Female labour force participation and household income inequality in Italy

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June 2021

Female Labour Force Participation

And

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Abstract

This study contributes in investigating how female participation in the workforce, together with main related socio-demographic changes, has affected household incomes and their distribution in Italy.

The Italian case has been investigated again, relying on theoretical and methodological knowledge of previous researches in the field of female employment and income inequality. The data employed in the analysis belong to the Bank of Italy's Historical Archive of the Survey on Household Income and Wealth (SHIW) for years between 2000 and 2016. From a methodological point of view the approach has been complemented and has enabled to fill previous research gaps. Not only married women have been considered and they are no more divided between working women and inactive one. The choice of consider existing heterogeneity in working hours has allowed to examine part-time role in inequality increase.

How female employment increase has affected income inequality has been analysed first at individual level and only later at the household one. The first analysis level has been performed with descriptive statistics and the second with two different decomposition methods, one for income sources and one for household types. To these a shift-share analysis and a counterfactual analysis have been applied.

In Italy, even with regional differences, female employment has continued to grow with overall equalizing effects on household income distribution. With regard to socio-demographic changes, male breadwinner households reduction and single households increase have contributed in household income inequality drop. For the Italian case, part-time can contribute in inequality decline only in the case of female breadwinner households.

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Keywords: female employment, household income inequality, household composition

JEL classification: D31, J12, J22

1. Introduction

This paper addresses the evolution of the relation between female employment rate and household income inequality in the specific case of Italy.

In many studies it has been emphasized that significant income inequality has detrimental effects on society, the economy, their functioning and social relations within. Relevant results in the context of OECD countries are those reported in Atkinson (2015), highlighting that countries with higher levels of income inequality cannot achieve low rates of poverty with respect to the median poverty rate and in Richard Wilkinson (2009) which claims that such higher level of income inequality are related to worse performance in indexes of health and social problems. In addition, increasing income inequality is deemed to have negatively affected social mobility in these countries (see Corak, 2013; Keeley B. , 2015).

What is shown in OECD (2015) about the contribution of an enhanced gender equality in fostering economic growth is also not to be overlooked. Key findings demonstrate how in the last fifty years about half of the economic growth in OECD countries is explained by an improved female educational attainment, which has favoured female labour force participation. The projections in the report estimate that a full convergence in participation rates by 2030, with a steady male share, would lead to an average GDP increase of 12% in twenty years for OECD, where the largest increase would be in Italy with an estimated average increase of more than 1%.

It is for these very reasons that studying changes in women employment which may affect income distribution is of central importance. The literature on the subject has provided evidence according to which, where scarce female participation in the workforce has been recorded, there is higher income inequality. By contrast, concerning female employment increase, it has been proven how over the years this has had equalizing effects on household income distribution in many cases (Pasqua, 2001, 2008; Harkness, 2010; Khun and Ravazzini, 2017). The effect of an increase in female participation affects income distribution differently depending on which women enter the labour force. In the case of women belonging to low income households, effects will be equalizing, conversely effects will be dis-equalizing.

In Italy, the relationship between female participation in the workforce and household income inequality had already been analysed for the years from 1977 to 1998 by Del Boca and Pasqua (2002), but without considering heterogeneity in working hours and socio-demographic changes that occurred together with employment increase of those years. This contribution purpose will be to investigate again the Italian case, verifying how the trend for female employment has evolved from 2000 onwards and with which effects on household income inequality. As opposed to the just mentioned approach, main socio-demographic changes that went together with trends for employment, and heterogeneity in working hours have been analysed. The choice to analyse working hours has also allowed to verify part-time role in fostering or reducing inequality in the Italian case.

How changes in female employment have affected income inequality have been analysed first at individual level and only later at the household one. The first analysis level has been performed with descriptive statistics and the second with two different decomposition methods, one for income sources and one for household types. To these a shift-share analysis and a counterfactual analysis have been applied.

The data provided by the Bank of Italy's Historical Archive of the Survey on Household Income and Wealth (SHIW) for years between 2000 and 2016 have been processed with the statistical software Stata. Decompositions have been performed with Stata modules which will be mentioned later. Shift-share and counterfactual analyses have been performed instead thorough self-made coding.

2. Theoretical framework

First of all, the theoretical framework resulting from previous research and upon which this paper is based will be defined. The various channel through which more female employment affects income at household level will be examined in detail.

As noted in Ponthieux and Meurs (2015) female participation into the workforce is affected by interactions between dynamics internal to the family with those related to public sphere. In general opportunities of employment are determined by education, the labour market, public policies and social norms but the individual dimension is not the only one of interest. Looking deeply into the household dimension, issues such as childcare and housework are important in the case of couple households. For example comparative evidence for European countries (Thevenon, 2011) shows that where we can find improved childcare services and support for working parents, there are higher levels of female workforce participation. This proves that where these sort of policies are missing, women participation in the labour force is limited by time dedicated to care activities and this time is taken away from paid work. Furthermore, household composition has a crucial role since single households and couple households are characterized by different phenomena. Considering couple households, increased female employment could be a response to gradual increase in spouses unemployment or stagnating real wages in the case of less skilled workers. An attempt to compensate for low income of partners or their unemployment, a phenomenon that takes the name of added worker effect (Lundberg, 1985). Females in single households and single mothers instead, for necessity tend to work more with respect to women in other household types. For this reason as already hypothesized in Khun and Ravazzini (2017) a demographic change involving more single households can be a cause of increased female participation.

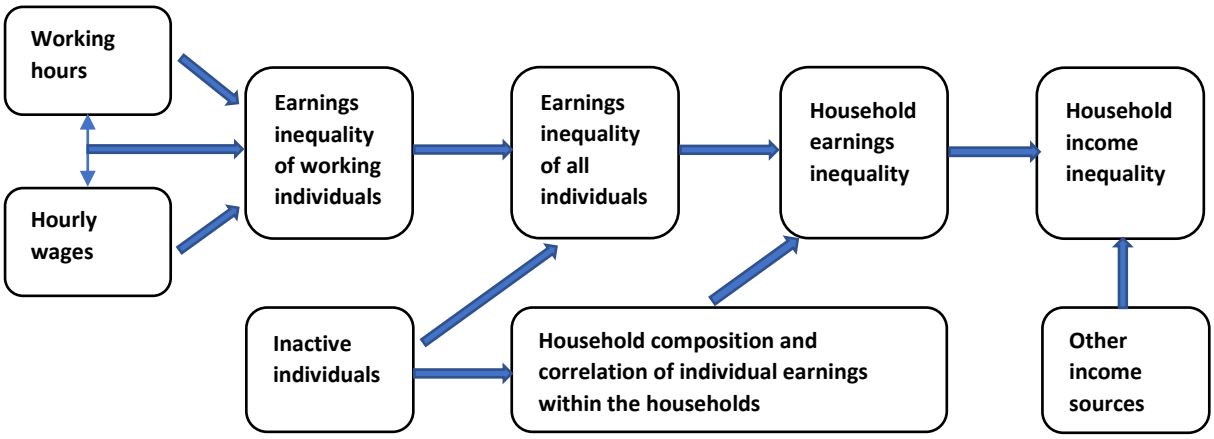
All the literature takes the view that women' earnings contribute to household income with different effects on distribution depending on which women enter the labour market or increase their working hours. If is the case of women belonging to low income households, this will mitigate inequality, but if instead is the case of women from high income households, distribution will be furtherly polarized (Del Boca and Pasqua, 2002; Kuhn and Ravazzini, 2017; Harkness, 2010; Pasqua ,2001).

Del Boca and Pasqua (2002) argue that in the case of married women employment, the impact on household income inequality is mediated by the extent of the added worker effect and assortative mating. Assortative mating for which Del Boca, Locatelli and Pasqua (2001) find evidence in Italy, (whereby women married to men with an high education level and high income are more likely to be part of the workforce). Therefore, if added worker effect dominates, an equalizing effect on household income distribution is to be expected.

In Kuhn and Ravazzini (2017) among household income inequality determinants (as defined in Jenkins 1995) are identified those related to labour force participation that are useful to clarify through which channels an increase in female employment affects household income inequality. The theoretical framework outlined below will be the basis of this paper, because to verify how female participation affected household income distribution, initially the different channels through which female earnings contribute to household income have been analyzed.

Determinants of household income inequality

Fig. 1



Source: Khun and Ravazzini, 2017

The determinants of earnings inequality of all individuals are the share of workforce participation, changes in working hours, hourly wages and correlation between the latter and working hours.

An increase in female employment reduces the quantity of inactive individuals with zero working hours and earnings. Being each participation increase also an increase of working hours, each hours increase from the state of complete inactivity involves a clear equalizing effect also on working hours of the whole female population.

Against each increment of working hours however, it must be considered that its effect on inequality will change depending on whether women with high or low amount of hours will increase or reduce their hours. Since there is an upper limit for working hours,

it is more likely that women with lower labour share increase their hours (here too an equalizing effect).

At parity of hourly wages any increase in working hours by women with few or zero hours will have an equalizing impact on individual earnings inequality. This equalizing effect can be inhibited or amplified depending on the correlation between hourly wage and working hours. Part-time can be paid less than full-time and the possibility of an higher wage could foster an increase of working hours, two aspects that need to be analyzed to understand if there is a positive or negative correlation between working hours and hourly wages. These are all aspects to take into account because of their effects on individual earnings inequality.

Individual earnings inequality contributes to household income inequality depending on household composition, correlation of individual earnings within the household and the correlation between income sources.

Household composition; the effect of an increase in female employment will vary depending on whether women increasing their hours are in single households or in couple households. An increase in participation due to more single households (as already stated) could increase inequality, particularly in the case of single mothers.

Correlation within family; women entering the workforce or in any case increasing their own hours, will lead working patterns of men and women to become increasingly similar along with earnings, but how this will impact household income inequality is dependent on spouses earnings correlation inside the household. The more correlated earnings will be depends on which women enter the workforce and increase their working hours. In this regard the role of assortative mating, the relationship between labour supply and spouse's earnings, along with quality of child-care facilities are important. If assortative mating prevails and women married to high-income spouses increase their hours, there will be a disequalizing effect. Where a negative relation between spouse's wage and female labour supply prevails, due to cultural reasons or poor incentives in augmenting working hours because of deficiencies in early childhood services (the burden is on women), instead there will be an equalizing effect. Presence and relevance of these features in the population will affect individual earnings contribution to distribution of household income.

Correlation between income sources; earnings of male and female are only two components of household income, and how they interact with other income components is crucial to determine income inequality at household level. Women entering the workforce and increasing their working hours contribute more to household income, but this will have equalizing effect if women' earnings are more equal than other income sources, like capital income and depending on how the increase affects other income components. An increase of employment and women' hours has effect on the correlation between female earnings and other sources of income, (the correlation between income

sources also reflects household structure in addition to hours worked) leading to equalizing or disequalizing effect. Analyze the evolution of this relationship is crucial in understanding how affects household income inequality. All these aspects need to be tested to see effects' extent and direction in the context of interest, to figure out how a rise in female employment affects inequality at household level.

3. Literature review

Each successive research has played a role with its own contribution in the evolution of the methodology employed to verify the impact of an increased women workforce participation on household income inequality. This evolution will be shown below for prevalent methodologies, from comparative studies up to the last approaches.

Comparative studies have found that countries with greater female participation in labour market are also those which perform better in terms of household income inequality. Pasqua (2001,2008), Kollmeyer (2012) and Harkness (2010) have performed static (for a single year) comparative analysis for European countries which stress the importance of female participation rates in the workforce and family structure role for household income inequality. European countries prove to be heterogeneous with regard to female participation rates in the labour market and household income inequality levels. Northern European countries are characterized by high participation and low household income inequality, while countries of southern Europe, viceversa, stand out for low rates of participation and a less equal distribution of household income.

With regard to the role of family structure, through inequality decomposition by household type demonstrate how this difference can be explained by the household type prevailing in each country. Almost everywhere income is distributed more equitably among families where both spouses work (dual earner) than in male-breadwinner households. The countries of northern Europe exhibit the largest share of dual earner households, that contribute to make their household income distribution more equal, instead southern Europe still show a marked presence of traditional family structure, where women are still overwhelmed by care activities which divert them from paid work.

An important weakness of these studies with a cross-national perspective, already pointed out by Khun and Ravazzini (2017) is the focus on a single year, not analyzing variations through time and trends. Such approaches do not take into account all those aspects related to an increase of female participation but merely check how inequality at household level would change if women do not work or if all enter the labour force. Insights that can be drawn are thus limited to a description of existing differences between national labour forces and household compositions.

There is a considerable amount of literature that has investigated the role of women's work on income inequality at household level, by using as main methods the decomposition of a measure of inequality and counterfactual analysis. The first contributions analyzed the influence of female participation on household income inequality, focusing on wives' role and taking in consideration a time span in which increase of female employment was coupled with changes of working patterns within

households and increased household income inequality, in a single-country context (Cancian et al., 1992; Karoly and Burtless, 1995; Cancian and Reed, 1999; Pencavel, 2006 for US; Del Boca and Pasqua, 2002 for Italy). The decomposition of indexes as Theil index, Gini coefficient and Coefficient of Variation by income sources allows identification of total household inequality quantity explained by female labour income. Looking whether an increase in female participation over time has been accompanied by an increase in total inequality explained by their labour income makes possible to identify an equalizing or disequalizing effect of female employment on household income distribution. Through counterfactual analysis can be conceived how household income inequality would change with different rates of female employment and how would it be without female earnings. Of these studies Karoly and Burtless (1995) (referring to years between 1959 and 1989), is the only research pointing out disequalizing effect of women entering the workforce for US, but anyway wives' work had a risible contribution to income inequality.

Nonetheless, above mentioned studies have clear methodological limits. Decomposition of household income inequality by income sources enables to decompose an inequality measure into three distinct elements for each income component: inequality in each factor, correlation with other factors and the share of any income source in total household income. This analytical tool enables to observe how each of these elements vary over time for each income sources but does not allow to study how female employment increase affects all of them and fails to capture how variations related to an income component as female earnings affect distribution at household level. The study of effects due to an increase in female participation was limited to wives, while remaining women and heterogeneity in their working hours were not considered. This has also prevented the possibility of verify how main socio-demographic changes that occurred together with employment increase of those years affected household income inequality. Furthermore, performed counterfactual analysis were limited to testing how household income inequality will change without female earnings.

Breen and Salazar (2010) first considered women and not just wives in order to treat also single households and households made of non-married couples. This through the use of a multivariate decomposition analysis which takes into account changes in women' and men' education, marriage patterns, assortative mating and labour supply. The Counterfactual analysis built on it find out that in UK between 1979 and 2000 the rise in household income inequality was mainly driven by increasing amount of unemployed men.

Of a whole series of researches employing decomposition by household composition (Pasqua, 2001, 2002; Harkness, 2010; Pasqua, 2008; Cancian and Reed, 1999), Larrimore (2014) first has performed decomposition of household income inequality into its components through the shift-share approach. What is most relevant for this study is that in the US from 1980's to 2000's the main drivers of inequality increase have changed, along with their relative importance. Female employment increase has mitigated income inequality growth up to late 90's, but in the 00' female employment changes have started to contribute in household income inequality rise. It would

therefore appear that female employment, after reaching a plateau, no longer has equalizing effects on household income distribution. Spouses' earnings correlations instead accounted for income inequality decline since 2000's.

In Kuhn and Ravazzini (2017) for the first time were analyzed the different determinants trough which an increase in women workforce participation affects household income inequality. Moreover, besides testing through different decomposition methods and counterfactual distributions the impact of high and rising female labour force participation on household income inequality for Switzerland, provide useful insights on the reason to include part-time work into the analysis and how it affects household income inequality. This research in accordance with both works above mentioned, takes account of all working-age individuals. The observation units is not restricted to married-couple households but includes a wider range of households, classified not only by cohabitation and employment status but also according to work percentages. In contrast to all previous studies on the subject that discriminated only between working and non-working women, now is taken into account heterogeneity in working hours. At methodological level, to test their hypotheses they have integrated to a factor decomposition a decomposition by population groups, to fill deficiencies of both typologies. Analysis results indicate that despite already high female participation, between 2000 and 2014 a further increase was anyway equalizing. Given the high rate of female employment, it has been hypothesized little space for improvement and so a stationary phase could have been reached. Concerning part-time work, although in literature is generally considered disequalizing, in Switzerland proved to be the opposite in the case of female employment.

4. Research questions and hypotheses

4.1 From literature review to the methodological approach

With regard to achieved results, all these analysis (Karoly and Burtless, 1995; Del Boca and Pasqua, 2002; Pencavel, 2006; Khun and Ravazzini, 2017) are undoubtedly dependent on the context in which they were carried out in terms of external factors, institutional setting, social and political implications. Their results do not apply to all contexts, there is no a one fits all theory given the different characteristics that each country shows under a multitude of aspects. As pointed out in Larrimore (2014) there are numerous factors to consider when trying to understand and evaluate household income inequality trends. Factors accounting for variations of household income inequality change over time along with their relative importance. A factor which has resulted useful almost everywhere in mitigating inequality increase as the rise in women workforce participation may no longer be. All this entails the need to broaden the research time horizon in order to capture certain factors which can be changed over time and find new ones.

That is what makes the case for the subsequent analysis intent, investigate again the Italian case, by expanding temporally what has been done in Del Boca and Pasqua (2002), enriching the methodological approach through tools made available by works

subsequent to their one. This will be useful for understanding how female participation role has changed in influencing household income inequality.

4.2 Methodological approach

In Del Boca and Pasqua (2002) it has been proven how in Italy between 1977 and 1998 female participation increase has mitigated the growth of household income inequality, that without wives earnings presence would have been much higher. However their methodology exhibits clear limitations as already indicated by the authors and in Khun and Ravazzini (2017).

In practice, building on the results provided by Del Boca and Pasqua (2002), identified trends will further be investigated up to 2016, updating research tools and relying on most recent methodology in the field of household income inequality in relation with female workforce. The analysis of the role of female workforce participation evolution on household income inequality over time will be mainly informed by methodology employed in Khun and Ravazzini (2017) both with regard to datasets processing and regarding decompositions and counterfactual analysis.

4.2.a Sample considered

Concerning the sample, Del Boca and Pasqua (2002) have opted for the choice of analyzing only married couples, a choice which led to the exclusion of too many household types already in the observed period. In a context where typical household structure patterns are changing, such approach turns out as no longer valid but actually outdated. Hence the necessity of taking into account all women and not just wives. With regard to household income, this has been adjusted for household size and composition according to OECD indications in order to consider how income is shared in family. Then the choice of differentiating income sources between men and women, with sons' earnings that are no longer counted in other income sources, along with public transfers in the form of retirement benefits.

4.2.b Employed decomposition methods

The choice of exclude different household types has not allowed to perform also a decomposition by household types which needs a number of discrete groups. The decomposition by income sources is unable to capture if over time there has been a variation in the prevailing household structure nor a variation of inequality between groups or within groups. For these reasons a decomposition by household types complementary to that by income source has been adopted.

The related counterfactual analysis shows limits, considering that is limited to testing how household income inequality will change without female earnings, method that as underlined in Del Boca and Pasqua (2002) does not take into account male labour supply variation that there would probably be to counteract household income reduction. The issue was first addressed in Larrimore (2014) and later in Khun and Ravazzini (2017) exploiting the features peculiar of shift-share analysis, technique followed also in the current research.

4.2.c Part-time and regional differences

Del Boca and Paqua (2002) justify the choice of considering separately northern regions from southern ones because of institutional, childcare and working opportunities differences. Notably a significant difference of part-time working opportunities between northern and southern Italy have been identified. Part-time which usually in literature has been indicated as a factor able to foster inequality, but has shown in Khun and Ravazzini (2017) may have equalizing effect, enabling to increase working hours of women who are not part of the workforce even in the case there isn't the possibility to work full-time. Part-time which for the Italian case has not been sufficiently studied, especially in relation to female employment and household income inequality, shortcoming that this research will endeavour to bridge, firstly checking if there has been an increase of this type of work in the observation period both in northern and southern Italy and whether have contributed or not in rising income inequality.

4.3 Research questions

In Italy between 1977 and 1998 the trend for workforce composition was characterized by a progressive rise of female employment and male employment reduction. This research's task will be to verify how female employment rate has changed. The growth trend may have remained unchanged or have slowed down. In addition, being central the shift from the education system to the labour market, women's position with respect to men will be analyzed both for educational attainment and in the transition to paid work. A very important aspect for the assessment of policies aimed at increase women inclusion in the productive system.

Between 1977 and 1998 the increase of wives average earnings in poorer quintiles has been observed, but is not very informative without considering if that was due to more working hours or higher hourly wages, despite is believed that it have balanced assortative mating increase at that time. Observing variations in average earnings irrespective of underlying determinants, permits only to get partial information. To understand how an increased female employment affect household income inequality, will first examined earnings dispersion determinants as displayed in fig. 1. So besides observing in which household income quintile the participation has increased more, as already pointed out in Pencavel (2006) and then in Khun and Ravazzini (2017), if in richer quintiles there are more working hours (an indicative aspect of assortative mating intensity), variations in women working hours (with a particular focus on the shift from unemployment to part-time and part-time to full-time) and the relation between working hours and hourly wages (where a strong positive correlation would make the part-time a factor able to foster earnings inequality) will be checked.

Although with abovementioned limits the decomposition has shown decline in wives earnings dispersion, decline due to increased employment (less zero earnings) instead of a decline in actual labour income distribution (working wives CV increased). This change was greater compared to assortative mating in determining household income distribution, therefore higher women employment had equalizing effects. Over

the monitored period, wives have increased their contribution to family income, partly making up for husbands' share decline and increased earnings dispersion. So at income distribution level, a more equal distribution of wives' labour income has limited the increase of household income inequality due to increased dispersion of husbands' earnings. Apparently the equalizing effect of wives' employment has been greater in northern regions due to conducive family backgrounds for added worker effect, more working opportunities and better childcare services, basic features to stimulate wives' employment in low-income households.

Variations in women and men' contributions to household income and the relation to household income distribution will be investigated in the observation period through decomposition by income sources and the shift-share analysis applied on. Understand whether after the 1998 women employment has continued to have an equalizing effect will be central, this time considering all women and not just wives.

Decomposition by household types and counterfactual analysis will be useful for understanding how inequality is, both within and between groups and how it has varied over time. This second type of decomposition will enable to determine if part-time have been a vector of inequality in the Italian case or otherwise like in the Switzerland one. How differences between northern and southern Italy have evolved will be considered and in case what type of changes there have been.

Summing up, will be interesting finding out whether after the strong female participation increase into the workforce recorded over the years before 1998, employment has continued to grow or has slowed down especially post 2008 and sovereign debt crisis, and how has been its influence on household income inequality. Could be the case that female participation has reached a plateau and is no longer able to contribute in limiting inequality growth because of an increasingly similar contribution to household income to that of men, which begins to resemble the same earnings inequality levels. Will be possible to theorize about the possibility that Italy is then following the same path of the Switzerland case with similar effects on inequality, even taking into account socio-institutional differences and external factors. Enabling to consider this as a common tendency of the female participation evolution.

4.4 Hypotheses

From what you can learn in the literature review, the part on research questions and looking to household income inequality determinants in fig. 1, is possible to make hypotheses about the relationship between workforce participation and household income inequality.

H1a:

women employment has increased *(equalizing/disequalizing effect)*

H1b:

women working hours have increased *(equalizing effect)*

H2:

Women have reached men's level in educational attainment

H3:

An higher number of single households will be presents *(dis-equalizing)*

H4:

Increased presence of part-time work *(equalizing)*

H5:

No part-time penalty *(equalizing)*

H6:

Higher women share in household income over time *(equalizing/dis-equalizing)*

H7:

Shrinking regional differences

H8:

Women participation in Italy will continue to grow until resembling increasingly northern European countries model

5. DATA

5.1 Data source

The data employed in the analysis belong to the Bank of Italy's Historical Archive of the Survey on Household Income and Wealth (SHIW), a survey started in the 1960's to collect data on incomes and savings of Italian households. The archive contains information related to anagraphic characteristics, employment status, income, wealth and consumption both at household level and for single components. The latest surveys sample includes 300 municipalities, 8000 households and 20000 individuals. The archive contains information on Italian households resulting from surveys for the period 1977-2016. All present amounts even relative to the period prior to euro introduction in Italy are however expressed in euro[1] (Bank of Italy, 2019; Bank of Italy, 2020).

5.2 Related issues

The datasets are afflicted by non-response bias like practically all statistical surveys, feature leading certain population segments to be under-represented into the sample and therefore to biased estimates of variables of interest (Bank of Italy, 2018; Bank of Italy, 2020). In SHIW's case the non-response is not random but a characteristic of richest households, where the bias is greater for financial assets than for labour income,

[1] https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/index.html?com.dotmarketing.htmlpage.language=1

probably because of a greater dispersion of the former. This could lead to problems in incomes and wealth dispersion measurement (D'Alessio and Faiella, 2002).

In order to avert such negative effects, the Bank of Italy at the end of the survey, has adopted different weights for different population segments with the aim of rebalance the weight within the sample (Bank of Italy, 2018; Bank of Italy, 2020), thus preventing biased estimates (Bank of Italy, 2019). The historical archive is also subject to sample weights revision to mitigate effects due to changes that sampling procedures have undergone over the years. The new re-proportioning coefficients are calculated on the basis of demographic statistics on Italian population, which are released by ISTAT[2] (Bank of Italy, 2019).

5.3 Household and individual income

Tab. 1 – Variables related to income present in datasets

VARIABLE	DESCRIPTION
ANNO	Year
NQUEST	Questionnaire number
NORD	Household member reference number
Y1	Household and individual income (income from financial capital excluded)
Y	Household and individual income
YL	Labour income
YL1	Net wage
YL2	Non-monetary additions
YT	Income from pensions and other transfers
YTP	Income from pensions
YTP1	Pensions
YTP2	Arrears
YTA	Other transfers
YM	Income from self-employment and enterprise
YM1	Income from self-employment
YM2	Amortisations (-)
YM3	Income from enterprise (profits and dividends)
YC	Capital income
YCA	Income from buildings
YCA1	Actual rents
YCA2	Imputed rents
YCF	Income from financial capital
YCF1	Interests on bank and postal deposits
YCF2	Interests on Government bonds
YCF3	Interests on other financial assets
YCF4	Payable interests (-)

Source: Banca d'Italia, 2019

[2] https://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/distribuzione-microdati/index.html

$$Y1 = YL + YT + YM + YCA$$

$$Y = YL + YT + YM + YC$$

Unit of analysis is the household and individuals within it. Already in Banca d'Italia (1966), one of the first reports on the survey, household importance in market economies was stressed on account of the share of wealth owned, income earned, and as a source of internal demand. As pointed out by Atkinson (2015) and D'Alessio and Signorini (2000) households and individuals are two complementary dimensions for income inequality analysis because of how individual incomes are aggregated and shared within households, where components can be earners or non-earners and resources sharing can be partial or total, a range of issues not further explored in this analysis. Household and individual income (variable "Y") as shown in tab. 1. comprise labour income "YL", income from pensions and other transfers "YT", income from self-employment and enterprise "YM" and capital income "YC". Given that tax system is irrelevant in this work, is not in any way taken into account.

5.4 Sample

Following Khun and Ravazzini (2017) methodology, the analysis is not limited to couple-households but all households in which the head is between 25 and 64 years old are included. The selection has been implemented to take into account main labour income earners and for household head identification the classification employed by the Bank of Italy in SHIW has been maintained (household head declared "CFDIC" and household head as defined by Eurostat "CFEUR"). In the sample employed for analysis at the individual level have been included individuals between 15 and 24 years old no longer students, working students, all women from the age of 25 non retired and retired women who reported working hours greater than 0 in questionnaire.

5.5 Operations on raw datasets

Data cleaning involved incomes deflation both at household and individual level, through deflators provided on annual basis from ISTAT source and reported in the historical archive (Bank of Italy, 2019). As performed by Khun and Ravazzini (2017) but also recommended in Atkinson (2015), household income has been adjusted for household size and composition through the modified OECD scale, technique that assign a weight equal to 1 for the first adult, 0.5 for the following (over 14 years old) and 0.3 for each child present in family. As suggested in Salverda et al. (2009) higher incomes have been top coded to avoid that an inequality measure sensitive to outliers as the CV was too influenced.

In datasets concerning employment and self-employment have been spotted several duplicate observations within the same questionnaire numbers. This issue has been addressed dropping the entire household from the sample due to impossibility in determining with certainty whether the typology of error was attributable to an error in numeration of any family member and then to correct it.

In order to disregard small variations in female employment, results will be shown only for years 2000, 2004, 2008, 2012 and 2016 at aggregate level for the whole country, for northern regions, central and southern Italy. Years have been chosen in order to show the first year after the analytical period covered in Del Boca and Pasqua (2002) for which data are available and the last year for which SHIW data are available. The analysis has been conducted considering both the whole of Italy and three macro-regions in order to take into account existing regional differences in social, institutional, demographic terms. Division into three macro-regions has been carried out relaying on the breakdown by region applied by the SHIW through the categorical variable AREA3. In Tab. 2 the partitioning of Italy in three geographical areas is reported according to AREA3.

1 = North

2 = Centre

3 = South and islands

Tab. 2 – Geographical areas

REGION	AREA3
Piemonte	1
Val d'Aosta	1
Lombardia	1
Trentino – Alto Adige	1
Veneto	1
Friuli – Venezia Giulia	1
Liguria	1
Emilia - Romagna	1
Toscana	2
Umbria	2
Marche	2
Lazio	2
Abruzzo	3
Molise	3
Campania	3
Puglia	3
Basilicata	3
Calabria	3
Sicilia	3
Sardegna	3

Source: Banca d'Italia, 2019

5.6 Final datasets

The final datasets are two, one that includes households incomes with incomes from each household component in order to calculate total CV at the household level and

for single household components and one containing classification for household type for applying decomposition by population groups. Employed classification follows the one applied in Khun and Ravazzini (2017) but with some variations.

Identified discrete groups are twelve and consist of : single men (1), single women (2), single mothers (3), female-breadwinner couples (4), male-breadwinner couples (5), couples with full-time working man and part-time working woman (6), couples with full-time working woman and part-time working man (7), full-time working couples (8), couples with either working part-time or not working (9), households with adult dependent children (10), households with children contributing in household income (11) and other households (12).

As well as by identification in SHIW, are considered spouses even household member reported as cohabitants in the questionnaire. For classification purposes, following indications provided in the glossary of ISTAT(2019), individuals of fifteen years old or more who have reported at least one hour of work per week both from employment and self-employment are considered employed.

Sticking to definitions by ILO and to Bank of Italy's classification in SHIW, individuals with an amount of weekly working hours greater than thirty-five are considered full-time workers. Among part-time workers, there is a distinction between small part-time workers, up to nineteen working hours and higher part-time workers up to thirty-five working hours per week. The distinction between couple households groups takes place on working hours basis.

The choice to create two separate groups for households with adult dependent children (10) and households with children contributing in household income (11) has been necessary on account of the different features in terms of income sharing within household that these two household types have, compared to the others. Given the definition of fiscally dependent person provided by Agenzia delle Entrate, Italian Revenue Agency, households in which children do not exceed the age of twenty-four and do not dispose of a total income equal or greater than 4000,00 €, these are considered dependent and their families have been assessed as couple households in the classification.

With regard to households with adult dependent children and households with children contributing to household income, sons with more than twenty-four years old but with an income below 4000,00 € are classified as adult dependent children, while all those with an income equal or greater than 4000,00 € irrespective of age, as children contributing to household income. To be included in one of these two typologies, a family must comprise both spouses.

Households for which in questionnaire has been reported "other" as degree of kinship of one member are considered complex households, given the impossibility in determining if there is kinship with such member and in case of what degree. For this reason such households are classified within "other households" group. Other households is defined as a residual group, mainly made up of complex households and single parents with one or several dependent children and/or contributing.

Households where the spouse or partner are of the same gender of the household head, are considered within other households. The decision of not constituting a group for LGBT households is due to the low number of those within datasets.

Certain variables are codified with arbitrary values 1-2 or 0-1 in order to simplify statistical processing and modelling. In the case of gender, only male and female are considered, respectively with value 1 and 2. This does not want to deny the existence of other gender identities but the analysis choice is bound, given that male and female are the only two gender taken into account by the SHIW.

6. Decomposition methods

The Squared Coefficient of Variation (CV^2) and the Theil Index (T), both belonging to general entropy measures, are the indexes selected to be decomposed.

6.1 Decomposition by income sources

The decomposition by income sources will be implemented following Khun and Ravazzini (2017), which employ the same decomposition present in Cancian, Danziger and Gottschalk (1992), Cancian and Reed (1999), Del Boca and Pasqua (2002) and based on Shorrocks (1982).

The choice of squared coefficient of variation, calculated as variance over squared mean, is based on popularity of its decomposition in literature and on its characteristics. CV^2 as belonging to generalized entropy indexes family (see Pigou 1912; Dalton 1920; Shorrocks 1980; Cowell 2016; Neves Costa and Pérez-Duarte 2019), is characterized by the additive decomposability property and is often employed for the simplicity of its decomposition. It is mean independent thus non-sensitive to proportional changes in all considered incomes. Its possible values starts from 0, are always positive, but without upper limits and enable comparisons over time and between groups. The only detected shortcoming is being sensitive to outliers, but has already been addressed as stated in the section about data.

$$CV_y^2 = \frac{\sigma_y^2}{\mu^2}$$

Factor decomposition allows to break down household income in different income components as in the following equation:

$$Y = Y_m + Y_f + Y_{ot}$$

In which the three considered income sources consists of men earnings, women earnings and other income sources, where according to tab. 1 :

$$Y_m = yl + ym$$

$$Y_f = yl + ym$$

$$Y_{ot} = yt + yc$$

Y_m e Y_f include both income from employment and from self-employment. Y_{ot} instead is considered as a residual category, containing retirement income, capital income and other transfers.

Considering inequality decomposition by factors in the case in which income sources are uncorrelated, squared coefficient of variation can be decomposed as follows:

$$CV_y^2 = \frac{\sigma_y^2}{\mu^2} = \sum_k \frac{\sigma^2{}_{y^k}}{\mu^2}$$

Where Y_i^k represents income of individual $i(i = 1, \dots, n)$ from source $k(k = 1, \dots, K)$, the distribution of total income is $Y = (Y_1 \dots, Y_n) = \sum_k Y^k$ and $\sigma^2{}_{y^k}/\mu^2$ is factor k contribution to inequality.

When on the contrary income sources are correlated, as in the present case, the most frequently-used formula is the following one:

$$CV_y^2 = S_m^2\, CV_m^2 + S_f^2\, CV_f^2 + S_{ot}^2\, CV_{ot}^2 + 2\,\rho_{m,f}\, S_m\, S_f\, CV_m\, CV_f$$
$$+ 2\,\rho_{m,ot}\, S_m\, S_{ot}\, CV_m\, CV_{ot} + 2\,\rho_{f,ot}\, S_f\, S_{ot}\, CV_f\, CV_{ot}$$

Where S_k is the income share from source (k) in total household income, CV_k is the inequality in each factor and ρ is the correlation between a pair of income sources. Therefore female earnings contribution to total household inequality depends on the income share S_f, inequality in the same female earnings CV_f and correlation with other income sources $\rho_{f,m}$ / $\rho_{f,ot}$. Changes in female employment act on all these components that therefore must be considered together, in order to evaluate their effects on household income inequality. For this reason a shift-share analysis will be performed on the decomposition.

Decomposition by income sources has been performed in Stata using INEQFAC, a Stata module provided in Jenkins (2009), while standard errors for coefficients of variation have been computed employing SVYGEI, a Stata module to derive sampling variances provided in Jenkins and Bewien (2005).

6.2 Shift share analysis

Employed for the first time in the decomposition of household income context by Larrimore (2014), the shift share analysis allows to evaluate how a variation in women and men' employment patterns affects household income inequality, considering both the above mentioned single components effects and also their aggregated effect. Actually, considering a time frame $t, t + 1$, the total inequality will be calculated with one or more components to $t + 1$ levels and leaving the others at time t values. Differently from a classic counterfactual analysis, a shift-share analysis makes possible to isolate female employment effects and to measure % of real change in income inequality owed to them, so testing if it makes the case for an equalizing or disequalizing impact. Is a tool

that makes possible to test if a greater female contribution in household income influence positively or negatively household income inequality.

The shift-share analysis has been performed through a self-made coding, given that an ad hoc Stata module applicable to the Italian case was not available and was more time-consuming to adapt an existing one to a single-country dataset like the SHIW.

6.3 Decomposition by population groups

The Theil index, from its creator's name Henri Theil who introduced it in 1967, is as well part of generalized entropy indexes and following Neves Costa and Pérez-Duarte (2019) is developed as follow:

Income share of all households in the distribution $z_i := xi \,/\, \sum_{i=1}^{n} x_i$ is represented by vector $z = (z_1, z_2, \dots, z_n)$ and when each household has the same weight, the entropy of the distribution of net income shares is $H(z) = \sum_{i=1}^{n} z_i \ln\left(\frac{1}{z_i}\right)$. Concerning both extreme cases, the maximum possible entropy, that is the state of complete equality in the income distribution where all households have the same level of positive income $z_i = \frac{1}{n}\ \forall i$, corresponds to $H(z) = \ln n$. When instead a single family get all the income, thus the state of complete inequality $\exists i\ s.t.\ z_i = 1$ and $z_j = 0\ \forall j \neq i$, so the entropy is $H(z) \underset{z \to 0}{\longrightarrow} 0$.

This index actually measures the difference between the maximum possible entropy and the observed entropy in the income distribution:

$$Theil = GE(\alpha = 1) = T = \sum_{i=1}^{n} z_i \ln(n z_i) = \frac{1}{n} \sum_{i=1}^{n} \frac{x_i}{\bar{x}} \ln\left(\frac{x_i}{\bar{x}}\right)$$

Where x_i is the income of $i(1, \dots, N)$. Is among the most used inequality measure for the purpose of decomposition by population groups, its value ranges from 0, situation in which there is perfect equality of income, to infinite. Its use involves an issue due to the impossibility of having zero incomes, because the logarithm in formula would not permit to define the index. Often, this is faced imputing extremely low income levels in place of zeros. In the current analysis this issue is missing, since there are no household income equal to 0. It is also possible to normalize index value, including it between 0 and 1 (DSP 2015; Bellù and Liberati 2006).

The Theil index will be decomposed by using the formula already present in Kuhn and Ravazzini (2017), that allows to distinguish total inequality in inequality within groups and between groups :

$$T = \frac{1}{n} + \sum_{i}^{N} \frac{x_i}{\bar{x}} \ln\left(\frac{x_i}{\bar{x}}\right) = \sum_{j}^{J} p_j \frac{\bar{x}_J}{\bar{x}} \ln\left(\frac{\bar{x}_J}{\bar{x}}\right) + \sum_{j}^{J} p_j \frac{\bar{x}_j}{\bar{x}} T_j$$

In which n is the number of total individuals i, $x_i, \bar{x}$ are respectively individual earnings and mean earnings, j is a defined population group where $j = 1, \dots, J$, p_j is the proportion of people in the group and $\bar{x}_j$ is its mean income . The inequality within each group is calculated as:

$$T_j = \frac{1}{n}\sum_{i=1}^{n} \frac{x_{i|j}}{\bar{x}_J} \ln\left(\frac{x_{i|j}}{\bar{x}_J}\right)$$

T_j is the Theil index for group j, n is the amount of people in the group and $x_{i|j}$ is the wage of individual i in the group. Groups number J and their characteristics have already been defined in the section on data.

The decomposition by population groups offers to observe inequality within several household types, to verify how inequality vary due to changes in amount of individuals in each groups, changes in whitin-group inequality and changes in inequality between different groups. Actually this decomposition typology will be performed in Stata with INEQDECO, a Stata module provided in Jenkins (1999) and freely available, which with various adjustments has been adapted to the Italian case as shown in annexes. Standard errors for Theil indexes have been computed employing the bootstrap Stata module.

6.4 Counterfactual analysis

In order to compare part-time and full-time in determining total household income inequality, and to test if more part-time working women would be equalizing in Italy as in the case of Switzerland, a counterfactual analysis has been applied to the decomposition by population groups.

A counterfactual analysis consists of examining the difference between 2 situations, the factual situation, that in this case is the one represented by actual observed inequality levels in the various years under review and the counterfactual situation, where inequality will be re-calculated simulating variations in the amount of people belonging to specific groups j . This will allow to verify if the situation improve or worsen in the counterfactual situation with respect to the real one. Counterfactual distributions have been calculated through a self-made coding as for the case of the shift-share analysis.

6.5 Limits

Clearly, as already stated in Khun and Ravazzini (2017), consisting of approximations, this kind of operation has clear limits, as for the case of selection effects, attributing to inactive women the same earnings of already working ones.

Given that here the focus is about socio-demographic changes, results will be reported only for certain years in order to consider exclusively more consistent variation of employment and household composition, disregarding smaller fluctuations due to business cycle.

7. Results and discussion

All the tables presented from now on have been built using asdoc, a Stata program written by Shah (2018) which enables to generate Word tables from results obtained by Stata commands, scalars and local macros. The application of this program makes possible that modifying years of interest, areas, etc., results of tables built-in the coding change accordingly.

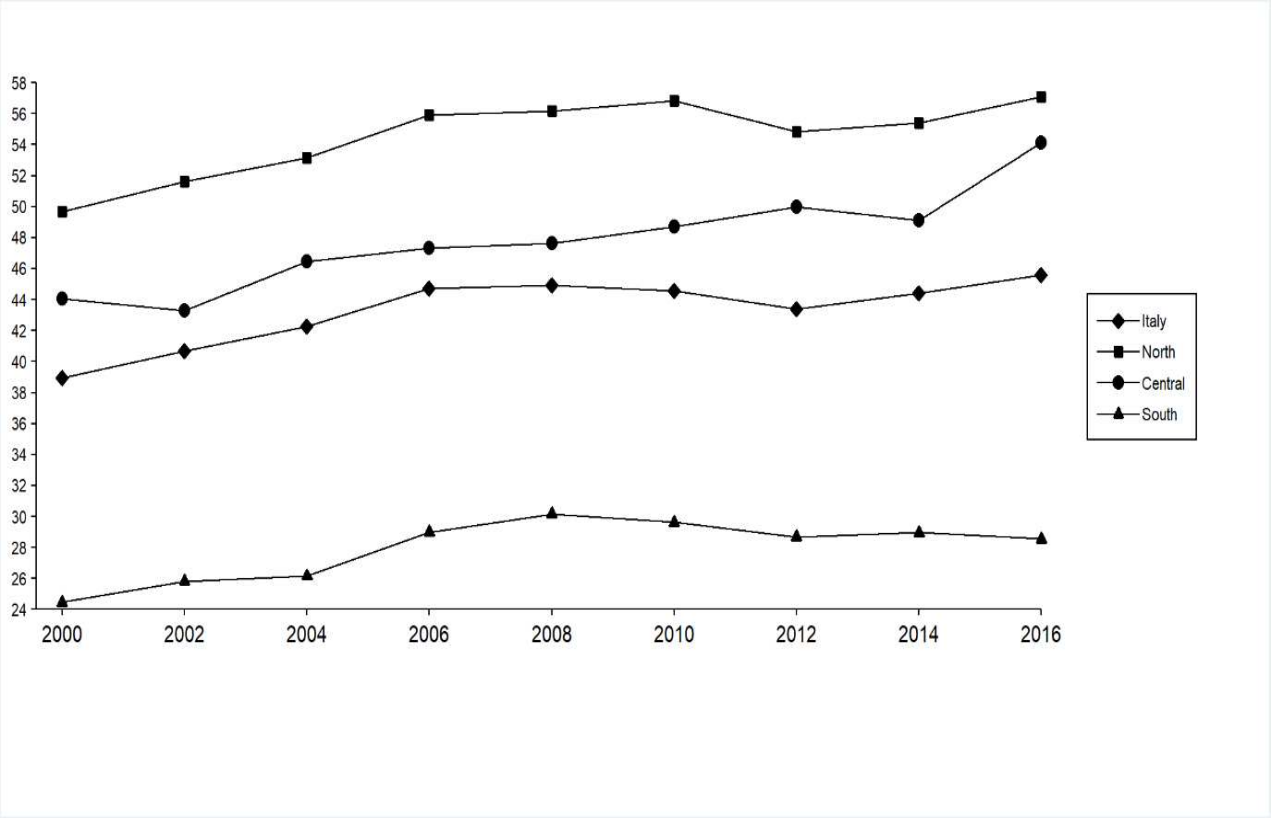
7.1 Descriptive statistics

7.1.a Women employment trend

Focusing on women's employment patterns, fig. 2 presents percentage of employed women in 2000-2016 time span for Northern, central, southern Italy and at aggregate level.

Employed women (in percentage)

Fig. 2



Source: Own elaboration based on SHIW datasets

(considered N country-wide range from 6774 in 2000 to 4139 in 2016, from 2802 to 1716 in north, 1410 to 844 in central and 2562 to 1579 in south)

Available data shows that women of fifteen years old or more who have reported at least one hour of work per week both from employment and self-employment during the period 2000-2016 have continued to increase, though at a slower pace than in

previous decades. Percentage for the whole peninsula has grown from 39.0 in 2000 to 45.6 in 2016, for an increase of 6.6 percentage points over a period of 16 years. However, examining principal Italian macro-areas, both significant differences in starting levels and in growth rates can be identified. Where north and central Italy started from higher level of employment, respectively 49.7 and 44.0 with respect to 24.5 in south. The same growth in southern regions was much lower, amounting to 4.1 points, carrying total employment at 28.6%. North e central Italy display growth rates twice as high, 7.4 for the former and 10.1 for the latter, leading employed women at rates of 57.1 and 54.1.

Regarding women employment, central Italy seem increasingly to resemble northern regions, while south slightly improves its situation but is lagging behind the rest of the country. In 2016 the distance between south and north-central Italy with respect to women employment is much more than in 2000. In any case female labour force participation growth in Italy appears to have slowed down, compared with the 1977-1988 period considered in Del Boca and Pasqua (2002). Aggregated mean annual growth has decreased from 0.9% to 0.4%, although has to be taken into account that population segments are different.

As already mentioned in Del Boca and Pasqua (2002), Italian labour market is characterized by rigidity in hiring and redundancies. Indeed in correspondence with the downturn periods of 2008-2009 and 2012-2013, brief decline in growth can be noticed instead of actual trend reversals.

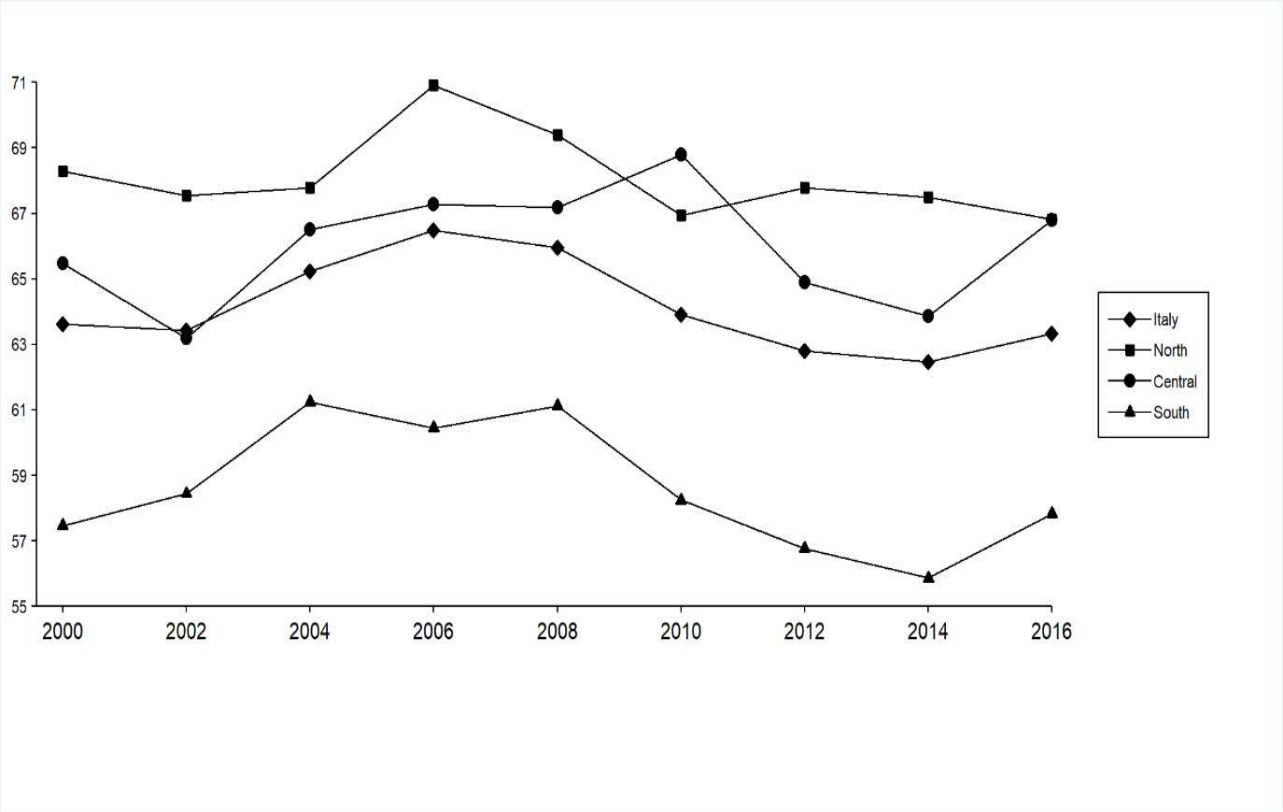
So concerning H1a, can be stated that employment has continued to increase although at a lower pace, with marked differences between north-central and southern Italy. How this has affected inequality at household level and whether has had equalizing effects will be investigated more in detail below.

7.1.b Comparison between women' and men' position

Regarding women' position with respect to men, the situation both at educational attainment level and after the transition to paid work has been analysed. During the same period as indicated in fig. 3 men employment has returned to the same levels of 2000, after having recovered by downturn years. It is possible to see how still in 2016 women employment is lower than that of men both for Italy in aggregate and within each macro-region. Nevertheless difference is reduced, since men employment levels in 2016 amount to the same levels of 2000. The constant declining men employment phase, started at the end of the 90's, has been replaced by a phase not distinguished for a clear trend but apparently rather by one more sensitive to business cycle in contrast to that of female employment. Percentage of employed men is diminished everywhere in 2008-2012 period, managing only in 2016 to reach the same employment levels of 2000. Even in this case, southern Italy appears lagging behind the rest of the country, with a percentage in 2016 of 57.8 against 66.8 of north-central regions, where levels have converged perfectly.

Employed men (in percentage)

Fig. 3



Source: Own elaboration based on SHIW datasets

Tab. 3 in addition to presenting descriptive statistics about households respective region in datasets, allows comparison of women position with respect to men also for educational attainment and reports indicative statistics to evaluate the transition to paid work. All individuals of 25 years old or older have been considered, age by which for most people education is presumed to be concluded. Levels of women educational attainment had almost reached that of men in 2000, and in just 16 years women have overcome in percentage men in higher level of education.

So H2 can be assumed strongly confirmed, given that women not only have reached men' educational attainment but have overtaken it, especially at undergraduate and postgraduate level. Despite this development, the data confirm what is stated in in OECD(2015). More equality in education has failed in ensuring that the transition to paid work took place to the same extent both for women and men. Despite improvements, in 2016 women still do not contribute in the productive system to the same extent of men, notably in southern regions and islands.

Descriptive statistics ***Tab. 3***

Years	2000	2002	2004	2006	2008	2010	2012	2014	2016
Households per area(%)									
North	45.00	46.58	47.06	48.97	47.79	44.33	43.26	46.74	43.94
Central	20.32	20.39	20.84	18.75	18.90	20.63	20.31	19.49	21.14
South	34.69	33.02	32.10	32.28	33.31	35.05	36.43	33.78	34.92
Men education (%)									
Lower-secondary	59.84	60.94	58.31	57.31	56.83	54.34	53.23	53.40	53.28
Upper-secondary	29.33	29.27	30.78	31.72	31.36	31.94	32.75	32.31	32.83
Undergraduate-postgraduate	10.83	9.78	10.91	10.97	11.81	13.72	14.02	14.29	13.89
Women education (%)									
Lower-secondary	62.79	61.18	59.16	56.65	55.46	51.88	50.46	50.33	49.91
Upper-secondary	27.17	28.75	29.48	30.34	31.08	32.64	32.49	32.42	33.60
Undergraduate-postgraduate	10.04	10.07	11.36	13.01	13.45	15.48	17.05	17.24	16.48
Men age	41.34	41.70	41.95	42.27	42.84	43.90	44.87	46.16	46.42
Women age	39.49	40.35	41.08	41.70	42.27	43.35	44.17	45.42	46.38
Working men(%)									
Italy	63.62	63.42	65.22	66.49	65.94	63.90	62.80	62.47	63.33
North	68.29	67.53	67.79	70.91	69.40	66.95	67.78	67.48	66.82
Central	65.47	63.20	66.51	67.29	67.18	68.79	64.89	63.85	66.79
Sud	57.47	58.45	61.24	60.46	61.13	58.25	56.77	55.87	57.83
Working women(%)									
Italy	38.97	40.67	42.26	44.71	44.94	44.59	43.39	44.42	45.61
North	49.68	51.60	53.17	55.91	56.17	56.81	54.87	55.39	57.11
Central	44.04	43.27	46.45	47.35	47.61	48.70	50.00	49.09	54.15
Sud	24.47	25.82	26.17	28.98	30.16	29.63	28.69	28.97	28.56

Source: Own calculation based on SHIW datasets

7.1.c Percentage of working women by quintile of household income distribution

So in order to understand how an increased female employment affect household income inequality, the starting point has been observing in which household income quintile the participation has increased more.

As shown in tab. 4, percentage of working women is greater in quintiles with higher household incomes. This is partially due to the presence of two incomes from labour in families with both spouses, but is also due to assortative mating presence, a situation capable of fostering inequality as already explained. Both at aggregate level and in single macro-regions, female workforce participation has increased in all quintiles, however the extent of variations and differences among quintiles are different across areas.

Percentages of working women by quintile of household income distribution ***Tab. 4***

Quintiles	1	2	3	4	5
			Italy		
2000	12.7	26.3	43.8	54.7	63.1
2002	12.4	29.3	46.0	58.3	60.2
2004	15.2	32.0	48.3	56.8	64.2
2006	16.2	34.7	51.5	61.9	63.8
2008	18.6	35.0	49.8	61.6	64.3
2010	17.5	34.7	52.9	59.6	63.7
2012	18.6	30.4	49.3	59.2	64.8
2014	19.0	33.4	50.4	60.2	65.6
2016	18.6	32.6	51.9	63.4	68.9
			North		
2000	18.7	28.3	48.0	57.3	64.3
2002	20.6	35.4	50.7	61.5	60.7
2004	28.9	39.2	54.3	59.7	65.5
2006	26.3	41.8	57.5	65.6	66.3
2008	32.4	48.6	55.1	62.3	65.2
2010	30.7	46.6	58.3	62.7	66.0
2012	28.6	44.2	53.9	64.1	64.9
2014	32.7	43.9	55.1	64.6	64.9
2016	25.1	44.0	57.5	67.8	69.0
			Central		
2000	20.2	29.6	45.3	54.7	64.6
2002	15.5	29.9	44.6	56.3	58.7
2004	15.9	32.4	45.4	54.9	63.0
2006	18.8	35.7	47.4	58.4	58.6
2008	18.5	32.4	45.6	59.0	63.5
2010	23.7	35.3	48.7	58.4	59.6
2012	25.0	36.3	52.9	55.6	63.4
2014	26.6	38.5	50.2	53.9	65.6
2016	34.8	40.0	54.2	61.9	68.7
			South		
2000	10.4	23.3	35.0	47.8	56.7
2002	10.2	23.9	39.1	50.7	60.0
2004	11.4	24.8	39.0	50.9	60.5
2006	12.9	27.7	44.5	55.0	61.5
2008	14.5	26.5	43.3	62.4	61.5
2010	13.2	27.4	47.6	53.5	62.3
2012	14.3	21.8	40.7	53.3	66.2
2014	12.6	25.0	42.2	55.4	68.3
2016	14.0	23.5	40.0	53.2	68.8

Source: Own calculation based on SHIW datasets

For the whole peninsula the quintile with higher incomes has been that with smaller increase, immediately followed by the one with lower incomes, while the fourth has recorded the largest increase. Looking at data disaggregated in 3 macro-regions is

possible to note relevant regional differences, primarily in terms of starting percentages and variations between north-central and southern Italy. Have been taken into account percentages only for 2000 and 2016, leaving aside variations in intermediate years due to business cycle.

Also in the north, the quintile with higher incomes has been that with the smaller increase and it is interesting noting how the increase recorded in the first two quintiles has been of 22.1% against 24.7% overall for remaining 3 quintiles. Possible clue of an equalizing effect on household income in northern regions. Situation even more significant in central regions, where the increase in first two quintiles has been of 25.0%, greater than 20.2% of the remaining three. Is indicative how in south the fastest growing quintile has been the fifth and that the first two together have recorded an increase of 3.8% against 22.5% of subsequent three, probable symptom of stronger assortative mating in this area. The two quintiles with lower incomes seem to have been those most severely affected by business cycle situation in years following 2008 and 2012. While in the other two areas these years do not match with a decrease in employment for lower income quintiles. The growth in employment has therefore been distributed differently among quintiles in all three Italian regions, with a possible stronger equalizing effect in north-central regions contrary to south, where an opposed effect can be hypothesized.

Notwithstanding the analysis just provided is a precious one in terms of insights, allowing to enrich understanding about actual distribution of women employment growth across income quintiles, this operation turns out to be insufficient in view of a full understanding of its impact on household income distribution and then in income quintiles formation. It is possible to assume that given the increase of employment, women earnings have been more important within family and that there are less zero working hours due to inactive women reduction, with potential equalizing effects. This has to be probed further and directly, given also differences between north-central regions and southern ones.

Looking at percentages by income quintiles does not give information about distribution of working hours among various quintiles, particularly if in richer quintiles there are more working hours (assortative mating). Neither the amount of variations that there have been in the observation period and the relation between working hours and hourly wages can be identified. To verify all of this, following fig. 1, an analysis of different determinants trough which an increase in women workforce participation affects household income inequality has been carried out.

7.1.d Working hours and hourly wages as determinants of individual earnings inequality

Having identified an increase in participation between 2000 and 2016, the next required step to understand effect of such growth on household income inequality is to look at individual level variations in working hours, hourly wages and the correlation between them.

Descriptive Statistics on working hours ***Tab. 5***

Women	2000	SD	2004	SD	2008	SD	2012	SD	2016	SD
					Italy					
Working type(%)										
0 hours	51.7		48.2		45.0		47.0		44.5	
1-19 hours	3.9		3.2		4.4		5.3		3.8	
20-35 hours	12.7		13.9		14.9		17.4		17.8	
36-max hours	31.8		34.7		35.7		30.2		33.8	
N	5353		4867		4582		4517		3376	
					North					
0 hours	38.5		34.6		30.9		33.1		30.8	
1-19 hours	3.9		3.5		4.1		4.8		3.7	
20-35 hours	14.3		17.5		17.7		23.3		19.7	
36-max hours	43.3		44.4		47.3		38.7		45.8	
N	2202		2127		2010		1778		1387	
					Central					
0 hours	44.5		41.4		40.2		37.9		32.4	
1-19 hours	5.2		4.3		6.4		6.5		5.7	
20-35 hours	15.1		14.6		16.2		17.8		21.5	
36-max hours	35.2		39.7		37.2		37.8		40.3	
N	1079		982		844		903		679	
					South					
0 hours	69.3		68.3		63.8		65.0		65.3	
1-19 hours	3.2		2.4		3.7		5.2		3.0	
20-35 hours	9.6		9.1		11.0		11.5		13.8	
36-max hours	17.8		20.2		21.5		18.2		17.9	
N	2072		1758		1728		1836		1310	
					Italy					
Weekly working hours										
1-max	34.9	(11.0)	35.1	(10.5)	34.7	(10.6)	33.1	(10.7)	34.3	(10.3)
0-max	16.9	(19.0)	18.2	(19.1)	19.1	(19.0)	17.5	(18.3)	19.0	(18.7)
					North					
1-max	35.8	(10.4)	35.2	(10.0)	35.5	(10.3)	33.5	(9.7)	35.4	(9.7)
0-max	22.0	(19.2)	23.0	(18.6)	24.5	(18.5)	22.5	(17.7)	24.5	(18.2)
					Central					
1-max	34.0	(10.7)	35.5	(11.7)	33.7	(10.3)	33.6	(11.1)	34.0	(11.1)
0-max	18.9	(18.7)	20.8	(19.6)	20.2	(18.4)	20.9	(18.5)	23.0	(18.4)
					South					
1-max	33.8	(12.2)	34.3	(10.3)	33.8	(11.5)	31.9	(12.1)	32.4	(10.4)
0-max	10.4	(17.0)	10.9	(17.0)	12.2	(17.6)	11.1	(16.8)	11.2	(16.6)

Source: Own calculation based on SHIW datasets

As reported in tab. 5 the increase in employment was accompanied by an important variations in prevalent types of work. Both at aggregate level and into all three macro-regions inactive women reduction can be noticed between 2000 and 2016. The most relevant decrease there was in central Italy regions, from 44.5% in 2000 to 32.4% in 2016. Concerning part-time, small part-time is not very present for whole Italy, with values around 4-5% everywhere and no variations over time. With regard instead to higher part-time, this typology has been the one with major increments, with 6.4 percentage points of increase in central regions. Being grown values for full-time in north-central and at aggregate level of 2-5 points (while steady in south), there is no way to determine to what extent the increases were due to a rise in working hours of active women or to inactive women entrance into the workforce.

How variation in working hours has diminished due to less inactive women and part-time women who have increased their working hours can be noticed looking to standard deviation of mean working hours. SD went from 11.0 to 10.3 for working women and from 19.0 to 18.7 including all women in Italy, but with similar changes in all regions.

It is then possible to confirm statement in H1b, women working hours have increased due to both a rise in working hours from active women and to less inactive women, that coupled with diminishing variations in working hours has equalizing effects on individual earnings inequality.

Weekly working hours of women by quintile of household income for 2000 and 2016 ***Tab. 6***

Quintiles	1		2		3		4		5	
Year	2000	2016	2000	2016	2000	2016	2000	2016	2000	2016
					Italy					
1-max	31.4	29.6	33.8	32.8	34.7	34.4	35.3	35.1	36.2	36.2
0-max	4.8	6.9	11.2	12.7	19.8	22.0	24.5	27.8	27.6	30.3
					North					
1-max	33.5	30.7	32.9	33.3	35.3	34.5	35.7	35.9	37.1	37.3
0-max	6.7	9.2	11.5	16.9	21.6	24.6	25.7	30.1	28.9	31.5
					Central					
1-max	27.8	25.9	33.2	32.9	34.2	35.1	34.9	34.4	34.7	35.7
0-max	6.2	11.3	12.3	16.1	20.4	23.8	24.8	27.9	26.8	30.2
					South					
1-max	31.6	30.4	34.9	32.1	34.1	33.4	34.5	33.2	33.5	33.0
0-max	4.2	5.4	10.6	9.1	15.8	16.0	21.1	21.6	23.2	26.7

Source: Own calculation based on SHIW datasets

Tab. 6 allows to gather information about working hours distribution according to household income quintiles and to analyse their variations in more detail. That working hours are tilted towards higher household income quintiles is a common feature of the all Italian peninsula. Mean Weekly working hours have remained almost unchanged or have had minimal variations looking at working women, while taking into account also inactive women, working hours have increased all over. It is therefore possible to infer that the

increase of working hours has been distributed equally across all household income quintiles, with the only exception of southern regions, where slightly higher increases in the higher income quintile can be detected. This last feature informs again about a possible stronger assortative mating in this area.

With respect to hourly wages and correlation between hourly wage and working hours, last determinants of inequality in individual earnings, tab. 7 shows their evolution. Both for aggregate level and specific macro-regions, mean hourly wages are almost similar for full-time and for higher part-time work, while wages twice as high are recorded for small part-time. This can be primarily due to low incidence of this working type and to scarce presence of non-paid internship in small part-time contracts. As a result there isn't a positive correlation between hourly wage and working hours in all areas for all years. Variations in hourly wages have declined over time in all areas of interest and notably for part-time, contributing to make women earnings more equal.

H4 can be confirmed, considering that part-time has increased, even though in higher part-time case, while the small one has not changed.

Over 16 years hourly wages have been stationary, considering that these were adjusted for inflation, in nominal terms they could have been increased, an aspect not furtherly addressed.

Although descriptive statistics does not allow for properly testing part-time wage penalty, for all already mentioned limitations, is it possible to infer that in Italy small part-time is not restricted to low paid jobs. So H5 can be accepted but with reserve.

Surprisingly the Italian case is much more similar to the Switzerland one reported in Kuhn and Ravazzini (2017), despite statements in OECD (2013).

After having considered all three determinants, whether individual earnings inequality actually has declined can be displayed looking at the Theil index for women earnings. All the Theil indexes are listed with respective standard errors. Between 2000 and 2016 both in aggregate and in each single macro-region, increase in women employment has lowered women' earnings inequality, one of the main determinants of household income inequality.

In order to properly test how the detected increase in women employment affected household income inequality, remains to inquire changes in female earnings contribution to household incomes and how households composition varied over the considered period.

Descriptive statistics on hourly wages ***Tab. 7***

Women	2000	SD	2004	SD	2008	SD	2012	SD	2016	SD
Mean hourly wage					Italy					
1-19	21.0	(39.8)	15.5	(12.5)	18.6	(17.2)	16.7	(21.2)	14.8	(9.7)
20-35	9.8	(4.7)	9.8	(6.2)	9.6	(4.4)	9.1	(5.8)	9.1	(4.0)
36-max	7.9	(3.4)	8.0	(4.2)	8.0	(3.6)	8.2	(5.1)	8.0	(3.2)
All	9.3	(11.3)	8.9	(5.9)	9.2	(6.5)	9.2	(8.4)	8.8	(4.4)
Theil index	0.214	(0.052)	0.149	(0.010)	0.159	(0.013)	0.192	(0.029)	0.104	(0.006)
Correlation hourly wage-working hours	-0.26		-0.28		-0.38		-0.27		-0.32	
N	2513		2502		2481		2327		1835	
Mean hourly wage					North					
1-19	23.0	(54.9)	15.7	(14.2)	19.0	(18.2)	17.3	(20.6)	16.1	(9.5)
20-35	10.0	(4.4)	10.2	(7.3)	9.6	(4.4)	9.4	(6.9)	9.4	(4.0)
36-max	8.2	(3.5)	8.3	(4.3)	8.3	(3.9)	8.7	(5.4)	8.3	(3.3)
All	9.4	(13.2)	9.1	(6.3)	9.2	(6.2)	9.5	(8.1)	9.0	(4.3)
Theil index	0.216	(0.092)	0.146	(0.019)	0.143	(0.017)	0.181	(0.029)	0.091	(0.008)
Correlation hourly wage-working hours	-0.20		-0.23		-0.34		-0.22		-0.31	
N	1328		1383		1372		1171		945	
Mean hourly wage					Central					
1-19	18.5	(32.9)	14.5	(8.4)	20.8	(19.6)	19.0	(31.0)	14.5	(11.3)
20-35	9.3	(5.3)	8.9	(4.2)	9.9	(4.2)	8.9	(4.2)	9.0	(3.7)
36-max	7.7	(2.9)	8.0	(4.4)	8.1	(3.3)	8.3	(5.9)	7.8	(3.0)
All	9.1	(10.5)	8.7	(5.0)	9.9	(8.0)	9.5	(11.3)	8.7	(4.7)
Theil index	0.230	(0.088)	0.133	(0.013)	0.193	(0.031)	0.257	(0.083)	0.113	(0.015)
Correlation hourly wage-working hours	-0.29		-0.30		-0.46		-0.28		-0.36	
N	585		572		499		550		451	
Mean hourly wage					South					
1-19	20.7	(14.5)	16.1	(13.1)	16.0	(12.9)	14.3	(9.0)	13.4	(8.3)
20-35	9.8	(4.6)	9.8	(4.9)	9.3	(4.7)	8.7	(4.4)	8.7	(4.3)
36-max	7.3	(3.5)	7.1	(3.4)	7.2	(3.2)	7.3	(3.1)	7.5	(3.1)
All	9.2	(6.7)	8.4	(5.6)	8.7	(5.8)	8.6	(5.1)	8.4	(4.4)
Theil index	0.192	(0.020)	0.170	(0.020)	0.164	(0.019)	0.146	(0.009)	0.123	(0.011)
Correlation hourly wage-working hours	-0.50		-0.40		-0.42		-0.45		-0.32	
N	600		547		610		606		439	

Source: Own calculation based on SHIW datasets

7.2 Inequality decompositions

Having ascertained equalizing effects that growth of female employment had on individual earnings inequality, then how individual earnings are distributed between households and with what effects on household income inequality will be analysed. To analyse the impact that the increase in women employment has had on household income, changes of female earnings contributions with associated dispersion, correlation with other income sources (men earnings and other income sources) and household composition will be checked.

7.2.a Inequality in household income sources

In tab. 8 squared coefficients of variations with related standard errors can be seen, both total and for single household income sources, concerning the whole of Italy and single macro-regions.

Total household inequality has diminished in all of Italy between 2000 and 2016, both considering inequality measures of income distribution for whole Italy and differentiating between north, centre and south of Italy, but with different trends according to the regions. The major decrease has been recorded in central Italy, immediately followed by south, while in north the drop was not considerable, from (0.293) to (0.272). Nonetheless southern regions still have very high levels of inequality at household level, much more higher than the other two regions (0.448), against (0.272) in north and (0.239) in centre. Central regions are thus the ones in which lowest levels of household income inequality can be found. Reported indexes are significant both in the case of squared coefficients of variation and Theil indexes. Only indexes related to inequality in other income sources distribution in some years are not significant or poorly significant.

Decreasing trends are different depending on the reference area. Whereas north-centre has stood out for important variations, with a strong increase of total inequality in 2004 followed by an even stronger shrinkage in 2008, after which lower swinging movements are recorded for 2012 and 2016, in south changes were not substantial in the observation period, with variations between -0.4% (2004-2008) and -7.5% (2000-2004). Household income inequality in southern regions seems to have had very different patterns with respect to the rest of the country, with constant reductions up to 2012 and instead an increase in 2016, in opposition to what has happened in the rest of the country.

Looking at single household income sources separately, their inequality levels are much higher than when aggregated, confirming another time what stated in Khun and Ravazzini(2017), Atkinson (2015) and D'Alessio and Signorini 2000 about household dimension of analysis importance. Lower inequality in total household income compared with single income sources, conceal the equalizing effect due to aggregation and income pooling within families. In 2000 female earnings were definitely the most unequal income source, both with respect to men earnings and other income sources. Everywhere the difference between inequality in women and men earnings has shrunk, even though with considerable discrepancies. Starting with inequality in men earnings, this has increased by

15.2% considering Italy integrally, but in the case of this income source, to what extent the situation is different across macro-regions can be noted. North, with a 27.1% rise, is the area in which men earnings inequality has increased mostly, followed by centre with a 14.7% growth, while for southern regions has been recorded a risible increase by 2.8%. Related trends, as in the case of total income, follow the same pattern in north-centre Italy, with south on a different pattern. Values of inequality are almost the same between north (1.398) and centre (1.396), while south is around almost double levels (3.080). In any case, differences have not changed between 2000 and 2016. In terms of overall changes, inequality in female earnings has declined all over more or less to the same extent, north -12.0%, centre -8.8% and south -10.4%, not contributing in widen differences between south and the other two macro-areas. The indexes evolution, at first sight, appear to be influenced by fluctuations of women employment patterns due to the business cycle, as can be clearly seen in the case of northern and central Italy in 2012, where there is a drop in employment and a rise in inequality. As already mentioned, the drop in women earnings inequality is due to a lesser working hours variations caused by more working women, increase of working hours by women with few hours and it reflects the lower variations of hourly wages for working women, particularly in the case of part-time working typologies.

Is peculiar how other income sources have varied differently compared to men and women earnings. Other income sources have declined only in south, while in centre-north have increased and in 2016 northern regions have become those with the highest inequality level. Concerning “relative rankings”, other income sources in north during 2016 are distributed similarly to female earnings, (1.385) against (1.398), whilst in centre are set at levels similar to men but lower than women ones. In south, other income sources remain less unequal than female earnings, due to little reduction for this source of income. The decrease of other income sources has had the effect of narrowing total inequality levels between southern and centre-northern regions, even if the difference is still sizeable.

Accordingly to what can be deduced looking at inequality in total household income and in single income sources, being inequality in men earnings grown, it remains to be investigated how much the decline of women earnings inequality due to more participation in the workforce has been able to contribute in total inequality reduction.

It is important to mention that despite what previously stated about the potential dis-equalizing effect that the growth of female employment might have had in southern regions, where greater assortative mating was hypothesized, even in this area the squared coefficient of variation for women earnings and in total household income have dropped. Task of the successive shift-share analysis is gonna be to define more precisely how much of this reduction in total household income is attributable both to women earnings and increased women participation in the workforce at large.

Squared coefficients of variation **T*ab.8***

Year	2000	2004	2008	2012	2016
			Italy		
Total	0.385	0.453	0.355	0.379	0.342
	(0.012)	(0.022)	(0.013)	(0.012)	(0.011)
Men	0.945	1.304	0.975	1.118	1.089
	(0.028)	(0.053)	(0.022)	(0.022)	(0.017)
Women	2.054	2.297	1.740	2.008	1.839
	(0.024)	(0.062)	(0.023)	(0.032)	(0.027)
Other	1.266	1.408	1.609	1.369	1.367
	(0.039)	(0.056)	(0.064)	(0.036)	(0.036)
			North		
Total	0.293	0.357	0.292	0.304	0.272
	(0.013)	(0.024)	(0.015)	(0.013)	(0.012)
Men	0.828	1.204	0.962	1.030	1.052
	(0.024)	(0.062)	(0.030)	(0.024)	(0.022)
Women	1.588	1.732	1.380	1.571	1.398
	(0.033)	(0.062)	(0.032)	(0.042)	(0.036)
Other	1.077	1.341	1.541	1.283	1.385
	(0.049)	(0.083)	(0.067)	(0.048)	(0.052)
			Central		
Total	0.289	0.441	0.250	0.312	0.239
	(0.023)	(0.047)	(0.016)	(0.025)	(0.016)
Men	0.900	1.605	0.991	1.171	1.032
	(0.080)	(0.122)	(0.040)	(0.058)	(0.028)
Women	1.530	2.218	1.440	1.586	1.396
	(0.026)	(0.199)	(0.027)	(0.069)	(0.050)
Other	1.065	1.013	0.950	1.147	1.099
	(0.066)	(0.055)	(0.048)	(0.059)	(0.051)
			South		
Total	0.483	0.447	0.445	0.416	0.448
	(0.030)	(0.036)	(0.043)	(0.024)	(0.032)
Men	1.108	0.946	0.887	1.103	1.139
	(0.080)	(0.057)	(0.038)	(0.038)	(0.042)
Women	3.439	3.604	2.639	3.011	3.080
	(0.036)	(0.057)	(0.026)	(0.038)	(0.027)
Other	1.536	1.606	2.220	1.466	1.259
	(0.091)	(0.108)	(0.300)	(0.089)	(0.055)

Source: Own calculation using INEQFAC and SVYGEI on SHIW datasets

7.2.b Women contribution in household income

Turning to contribution share in household income, tab. 9 indicates that in 2000 women earnings share was lower than other components of household income and instead in 2016 has reached levels similar to other income sources in centre-north, while still accounts for the lowest percentage of household income in south, despite improvements. Men earnings remain the main income component but women earnings contribution has increased across all Italian regions, even with differences between north-centre and south. The share gained by women earnings in relative terms has gone to the detriment of other income sources, while men earnings have lost only few percentage points. In north the increase has been of 7.4% against a loss of 5.9% by other income sources, situation very similar to the central regions one. Even in this case south has proven to be an isolated case, with no drop in men earnings but anyway having recorded a minor increase of women earnings contribution. Increases of women earnings contribution in household income are due to more working women present into the workforce and more working hours considering all women in datasets. Paying attention to the parallelism between share growth and increase of women into the workforce, is clearly observable that major rise in contribution have been in correspondence of major increase of employment. Men earnings contribution seems to have been more stable despite greater swings in employment.

Income share in percentage ***Tab.9***

Year	2000	2004	2008	2012	2016
			Italy		
Men	43.6	43.6	41.8	40.1	42.0
Women	20.2	22.5	23.5	23.8	26.3
Other	36.1	33.9	34.7	36.2	31.6
			North		
Men	41.4	41.5	39.9	39.0	39.7
Women	21.9	24.7	25.7	26.3	29.3
Other	36.6	33.7	34.5	34.6	30.9
			Central		
Men	42.6	42.8	39.4	37.2	39.1
Women	20.3	21.2	22.6	23.5	27.4
Other	37.1	36.0	38.0	39.3	33.5
			South		
Men	49.3	49.6	47.9	44.5	49.2
Women	16.5	18.3	19.5	19.2	19.6
Other	34.2	32.0	32.5	36.3	31.2

Source: Own calculation using INEQFAC on SHIW datasets

Addressing H6, is it possible to confirm the hypothesis because women contribution in household income has increased. This although it is not possible to determine with certainty if this has been equalizing or not without apply the shift-share analysis, given that as already seen, this income source is more unequal than men earnings and women earnings distribution among various families needs to be taken in consideration.

7.2.c Correlations

Tab. 10 reveals that despite correlation between men and women earnings is negative or uncorrelated everywhere, considering only couples is possible to notice the presence of a positive correlation caused by assortative mating. This difference as already underlined in Khun and Ravazzini (2017) is attributable to the presence of single households and households with children contributing to household income.

Correlation between income sources ***Tab.10***

Year	2000	2004	2008	2012	2016
			Italy		
Women/Men	0.02	-0.04	-0.09	-0.08	-0.17
Other/Men	-0.13	-0.12	-0.18	-0.16	-0.17
Other/Women	-0.01	-0.04	-0.06	-0.04	-0.04
Women/Men couple	0.30	0.27	0.24	0.24	0.23
			North		
Women/Men	-0.02	-0.08	-0.16	-0.15	-0.24
Other/Men	-0.16	-0.15	-0.18	-0.17	-0.18
Other/Women	-0.09	-0.12	-0.14	-0.09	-0.11
Women/Men couple	0.33	0.20	0.20	0.20	0.19
			Central		
Women/Men	-0.03	-0.07	-0.09	-0.11	-0.26
Other/Men	-0.19	-0.12	-0.25	-0.17	-0.23
Other/Women	-0.11	-0.07	-0.12	-0.12	-0.08
Women/Men couple	0.25	0.32	0.20	0.18	0.23
			South		
Women/Men	0.01	-0.02	-0.04	-0.03	-0.04
Other/Men	-0.17	-0.18	-0.21	-0.25	-0.15
Other/Women	0.06	0.01	0.03	0.02	0.01
Women/Men couple	0.16	0.25	0.25	0.22	0.23

Source: Own calculation using INEQFAC on SHIW datasets

Surprisingly north-central Italy had a stronger correlation with respect to south, but if in the former it has diminished overtime, following a negative time trend, in the latter it has intensified. As confirmation of what already seen for percentages of employment and mean weekly working hours by household income quintiles, for which employment and working hours have increased more in higher income quintiles, in southern Italy assortative mating may has intensified and in 2016 is definitely more present than in the rest of the country. The presence of assortative mating in Italy was confirmed even in Rossetti and Tanda (2000), Del Boca, Locatelli and Pasqua (2001), Del Boca and Pasqua (2002), Pasqua (2008).

Anyway, Looking at correlation does not allow to understand whether, both in the case of north-central Italy where earnings correlation between spouses has reduced and in south where it has intensified, the added worker effect could have been predominant in female participation increase for couple households.

Regarding instead men and women earnings correlations with other income sources, these have been steady or have experienced minor changes.

Comparing these results with those reached by Del Boca and Pasqua (2002), always taking into account that in their analysis only couple households were considered and division by regions was done differently, is possible to grasp insights about the way in which women earnings contribution in household income has changed. Over an observation period of 22 years (1977-1998) women earnings share in household income in Italy grew by 6.7 percentage points, with respect to an increase of 6.1% between 2000 and 2016. The authors reported a poor increase in the second decade of their interest (89-98), in the range of 1-2 percentage points, despite women employment continued to grow. The cause was identified in the widening difference between male and female earnings and family wage gap, two aspects not processed in the present research. What can be deduced by the comparison is only that with respect to the period before 1998, women earnings share in household income has grown more substantially. Concerning inequality in income sources, that of women earnings has continued to drop but at a lower annual rate, -0.6% against -2.2% of the previous period, while inequality in men earnings has continued at 0.8% annual growth rate.

In conclusion, women earnings contribution to household income has increased but is still a more unequal income source with respect to men earnings and with assortative mating still present, so whether an increased women employment has had equalizing effect remains an open question. To properly test how and to what extent this higher women earnings contribution due to more working women has managed to offset growing inequality in men earnings and has affected household income distribution across Italian regions, a shift-share analysis has been applied to the decomposition by income sources.

7.2.d Shift-share analysis

On a technical level, being results influenced by selected years, time intervals assessed are 2000-2016, 2000-2008 and 2008-2016. Such a choice is due to the need of showing how the impact has been over the entire period of observation, both distinguishing years prior 2008 and the sovereign debt crisis wit those immediately after.

In tab. 11 values for CV_y^2 have been reported in base year t0 and under several assumptions in t1. In t1 total inequality will be calculated leading one or more decomposition components from base year to values recorded in t1, leaving the others unchanged. The shift-share analysis has been applied only to decomposition components linked to women participation, in order to isolate their effect from other components. For each counterfactual distribution, percentage variations by base year are also indicated and in conclusion the actual percentage of variations in CV_y^2 explained by changes of decomposition components relative to female labour income.

Under the first assumption, only women earnings inequality reach t1 level and other decomposition components are unchanged (CV_f to t1). Counterfactual distributions are similar both in aggregate and for single areas even with different percentage changes since t0. For Italy the squared coefficient of variation has decreased by 2.3% between 2000 and 2016, with similar values for regional areas. Deserving a mention is the fact that only in central Italy the index has declined in 2008-2016 while has worsened in north and south as could be expected given women earnings inequality movements referred above. Even if changes of inequality in female earnings over the whole period have been equalizing, in northern and southern Italy after 2008 have fostered inequality in household income irrespective of other components.

The scenario in which only correlation between women earnings and other components of household income reach t1 level (ρ_f to t1) reduce total inequality in all areas for all time span. Only in central Italy the squared coefficient of variation decreases much more in 2008-2016 (10.9%) than in 2000-2008 (5.4%) while the opposite happen in north (13.4) to (3.2) and south (4.8%) to (0.9%). Consequently, changes occurred in correlations between income sources within households have had equalizing effects.

The third assumption (S_f to t1) involves that only value of female earnings share in household income reach t1 values. In this setting all counterfactual distributions are more unequal in t1 with respect to t0, due to higher level of women earnings inequality compared to men earnings and other income sources in certain cases and periods.

The last assumption shows the level of total household inequality varying at t1 all the decomposition components through which an increase in female employment can affect household income, but keeping unchanged those related to men earnings and other income sources. Considering Italy altogether, squared coefficient of variations has dropped between 2000 and 2016 by 3.2%, a decline amounting to 20.3% of the actual decrease in total household income inequality which can be attributed to components related to female participation in the workforce. Splitting in two time span is it possible to note how actually there is a decline only in 2000-2008 (4.4%), while in the following

period inequality measures even goes up by 0.9% and in this last case female income related decomposition components explain 57.8% of inequality increase.

Shift-share analysis ***Tab.11***

Changes between	2000 - 2016		2000 - 2008		2008 - 2016	
	CV	change since t0	CV	change since t0	CV	change since t0
			Italy			
CV_y^2 t0	0.385		0.385		0.355	
CV_f to t1	0.376	-2.3%	0.372	-3.4%	0.360	1.2%
ρ_f to t1	0.334	-13.1%	0.346	-10.1%	0.344	-3.2%
S_f to t1	0.443	15.3%	0.414	7.7%	0.375	5.5%
CV_f-ρ_f-S_f to t1	0.372	-3.2%	0.368	-4.4%	0.359	0.9%
CV_y^2 t1	0.342	-11.2%	0.355	-7.6%	0.342	-3.9%
Δ explained		28.3%		57.8%		-23.9%
			North			
CV_y^2 t0	0.293		0.293		0.292	
CV_f to t1	0.285	-2.6%	0.285	-2.9%	0.292	0.2%
ρ_f to t1	0.245	-16.5%	0.254	-13.4%	0.282	-3.2%
S_f to t1	0.345	17.9%	0.317	8.3%	0.309	5.9%
CV_f-ρ_f-S_f to t1	0.274	-6.4%	0.274	-6.5%	0.289	-1.0%
CV_y^2 t1	0.272	-7.3%	0.292	-0.5%	0.272	-6.8%
Δ explained		88.1%		1356.3%		14.9%
			Central			
CV_y^2 t0	0.289		0.289		0.250	
CV_f to t1	0.285	-1.5%	0.286	-1.0%	0.248	-0.6%
ρ_f to t1	0.248	-14.3%	0.274	-5.4%	0.223	-10.9%
S_f to t1	0.332	14.8%	0.301	4.1%	0.276	10.2%
CV_f-ρ_f-S_f to t1	0.263	-9.2%	0.283	-2.1%	0.230	-7.8%
CV_y^2 t1	0.239	-17.5%	0.250	-13.6%	0.239	-4.5%
Δ explained		52.7%		15.3%		173.7%
			South			
CV_y^2 t0	0.483		0.483		0.445	
CV_f to t1	0.472	-2.2%	0.459	-5.0%	0.462	3.7%
ρ_f to t1	0.456	-5.6%	0.460	-4.8%	0.441	-0.9%
S_f to t1	0.524	8.4%	0.523	8.3%	0.445	0.0%
CV_f-ρ_f-S_f to t1	0.492	1.8%	0.475	-1.6%	0.461	3.6%
CV_y^2 t1	0.448	-7.3%	0.445	-7.9%	0.448	0.6%
Δ explained		-24.9%		20.7%		556.5%

Source: Own calculation and coding applied on SHIW datasets

Diversifying by single areas, in northern and central Italy CV_y^2 has diminished both before and after 2008 and the fact that decomposition components linked to female income explain 88.1% of household income inequality reduction between 2000 and 2016

in north and 52.7% in central Italy must be underlined. At the opposite in southern Italy over 2008-2016 the inequality index value has risen by 3.6%, with a 24.9% share of this increase that can be attributed to female income related decomposition components.

Changes in women earnings inequality have been useful to reduce total household income inequality only prior to 2008 while inequality is grown in the successive six years. Nevertheless through the entire observation period it has contributed in reducing inequality at household level. The very same correlation between women earnings and other sources of income has contributed in lowering total inequality, even in south, where effects of a major assortative mating have been detected, indication that the importance of this feature is slowly but progressively diminishing even in this region. Despite improvements, female earnings are still more unequal than men one but the most significant overall result of this analysis is that changes associated to female earnings due to more female employment has compensated the growing inequality in men earnings and have been crucial in household income inequality reduction in Italy.

Southern Italy after 2008 is the exception, in this area the decline of inequality in women earnings has not been enough to counteract the growth identified in correlation between spouses earnings mainly after 2008, despite the increase in inequality of men earnings was minor.

Can be established that only in northern and central regions added worker effect could have been superior to assortative mating. Nevertheless, from the decomposition by income sources and the shift-share analysis is not possible to understand the real extent of added worker effect for couple households and to what extent inequality has declined due to changes in household composition. A greater presence of single households to the detriment of couple households may have reduced assortative mating importance in determining how more female employment affects household income distribution. Given the observed reduction of correlation between men and women earnings, this aspects will be assessed in the decomposition by population groups and its counterfactual analysis.

7.2.e Inequality within and between groups

To investigate the state of inequality both within and between different household types and how it has varied over time, a decomposition by population groups has been performed. This as made possible to look at the relationship between growth in women employment and household composition changes, for example if there was an increase in one or more household types. Moreover if part-time have been a vector of inequality in the Italian case or otherwise like the Switzerland one will be tested.

In tab. 12 main decomposition components are presented: the share of each household type, its average income and within-group inequality. 2000 and 2016 are the only considered years. If not explicitly stated, results are supposed to be significant at 95% confidence level. Numerical classification reported in tables and relative to household types is the one described into the section about data. As an important remark, average incomes are reported as relative means for a better readability and interpretation.

Looking at Italy, the quantity of inequality explained by the twelve household types has not varied, it amounted to 14.1% in 2000 and 13.7% in 2016. Differentiating by macro areas there are significative disparities, with southern regions showing between groups level of inequality much more higher, 19.1% in 2016 against 7.8% in northern regions and 13.5% in centre. Even across regions these levels have remained rather stable over the considered period. Inequality is mostly within households types, even considering the higher value in south.

The three different types of single households, namely single men (1), single women (2) and single mothers (3) are those whose share has increased more in Italy between 2000 and 2016. The trend has been common for all three geographical reference areas, even though in southern regions the presence of single households is lower than in north and central Italy. H3 is confirmed, Italy as a country characterized by a marked presence of traditional households (Del Boca and Pasqua, 2002) until the 2000's, has had a relevant increase of single households, as confirmed in EUROSTAT (2015), resembling much more northern European countries. Is it possible to identify share more than doubled for these household types as an issue related to female employment growth (excluding single men). Observing inequality levels and average household income is therefore critical.

Strikingly, the larger presence of (1) and (2) has not increased household income inequality, since their income levels and within-group inequality are very close to average level, especially in 2016. Instead, as confirmed in literature (Western et al., 2008; Kollmeyer, 2012; Khun and Ravazzini, 2017) single mothers (3) is an household type marked by income below the average (notably in southern regions) and high inequality. Their increase has therefore fostered household income inequality expansion in whole Italy.

Switching to couple households observation, male-breadwinner couples (5), the most present typology in 2000 everywhere, has experienced a strong reduction all over, even if in south with a 19.5% share is still the main household type. Full-time working couples (8) as well, from a very high share in northern and central Italy, mainly in the former with a 17.6%, are greatly diminished. This group already in 2000 was less present in south and its reduction has been lower, from 7.8% to 5.7%. Both couples with full-time working man and part-time working woman (6) and couples with full-time working woman and part-time working man (7) have maintained the same share in the whole Italy, with (7) that was and continued to be marginal. The declining presence of these household types has involved different effects on inequality at household level. Reduction of (5) has contributed to a more equal distribution of household income, considering that its average income has been around 0.7 ≈ 0.8 times the aggregated average household income and inequality levels have been higher than the aggregated one everywhere. Differently, if it has been the same for full-time working couples (8) remains unclear, given that this group shows high level of mean income compared to the average one (1.7 times in south) but very low within-group inequality. Effects of a bigger share for groups (6) and (7) are not easy to be interpreted, being relative income higher than the average but with

within groups inequality levels lower than aggregated values. households in which women work part-time have become more equal even because of lower variations in hourly wages recorded for small part-time work and higher part-time work.

Focusing on differences between part-time and full-time, because of the divergences in income and within-group inequality across regions and over years, the mere observation of decomposition components is not enough to determine whether and to what extent a switch from part-time to full-time would affect household income inequality. For this reason a counterfactual analysis has been carried out as already explained, which results are provided below.

Concerning other categories, households with adult dependent children (10) have become more common, especially in the south where they went up from 10.9% to 15.0%. Stronger presence of this group has not implied dis-equalizing effects, being its income level and within-group inequality around average in all regions. Instead, households with children contributing in household income (11) have become less common, halving their presence in Italy, from 10.8% to 5.7%. A change which effect is not clear, having an average income 1.2 ≈ 1.3 times higher than the average one almost everywhere and inequality level under the aggregated one.

Southern Italy looks different from the rest of the country even in terms of household composition. It has been an area characterized by strong presence of traditional male-breadwinner households, but even of couples with either spouses working part-time or not working. Both households types that have become less common, but are still more present here than in north or centre. Also households in which a spouse works part-time and the other full-time are less present with respect to the rest of Italy. These three household types show both internal inequality and mean income levels different to other regions. On these grounds different results in the counterfactual analysis performed only for southern regions can be expected.

Major socio-demographic changes occurred in Italy between 2000 and 2016 have resulted in single households increase and male-breadwinner ones reduction. This aspect has been equalizing but in any case inequality is mainly within groups, making these changes less important in terms of household income inequality effects.

Theil index decomposition by household types ***Tab.12***

Household type	Population share	Population share	Average income	Average income	Theil	Theil
Year	2000	2016	2000	2016	2000	2016
			Italy			
(1)	0.055	0.143	1.160	1.069	0.162	0.157
(2)	0.053	0.119	1.045	1.005	0.141	0.147
(3)	0.023	0.044	0.734	0.719	0.255	0.245
(4)	0.017	0.020	1.016	1.381	0.133	0.168
(5)	0.203	0.134	0.720	0.773	0.188	0.151
(6)	0.073	0.071	1.194	1.211	0.103	0.091
(7)	0.007	0.006	1.311	1.111	0.140	0.116
(8)	0.136	0.100	1.300	1.388	0.092	0.071
(9)	0.126	0.101	0.883	0.801	0.244	0.232
(10)	0.067	0.083	0.776	0.767	0.185	0.167
(11)	0.108	0.057	1.261	1.277	0.097	0.079
(12)	0.133	0.122	0.969	0.951	0.128	0.149
Aggregated	100.000	100.000	1.000	1.000	0.169	0.163
% Between groups inequality					14.087	13.689
			North			
(1)	0.070	0.167	0.974	0.979	0.152	0.153
(2)	0.068	0.138	0.962	0.969	0.119	0.121
(3)	0.025	0.052	0.743	0.717	0.260	0.198
(4)	0.021	0.025	1.013	1.305	0.099	0.133
(5)	0.143	0.099	0.772	0.818	0.169	0.210
(6)	0.085	0.086	1.083	1.075	0.100	0.076
(7)	0.008	0.006	1.221	1.378	0.088	0.043
(8)	0.176	0.131	1.178	1.237	0.086	0.062
(9)	0.116	0.082	0.952	0.883	0.195	0.149
(10)	0.039	0.041	0.956	0.970	0.125	0.111
(11)	0.132	0.065	1.115	1.108	0.075	0.070
(12)	0.118	0.110	0.959	0.977	0.087	0.120
Aggregated	100.000	100.000	1.000	1.000	0.128	0.131
% Between groups inequality					7.209	7.830
			Central			
(1)	0.060	0.136	1.242	1.056	0.135	0.110
(2)	0.050	0.136	0.899	0.984	0.099	0.105
(3)	0.024	0.047	0.711	0.744	0.079	0.201
(4)	0.014	0.019	0.976	1.285	0.072	0.184
(5)	0.163	0.104	0.775	0.774	0.136	0.068
(6)	0.091	0.096	1.076	1.071	0.093	0.075
(7)	0.006	0.004	0.927	0.816	0.036	0.070
(8)	0.146	0.106	1.202	1.283	0.069	0.065
(9)	0.110	0.096	0.877	0.820	0.147	0.139
(10)	0.055	0.060	0.822	0.856	0.103	0.100
(11)	0.112	0.055	1.245	1.361	0.121	0.059
(12)	0.169	0.141	0.967	0.961	0.098	0.108
Aggregated	100.000	100.000	1.000	1.000	0.123	0.114
% Between groups inequality					12.682	13.471
			South			
(1)	0.032	0.116	1.392	1.197	0.212	0.185
(2)	0.036	0.084	1.209	0.938	0.210	0.197
(3)	0.019	0.033	0.653	0.552	0.265	0.272
(4)	0.014	0.015	0.862	1.468	0.123	0.212
(5)	0.304	0.195	0.789	0.856	0.168	0.093
(6)	0.046	0.036	1.435	1.578	0.102	0.164
(7)	0.008	0.008	1.790	0.999	0.226	0.063
(8)	0.078	0.057	1.431	1.675	0.104	0.099
(9)	0.148	0.128	0.845	0.778	0.264	0.315
(10)	0.109	0.150	0.807	0.810	0.166	0.150
(11)	0.074	0.050	1.473	1.509	0.112	0.094
(12)	0.132	0.127	1.016	0.923	0.165	0.156
Aggregated	100.000	100.000	1.000	1.000	0.202	0.199
% Between groups inequality					17.350	19.109

Source: Own calculation using INEQDECO on SHIW datasets

7.2.f Counterfactual analysis

The decomposition by population groups alone has not enabled to test effects on household income inequality of an increase of participation in the form of part-time work and even differences between this and full-time. For this purposes, as already explained in the section about decomposition methods, a counterfactual analysis of the decomposition by household types has been computed, which results are reported in tab. 13. Each counterfactual has been computed both for Italy and macro-regions, in order to take into account socio-demographic differences between north, central and southern Italy. From a methodological point of view, the analysis has been performed for 2000 and 2016, simulating the transition of all households belonging to a group in another one. Population share is the only decomposition component that has been changed, whilst within-group inequality and mean incomes were left as in the factual situation.

In the first counterfactual the employment for all inactive men belonging to a female-breadwinner households has been simulated. In 2000 the Theil index has dropped only in central Italy by less than a percentage point, thus in this year more part-time work can be assumed dis-equalizing. At the opposite in 2016 the Theil index has declined in all regions, with the stronger percentage decrease (-11.2) in central Italy.

Simulating that instead inactive women in male-breadwinner households enter the labour force with a part-time job, second counterfactual, household income inequality has increased sharply both in 2000 and in 2016 in all regions. The highest recorded values is in southern Italy in 2000, with a plus 107.9%.

In the third counterfactual women working part-time with a partner in a full-time job switch to a full-time work either. In this case the effect is more towards inequality in aggregate, but in southern Italy inequality is unchanged.

In the last counterfactual, this time men working part-time with a partner working full-time switch to a full-time job. In this case the Theil index reaction across regions is quite different. In northern Italy inequality has dropped by less than a percentage point both in 2000 and 2016, in central Italy it rise by 1.8% in 2000 and 1.7% in 2016, while in southern it has diminished by 2.9% in 2000 but it has risen by 3.8% in 2016.

The counterfactual analysis does not consider changes of mean income and within-group inequality due to higher share of population in a group, assuming that all individuals who switch to another household type will have the same mean earning of the final group. It is an approximation of a real socio-demographic change, but that the Italian case for part-time is different to the swiss one can be deduced. Despite regional differences, in the overall Italian context and with previously mentioned conditions (namely without changes in mean income and within-group inequality), part-time would be beneficial only for inactive men with a full-time working partner. Inactive women with full-time working partner instead would benefit only entering the workforce with a full-time job. Concerning switching from part-time to full-time in the case of an individual working part-time with a full-time working partner gives back mixed results. Part-time classification employed in Italy by official statistics and public authorities, where in contrast to Switzerland is

considered part-time a range of working hours spanning from 1 to 35 per week, affects inequality in this group. A feature that could have affected results for women part-time employment to some degree.

Counterfactual analysis ***Tab.13***

Year	2000	Δ%	2016	Δ%
		Italy		
Theil index	0.169		0.163	
(4) to (7)	0.175	3.873	0.154	-5.315
(5) to (6)	0.257	52.309	0.219	34.867
(6) to (8)	0.178	5.423	0.178	9.137
(7) to (8)	0.168	-0.337	0.165	1.123
		North		
Theil index	0.128		0.131	
(4) to (7)	0.133	3.875	0.130	-0.355
(5) to (6)	0.165	29.526	0.146	11.551
(6) to (8)	0.136	6.565	0.146	11.842
(7) to (8)	0.127	-0.335	0.130	-0.689
		Central		
Theil index	0.123		0.114	
(4) to (7)	0.122	-0.943	0.101	-11.225
(5) to (6)	0.167	35.960	0.145	27.140
(6) to (8)	0.134	9.338	0.138	21.064
(7) to (8)	0.125	1.797	0.116	1.722
		South		
Theil index	0.202		0.199	
(4) to (7)	0.222	9.809	0.187	-6.021
(5) to (6)	0.421	107.879	0.400	101.333
(6) to (8)	0.202	-0.093	0.201	0.947
(7) to (8)	0.196	-2.942	0.206	3.770

Source: Own calculation and coding applied on SHIW datasets

8. Conclusions

Research and analysis carried out in this paper have contributed to understand how after 1998, last year covered in Del Boca and Pasqua (2002), changes in women' workforce participation and in household types have affected inequality at household level in Italy.

Female participation in the labour force has continued to grow but slower than in 1977-1998 period. In southern Italy where female employment levels were already lower compared to north and central regions, the growth has been smaller resulting in greater differences with these regions. Male employment has been more sensitive to the business cycle, managing to recover from financial and sovereign debt crisis only in 2016. Despite women have reached men' educational attainment and are more present at undergraduate and postgraduate level indeed, are still disadvantaged in the transition to paid work. Therefore more equality in education has failed in ensuring that the transition to paid work took place to the same extent both for women and men. Despite

improvements, in 2016 women still do not contribute in the productive system to the same extent of men, notably in southern regions and islands.

Female employment increase has had equalizing effects both on women individual earnings inequality and for dispersion of women earnings contribution in household income. These equalizing effects are due to a lesser working hours variations caused by more working women, increase of working hours by women with few hours and they reflects the lower variations of hourly wages for working women, particularly in the case of part-time working typologies. That some determinants of inequality at household level have not been relevant for the Italian case, notably working hours-hourly wage correlations, must be underlined.

Results provided by the shift-share analysis demonstrate that changes in women earnings inequality have contributed to household income inequality reduction only before 2008 while those of correlations between women earnings and remaining income sources have always been equalizing. Concerning correlations between men and women, this was due to lower correlation of partners' earnings and a smaller share of couple households. Even in southern Italy where correlation between spouses' earnings increased, a smaller number of couple households has contributed in decreasing correlation between women earnings. The overall effect inclusive of changes in household income contributions, enables to state that in addition to counteracting the increase of men earnings dispersion, most of household income inequality decline can be attributed to female participation growth, except in southern Italy after 2008.

The main Italian socio-demographic change that occurred alongside to women employment increase has been the reduction of male breadwinner households and increase of single households. Despite what assumed in Khun and Ravazzini (2017) and in literature, this change has had equalizing effect on household income distribution.

Even if this research shows clear equalizing effect for the growth of female labour force participation in general, entering the workforce with a part-time job in the case of couple households where one partner works full-time and the other one does not work would be beneficial only in the case of non-working men (female breadwinner households). Non-working women with a full-time working partner (male breadwinner households) instead would lower inequality only entering the workforce with a full-time job. Concerning switching from part-time to full-time in the case of an individual working part-time with a full-time working partner gives back mixed results depending on reference years and areas.

While norther and central Italy seem to be more similar in 2016 than in 2000, differences among them and southern regions have widen. In a seventeen years time span in terms of employed women and share of income sources in household income, differences across northern and central regions are dropped remarkably. As for the case of percentage of employed men, differences are no longer existing. The same correlations between income sources, are very similar even though there is a more evident presence of single households in north. Southern regions, besides having a different household composition, with a considerable presence of male-breadwinner households, have been

different in terms of employment and inequality patterns with respect to the rest of the country. Men' employment is below north-centre levels too and despite the increase of the female one, the share of women earnings contribution to household income has remained the lowest of Italy. Thanks to both individual and household level analysis, it has turned out as the only region in which the detected trend for assortative mating could have been positive and in 2016 is definitely more present than in the rest of the country. Although the potential dis-equalizing effect that the growth of female employment might have had in this macro-region, inequality of women earnings and in total household income has dropped. Correlation of spouses' earnings has in fact increased but due to the larger number of single households, it has become less important and that explains women earnings inequality reduction and consequently even the equalizing effect of female employment before 2008. Here contrary to other regions, only before this date household income inequality reduction can be attributed to the growth of female participation, while after it has been a contributing factor. In this area the decline of total household income inequality is partially due to non-increase of men earnings inequality, but mainly to inequality of other income sources reduction and male-breadwinner households shrinking. Notwithstanding south has still in 2016 highest total inequality level compared to other regions.

For all the reasons listed above, is it possible to claim that regional differences already identified up to 1998 are considerably decreased only between north and centre, while have become aggravated among them and south of Italy. H7 Cannot be confirmed.

As already stated with respect to the period before 1998, female participation growth has slowed down but women earnings share in household income has grown more substantially. Concerning inequality in income sources instead, that of women earnings has continued to drop but at a lower annual rate while trends of men earnings inequality have continued to be positive and steady. Therefore with regard to the period prior to 1998 women employment has grown less but women contribution has risen significantly. At the basis of this difference, the reason of the low increase of women contribution between 1989 and 1998 was attributed to the widening difference between male and female earnings and family wage gap, two issues not considered by this research. However it remains possible that the greater increase of women earnings contribution after 2000 is due to the working hours increase for already working women in this period, for which a comparison is not possible since heterogeneity in working hours was not considered in Del Boca and Pasqua (2002). The possibility that there has been a declining gap between male and female wages is not excluded anyway.

So, despite female employment growth in Italy appears to have slowed down, compared with the 1977-1998 period, has continued to increase and it has been able to decrease household income inequality. Definitely the moderation of women earnings inequality decline after 1998 can be a possible clue that the female work equalizing effect on household income is reaching a plateau, however there is lack of evidences supporting this conjecture. Given also the gap between percentages of men and women employment, confirm or reject the last hypothesis H8 is not possible.

In order to understand if the Italian case is following the same course as the Switzerland one and whether there are common trends governing the growth path of female employment for all countries, more in-depth comparative studies are necessary.

About limits of this research, in addition to already mentioned limits about counterfactual analysis, whose simulations are just an approximation of a real socio-demographic change, other limits related to achieved results and findings can be identified. For instance household income has been adjusted for household size and composition through the modified OECD scale in order to consider income pooling and sharing within households, but real capabilities of the household members are not considered at all. As for the case of people with handicaps within a family, needs of such individuals are greater for the same amount of income and it would be appropriate taking into account such situations in adjusting household income. Moreover, the decision of not constituting a group for LGBT households in the household types for the decomposition by population groups, due to the low number of those within datasets places a limit, being this types of households actual and therefore not to be neglected. At last the choice of part-time classification in two groups, small and higher, has affected results of the analysis on working hours and hourly wages at individual level. In any case considering for the first time heterogeneity in working hours in the Italian case has made possible to deepen the analysis about employment changes impact on household income.

Both descriptive statistics and decompositions are confined in analysing snapshots with related trends, do not address the structural causes of increase or decline of inequality. In the context of this research have been addressed only partially and at theoretical level those related to the possibility of women working hours increase, participation in the work force and then in the productive system. The causes underlying the growth of female participation in Italy, assortative mating variations and household types changes should be probed in order to grasp a better comprehension of these and understand what has distinguished certain areas.

In conclusion, results of this paper beyond confirming further the equalizing effects of an increase of female participation in the workforce, has raised research hypotheses for the future which make the case for comparative studies.

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