	-.003	.001	***	-.005	.001	***
Education: Reference - Primary												
Secondary education	.060	.010	***	.042	.011	***	.027	.012	*	.021	.012	*
Tertiary education	.094	.012	***	.029	.013	*	.044	.012	***	.036	.013	***
Married	.044	.009	***	.004	.010		.014	.009		-.025	.010	*
Geographical area of residence: Reference – South												
North	-.005	.010		.000	.011		.014	.011		.020	.011	*
Centre	.010	.012		.020	.013		-.018	.012		.014	.013	***
Caring activities: children, disabled, household composition												
Kids [0, 6]	.046	.011	***	-.014	.009		.082	.010	***	.001	.010	
Disabled in household	-.111	.012	***	-.086	.013	***	-.085	.013	***	-.077	.013	***
Strongly disabled in household	-.093	.016	***	-.098	.018	***	-.108	.016	***	-.094	.017	***
Household components	.067	.008	***	.027	.009	***	.018	.004	***	.022	.004	***
Equivalized household income	.002	.000	***	.001	.000	*	.002	.000	***	.001	.000	***
Yearly dummies												
2008/2012	-.031	.011	***	-.020	.012	*	.006	.012		.014	.012	
2009/2013	-.033	.011	***	-.012	.012		.000	.012		.013	.012	
2010/2014	-.022	.012	***	-.003	.012		.009	.013		.028	.013	*
Rho	-.044	.042	*	-.036	.057		-.191	.043	***	-.151	.055	***
Observations	12,592			11,172			12,123			11,000		

*Note: Average marginal effects, Standard errors, and significance levels: § p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.*
Source: Authors' calculations on 2007/2010 and 2011/2014 EU SILC data.

5. Concluding remarks

In all industrialized countries, the labour force participation rate of women has increased rapidly over the past decades. It nonetheless continues to stand below that of men. Moreover, women in most countries continue to have a discontinuous pattern of employment over their life-course resulting in substantial income loss (Gash, 2009; Sigle-Rushton and Waldfogel, 2007).

Lower levels of female employment together with lower participation in the active economic life and other undue gender economic gaps (for instance, the pay gap) imply a lower income expectation and return over the whole life cycle of women. This generates a persistent vicious circle through which women, by earning systematically less, even when they work at same level, have access to lower personal income, lower autonomy and wealth, thus perpetrating their vulnerability over time and through generations. This is not only an individual loss: this

contributes to keep low the potential aggregate income and development of a country, no matter if advanced or less developed.

To support and encourage an increased participation of women in the labour market, governments in most countries have adopted various work-family reconciliation policies in recent decades. Despite these, major obstacles to maternal employment nonetheless persist (Mills et al., 2014). In addition, care responsibilities, such as childcare, disabled or elderly care, housework, still remain considerably on women's side and constitute strong barriers to employment and its continuity through the life course. These burdens also negatively affect women's health.

The increased physical fatigue due to a larger share of family burdens and responsibilities, coupled with the mental stress of multiple burdens and roles, which are often partially or totally unpaid, add up to an infinite restricted access of economic and social opportunities for all women around the world.

In order to capture the relationship between employment and health for women and the gender gap in this link, in this work we simultaneously analysed employment probabilities and health status by gender.

We selected Italy and France, countries that differ widely in terms of their cultural norms as well as social, economic and institutional characteristics. Italy is characterised by the lack of employment opportunities and this negatively affect women labour market participation, and women's return to work after childbirth. France, instead, belongs to the Corporatist welfare state regime that provides relatively high financial support for families but more limited support to working parents, with young children. One of the implications of the discrepancies is that the employment gender gap is considerably higher in Italy with respect to France.

We find that employment probabilities are positively associated to education in both countries. Interestingly, especially women employment benefits from high education, thereby suggesting possible positive selection of women into employment. Despite this, employment especially for women is negatively associated to caring responsibilities, such as the presence of both kids aged between 0 and 6 years and disabled with some and strong activity limitations in the household. The effect for women and men employment probability only slightly changes with the economic downturn.

In conclusion, hampering or simply not supporting and empowering an equal set of employment opportunities together with an equal share of family burdens and responsibilities yields a threefold stumbling block for the whole development of economy and society: the costs of inactive population and the unbalanced share between working and not working

people in term of pensions sustainability; the waste of talents; the missed return to human capital investments and the missed earning opportunities by the other half of the sky.

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