

MEASURING INEQUALITY IN INCOME DISTRIBUTION BETWEEN MEN AND WOMEN. WHAT CAUSES GENDER INEQUALITY IN EUROPE?

1. INTRODUCTION

The IV World Conference on Women, held in Beijing in September 1995 (UNDP, 1996), provided the decisive impetus for mainstreaming the gender approach in all areas of public life at the international level. Since then, researchers' interest in this problem has also grown, and this is not only because of the ethical issue of discrimination but also the effects that gender inequality has on the economy and society; even leading to gender equity being recognized as a development goal in itself (World Bank, 2012).

In Europe, promoting gender equality and equity lies at the heart of social policies (European Commission, 1996). That is why we have raised several questions in this work. Are European countries with the highest social spending the ones with the lowest gender inequality? What social spending items are most effective in the fight against gender inequality? We have tried to respond to these and other issues in this work, estimating a panel data model for 33 European countries over a time period of 15 years (from 2003 to 2017).

The main novelties presented in this article lie firstly in the measure of gender inequality. This is usually measured in terms of health and through the wage gap between men and women. Our paper proposes measuring gender inequality using the income distribution, which allows us to analyze whether the social spending policy reduces the income gap or not between men and women. The use of disposable personal income attempts to fill the existing gaps in the economic literature that only take into account wages as a source of income, without considering that the composition of income and the role of the public sector in determining it are also determinants of inequalities between men and women. Taking into account what was mentioned above, the second important novelty this study incorporates is based on measuring the effect that each of the social spending items has on this inequality. This is one of the main objectives of this work. In

fact, the results obtained allow us to state that health care expenditure and aids to avoid social exclusion are the tools that improve income distribution equity between men and women. In contrast, pension benefits and insufficient support for widowhood and orphanhood are less effective in the fight against inequality.

The work is structured as follows: after this introduction, paragraph 2 revises the theoretical framework for the various measures of gender inequality and the role of the State in combating it. Subsequently, in paragraph 3, an empirical analysis is carried out to determine the influence of different explanatory variables on gender inequality. Finally, in paragraph 4, the main conclusions of this work are laid out.

2. THEORETICAL FRAMEWORK

Since the origin of economic thought, the issue of income distribution has been the focus of the attention of economists of the most diverse currents. The existing income inequality between individuals has been the object of study from different perspectives, the subject on many occasions controversial, due to the strong ideological content of the subject. Within this field of study, over the last few decades, many researchers have become increasingly interested in studying the causes and consequences of the inequalities between men and women, not only in the income distribution, but also in other aspects such as health, education or the labor situation (Jacobs, 1996; Lorber, 1998; Dollar y Gatti, 1999; Sen, 2001; England, 2005; Ridgeway, 2011; and Rieker and Read, 2017).

This has strengthened the gender approach as a tool for analyzing social reality (Umberson et al., 1996; Walby, 2005 and 2011; García-Calvente et al., 2012). Consequently, at present, it is assumed that gender equality and equity represent a fundamental right, a common value and a necessary condition for achieving growth, cohesion and social development (Sen, 1992; UN, 2016).

In the context of social policies, gender analysis has led to the question of whether equality should be measured as equity of outcomes or as equal opportunities (European

Commission, 1996; World Bank, 2012). Some traditional indicators have begun to disaggregate by sex, although this does not seem enough to show the complex reality that places men and women in non-egalitarian positions (Phillips, 2008). This has led different international agencies to enhance the development of gender-sensitive indicator systems. In order to construct gender indicators and show unequal situations in different fields, the information itself is more important - not individually taking the value of each indicator by sex but by comparing the two indicators. In this way, one can observe the gender gap, and this allows us to analyze the difference between men and women for each indicator (Carr-Hill and Chalmers-Dixon; Hausmann, Tyson and Zahidi, 2012). Table 1 presents a summary of the indexes most widely used at the international level to measure gender gaps and inequalities.

(See table 1)

When addressing gender inequality in empirical analysis, the differences between men and women in the labor market are usually analyzed almost exclusively by means of indicators such as activity and employment rates (Duncan and Duncan, 1955; Cebrián and Moreno, 2015 and 2018; ILO, 2016), and, above all, the wage level (Anker 1998; Plantengan and Jansen, 1999; Cortés, 2003; Lázaro et al., 2004). This has important implications at the household level, since the economic instability that women face as a result of more temporary and lower-paid employment diminished their power to influence decision-making, not only at the general level but also within their own households (Fritzell, 1999). Nevertheless, Gharehgozli and Atal (2020) argue that the traditional economic reasons for the wage gap, i.e. the greater precariousness of jobs and the lack of qualifications of women in relation to men, do not currently explain the existing wage gap, indicating implicit gender discrimination.

The relationship between gender inequality and health differences has also studied, as in the WHO Commission report on Social Determinants of Health (Sen and Ostlin, 2007) and works such as Ruiz-Cantero et al. (2007). Amongst the structural determinants related to gender and health, processes such as literacy and education, demographic transition or globalization are often highlighted, without forgetting the influence of the social stratification itself in relation to factors such as socioeconomic status (Macintyre, 1997). However, as Rieker and Read (2017) suggest, there are limitations to explaining

gender differences in health as researchers try to explain them either through socioeconomic factors or based on biological differences. Therefore, they claim the need for a model that integrates both approaches.

Since most of the academic literature has focused on the wage gap and on gender inequality in health, this paper presents, as a novelty, a measure of inequality that focuses on the differences in income distribution between men and women. Using income means being able to evaluate a wider variable than simply differences in wages. Income is composed not only of wage income but also of capital income, as well as transfers from the public sector. Therefore, in our opinion, using a broader variable that considers differences in the composition of income between men and women can enrich the analysis of gender inequality. In this regard, Malroux and Xiao (1995) and Díaz-Serrano and O'Neil (2004) argue that women are less likely to save than men because of differences in income levels, among other reasons (Fernández-López et al., 2012). Moreover, the consideration of total income, i.e. not only income from work but also from social monetary transfers and property income, makes the differences between men and women more pronounced (Consejo Económico y Social España, 2013). In this way, using data from Eurostat, we have prepared a simple index based on the median income ratio of men compared to women, and from here an analysis is made of the factors that determine gender inequality in Europe.

3. THE MODEL

A linear model is used which aims to explain what the determining factors are for the income distribution inequality between men and women, paying special attention to the impact of public sector activity on this inequality. In this sense, it is studied which social expenditure items are the most effective in combating gender inequality, following Eurostat's European System of Integrated Social Protection Statistics (ESSPROS). We also use other control variables such as the female labor force participation rate, with which we try to study whether the incorporation of women into the labor market helps to reduce gender inequality or, conversely, whether it is a source of greater inequality. In addition, the role of women's education in inequality, the institutional quality of the

countries and the incidence of the main welfare state models on such inequality is analyzed.

The analysis was carried out for a sample of 33 countries (the 28 EU nations as well as Iceland, Norway, Serbia, Switzerland, and Turkey) over a 15-year period (between 2003 and 2017). This has allowed us to compile panel data containing 495 observations; although the lack of observations in some countries and years has meant the entire panel is composed of a maximum of 336 observations. The choice of countries and years in the sample is due to a double reason, on the one hand, the objective of this work which is to analyze the differences in the inequality of income distribution between men and women in Europe and, on the other hand, the availability of data provided by the aforementioned Eurostat statistical database.

A) Data

The variables we have used are summarized in the following table:

(See table 2)

B) The model

An important novelty of this work is the measure of gender inequality. Through Eurostat's statistical database on income distribution, we have developed our own measure of inequality using the following formula:

$$GIID_{it} = \frac{MMI_{it}}{MFI_{it}} \quad (1)$$

where,

GIID is the gender inequality in the income distribution; *MMI* measures the median male income; *MFI* is the median female income; and the subscripts *i* and *t* refer to the country

and the year under study, respectively. Therefore, using this simple formula, we can measure in what proportion men have more income than women. The use of median income, as it represents 50% of the population, instead of mean income is due to the fact that it offers a measure of this variable's central tendency, making it possible to measure more robustly the dispersion that may exist in the population's income distribution (Leys et al., 2013). The income variable used is disposable personal income, that is, the total income after tax and other deductions that is available for spending or saving.

From here and as mentioned above, a linear model has been estimated using the Panel Corrected Standard Error (PCSE) and the Generalized Method of Moments (GMM) estimation. First of all, a graphical analysis was carried out to detect any potentially atypical cases. This made it possible to verify that no atypical data were present in our sample. Subsequently, a VIF (Variance Inflation Factor) analysis was carried out, which has determined possible multicollinearity problems in some of the variables used, for which a residual analysis was performed to confirm them. This analysis verified the existence of multicollinearity only in the GDP per capita. To solve this problem, it has been decided to estimate a model that includes GDP per capita to analyze how this variable affects gender inequality, and then to eliminate this variable in the rest of the models.

Then, we performed the Lagrange Multiplier Test for random effects. The value obtained for the Chi squared (χ^2) makes us reject the null hypothesis, so it is preferable to use Ordinary Least Squares (OLS) with random effects to grouped regression; i.e. the usual OLS estimator.

Subsequently, the Hausman test was performed to decide between random effects and fixed effects. The " χ^2 " value obtained allows us to reject the null hypothesis; in other words, the difference between the random and fixed-effect coefficients is systemic, so it is advisable to use the fixed effects method.

We then carried out the Wooldridge Test. This determines that the model does present autocorrelation problems. Finally, Wald's modified test showed that the model is heteroscedastic. To solve both problems, the two best estimators are Feasible Generalized Minimum Squares (FGLS) and PCSE. However, Beck and Katz (1995) demonstrated that the standard errors of PCSE are more accurate than those of FGLS, since as the authors

point out when $N > T$ (as in this case, where $N = 33$ and $T = 15$), FGLS should not be used. On the other hand, given the possible existence of endogeneity in the macroeconomic and fiscal variables, we opted to use the robust version of the GMM estimator (Arellano and Bond, 1991) on the dynamic panel data to test for the presence of heteroscedasticity. The instruments used were the lagged dependent variable, personal income tax, the female activity rate and the expected years of schooling for the women. The tests performed after estimation by GMM show that the instruments are valid and there is no overidentification.

As mentioned above, panel data have been used, despite the limited variability in time that some of the variables used in the model have, through which we have been able to jointly estimate all the economic variables and demographics used. The use of panel data allows us to control the individual heterogeneity, provide data with a greater degree of variability and with a lower level of collinearity between the regressors, study dynamic adjustment processes, identify and measure effects that are not detectable with pure cross-sectional or time-series data, and build and contrast more complex behavioral models than with simpler data.

We have made 20 different estimates depending on the estimator used, whether or not to include GDP per capita in the model, the social expenditure variables used and the dependent variables employed. In this sense, apart from the gender inequality variable created for this work, two other gender inequality indicators have been used, which are widely used in economic literature, such as the Global Gender Gap and the Gender Inequality Index. The aim is to carry out a robustness analysis that will make it possible to study whether or not our inequality measure is valid. In this way, we have elaborated the following models:

$$\begin{aligned}
 GI_{it} = & \beta_1 GDP_{it} + \beta_2 TAX_{it} + \beta_3 ACTIVITY_{it} + \beta_4 SCHOOL_{it} + \gamma_1 SPB_{it} + \lambda_1 POPULATION_{it} \\
 & + \lambda_2 NORDIC_{it} + \lambda_3 CONTINENTAL_{it} + \lambda_4 MEDITERRANEAN_{it} + \theta_1 INSTITUTIONS_{it} + \\
 & \theta_2 GINI_{it} + \eta_i + \delta_t + \mu_{it}
 \end{aligned} \tag{2}$$

where,

GI, the dependent variable in our model, measures the gender inequality. As explained above, three measures of gender inequality are used in this paper. The first of these is the indicator created in this paper, which measures inequality in the income distribution

between men and women through the quotient between their median incomes. As discussed above, the income variable used is disposable personal income, that is, the total income after tax and other deductions that is available for spending or saving. The other two indicators used are the Global Gender Gap, developed by World Economic Forum, which measures gender inequality more broadly, i.e., through women's participation in the economy, educational attainment, political empowerment and health, and the Gender Inequality Index, which measures gender inequality through women's health, empowerment and economic status and which is developed by UNDP. These two measures are used to test the robustness of the proposed model. *GDP* is the GDP per capita in purchasing power parity in constant 2011 international dollars. This variable is intended to analyze the effect of economic development on gender inequality. *TAX* collects public revenues from personal income taxes relative to GDP. This variable allows us to study whether the progressiveness of the tax results in a greater reduction in gender inequality. *ACTIVITY* is the rate of female activity. As discussed above, this will allow us to examine whether the incorporation of women into the labor market has led to reduced gender inequality or if, conversely, it is a source of inequality. *SCHOOL* reflects the number of years of expected schooling for girls born in a given country. This variable is used as a proxy for the educational level of women in a country and allows us to analyze if the education contributes to reducing gender inequality in the income distribution. Both the variable "Activity" and the latter are not used in the model when the "Global Gender Gap" and the "Gender Inequality Index" are used as dependent variables, since both form part of the calculation of these indexes. *SPB* measures the social protection benefits in constant 2010 euros per capita. This variable is key in our analysis since it will allow us to measure the impact of the social policy of European countries on the variation in the gender inequality. *POPULATION* is the population of each country under study and is used as a proxy variable for the country's size; the aim being to determine whether the larger countries fight more against gender inequality or not. *NORDIC* is a dummy variable that takes the value 1 if the country in question follows the Nordic welfare state model and 0 if otherwise. *CONTINENTAL* is a dummy variable that takes the value 1 if the country in question follows the Continental welfare state model and 0 if otherwise. *MEDITERRANEAN* is a dummy variable that takes the value 1 if the country in question follows the Mediterranean welfare state model and 0 if otherwise. These three variables are used to analyze which welfare state model is most effective in the fight against gender inequality. *INSTITUTIONS* measures the institutional quality of countries using the

average value of the six indicators that comprise the World Bank's Worldwide Governance Indicators database; i.e., voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and corruption control. Using this variable, we will be able to study the effect of institutional quality on gender inequality. *GINI* measures inequality in income distribution through the Gini index. η_i measures individual country-specific unobserved effects, but constant in time, while δ_t measures the unobserved temporal effects that are variable in time but identical between countries.

Subsequently, a second model has been estimated which is the same as the first, but the GDP per capita has been removed due to the multicollinearity problems referred to above.

$$GI_{it} = \beta_1 TAX_{it} + \beta_2 ACTIVITY_{it} + \beta_3 SCHOOL_{it} + \gamma_1 SPB_{it} + \lambda_1 POPULATION_{it} + \lambda_2 NORDIC_{it} + \lambda_3 CONTINENTAL_{it} + \lambda_4 MEDITERRANEAN_{it} + \theta_1 INSTITUTIONS_{it} + \theta_2 GINI_{it} + \eta_i + \delta_t + \mu_{it} \quad (3)$$

Next, the variable "School" is replaced by the indicator "Global Gender Gap Educational Attainment", developed by the World Economic Forum, which measures the gap between men and women in terms of access to education. With this, we want to check whether the model is robust when we use alternative independent variables. Likewise, we incorporate the variable "Global Gender Gap Political Empowerment" into our model to analyze whether women's participation in institutions is more relevant to reducing inequality than institutional quality per se. When the "Global Gender Gap" and the "Gender Inequality Index" are used as dependent variables, these two variables are not used for the reasons already explained.

$$GI_{it} = \beta_1 TAX_{it} + \beta_2 ACTIVITY_{it} + \beta_3 GGGEA_{it} + \gamma_1 SPB_{it} + \lambda_1 POPULATION_{it} + \lambda_2 NORDIC_{it} + \lambda_3 CONTINENTAL_{it} + \lambda_4 MEDITERRANEAN_{it} + \theta_1 INSTITUTIONS_{it} + \theta_2 GGGPE_{it} + \theta_3 GINI_{it} + \eta_i + \delta_t + \mu_{it} \quad (4)$$

where,

GGGEA is the Global Gender Gap Educational Attainment; and *GGGPE* is the Global Gender Gap Political Empowerment.

Finally, a third model is estimated in which the impact of each of the social expenditure items on gender inequality is analyzed.

$$GI_{it} = \beta_1 TAX_{it} + \beta_3 ACTIVITY_{it} + \beta_4 SCHOOL_{it} + \gamma_1 HEALTH_{it} + \gamma_2 DISABILITY_{it} + \gamma_3 OLD_{it} + \gamma_4 SURVIVORS_{it} + \gamma_5 FAMILY_{it} + \gamma_6 UNEMPLOYMENT_{it} + \gamma_7 HOUSING_{it} + \gamma_8 EXCLUSION_{it} + \lambda_1 POPULATION_{it} + \lambda_2 NORDIC_{it} + \lambda_3 CONTINENTAL_{it} + \lambda_4 MEDITERRANEAN_{it} + \theta_1 INSTITUTIONS_{it} + \theta_2 GINI_{it} + \eta_i + \delta_t + \mu_{it} \quad (5)$$

where,

HEALTH reflects the cash benefits that replace loss of income due to sickness, and the provision of health care irrespective of the reason that produced it. *DISABILITY* measures the economic benefits intended to compensate the beneficiary for the reduction of income because of the total or partial loss of their capacity to create work activity, in the terms established by legislation, rehabilitation services and others, except for health care. *OLD* covers the whole set of benefits designed to alleviate the consequences of old age, including the loss of income, the loss of autonomy in carrying out daily tasks or decreased social activity. *SURVIVORS* are the economic benefits granted to people below retirement age who have suffered the loss of a relative or person who had been their principal financial support. *FAMILY* is the financial aid granted to households aimed at reducing the burdens of birth and parenting, as well as supporting other family members. *UNEMPLOYMENT*, on the one hand, reflects passive measures; i.e. those aimed at alleviating the consequences caused by the lack of paid employment, especially those concerned with being deprived of a sufficient source of income; and on the other, active measures aimed at preventing or reducing unemployment. *HOUSING* measures the aid provided to households to cope with housing costs. *EXCLUSION* is a heterogeneous series of benefits whose common characteristic is that they seek to avoid or alleviate situations of social exclusion linked to the scarcity of economic resources, or the presence of problems related to health, education or employment. All these variables are valued in constant 2010 euros per capita and their inclusion in the model allows us to analyze which

of these items has an impact on the fight against gender inequality; and thus, can determine which are the most effective policies in this regard.

As we have done in the second model, in this third model we again replace the variable "school" with the indicator "Global Gender Gap Educational Attainment" and include the variable "Global Gender Gap Political Empowerment".

$$\begin{aligned}
 GI_{it} = & \beta_1 TAX_{it} + \beta_3 ACTIVITY_{it} + \beta_4 GGGEA_{it} + \gamma_1 HEALTH_{it} + \gamma_2 DISABILITY_{it} + \\
 & \gamma_3 OLD_{it} + \gamma_4 SURVIVORS_{it} + \gamma_5 FAMILY_{it} + \gamma_6 UNEMPLOYMENT_{it} + \gamma_7 HOUSING_{it} + \\
 & \gamma_8 EXCLUSION_{it} + \lambda_1 POPULATION_{it} + \lambda_2 NORDIC_{it} + \lambda_3 CONTINENTAL_{it} \\
 & + \lambda_4 MEDITERRANEAN_{it} + \theta_1 INSTITUTIONS_{it} + \theta_2 GGGPE_{it} + \theta_3 GINI_{it} + \eta_i + \delta_t + \mu_{it}
 \end{aligned}
 \tag{6}$$

C) Results

After the models are estimated by PCSE and GMM, we obtain the following results:

Based on the estimations, the first conclusion is that the results appear to be robust since there are few differences in the estimations in terms of the explanatory variables used. In fact, the robustness analysis performed when alternative dependent variables are used does not significantly vary the results. In addition, R^2 is very high reflecting the quality of the adjustment.

As for the values we have obtained, in most cases they are what were expected a priori. Therefore, economic development, approximated by GDP per capita, does not appear to have a clear impact on gender inequality, since both the sign and the significance of the estimated regressor vary based on the estimator and the dependent variables used. Thus, economic development has a positive impact on gender inequality in income distribution (according to model 1 in Table 3); that is, the higher the per capita income in a country, the worse it is distributed between men and women. Even so, when we use a global measure of gender inequality such as the Global Gender Gap, the sign changes, so that those more developed countries have less gender inequality which, however, contradicts the result obtained when we use the Gender Inequality Index as a

dependent variable. These non-clarifying results are consistent with that obtained by Rashmi Umesh (2012) who analyzed the impact of economic development on gender inequality in different Indian states, each with different levels of development; they too did not reach a clear conclusion regarding this relationship. The same applies for the variable that reflects the effect of income tax on gender inequality. The estimated parameter is not significant in many of the estimates and in the estimates in which this parameter is significant, the sign changes based on the measure of inequality used, so we cannot say that the progressivity of this tax has a clear impact on reducing gender inequality.

The incorporation of women into the labor market, measured through the female activity rate, negatively affects the gender equity in income distribution. The positive sign of the estimated coefficient, although only significant in the half of the estimates (models 1, 2 and 3 estimated by PCSE), shows that the higher the rate of female activity, the greater the gender inequality in income distribution between men and women. This reflects the fact that the labor market does not reduce gender inequality, but rather increases it due to the existing wage gap and the difficulties women have in advancing in their professional careers. Accordingly, Berloff et al. (2019) advise that women encounter greater problems when it comes to excelling in the labor market, meaning that the more women participate in the labor market, the greater the wage distortion (Witkowska, 2013).

However, as Goldin (2014) points out, the wage gap between men and women has declined as gender convergence has taken place in the level of acquired education. Even so, in this work, for the "school" variable, which measures the years of expected schooling for girls born in a given country and serves to approximate the level of education of women in each of the sample countries, one can observe that the estimated regressor is positive and significant, hence the same conclusion cannot be drawn as in the aforementioned work, that is, that women's education allows gender inequality in income distribution to be lower. This may be because the "school" variable does not take into account the years of schooling of women in relation to men, but it is an absolute variable. However, when this variable is replaced by the Global Gender Gap Educational Attainment index, which does capture women's educational attainment relative to men, the result is the same. Probably, the reason for this a priori surprising result is due to the

few differences that exist among the sample countries in terms of the educational level of women, which is practically the same as that of men. On the other hand, this result may be due to the existence of a strong correlation between women's level of education and their participation in the labor market, as stated by Lincove (2008) and, as mentioned above, in this sense, the greater gender inequality would not be produced by women's higher level of education but by their greater participation in the labor market in which it is translated, thus contradicting the theses, mentioned above, of Goldin (2014).

With regard to the effect of social spending on gender inequality (the main objective of this work), according to the results obtained, we can state that social welfare benefits do have a negative and significant effect on gender inequality, both in the income distribution between men and women and in gender inequality as a whole, i.e. the countries with the most social expenditure have the least gender inequality. Which social expenditure item makes gender inequality lower? The negative estimated coefficient, although not significant in all the estimates (only significant in model 3 estimated by PCSE when both Gender Inequality in Income Distribution and Global Gender Gap are used as dependent variables), of expenditure for sickness and health care makes it possible to affirm that the higher the expenditure on health, the lower the gender inequality, both in the income distribution and in inequality as a whole. This may be due to the fact that, although women live longer than men in European countries (Jaba et al., 2011), however, their health status is worse (Artazcoz et al., 2002; Morcillo-Cebolla et al., 2014). Furthermore, as pointed out by Vela et al. (2019), the highest health expenditure in the Spanish case occurs in the 80-84 age group, and the total expenditure is higher for women between 80 and 89 years of age since the number of women exceeds the number of men.

The fact that women have a longer life expectancy and that there are gender inequalities in the labor market, as mentioned above, means that retirement benefits increase that inequality. This is why the estimated parameter for retirement benefits is negative and significant (when estimated by PCSE), i.e. the countries that spend the most on retirement benefits have a higher level of inequality in the distribution of income between men and women as they contribute less than men and therefore receive fewer pensions. We can therefore state that there is inequality in public pensions between men and women, as suggested by Vara (2013) for the Spanish case.

With regard to the item of expenditure that seeks to combat social exclusion, i.e. that aimed at families and individuals with scarce economic resources, or with problems relating to health, education or employment, the result is as expected, i.e. the estimated parameter is negative and mostly significant, with the result that the countries that spend more on this policy have a lower gender inequality index. This is due to the fact that gender inequality in income distribution means that women, more so than men, find themselves facing a situation of social exclusion (Bhalla and Lapeyre, 2004).

The rest of the benefits do not have a clear effect on gender inequality, since either the parameter estimated for each of them is not significant, or the sign changes depending on the dependent variable used, with the exception of unemployment benefits, whose estimated regressor is negative although only significant in one of the eight estimates made (when using the Gender Inequality Index as a dependent variable and estimated by PCSE). This means that those countries that spend the most on this type of benefit have less gender inequality. In fact, as Lalive (2007) points out, unemployment affects women to a greater extent and higher unemployment benefits have a positive effect on reducing the duration of unemployment among women. Perhaps, at first glance, the result obtained for the variable "survivors" which basically comprises pensions for widowhood and orphanhood is surprising. Although women receive a greater proportion of these pensions for the reasons commented on above, the fact that the sign of the estimated coefficient changes according to the employed gender inequality index does not allow us to conclude that this type of benefit helps to reduce gender inequality. This result is caused by the fact that these benefits are usually very small. On this matter, Bonnet et al. (2012) stated that this type of benefit is becoming less important in European welfare models in accordance with the new family structures, where divorces have increased over recent decades. In fact, countries like Sweden have eliminated such aid. This result is important because, as Arber and Ginn (1993) argue, widows, who make up a significant percentage of elderly women, are disadvantaged in terms of personal income compared to men and to women who have never married.

With regard to the size of the countries, approximated by the population, one can observe that it has no impact on reducing gender inequality. The estimated coefficient is only significant in 1 of the 20 estimates, so no conclusion can be made (model 1 using the Global Gender Gap as a dependent variable and estimating by PCSE). On the other

hand, the way social spending is programmed through the main welfare state models does have distinct effects on reducing gender inequality. Thus, the Nordic countries have less gender inequality both in income distribution and globally. This result confirms what was obtained by other authors such as Pascall (2008), who maintains that gender inequality is lower in the Nordic countries than in the countries of the Continental model. In fact, the results obtained do not allow a clear conclusion to be drawn about the effect that the Continental welfare model has on gender inequality, since the sign of the estimated parameter is changing and, moreover, very little significant. As for the Mediterranean model, the result is confusing, since the estimated regressor is highly significant in almost all the estimates made, and yet the sign is not consistent. In this sense, when we use inequality in income distribution between men and women, the sign is negative, so we could say that the countries within the Mediterranean welfare models apply effective policies in the fight against gender inequality. However, when we use gender inequality through the Global Gender Gap, the sign is positive, so perhaps these countries redistribute income better between men and women, but worsen other indicators such as empowerment, working conditions, educational level or women's health.

The estimated coefficient for the “institutions” variable throws up a surprising a priori result. Although this is not significant in all the estimates (it is significant in models 2 and 3 in Table 3, and in all estimates in Table 4 except when the Gender Inequality Index is used as a dependent variable), it is positive, that is, the institutional quality does not improve equity in the distribution of income between men and women. Perhaps the reason for this result lies in the fact that the institutional differences between the sample countries are very small. In addition, as Beer (2009) points out, it is not so much the institutional quality as the participation of women in institutions that can improve gender equity. In fact, when we use gender inequality as a dependent variable in a global manner, the result is the opposite, i.e. the countries with the highest institutional quality have the lowest gender inequality. This is why we include in our model the variable "Global Gender Gap Political Empowerment". However, although the regressor obtained is negative and, therefore, a greater participation of women in political and economic decision-making would reduce inequality in income distribution between men and women, it is not significant, so we cannot come to a clear conclusion on this matter.

Finally, the relationship between the Gini index and gender inequality is positive and very significant, that is to say, countries with the highest income inequality problems also suffer from greater gender inequality in income distribution and globally. This shows that a substantial part of income distribution inequality is explained by the differences in income between men and women.

4. CONCLUSIONS

We have raised a double objective in this work. On the one hand, an index has been elaborated that tries to measure the income inequality between men and women. Secondly, the factors that determine this inequality have been analyzed, paying special attention to the role of the public sector through social expenditure policy. The use of income inequality aims to fill the gaps in this type of studies based on wage gaps without considering that the other sources of income that make up an individual's disposable income can also be the source of inequalities between men and women.

The results show that, while spending on social welfare is not specifically designed to combat gender inequality, it is reduced by state intervention. In fact, one of the main objectives of social spending is equity in income distribution and, as it does achieve this goal, it also leads to greater equality in income distribution between men and women. It can therefore be concluded that income inequality is largely due to gender inequality. In this matter, European governments should design specific measures to converge the incomes of women and men, as this would also reduce income inequality in general.

The measures currently shown to be most effective in the fight against gender inequality include spending on health. Among the measures that are currently most effective in combating gender inequality is spending on health. The fact that women live longer but in poorer health means that they benefit more from health care. However, the gender inequalities observed in the labor market in terms of the wage gap, the greater difficulties that women have in entering the labor market or growing professionally within it means that they contribute less to Social Security and that, therefore, public pension systems do not allow for a reduction in gender inequality; quite the opposite. For this

reason, it is necessary to promote the participation of women in the labor market, to reduce the wage gap and to encourage parity between women and men in management positions in companies and institutions. In fact, women are at greater risk of social exclusion and, therefore, public expenditures targeted at these most vulnerable population groups effectively contribute to reducing gender inequality. However, other types of aids, also mostly targeted at women, such as widow's and orphan's pensions, are less effective in the fight against income differences between men and women. In any case, it should be noted that the unavailability of income data by percentiles, differentiated between men and women, makes an analysis impossible for the lower income percentiles where this type of aid is mainly targeted and would have made it possible to specify the effect of these public programmes on income inequality between men and women. Even so, it might be advisable to reconsider these aids given the transformations that are occurring in families, and rather create benefits that directly target women in order to reduce the wage gap. In this regard, it should be noted that the Nordic welfare model is more focused on gender equity than other models.

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