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## Motherhood Postponement and Wages in Europe

### INTRODUCTION

Nowadays it is not unusual for women to have their first child in their thirties. Figure 1 shows the trend in mean age at first birth in a sample of European countries. Starting from the 1980s, in almost all countries there is a sharp increase in the age of first motherhood. Multiple factors have been advanced to explain this trend. Education is surely an important one. Women's educational levels have been increasing at a faster pace than those of men in the last decades. Female education has a twofold delaying effect on age at first birth. The first is an "incapacitation effect", because enrolment in and completion of education are activities generally incompatible with childrearing. The second is an "aspiration effect", because one reason why individuals invest in their human capital (including inter alia on the job training) is to reap economic returns in the labour market (Becker 1994). It may be the case that these returns are maximised for women if they delay motherhood. Consistent with this view, two main reasons for postponing having children have been stressed in the economic literature: the *career planning motive* and the *consumption smoothing motive* (Gustafsson 2001). The career planning motive posits that women have their first child when motherhood is likely not to represent an obstacle any more to their full realisation in the labour market. This typically happens when they are at the apex of their careers or have little prospect of further promotion. The salience of this motive depends of course on the level of gender discrimination existing in the labour market and on the absence of labour market institutions favouring the full conciliation of family and work. The consumption smoothing motive is strictly related to the previous one, as it states that women give birth when children are unlikely to negatively impact household consumption levels, i.e. households dispose of enough income and wealth to smooth consumption. A slightly different interpretation of this motive is that women (and parents in general) wait to have children until they are sure to have enough resources to grant them the best life opportunities, or in more technical terms when they have the financial resources to invest in child quality (Becker and Lewis 1973). The rising competitiveness of the economic environment and the slower economic growth prevailing in most developed countries compared to the past may indeed require greater investments in child quality.

Besides labour market reasons for postponing the first birth, it must be noted that economic, demographic and sociological literature has stressed many other factors (see Sobotka 2004), such as, just to mention a few, the diffusion of contraception (giving increasing power to women), changes in sexual habits and social norms, and the development of assisted reproduction technologies, which potentially enable women to become mothers at older ages with respect to the past while focusing on their careers in their 30s and 40s.

The remaining article develops as follows. In the next section, we stress our main contribution to the existing literature. Then we describe our empirical strategy and the data used in the empirical analysis. The main findings are commented on in the results section, and summarised in the conclusion.

### EXISTING LITERATURE

The existing literature generally shows a positive association between postponement of first childbirth and labour market outcomes (see Bratti 2015, for a review). Delaying motherhood positively affects both women's labour incomes (e.g., Miller 2011; Karimi 2014; Herr 2016; Leung et al. 2016) and labour force participation (e.g., Troske et al. 2013; Bratti 2014; Mølland 2016).

While evidence on the "postponement premia", i.e. the increase in wages or employability associated with late motherhood, is already widespread for a number of countries, our contribution to the existing literature is twofold. First, we provide comparative evidence for a large set of European countries using harmonised data from the European Union Statistics on Income and Living Conditions (EU-SILC) survey. Second, and most important, we make an attempt to relate country-specific estimates of "postponement premia" to indicators summarising the policy and cultural contexts prevailing in the different EU countries.

### EMPIRICAL STRATEGY

We use EU-SILC data, described in the following section, to estimate country-specific "postponement premia" using the following equation

$$y_{ijt} = \alpha_0 + \alpha_{1j}A1B_i + \alpha_2X_{it} + D_{jt} + \epsilon_{ijt} \quad (1)$$

where  $y_{ijt}$  is an outcome variable referring to women's labour market performance (gross hourly wage);  $A1B_i$  is a woman's age at first birth;  $X_{it}$  is a vector of control variables including age, level of education grouped in three categories (low, medium and high); migrant status and age of the youngest child. (We also estimated models controlling for current partners' presence, level of education and age, and results were only marginally different.).  $D_{jt}$  are country-year fixed effects, which capture, among others, differences in business cycles;  $\epsilon_{ijt}$  is an idiosyncratic error term. Our parameters of interest are the country-specific estimates of "postponement



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premia” ( $\alpha_{1j}$ ). Equation (1) is estimated using Ordinary Least Squares (OLS). A positive (negative) sign on  $\alpha_{1j}$  means that postponement of first birth has a positive (negative) effect on wage in country  $j$ . We expect “postponement premia” to be positive, at least in countries in which family and work are scarcely compatible. In particular, postponing motherhood may generate a double dividend on mothers’ careers. First, women delay a potential source of gender discrimination in both hiring and career promotion. We label this effect as the pure “career planning effect”. Second, starting childbearing later will probably entail a lower number of children (in demography the so called “postponement effect”, see Bratti and Tatsiramos 2012), also improving labour market outcomes via reduced fertility (see, for instance, the discussion in Miller 2011). In equation (1) we do not control for the number of children and estimate the gross “postponement premia” capturing both effects.<sup>1</sup>

Although the recent literature has emphasised endogeneity issues related to pregnancy postponement (i.e. delayers may have unobservable characteristics also affecting labour market outcomes, such as “work orientation”) potentially biasing the OLS estimates (Miller 2011; Bratti and Cavalli 2014), our main interest lies in relating the estimates of the “postponement premia” to country-level policy and cultural features. In order to do so, we estimate the following equation

$$\hat{\alpha}_{1j} = \beta_0 + \beta_1 \text{Characteristic}_j + u_j \quad (2)$$

where  $\hat{\alpha}_{1j}$  is the OLS estimates of the “postponement premia”;  $\text{Characteristic}_j$  is a summary indicator of a country’s policy or cultural orientation during the estimation period; and  $u_j$  an error term. In each estimate of equation (2), only one country characteristic is included at the time to avoid multicollinearity problems. We maintain that, conditional on country-year fixed effects controlled for in equation (1), countries’ features are less likely to be correlated with unobservable individual characteristics, which then enter the error term of the second-step of our analysis ( $u_j$ ). The estimates are weighted by the inverse of the standard errors of  $s$  – using Weighted Least Squares (WLS) – since the dependent variable is generated by a regression. The sign and magnitude of the estimate of the parameter  $\beta_1$  indicates whether “postponement premia” are on average positively or negatively affected by some specific countries’ attributes.

## DATA

The data used for the estimation of equation (1) are a pooled sample of the cross-sectional version of EU-SILC from 2004 to 2014.<sup>2</sup> The EU-SILC currently covers the

EU28 members and adjacent countries such as Norway, Switzerland and Iceland. It collects information on all members of the sampled households, and contains detailed information on the respondents’ current economic and social conditions, with the main focus on income, poverty, living conditions and social exclusion. As this survey is not designed for demographic analysis, fertility data (age at first birth) had to be reconstructed from household information, relying on the “own child method” (OCM) (Bordone et al. 2009; Coleman and Dubuc 2010; Klesment et al. 2014) matching children and mothers within households. One drawback is that information is limited to children still living in the household, thus we have no information on dates of birth of children who have already left the parental home and do not belong to the surveyed household anymore. To overcome this limitation we focus on young women, so that their children are more likely to be still living in the parental household. We also decided not to consider teenage mothers, as they represent quite a different category of women. Thus, our working sample is composed of all mothers, aged between 18 and 45, at the time of the survey, for whom we observe having their first child between age 18 and 40.

We only include mothers who are currently working as employees, excluding self-employed mothers, and mothers whose income comes exclusively from dependent work, excluding employees who also have self-employment incomes.

To explain country differences in the impact of age at first motherhood on subsequent labour market outcomes (equation 2), we consider three main groups of indicators: the first one is composed of indicators which describe the social and economic conditions faced by women; the second one reflects culture and values of the analysed countries; the last one contains composite indexes which put together different dimensions related to gender equality and family-friendly policies. When possible, we consider the average value of the indicators over the years 2004-2014. If not possible, we consider the average value over the available years.

## A) SOCIO-ECONOMIC INDICATORS

- *Strictness of employment protection*. It expresses the rigidity of the labour market in terms of costs related to individual dismissals in regular contracts [Source: OECD Indicators for Employment protection].
- *The unadjusted Gender Pay Gap (GPG)*. It is calculated as the ratio between the average gross hourly earnings of female paid employees and the average gross hourly earnings of male paid employees, multiplied by 100 [Source: The Structure of Earnings Survey, Eurostat].
- *Part-time jobs diffusion*. It is calculated as the share of women of age 20-64 working on a part-time basis [Source: LFS, Eurostat; available in the years 2007-2014 only].

<sup>1</sup> We also estimated models including the number of children. The “postponement premia” are generally smaller in size, showing that part of the labour market advantage of giving birth later is mediated by lower fertility.

<sup>2</sup> <http://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions>.

- *Parental leave arrangements.* It is the total number of paid weeks to mothers, including both maternity and parental leave [Source: CESifo database; available in the year 2015 only].
- *Early formal childcare availability.* It is calculated as the proportion of children younger than three years old enrolled in formal childcare [Source: EU-SILC, Eurostat; available years 2005-2014 only].

## B) CULTURE AND VALUES INDICATORS

- “Pre-school children suffer with working mothers / Being a housewife is as fulfilling as working / When jobs are scarce men should have the priority over women.” We calculate the percentage of male and female respondents who agree and strongly agree with the above statements [Source: own elaboration from the European Value survey; available in year 2008 only].
- *Age norm.* It is calculated as the percentage of respondents stating that the ideal age to become a mother is after 30 [Source: own elaboration from the “Timing of life” section of the European Social Survey; available in year 2008 only].
- *Leave - sharing.* It is calculated as the percentage of respondents to the question: “Consider a couple who both work full-time and now have a new-born child. Both are in a similar work situation and are eligible for paid leave. How should this paid leave period be divided between the mother and the father?” who respond “The leave should be used entirely by the mother” or “The leave should be used mostly by the mother” [Source: International Social Survey Programme; available in year 2012 only].
- *Religious participation.* It is calculated as the percentage of respondents attending religious services at least once per week. [Source: European value survey; available in year 2008 only].

## C) COMPOSITE INDEXES

- *The family-friendly society index “Target field index”.* It summarises five sub-indicators: high birth rate, high female employment, high level of education, low poverty of families and gender equality; it takes values from 0 to 100 [Source: CESifo; available in year 2009 only].
- *The family-friendly society index “Fields of action index”.* It summarises three sub-indicators: “financial support”, which describes the degree of transfers, tax allowances or continuation of payments for families; “infrastructure”, which describes the coverage of formal childcare; and “time”, which describes the work-life balance, the efficiency of the educational system and tax system for the work-life balance; it takes values from 0 to 100 [Source: CESifo; available in year 2009 only].
- *The Gender Development index (GDI).* It measures gender gaps in human development achievements

by accounting for disparities between women and men in three basic dimensions of human development – health, knowledge and living standard – using the same component indicators as in the Human Development Index (HDI). It is a direct measure of gender gap showing the female HDI as a percentage of the male HDI [Source: UN; available years 2005-2014 only].

Obviously, many indicators are correlated among each other, and groups of countries may share similar values of these indicators. Countries with high availability of formal childcare are also the ones where part-time jobs are more diffused. In contrast, countries with longer parental leaves are the ones where fewer part-time jobs are available. These correlations identify different family-work strategies: the diffusion of the part-time option is related to the necessity to return to the labour market relatively early since formal childcare hardly covers a full-time work-day, and the mother is willing to spend time with the young child; on the other hand, where parental leaves are longer, mothers are supposed to be working full time once they are back to their jobs.

It is interesting to observe the relationship between objective measures and values. Countries with high level of agreement with the statements “mothers should mainly look after children”, “pre-school children suffer if mother works”, “if jobs are scarce, men should take them” are the countries with lower availability of formal childcare and with fewer part-time job opportunities. We also observe a positive correlation between more people agreeing with “being a housewife is as fulfilling as ...” and high levels of employment protection. Countries with higher employment protection are generally “dualist” and women are less likely to be in the protected sector and more likely to have less protected and less satisfying jobs.

Values may be the causes but also the consequences of different institutional settings: If women want to be at home and look after children, they are less likely to demand childcare services; if women do not face high availability of childcare and the possibility to work, this may tend to reinforce their beliefs.

We can cluster the countries in four groups, which roughly correspond to different European geographical areas: a first group of Nordic countries with medium levels of employment protection, part-time diffusion and leave length but the highest availability of formal childcare and the lowest attachment to “traditional” values; a second group of Continental European countries with lower employment protection and short leaves, higher availability of part-time jobs and childcare and low attachment to traditional values; a third group of Eastern European countries with medium employment protection, little part-time and childcare, longer leaves; a fourth group of Mediterranean countries with high employment protection, medium level of childcare, part-time and leave length, and strong attachment to traditional values.

RESULTS

In Figure 1 we plot the coefficients associated with the “postponement premia” in each country. With the exception of very few countries, having the first child at a later age is associated with a positive and statistically significant wage premium. In more detail, we see that the countries where the premium is negative or non-significant are mostly Nordic countries (Sweden, Iceland, Norway, Denmark) and a few Eastern European ones (Slovenia, Slovakia, Estonia, Lithuania). In all the Continental and Southern countries, the premia are always positive.

The three countries with higher premia belong to three different clusters: Germany (Continental), Poland (Eastern) and Portugal (Mediterranean). Nevertheless they share some common features in terms of country indicators: Poland and Portugal are Catholic countries; with relative low shares of part-time jobs, and very traditional values. Portugal, in addition, has very strict employment protection legislation, and Poland a very low share of childcare availability. We can expect that in those countries reconciliation of family and work is quite hard, and that there is “pressure” from social norms on focusing on childrearing after having a child, which could lead highly educated and/or motivated women to wait longer to become mothers so as not to waste their human capital and to enjoy higher re-entering wages after a maternity leave. This is also true for other countries which show positive though slightly lower premia, such as the Mediterranean European ones – Italy, Spain, Greece and Cyprus – and the more Catholic and traditional Ireland, Romania and Malta. Germany, on the other hand, has very long paid maternity leaves but low enrollment of children under age three in childcare and also one of the highest gender wage gaps.

In Table 1 we report the coefficient of the second model, where we regress the premia estimated in model (1) on indicators of countries’ policies and culture. We do as many regressions as the number of chosen indicators including one indicator at a time. A positive sign means that higher values of the indicators are

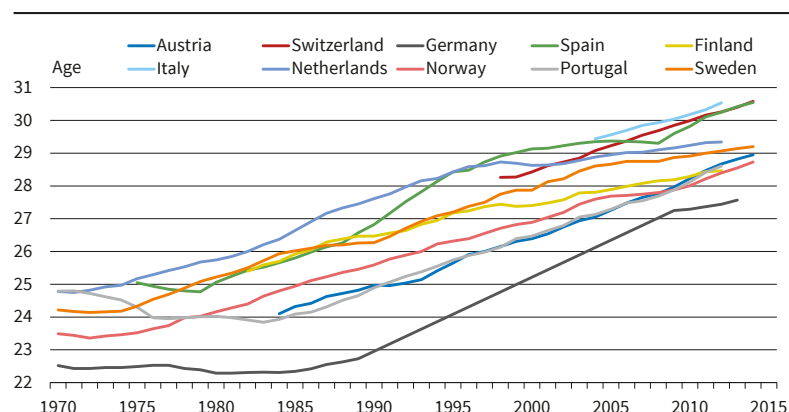
associated with higher premia for waiting longer to become a mother. In the Table, each cell corresponds to a different regression. In Figures 3 and 4, we report the cross plots between the wage premia and the statistically significant indicators.

When considering objective indicators, we see that the proportion of children aged between zero and three attending formal care and the length of maternity and parental leave have a negative association with the wage premia, suggesting that in countries which offer more family-friendly services (more childcare and more paid parental leave), the premia to have a child at older ages is lower, or the other way around, the penalty to become mother at younger ages is less.

When we focus on the indicators capturing culture and values, we see that three of them, namely the proportion of individuals agreeing that a pre-school child suffers if the mother works, the proportion of individuals agreeing that if jobs are scarce men should have the

Figure 1

Mother’s Mean Age at First Birth

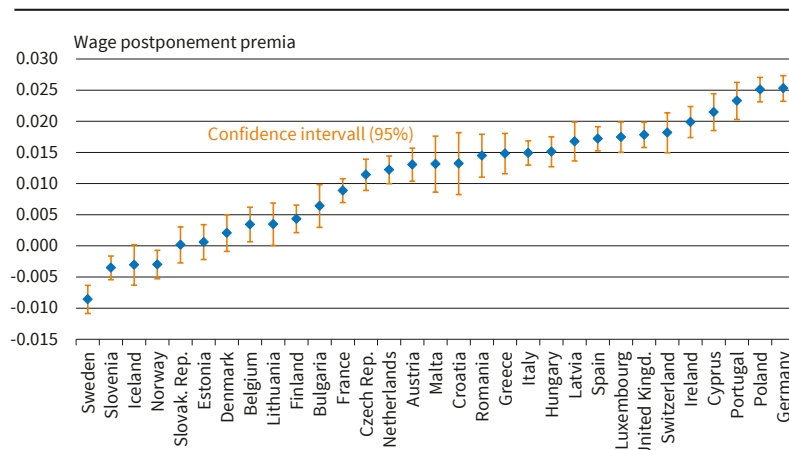


Source: Human Fertility Database (HFD); authors’ calculations.

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Figure 2

Effect of Maternal Age at First Birth on (log) Gross-Hourly Wages



Source: EU-SILC data; authors’ calculations.

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priority, and the proportion of individuals attending religious services at least once a week are positively correlated with the premia, and thus a higher value of these indicators raises the premia to become mother at a later age. Countries with higher values of these indicators can be considered as “more conservative” and indeed they are mostly Mediterranean countries (Italy, Portugal, Cyprus, Greece and Malta) and/or the most Catholic ones (Ireland and Poland). Of course these cultural values are associated with other objective indicators (e.g., negatively with proportion of children enrolled in childcare).

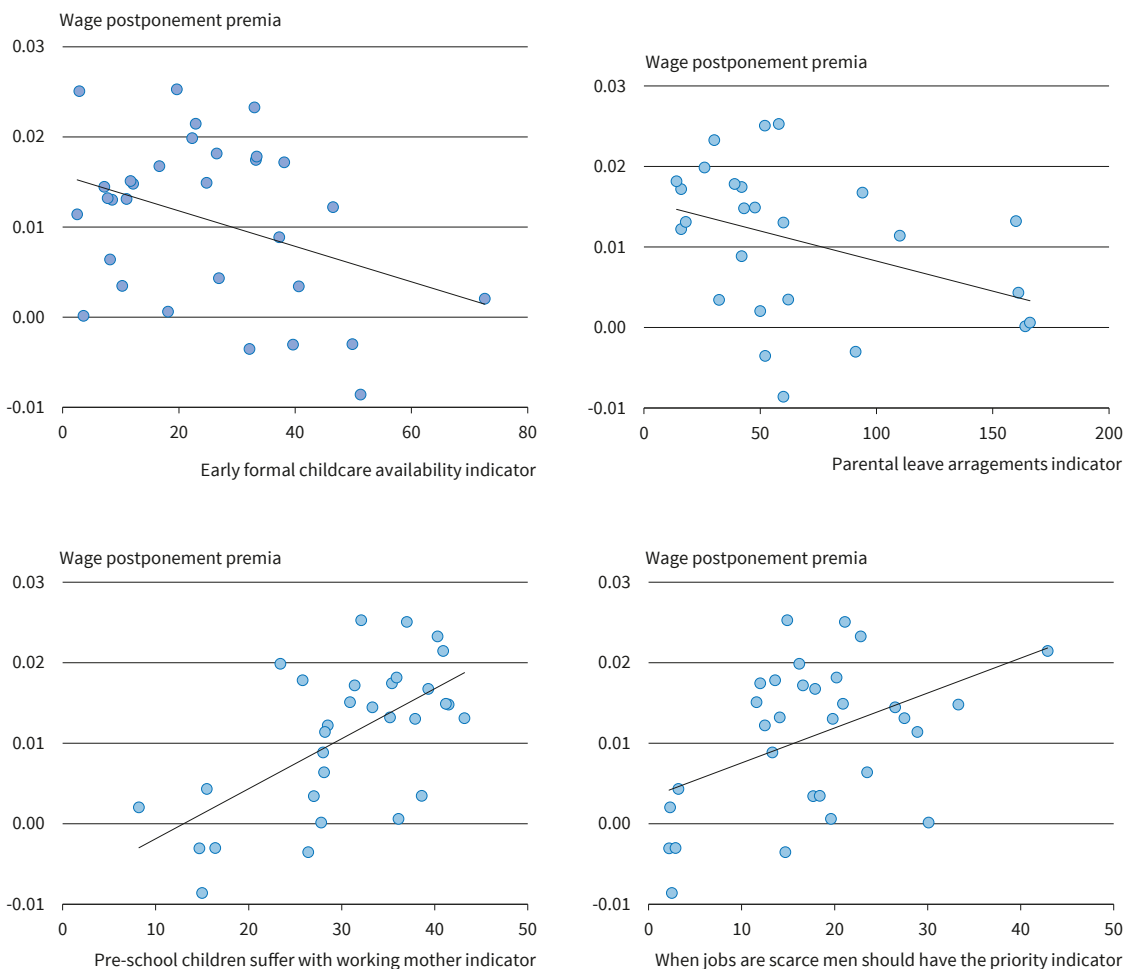
Finally, when focusing on composite indices we see that both the fields of action index and the target fields index are positively associated with the premia. Thus, higher values of the indices, representing more family-friendly societies, are associated with lower premia for late-age mothers. Similarly the Gender Development Index, whose higher values represent a more gender equal society based on health, knowledge and living standards, is negatively associated with the premia.

**CONCLUSION**

Given the several challenges that women with children face in the labour market, late motherhood may represent a way for women to delay the labour market costs of having children. This article represents a first attempt to investigate the differences in the labour market returns from motherhood postponement in Europe (“postponement premia”) using highly comparable EU data. Our analysis shows a high variability in the “postponement premia” related to wages. In some countries delaying the birth of the first child by one year may produce an increase in wages as high as 2.5% (Germany or Poland), while in other countries the effect can be negative. We provide some evidence that these premia are related to the policies and institutions in place in the different countries. Namely, the wage gains from postponing motherhood are larger in countries lacking family-friendly policies and in more traditional societies, and smaller in countries promoting higher gender equality.

Figure3

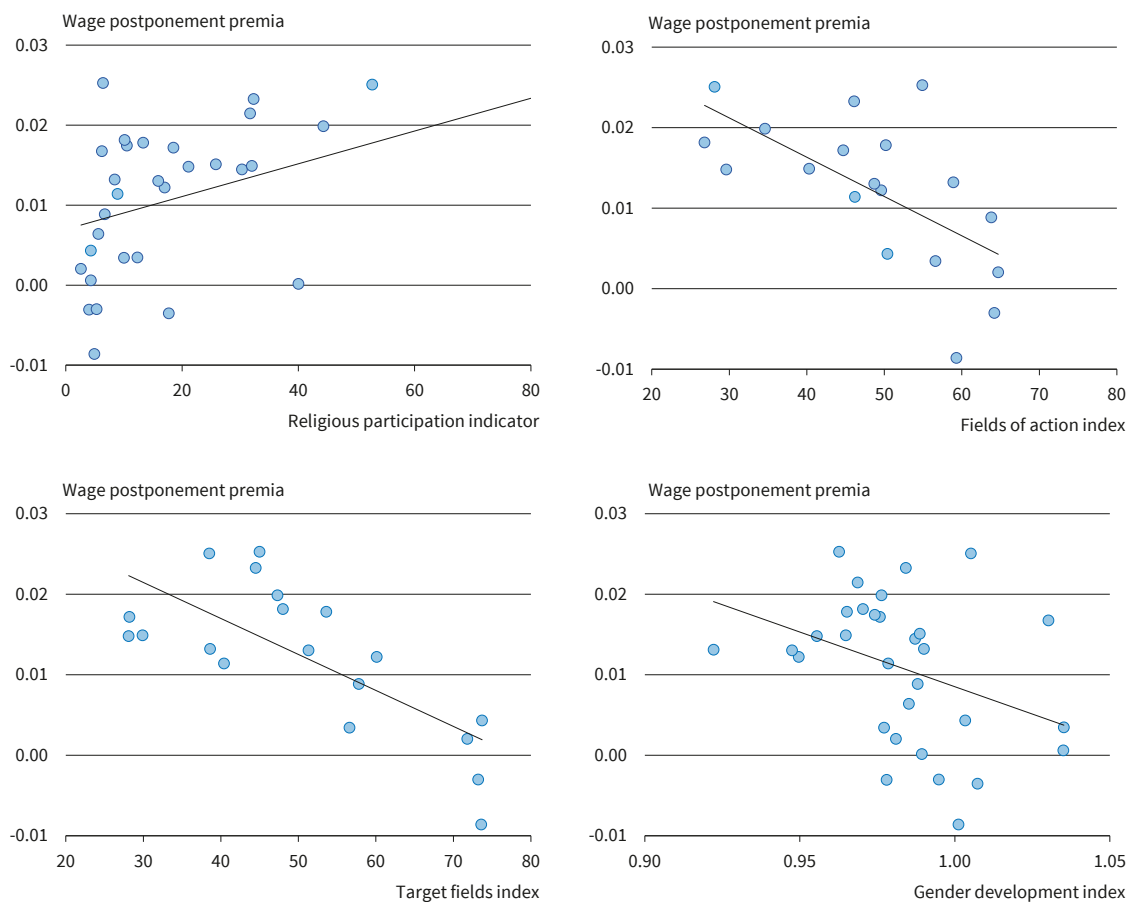
**Cross Plot of Wage “postponement premia” and Countries’ Policy/Values Indicators**



Source: Authors’ computations.

Figure 4

## Cross Plot of Wage “postponement premia” and Countries’ Values/Gender Indicators



Source: Authors' computations.

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Table 1

**Regression of Wage “Postponement Premia” on Countries’ Characteristics**

Indicators	Estimates	Observations
Strictness of employment protection	0.00123 (0.34)	26
Unadjusted Gender Pay Gap	-0.0000899 (-0.32)	31
Part-time jobs diffusion	-0.0000116 (-0.12)	30
Parental leave arrangements	-0.0000837* (-2.13)	26
Early formal childcare availability	-0.000223* (-2.31)	31
Pre-school children suffer with working mother	0.000662*** (4.31)	31
Being housewife is as fulfilling as working	-0.0000734 (-0.45)	31
When jobs are scarce men should have the priority	0.000462* (2.72)	31
Age norm	0.000324 (1.01)	21
Leave - sharing	0.0000674 (0.45)	20
Religious participation	0.000248* (2.52)	31
Target fields index	-0.000455*** (-4.50)	19
Fields of action index	-0.000516** (-3.45)	19
Gender Development Index	-0.160* (-2.30)	31

t-statistics in parentheses, + p < 0.10, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

Note. “Estimates” are the estimated coefficients from a regression of country-specific postponement premia on the indicators listed in column 1, obtained using WLS (weighted by the inverse of the standard error of the generated dependent variable). The number of observations may differ across regressions depending on the availability of the indicators.

Source: Authors’ computations.