

# female labour force participation: persistence and evolution

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## Abstract

This article explores the relevance of deep historical forces that have influenced the historical gender division of labour and the perception of women's roles in society more generally. In particular, we will review how different types of subsistence activity in the ancient past – such as hunting and gathering and various types of agricultural technology – and geography and language can affect the role of women and their relative bargaining positions up to modern times. Finally, we will review the relevance of mechanisms such as learning, in contrast to deep historical forces, to explain the evolution of female labour force participation.

## Keywords

beliefs; culture; female labour force participation; gender roles; values

## JEL classifications

D03; J16; N30

## Article

Social attitudes toward women and their role in society show remarkable differences across countries, including those with similar institutions or economic development; in some countries, they have also changed dramatically in a relatively short time.

The economics literature initially explained differences in female labour force participation by looking at standard economic variables such as the level of development, women's education, fertility and marriage/divorce prospects and the expansion of the service sector (see Goldin (1990) for a review). Some scholars have emphasised the role played by market prices, such as the decline in childcare costs (Attanasio *et al.*, 2008), and by technological factors such as the invention of baby formula (Albanesi and Olivetti, 2014).

A more recent literature has argued that differences in female labour force participation across countries could reflect underlying cultural values and beliefs, which tend to be transmitted from parents to children and to stay fairly stable over time. This article will review the literature on the relevance of culture in the determination of female labour force participation and especially on the long-term historical origins of these differences, which will help us understand their persistence. We will also look at research emphasising a change in the bargaining power of women inside the married couple which helps explain the dramatic increase

in female labour force participation in many countries over the last century. Concluding remarks will discuss directions for further research.

## **Persistence in female labour force participation**

In 2000, the share of women aged 15 to 64 in the labour force ranged from 16% in Pakistan to 90.5% in Burundi. Traditional economic interpretations having proven insufficient to explain these differences, a recent strand of literature has emphasised the role of culture. In an important contribution, Fernandez and Fogli (2009) show that female labour force participation amongst second-generation immigrants in the USA is very strongly correlated with female labour force participation in the country of origin. This evidence is relevant to explain the importance of culture, because migrant women of various origins are all observed in the same institutional and labour market environment. (The authors chose second-generation immigrants because the problem of selection and disruption due to migration is less relevant for them than for first-generation immigrants.)

Although this evidence clearly shows that culture matters, little is known of the historical origin of these cultural differences. In this section, we will look at three important long-term historical determinants of gender roles: agricultural technology, language and geography.

### *Differences in historical agricultural technologies*

Alesina *et al.* (2013) study the historical persistence of differences in female labour force participation. The hypothesis for their empirical analysis comes from the seminal work of Ester Boserup (1970), in which she argued that differences in the role of women in societies originate in different types of agricultural technologies, particularly the differences between shifting and plough agriculture. Shifting agriculture, which uses hand-held tools such as the hoe and the digging stick, is labour-intensive, with women actively participating in farm work, while plough agriculture is more capital-intensive, using the plough to prepare the soil. Unlike the hoe or digging stick, the plough requires significant upper-body strength, grip strength and bursts of power to either pull the plough or control the animal that pulls it. Farming with the plough is also less compatible with childcare, which is almost always the responsibility of women. As a result, men tended to specialise in agricultural work outside the home, while women specialised in activities within the home. In turn, this division of labour generated different norms about the appropriate role of women in society. Societies characterised by plough agriculture developed the belief that the natural place for women is in the home. This belief tends to persist even if the economy moves out of agriculture, affecting the participation of women in activities performed outside the home, including market employment, entrepreneurship and politics.

The authors start their analysis by documenting a very strong negative correlation between traditional use of the plough and female participation in agriculture in pre-industrial societies, using the Ethnographic Atlas, a dataset assembled by George Peter Murdock in 1967 and containing ethnographic information for 1,265 ethnic groups covering the whole world. To investigate whether plough-based agriculture correlates with lower female participation in all agricultural tasks or only in a few (such as soil preparation), the authors report

results on specific activities carried out in the field or outside the home: land clearance, soil preparation, planting, crop tending, harvesting, caring for small and large animals, milking, cooking, fuel gathering, water fetching, burden carrying, handicraft production and trading. Their empirical analysis carefully controls for all the other variables that could be correlated with plough use and gender roles: the presence of large domesticated animals, a measure of economic development, the fraction of land where the ethnic group lives defined as tropical or subtropical, and the fraction of land that is defined as overall suitable for agriculture. Overall, the authors find that plough use is associated with less female participation in all agricultural tasks, with the largest declines in soil preparation, planting, crop tending and burden carrying. But they find that plough use tends not to be significantly correlated with female participation in other activities. This interpretation of the correlations is fully consistent with Boserup's hypothesis.

After looking at the correlation between agricultural technology and female participation in agriculture in pre-industrial societies, Alesina *et al.* (2013) study whether differences in agriculture technologies still have an impact on female labour force participation today. The existence of a correlation between female labour force participation in agriculture and agricultural technology in the past does not necessarily imply that differences in historical agriculture technologies affect female labour force participation today. Goldin and Sokoloff (1984), for example, document that within the northeastern USA the low relative productivity of women and children in agriculture (and their low participation in this sector) allowed them to participate actively in the manufacturing sector. In this setting, initial female labour force participation in agriculture is inversely related to subsequent participation in manufacturing, showing a lack of continuity of female labour force participation over time as industrialisation occurred. An interpretation based on social norms could, however, help explain the long-term persistence.

To show long-term persistence, Alesina *et al.* (2013) look at differences in female labour force participation, but also at beliefs about the role of women in society in 2000.

To analyse contemporary female labour force participation, they match ethnographic data to current populations using the global distribution of 7,612 language groups from the 15th edition of the *Ethnologue* and the global distribution of population densities from the 2000 *Landscan* database, generating a measure of the fraction of a country's ancestors who traditionally engaged in plough agriculture.

At the country level, the authors look at differences in female labour force participation and also at two other measures that could reflect cultural attitudes and beliefs about the role of women in society: a measure of entrepreneurship (given by the share of firms with a woman among the principal owners) and the presence of women in national politics (given by the proportion of parliamentary seats held by women). In countries with a tradition of plough use, women are less likely to participate in the labour market, own firms and participate in national politics.

Along the lines of Alesina *et al.* (2013), Hansen *et al.* (2013) hypothesise that societies with long histories of agriculture have less equality in gender roles as a consequence of more patriarchal values and beliefs regarding the proper role of women in society. Their research is motivated by the idea that patriarchy originated in the Neolithic Revolution – the prehistoric transition from a hunter-gatherer society to an agricultural one – and that patriarchal values and beliefs have persisted and become more ingrained in countries with long histories of agriculture. Agricultural societies were more gender-biased than hunter-gatherer societies. Population growth

and land scarcity made cultivation of food more labour-intensive, which created ‘a premium on male brawn in plowing and other heavy farm work’ (Iversen and Rusenbluth, 2010). This led to a division of labour within the family, where the man used his physical strength in food production and the woman took care of child rearing, cooking and other family-related duties. This increased the male’s bargaining power within the family, which, over generations, translated into norms and behaviour which shaped cultural beliefs on gender roles.

Using a world sample, a European regional sample and a sample of children of immigrants living in the USA, the authors find a negative association between the number of years that a country had been an agrarian society in 1500 CE and measures of gender equality, including female labour force participation, number of years since women gained suffrage and percentage of seats in parliament held by women.

### *Language*

Another interesting aspect of long-term persistence in gender roles is the relation between grammatical gender-marking and female participation in the labour market, the credit market, land ownership and politics (Gay *et al.*, 2013). The grammatical features of a language are inherited from the distant past and the gender system is one of the most stable linguistic features, surviving for thousands of years. Gay *et al.* (2013) broadly follow Whorf (1956): ‘We are inclined to think of language simply as a technique of expression, and not to realize that language first of all is a classification and arrangement of the stream of sensory experience which results in a certain world-order, a certain segment of the world that is easily expressible by the type of symbolic means that language employs’.

In linguistics, a grammatical gender system is defined as a set of rules for agreement that depends on nouns of different types. These are normally based on biological sex, but can also be based on social constructs, such as age or social status. Gay *et al.* (2013) rely on the *World Atlas of Linguistic Structures*, the most comprehensive data source of grammatical structures, and use four very stable grammatical variables related to gender: the number of genders in the language, whether the gender system is sex-based, rules for gender assignment and gender distinctions in pronouns. The authors construct the Gender Intensity Index by summing these features for the most commonly spoken language in a country.

Using cross-country and individual-level data, they find that women speaking languages that more pervasively mark gender distinctions are less likely to participate in economic and political activities and more likely to encounter barriers in their access to land and credit. The authors also investigate a sample of migrants living in the USA – that is, all facing the same institutional and labour-market environment – and find consistent results.

### *Geography*

A long-term determinant of differences in gender roles can be found in geography. In a fascinating paper, Carranza (2012), having pointed out that soil texture, which varies exogenously, determines the workability of the soil and the technology used in land preparation, uses this as a lens to look at differences in female labour force participation in India. Deep tillage of land reduces the need for transplanting, fertilising and weeding, which are typically performed by women (Basant, 1987).

In areas where deep tillage is required, the lower demand for female labour relative to the demand for male labour is expected to have a negative impact on the perceived relative value of girls to a household (Boserup, 1970).

Carranza (2012) finds that soil texture explains a large part of the variation in women's relative participation in agriculture. The author also goes further and examines the impact of geography on infant sex ratio, perhaps the most extreme indicator of gender-based discrimination. Because relatively smaller female labour contributions in loamy areas make girls relatively more costly, the ratio of girls to boys will be negatively related to the difference between the fractions of loamy and clayey soils. Sex ratios and female labour force participation in India show a large geographical heterogeneity, even within the same state and cultural region (Dyson and Moore, 1983; Agnihotri, 1996). These differences within the same state are not driven by alternative mechanisms, including cultural, social, economic or policy variables.

Carranza (2012) estimates that soil texture explains 62% of the within-state variation in female agricultural labor force participation and 70% of the variation in the sex ratio for zero- to six-year-olds. A 10 percentage point greater fraction of loamy soils relative to clayey soils is associated with a 5.1% lower share of female agricultural labourers and a 2.7% lower ratio of female to male children. The relationship between soil texture, relative female labor-force participation, and the ratio of female to male children did not change significantly between 1961 and 2001.

Alesina *et al.* (2013) also examine the effect of geography on female labour force participation. They run both instrumental variables regressions and reduced-form regressions using the suitability of the soil for crops that do or do not benefit from the use of the plough. The primary benefit of the plough is that you can cultivate a given amount of land more quickly and thus you can cultivate more land in a given amount of time. This capability is more advantageous for crops that require specific planting conditions that occur during narrow windows of time or for crops that require more land to cultivate a given amount of calories. The benefit of the plough is reduced or eliminated for crops grown in swampy, sloped, rocky or shallow soils, where it is less efficient or impossible to use. Taking these factors into consideration, crops can be classified into 'plough-positive crops' – those such as wheat, teff, barley and rye whose cultivation benefits greatly from the use of the plough – and 'plough-negative crops' – those such as sorghum, maize, millet, roots, tubers and tree crops, whose cultivation benefits less from the use of the plough (Pryor, 1985).

The authors' estimates show that the adoption of the plough is positively correlated with an environment suitable for plough-positive crops, but not with an environment suitable for plough-negative crops. In a different specification, the authors look directly at the relationship between crop suitabilities and current gender roles. They find that having an ancestral environment that was more suitable to plough-positive crops is always associated with less equal gender roles today, while an environment more suitable to plough-negative crops is generally associated with more equal gender roles today.

## **Historical changes in female labour force participation**

A unifying interpretation for the historical change in labour force participation among married women supposes that a working wife has become more attractive to

married couples (differences in female labor force participations are more pronounced among married women). In the previous section, we analysed the long-term determinants of gender roles. In this section we will review the factors that determined their evolution. The explanation in the literature has centred on four factors: women having more marital bargaining power because they spend less time on household chores (Greenwood *et al.*, 2005), a changing social atmosphere (Fernandez *et al.*, 2004), the introduction of the contraceptive pill (Goldin and Katz, 2002) and learning about the effects of female labour force participation (Fogli and Veldkamp, 2011; Fernandez, forthcoming).

### *The adoption of household technology*

According to Greenwood and his co-authors (2005), married women could not enter the labour force until housework had become less time-consuming. Specifically, the authors focused on the widespread adoption of household technologies – such as washing machines, vacuum cleaners and dishwashers – that greatly reduced the time needed to do housework. The authors consider a household in which the husband always works in the labour market and the wife always does the housework. A decline in the price of the technology (which is at the origin of its widespread diffusion) had a large impact on women's labour force participation: more than half of the increase in women's labour force participation was due to labour-saving technology. For comparison, only one-fifth of the increase was directly due to the decline in the gender wage gap. The main conclusion is that a better outside option could encourage women to join the labour force only after the technology to free their time had appeared.

### *Changing social norms*

Fernandez *et al.* (2004) hypothesised that men with working mothers were more likely to have working wives. A son's preference to marry a woman who works may have been influenced by having a working mother. Also, a working mother would be motivated to make her son more productive with household chores, which would later allow his wife more time for work outside the home.

The authors find that the probability that a married woman worked full-time was 32 percentage points higher if her husband's mother had worked for at least one year when he was young. To rule out the possibility that the husband's behaviour is determined by assortative mating of individuals whose mothers had worked, the authors look at whether a mother's decision to work also affects her daughter's decision to work. Surprisingly, the wife's decision to work was unaffected by her own mother's labour force status.

### *The pill*

Goldin and Katz (2002) focus their attention on the birth control pill. According to the authors, the pill caused an increase in female labour force participation because it changed the age at which women married and became pregnant. Goldin and Katz (2002) argue that the pill's availability to unmarried college-aged women increased their career investment and, hence, their long-term labour force participation. Without the pill, young women who wanted professional careers would have to

either practice abstinence or run the risk of pregnancy. The pill, in contrast, meant that women did not have to choose one or the other, which lowered the cost of delaying marriage and investing in a long-term career.

Marital decisions across groups reflect the effect of the pill's availability on the workforce decisions of single young women. The proportion of female college graduates born in 1950–54 who were married by age 23 declined by 8.7 percentage points, compared with those born in 1940–49. Access to the pill by age 17 lowered the fraction of married women by 3.2 percentage points (37% of the total decline).

Goldin and Katz (2002) also look at long-term career investments, estimating an increase, between 1970 and 1990, of five percentage points in the share of 30- to 49-year-old women in professional occupations. Approximately 1.7 percentage points (one-third of that increase) can be attributed to increased pill use. The effect is even bigger for the share of college women who became doctors and lawyers: of the total increase of 1.7 percentage points, increased use of the pill explains 1.2 percentage points (three-fourth of the total).

### *Learning*

Two recent papers emphasise the role of learning in the transition from a low to a high level of female labour force participation in the USA.

Fogli and Veldkamp (2011) develop a model in which women learn about the effects of maternal employment on children by observing nearby employed women. When few women participate in the labour force, information is scarce and participation rises slowly. As information accumulates in some regions, the effects of maternal employment become less uncertain and more women in that region participate. Learning accelerates, labour force participation rises more quickly and regional participation diverges. Eventually, information diffuses throughout the economy, beliefs converge to the truth, participation flattens out and regions become more similar again. This model generates changes in female labour force participation that are geographically heterogeneous, locally correlated and smooth in the aggregate, corresponding to the trends in historical female labour force participation data.

Fernandez (forthcoming) develops a model in which labour force participation by married women and cultural beliefs about the role of women in society evolve jointly. The basic idea is that the probability that individuals assign to different views of the long-term consequences of married women working is updated in a Bayesian fashion as new information endogenously becomes available. Married women compare the benefits of increased consumption from labour earnings with the expected utility cost of working. This cost was at first unknown and women's beliefs about it evolved endogenously over time in a Bayesian fashion. A model with these features, calibrated to key statistics from the twentieth century, generates a time-trend of labour force participation by married women that corresponds to its historical evolution in the USA over the last 120 years.

### **Concluding remarks**

Differences in female labour force participation have long been remarkably stable. At the same time, female labour force participation has increased quickly in several countries. We review the historical origins of the observed persistence and also study

the most recent factors that made a working wife more attractive to married couples and therefore implied an increase in female labour force participation. Several questions remain open: what determines the speed of the evolution of gender roles? When do gender role differences persist or not? What factors affect their persistence?

The literature has so far focused on documenting historical and cultural persistence, yet this persistence remains poorly understood. Various reasons could explain it: underlying cultural traits may be reinforced by policies, laws and institutions which affect the benefits of beliefs about gender inequality. A society with traditional beliefs about gender inequality may, for example, perpetuate these beliefs by institutionalising unequal property and voting rights. Beliefs about gender inequality may also cause a society to specialise in capital-intensive industries, which in turn decreases the relative cost of those gender-inequality norms, which in turn helps perpetuate them. More research should be done to understand these interactions.

Most of the papers in the literature also try to examine an event in isolation from other events, except possibly to account for other covariates. However, the evolution of gender roles is much more complex and highly nonlinear. Understanding the evolution of female labour force participation will depend on obtaining a chronology of both cultural and institutional changes and examining the interrelationships between them.

## See Also

- cultural transmission;
- culture and economics;
- gender roles and division of labour;
- women's work and wages

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