Gender Culture and Gender Gap in Employment

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Abstract

This paper analyzes to what extent gender culture affects gender gap in employment. Drawing on Italian data, we measure culture by building two indices: one based on individual attitudes, as done in the existing literature; one based on firms' attitudes. Firms' beliefs, which express their set of ideas, values and norms, though generally neglected, are as important as individuals' attitudes to explain female labor market outcomes. Using an instrumental variable analysis, we show that our index of gender culture based on firms' attitudes is significant in explaining gender gap in employment in Italian provinces. We show that the same holds when culture is measured with reference to individual attitudes.

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1. Introduction

The question of whether culture plays a role in determining economic outcomes is receiving growing attention in the economics literature. The working definition of culture proposed by Guiso, Sapienza and Zingales (2006) identifies it with "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation". One of the most used approaches to test the relationship between culture and economic outcomes is to draw on survey-based evidence and to measure culture directly referring to the beliefs or attitudes expressed by individuals on a series of issues. This is done for instance in Fernandez (2007a), Tabellini (2007), Alesina and Giuliano (2007), Giuliano (2007), who, relying on data from the World Value Survey,[1] find that culture is significant in explaining respectively female labor force participation, economic development, family ties and family arrangements.

In this paper we investigate how culture affects a measure of gender gap in employment. Indeed, one of the main issues for which culture may be crucial concerns the view on women's and men's roles in society, on their responsibilities in the family context, on their position in the labour market and the social evaluation attached to these positions. These aspects are captured in the definition of gender culture proposed by Pfau-Effinger (2000). Gender culture may influence female versus male labour market participation, education decisions, career prospects or fertility.

To measure culture we build two indices based on firms' and individuals' attitudes, respectively. While individuals' attitudes have been used in previous research, although not in the context developed here, firms' attitudes are – as far as we know – first introduced in this paper.[2] The role of firms and firms' beliefs in determining gender gaps in occupation and wages has recently been stressed in the theoretical literature (see for instance Francois, 1998 and Bjerk and Hahn, 2007). Our focus enriches the previous studies on gender culture and economic outcomes by explicitly allowing for a role of firms, whose set of ideas, values and relative norms may differ across time and space. When culture is measured looking at the beliefs of a firm, we will refer to it as *firm's culture*. When it is measured looking at individual preferences or attitudes, we will refer to it as *individuals' culture*. We argue that culture influences both firms' and individuals' behavior in the labor market. In particular, it may affect the firms' decision to hire a woman rather than a man and the labour supply decision within the household, thus influencing the gender gap in employment.

We focus on Italy which is an interesting case to investigate, given the large heterogeneity in female employment rates within the country: the female employment rate in 2007 ranges from 56.8% of the

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[1] For a survey of the different approaches developed to assess the influence of culture on economic outcomes, especially the epidemiological one, see Fernandez (2007b).
[2] Guiso, Sapienza and Zingales (2007) focus on managers and look at the issue of trust and trustworthiness.

women aged 15-64 in the North, to only 31.1% in the South. The variation for male is smaller, with the 2007 male employment rate equal to 76.3% in the North and 62.2% in the South, suggesting that differences in employment levels across regions are not solely driven by differences in unemployment, demographics or other non-gender related features. Culture is often proposed as one of the possible causes of these differences but no rigorous analysis has been done so far on the issue.

We compute firm's culture using data on a large sample of Italian private firms related to their intentions to hire workers (Indagine Excelsior, Unioncamere). Firms are asked, among other things, whether they prefer to hire a man, a woman or whether they are indifferent. We focus on the percentage of positions for which the firm declares to prefer hiring a man over the total number of open positions and we call this percentage the "firm's culture": obviously, a higher value of this measure implies a lower firm's gender culture. Notice that this type of information is a unique opportunity to study the role of firms' preferences, since surveys at the firm's level do not generally include this explicit question. As a consequence, Italy becomes a unique laboratory to be explored and the interest of the analysis goes beyond that of a country study.

To measure the differences in employment between men and women we use the ratio of employed women over the total number of employed workers. In the analysis we refer to this ratio as to a measure of gender equality in employment. The higher the ratio, the higher is the gender equality.[3] This measure of gender equality varies largely within the country, as firm's culture does, suggesting that the two may indeed be related.

The issue of a possible causality from culture to employment is more complex and we address it using instrumental variables. The instrument we choose is the ratio between the female and the male literacy rate in 1911 in Italian provinces as a long-term determinant of the environment where firms take their current decisions, which is however not related with the ratio between female and male employment in 1911, as we will show.

We find that the firm's culture is significant in determining the differences in the ratios of employed women over the total number of employed workers across Italian provinces, even when we introduce a series of control variables that are possibly correlated with both gender equality and firm's gender culture (distribution of part-time jobs, percentage of firms in the service sector and percentage of large firms, education, availability of child care services, fertility rates, average salary level). In the North, fewer positions are declared to be preferably allocated to men: this contributes to deliver the higher gender equality in employment we observe in the North rather than in the South.

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[3] In the next section we will provide a more rigorous description of how we obtain this measure of gender equality in employment.

We also perform our analysis using the more standard definition of culture based on individual preferences. Namely, we build a gender culture index based on the answers to some questions asked by the World Value Survey which are related to the satisfaction of women working in the market rather than staying at home, to the well-being of children with working mothers and to the relative rights of men and women to paid jobs when the latter are scarce. This database on Italian provinces has not been used before to address these issues. Again, the answers differ substantially across Italian provinces. Our regression analysis with instrumental variables confirms that indeed culture plays a role in determining the different employment results across the country.

The paper is organized as follows: in Section 2 we focus on Italy and provide descriptive statistics on female employment and on culture. In Section 3 we present the empirical strategy. Section 4 and 5 present the results and the sensitivity analysis when, respectively, gender culture is measured looking at firms and at individuals. Section 6 concludes.

2. Gender equality in employment and culture in Italy

Italy is an interesting case to analyze the impact of culture on women's occupations and on the gender equality in employment. First of all, the low average female employment rate is a crucial feature of the Italian labour market and one which has attracted the attention of the policy makers in the last years, both with respect to the (far-away) 60% Lisbon target on female employment, and with reference to the more general strategies to trigger a re-launch of the growth process. Second, the heterogeneity in female employment rates within the country is huge, with the North showing values close to the EU average and on an increasing trend (around 55% in 2003, 57% in 2008) and the South lagging permanently behind (at around 31% both in 2003 and in 2008). Although this heterogeneity is in line with the higher unemployment in the South, it may not depend entirely on it. In fact, when we focus on a measure of gender equality in employment, rather than female employment, the country is still highly heterogeneous. In Figure 1 we use as a measure of gender equality in employment the proportion of employed women in the age group 15-64 over the total number of workers in the same age group in Italian regions in 2003. This is the same as calculating, out of 100 workers, how many of them women are. Gender equality would require that in each region/province our measure replicates the gender distribution in the population (if the proportion of women over the total population in a given area is 50%, a proportion of employed women over the total number of workers equal to 50% would indicate gender equality). Given that the gender differences across provinces in the demographic composition in the age group 15-64 are irrelevant (on average, women account for 51.5% of the total population, with a standard deviation of 0.5), a lower value of our index can be interpreted as a stronger departure from gender equality. As Figure

1 shows, the North is characterized by a higher gender equality followed by the Centre and then by the South.

Can part of the differences in gender equality across Italy be due to cultural factors? This paper addresses this question. At first sight, looking at Figure 2 and 3, a positive answer seems plausible. Figure 2 and 3 show the values of two different indices of culture for Italian regions. The first index is a measure of what we call firms' culture, i.e. the attitudes of the firms' towards the role of women as expressed by their preferences in each province. Our index is based on the answers from a large sample including approximately 100.000 Italian private firms to the survey "Excelsior" conducted by Unioncamere each year.[4] Firms are asked how many people they plan to hire for the next year and what characteristics a future employee should have. Among other things, firms are asked whether they prefer to hire a man, a woman, or whether they are indifferent between the two. We focus on the percentage of positions for which the firms of each province declare to prefer hiring a man in 2003, over the total number of open positions.[5] This percentage represents our measure of firms' culture: a higher percentage of preferences for men is interpreted as a less favorable attitude towards women employment in firms. Figure 2 shows the values of this index for Italian regions: regions in the Center-North have, on average, a more favorable culture to women employment than regions in the South.[6]

Figure 3 presents the values of our second gender culture measure: individuals' culture. Similarly to previous contributions (see Fernandez, 2007a) we use the answers of citizens to specific questions of the 2000 World Value Survey (Ingelhart et al. 2000).[7] In particular, we consider how in each province Italians reply to the following questions: (i) Being a housewife is just as fulfilling as working for pay; (ii) A pre-school child is more likely to suffer if his or her mother works; (iii) When jobs are scarce, men should have more rights than women. For each question and each province we calculate an average score which increases with a more favorable attitude towards

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[4] Starting from 1997, the Excelsior Survey represents one of the main sources of information on the Italian labor market. Data are collected yearly and contain information on the demand of labor by Italian firms and on the required characteristics for a future employee (age, sex, seniority, education, etc.). The sample is drawn from the entire population of registered firms and it is representative of sectors, occupations, economic activity, dimensions relevant in each province. For further details see
http://excelsior.unioncamere.net/excelsior11/ver4/note_metodologiche_occ_sez1.htm
[5] As a measure of firms' culture we have also used the percentage of positions for which the firms of each province declare they are indifferent. This does not alter our conclusions.
[6] One may argue that culture as measured by firm's preferences may be relevant only for female employment in the private sector, while our dependent variable includes also public employees. We believe that the appropriate reference to evaluate gender equality is overall employment. Looking at Italian regions, we find that there is more gender equality in employment in the public sector than in the private one. Moreover, gender equality in overall employment and gender equality in employment in the public sector are negatively correlated across regions. Restricting our attention to the private sector only in order to measure gender equality could therefore be misleading.
[7] In Italy the survey was conducted in 1999.

female employment.[8] We sum the scores for the three questions to get a comprehensive index of individuals' culture in each province: an individual culture more favorable to women employment would result in a higher value of our index. Again, as it is clear from Figure 3, the North shows a more favorable individuals' culture towards women employment rather than the South.

Finally, we show in Figures 4 and 5 the correlation between our measure of gender equality in employment in Italian regions and our index of firm's culture and individuals' culture respectively. The figures suggest that more gender equality in employment is associated with a more favorable gender culture. In order to address the issue of causality, in the next sections we will resort to an instrumental variable estimation.

3. Empirical strategy

Our purpose is to estimate the impact of gender culture on the levels of gender equality in employment in Italian provinces.

The simplest way to do it would be to run an OLS regression, with the measure of gender equality as the dependent variable, and with the index of gender culture as the independent variable, controlling for the factors that are likely to affect both of them.

However, this strategy may result in a biased estimate of the coefficient of interest, due both to potential reverse causality and omitted variables problems. A reverse causality bias between gender equality in employment and gender culture may arise if provinces where more women work have developed, as a consequence of that, a better attitude towards female employment, and thus they show higher levels of gender culture. Indeed, Fogli and Veldkamp (2007) show that where the number of working mothers increases, the views on the impact of maternal employment on children well-being change, pointing towards the fact that people update their beliefs on the basis of new pieces of information they may have. Moreover, an omitted variable bias problem may arise if there are unobservable characteristics that are correlated both with gender equality and gender culture. Notice that these are the problems generally encountered in research on the role of culture in explaining cross-country differences in economic outcomes.

In order to decrease the risk of bias due to reverse causality, the literature has proposed the use of an Instrumental Variable Model. A standard characteristic of the selected instrument must be its correlation with our index of gender culture. Following Tabellini (2005), since history has a crucial role in shaping the cultural traits of populations, historical variables may be appropriate. Using a

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[8] To get these scores, we attribute for the first two questions different values to the four possible answers: a value equal to 1 if the answer is "strongly agree", 2 if it is "agree", 3 if it is "disagree" and 4 if it is "strongly disagree". For the third question we attribute a value equal to 1 if the answer is "agree" and 2 if it is "disagree" and we neglect those who answer "neither". The results established in the paper are robust to alternative ways of building the score.

historical variable as an instrument is a safe way to eliminate the problem of reverse causality. We follow this approach and look for a historical index of gender culture, which is correlated with our current gender culture measures. The historical index of gender culture we select is the ratio between the female literacy rate and the male literacy rate in 1911 drawn from the Italian Census data. The correlation between the female over the male literacy rate in 1911 and gender culture as measured by firm's culture is – 0.64, while the correlation is 0.4 when gender culture is measured on the basis of individuals' culture.

While it is typically difficult to build a general consensus on the use of a specific instrument, we argue that our instrumental variable is appropriate for several reasons. First, the use of the ratio between female and male literacy rates in 1911 rather than the simple female literacy rate decreases the risk of capturing differences in the literacy level of the entire population (men and women) across provinces due to variables such as income and institutional features.[9] Our instrumental variable rather encapsulates the heterogeneity in women *versus* men educational outcomes across provinces. Second, notice that the ratio between female and male literacy rates is hardly correlated with the ratio between female and male employment in 1911 (the correlation is – 0.083). This suggests that our instrumental variable is not capturing labor market characteristics that favor female to male employment in a given province, making thus female education there more attractive than elsewhere in the country.[10] Our argument is that, if the ratio between female and male literacy rates is larger in some provinces rather than in others, in those provinces there would be a better attitude towards women education which, if not explained by labor market characteristics (and we believe that this is the case), is very likely to be caused by cultural features.

In their criticism towards the instrument used by Tabellini (2005), Algan and Cahuc (2007) argue that a problem of omitted variable bias exists when a fixed effect is not included. They think that there may be unobserved characteristics that are correlated both with the instrument and the dependent variable, which can be captured only using panel-data and then including a fixed effect at the regional level. In our context however the lack of fixed effects is not so worrying, because we can hardly think about time-invariant characteristics that may affect both the ratio of female to male literacy rates in 1911 and our measure of gender equality. The typical ones, such as geography or religion, do not matter in our context. First, a potential impact of geography on both gender equality

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[9] For instance, the different degree of fulfillment across provinces of the "Legge Coppino" (1877) which introduced compulsory primary education all over the country. In particular, literacy levels for the entire population are higher in richer regions (North), and lower in poorer regions (South).

[10] To corroborate that differences in the ratio of female versus male literacy rate across provinces are not due to labor market characteristics, one can consider the following example for the printing industry, widely recognized as the most human capital intensive among the industries of the beginning of the XX century. In 1911 in Piacenza, the province characterized by the highest value of *LiteracyFtoM* (equal to 101) there were 10 printing firms and in these firms only men (102) were employed (0 women). This example is at odds with the idea that investments in education are related to the labor market demand.

in employment and literacy may pass through labor market characteristics which are persistent in time, i.e. they show up both in 1911 and now. However, we find that the gender equality in employment in 1911 is not correlated with the 1999 and 2003 ones.[11] Second, in our analysis based on Italian provinces, religion as a time-invariant characteristic cannot generate the omitted variable bias problem, since the Catholic religion has always been the dominant one all over Italy. In general, we can argue that given that we are looking at within-country data, sources of heterogeneity that usually matter when one does cross-country comparisons should not play a relevant role.

We estimate the following model:

$$(1) \qquad G_i = \delta + \beta C_i + X_i + \xi_i$$

where G_i is our measure of gender equality, C_i the index of gender culture, X_i the set of controls and ξ_i is the error term.

Given the issue of endogeneity, our instrument aims at isolating the exogenous variation of culture, through the estimation of the following equation:

$$(2) \qquad C_i = \mu + \lambda Z_i + \pi X_i + \varphi_i$$

where Z_i is the ratio between the female and the male literacy rate we described above.

In the following sections we will present the results of the estimation of the model.

Summary statistics of all variables are in table 1 for the analysis of firms' culture (section 4) and in table 6 for the individuals' culture (section 5).

4. Firm's culture: results and sensitivity analysis

We start by estimating the reduced form that ties the measure of the current gender equality in employment (*Gender Equality in Employment_2003)* to the percentage of the female over the male literacy rates in 1911 *(LiteracyFtoM)*. If past literacy is correlated with firm's gender culture, which in turn influences the current levels of gender equality in employment, we ought to find that literacy is significant in explaining the current gender equality in employment. We also introduce, as we will do in the core regression, the variable *Large firms* which identifies the percentage of firms with more than 50 employees over the total number of firms for each province. This variable measures how tilted towards large firms is the production structure of the province and it serves to control for the possibility that these firms have smaller adjustment costs associated with maternity and therefore they are less reluctant to hire women. In Table 2 we find a positive and significant effect of *LiteracyFtoM* on *Gender Equality in Employment_2003*. Since both variables are expressed in percentages, our estimates suggest that, if there is a 1 percentage point increase in *LiteracyFtoM*,

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[11] These are, as we will see, the reference years for our estimations.

the number of women employed over 100 workers in the province in 2003 increases by 0.086 percentage points.[12]

We then turn to the core specification where we regress the gender equality in employment on our measure of firm's gender culture, instrumented with the percentage of female over male literacy rates in 1911, including the control *Large Firms,* that can have an impact not only on gender equality in employment, as we stated above, but also on firm's culture. To take into account that in our sample some of the Provinces were founded after 1911 by splitting parts of other provinces of the same region, we build a variable called *Prov_cod* which attributes the same code to provinces that were together in 1911 and are separated today. We attribute the same value of the instrumental variable to these provinces and we allow for arbitrary heteroschedasticity and arbitrary intra-cluster correlation. Table 3 shows that the coefficient of *LiteracyFtoM* is negative and significant. If *LiteracyFtoM* increases by one percentage point, our measure of firm's gender culture decreases by 0.336%. The firm's gender culture has, in turn, a negative and significant impact on the measure of gender equality in employment. The F-Test is equal to 38.4, well above the threshold of 10 fixed by Staiger and Stock (1997*). Large firms* is positive and significant, as expected.

We perform a sensitivity analysis to check the robustness of our results and to verify that our instrument is appropriate: for this purpose, we not only require a significant correlation between the instrument and the dependent variable (see Table 3) but also that this relationship is not due to omitted variables (exclusion restriction). Table 4a and 4b report the first and second stage regressions when additional controls are included.

We first include (see Column 1 and 2, Table 4a) a measure of female education in the Province (the percentage of 19-34 year old women with a high school degree over the total number of women in the same cohort, Italian Census Data, 2001): since education and employment are typically positively correlated, a higher percentage of the female over the male literacy rates in 1911 may be associated with higher female education today and, as a consequence, with higher gender equality in employment today. As expected, female education is significant in explaining gender equality. However, the effect of firm's culture remains significant at the 1% level. *Large firms* is still positive and significant.

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[12] In our sample, the lowest value for *LiteracyFtoM* is measured in the province of Catanzaro, while the highest one is measured in the province of Piacenza, the former being 54 and the latter 101. According to our estimates, if in 1911 the percentage of female to male literacy rates in the province of Catanzaro had been the same as in the province of Piacenza, then in 2003 the number of women employed over 100 workers in the province of Catanzaro would have increased from the observed 34.73 to 37.08, a 7% increase in the current value of *Gender Equality in Employment_2003*.

We then add (see Column 3 and 4, Table 4a) the availability of child care in the province[13] (the percentage of children between 0 and 2 years old who attend day care centers over the total number of children of age 0-2; Italian Census Data), which, as expected, is positively related with gender equality in employment, although it is not significant. The impact of the other variables is left unaffected.

In columns 5 and 6, Table 4a, we add the fertility rate of the province (defined as the ratio between the resident live births and the average female resident population aged 15-49, multiplied by 1000, based on Istat data, see the Appendix) which turns out to be negatively and significantly related with gender equality in employment. In provinces where the fertility rate is higher, the gender equality in employment is smaller. Differently from other European countries,[14] this within-Italy result shows that the trade-off between being a mother and being a worker is still relevant. The other variables however keep their significance.

In columns 7 and 8, Table 4b we add a measure of the diffusion of the service sector in the province. The variable *Service sector* identifies the percentage of firms operating in the service sector over the total number of firms in each province, taken from ISTAT Sistema di Indicatori Territoriali, 2003. This variable captures how large the service sector is with respect to industry and agriculture in a given province. Female employment in Italy – as in all other countries – is higher in the service sector than it is in the other sectors: in 2003, our year of analysis, it was 45,76% in the service sector, versus 23,8% in the industry and 29,8% in agriculture. Thus, one could suspect that higher gender equality in employment in some provinces may depend on their larger service sector. This is however not the case, as it turns out that a larger service sector is associated with lower gender equality in employment. A way to explain this is to consider that the total number of jobs differs across provinces: where the public sector, which is included in the service sector (the correlation among the two is 0.62) is larger (typically in the South), jobs are scarcer and female employment is lower. Public sector and gender equality in employment are indeed negatively related (-0.71). The correlation between service sector and gender equality in employment is in fact -0.46. In other words, it seems that the dominance of the service (public) sector, which should lead to larger gender equality in employment (see footnote 6), is not sufficient in Southern provinces to increase gender equality up to the Northern levels.

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[13] Childcare availability is supposed to have a positive effect on female employment, because it favours work-life balance; moreover, it may be correlated with gender culture, because it is argued that areas with a more progressive gender culture provide better childcare services (See the seminal work by Hirdmann, as reported in Duncan, 2000).

[14] In some European countries, the relation between the total fertility rate and female labor force participation was negative in the past, because women traded-off their role as mothers and as workers, since they had to take care of children. However, in more recent times the relation has become positive (see Del Boca et al. 2005). Double-earners couples are more likely to have more children because they can better afford the costs related to child rearing and they are better equipped to face risky situations, due to familiar (e.g. divorces) or professional (e.g. firing) causes.

In Table 4b we introduce two additional variables, which may have an impact on gender equality in employment: *Part-time jobs* and *Regional Average wages*. The data for these two variables are at regional levels, as there are no province-level data.[15] In columns 1 and 2 we introduce *Part-time jobs,* as reflecting a feature of the production sector which may have an impact on gender equality in employment. It represents the percentage of part-time employees over the total number of employees in each Region, to control for the fact that female employment in part-time jobs dominates the male one.[16] *Part-time jobs* is not significant, while our measure of firm culture remains significant.

In columns 3 and 4, Table 4b we finally control for the average regional salary (taken from INPS). We would like to exclude that differences in gender equality in employment are explained only by differences in wages and therefore in how rewarding the participation to the labour market is. Although the correlation between our measure of average wages and gender equality in employment is positive, as we expect, this variable turns out not to be significant and it does not alter the impact of culture and of the other variables on gender equality in employment.

Our sensitivity analysis confirms that firm's culture is significant in explaining the gender equality in employment.[17] The coefficient of *Firm's Culture* is sufficiently stable. More precisely, our estimates suggest that, if the percentage of positions for which firms declare to prefer a man decreases by 1 percentage point, the number of employed women over 100 workers rises by a range of 0.25-0.35 percentage points in all specifications.[18]

Our approach may suffer from the typical concern in cross-country analyses related to the role of unobservable characteristics. We have tried to include all the appropriate controls which are suggested by the literature and for which data are available.[19] The analysis performed in the next section, where a different measure of culture is introduced, in addition to its own value, may also be considered as a further robustness check for the results achieved here.

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[15] In these cases we cluster for regions.

[16] An alternative we have tried is to use Unioncamere data where we have province-level data on the number of prospective part-time jobs offered in the relevant year. Results do not change.

[17] We have performed additional regressions to check that the order of introduction and the number of the control variables jointly considered does not alter the results.

[18] It is well known that Italy is divided in two parts under several socio-economic respects: the North shows higher per capita income levels, higher employment rates, a more developed industrial sector, larger infrastructures as well as better social indicators (justice, school, health etc.) than the South (Sylos Labini, 2003). To capture the impact of further unobserved heterogeneity across the country we have included a geographical dummy variable, North, which is equal to 1 if the province is in the Northern part of Italy and 0 otherwise. North turns out not to be significant and it does not affect the role of firms' culture.

[19] One may think that irregular employment contributes to explain the across provinces heterogeneity in gender equality in employment. Indeed there is more irregular employment in Southern regions than in Northern ones. However notice that, according to an ISFOL survey (Isfol 2007), when we look at the gender composition of irregular employment across areas of the country, 64.2% of irregular workers are female in the North as opposed to 31.5% in the South. This observation is at odds with the idea that the gender equality in employment may be lower in the South due to higher irregular female employment there.

5. Individuals' culture: results and sensitivity analysis

Following the same analysis of Section 4, we first focus on the reduced form that links our measure of gender equality in employment in 1999 (*Gender Equality in Employment_1999*) to the percentage of the female over the male literacy rates in 1911 (*LiteracyFtoM*).[20] We first include as controls two variables, *Female education* and C*hildcare,* which are likely to affect female labour supply and thus gender equality in employment.[21] In Table 6 we find a positive and significant effect of *LiteracyFtoM* on gender equality in employment.

In Table 7 we present the results of the core specification, where we regress the gender equality in employment on individuals' culture, instrumented, as before, with the ratio of female over male literacy rates in 1911. We include female education and child care as controls, because they could be alternative channels that link *LiteracyFtoM* and gender equality in employment. Table 7 shows that the coefficient of *LiteracyFtoM* is positive and significant in explaining individuals' culture, which in turn has a positive and significant impact on the measure of gender equality in employment. Female education is positively and significatively related to gender equality, while child care is not.

Finally, in Table 8 we include additional control variables which, as already discussed in the previous Section, may play a role in explaining gender equality: fertility, service sector, part-time jobs and regional average wages.[22] The coefficient of individuals' culture remains positive and significant in all specifications. Also, fertility and service sector have a significant impact on gender equality.[23] The coefficients of all control variables have the same sign as in the regressions where gender culture was measured by firm's attitudes. We refer back to Section 4 for the interpretation of the results.

6. Conclusions

Gender culture is important in explaining female versus male labour market participation across Italian provinces. This conclusion is reached measuring gender culture in two different ways: firm's culture and individuals' culture. While the latter has been used in previous research – though not in

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[20] Summary statistics are reported in Table 5.

[21] For the definition of these variables, see Section 4 and the Appendix. The reference year is however different in order to make it consistent with the year where the culture index and the dependent variable are measured.

[22] Since the elderly may provide informal child care and thus contribute to raise female employment, we introduced the dependency ratio as a further control variable. This variable turns out not to be significant and the results do not change.

[23] We have performed additional regressions to check that the order of introduction and the number of the control variables jointly considered does not alter the results. When fertility, service sector, part-time jobs and average regional salary are introduced one by one in the core specification, female education is positively related to gender equality and it becomes significant at 10%.

the context developed here –, the former is first introduced in this paper, and thus potentially improves the analysis of the relationship between culture and economic outcomes.

Studies on the role of culture on economic outcomes typically suffer from two problems: reverse causality and the omitted variables bias. We have tried to address the endogeneity problems by using a reasonable instrument for our measure of culture. We have also tried to control for a number of potential sources of omitted variables bias. Although the list of control considered may not be completely exhaustive, it includes the most common determinants of gender equality in employment. Moreover, since culture is difficult to measure, having two indices coming from two different data sources may in itself represent a robustness check.

Our analysis suggests that the large heterogeneity in labour market outcomes across Italy depends crucially on the heterogeneity in culture. Two lessons can be drawn from our results as far as policy design is concerned: first, the local environment cannot be ignored. Although the gender equality should be common target to the entire country, the means of achieving it should be area- specific. Changes in attitudes and values may be a difficult process, one that also depends on the local context. Second, the demand side plays also an important role in defining the cultural local environment. In this context, incentives to firms who hire and advance women may prove effective in promoting more positive attitudes of firms towards female employment.

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Appendix

Variables description

Average_regional_salary: Annual average salary by region, 1999 and 2003.
SOURCE: INPS, *Osservatorio sul lavoro dipendente*.

Childcare: (Children aged 0-2 who attend the nursery /Children aged 0-2)*100.
SOURCE: ISTAT, National Census, Resident population attending the nursery or enrolled in a regular course of studies. Italy, Provinces, 2001.

Female_education: (women aged 19-34 with high school diploma/women aged 19-34)*100.
SOURCE: ISTAT, National Census, Index of high school education by sex (19-34) – Italy, Provinces 2001.

Fertility: (Resident live births / Average female resident population aged 15-49) * 1,000.
SOURCE: ISTAT, *Sistema di Indicatori Territoriali*, http://sitis.istat.it/sitis/html/index.htm Population, Italy, Provinces, 1999 and 2003.

Firm_Culture: (Positions for which the firms declare to prefer hiring a man /Total number of open positions)*100.
SOURCE: *Indagine Excelsior*, Expected Flows into Employment, 2002 for 2003. Data on Provinces.

Gender_Equality_Employment_2003: Females employed per 100 persons employed ((Females employed / Total number of persons employed) *100).
SOURCE: ISTAT, *Sistema di Indicatori Territoriali*, Labour Market, Italy, Provinces, 2003.

Individuals_culture: see the main text in Section 2 and footnote 8.

Large_firms: (Firms with 50 or more employees/Total number of firms)*100
SOURCE: ISTAT, *Sistema di Indicatori Territoriali*, Industry, Italy, Provinces, 2003.

LiteracyFtoM : (Literate women aged 6 years of more/ Women aged 6 years or more who answered to the survey) / (Literate men aged 6 years of more/ Men aged 6 years or more who answered to the survey)*100.

SOURCE: Census of the population of the Italian Kingdom / Ministry of Agriculture, Industry and Commerce. Rome: Tip. Bodoniana, 1883-1923.

Part_time_jobs: (Part-time employees in the Region/Total number of employees in the region)*100
SOURCE: ISTAT, *Rilevazione sulle forze di lavoro.*

Service_sector: (Private Firms in the service sector /Total number of private firms)*100
SOURCE: ISTAT, *Sistema di Indicatori Territoriali*, Industry, Italy, Provinces, 1999 and 2003.

Figure 1: Gender equality in employment (2003)
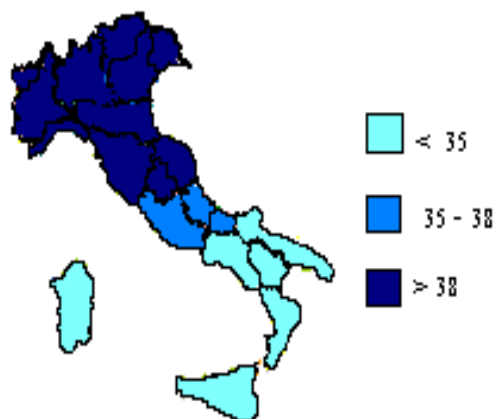
Note: *Gender equality* is defined as the proportion of employed women in the age group 15-64 over the total number of workers. A higher value implies more equality between female and male employment levels. See also the main text

Figure 2: Firms' culture (2003)
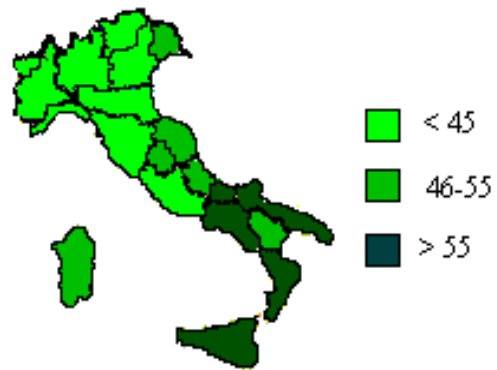
Note: *Firms' culture* is an index value built on firms' answers to the Excelsior survey, which measures the preference of firms towards hiring a man. A higher value implies that firms prefer hiring a man, and thus expresses a firms' culture less favorable to female employment.

Figure 3: Individuals' culture (1999)
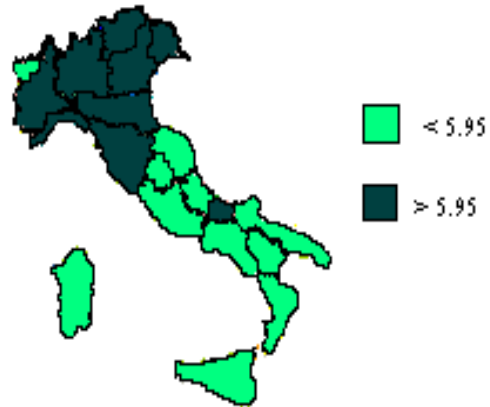
Note: Individuals' culture is an index value built on individuals' answers to several questions in the World Value Survey on the role of women in society and jobs. A higher index expresses an attitude more favourable to women employment. See also the main text.

Figure 4. Firms' Culture and Gender Equality in Employment 2003
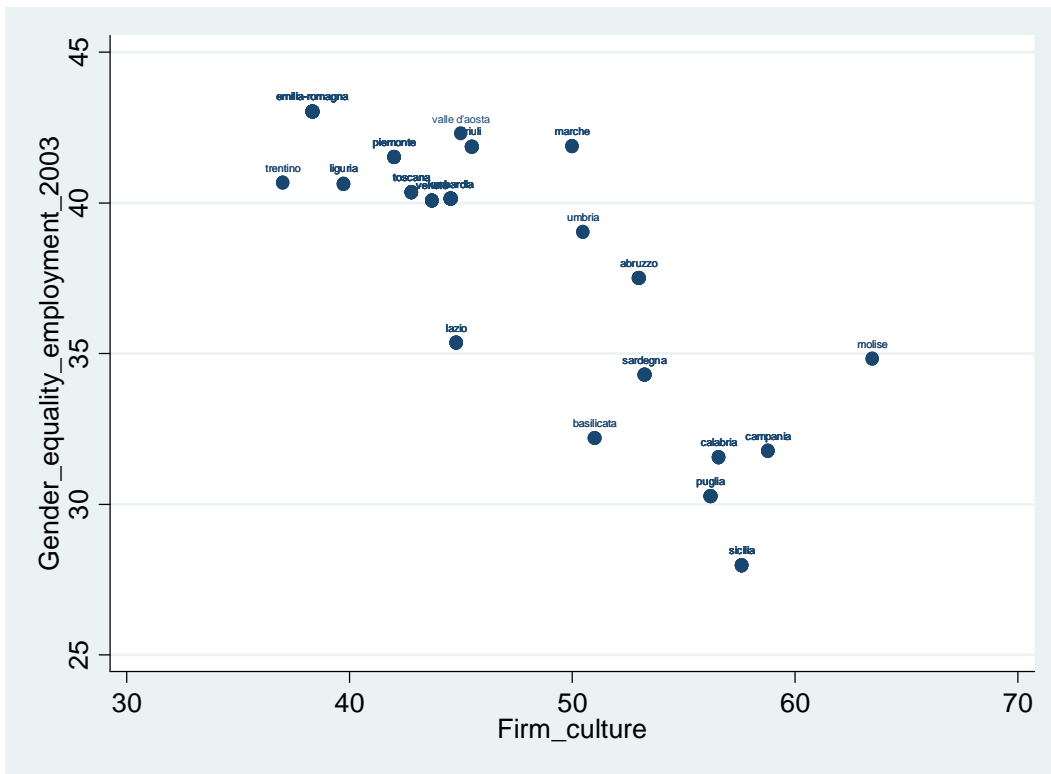
Figure 5. Individuals' Culture and Gender Equality in Employment 1999
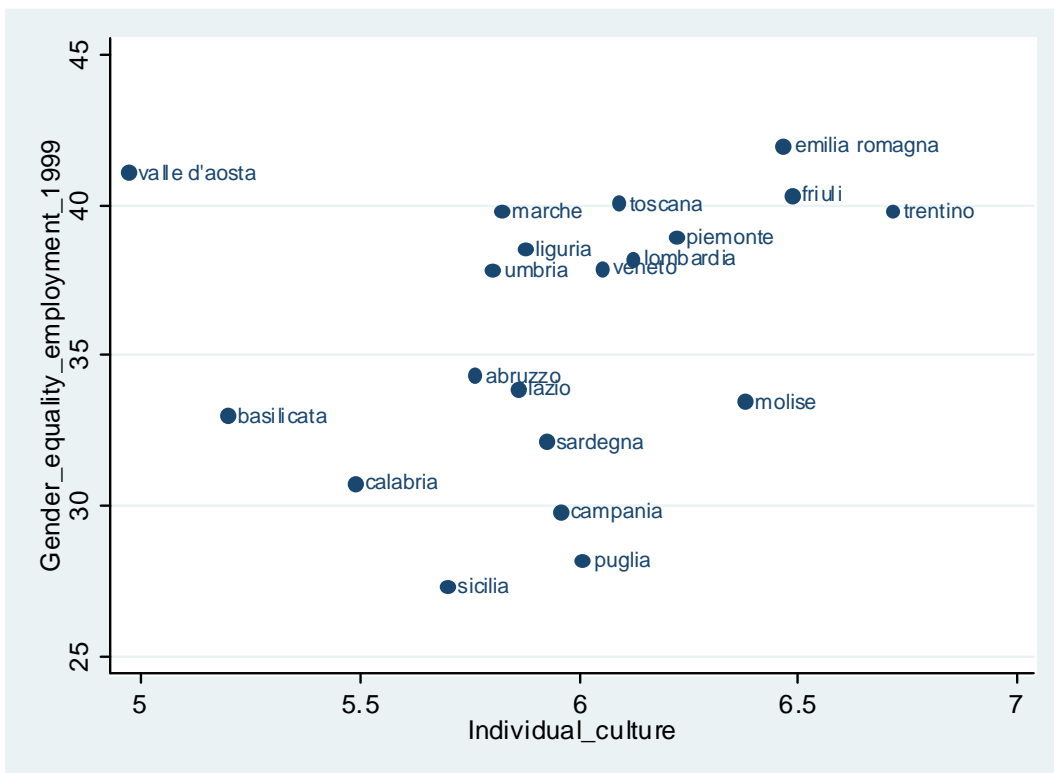
Table 1. Summary statistics (firm's culture dataset)

Variable	Obs	Mean	Std. Dev	Min	Max
Gender_Equality_Employment_2003	102	37.59304	5.273626	23.45	45.84
Firm_Culture	102	47.67647	8.812864	31	68
LiteracyFtoM	102	81.68627	14.19872	54	101
Childcare	81	19.6422	8.026601	7.052851	60.46585
Part_time_jobs	100	0.669	0.4814	0.3259	3.351
Service_sector	102	73.22497	4.710778	58.70176	83.31963
Female_education	81	58.58889	5.71021	46.8	71.4
Fertility	102	37.92461	3.687494	29.59	47.4
Large_firms	102	.4984506	.2318459	.13679	1.04983
Average_regional_salary	102	36495.79	2714.278	31816	43758

Table 2. Firm's culture and gender equality: reduced form

	Gender_Equality_Employment_2003
LiteracyFtoM	0.086**
	(0.029)
Large_firms	11.008***
	(2.218)
Observations	102
Adjusted R-squared	0.4

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3. Firm's culture and gender equality: IV estimation

	(1)	(2)
VARIABLES	Firm_Culture	Gender_Equality_Employment_2003
LiteracyFtoM	-0.336***	
	(0.054)	
Firm_Culture		-0.256**
		(0.083)
Large_firms		9.137***
		(2.274)
Observations	102	102
Adjusted R-squared	0.432	
F-test	39.43	

Robust standard errors in parentheses, cluster for *Prov_cod*
*** p<0.01, ** p<0.05, * p<0.1

Table 4a: Firm's culture and gender equality: sensitivity analysis I

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Firm_Culture	Gender_Equality_ Employment_2003	Firm_Culture	Gender_Equality_ Employment_2003	Firm_Culture	Gender_Equality_ Employment_2003	Firm_Culture	Gender_Equality_ Employment_2003
LiteracyFtoM	-0.365*** (0.0669)		-0.353*** (0.0685)		-0.356*** (0.0719)		-0.354*** (0.0727)	
Firm_Culture		-0.320** (0.089)		-0.3186** (0.0905)		-0.288*** (0.088)		-0.308*** (0.0825)
Large_firms		8.029*** (2.147)		8.043*** (2.16)		10.185*** (2.187)		6.621** (2.378)
Female_education		0.27 ** (0.0816)		0.2677** (0.082)		0.15* (0.077)		0.192* (0.077)
Childcare				0.007 (0.039)		0.017 (0.044)		0.015 (0.0396)
Fertility						-0.337** (0.102)		-0.255* (0.109)
Service_sector								-0.244* (0.0101)
Observations	81	81	81	81	81	81	81	81
F-test	27.15		21.17		16.81		13.85	
Adjusted R-squared	0.5141		0.5021		0.497		0.49	

Robust standard errors in parentheses, cluster for *Prov_cod*

*** p<0.01, ** p<0.05, * p<0.1

Table 4b: Firm's culture and gender equality: sensitivity analysis II

	(1)	(2)	(3)	(4)
	Firm_Culture	Gender_Equality_Employment_2003	Firm_Culture	Gender_Equality_Employment_2003
LiteracyFtoM	-0.3019**		-0.272**	
	(0.087)		(0.0862)	
Firm_Culture		-0.256*		-0.311*
		(0.102)		(0.156)
Large_firms		6.636*		6.097*
		(3.106)		(3.44)
Female_education		0.236*		0.203*
		(0.088)		(0.106)
Childcare		0.0314		0.024
		(0.0346)		(0.037)
Fertility		-0.281**		-0.294**
		(0.0922)		(0.094)
Service_sector		-0.261*		-0.26*
		(0.104)		(0.115)
Part_time jobs		-0.82		-0.729
		(1.464)		(1.604)
Average_Regional_Salary				-0.0001
				(0.00018)
Observations	79	79	79	79
Adjusted R-squared	0.4975		0.495	
F-test	12.03		10.56	

Robust standard errors in parentheses, cluster for *Regio_cod*
*** p<0.01, ** p<0.05, * p<0.1

Table 5. Summary statistics (Individuals' culture dataset)

Variable	Obs	Mean	Std. Dev	Min	Max
Gender_Equality_Employment_1999	81	36.03333	4.995022	24.4	44.4
Individual_Culture	81	6.002037	.4814313	4.9227	6.99321
LiteracyFtoM	81	82.74074	14.01765	54	101
Female_education	81	58.58889	5.71021	46.8	71.4
Service sector	81	60.53951	9.326705	30.4	81.4
Part_time_jobs	79	0.7299	0.479	0.363	3.587
Fertility	81	37.01605	4.745326	26.4	49.4
Childcare	81	19.6422	8.026601	7.052851	60.46585
Average_regional_salary	81	32429.69	2232.58	28243	37731

Table 6. Individuals' culture and gender equality. Reduced form

Dep.variable	**Gender_Equality_Employment_1999**
LiteracyFtoM	0.199***
	(0.0268)
Female_education	0.433***
	(0.0847)
Childcare	0.0482
	(0.0642)
Observations	81
Adjusted R-squared	0.486

Robust standard errors in parenthesis
*** p<0.01, ** p<0.05, * p<0.1

Table 7. Individuals' culture and gender equality: IV estimation

Dep. Variable	(1) Individual_Culture	**(2) Gender_Equality_Employment_1999**
LiteracyFtoM	0.0146***	
	(0.00322)	
Individual_Culture		13.63***
		(2.773)
Female_education		0.243*
		(0.135)
Childcare		0.0667
		(0.103)
Observations	81	81
Adjusted R-squared	0.150	
F-test	20.70	

Robust standard errors in parenthesis, cluster for Prov_cod
*** p<0.01, ** p<0.05, * p<0.1

Table 8. Individuals' culture and gender equality: Sensitivity analysis

Dep.variable	(1) Individual _Culture	(2) Gender_Equality_ Employment_1999	(3) Individual _Culture	(4) Gender_Equality_ Employment_1999	(5) Individual _Culture	(6) Gender_Equality_ Employment_1999	(7) Individual _Culture	(8) Gender_Equality_ Employment_1999
LiteracyFtoM	0.0154*** (0.00330)		0.0153*** (0.00347)		0.0119* (0.0052)		0.0129* (0.0063)	
Individual_Culture		12.17*** (2.537)		11.81*** (2.519)		10.82*** (4.39)		11.64*** (4.747)
Female_education		0.0828 (0.141)		0.102 (0.138)		0.152 (0.135)		0.132 (0.153)
Childcare		0.0571 (0.0892)		0.0739 (0.0866)		0.079 (0.077)		0.078 (0.0858)
Fertility		-0.349** (0.152)		-0.319** (0.148)		-0.298* (0.144)		-0.303* (0.153)
Service_sector				-0.0789 (0.0734)		-0.079 (0.068)		-0.073 (0.083)
Part_time_jobs						-0.734 (1.977)		-0.639 (2.089)
Average_regional_ salary								-0.0001 (0.0002)
Observations	81	81	81	81	81	79	79	79
Adjusted R-squared	0.148		0.137		0.105		0.095	
F-test	21.77		19.40		11.72		9.55	

Robust standard errors in parentheses, cluster for *Prov_cod columns 1-4;* for *Regio_cod columns 5-8*
*** p<0.01, ** p<0.05, * p<0.1

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