Gender longevity gap and socioeconomic indicators in developed countries

Igor Fedotenkov and Pavel Derkachev

8 December 2017

Gender longevity gap and socioeconomic indicators in developed countries

Igor Fedotenkov[1]
Pavel Derkachev[2][3]

Abstract

In most countries, women live longer than men. Differences in longevities are country-specific and change over time. We perform a cross-country panel data analysis in developed countries (OECD and EU) to study the gender-longevity gap dependence on various socio-economic indicators and test a number of contradicting theories. We show that a lower gender longevity gap is associated with a higher real GDP per capita, a higher level of urbanization, lower income inequality, lower per capita alcohol consumption and a better ecological environment. An increase in women's aggregate unemployment rate and a decline in men's unemployment are associated with a higher gap in life expectancies. The effect of the share of women in parliaments in the gender-longevity gap is estimated to have a U-shape; it has a better descriptive efficiency if taken with a 5-years lag, which approximately corresponds to the length of political cycles.

JEL Classification: J11, J14, J16, J71

Keywords: Gender longevity gap, inequality, cross-country analysis, life expectancy.

[1]Russian Presidential Academy of National Economy and Public Administration, Moscow, Russia. i.fedotenkov@gmail.com, +7(916)615-6971.

[2]National Research University Higher School of Economics, Center for Institutional Studies, Moscow, Russia. pderkachev@gmail.com, +7(495)772-9590.

[3]The financial support from the Government of the Russian Federation within the framework of the Basic Research Program at the National Research University Higher School of Economics and within the framework of the implementation of the 5-100 Programme Roadmap of the National Research University Higher School of Economics is acknowledged.

1 Introduction

On average, women live longer than men, and the gender longevity gaps differ across countries and change over time. To what extent can these differences and changes be explained by the socio-economic environment and development? Does economic inequality between the sexes play a role? These questions are the focus of our research. We show that higher income (per capita) and lower income inequality are associated with a smaller gender-longevity gap; a higher level of per capita alcohol consumption in a country, and a higher percentage of population living in a rural area give rise to a larger gender longevity gap. A greater difference between female and male aggregate unemployment rates increases the female advantage in life expectancy. We also found evidence that an improvement in environmental factors, such as a higher percentage of renewable energy consumption and lower greenhouse gas emissions per capita are associated with a lower gender longevity gap. Country-fixed and random effects models also reveal some evidence for a U-shaped relation between the percentage of women in parliaments and the gender longevity gap - the minimum gap achieved when 31-45% of parliament members are females (50% female membership is always covered by the 95% confidence interval). This finding is stronger if the percentage of women in parliaments is taken with a 5-year lag, which approximately corresponds to the length of political cycles.

Some divergence between gender life expectancies can be attributed to natural biological factors (see Aviv et al. 2005, Seifarth et al. 2012, for example). - a difference observable not only in humans, but also in a number of animal species. Nevertheless, human and animal causes of death are different (Smith 1989), and, in human societies socioeconomic factors must also be taken into account (Rieker and Bird 2005). If cross-country differences in gender longevity gaps are analyzed, socioeconomic factors should play a crucial role. In our paper, we study a number of theories which aim to explain the dependence of the gender longevity gap on socioeconomic factors at the cross-country level. Some theories are confirmed, others not.

While the topic of gender longevity differences is interesting to policymakers, e.g. those who analyze public pension designs,[4] there are few cross-country studies that address the links between socioeconomic factors and the gender longevity gap. A few papers have studied large pools of countries (Ram 1993; Clark and Peck 2012; Ricketts 2014). They find that higher income inequality and a higher level of economic development, measured as GDP per capita or energy consumption per capita, increase the gender longevity gap. These papers also find that the gender longevity gap increases with a higher level of female discrimination, measured as the ratio of male to female labor-force participation and enrollment in secondary schools. However, do these factors play the same role in developed and developing countries? In 32 developing countries women do not even have the right to apply for a passport; in 17 countries women cannot freely leave the home (World Bank Group 2015). Such conditions are

[4] See Bajtelsmit et al. (1999), Bertranou (2001) or Hári et al. (2008), for example.

unimaginable in the European Union or OECD countries. Do socioeconomic factors have the same effects in African countries and in the EU? Not necessarily so. Clark and Peck (2012) mitigated this problem by controlling for country-fixed effects in their models. However, in general, the slopes can also be different.

In our paper, we reconsider Clark and Peck and show that some of the findings hold not only for large pools of countries, including mostly developing countries, but also for developed countries only (OECD and the European Union), while some results shift to the converse. For example, in contrast to Clark and Peck we note that in developed countries a higher level of economic development, measured by per capita GDP, negatively affects the gender longevity gap. Other factors, however, such as female enrollment in secondary school, are of lesser importance in developed countries, since all girls have a right to secondary education. This allows us to expand our model with a number of other factors ignored in previous cross-country studies: the percentage of women in parliaments, alcohol consumption and environmental protection.

A number of empirical studies examining the link between socio-economic indicators and the longevity gap have been undertaken on the national level. Anson (2003) for Belgium, Gächter et al. (2012) studied Austrian data. They found that in municipalities with higher income, the gender gap is lower. As we study cross-country effects in developed countries only, our results for income are closer to those found by Anson and Gächter et al. than to those cross-country works cited above.

An explanation to why higher income in developed countries is associated with a lower longevity gap has been offered in a number of papers. In Leung et al. (2004) time is used for both health-improving activities and work, and goods are apportioned between consumption and health investment. In their model men provide mental and physical labor, while women provide mental labor only. This setting assures that men's wages are higher than women's, and, consequently, women supply less labor compared to men due to lower opportunity costs. However, when the economy grows, the difference between men's and women's incomes declines, reducing the differences in time and health goods allocations between the genders. This leads to a lower gender longevity gap. Felder (2006) argues that there are higher marginal costs to maintain men's health capital stock than women's. Consequently, men live shorter lives. If income grows, health investments increase, both for men and women, but the effect on men is more pronounced. Therefore, higher income leads to a decline in the gender longevity gap. Schünemann et al. (2017) suggest that men and women have different preferences for health goods, but when income grows, gender-specific utility functions become similar, leading to similar preferences, and narrowing the gender longevity gap. In our empirical model, we cannot address the question of which of these explanations is valid. But, unlike other cross-country studies, our estimates are in line with these theoretical predictions.

It is also known that income inequality is one of the factors affecting longevity. A number of hypotheses about the links between income inequality and longevities are well explained by Wagstaff and Van Doorslaer (2000) - principally these theories are: the absolute-income hypothesis and the relative-income hypothesis. The former is based on the assumption that the relationship between health and income is concave: each additional dollar of income boosts agents' health by a smaller amount. This hypothesis was empirically confirmed in a number of papers (Preston 1975; Rodgers 1979; Gravelle 1998). The relative-income hypothesis asserts that higher mortality among the poor is a result of their low social status. Although the exact mechanisms of this relationship are debatable (Smith 1996), this hypothesis has also garnered vast empirical confirmation (Duleep 1995; Wilkinson 1998; Lobmayer and Wilkinson 2000; Elstad, Dahl, and Hofoss 2006; Karlsson, Nilsson, Lyttkens, and Leeson 2010). Moreover, men's death rates are more sensitive to socioeconomic factors than women's (MacIntyre and Hunt 1997; Mustard and Etches 2003). Therefore, the hypothesis arises that the gender longevity gap may also depend on income distribution. We test this hypothesis, and confirm, that higher income inequality increases the gender longevity gap at the national level.

Higher agent's income is often associated with higher social status. The effect of social status on mortality has also been studied from other perspectives: education, race and other diverse factors, with higher social status being associated with increased longevity (Williams 1999, Crimmins and Saito 2001, Shkolnikov et al. 2006, Olshansky et al. 2012). Likewise, the improved social status accruing to members of a national academy of science or to winners of the Nobel Prize has a positive effect on their longevity vis-a-vis the rest of the nation's scientific community (Rablen and Oswald 2008, Liu et al. 2017). Gavrilov and Gavrilova (2015) found that the availability of radio in the household, (1930 U.S. census data) could be used as a measure of social status and a gender-specific predictor for female longevity.

Employment can also be considered a determinant of social status. Most micro-level studies find that paid work increases agents' life expectancy (Rogot et al. 1992, Rose et al. 2004). Employment may also facilitate access to public healthcare provide social support from coworkers, and build up a sense of achievement (Kalben 2002). Therefore, hypothetically, the improving socioeconomic status of women, as well as greater female participation in the labor force, should increase the gender longevity gap (Repetti, Matthews, and Waldron 1989; Waldron 1991). However, apart from the positive effects on social status and the affordability of healthcare, labour participation can also bring harmful health effects: exposure to job stress and physical and chemical occupational hazards. Moreover, the combination of job and domestic responsibilities may lead to overload, especially for employed women with children (Arber, Gilbert, and Dale 1985; Waldron 1991). In our models we control for gender-specific unemployment rates; and our result is in line with the latter hypothesis: higher rates of unemployment for men and women increase their longevities vis-a-vis the opposite gender. We also controlled for the number of women members of parliament as a proxy for women's socioeconomic-status. However, our estimates reveal a more complicated relation between this factor and the gender longevity gap.

It is also generally accepted that men's lives are valued lower than women's, and that most dangerous and arduous work is usually done by men (Leigh 1987;

Table 1: Descriptive statistics

	mean	min	max	sd
Life expectancy at birth, female (years)	83.14	78.00	87.05	2.278
Life expectancy at birth, male (years)	77.55	69.10	81.30	3.485
Gender gap of life expectancy (years)	5.594	3.200	10.70	1.793
GDP per capita, 2011 prices (dollars)	3.636×10^4	1.649×10^4	9.390×10^4	1.481×10^4
Gini coefficient	32.30	25.59	48.07	4.885
Women in parliament (%)	26.53	9.500	43.60	10.20
Employment in services, male (%)	60.02	39.51	72.18	8.274
Employment in services, female (%)	12.11	12.11	23.74	5.009
Employment in industry, male (%)	32.51	17.49	49.12	6.744
Employment in industry, female (%)	82.87	52.70	91.70	8.902
Rural population (%)	23.17	2, 142	50.35	12.38
Unemployment, male (%)	8.174	3.616	21.81	4.231
Unemployment, female (%)	8.412	3.113	28.84	5.182
Alcohol consumption (litres per capita)	9.464	1.450	15.19	2.866
Voice and Accountability (ranges from -2,5 to 2,5)	1.064	-0.374	1.702	0.464
Renewable Energy (%)	20.67	2.838	76.42	15.66
Greenhouse gas emissions (kt of CO2 equivalent per capita)	1.164×10^{-2}	5.435×10^{-3}	3.351×10^{-2}	6.221×10^{-3}
Combust. Renewables (%)	20.67	28.38	76.42	15.66

Hersch 1998; Viscusi 2004), placing men therefore at greater risk of environmental and pollution-related hazards than women. Kalben (2002) formulated a hypothesis that environmental factors do affect the gender longevity gap; however, we are not aware of any empirical work that tests this hypothesis. We include environmental variables in our model and find that higher pollution indeed widens the gender longevity gap.

Finally, the literature suggests that well-functioning democratic institutions increase women life expectancies (Williamson and Boehmer 1997); and hypothetically this factor may increase the gender longevity gap (Clark and Peck 2012). We test this hypothesis for developed countries but have not confirmed it. In our case, variables, which were used for democracy control have the opposite sign, and are insignificant at 10% significance level.

The rest of this paper is designed thusly: the following section discusses data and methodology. Section 3 presents our main results. Section 4 discusses the robustness of our results. Section 5 concludes.

2 Data and methodology

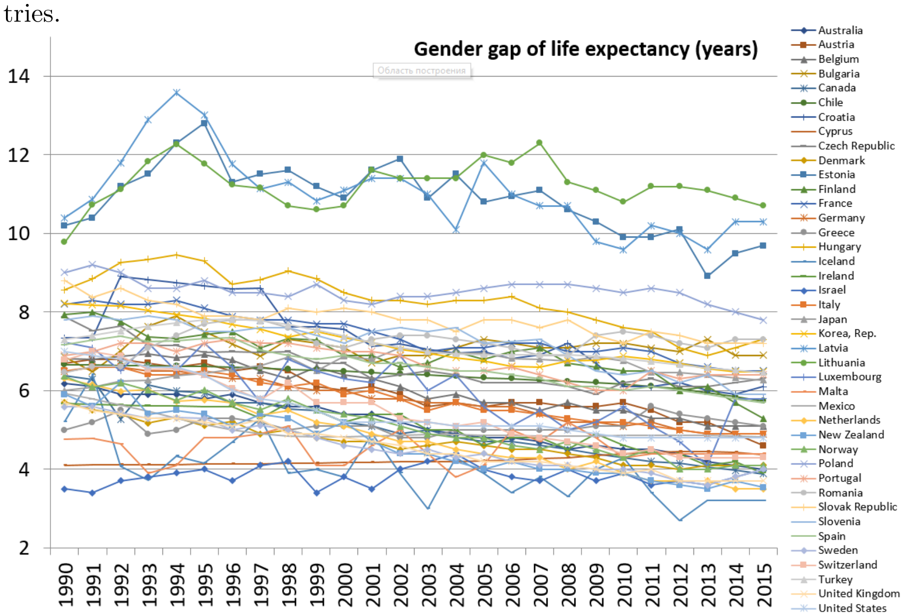
We use data from the following sources: World Bank Development Indicators, World Bank Health Organization, International Labour Organization.

Our focus is on developed countries, members of the Organization for Economic Co-operation and Development (OECD) or European Union (EU). The period examined is 1990-2015; however, most observations are post-1995. The data constitute an unbalanced panel.

2.1 Descriptive statistics

Table 1 presents descriptive statistics of the data used in our analysis. It is worth mentioning that the volatility of female longevity (standard deviation is 2.278%) is lower than the volatility of male longevity (standard deviation is

Fig. 1: Gender longevity gap of life expectancies at birth in 1990-2014 by countries.



3.485%). The scale of GDP per capita in 2011 prices is much higher compared to other observations; numerical methods of estimation work badly with very low or high values. For this reason we rescale GDP per capita, dividing it by its arithmetic mean.

We illustrate statistics for employment in various sectors for males and females, but differences between male and female employment are used in regressions. The variable 'women in parliament' represents the percentage of women in lower chambers of parliaments, elected under generally free and fair conditions in the countries under analysis. In our models, we do not specify those countries wherein a minimal number of women in parliaments is prescribed by law. We presume that if such laws exist, the societies are disposed to a higher number of women-politicians. Upper parliament chambers are not considered.

In Fig. 1 we present the difference between female and male life expectancies at birth in the countries under analysis. The figure indicates that there is a small but permanent long-term downward trend in the gender longevity gap. On the one hand, it is interesting to consider whether this trend is determined by socioeconomic factors, but on the other, if we do not remove the trend with time-fixed effects, the significance of certain coefficients may be determined by similar time-specific trends in the explanatory variables. Therefore, we estimate models both with and without time effects. Fig. 1 also indicates that the dynamics of the gender longevity gap in the Baltic States is distinct from the other countries.

Figures 2 and 3 decompose the dynamics of the gender longevity gap into

Fig. 2: Female life expectancy at birth in 1990-2014 by countries.

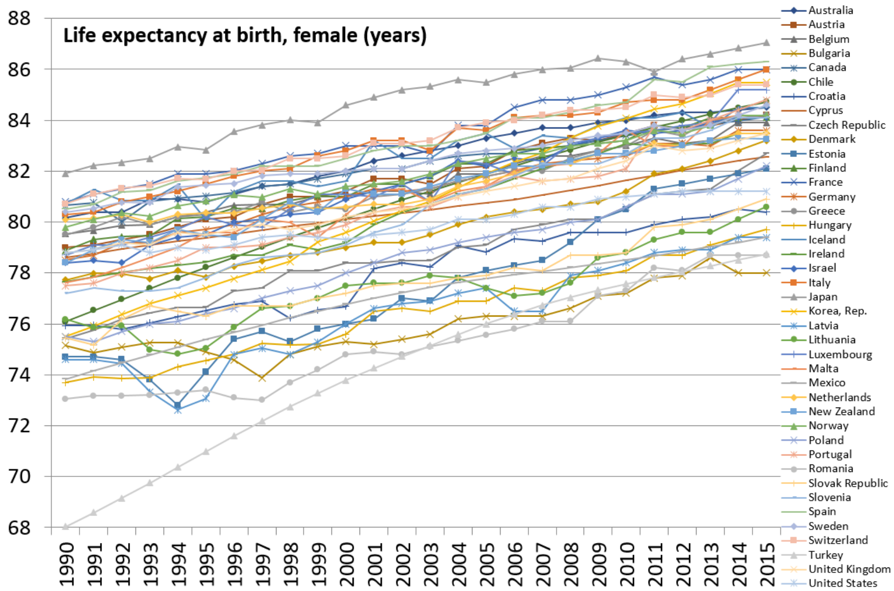


Fig. 3: Male life expectancy at birth in 1990-2014 by countries.

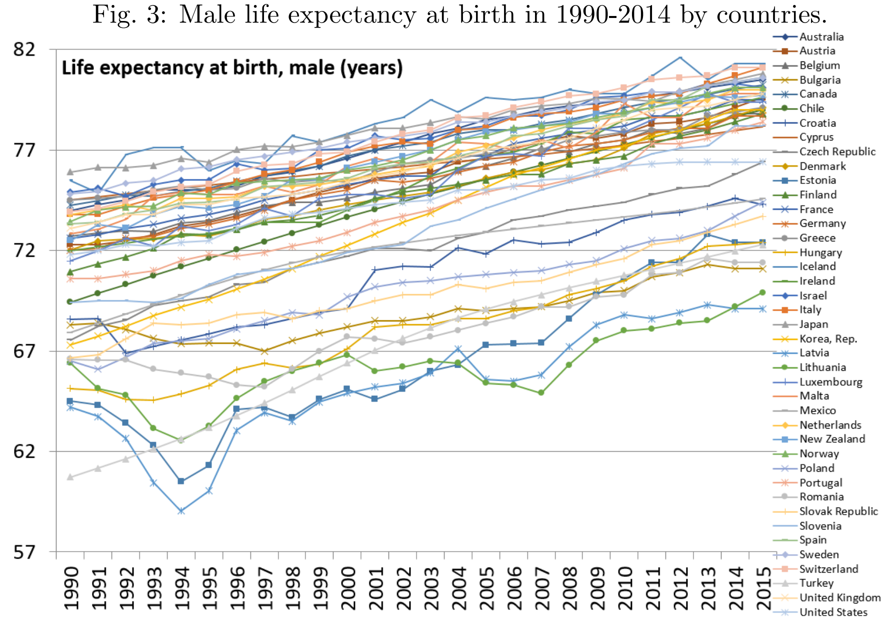
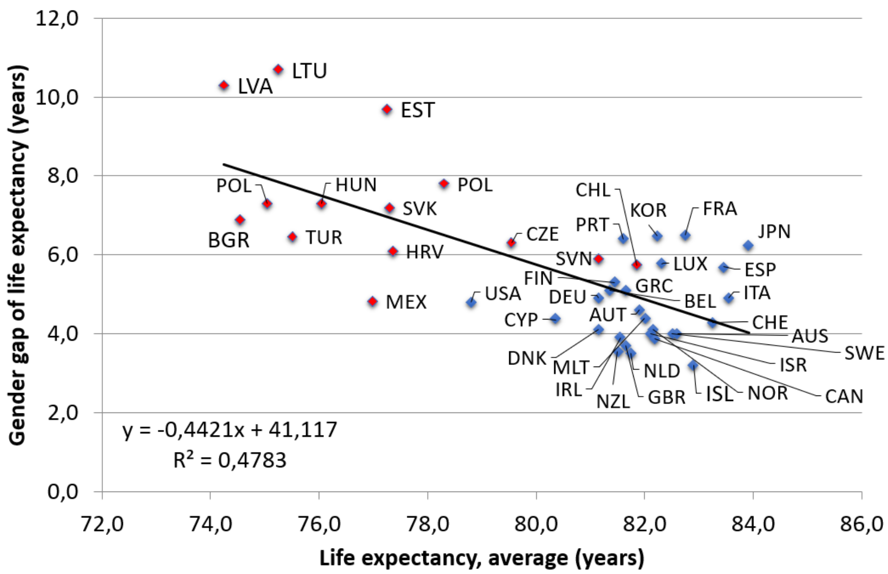


Fig. 4: Gender longevity gap vs. Average life expectancy by countries in 2015



male and female life expectancies at birth. The dynamics of male life expectancies compared to the female are more diverse by country - both more volatile and with a wider range of values. This implies that to a large degree the volatility of gender gaps is determined by male longevities. In fact, in figure 3, which presents male longevities, the distinction between developed and developing countries can be seen more readily than the female longevities presented in figure 2.

Fig. 4 presents the gender longevity gap as a function of average life expectancy. There is a moderate (R^2=0.56) negative statistical relation between the longevity gender gap and the average longevity by country. Thus, an improvement in life quality leads to a decline in the gender longevity gap. Moreover, the figures indicate that gender longevity gaps may behave differently in rich western economies from those in less wealthy countries, such as the Baltic States and other post-communist countries. An extensive robustness check is needed to see whether the dynamics of the gender longevity gaps are determined by the same mechanisms.

2.2 Methodology

Suppose that in one country women's life expectancy at birth is 60 years and men's is 50, while in another these values are 90 and 80 years respectively. In both cases the difference between life expectancies at birth is 10 years. However, the ratios of men's and women's longevities are different. We find it more convenient to define our dependent variable as the ratio of male and female longevities. In addition, we multiply it by -100 so as to rescale the coefficients. The negative sign is used so that an increase in the explanatory variable corresponds to an increase in the longevity gap (if the corresponding coefficient is positive). Namely, our dependent variable is defined as

$$Y = -100\left(\frac{male \quad life \quad expectancy}{female \quad life \quad expectancy}\right). \tag{1}$$

Our random effects models have the following form

$$Y_{c,t} = \beta_0 + \beta_1 X_{1,ct} + \beta_2 X_{2,ct} + ... + \beta_k X_{k,ct} + u_c + \varepsilon_{ct}, \tag{2}$$

where index c stands for country, t denotes time, $X_{j,ct}$ - explanatory variables, $j = 1, ..., k$, u_c -country-specific random effects, and ε_{ct} - unobserved shocks.

In fixed effects models, the functional form is the following:

$$Y_{c,t} = f_c(+f_t) + \gamma_1 X_{1,ct} + \gamma_2 X_{2,ct} + ... + \gamma_k X_{k,ct} + \epsilon_{ct}. \tag{3}$$

In this case, f_c and f_t are country and time fixed effects, and ϵ_{ct} - unobserved shocks.

Using the Breusch-Godfrey test (Breusch 1978; Godfrey 1978), we find that the residuals are auto-correlated in all our models. Consequently, we use an Arellano-type auto-correlation-robust covariance matrix (Arellano 1987) to test the significance of the coefficients.

3 The results

3.1 Country random and fixed effects

In table 2, we present a number of equation (2) estimates (random effect model); table 3 presents the equation (3) estimates with country-fixed effects. The models indicate that higher GDP per capita reduces the gender longevity gap, while higher income inequality increases it. In all cases, the corresponding coefficients are highly significant. The percentage of rural population has a positive impact on the gender longevity gap. The difference in unemployment rates, defined as female unemployment minus male unemployment, has a positive impact as well. This suggests that higher gender-specific unemployment increases the life expectancy of that gender. As table 1 implies, women's unemployment is on average higher than men's; therefore, an equalization of these two factors between the genders should reduce the gender longevity gap.

Higher per capita alcohol consumption in a country increases the gender longevity gap, implying that most alcohol is consumed by men. Improved environmental conditions, measured as a more intensive use of renewable energy as a percentage of energy produced in a country, a more intensive use of combustible renewables and a lower emission of greenhouse gases per capita, reduce the gender longevity gap. Because combustible renewables reduce CO_2 emissions

Table 2: Dependent variable: longevity ratio, random country-specific effects

regressors	1	2	3	4	5
Intercept	-93.282***	-93.247***	-92.857***	-93.351***	-93.235***
	(1.5068)	(1.0539)	(1.1220)	(1.0656)	(1.0483)
GDP/cap 2011 prices	-2.0901***	-2.5639***	-2.2317***	-2.5558***	-2.1378***
	(0.4990)	(0.5375)	(0.5529)	(0.5469)	(0.5444)
Gini coefficient	0.0432**	0.0364**	0.0433***	0.0372**	0.0395**
	(0.0195)	(0.0166)	(0.0160)	(0.0169)	(0.0158)
Rural population	0.1033**	0.0846***	0.0839***	0.0838**	0.0875***
	(0.0406)	(0.0324)	(0.0317)	(0.0330)	(0.0281)
Diff. unemployment	0.1371***	0.1303***	0.1078***	0.1270***	0.10354***
	(0.0237)	(0.0266)	(0.0298)	(0.0280)	(0.0300)
Diff. Services empl.	0.0068	0.0082	0.0072	0.0082	0.0041
	(0.0162)	(0.0149)	(0.0158)	(0.0167)	(0.0149)
Diff. Industry empl.	0.0161	0.0186	0.0185	0.0203	0.0137
	(0.0203)	(0.0180)	(0.0170)	(0.0188)	(0.0159)
Women in parliament	-0.0582**	-0.0453*	-0.0552**	-0.0423	-0.0435*
	(0.0505)	(0.0272)	(0.0281)	(0.0263)	(0.0257)
Wom.parliament^2	0.0009**	0.0005	0.0009*	0.0005	0.0006
	(0.0004)	(0.0004)	(0.0005)	(0.004)	(0.0004)
Alcohol consumption		0.1165***	0.1071**	0.1086**	0.1057**
		(0.0441)	(0.0492)	(0.0433)	(0.0505)
Voice&Accountability			-0.2056	-0.1714	-0.1652
			(0.2940)	(0.3106)	(0.2825)
Renewable Energy			-0.0360***		
			(0.0114)		
Greenhouse gases				43.356***	
				(19.263)	
Combust. renewables					-0.0569***
					(0.0191)
R^2	0.9017	0.9050	0.9030	0.9071	0.9162
R^2-adj	0.8783	0.8784	0.8711	0.8741	0.8838
N	346	340	340	332	340
DF	337	330	328	320	328

* $p < 0.1$
** $p < 0.05$
*** $p < 0.01$ significance level

in comparison with fossil fuel (Jebli and Youssef 2015), in developed countries their usage may serve as a proxy for ecological standards.[5] The 'ecological' variables are considered to be proxies. It is likely that these proxies are correlated with better environmental standards, which have direct effects on worker's life expectancies, men being faced with unhealthy working conditions more often than women.

We also hypothesize that not all jobs are equally risky, and controlled for differences in employment sectors: services and industry with agricultural sector

[5]For comparison, combustible renewables are also common in the poorest African countries, where their usage represents mainly insufficient access to fossil fuels.

Table 3: Dependent variable: longevity ratio, fixed country-specific effects

regressors	1	2	3	4	5
GDP/cap 2011 prices	-2.2189***	-2.7035***	-2.2325***	-2.6754***	-2.0066***
	(0.5841)	(0.5696)	(0.6007)	(0.5949)	(0.5638)
Gini coefficient	0.0473**	0.0400**	0.0479***	0.0410**	0.0428**
	(0.0194)	(0.0166)	(0.0171)	(0.0170)	(0.0166)
Rural population	0.1256**	0.1106**	0.1080**	0.1101*	0.1173**
	(0.0622)	(0.0513)	(0.0527)	(0.0584)	(0.0491)
Diff. unemployment	0.1396***	0.1317***	0.1061***	0.1301***	0.1017***
	(0.0266)	(0.0293)	(0.0306)	(0.0296)	(0.0299)
Diff. Services empl.	0.0071	0.0112	0.0069	0.0100	0.0026
	(0.0192)	(0.0168)	(0.0175)	(0.0187)	(0.0164)
Diff. Industry empl.	0.0146	0.0166	0.0153	0.0172	0.0096
	(0.0203)	(0.0183)	(0.0168)	(0.0189)	(0.0154)
Women in parliament	-0.0550**	-0.0418	-0.0513*	-0.0374	-0.0382
	(0.0262)	(0.0281)	(0.0304)	(0.0275)	(0.0263)
Wom.parliament^2	0.0008*	0.0005	0.0008	0.0004	0.0005
	(0.0005)	(0.0005)	(0.0006)	(0.0004)	(0.0004)
Alcohol consumption		0.1055**	0.0950 *	0.0985**	0.0850
		(0.0457)	(0.0516)	(0.04405)	(0.0547)
Voice&Accountability			-0.3980	-0.3166	-0.3501
			(0.3084)	(0.3253)	(0.3134)
Renewable Energy			-0.0437***		
			(0.0129)		
Greenhouse gases				38.928**	
				(18.562)	
Combust. renewables					-0.0697***
					(0.0209)
R^2	0.4363	0.4634	0.4958	0.4612	0.4971
R^2-adj	0.3783	0.3993	0.4243	0.3931	0.4254
N	346	340	340	332	340
DF	300	293	291	283	291

* $p < 0.1$
** $p < 0.05$
*** $p < 0.01$ significance level

as a control group. However, none of these variables is significant at the 10% significance level.

The estimates suggest a link between the percentage of women in parliament and the gender longevity gap. In some cases, the square of this variable is also significant, implying that there can be a U-shape dependence between the percentage of women in parliament and the gender longevity gap, with the minimum being around 31%-45%. (50% female membership is always covered by the 95% confidence interval.) This implies that greater political equality between men and women reduces men's disadvantage in longevity. The result is rather surprising because an increasing number of women in parliaments may reflect the improved social status of women and lead to the adoption of woman-affirmative laws. Our estimates suggest that this may be the case when the percentage of women in parliaments is large. However, most ‘in-sample’ observations coincide with the declining part of the U-shape relation.

According to Edlund and Pande (2002) women’s political views are more ‘left’ compared to men. ‘Left’ re-distributional policies may provide a sort of insurance against income losses due to divorce. Indeed, ‘left’ policies may also be correlated with better labor protection, more affordable medical care, numerous environmental factors - not controlled for in our model - and measures of social (in)equality, which are not captured by the Gini coefficient. ‘Left’, policies may be more beneficial to men, prolonging their longevities in comparison with women.

An alternative explanation for this phenomenon may be that in patriarchal societies most important decisions are made by men, hence a low number of women in politics. But, likewise, patriarchy also imposes greater responsibilities on men, and if a man is unable to cope with these responsibilities, he may seek consolation in alcohol, drugs, or other self-destructive behavior. An increase in the percentage of women in parliaments may reflect an increasing role of women in decision making and responsibility sharing, which is beneficial for men and results in a lower gender-longevity gap. This hypothesis is also indirectly confirmed by the fact that in table 3 the significance of the percentage of women in parliament declines when alcohol consumption is included in regressions.

In models 1-4, the Hausman test (Hausman 1978) accepts a null hypothesis wherein country specific effects are uncorrelated with explanatory variables at all reasonable significance levels, implying that the random effects models are preferable (Mundlak 1978). However, in model 5, Hausman test results favor the fixed effects model (p-value=$3.537 * 10^{-10}$). Nevertheless, the results are still very similar, which shows a certain degree of robustness of the models to misspecification.

A decline in the gender longevity gap may result from an increase in male longevity, but also from a decline in female longevity. To ascertain if our above explanations are correct, we present estimates of regressions separately for male and female life expectancies at birth in the appendix (tables 7 and 8). The main finding is: the factors which reduce the gender longevity gap increase both male and female longevities. But absolute sizes of coefficients for men are higher than those for women, which implies that male life expectancies are more sensitive to socioeconomic factors. The only exception is that the allocation of women between sectors does have a statistically significant impact on their longevities. Namely, service work prolongs female lifespan vis-a-vis agricultural work, which is taken as a control group, and work in industry shortens it. For men, no statistically significant relation was found; the coefficients are lower in absolute terms, compared to those of women. This result for services can be explained by the fact that men and women often choose different jobs: men often prefer transportation and communication, while women work in healthcare, education and domestic services (OECD 2002, chapter 2, p.87). Nevertheless, the signs of the estimated coefficients are the same.

Table 4: Dependent variable: longevity ratio, fixed country- and time-specific effects

regressors	1	2	3	4	5
GDP/cap 2011 prices	-1.0977	-1.9541**	-1.4140**	-2.0316**	-1.7416*
	(0.9534)	(0.9018)	(0.9153)	(0.9132)	(0.8920)
Gini coefficient	0.0560***	0.0478***	0.0506***	0.0503***	0.0491***
	(0.0196)	(0.0162)	(0.0155)	(0.0161)	(0.0155)
Rural population	0.0310	0.0352	0.0497	0.0346	0.0540
	(0.0716)	(0.0574)	(0.0587)	(0.0603)	(0.0568)
Diff. unemployment	0.0648***	0.0678**	0.0709**	0.0687**	0.0675**
	(0.0238)	(0.0307)	(0.0291)	(0.0311)	(0.0301)
Diff. Services empl.	0.0058	0.0097	0.0078	0.0121	0.0047
	(0.0175)	(0.0158)	(0.0170)	(0.0186)	(0.0166)
Diff. Industry empl.	0.0147	0.0182	0.0188	0.0194	0.0156
	(0.0171)	(0.0160)	(0.0169)	(0.0172)	(0.0158)
Women in parliament	-0.0306	-0.0189	-0.0237	-0.0172	-0.0186
	(0.0283)	(0.0267)	(0.0280)	(0.0266)	(0.0256)
Wom.parliament^2	0.0008	0.0004	0.0005	0.0003	0.0004
	(0.0006)	(0.0005)	(0.0006)	(0.0005)	(0.0005)
Alcohol consumption		0.1174**	0.1160**	0.1176**	0.1092*
		(0.0546)	(0.0556)	(0.0540)	(0.0583)
Voice&Accountability			-0.1213	-0.1112	-0.1246
			(0.393)	(0.4028)	(0.3832)
Renewable Energy			-0.0167		
			(0.0174)		
Greenhouse gases				13.2990	
				(15.0834)	
Combust. renewables					-0.0311
					(0.0240)
R^2	0.0871	0.1188	0.1240	0.1235	0.1262
R^2-adj	0.0712	0.0964	0.0999	0.0997	0.1017
N	346	340		332	340
DF	283	276	274	268	274

* $p < 0.1$
** $p < 0.05$
*** $p < 0.01$ significance level

3.2 Country and time fixed effects

When time-fixed effects are added to the model, all global trends, seen in the data are removed, and only short-run deviations from these global trends are analyzed. Table 4 presents regression estimates, where both time- and country-specific effects are included in the model. In this case, the coefficient of GDP per capita declines, remaining, however, statistically significant in most of the models. Gini coefficients, unemployment rate disparities between women and men and per capita alcohol consumption remain highly significant with reasonable coefficient signs. This means that short-run deviations from these trends do

Table 5: Dependent variable: longevity ratio, fixed country-specific effects

regressors	lag=1	lag=2	lag=3	lag=5	lag=10
GDP/cap 2011 prices	-2.5420***	-2.2221***	-2.4296***	-2.7940***	-2.8243**
	(0.6553)	(0.5651)	(0.6341)	(0.4604)	(1.0622)
Gini coefficient	0.0437***	0.0456***	0.0478***	0.0166	0.0009
	(0.0166)	(0.0156)	(0.0154)	(0.0207)	(0.0210)
Rural population	0.1086**	0.1061**	0.0831**	0.0528	-0.0465
	(0.0523)	(0.0475)	(0.0462)	(0.0544)	(0.0562)
Diff. unemployment	0.1138***	0.1085***	0.1019***	0.0303	0.0217
	(0.0313)	(0.0321)	(0.0240)	(0.0263)	(0.0353)
Diff. Services empl.	0.0000	-0.0053	0.0107	0.0200	-0.0154
	(0.0185)	(0.0215)	(0.0207)	(0.0286)	(0.0421)
Diff. Industry empl.	0.0113	0.0372	0.0340	0.0311*	0.0383
	(0.0209)	(0.0239)	(0.0233)	(0.0188)	(0.0465)
Women in parliament	-0.0399	-0.0058	-0.0338	-0.0835***	-0.0734
	(0.0256)	(0.0238)	(0.0222)	(0.0300)	(0.0528)
Wom.parliament^2	0.0005	-0.0003	0.0002	0.0012**	0.0017
	(0.0005)	(0.0006)	(0.0006)	(0.0006)	(0.0016)
Alcohol consumption	0.0925	0.0658	0.0055	-0.0223	-0.0077
	(0.0586)	(0.0460)	(0.0396)	(0.0415)	(0.0510)
Voice&Accountability	-0.4748	-0.1626	0.1650	0.3937	-0.5165*
	(0.3113)	(0.3359)	(0.2854)	(0.2720)	(0.3060)
Renewable Energy	-0.0347***	-0.0286*	-0.0398**	-0.0376*	0.0046
	(0.0130)	(0.0169)	(0.0167)	(0.0194)	(0.0397)
R^2	0.5238	0.5215	0.5457	0.5726	0.5279
R^2-adj	0.4483	0.4451	0.4657	0.4698	0.3021
N	340	339	334	273	109
DF	291	290	285	224	63

* $p < 0.1$
** $p < 0.05$
*** $p < 0.01$ significance level

affect the gender longevity gap. However, 'rural population', 'share of women in parliaments' and 'ecological factors' lose their significance. Nevertheless, their signs remain unchanged.

3.3 Lags

In table 5 we present a model with country-specific effects (no time-fixed effects), where explanatory variables are taken with lags. The use of lagged regressors allows us to refer to Granger causality (Granger 1969).

The models imply that GDP per capita is always significant even when considered with a 10-year lag. In fact, higher GDP per capita permits agents to accumulate greater savings in public and private pension funds. Higher savings, in turn, bring about a better quality of life and the affordability of medical treatment, which may have long-lasting effects on agents' health. Considering that men's life expectancy is more sensitive to socioeconomic factors, this explains such a long-lasting effect.

The Gini coefficient, the percentage of rural population, and the difference between women and men's unemployment rates are significant up to the three-year lag, implying that these factors have temporal effects on the gender longevity gap. The percentage of renewable energy coefficient remains significant up to the 5-year lag. Highly significant medium-term 5-year lag in the share of woman in parliament could relate to the fact that most political and economic reforms start yielding results after a transitional period. Five year lags may also be determined by the political cycles of parliamentary elections.

4 Robustness

In this section we present robustness checks with country-fixed effects. Table 6 presents the results of a number of these checks. The first model presents the estimated results based on different data for life expectancy. Instead of life expectancy at birth we used the life expectancies at age 20-24 for gender longevity ratio calculation.[6] In this case, the results are very similar to the life expectancies at birth in table 3. The only important difference is the coefficient corresponding to the share of rural population; it is lower and statistically insignificant at the 10% significance level.

In models 2 and 3 we use the same data as in table 3, but evaluate different functional forms. In model 2, we use the logarithm of the dependent variable. Namely, calculated as

$$\tilde{Y} = -\log\left(\frac{male \quad life \quad expectancy}{female \quad life \quad expectancy}\right). \tag{4}$$

In model 3, the logarithm is also taken of a number of explanatory variables: GDP per capita, in 2011 prices, Gini coefficient, alcohol consumption and percentage of renewable energy. Differences between male and female unemployment ratios as well as sector specific employments and Voice&Accountability contain negative values; therefore we leave them unmodified. Because of the properties of the logarithmic function, the logarithms of women's share in parliament and their square are proportional to each other, which leads to the multicollinearity of the model; therefore, neither of them is modified. The results roughly coincide with those presented in table 3.

Next, we split our sample into two sub-samples: "developing" countries: Chili, Mexico and Turkey and the countries of the ex-Warsaw Pact Treaty of Friendship - excluding East Germany. Germany as well as other Western OECD and/or EU countries is placed in the sub-sample of "developed" countries. In figure 4, developed and developing countries are distinguished by color. Models 4 and 5 present estimates for these two subgroups. The results are similar. Although the Gini coefficient is significant at the 10% significance level for developing countries only, the corresponding estimate for developed countries is very

[6] As the data report remaining life expectancies at ages 20-24 only, we add 22 years to each observation.

Table 6: Fixed country-specific effects

regressors	1 LE 20-24 years+	2 log-linear	3 log-log	4 developed countries	5 developing countries	6 developed lag=5years
GDP/cap 2011 prices	-1.4650**	-0.0245***	-0.0129*	-2.3093***	-2.5129***	-1.9457***
	(0.6385)	(0.0068)	(0.0066)	(0.5564)	(0.8873)	(0.2940)
Gini coefficient	0.0402***	0.0005***	0.0146**	0.0339	0.0363*	-0.0160
	(0.0150)	(0.0002)	(0.0062)	(0.0222)	(0.0193)	(0.0282)
Rural population	0.0399	0.0011*	0.0267***	0.1375***	0.1643**	0.0641***
	(0.0483)	(0.0006)	(0.0100)	(0.0378)	(0.0667)	(0.0213)
Diff. unemployment	0.0820***	0.0012***	0.0013***	0.0425	0.1913***	0.0015
	(0.0140)	(0.0004)	(0.0004)	(0.0337)	(0.0142)	(0.0306)
Diff. Services empl.	0.0134	0.0001	0.0000	0.0257	0.0501*	0.0629
	(0.0152)	(0.0002)	(0.0002)	(0.0170)	(0.0242)	(0.0446)
Diff. Industry empl.	0.0156	0.0002	0.0002	0.0067	0.0542	0.0308
	(0.0134)	(0.0002)	(0.0002)	(0.0076)	(0.0332)	(0.0478)
Women in parliament	-0.0813***	-0.0006*	-0.0006*	0.0026	-0.0436	-0.1234**
	(0.0270)	(0.0003)	(0.0003)	(0.0254)	(0.0481)	(0.0507)
Wom.parliament^2	0.0009*	$9.30*10^{-6}$	$9.44*10^{-6}$*	0.0003	-0.0006	0.0021**
	(0.0005)	$(6.09*10^{-6})$	$(5.04*10^{-6})$	(0.0005)	(0.0013)	(0.0009)
Alcohol consumption	0.0673	0.0010*	0.0101*	0.1462***	0.0193	-0.0121
	(0.04990)	(0.0006)	(0.0060)	(0.0347)	(0.0283)	(0.0618)
Voice&Accountability	-0.0920	-0.0043	-0.0013	-0.4567*	0.4184	0.4590
	(0.3561)	(0.0034)	(0.0043)	(0.2691)	(0.4027)	(0.6690)
Renewable Energy	-0.0531***	-0.0005***	-0.0024	-0.0465***	-0.0207	-0.0396***
	(0.0134)	(0.0001)	(0.0021)	(0.0119)	(0.0237)	(0.0078)
R^2	0.5588	0.4867	0.4411	0.5148	0.6794	0.8901
R^2-adj	0.4741	0.4166	0.3776	0.4254	0.5563	0.6842
N	323	340	340	213	127	134
DF	274	291	291	176	104	103

* $p < 0.1$
** $p < 0.05$
*** $p < 0.01$ significance level

similar in size. The difference in unemployment rates is statistically significant in developing countries only, while alcohol consumption and renewable energy are statistically significant in developed countries. Nevertheless, the signs of the coefficients are the same. The insignificant coefficient for alcohol in developing countries can be attributed to a considerable portion of unrecorded alcohol consumption. (World Health Organization 2014)

When the sample is split into "developed" and "developing" countries, the percentage of women in parliaments turns insignificant and their signs become unstable. One can surmise that in the pooled sample, the percentage of women in parliaments is significant because it distinguishes between developed and developing countries. However, if we consider explanatory variables with a lag of 5 years, the coefficients corresponding to the percentage of women in parliaments become significant at a 5% significance level (model 6). In model 6, we present estimates for developed countries only. In fact, the estimates for developing countries with a 5-year lag are similar, but they are less significant (at 10% significance level) due to a lower number of degrees of freedom.

5 Conclusions

In this paper, we analyzed the relation between the socioeconomic environment in developed countries (OECD and EU) and the gender longevity gap. We found that a smaller gender longevity gap is associated with higher income (measured as GDP per capita), lower income inequality, lower per capita alcohol consumption, a higher level of urbanization and better environmental conditions. Higher female unemployment rates are associated with a larger gender longevity gap, higher male unemployment reduces it. However, the allocation of males and females among economic sectors does not play a statistically significant role. The effect of the number of women in parliaments on the gender longevity gap has a U-shape effect; a minimum of 31%-45%, depending on the exact functional form, with 50% always belonging to the 95% confidence interval. The effect is the strongest if the corresponding explanatory variables are used with a 5-year lag, the approximate length of political cycles. This result indicates that men are the main beneficiaries of a more equitable gender representation in politics, but the effects are not immediate.

As our findings for developed countries sometimes contradict other studies of large pools of countries, (those comprising mainly developing countries), such as Clark and Peck (2012), we suggest future cross-country research in this field include a focus on different sets of developing countries: CIS, MENA, Latin America, South East Asia, Sub-Saharan Africa. These regions provide diverse cultural and historical backgrounds and diverse economic challenges, which may affect not only country-specific fixed effects, but also the slopes of the socioeconomic factors. A comparison of these results could provide a clearer understanding of the dynamics of the gender longevity gap.

References

Anson, J. (2003). Sex differences in mortality at the local level: An analysis of Belgian municipalities. *European Journal of Population/Revue Europeenne de Demographie 19*(1), 1–28.

Arber, S., G. N. Gilbert, and A. Dale (1985). Paid employment and women's health: a benefit or a source of role strain? *Sociology of Health & Illness 7*(3), 375–400.

Arellano, M. (1987). Computing robust standard errors for within-group estimators. *Oxford Bulletin of Economics and Statistics 49*(4), 431–434.

Aviv, A., J. Shay, K. Christensen, and W. Wright (2005). The longevity gender gap: are telomeres the explanation? *Science's SAGE KE 2005*(23), pe16.

Bajtelsmit, V. L., A. Bernasek, and N. A. Jianakoplos (1999). Gender differences in defined contribution pension decisions. *Financial Services Review 8*(1), 1–10.

Bertranou, F. M. (2001). Pension reform and gender gaps in Latin America: What are the policy options? *World Development 29*(5), 911–923.

Breusch, T. (1978). Testing for autocorrelation in dynamic linear models. *Australian Economic Papers 17*(31), 334–355.

Clark, R. and B. M. Peck (2012). Examining the gender gap in life expectancy: A cross-national analysis, 1980–2005. *Social Science Quarterly 93*(3), 820–837.

Crimmins, E. M. and Y. Saito (2001). Trends in healthy life expectancy in the United States, 1970–1990: gender, racial, and educational differences. *Social science & medicine 52*(11), 1629–1641.

Duleep, H. O. (1995). Mortality and income inequality among economically developed countries. *Soc. Sec. Bull. 58*, 34–50.

Edlund, L. and R. Pande (2002). Why have women become left-wing? The political gender gap and the decline in marriage. *The Quarterly Journal of Economics 117*(3), 917–961.

Elstad, J. I., E. Dahl, and D. Hofoss (2006). Associations between relative income and mortality in Norway: a register-based study. *The European Journal of Public Health 16*(6), 640–644.

Felder, S. (2006). The gender longevity gap: explaining the difference between singles and couples. *Journal of Population Economics 19*(3), 543–557.

Gächter, M., P. Schwazer, and E. Theurl (2012). Stronger sex but earlier death: A multi-level socioeconomic analysis of gender differences in mortality in Austria. *DANUBE: Law and Economics Review 1*, 1–23.

Gavrilov, L. A. and N. S. Gavrilova (2015). Predictors of exceptional longevity: Effects of early-life and midlife conditions, and familial longevity. *North American Actuarial Journal 19*(3), 174–186.

Godfrey, L. (1978). Testing against general autoregressive and moving average error models when the regressors include lagged dependent variables. *Econometrica 46*(6), 1293–1301.

Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica 37*(3), 424–438.

Gravelle, H. (1998). How much of the relation between population mortality and unequal distribution of income is a statistical artefact? *BMJ: British Medical Journal 316*(7128), 382–385.

Hári, N., A. De Waegenaere, B. Melenberg, and T. E. Nijman (2008). Longevity risk in portfolios of pension annuities. *Insurance: Mathematics and Economics 42*(2), 505–519.

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica 46*(6), 1251–1271.

Hersch, J. (1998). Compensating differentials for gender-specific job injury risks. *The American Economic Review 88*(3), 598–607.

Jebli, M. B. and S. B. Youssef (2015). Economic growth, combustible renewables and waste consumption, and co2 emissions in North Africa. *Environmental Science and Pollution Research 22*(20), 16022–16030.

Kalben, B. B. (2002). Why men die younger: Causes of mortality differences by sex. SOA Monograph.

Karlsson, M., T. Nilsson, C. H. Lyttkens, and G. Leeson (2010). Income inequality and health: Importance of a cross-country perspective. *Social science & medicine 70*(6), 875–885.

Leigh, J. P. (1987). Gender, firm size, industry, and estimates of the value-of-life. *Journal of Health Economics 6*(3), 255–273.

Leung, M. C., J. Zhang, and J. Zhang (2004). An economic analysis of life expectancy by gender with application to the United States. *Journal of Health Economics 23*(4), 737–759.

Liu, G. G., O. Kwon, X. Xue, and B. M. Fleisher (2017). How much does social status matter to longevity? evidence from China's academician election. *Health economics 26*(3), 292–304.

Lobmayer, P. and R. Wilkinson (2000). Income, inequality and mortality in 14 developed countries. *Sociology of Health & Illness 22*(4), 401–414.

MacIntyre, S. and K. Hunt (1997). Socio-economic position, gender and health: How do they interact? *Journal of Health Psychology 2*(3), 315–334.

Mundlak, Y. (1978). On the pooling of time series and cross section data. *Econometrica 46*(1), 69–85.

Mustard, C. A. and J. Etches (2003). Gender differences in socioeconomic inequality in mortality. *Journal of Epidemiology & Community Health 57*(12), 974–980.

OECD (2002). OECD employment outlook. ISBN:9789264194410.

Olshansky, S. J., T. Antonucci, L. Berkman, R. H. Binstock, A. Boersch-Supan, J. T. Cacioppo, B. A. Carnes, L. L. Carstensen, L. P. Fried, D. P. Goldman, et al. (2012). Differences in life expectancy due to race and educational differences are widening, and many may not catch up. *Health Affairs 31*(8), 1803–1813.

Preston, S. H. (1975). The changing relation between mortality and level of economic development. *Population studies 29*(2), 231–248.

Rablen, M. D. and A. J. Oswald (2008). Mortality and immortality: The Nobel Prize as an experiment into the effect of status upon longevity. *Journal of Health Economics 27*(6), 1462–1471.

Ram, B. (1993). Sex differences in mortality as a social indicator. *Social Indicators Research 29*(1), 83–108.

Repetti, R., K. Matthews, and I. Waldron (1989). Effects of paid employment on women's mental and physical health. *American Psychologist 44*, 1394–1401.

Ricketts, C. F. (2014). Re-examining the gender gap in life expectancy: a cross country analysis. *International Journal of Humanities and Social Science 4*(10(1)), 38–51.

Rieker, P. P. and C. E. Bird (2005). Rethinking gender differences in health: why we need to integrate social and biological perspectives. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences 60*(Special_Issue_2), S40–S47.

Rodgers, G. B. (1979). Income and inequality as determinants of mortality: an international cross-section analysis. *Population studies 33*(2), 343–351.

Rogot, E., P. D. Sorlie, and N. J. Johnson (1992). Life expectancy by employment status, income, and education in the national longitudinal mortality study. *Public health reports 107*(4), 457.

Rose, K. M., A. P. Carson, D. Catellier, A. V. D. Roux, C. Muntaner, H. A. Tyroler, and S. B. Wyatt (2004). Women's employment status and mortality: the atherosclerosis risk in communities study. *Journal of Women's Health 13*(10), 1108–1118.

Schünemann, J., H. Strulik, and T. Trimborn (2017). The gender gap in mortality: How much is explained by behavior? *Journal of Health Economics 54*, 79–90.

Seifarth, J. E., C. L. McGowan, and K. J. Milne (2012). Sex and life expectancy. *Gender medicine 9*(6), 390–401.

Shkolnikov, V. M., E. M. Andreev, D. Jasilionis, M. Leinsalu, O. I. Antonova, and M. McKee (2006). The changing relation between education and life expectancy in central and eastern Europe in the 1990s. *Journal of Epidemiology & Community Health 60*(10), 875–881.

Smith, D. W. (1989). Is greater female longevity a general finding among animals? *Biological Reviews 64*(1), 1–12.

Smith, G. D. (1996). Income inequality and mortality: why are they related? *BMJ: British Medical Journal 312*(7037), 987.

Viscusi, W. K. (2004). The value of life: Estimates with risks by occupation and industry. *Economic Inquiry 42*(1), 29–48.

Wagstaff, A. and E. Van Doorslaer (2000). Income inequality and health: What does the literature tell us? *Annual review of public health 21*(1), 543–567.

Waldron, I. (1991). *Effects of Labor Force Participation on Sex Differences in Mortality and Morbidity*, pp. 17–38. Boston, MA: Springer US.

Wilkinson, R. G. (1998). Mortality and distribution of income. Low relative income affects mortality. *BMJ (Clinical research ed.) 316*(7144), 1611–1612.

Williams, D. R. (1999). Race, socioeconomic status, and health the added effects of racism and discrimination. *Annals of the New York Academy of Sciences 896*(1), 173–188.

Williamson, J. B. and U. Boehmer (1997). Female life expectancy, gender stratification, health status, and level of economic development: A cross-national study of less developed countries. *Social Science & Medicine 45*(2), 305–317.

World Bank Group (2015). Women, business and the law 2016: Getting to equal. Washington, DC: World Bank. doi:10.1596/978-1-4648-0677-3. License: Creative Commons Attribution CC BY 3.0 IGO.

World Health Organization (2014). Global status report on alcohol and health. Geneva, Switzerland.

5.1 Appendix

Table 7: Dependent variable: female longevity, fixed country-specific effects

regressors	1	2	3	4	5
GDP/cap 2011 prices	3.5236***	2.95106***	2.6003***	2.5608***	2.3044***
	(1.3564)	(1.0731)	(0.9673)	(0.8996)	(0.9295)
Gini coefficient	-0.0542*	-0.0352	-0.0426*	-0.0219	-0.0373*
	(0.0314)	(0.0244)	(0.0217)	(0.0214)	(0.0213)
Rural population	-0.1465**	-0.1734***	-0.2080***	-0.1824***	-0.2229**
	(0.0672)	(0.0477)	(0.0481)	(0.0411)	(0.0449)
Women, unemployment	0.0517*	0.0332***	0.0222	0.0345	0.0274
	(0.0312)	(0.0272)	(0.0256)	(0.0263)	(0.0239)
Women, Services	0.0883***	0.0976***	0.0878***	0.1004***	0.0882***
	(0.0262)	(0.0257)	(0.0198)	(0.0205)	(0.0186)
Women, Industry	-0.2098***	-0.1890***	-0.1575***	-0.1849***	-0.1433***
	(0.0320)	(0.0292)	(0.0239)	(0.0270)	(0.0267)
Women in parliament	0.0404	0.0318	0.0531*	0.0223	0.0382
	(0.0261)	(0.0281)	(0.0292)	(0.0271)	(0.0302)
Wom.parliament^2	-0.0008	-0.0006	-0.0010**	-0.0004	-0.0006
	(0.0005)	(0.0006)	(0.0005)	(0.0006)	(0.0005)
Alcohol consumption		-0.0595	-0.0480	-0.0381	-0.0316
		(0.0634)	(0.0655)	(0.0638)	(0.0718)
Voice&Accountability			0.9714**	0.7691**	0.9010**
			(0.3938)	(0.3569)	(0.3860)
Renewable Energy			0.0590***		
			(0.0173)		
Greenhouse gases				-53.0540**	
				(22.9468)	
Combust. renewables					0.1075***
					(0.0269)
R^2	0.7874	0.7958	0.8151	0.8051	0.8210
R^2-adj	0.6827	0.6858	0.6976	0.6863	0.7027
N	346	340	340	332	340
DF	300	293	291	283	291

* $p < 0.1$
** $p < 0.05$
*** $p < 0.01$ significance level

Table 8: Dependent variable: male longevity, fixed country-specific effects

regressors	1	2	3	4	5
GDP/cap 2011 prices	9.1057***	8.3186***	7.2653***	8.1675***	6.6462***
	(2.5148)	(1.9545)	(1.712)	(1.9017)	(1.6792)
Gini coefficient	-0.0941***	-0.0805**	-0.0903***	-0.0681**	-0.0782***
	(0.0346)	(0.0316)	(0.0288)	(0.0317)	(0.0267)
Rural population	-0.2581***	-0.2708***	-0.3015***	-0.2819***	-0.3265***
	(0.0875)	(0.0663)	(0.0700)	(0.0738)	(0.0662)
Men, unemployment	0.1216*	0.0906	0.0943	0.0919	0.0824
	(0.0698)	(0.0624)	(0.0542)	(0.0610)	(0.0527)
Men, services	0.0676***	0.1012	0.0647	0.0919	0.0566
	(0.0765)	(0.0670)	(0.0634)	(0.0632)	(0.0607)
Men, industry	-0.0362	-0.0193	-0.0115	-0.0227	-0.0136
	(0.0315)	(0.0290)	(0.0269)	(0.0289)	(0.0276)
Women in parliament	0.1190***	0.1041**	0.1377***	0.0942**	0.1111***
	(0.0408)	(0.0447)	(0.0451)	(0.0420)	(0.0386)
Wom.parliament^2	-0.0015*	-0.0012	-0.0021**	-0.0009	-0.0013**
	(0.0008)	(0.0008)	(0.0009)	(0.0007)	(0.0006)
Alcohol consumption		-0.1239	-0.1060	-0.0969	-0.0773
		(0.1024)	(0.1014)	(0.0991)	(0.1101)
Voice&Accountability			1.1946**	0.9689**	1.0696***
			(0.3765)	(0.3841)	(0.3793)
Renewable Energy			0.1061***		
			(0.0265)		
Greenhouse gases				-80.6964**	
				(36.0027)	
Combust. renewables					0.1817***
					(0.0399)
R^2	0.7318	0.7545	0.7878	0.7567	0.7964
R^2-adj	0.6345	0.6502	0.6742	0.6450	0.6816
N	346	340	340	332	340
DF	300	293	291	283	291

* $p < 0.1$
** $p < 0.05$
*** $p < 0.01$ significance level