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# How Do Changes in Gender Role Attitudes Towards Female Employment Influence Fertility? A Macro-Level Analysis

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## Abstract

This study explores whether the diffusion of gender-equitable attitudes towards female employment is associated with fertility. We argue that any positive effect on fertility requires not only high levels of gender-equitable attitudes overall, but also attitude convergence between men and women. We analyse 27 countries using data from the World Values Surveys and European Values Studies. We find support for a U-shaped relationship between changes in gender role attitudes and fertility: an initial drop in fertility is observed as countries move from a traditional to a more gender-symmetric model. Beyond a certain threshold, additional increases in gender egalitarianism become positively associated with fertility. This curvi-linear relationship is moderated by the difference in attitudes between men and women: when there is more agreement, changes are more rapid and the effect of gender egalitarian attitudes on fertility strengthens.

## Introduction

The second half of the 21st century witnessed major demographic shifts. All developed countries experienced a decline in marriages accompanied by a rise in divorce and cohabitation, and fertility rates dropped to historically low levels. But since the late 1990s we observe a fertility recovery in a large number of the advanced OECD nations (Goldstein, Sobotka, and Jasilioniene, 2009; World Bank, 2010; Bongaarts and Sobotka, 2012).

There are several explanations for this fertility reversal. First, as Myrskylä, Kohler and Billari (2009) argue, the recovery is especially likely to occur at advanced development levels, measured by the Human Development Index.

A second approach emphasizes the role of female employment, showing that the fertility rebound is especially

likely to occur when, as in France, Scandinavia, or the United States, female employment becomes the norm (Ahn and Mira, 2002; Luci and Thévenon, 2010; OECD, 2011). In contrast, the Eastern European and Mediterranean countries suffer from seemingly persistent ‘lowest-low’ fertility rates, i.e. with Total Fertility Rates (TFRs) < 1.3 (Kohler, Billari and Ortega, 2002).

A third perspective emphasizes the importance of reconciling work and motherhood and the degree to which institutions and policy context promote the combination of both (Castles, 2003; Saraceno, 2010; Esping-Andersen *et al.*, 2013). Where it does not, as in the Mediterranean countries, we are more likely to find persistent low fertility.

In an early study, Chesnais (1996) suggests that fertility is positively associated with gender egalitarianism

and reconciliation policies—although only within advanced nations. McDonald (2000a, 2000b, 2006) develops this idea further. He predicts exceptionally low fertility where women's roles have changed but where institutions and families have not yet adapted. In work life, this is exemplified by the persistency of gendered occupational segregation, which tends to mirror the traditional division of labour in the home (Badgett and Folbre, 1999; see also Begall and Mills, 2013).

As Esping-Andersen and Billari (2012) argue, the emergence of reconciliation policies is probably endogenous with respect to women's changing roles, in the sense that they are likely to emerge only when the revolution of women's roles is already advanced.

Rather than focus on female employment per se, we attempt to capture society-level attitudes regarding equal opportunities for participation in the labour market for men and women. We explore whether attitudes in support of men's and women's equal right to paid work are associated with fertility trends at the country level. Our core hypothesis is that a pervasive degree of gender-equitable attitudes will promote a better reconciliation of motherhood and careers. Inspired by the theoretical contributions of McDonald (2000a, 2000b, 2006) and of Esping-Andersen and Billari (2012), we argue that to be positively associated with fertility, gender-equitable attitudes must not only be strongly present overall, but also similarly diffused among women and men.

We use data from the World Values Surveys (WVS) and European Values Studies (EVS) integrated with data on TFR from the World Bank's Indicators and the Human Fertility Database. Our empirical analyses include 27 countries observed in 1990, 2000 and 2009. This allows us to identify shifts from traditional to more gender-symmetric normative contexts and how these changes relate to fertility. We find evidence in support of the hypothesized U-shaped relationship between changes in gender role attitudes and fertility at the country level. Our results also show that this relationship is stronger when the attitudes of men and women converge.

### Gender Equality, Gender Equity, and Fertility

Fraser (1994) and McDonald (2000b, 2013) make a clear distinction between gender equality and gender equity, both conceptually and empirically. Gender *equality*, they argue, measures how outcomes in different domains (i.e. education, labour market, health, etc.) differ between men and women. Gender *equity*, in

contrast, is about the perception of equal opportunities rather than equality of outcomes (McDonald, 2013, p. 983). While gender equality is easily quantified, gender equity reflects subjective views. As highlighted by both Mills (2010) and McDonald (2013), gender equity is difficult to measure especially at the contextual level and, in fact, measures of gender equality are often used as a surrogate.

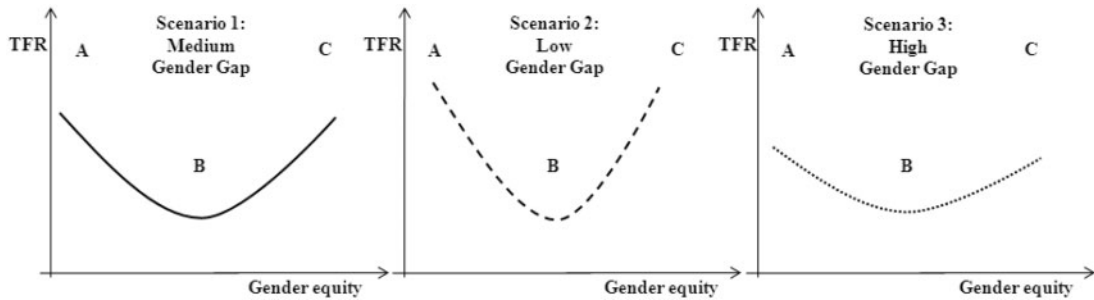
The Gender-related Development Index (GDI) is an example of a gender equality measure (McDonald, 2013). In Mills' (2010) micro-macro study, it emerges that the GDI is positively and significantly associated with stronger fertility intentions at the individual level. Mills illustrates how the societal context of gender equality also matters for fertility.

A measure similar to the GDI, the Global Gender Gap Index (GGG), is used by Myrskylä, Kohler and Billari (2011). They show that gender equality, as measured by cross-sectional levels of GGG,<sup>1</sup> is a necessary condition for a reversal in the relationship between fertility and high degrees of socio-economic development. In other words, countries ranking high in development but low in gender equality continue to experience low fertility.

We believe there is a strong case in favour of a gender equity effect on fertility, primarily because equity captures notions of fairness. As emphasized by McDonald (2013), what matters for fertility is not so much whether outcomes are gender equal or unequal, but whether they are considered to be both fair and desirable.

Our study differs from Mills' (2010) and Myrskylä, Kohler and Billari (2011) in two significant respects: (i) we focus on the prevalence of gender-equitable *attitudes* towards female employment; (ii) we analyze the changing association between attitudes and fertility within and across countries and over time. Following McDonald's (2013) equity definition, our aim is to capture perceived gender norms at different times and in different contexts rather than focusing on gendered outcomes. The role of established social norms with respect to gender roles and the division of labour is also stressed in Esping-Andersen's (2009) 'multiple-equilibrium' framework which predicts fertility to be lowest in the early stages of the transition from a traditional to a 'gender-symmetric' family model. Once the transition is completed and a new equilibrium is attained, one would expect higher fertility levels.

Using outcomes as a measure of gender equality can in some cases be misleading. For instance, post-Soviet countries in the 1990s—such as the Balkan countries—boasted levels of female participation (and education) similar to the Nordic countries (World Bank, 2010).



**Figure 1.** Fertility and gender equity: three hypothetical dynamics according to the level of the Gender Gap over time. *Note:* the three scenarios differ for the level of Gender Gap (assumed to be constant over time): medium, low, and high, respectively.

In terms of outcomes, we would classify these countries as fairly egalitarian. However, these countries displayed quite traditional gender role attitudes. As Hofäcker, Stoilova and Riebling (2013) note, the ‘double-shift’ phenomenon was prevalent in post-Soviet countries: employed women generally performed the majority of household work. Indeed, we shall see that these countries rank low on our gender equity measure even if they would score quite high on standard measures of gendered outcomes, such as female education or employment.

As mentioned, we focus on the work dimension of gender equity, using a measure of attitudes regarding the equal rights of women and men to participate in the labour force.

Our hypotheses are summarized in Figure 1. The idea of a U-shaped relationship between TFR and equitable gender attitudes over time and for a given country is taken from Esping-Andersen (2009) and Aassve, Billari and Pessin (2012). The intervals A, B and C represent three stages in the transition from traditional to equitable gender roles attitudes. A represents a society dominated by traditional gender role attitudes, which is characterized by the adherence to the male breadwinner model. In this model, the vast majority of the population (women included) accept an unequal division of labour. This is seen as fair and desirable because there is a low prevalence of persons with gender-equitable attitudes. This traditional equilibrium should produce high fertility (and stable marriages). B is an intermediary stage in which women have abandoned the housewife identity while society has yet to adapt. In this stage, the percentage of people (especially women) with gender-equitable attitudes is higher than before but is not coupled with increased opportunities for women. Therefore, the contextual situation is considered as unfair by an increased amount of people. C represents a society that has fully embraced equitable views towards gender roles.

This new equilibrium is considered by a majority of the population as fair because the high prevalence of gender-equitable attitudes is reflected in a society that offers more equal opportunities.

In the initial stage (moving from A to B), we should expect declining fertility because this is when women should experience reconciliation problems (and possibly also role conflicts) most acutely. As institutions and partnerships adapt to women’s new identities, and as gender-equitable attitudes come into dominance (moving from B to C), we should see a return to higher fertility—in part because this should be accompanied by greater gender symmetry in domestic tasks and, in part, because role conflicts are likely to abate at this stage.

According to Esping-Andersen and Billari (2012), when women’s role change has not been accompanied by greater equity in gender relations, women can respond to perceived unfairness in three distinct ways: exit, voice, or loyalty. The exit strategy implies foregoing marriage and/or reducing fertility in situations where women are unlikely to find a gender-equitable partner, or divorcing when conflicts about couple arrangements emerge. Loyalty implies that women renounce on their ambitions for emancipation and independence. For example, they may curtail their career after having the first child. Finally, the voice strategy implies an active effort to realize gender equity. We believe that the gap between men’s and women’s gender equity attitudes influences which strategy is more likely to be adopted, and this can have an impact on how fertility changes during the transition.

In the first stage of the transition (from A to B), the diffusion of gender-equitable attitudes is too limited for the voice strategy to be viable. One would expect that the loyalty or exit strategy will prevail at this stage. In contrast, the voice strategy is expected to be more effective and to be more widely adopted when a ‘critical

mass' has been reached and when the dynamics of the transition accelerate, i.e. in the second stage of the transition (from B to C).

Esping-Andersen and Billari (2012) and Feichtinger *et al.* (2013) expect the transition to be more rapid and the curve to be steeper in more homogenous and less stratified societies (e.g. where ethnic or social-class barriers are less accentuated), where also institutions are expected to adapt quicker. In parallel, we argue that the transition will also be quicker when there is more agreement across the sexes.

The panels in Figure 1 represent three different curves for three hypothetical countries characterized by different transition scenarios. Panels I, II, and III represent a hypothetical country where the gender equity gap between men and women is, respectively, medium, low, and high.<sup>2</sup> While a U-shaped dynamic is expected for all countries, we argue that the transition is characterized by a steeper curve for countries where there is more agreement across the sexes (panel II).

Our hypothesis implies that in the first stage of the transition, from A to B, the effect of an increase in gender equity on TFR is weaker in a country with a larger gap between men and women. A larger gap implies that women with gender-equitable attitudes are more likely to adopt a loyalty strategy. If this is the case, an increase in gender-equitable attitudes (mainly driven by women) will not produce strong effects on fertility. If there is a narrower gender gap, more men will accept their partners to participate in the labour force. However, in the first stage of the gender revolution it is likely that institutions have not (completely) adapted and this may depress fertility.

Exit strategies are also likely to be adopted in the first stage of the transition both when the gap is large or small. However, in the former case it is more likely that exit strategies increase marital instability (reduced marital rates and higher divorce rates), while when gap is lower the exit strategy may imply reducing the number of children also for married couples. Therefore, in this case a larger share of couples can be interested and the depressive effect of fertility is expected to be stronger.

As noted, in the second stage of the transition (from B to C), gender-equitable values will spread throughout society. It is in this phase that the voice strategy is likely to play an important role. We therefore expect that overall high levels of gender equity, when combined with a narrowing of the gender gap, will promote higher fertility. This is, however, unlikely to occur if only one of the conditions is met. If high levels of gender equity coincide with a large gender gap, we should expect that

the exit strategy will still be adopted by a considerable share of women, implying a weaker positive effect on fertility.

To summarize, we expect, firstly, to find a U-shaped relationship between changes in gender equity and fertility for all countries (Hypothesis 1). Secondly, we argue that the effect of changes in gender equity on fertility is stronger when the gap in gender-equitable attitudes by gender is smaller (Hypothesis 2).

## Data and Methods

Our analyses are based on data from the World Values Survey and the European Values Study. They consist of repeated cross-sectional individual-level surveys, which are conducted approximately every 10 years (5 years for some countries). The first wave was conducted in 1981 and the latest in 2008–2009. Both the countries and the questionnaires have changed over the years. We focus on advanced countries, excluding the first wave for lack of information on our gender equity indicator. To obtain a balanced data set, we use information on 27 countries for the following three waves: 1990–1993, 1999–2000, and 2006–2009 (See [Supplementary Table S1](#) for a list of countries).

We focus on one expression of gender equity, namely, views regarding the proper role of women in the labour market.<sup>3</sup> Our measure is based on the following question: 'When jobs are scarce, men should have more right to a job than women'. This question has been used to measure discriminatory attitudes towards working women as it measures whether respondents think that women are less deserving of employment (Fortin, 2005; Azmat, Guell and Manning, 2006; Arpino and Tavares, 2013). Seguino (2007) used this question as a measure of 'the degree of adherence to norms and stereotypes about the gender division of labour, gender power, and men's and women's relative rights of access to resources and opportunities'. The question offers three possible answers: (i) 'agree', (ii) 'disagree', and (iii) 'neither'. We recode the variable into a binary response: 0 is 'agree' or 'neither' and 1 is 'disagree'. Those who score '1' are classified as having gender-equitable views regarding working women. We limit our sample to respondents aged 14–50 years, i.e. to the population in the childbearing ages. As a first step, we construct a variable, which measures the percent gender-equitable respondents by country and by wave. We will refer to this as the Gender Equity<sup>4</sup> indicator:

$$\text{Gender Equity}_{c,t} = \% \text{ gender equitable respondents} \\ \text{in country } c \text{ and in wave } t.$$

We interpret the aggregated attitudinal indicator as a measure of gender equity in the labour market. For the sake of brevity we will use the term gender-equitable attitudes without specifying that they refer to the work domain only from here onwards. Our indicator does not capture directly the perception of fairness and desirability of opportunities offered by the society to women in the labour market, but the two measures are correlated according to the gender equity theories summarized above. In particular, there is a U-shaped relationship between the perception of fairness and the prevalence of gender-equitable attitudes: in societies that are at stage A and C, the level of perceived fairness is high, while it is lower in the intermediate phase.

Our indicator is also a measure of dispersion/concentration: the closer the percentage of gender-equitable people is to either 0 or 1, the more similar are the values within a country at a given point in time. However, for values different from 0 and 1, the same level of gender equity in two countries can correspond to different patterns of distribution among groups. So, to better analyse the diffusion of attitudes we also calculate the percentage of gender-equitable respondents by sex and compute the difference to obtain a Gender Gap indicator:

$$\text{Gender Gap}_{c,t} = \% \text{ gender equitable women}_{c,t} - \% \text{ gender equitable men}_{c,t}.$$

The Gender Gap indicator measures the extent to which gender role attitudes diverge across the sexes. To adjust for compositional differences across countries and waves, we replace the actual percent of gender-equitable respondents by gender/country/wave with the predicted probabilities of being gender equitable via a simple probit model where we control for age and education.<sup>5</sup> Estimates from these models are used to obtain country-/wave-specific gender equity measures net of differences in age and educational distributions, i.e. the resulting levels and gaps will be referred to as 'adjusted'.

In a second step, we assess the dynamic association between fertility and gender-equitable attitudes. To measure fertility, we use data on the TFR taken from the World Bank's Indicators<sup>6</sup> for all countries with the exception of East and West Germany, for which we used the Human Fertility Database (HFD, 2013).

We estimate the following longitudinal model:

$$\begin{aligned} \text{TFR}_{c,t} = & \beta_0 + \beta_1 \text{Gender Equity}_{c,t} + \beta_2 \text{Gender Equity}_{c,t}^2 \\ & + \beta_3 \text{Gender Gap}_{c,t} + \beta_4 \text{Gender Gap}_{c,t}^2 \\ & + \beta_5 \text{Gender Equity}_{c,t} \times \text{Gender Gap}_{c,t} \\ & + \beta_6 \text{Gender Equity}_{c,t}^2 \times \text{Gender Gap}_{c,t} + \alpha_c + \varepsilon_{c,t}, \end{aligned}$$

where the subscripts  $c$  and  $t$  refer, respectively, to countries and times;  $\alpha_c$  are country fixed effects;  $\varepsilon_{c,t}$  is the idiosyncratic error. Because we are interested in within-country dynamics for gender equity and TFR, we estimate with country fixed effects instead of random effects. In this way we avoid the implausible assumption that country-specific effects are uncorrelated with gender attitude dynamics. To test our hypotheses, the model allows for a non-linear effect of gender equity on TFR, and for interaction effects between changes in gender equity levels and the gender gap.

Because the TFR can be subject to annual fluctuations, we take a 3-year average of TFR around the corresponding survey year instead of the single annual value.<sup>7</sup>

## Results

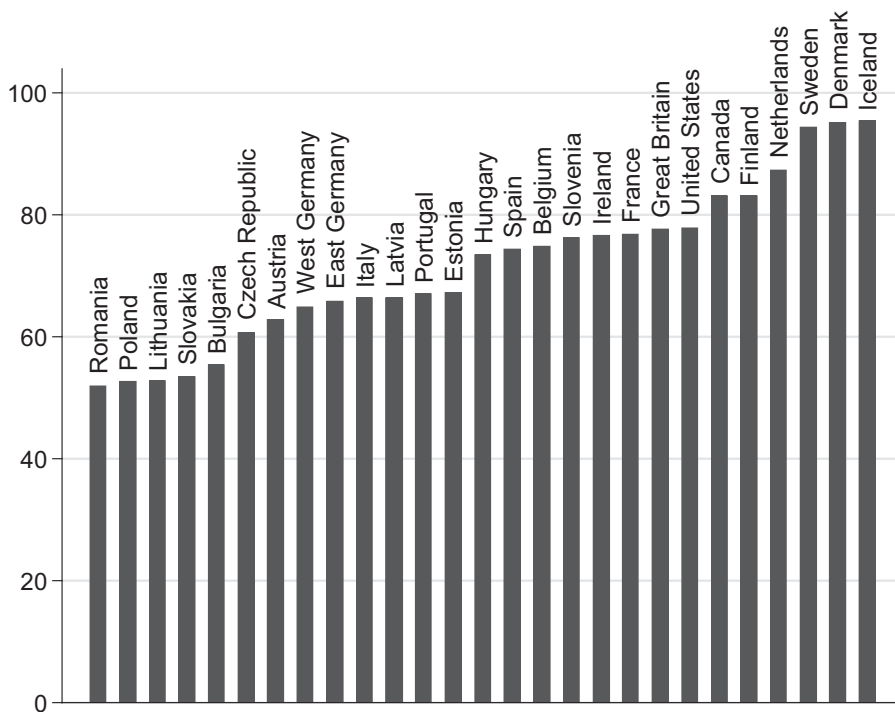
### Dynamics of Gender-Equitable Attitudes by Gender

We start by describing Gender Equity levels and dynamics during the period 1990–2009. Complete information by country and wave on the variables Gender Equity, Gender Gap, and TFR is available in [Supplementary Table S1](#). We begin by illustrating the data graphically. [Figure 2](#) shows the average (over all waves) Gender Equity indicator by country. As expected, the Nordic countries score highest, with average values > 80%. The Anglo-Saxon and some Continental European countries (e.g. France) score somewhat lower, followed by Spain with an average value of 74%. Other Southern European and the German-speaking countries show much lower values, and at the bottom of the distribution we find the majority of Eastern European countries with average values < 60%.

[Figure 3](#) shows the dynamics of Gender Equity for men and women separately for each country. The countries are sorted in increasing order according to the level of Gender Equity in the first wave of the survey. From [Figure 3](#), it is evident that patterns differ: not only the average level at a given time point varies among countries, but also the way countries experience the transition towards equity—in terms of agreement among men and women—is heterogeneous. We focus on two main characteristics: firstly, how the overall level of Gender Equity shifts over time; secondly, whether the change is driven by only one or both genders.

Starting from the top of [Figure 3](#), we can identify countries at stage A (in [Figure 1](#)) with low Gender Equity values in the 1990s. This is where most of the Eastern-European countries are located. These countries have been moving from traditionalism towards a more





**Figure 2.** Average level of Gender Equity by country and across waves.

gender-equitable society but are still characterized by comparatively low levels of Gender Equity. Nevertheless, when examining the Gender Gap, we observe distinctive patterns. To exemplify, in Bulgaria and Romania, women scored higher on Gender Equity in 1990, but men have caught up by 2009. In other countries, women clearly outpace men, and the Gender Gap is widening rather than closing—this is the case in Lithuania, the Czech Republic, and in Estonia.

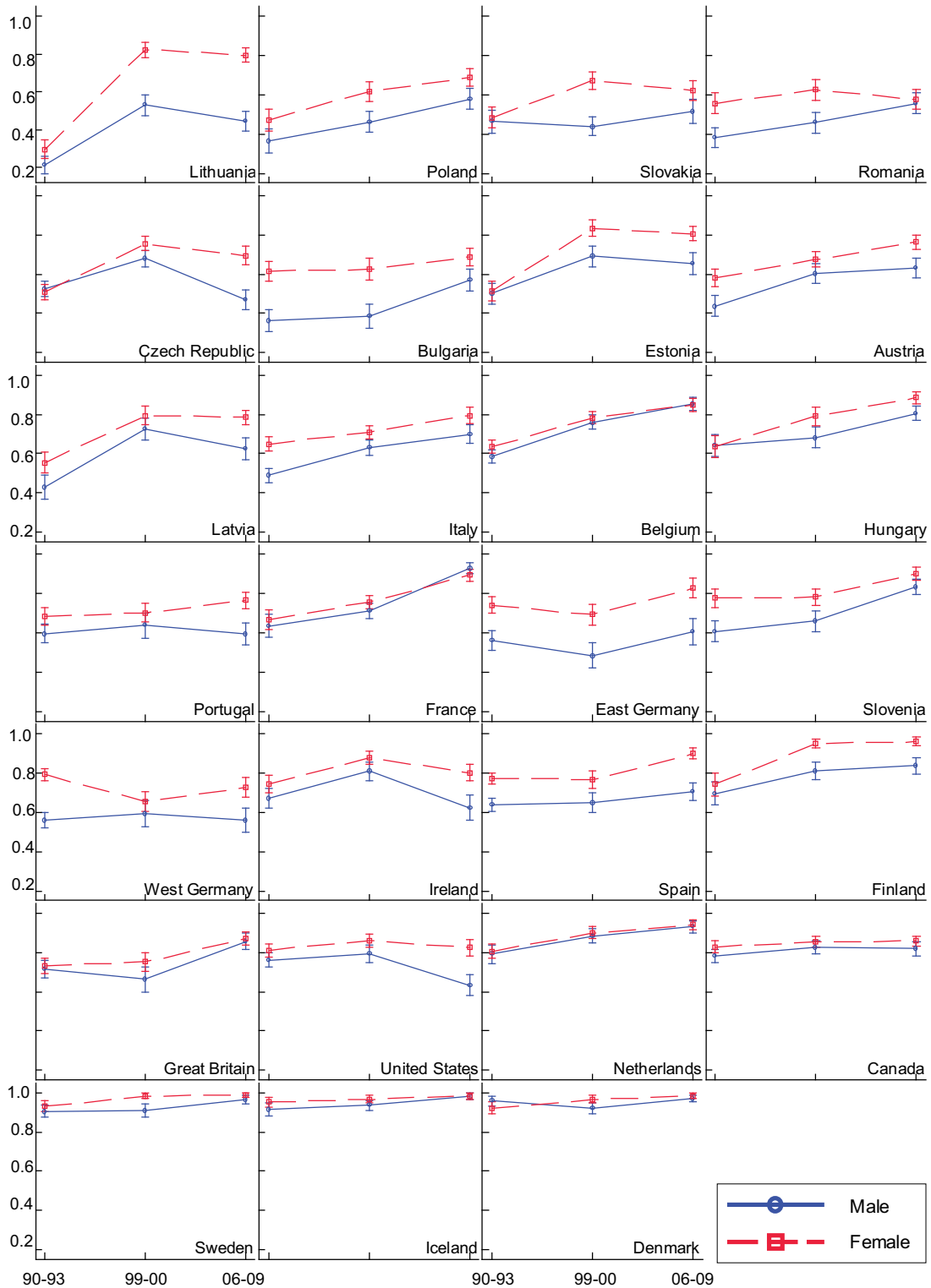
Moving to the middle of [Figure 3](#), we observe countries that seem to be hovering between the traditional and equitable stage (stage B in [Figure 1](#)). Here we observe a greater diversity of countries—mostly Continental, Mediterranean, and a few Eastern European countries. In countries such as Belgium, Hungary, France, Slovenia, and Spain, a steady diffusion of gender equity can be observed—implying a shift towards stage C. Other countries (Italy, Portugal, East and West Germany, and Ireland) change at a slower pace. Regardless of the speed of change, gender differences in terms of attitudes are noticeable in some countries (e.g. East Germany and Spain) while inexistent in others (e.g. France and Belgium). Generally, women are the vanguard of change.

In the bottom of [Figure 3](#) we find the Nordic and Anglo-Saxon countries, all of which adhered to stage C

already in the first wave. In Canada, Sweden, Iceland, and Denmark, gender equity was already widely diffused across the population in 1990 and, moreover, there were hardly any differences between women and men. These countries do not experience significant changes over the period. Indeed, it would seem that they have completed the transition towards a gender-equitable society, with the exception of Canada where the level of Gender Equity stagnates around 80%. Finland and the Netherlands show lower percentages of gender-equitable respondents in the early 90s (78 and 72%, respectively) but moved rapidly towards the completion of the gender role revolution. In the Netherlands, which reaches a similar average as Denmark in the third wave, gender role attitudes have spread equally among women and men throughout the decades (the gap is always very close to 0). In contrast, Gender Equity in Finland increased more among women than men (94 and 80%, respectively in the third wave). As a consequence, the Gender Gap widened from 6 to 14 percentage points.

### The Association between Gender Role Attitudes and Fertility

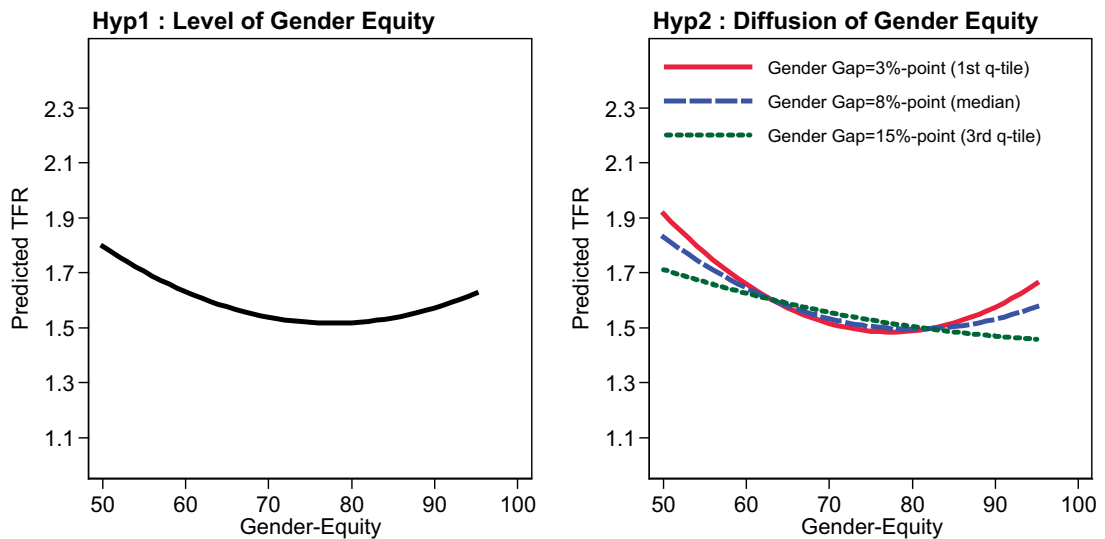
We use the panel model described above to test our overriding hypothesis: namely, that as countries move



**Figure 3.** Dynamics of adjusted Gender Equity by gender for each country.

*Note:* Countries are placed in increasing order by the average value of Gender Equity in the first wave of our sample. The percentage of gender-equitable men and women are referred to as adjusted because they are estimated using a probit model with controls for age and education.





**Figure 4.** Predicted TFR based on *Gender Equity* dynamic (Model 2) and for three hypothetical scenarios for the *Gender Gap* (Model 5).

*Note:* The graphs are constructed using estimates of models 2 and 5.

from a traditionalism to gender equity, changes in gender attitudes and TFR are characterized by a U-shaped relationship; and a low gap between women and men makes the effect of changes in gender attitudes stronger. Parameter estimates, reported in Table 2, are difficult to interpret given the non-linear terms and interactions involving continuous variables. To ease the interpretation of the results, in Figure 4 we show predicted values of TFR corresponding to different dynamics of Gender Equity. In particular, in the left panel of Figure 4 we use estimates from Model 2 (see Table 2) where only Gender Equity and its squared value are included as covariates, and we predict TFR values corresponding to changes in the level of Gender Equity from 50 to 95%.

The predicted trajectory of TFR as Gender Equity moves from low to high levels is U-shaped and thus supports our first hypothesis. The plotted U-shape corresponds, in fact, to a negative estimated coefficient for Gender Equity and a positive one for its squared term, as we can see in Table 2. Both coefficients are statistically significant and indicate that in our sample we observe a predominantly negative relationship between changes in equitable attitudes and TFR (a negative coefficient for the linear term), but the relationship turns positive for high levels of Gender Equity. This happens around the 75% level.

In the right panel of Figure 4 we use estimates from the full model (model 5), which includes also the Gender Gap and its interaction with Gender Equity (i.e. the model we presented above). Regarding the Gender Gap

we consider three scenarios: small, medium, and large gaps between women and men. In calculating the predicted probabilities, we hold the gap constant to show the effect of changes in levels of Gender Equity in different contexts (more or less agreement across genders). The three levels of the gap correspond to the three quartiles of the Gender Gap in the pooled data set (see Table 1).

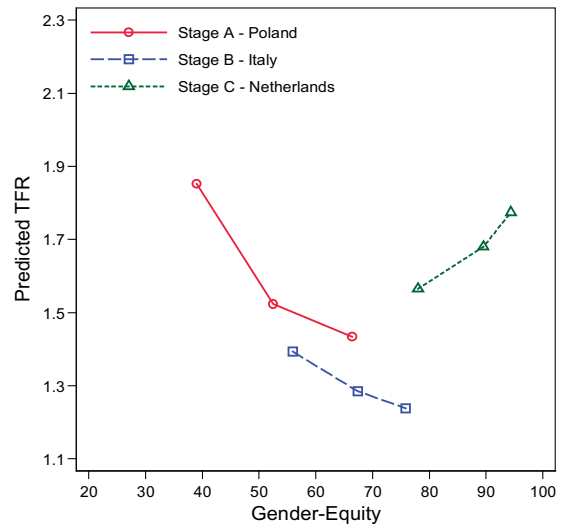
The right panel of Figure 4 supports our second hypothesis: the effect of changes in attitudes on TFR is stronger the smaller is the Gender Gap.<sup>8</sup> In the first stage of the transition (from a traditional to a gender-equitable society) the effect of an increase in Gender Equity on TFR is negative for all considered scenarios. But the effect is stronger in countries where women and men are more in agreement (low Gender Gap). The negative effect of the Gender Gap provides empirical support for the loyalty strategy over the exit strategy in the first stage of the transition (stage A). Accordingly, one possible interpretation is that the larger the Gender Gap, the more likely women are to renounce on their career ambitions and to comply with their partners' gender attitudes. In stage B, the moderating effect of the Gender Gap is almost absent. We observe again a strong interaction between Gender Gap and Gender Equity when the gender role revolution is mature (stage C). In fact, we observe a positive relationship between Gender Equity and TFR for countries with low and medium levels of the Gender Gap, with a stronger relationship for countries with a small Gap. For a very large Gender

**Table 1.** Descriptive statistics for Gender Equity and Gender Gap by wave and across all waves

	Mean	SD	Minimum	Maximum	First quartile	Median	Third quartile
Gender Equity							
Wave 90–93	63.28	16.57	25.96	94.16	50.71	65.07	71.87
Wave 99–00	73.69	12.73	52.53	95.14	64.39	72.99	84.46
Wave 06–09	77.84	12.84	56.45	98.02	66.36	75.79	88.68
Total	71.60	15.28	25.96	98.02	62.52	71.87	84.46
Gender Gap							
Wave 90–93	7.85	7.36	−4.36	25.04	2.55	5.82	13.39
Wave 99–00	10.02	7.22	0.57	29.32	5.37	7.52	13.99
Wave 06–09	10.77	8.68	−2.63	35.73	2.12	10.59	17.28
Total	9.55	7.78	−4.36	35.73	3.54	7.96	14.75

Gap (15 percentage points) it seems that the relationship remains negative also for very high overall levels of Gender Equity. However, these results can be owing to extrapolations over combinations of levels and gaps not observed in the data. In fact, for very high levels of Gender Equity and balanced gender distributions, it is almost impossible to observe levels of a Gender Gap as high as 15 percentage points or so. However, the fact that for very high levels of the gap the effect of increasing Gender Equity on TFR is strongly and persistently negative is consistent with the hypothesis that gender convergence in attitudes is decisive to create favourable conditions for fertility. The predicted TFR dynamics in Figure 4 refer to a hypothetical country that experiences a transition from low to high levels of Gender Equity while maintaining a constant Gender Gap. As was evident in Figure 3, we cannot actually observe any country in the considered period undergoing the entire transition from stage A to C, and not all the countries experience changes in Gender Equity while maintaining a constant Gender Gap. With the aim of interpreting dynamics closer to those that we are actually able to observe, in Figure 5 we consider predicted values of TFR for dynamics of the Gender Equity and Gender Gap that resemble those of some selected countries that are observed in different stages of the transition in the first wave. In Supplementary Figure S1, we report the predicted TFRs vs. the observed TFRs for each country using the country's Gender Equity and Gender Gap values and model 5 estimates.

Figure 5 plots the predicted TFR corresponding to values of the Gender Equity and Gender Gap observed for Poland, Italy, and the Netherlands, which in the 90s can be classified at stage A, B, and C, respectively. We can see that no country is observed in the whole range of the Gender Equity distribution, and so for a specific country we cannot predict the U-shaped relationship. However, the relationship between TFR and Gender

**Figure 5.** Predicted TFR using Gender Equity and Gender Gap values of selected countries observed at different stages of the transition in the first wave.

Source: Own calculations from World Values Survey, European Values Study and World Bank Indicators.

Note: The values for Gender Equity and Gender Gap used for the predictions can be found in Supplementary Table S1 in the Supplementary Material for each of the selected countries.

Equity predicted for each country is consistent with our first hypothesis: if a country is at stage A (as Poland), an increase in Gender Equity has negative effects on TFR, while for countries at stage C (as the Netherlands), Gender Equity and TFR variations are positively associated.

### Robustness Checks

We use several checks to assess the robustness of our final model (Table 2—Model 5). First, we discuss the theoretical and empirical validity of our gender equity measure and replicate our analysis with a synthetic

**Table 2.** Regression results of fixed effects models

Dependent variable: TFR	(1)	(2)	(3)	(4)	(5)
Gender Equity	-0.00985 (0.00261)***	-0.05686 (0.01168)***	-0.00826 (0.00258)**	-0.10648 (0.02866)***	0.00070 (0.00020)***
Gender Equity <sup>2</sup>		0.00037 (0.00009)***			-0.20979 (0.09425)*
Gender Gap			-0.01440 (0.00462)**	-0.01085 (0.00441)*	0.00589 (0.00274)*
Gender Equity × Gender Gap					-0.00004 (0.00002)*
Gender Equity <sup>2</sup> × Gender Gap					5.34598 (1.01732)***
Constant	2.02436 (0.19855)***	3.50182 (0.39995)***	1.54567 (0.12439)***	2.02985 (0.18970)***	
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	81	81	81	81	81
Adjusted R <sup>2</sup>	0.56421	0.66449	0.53265	0.60224	0.68466

Note: Standard errors in parenthesis; \*P < 0.05; \*\*P < 0.01; \*\*\*P < 0.001.

gender index. We argue that among the available gender items in the WVS–EVS, the survey question we select is the only that clearly juxtaposes men and women in terms of their gender roles. In any case, for a smaller sample we construct a synthetic index using all the available gender items in the WVS–EVS. Using this index, our findings support the curvi-linear association between Gender Equity and TFR but not for the Gender Gap.

Secondly, we investigate whether the timing of fertility could affect our results. Tempo-adjusted TFRs are not available for all the countries and waves in our data set. So, similarly to Myrskylä, Kohler and Billari (2011), we opt for a second-best solution. We include in our final regression the pace at which the mean age at child-bearing is increasing around the survey year. We also replicate this robustness test using mean age at first birth. Overall, we find that the curvi-linear relationship between Gender Equity and TFR remains significant, while the association with the gender gap loses some statistical significance.

Thirdly, we consider whether our findings disappear when adding, in the regression models, independent variables such as the Human Development Indicator and female labour force participation rates, which have been found to be important predictors of TFR changes in previous studies. We find that the non-linear relationship between Gender Equity and fertility is robust and that the interaction between Gender Equity and the Gender Gap remains significant, although only at the 10% level.

Finally, we assess the robustness of our results with regard to influential data points or any single country. Excluding influential cases from our preferred model, we mostly confirm our main empirical findings: we consistently confirm Hypothesis 1 (Gender Level) while we find weaker support for Hypothesis 2 (Gender Gap).

Taken together, our tests lead us to conclude that our initial results remain robust. The curvi-linear association between Gender Equity and TFRs is consistently replicated throughout the different robustness checks. However, the Gender Gap effect is less robust to different specifications. Results from this sensitivity analysis can be found in the [Supplementary Materials](#).

### Concluding Remarks

Our study builds on existing cultural and gendered explanations of fertility in advanced economies. In contrast to previous studies, our focus is on gender equity effects. We construct an attitudinal indicator of Gender Equity that aims to capture the country-level normative

context with respect to women's employment, and test its effects on aggregate country-level fertility trends in developed countries.

By and large, the analyses support our hypotheses: both the level of Gender Equity and the homogeneity of its diffusion matters for fertility. We find evidence in support of a U-shaped relationship between changes in Gender Equity values and TFR: as countries start the transition from a traditional to a more gender symmetric partnership model, the diffusion of gender-equitable attitudes has a negative impact on fertility until these attitudes are sufficiently spread in the society. Unsurprisingly, women everywhere pioneer the diffusion of gender equity. In some countries men catch up quite rapidly but in others they remain well behind. The more women and men share equitable values, the more 'dramatic' is the transition in the sense that its effects are more evident on fertility.

Our analytical framework builds on an assumed process of attitudinal diffusion. This, of course, begs the question of what drives such dynamics. What explains why some societies embrace norms of gender equity more rapidly and more homogeneously than others? Providing answers to these questions is clearly beyond the scope of this article. And yet, it is possible to identify some key drivers. One is undoubtedly related to the maturation of the female role revolution. As long as women's employment is strongly dominated by part-time commitments, their role transformation will remain ambivalent. We should expect gender egalitarianism to accelerate once it becomes normative for women to adopt a full-timer-for-life identity. It is, secondly, at this point that serious reconciliation policies, so much stressed by McDonald (2006, 2013), are likely to emerge. And thirdly, as emphasized by Esping-Andersen and Billari (2012), the degree of social stratification in a society is likely to influence the pace of diffusion. Where there are no significant ethnic, racial, or religious dividers, we should expect a more rapid (and universal) diffusion.

We conducted several checks to test whether the empirical findings are robust to an alternative operationalization of the gender equity measure, fertility tempo distortions, inclusion of additional independent variables, and outliers. Throughout, our key finding of a parabolic relationship between the level of Gender Equity and TFR is confirmed. The moderating effect of the Gender Gap is consistent throughout the sensitivity analyses but loses some statistical significance when the sample size is reduced.

Our analyses have some limitations. The observation window is limited to a couple of decades and so we

cannot observe the full transition from a traditional to a gender egalitarian equilibrium for any given country. Hence, we can only speculate about trends in gender attitudes before the 1990s. Our analyses are based on countries observed at different stages of the gender revolution. To our knowledge, the World Values Survey and European Values Study provide the oldest source of data with a sample of countries large enough for cross-national analysis. As an alternative, the International Social Survey Program has a first rotating module in 1988 on gender, but very few countries were present in its first wave.

Our empirical analysis is carried out at the macro level to study the association between changes in gender attitudes and fertility. When interpreting our findings, it is important to bear in mind that they refer to the country level and cannot be applied to individual behaviours. In other words, we cannot infer from our empirical findings which micro mechanisms are producing changes in aggregate fertility trends. Our decision to focus on aggregate rather than individual-level behaviour is motivated by several considerations. First and foremost, as highlighted by McDonald (2013), the Gender Equity theory, which we largely build on, was originally developed as a macro theory to explain fertility trends across different societal contexts. Therefore, the argument we put forward stresses the importance of the contextual level of gender equity and focuses on aggregate explanations.

Secondly, conducting a micro-macro analysis across several time periods and countries would present itself with some practical issues. Each wave of the WVS-EVS is a repeated cross-section with no retrospective information on fertility. Therefore, when using these data, it would not be possible to carry out a longitudinal analysis matching individual fertility decisions to contextual levels of gender equity. At the individual level, gender attitudes may influence fertility decisions but the reverse is also possible. Furthermore, gender attitudes are collected for the respondent but not for his/her partner. Childbearing decisions are usually taken at the couple level. Thus, not having both partners' information restricts the analysis. While this is beyond the scope of this article, a mismatch in gender-equitable attitudes at the couple level may also influence fertility decisions. To exemplify, Aassve *et al.* (2014) show that couple-level inconsistencies in gender ideology lower the risk of having a second child. An interesting avenue for future research would be to study how the normative context of gender equity interacts with couples' gender attitudes in influencing fertility decisions.

## Notes

- 1 Due to data limitations, Myrskylä, Kohler and Billari (2011) use the average GGG index between the years 2006 and 2010.
- 2 Of course, at the extremes of the gender equity distribution the gap between men and women is necessarily 0, but during the transition different configurations of the average level and gap between men and women are possible.
- 3 We also attempted to construct a gender ideology index using several items included in the data. However, similar to Breen and Cooke (2005), we did not find a clearly interpretable solution and we preferred to use a single item that clearly represents normative views concerning a gendered division of labour. More details on alternative items included in the WVS/EVS data and a discussion on the validity of our item is included in the [Supplementary material](#).
- 4 For simplicity, we refer to gender equity or gender-equitable attitudes/respondents although we only measure one dimension of gender role attitudes—namely, attitudes towards women in the labour market.
- 5 Controlling for age and education is important because both are strongly associated with gender-role attitudes and fertility. Moreover, recent analyses by Eeckhaut *et al.* (2013) suggest that specialization models based on comparative advantages owing to educational heterogeneity (and subsequent potential earnings disparities) in couples are more relevant in male-breadwinner contexts than in more gender-equal societies.
- 6 TFR data come from the World Bank Indicators through the STATA module *wbopendata* (Azevedo, 2011).
- 7 To exemplify, in the first wave, Austria is surveyed in 1990, so we use the average of the TFRs of year 1989, 1990, and 1991.
- 8 In the [supplementary materials](#), we provide an additional test for the effects of the Gender Gap by replicating our analysis with a split sample before and after phase B (the inflection point in [Figure 4](#)). Our results are consistent with the full model specification but lose some statistical significance as the sample size is reduced.

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## Supplementary Data

[Supplementary data](#) are available at *ESR* online.

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