Culture, institutions and contemporary fertility dynamics in Europe*

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Extended abstract for EPC 2020 – incomplete – please better not to quote

Abstract

In this paper, we investigate the role of culture as a co-determinant of European contemporary fertility dynamics. The focus is put on *generalized morality*, a cultural trait conceptualized and measured through the values of *respect*, *obedience*, *generalized trust* and *control.* This cultural trait correlates with institutional quality and other factors that are known to play a role for fertility. We focus on the period between 1990 and 2014, when fertility experienced diverging trends and was affected by the Great Recession. Using Eurostat and OECD macro data for 177 regions in 23 European countries, moderation analysis provides evidence that values of generalized morality affect fertility through educational expansion, child-care services and perceived uncertainty.

Keywords: Generalized morality, European fertility dynamics, Institutional quality, Childcare provision

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1. Introduction

In demography, the term culture is often invoked when explaining persistency in high fertility levels (Romaniuk, 2011). Several studies argue that individuals who had many siblings are themselves more likely to have many children - also in developed countries (Anderton *et al*. 198a7; Dronkers and Härkönen, 2008; Fernández and Fogli, 2006). Family demographers have consequently put forward the idea that there is cultural transmission in contemporary fertility. However, this is a simplistic perspective of the role culture may have on childbearing behaviour. As fertility patterns can be explained through several factors directly, cultural transmission might affect fertility indirectly through the very same channels. That is, cultural traits would necessarily interact with and shape the structure of institutions that may otherwise explain fertility trends (see Alesina and Giuliano 2015 for a review). This is an important insight, because in recent years scholars have argued that fertility dynamics across countries can be explained by its institutional setting and hence its welfare regime typology (Esping-Andersen, 1990). This literature is extensive and within the realm of the welfare regimes, several lines of explanations are put forward to explain fertility dynamics, including labour market policies as a means to balance work and family, public childcare provision, gender equity and equality, and policies geared towards supporting parenthood. However, such an approach is not entirely satisfactory in terms of explaining country differences in fertility. For instance, both Anglo-Saxon and Nordic countries have managed to keep fertility levels rather high, despite being rather different in terms of welfare organization. In this study, we revisit the role of culture in explaining fertility patterns by integrating the idea that culture may have an impact (or interact) through the factors that are typically promoted as explaining fertility differences.

Culture is a broad concept, and though the general definition is clear enough, namely, ideas and norms being transmitted from one generation down to the other (Guiso et al., 2006), the key is to identify which kind of cultural traits matter for fertility dynamics. This is very much an open question, where the existing demography literature cannot inform us much. Acknowledging that several traits may play a role, and that they often do so in an indirect way, this paper singles in one particular set of cultural traits that have received considerable attention in sociology and economics, namely, the concept of 'generalized morality'. Generalized Morality prescribes that rules of good conduct and honest behaviour should trespass the narrow interest of the individual (or of her/his own family). Following Tabellini (2010), the concept encompasses values of *respect*, *obedience*, *generalized trust* and *control*. These cultural traits appear in the economic and sociological literature as stable features of diverse institutional arrangements (e.g. Banfield, 1957; Putnam, 1993; Platteau, 2000), and receive particular interest because they are seen as key ingredients of economic success (e.g. Guiso et al., 2006; Tabellini, 2008; Algan and Cahuc, 2010). Low levels of trust and respect for others are typical of hierarchical societies, where good conduct is a result of coercion (e.g. from the State) instead of

internalized values. In these contexts, parents' control over children's instinct is even sometime exercised through forcefulness, and therefore obedience is a fundamental pillar for the transmission of values. Furthermore, lack of control over one's own life would capture the resignation and low entrepreneurial spirit of individuals who feel that outcomes result mainly from luck, uncontrollable events or the discretional use of political power, instead of their personal efforts. Lack of trust and respect, high obedience and low control would subordinate the individuals' morality to the interests of a small circle of one's related persons (e.g. the family) and discourage personal initiative, which is otherwise seen as a 'lubricant' of the entire socio-economic system (Arrow, 1972).

Whereas there is strong support for Generalized Morality playing a role for economic prosperity (which may have an impact on fertility), social trust has also been shown to matter for the evolution of welfare regimes (e.g. Bjornskov and Svendsen, 2015). In other words, such a cultural trait may have mattered for welfare provision, which may in turn matter for fertility. In so far institutions are shaped by cultural traits, the observed policies contained within the welfare regime, so often used to explain fertility differentials, are necessarily themselves outcomes of the same underlying cultural traits (Esping-Andersen and Billari, 2015).

This study diverges from the mainstream in the sense that we go beyond the classical explanatory framework of welfare regimes as means to explain fertility trends. In particular, we consider differential fertility trends as a function of the usual predictors, but where those factors may be moderated by the cultural trait. These predictors include economic prosperity, women's education and labour force participation, perceived uncertainty, and childcare policy. The empirical analysis consists of two parts. We first describe fertility trends at the country level, but where countries are divided by their level of generalized morality. We then run a series of regressions where the unit of observation is defined at the sub-regional level. We use both the total fertility rate (TFR) and age specific fertility rates as dependent variables. We construct the measure of Generalized Morality from the European Values Survey, which is matched with the respective sub-national regions. The role of Generalized morality is assessed through a moderation analysis in the sense that we control for a set explanatory variables that are interacted with our measure of Generalized Morality. Using the sub-national level is important since actual value of generalized morality found in certain regions in some countries overlaps with regions in other countries - despite those countries overall are classified as different in terms of generalized morality. In other words, the patterns we find in terms of fertility and generalized morality differ significantly if considered at the sub-national level as opposed to the national level. We find robust results that Generalized Morality moderates the effect of education, child-care services, and uncertainty with respect to fertility – though differently depending on the age specific fertility rate.

2. Background

The concept of *generalized morality*, embraces 'those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation' (Guiso et al. 2006). The roots of this concept dates back to Max Weber (1958), who recognized the role of culture – in particular of religion – for economic and political outcomes. His main argument was that, by instilling in the bourgeoisie the pursuit of wealth as a main moral duty, the 'Protestant ethic' stimulated the creation of a new order based on markets and the search for individual profit, which acted as preconditions for the development of capitalism. In a similar spirit, but stressing the social component of culture, Banfield's ethnographic research ascribed the underdevelopment of South Italy to 'amoral familism' (Banfield, 1957), that is the social norm of individuals prescribing that codes of good conduct apply only within small circles of related persons (family or clan), whereas selfishness in interactions with strangers is morally acceptable. Since amoral familists have lower level of trust and trustworthiness when dealing with people outside their clan, they practice 'limited' morality as opposed to 'generalized' one, which results into a limited spectrum of socio-economic exchanges and inferior quality of institutions (Tabellini, 2008; Platteau, 2000). This happens mainly because individuals with limited morality are more inclined to free-ride on others when it comes to the contribution for the production of public goods, thereby hindering policies that might potentially benefit everybody (e.g. universalistic welfare regimes). They rarely get involved into the political and administrative life, with 'bad' governance likely to emerge. In this case, lack of monitoring of public officials would enhance corruption and clientelism, and put society on a lower path of socio-economic development.

The relationship between culture and institutional features can be further analyzed by looking at the single constituents of generalized morality, that is, the values of *respect* and *obedience*, and the levels of *generalized trust* and *control* (Tabellini, 2008). Low levels of trust and respect for others are typical of hierarchical societies, where communication and decision making tend to be made vertically downwards rather than horizontally. In these societies, informal enforcement mechanisms – sustained by vertical obedience, strong family ties and parochial altruism – tend to crowd out demand for a public, effective legal system (Greif, 1994). Similarly, lack of control over one's own life is a symptom of the diffuse resignation of individuals who feel that outcomes result mainly from luck, uncontrollable events or the discretional use of political power, instead of their personal efforts. In such societies, individuals tend to put less effort in economic activities, and often withdraw to private life, leaving the *res publica* to politicians who are reluctant to reforms benefiting citizens' wellbeing at the cost of losing privileges. In sum, lack of trust and respect, strong obedience and low control would subordinate the individuals' morality to the narrow interests of the family, thereby

hindering cooperation, civic sense, individual initiative and political participation, which are well-recognized ingredients of economic, financial and institutional development (e.g. Coleman, 1990; Putnam, 1993; Alesina and Giuliano, 2015).

There are two mechanisms in which Generalized Morality will play a role in these relationships. One is that Generalized Morality correlates with family systems. Western countries vary distinctly in their family system (e.g. Monkediek and Bras, 2014), where the Southern European countries are pictured with a family system of strong ties, where trust is strong among family members, but weak when counting in the larger community where they live. As argued previously, strong family ties brings about a detachment from enlarged cooperation or associations outside the family, which is reflected by the inverse relationship with social trust (Ermish and Gambetta, 2010; Alesina and Giuliano, 2011). Importantly, strong family ties would prescribe childbearing as a venture that ought to take place within the family sphere, and where close relatives should be relied upon for support, either in terms of financial and economic transfers and in terms of childcare provision (Livi-Bacci, 2001). Thus, despite of economic progress and increasing educational attainment among women, strong norms may nevertheless persist, thereby holding back the diffusion of family policies. Secondly, in low generalized morality societies, socio-economic transactions rely on mutual obligations among known individuals, and therefore the risk of being cheated is mitigated by informal but strong commitment formation. Trust in other unknown persons, instead, is jeopardized (Yamagishi and Yamagishi 1994; Yamagishi et al. 1998) as strong and stable relations provide 'assurance' of mutual cooperation and decrease social risk (Yamagishi and Yamagishi 1994). Since such relations cannot easily extend into the larger institutional framework of a society, the consequence is a demand for stronger regulation, hence making those institutions more hierarchical (Aghion et al 2014). This means that communications and decision making processes operate in a vertical manner, and tend to do so across a range of institutions, including public sector bureaucracy, schools and higher education, institutions tend to reinforce cultural beliefs, thereby cementing social norms. But in addition, strong vertical hierarchies tend to have slower decision making processes, hence making it harder for policy makers to implement new policies as a response to new emerging preferences. In other words, polices potentially being beneficial for increasing fertility when societies changes from the male breadwinner model to a dual earner egalitarian model, in large part being a results of educational expansion, may be both harder to implement due to the decision making process and because social norms are more persistent.

Our aim is to gain insight into why, and how, general morality matter for fertility. To do so, we present a set of standard channels considered important for fertility change, and discuss how Generalized Morality moderates this relationship. The first channels concern economic prosperity, educational expansion and family policy. On one hand, economic prosperity may increase fertility

through an income effect, though the effect could be non-linear. In the past, economic development may have lowered fertility, as the opportunity cost of children outweighed the income effect, and as Becker argued, with higher income, couples increase their investment in their children rather than increasing the quantity. It is also true that those countries having grown the most in terms of economic prosperity today also see higher fertility levels Myrskala et al (2009). One likely driver behind this trend is that dual worker households are become the norm in highly developed countries. As men increase their share of household work, and women contribute equally to the household income, it is no longer obvious that the opportunity cost of children will dominate the income effect, thereby bringing about higher fertility again.

All Western countries have seen tremendous economic growth since the Second World War. One important element of this growth is manifested through an equally broad expansion in education. Whereas education increases human capital, and thereby spurs economic prosperity, it may also have driven fertility down - especially since educational expansion also took place for women. As is well documented, education is perhaps the strongest predictor of fertility decline. As women attain higher levels of education and seek to combine working life with family formation, traditional childrearing activities need to be outsourced to institutions outside the household and the extended family. Thus, in order to explain modern fertility dynamics, one cannot ignore the role of family policy and childcare infra-structure. For instance, higher fertility in the Nordic countries are often explained in terms of generous family policies, whereas low fertility is frequently argued to be a result of poor coverage of childcare and support for couples with young children.

The next channel of interest concerns perceived uncertainty. Everyone face a risk to be cheated in social interactions, a feature commonly referred to as social uncertainty (Yamagishi and Yamagishi, 1994; Yamagishi et al. 1998). In collectivistic societies, the risk is mitigated by social commitments among circles of known persons, in which there is less need to trust because there is less risk of being cheated. Instead, in individualistic societies, the social commitment is weaker. Since socio-economic interactions occur more often among unknown persons, the risk of being cheated would be potentially higher. Yet, at the same time, because interactions in individualistic societies take place among a broader group of citizens, there is a stronger need to trust and take that risk. Generalized morality is consequently higher in those societies. However, the vast majority of the literature considering the relationship between uncertainty and fertility, tend to measure uncertainty in terms of insecure jobs and, though more rarely, uncertain economic circumstances. This is of course appropriate, since in most cases, a great deal of planning – and a conscious decision – is involved when having children. Their irreversible nature of children means that children impose substantial long-term costs. Ranjan (1999), drawing on the financial option theory by Dixit and Pindyck (1994), shows that decision makers tend to postpone irreversible and long-term decisions

when the future is uncertain, childbearing being a prime example. Indeed, these ideas have found traction in several studies. Kohler and colleagues (2002) argued that couples in lowest-low fertility countries limited their childbearing due to the economic uncertainty caused by economic difficulties or depression. Similarly, Mills and Blossfeld (2011) argue that with the onset of globalization, labor markets have become more uncertain. As the World is ever more interconnected there is also greater demands being put on individuals in terms of geographical mobility. The hypothesis is that the traditional collectivistic societies will perceive these sweeping changes with a stronger sense of uncertainty. In other words, in case of adverse events, they feel more exposed in terms of being able to cope. Consistent with the concept of generalized morality, the lack of perceived control, would imply a stronger feeling of resignation and that life outcomes are predominantly a result of luck. If this is the case, then indeed, they will also feel a more acute sense of uncertainty in terms of what the future will bring.

In other words, one potential channel in which culture matter for fertility, is that in those societies where Generalized Morality low, there is generally a stronger sense of uncertainty. However, in order to test this hypothesis, one would ideally consider the effect of an exogenous shock in terms of uncertainty. Other than considering the unemployment rate, which among many is considered a proxy for uncertainty, we additionally exploit the fact that our sample encompasses the economic recession that started in 2007, and for the European countries unfolded unexpectedly.

3. ***Data***

Following Tabellini (2008, 2010), we construct the measure of *generalized morality* by using the values of (1) *generalized trust,* (2) *respect*, (3) *obedience* and (4) *control* as reported in the European Values Study (2000). In EVS, *generalized trust* (1) is measured by the question "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" *Respect* (2) for others is measured by "tolerance and respect for other people" as being important to the question: "Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five". Similarly, the value of *obedience* (3) is represented by respondents mentioning "obedience" in the question above. *Control* over one's own life (4) is built from the following question in the survey: "Some people feel they have completely free choice and control over their lives, while other people feel that what we do has no real effect on what happens to them. Please use this scale (from 1 to 10) where 1 means "none at all" and 10 means "a great deal" to indicate how much freedom of choice and control in life you have over the way your life turns out". Our measure of generalized morality is then created through a principal component analysis and extract the first component (*pc_culture*). As expected, the

component is positively correlated with trust, respect and control while negatively with obedience (see Table 1). For our regression analysis, we aggregate the measure of generalized morality up to country levels, and regional levels (i.e. NUTS2).

Table 1: Pearson pairwise correlations between cultural variables at the regional level.

Variable	*pc_culture*	*Trust*	*Obedience*	*Respect*	*Control*
Trust	0.8474***	1			
Obedience	-0.4561***	-0.3404***	1		
Respect	0.655***	0.4073***	-0.0132	1	
Control	0.6406***	0.3537***	-0.0812	0.2345***	1

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

There are several important aspect to consider with respect to the measure of generalized morality. First, pc_culture is derived from the 2000 wave of the EVS. The items used to construct the variable are available in later survey rounds, as well as in earlier ones - though in the latter case, considerably fewer countries participated. Nevertheless, those surveys are valuable for comparing the variable pc_culture over time. Appendix A shows that when comparing regions and countries over time by simple t-tests, there is no significant difference across waves. Similarly, once countries and regions are split into low, medium and high levels of pc_culture (see details below for how this is done), we find hardly any difference in group membership across time. In fact, there is no change in group membership when considering countries, whereas for the sub-national regions, only a handful of regions change group membership. In other words, for the time periods covered by the EVS, pc_culture remains remarkably stable.

We have argued that generalized morality will moderate the relationship between a series of channels and fertility. At the same time, we have argued that the effect of culture will work through its impact on institutional effectiveness. A first step is therefore to establish empirically that culture indeed relates to the effectiveness of institutions – broadly speaking. In order to do so we use data from the European Quality of Governance index (EQI) as measured at 2010 (Charron et al. 2014). This index captures regional performance in four dimensions, namely *control of corruption, rule of law, government effectiveness,* and *voice and accountability*. As we have argued, a government that is impartial, efficient and non-corrupt might be both a product of a generalized-morality culture and a determinant for the implementation of effective policies, thereby influencing fertility dynamics. Again looking at Appendix A2, we see that the correlation between this measure and pc_culture is as high as 0.8, confirming the strong relationship between cultural values as measured in the EVS, and institutional quality measured by the QoG. [Footnote: Unfortunately, the Quality of Governance index does not go further back in time than 2010. We cannot assess in the same way to what extent this measure is stable over time].

We retrieve macro data on age-specific fertility rates, per capita GDP and female tertiary education both at the country level and the NUTS-2 level (i.e. basic macro regions for the application of regional policies) from Eurostat and OECD databases (see Table 1 for descriptive statistics). Throughout we operate with age specific fertility rates. We compute the fertility rate for the ages 18 to 25, 26 to 35, and from 36 and above. In this way, we have a measure of fertility for a very young age group, the fertility for the age where most of childbirths take place, and fertility for the older age group. We use two different proxies for uncertainty. The first is the female unemployment rate, measured both at the country level and the regional level. This variable is rather standard in the demography literature, where it is taken as a measure of how uncertain the job market is. The second proxy for uncertainty is rather different, and refers to the onset of the economic crisis. Clearly, the crisis correlates with economic prosperity, and countries and regions across Europe were hit rather differently by the crisis. In the South, including Portugal, Spain, Italy and Greece, the crisis hit rather hard, with declining GDP and increasing unemployment, and in these countries, one also observed a decline in fertility. In other words, in so far the onset of the economic crisis should reflect heightened uncertainty, we do need to control for GDP per capita.

Several data sources are available for country variation in family policy. The OECD for instance contains a detailed menu of the various family policies. However, the information is typically available at the country level, and rarely do they go sufficiently back in time. We consequently use EU-SILC survey rounds from 2004 to 2015 to generate such a measure for the sub-national level. The variable is constructed as the average number of hours in formal childcare (i.e. pre-school, childcare centers, day-care centers, nannies) for children under age of three (regional mean) over the 12 years. Since childcare data are not available for each region, we aggregate them at a higher territorial level, i.e. NUTS-1 level. Because regional data are not available for all EU-SILC countries, in this case our sample ends up with 63 regions. The final sample is made up 23 countries and 177 regions, which are consistent with the regions recorded from the EVS. With these variables, the earliest time point for our regression analysis is the year of 2000, whereas when childcare policies are included, the earliest start point is 2004.

Table 2: Descriptive Statistics of relevant variable

Variable	Obs	Mean	Std. Dev.	Min	Max
		Culture			
pc_culture (2008)	2640	0.101	0.452	-0.892	1.282
Trust	2640	0.363	0.186	0.058	0.914
Obedience	2640	0.290	0.144	0.000	0.833
Respect	2640	0.745	0.134	0.280	1.000
Control	2640	6.673	0.644	4.442	8.404
		Fertility Rates, T = 2000-2014			
Total	2417	1.485	0.282	0.727	2.428
Age 15-24	2504	0.324	0.138	0.064	0.938
Age 25-25	2417	0.918	0.158	0.495	1.424

Age 36-50	2443	0.248	0.088	0.046	0.655
Other controls, T = 2000-2014					
% female in tertiary educ.	2428	31.858	13.497	4.700	67.400
GDP	2517	9.912	0.481	8.132	10.953
Female unemployment	2452	8.738	5.467	0.800	35.200
Hours of formal childcare	1226	5.865	2.811	0.896	22.070

Table 3: Correlations matrix of relevant variables

	pc_culture	TFR	15-24	24-35	35-50	Female tertiary education	GDP	Female unemployment	Formal childcare h
pc_culture	1								
TFR	0.008	1							
FR 15-24	-0.175	0.677	1						
FR 24-35	0.089	0.907	0.424	1					
FR 35-50	0.104	0.526	-0.051	0.405	1				
Female tertiary education	0.461	0.127	-0.144	0.214	0.206	1			
GDP	0.481	-0.249	-0.507	-0.041	-0.004	0.408	1		
female unemployment	-0.191	-0.171	-0.107	-0.255	0.090	-0.069	-0.296	1	
formal childcare h	0.186	0.234	-0.013	0.371	0.061	0.317	0.126	-0.146	1

Table 3 shows the correlations between our measure of generalized morality and the key variables which are used to explain fertility. First, we see that the direct correlation between GM and TFR is close to zero, but considerably stronger once we consider the age specific fertility rates. In particular, the fertility rate for the age group 15 to 24 is negative suggesting that fertility among the younger age groups is lower in the high GM regions. The opposite is the case for fertility in the 24 - 35 and the 35 - 50 age groups. Then we see that Generalized Morality correlates positively with the rate of female tertiary education and GDP per capita, whereas it is negatively correlated with unemployment, but, not unexpected, positively correlated with supply of childcare. As for the TFR, it correlates positively with female tertiary education, negatively with GDP, negatively with high female unemployment, whereas there is a positive correlation with the supply of childcare. It is also important to note the positive correlations between the female rate of education and GDP per capita, since the two measures have opposite sign of their correlation with the TFR, they both have positive correlations with GM.

4. Generalized Morality and fertility - descriptive analysis

With the measure of Generalized Morality, we can take another look at these fertility trends across countries, but where they are divided into different levels of generalized morality. As is well documented, after the baby boom of the 1960s and the 1970s, European fertility rates declined substantially resulting in an unambiguous baby bust. In the 1990s they reached unprecedented low levels, giving rise to the so called 'lowest-low fertility', with less than 1.3 children per woman (Billari and Kohler, 2004; Kohler et al., 2006; Myrskyla et al., 2009). Paradoxically, lowest-low fertility

emerged in "child-loving" societies, the Mediterranean countries being the prime examples, though it also emerged in the East-European countries after the fall of the Iron curtain. Anglo-Saxon and the Nordic countries, in contrast, never reached very low level of fertility, the decline was shorter and smaller, and soon they seemed to reach stability with a considerably higher levels of fertility. These new patterns gave rise to a flurry of studies trying to understand how countries ended up with such diverging fertility trends. At the beginning of the new century, fertility started to grow almost everywhere in Europe, partly because of recuperation of fertility at higher reproductive ages. In few years, most of European countries were above the threshold of 1.3 children per woman and therefore were no longer in the lowest-low group (in 2008 only Moldova still is). Fertility increased in Southern European countries (where it in any case does not goes above 1.5) and also in countries where it was already higher and closer to two children per woman, such as the United Kingdom, France, the Netherlands and Scandinavian countries, with the only exception of German speaking countries.

Figure 1: Country level trends of TFR by three levels of Generalized Morality (GM)

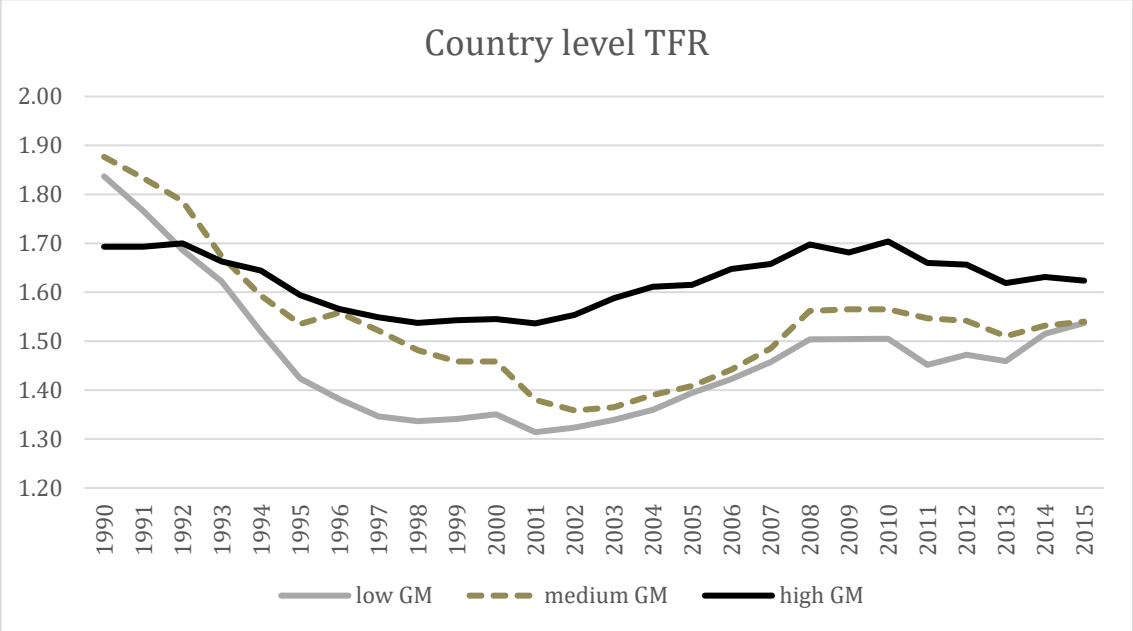


Figure 1 shows trends in TFR form 1990 to 2015, but where countries are grouped according to the level of GM. The groups are constructed by taking the tertiles of the Generalized Morality distribution as cutoff points. The black solid line represents countries with high level of GM, the dotted line medium level, and the grey solid line represents countries with low levels of GM. These trends do not look totally different from the case in which TFR would have been plotted against welfare regimes. The black solid line mimics quite closely the TFR of Nordic social democratic countries, the dotted line the countries of East-Europe, and grey dotted line those of the Southern European countries. In fact, Appendix A3, shows that the GM group membership is quite close to that the original Esping-Andersen classification. We see that from 2002 onwards, all three groups

experiences an increase in fertility, a trend many referred to as a "small baby boom" and consequently suggested the end of the lowest-low fertility era (Sobotka, 2009). However, coinciding with the economic recession, we observe a trend break, where the TFR becomes flat from 2008 and onwards, and there is a slight decline in fertility even for the high GM countries.

In figures 2 to 4 we plot again fertility trends according to low, medium and high GM, but for fertility rates for different age categories. They are respectively, the age groups 15 to 24, 25 to 35, and 36 to 50.

Figure 2: Country level trends of age specific Fertility Rate (15 to 24) by three levels of Generalized Morality (GM)

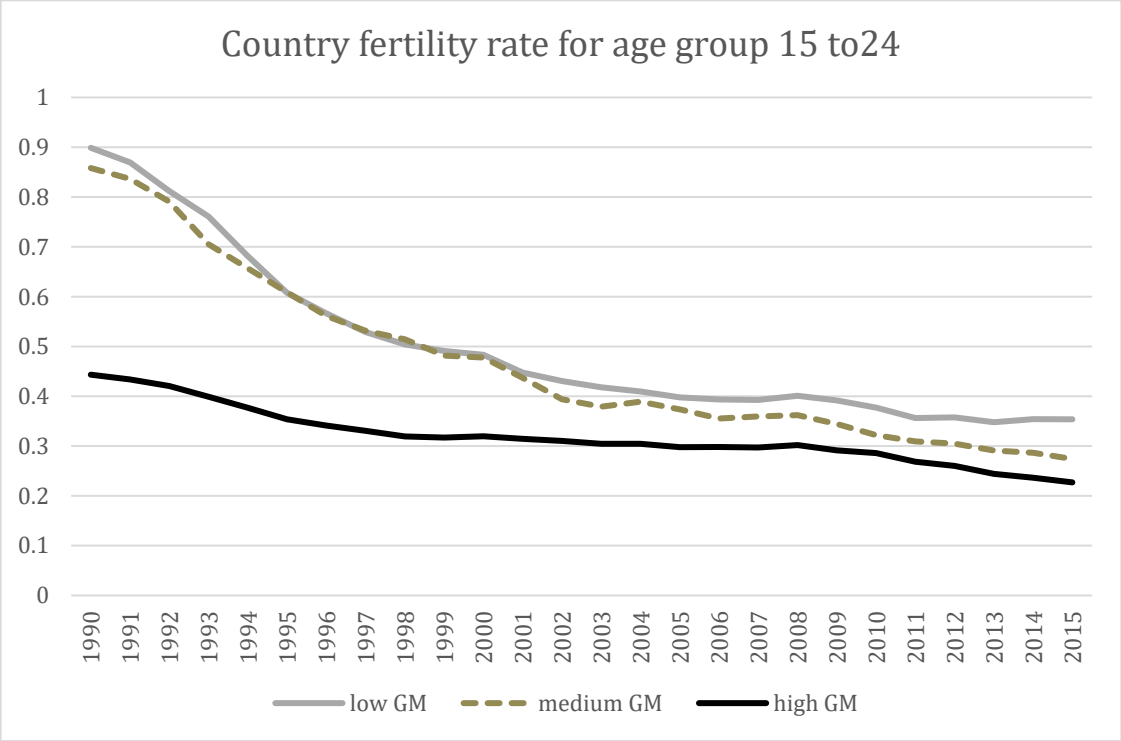


Figure 3: Country level trends of age specific Fertility Rate (25 to 35) by three levels of Generalized Morality (GM)

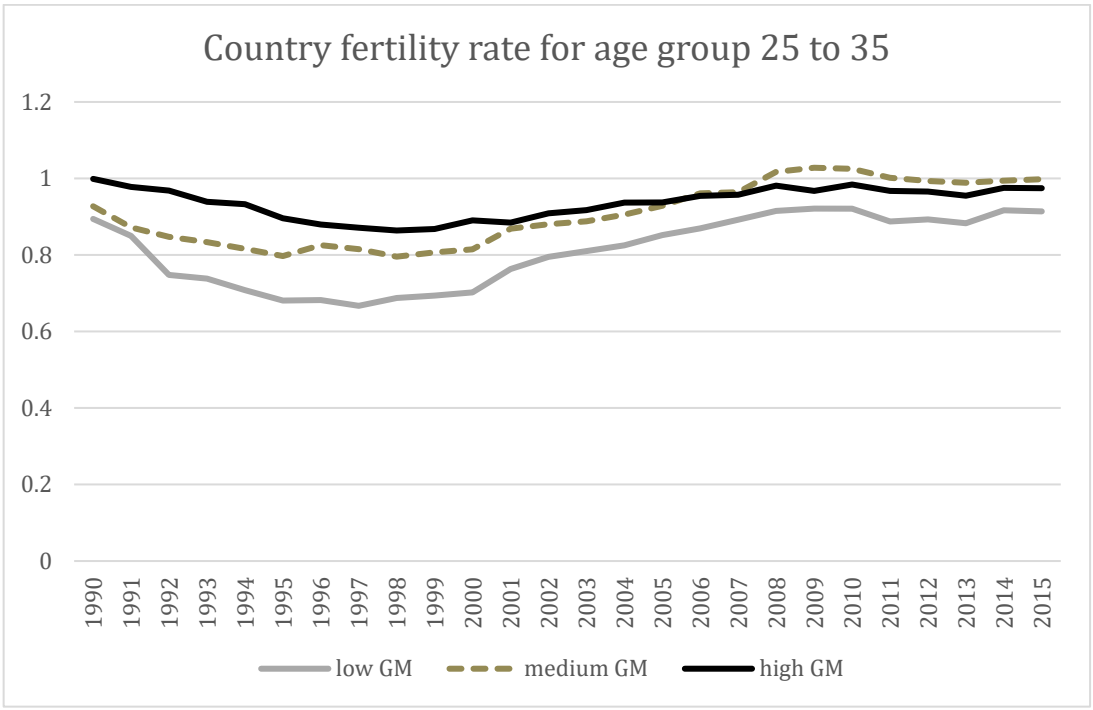
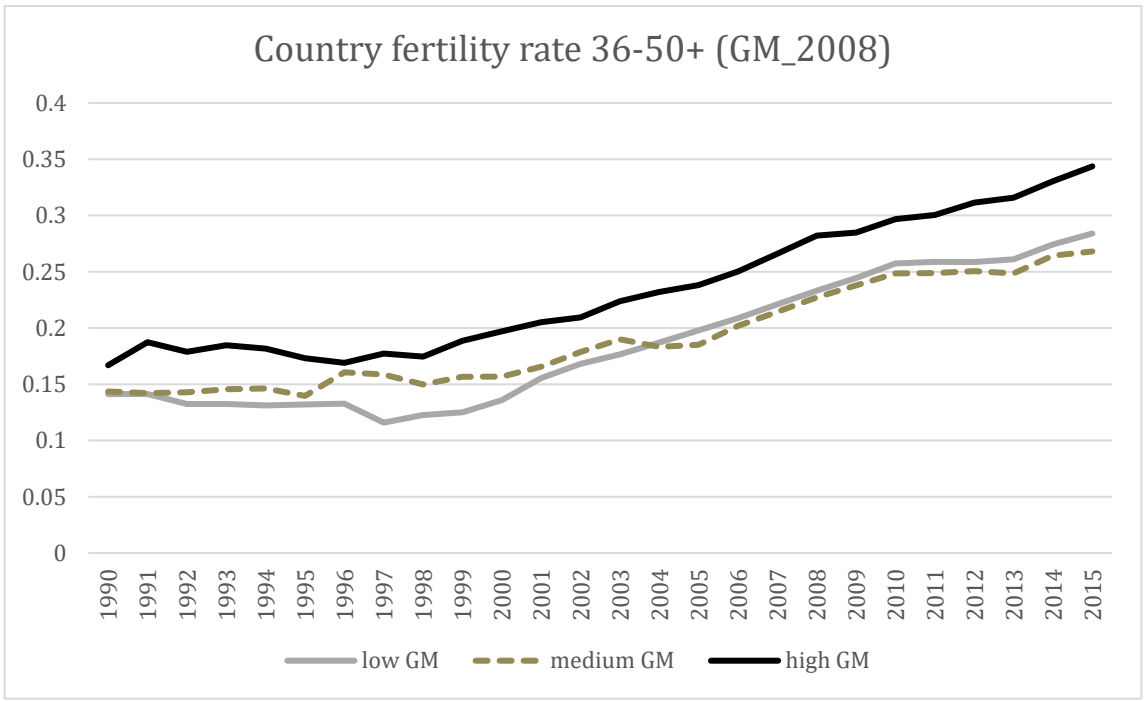


Figure 4: Country level trends of age specific Fertility Rate (36 to 50 +) by three levels of Generalized Morality (GM)



These age specific fertility trends show first the decline in fertility among the young age group. What is clear however, is that the fertility decline took place much earlier for the high GM group. As for the middle age group, where most of the births take place, we see a similar pattern to that of the

TFR, where high GM countries maintain high fertility, and the low and medium GM countries, are considerably lower. In the last figure, where we plot the fertility rate among the age group 35 to 50, fertility is on the increase. It is also increasing for the low and medium GM countries, but the levels are lower than the high GM countries.

In figure 5 and 6 we show the geographical patterns of Generalized Morality first by country level and then by NUTS-2 sub-national regions. The key message here, is that the common practice of classifying countries according to cultural traits, here generalized morality, is not strongly supported by the data. True, some countries appear very homogenous, but for most of them, there is considerable within variation. Perhaps surprisingly, Spain gets classified as high GM, but with differences across regions. The Nordic countries are all homognous and all classified as high GM. This goes for Germany as well, but we see considerable variation across the sub-national regions. The UK is another example where there is considerable variation, where some regions get classified as high GM, other as low. Poland is yet another example, where overall it gets classified as medium GM, but where within there are regions both with low and high levels of GM. In Italy there is also within variation. Most of the regions have low GM, whereas some are medium, whereas the smallest region in the North (Aosta Valley) has high GM.

Figure 6: Regional variation (country level) of Generlized Morality

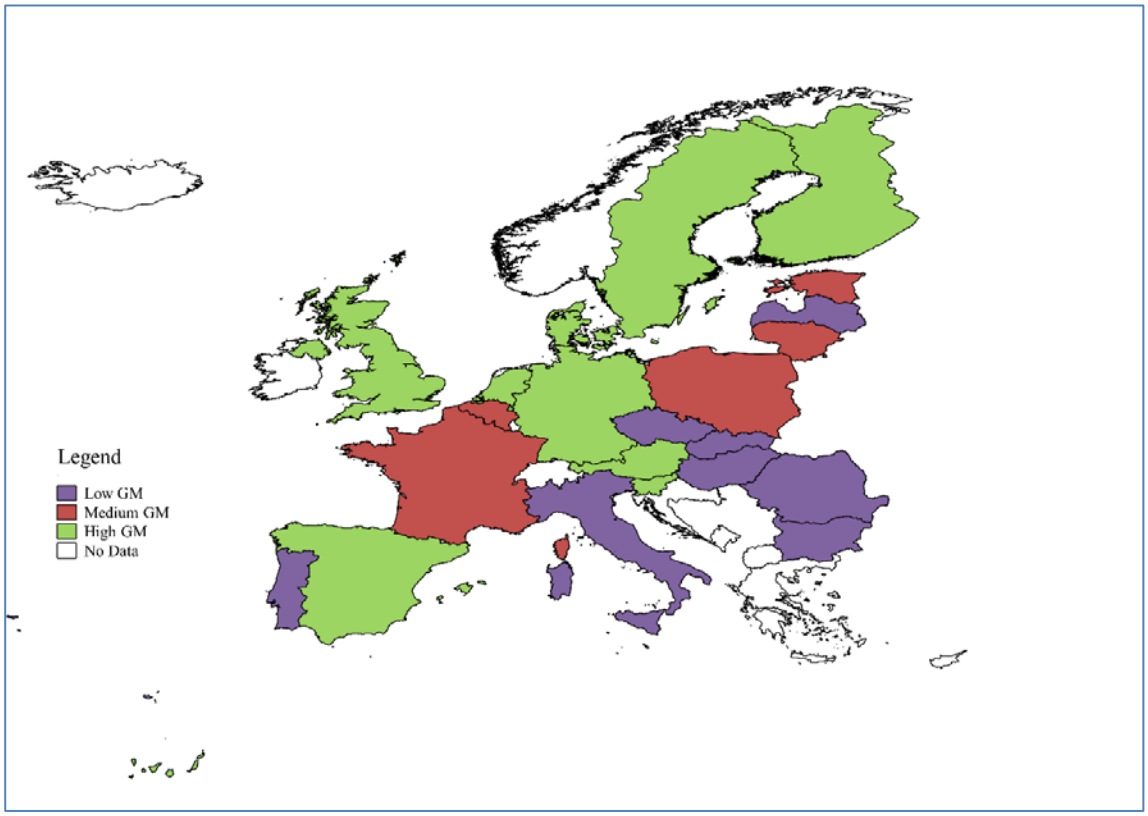
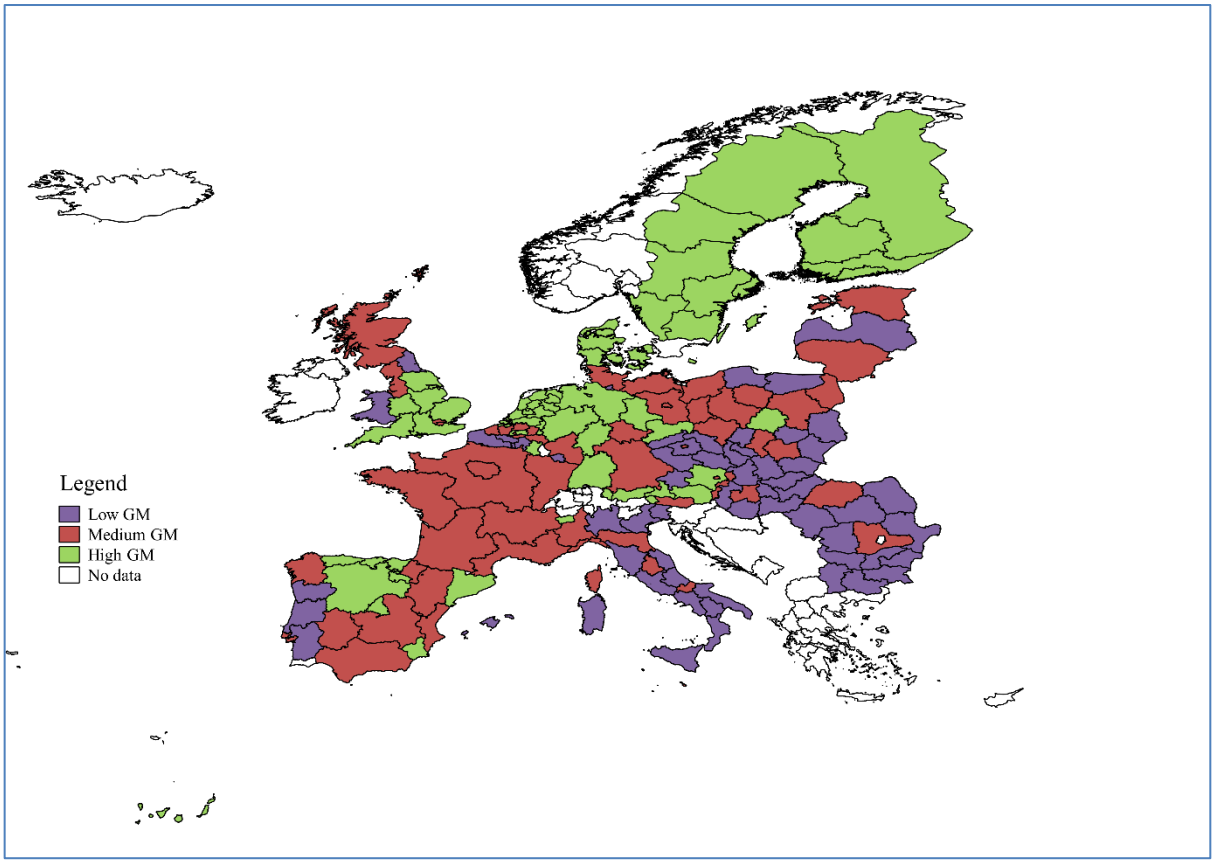


Figure 6: Regional variation (sub-national level) of Generlized Morality



5. Regression analysis - Generalized Morality as a moderator for fertility

The regression analysis is based on the sample of sub-national regions. We estimate a series of fixed effect models, where the hypothesized channels with regard to fertility, is interacted with Generalized Morality. In contrast to the trends shown in previous section, we can only perform the regression analysis for a sample that starts in 2000. For the regression where we also include child-care supply, we only have data from 2004 and the number of regions are fewer. This means that our analysis of GM as a moderator for fertility applies only to the period in which fertility was again increasing after 2000. The regression equation is expressed as:

$$FR_{rt} = \alpha_t + \sum_k \beta_k X_{k,rt} + \sum_k \beta_k X_{k,rt} * GM_r + \varepsilon_{rt}$$

Eq. 2

where FR is the fertility rate in region r and at time t. X is the vector of time varying variables, which are included as controls but also as interaction terms with the time constant variable of Generalized Morality, and reflect therefore potential moderation effects of culture. Given that the unit of analysis is at the sub-national NUTS-2 level, which is nested within countries, we cluster standard errors by

country throughout the regression analysis. We are also able to control for time fixed effects, which is implemented as a series of time dummy variables. We are consequently able to control for systematic time trends, and also capture the shift in the fertility trends because of the economic recession.

In the first regression, we use TFR as the dependent variable, and explanatory variables are included in a stepwise manner, as shown in table XX. In model (1), we only include female tertiary education and its interaction with GM. The interaction is strong and positive showing that as more women enter higher education, fertility is higher in the high GM regions (and hence lower in the low GM regions). In Model (2), we also include GDP per capita and its interaction with GM. We do not find any significant effects here, whereas the impact of education interacted with GM remains. Also, the inclusion of the female unemployment rate, which we take as a proxy for uncertainty, we find no significant effects, though again the effect of education interacted with GM remains significant.

In the last model, we also include the supply of childcare. The coefficient on child-care supply is negative, whereas the interaction between child-care supply and GM is positive and significant. This might at first look counter-intuitive, but the effect needs to be considered in conjunction with the education variable. For instance, education is strongly correlated with GM, but so is the level of child-care supply – though the correlation is weaker (see Table 2). The estimates show that increasing supply of childcare associates with higher fertility in high GM regions.

Table 4: Fixed-effect estimation, region-level regressions (TFR)Dep. Var.: *TFR*	(1)	(2)	(3)	(4)
Female tertiary education	-0.00164	-0.00112	-0.00147	-0.00101
	(0.00144)	(0.00109)	(0.000996)	(0.000932)
pc_culture*Female tertiary education	0.00427***	0.00459***	0.00518***	0.00338***
	(0.00120)	(0.00124)	(0.000922)	(0.000758)
lnGDPpc		-0.0831	-0.118	-0.134
		(0.0949)	(0.0911)	(0.0868)
pc_culture*lnGDPpc		-0.0567	-0.0852	-0.133
		(0.101)	(0.105)	(0.0986)
female unemployment			-0.00300	-0.00294
			(0.00213)	(0.00182)
pc_culture*female unemployment			-0.00132	-0.00241
			(0.00489)	(0.00397)
formal childcare h				-0.00612***
				(0.00206)
pc_culture*formal childcare				0.00924***
				(0.00134)
Year dummies	Yes	Yes	Yes	Yes
Observations	2,310	2,277	2,249	2,249
R-squared	0.427	0.419	0.424	0.453
Number of regions	168	168	167	167

Standard errors in parentheses, clustered at country level. Missing values are flagged for *formal_childcare* in column 4.
*** p<0.01, ** p<0.05, * p<0.1

Next, we repeat the regression but where the dependent variable is the fertility rate among 15 to 24 year olds. As we have seen from Figure 5, the period we consider was characterized by declining fertility for this age group. Moreover, fertility among the high GM regions were considerably lower than those of medium and low GM. For model (1) we find a similar pattern for education. Its direct effect is negative, though not significant, whereas the interaction with GM is positive and highly significant. However, the effect does not remain once we include the other explanatory variables. In particular, it effect disappears once we include GDP which has a negative impact on fertility among this very young age group.

Table 5: Fixed-effect estimation, region-level regressions (ASFR: 15-24)

Dep. Var.: *ASFR 15-24*	(1)	(2)	(3)	(4)
Female tertiary education	-0.000613	-0.000266	-0.000354	-0.000396
	(0.000528)	(0.000396)	(0.000416)	(0.000428)
pc_culture*Female tertiary education	0.00229***	0.00120	0.00116	0.000163
	(0.000583)	(0.000763)	(0.000754)	(0.000731)
lnGDPpc		-0.0781*	-0.0844*	-0.0944**
		(0.0432)	(0.0467)	(0.0450)
pc_culture*lnGDPpc		0.0511	0.0590	0.0221
		(0.0714)	(0.0783)	(0.0698)
female unemployment			-0.000746	-0.00100*
			(0.000627)	(0.000542)
pc_culture*female unemployment			0.000816	0.000733
			(0.00193)	(0.00173)
formal childcare h				-0.000979
				(0.00154)
pc_culture*formal childcare				-0.000128
				(0.00177)
Year dummies	Yes	Yes	Yes	Yes
Observations	2,385	2,352	2,324	2,324
R-squared	0.452	0.481	0.485	0.502
Number of regions	168	168	167	167

Standard errors in parentheses, clustered at country level. Missing values are flagged for *formal_childcare* in column 4.
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Fixed-effect estimation, country-level regressions (ASFR: 25-35)

Dep. Var.: *ASFR 25-35*	(1)	(2)	(3)	(4)
Female tertiary education	-0.000358	-0.000419	-0.000600	-0.000253
	(0.000684)	(0.000603)	(0.000558)	(0.000533)
pc_culture*Female tertiary education	0.00160*	0.00277***	0.00325***	0.00255***
	(0.000880)	(0.000647)	(0.000510)	(0.000462)
lnGDPpc		0.0356	0.0129	0.00801
		(0.0526)	(0.0519)	(0.0497)
pc_culture*lnGDPpc		-0.0749	-0.105	-0.120*
		(0.0467)	(0.0657)	(0.0634)
female unemployment			-0.00186	-0.00164
			(0.00130)	(0.00116)
pc_culture*female unemployment			-0.000670	-0.00148
			(0.00268)	(0.00207)
formal childcare h				-0.00416**
				(0.00170)
pc_culture*formal childcare				0.00683***
				(0.00203)
Year dummies	Yes	Yes	Yes	Yes
Observations	2,310	2,277	2,249	2,249
R-squared	0.442	0.431	0.435	0.465
Number of regions	168	168	167	167

Standard errors in parentheses, clustered at country level. Missing values are flagged for *formal_childcare* in column 4.
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Fixed-effect estimation, country-level regressions (ASFR: 36-50)

Dep. Var.: *ASFR 36-50*	(1)	(2)	(3)	(4)
Female tertiary education	-0.000617	-0.000437	-0.000517	-0.000364
	(0.000521)	(0.000407)	(0.000329)	(0.000295)
pc_culture*Female tertiary education	0.000475	0.000415	0.000571	0.000434
	(0.000374)	(0.000405)	(0.000358)	(0.000356)
lnGDPpc		-0.0374	-0.0448**	-0.0468**
		(0.0218)	(0.0174)	(0.0183)
pc_culture*lnGDPpc		-0.0100	-0.0173	-0.0212
		(0.0350)	(0.0300)	(0.0306)
female unemployment			-0.000550	-0.000470
			(0.000751)	(0.000707)
pc_culture*female unemployment			-0.00129	-0.00154**
			(0.000821)	(0.000597)
formal childcare h				-0.00108**
				(0.000387)
pc_culture*formal childcare				0.00277***
				(0.000594)
Year dummies	Yes	Yes	Yes	Yes
Observations	2,333	2,300	2,272	2,272
R-squared	0.803	0.803	0.806	0.812
Number of regions	168	168	167	167

Standard errors in parentheses, clustered at country level. Missing values are flagged for *formal_childcare* in column 4.
*** p<0.01, ** p<0.05, * p<0.1

Effect of the crisis and increased uncertainty

In the next regressions we assess the effect of Generlized Morality as a moderator of the effect of the crisis on fertility. Again, we perform the analysis separately by age specific fertility rates. We also control for GDP throughout, which means that any effect of the recession may be interpreted as a change in uncertainty (See Aassve et al 2019). In contrast the previous regression, we include here a dummy for the post-recession period, which is then interacted with the Generalized Morality variable.

Figure 7: Fertility trends for Low, Medium and High levels of GM during the period of pre and post economic recession.

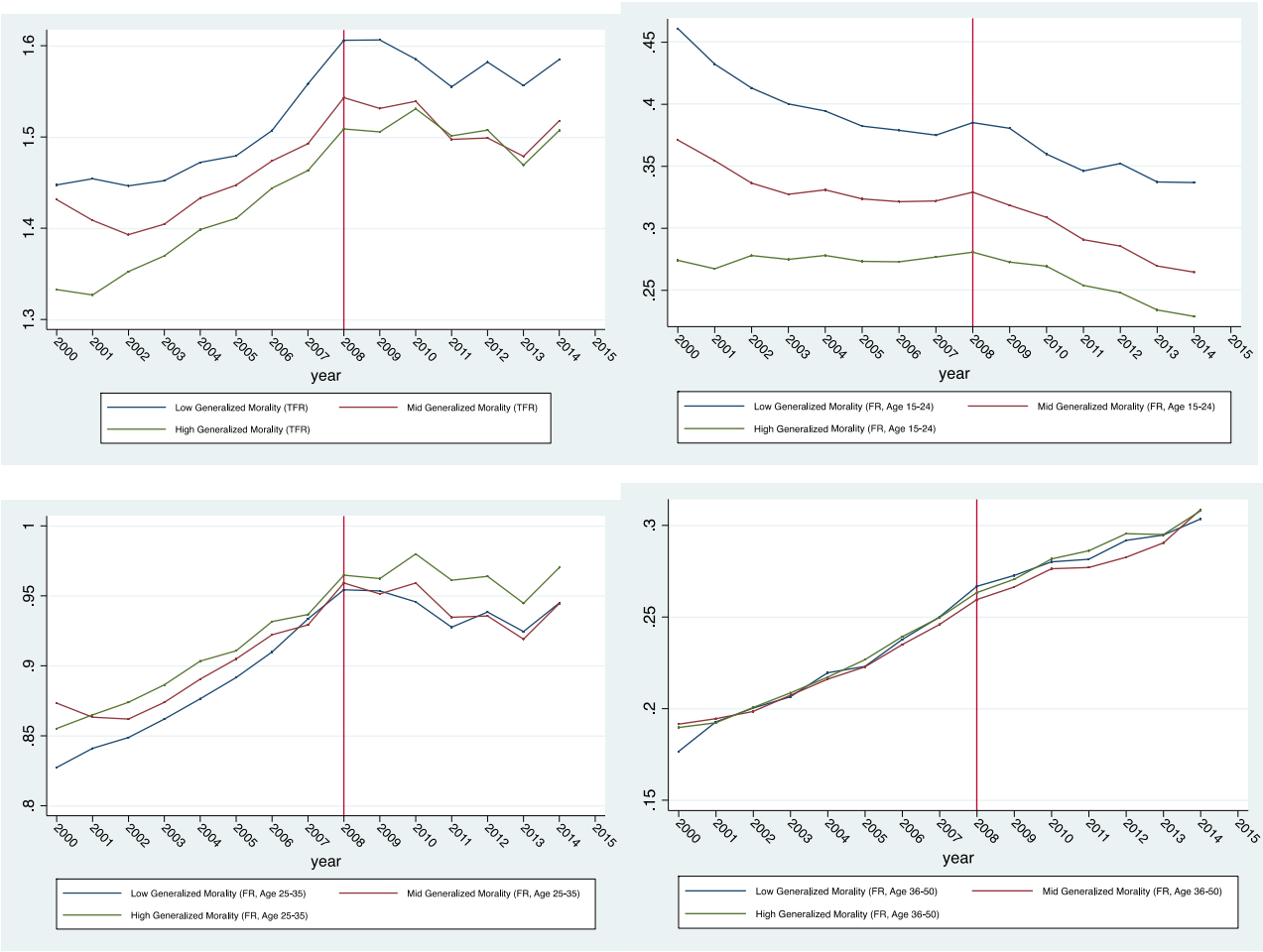


Table 8: Fixed effect estimation, region level regression.

	(1) RE	(2) FE	(3) RE	(4) FE	(5) RE	(6) FE	(7) RE	(8) FE
VARIABLES	TFR		ASFR: 15-24		ASFR: 25-35		ASFR: 36-50	
pc_culture	-0.0114		-0.0204		-0.0221		0.0323*	
(2008)	(0.0468)		(0.0180)		(0.0275)		(0.0186)	
precrisistrend	0.0233***	0.0223***	-0.000414	-0.000802	0.0113***	0.0104***	0.0120***	0.0121***
(2000-2007)	(0.00111)	(0.00114)	(0.000493)	(0.000511)	(0.000678)	(0.000696)	(0.000324)	(0.000327)
crisistrend	0.0129***	0.0133***	0.00392***	0.00398***	0.00612***	0.00656***	0.00347***	0.00341***
(2008-2009)	(0.00294)	(0.00294)	(0.00134)	(0.00134)	(0.00180)	(0.00179)	(0.000868)	(0.000860)
postcrisistrend	0.00382***	0.00322**	-0.00615***	-0.00636***	3.18e-05	-0.000460	0.0103***	0.0103***
(2010-2014)	(0.00126)	(0.00126)	(0.000571)	(0.000572)	(0.000769)	(0.000770)	(0.000372)	(0.000370)
pc_culture*	0.00565***	0.00600***	0.00204**	0.00218**	0.00382***	0.00419***	7.37e-05	2.17e-05
postcrisistrend	(0.00192)	(0.00192)	(0.000882)	(0.000879)	(0.00118)	(0.00117)	(0.000568)	(0.000563)
Female	-0.00113***	-0.000962***	-0.000359**	-0.000231	-0.000364*	-0.000250	-0.000379***	-0.000397***
tertiary educ.	(0.000354)	(0.000357)	(0.000158)	(0.000160)	(0.000216)	(0.000218)	(0.000103)	(0.000103)
lnGDPpc	-0.137***	-0.121***	-0.102***	-0.0989***	0.00262	0.0208**	-0.0437***	-0.0453***
	(0.0165)	(0.0174)	(0.00734)	(0.00783)	(0.0101)	(0.0106)	(0.00499)	(0.00510)
female unemployment	-0.00277***	-0.00260***	-0.000830***	-0.000882***	-0.00164***	-0.00146***	-0.000449***	-0.000430***
	(0.000514)	(0.000517)	(0.000233)	(0.000235)	(0.000314)	(0.000315)	(0.000152)	(0.000151)
country dummies	YES	NO	YES	NO	YES	NO	YES	NO
Observations	2,249	2,249	2,324	2,324	2,249	2,249	2,272	2,272
R-squared		0.356		0.439		0.383		0.791
Number of nuts2	167	167	167	167	167	167	167	167

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Fixed effect estimation, region level regression – excluding 2014 (when FR start increasing again)

	(1) RE	(2) FE	(3) RE	(4) FE	(5) RE	(6) FE	(7) RE	(8) FE
VARIABLES	TFR		ASFR: 15-24		ASFR: 25-35		ASFR: 36-50	
pc_culture	-0.0174		-0.0201		-0.0229		0.0259	
(2008)	(0.0471)		(0.0182)		(0.0275)		(0.0186)	
precrisistrend	0.0240***	0.0231***	-0.000119	-0.000491	0.0121***	0.0111***	0.0116***	0.0117***
(2000-2007)	(0.00116)	(0.00120)	(0.000517)	(0.000539)	(0.000704)	(0.000726)	(0.000328)	(0.000333)
crisistrend	0.0112***	0.0115***	0.00330**	0.00334**	0.00469***	0.00517***	0.00390***	0.00384***
(2008-2009)	(0.00294)	(0.00294)	(0.00136)	(0.00135)	(0.00179)	(0.00179)	(0.000840)	(0.000837)
postcrisistrend	0.00108	0.000573	-0.00680***	-0.00700***	-0.00208**	-0.00252***	0.0105***	0.0106***
(2010-2014)	(0.00158)	(0.00158)	(0.000719)	(0.000719)	(0.000963)	(0.000963)	(0.000452)	(0.000451)
pc_culture*	0.00922***	0.00962***	0.00372***	0.00385***	0.00540***	0.00583***	0.000515	0.000465
postcrisistrend	(0.00247)	(0.00247)	(0.00115)	(0.00114)	(0.00151)	(0.00150)	(0.000709)	(0.000706)
Female	-0.00109***	-0.000919**	-0.000234	-8.91e-05	-0.000437*	-0.000315	-0.000387***	-0.000412***
tertiary educ.	(0.000382)	(0.000386)	(0.000172)	(0.000174)	(0.000233)	(0.000235)	(0.000108)	(0.000108)
lnGDPpc	-0.143***	-0.127***	-0.113***	-0.111***	-0.000121	0.0184*	-0.0357***	-0.0373***
	(0.0170)	(0.0180)	(0.00759)	(0.00815)	(0.0103)	(0.0109)	(0.00499)	(0.00512)
female unemployment	-0.00246***	-0.00232***	-0.000929***	-0.000997***	-0.00133***	-0.00116***	-0.000389**	-0.000373**
	(0.000530)	(0.000535)	(0.000242)	(0.000244)	(0.000323)	(0.000325)	(0.000152)	(0.000152)
country dummies	YES	NO	YES	NO	YES	NO	YES	NO
Observations	2,082	2,082	2,157	2,157	2,082	2,082	2,105	2,105
R-squared		0.376		0.409		0.401		0.791
Number of nuts2	166	166	167	167	166	166	166	166

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10: Fixed effect estimation, region level regression, with cluster std err at country level

	(1) RE	(2) FE	(3) RE	(4) FE	(5) RE	(6) FE	(7) RE	(8) FE
VARIABLES	TFR		ASFR: 15-24		ASFR: 25-35		ASFR: 36-50	
pc_culture	-0.0114		-0.0204		-0.0221		0.0323	
(2008)	(0.0612)		(0.0215)		(0.0369)		(0.0204)	
precrisistrend	0.0233***	0.0223***	-0.000414	-0.000802	0.0113***	0.0104***	0.0120***	0.0121***
(2000-2007)	(0.00398)	(0.00422)	(0.00278)	(0.00296)	(0.00306)	(0.00319)	(0.00110)	(0.00110)
crisistrend	0.0129**	0.0133**	0.00392	0.00398	0.00612***	0.00656***	0.00347***	0.00341***
(2008-2009)	(0.00538)	(0.00530)	(0.00365)	(0.00365)	(0.00219)	(0.00217)	(0.00111)	(0.00112)
postcrisistrend	0.00382	0.00322	-0.00615**	-0.00636**	3.18e-05	-0.000460	0.0103***	0.0103***
(2010-2014)	(0.00405)	(0.00415)	(0.00278)	(0.00278)	(0.00148)	(0.00152)	(0.00123)	(0.00124)
pc_culture*	0.00565	0.00600	0.00204	0.00218	0.00382	0.00419	7.37e-05	2.17e-05
postcrisistrend	(0.00535)	(0.00541)	(0.00254)	(0.00254)	(0.00319)	(0.00313)	(0.00156)	(0.00155)
Female	-0.00113	-0.000962	-0.000359	-0.000231	-0.000364	-0.000250	-0.000379	-0.000397
tertiary educ.	(0.00122)	(0.00130)	(0.000444)	(0.000472)	(0.000650)	(0.000713)	(0.000361)	(0.000354)
lnGDPpc	-0.137*	-0.121	-0.102***	-0.0989**	0.00262	0.0208	-0.0437***	-0.0453***
	(0.0764)	(0.0824)	(0.0354)	(0.0413)	(0.0473)	(0.0483)	(0.0150)	(0.0157)
female unemployment	-0.00277	-0.00260	-0.000830	-0.000882	-0.00164	-0.00146	-0.000449	-0.000430
	(0.00237)	(0.00237)	(0.000754)	(0.000768)	(0.00139)	(0.00137)	(0.000749)	(0.000748)
country dummies	YES	NO	YES	NO	YES	NO	YES	NO
Observations	2,249	2,249	2,324	2,324	2,249	2,249	2,272	2,272
R-squared		0.356		0.439		0.383		0.791
Number of nuts2	167	167	167	167	167	167	167	167

Standard errors in parentheses clustered at country level
*** p<0.01, ** p<0.05, * p<0.1

Table 11: Fixed effect estimation, region level regression , with cluster std err at country level – excluding 2014 (when FR start increasing again)

	(1) RE	(2) FE	(3) RE	(4) FE	(5) RE	(6) FE	(7) RE	(8) FE
VARIABLES	TFR		ASFR: 15-24		ASFR: 25-35		ASFR: 36-50	
pc_culture	-0.0174		-0.0201		-0.0229		0.0259	
(2008)	(0.0621)		(0.0213)		(0.0366)		(0.0204)	
precrisistrend	0.0240***	0.0231***	-0.000119	-0.000491	0.0121***	0.0111***	0.0116***	0.0117***
(2000-2007)	(0.00413)	(0.00440)	(0.00280)	(0.00296)	(0.00308)	(0.00322)	(0.00126)	(0.00127)
crisistrend	0.0112*	0.0115*	0.00330	0.00334	0.00469**	0.00517**	0.00390***	0.00384***
(2008-2009)	(0.00569)	(0.00561)	(0.00391)	(0.00391)	(0.00227)	(0.00223)	(0.00123)	(0.00125)
postcrisistrend	0.00108	0.000573	-0.00680**	-0.00700**	-0.00208	-0.00252	0.0105***	0.0106***
(2010-2014)	(0.00456)	(0.00461)	(0.00323)	(0.00321)	(0.00163)	(0.00166)	(0.00131)	(0.00130)
pc_culture*	0.00922	0.00962	0.00372	0.00385	0.00540	0.00583	0.000515	0.000465
postcrisistrend	(0.00687)	(0.00687)	(0.00298)	(0.00298)	(0.00415)	(0.00407)	(0.00165)	(0.00164)
Female	-0.00109	-0.000919	-0.000234	-8.91e-05	-0.000437	-0.000315	-0.000387	-0.000412
tertiary educ.	(0.00129)	(0.00138)	(0.000461)	(0.000491)	(0.000666)	(0.000733)	(0.000419)	(0.000411)
lnGDPpc	-0.143*	-0.127	-0.113***	-0.111**	-0.000121	0.0184	-0.0357**	-0.0373*
	(0.0778)	(0.0843)	(0.0330)	(0.0392)	(0.0476)	(0.0487)	(0.0173)	(0.0181)
female unemployment	-0.00246	-0.00232	-0.000929	-0.000997	-0.00133	-0.00116	-0.000389	-0.000373
	(0.00236)	(0.00236)	(0.000766)	(0.000780)	(0.00138)	(0.00136)	(0.000773)	(0.000770)
country dummies	YES	NO	YES	NO	YES	NO	YES	NO
Observations	2,082	2,082	2,157	2,157	2,082	2,082	2,105	2,105
R-squared		0.376		0.409		0.401		0.791
Number of nuts2	166	166	167	167	166	166	166	166

Standard errors in parentheses clustered at country level
*** p<0.01, ** p<0.05, * p<0.1

6. Discussion

The paper shows that generalized morality, here viewed as a cultural trait, matters for fertility. This finding is important, as generalized morality is a characteristic that is highly persistent over time,

suggesting that stable benevolent circumstances, as described by social trust, control over life, obedience and respect, have an additional effect compared to the 'usual' forces such as economic prosperity and employment. Whereas many may have suspected that this could be so, and the very fact that it makes intuitive sense, none have so far been able to demonstrate this convincingly.

Our empirical test is rather stringent since we exploit variation across regions within countries. The benefit of this approach is that our estimates are not driven by other country specific characteristics, which we here instead are able to control for. We also have explored possible channels for why generalized morality would matter for fertility. One hypothesis relies on the idea that cultural traits and institutional quality are closely embedded and even reinforce each other. For instance, low values of generalized morality are typically associated with hierarchical and inefficient institutions. Low trust, for example, is found to be associated with higher rigidity and more regulation, which may stifle any change arising from new preference structures. This idea was introduced in Aassve et al (2016), where they argue (though not demonstrate) that institutions may not be able to respond to new demands arising from women gaining higher education. In our analysis, we control specifically for institutional quality and find that it has a strong significant effect on fertility. Furthermore, the effect of generalized morality remains even when institutional quality is controlled for. Spurred by this finding, we consider yet another channel, namely that of childcare provision. Aassve et al. (2016) sustain the idea that childcare provision is higher in regions where trust is high. Even if trust is only one component of generalized morality, here we nevertheless expect that childcare provision is higher in those areas where generalized morality is also higher.

One important aspect of our finding is that the generalized morality matters for the changes in TFRs of the group aged below 30, but not for the age group 30 and above. As is well documented European fertility declined at different levels across countries over recent decades. This is consistent with the fact that the Great Recession affected mostly young people, who experienced unprecedented high rates of unemployment and increasing job insecurity, driving down fertility rates especially for individual under 30s, who can postpone their fertility. At high reproductive ages, in particular after 35, not only the Great Depression had a smaller effect on individuals' economic conditions, but in any case those ones could not postpone to higher age their fertility. In fact, whereas fertility fell among the younger age groups, TFR for the older age groups remained fairly constant. We also see that generalized morality matters in the period between 2003 and 2008, but has no discerning effect in the aftermath of the financial crisis. The first period is characterized by a modest but steady upswing in fertility, and our result suggest that fertility is higher in the lower age group where generalized morality is high. In the 2008 - 2013 period, there is more heterogeneity in terms of fertility trends, and adding the relatively smaller sample size, this may be the reason why we do not find discerning effect.

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APPENDIX

Table A1 - Random-effects, region-level regressions (TFR)

No direct significant effect of culture on TFR

Dep. Var.: *TFR*	(1)	(2)	(3)	(4)	(5)
pc_culture	-0.0196	-0.0289	0.637	0.935	1.376
	(0.0413)	(0.0444)	(0.894)	(0.936)	(0.860)
Female tertiary education		-0.00170	-0.00127	-0.00162*	-0.00115
		(0.00168)	(0.00100)	(0.000928)	(0.000862)
pc_culture*Female tertiary education			0.00470***	0.00531***	0.00337***
			(0.00121)	(0.000903)	(0.000782)
lnGDPpc			-0.103	-0.138*	-0.152**
			(0.0842)	(0.0799)	(0.0755)
pc_culture*lnGDPpc			-0.0793	-0.110	-0.150*
			(0.0879)	(0.0895)	(0.0823)
female unemployment				-0.00320	-0.00314*
				(0.00214)	(0.00183)
pc_culture*female unemployment				-0.00152	-0.00252
				(0.00475)	(0.00388)
formal childcare h					-0.00601***
					(0.00208)
pc_culture*formal childcare					0.00924***
					(0.00132)
Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	2,417	2,310	2,277	2,249	2,249
Number of regions	170	168	168	167	167

Standard errors in parentheses, clustered at country level. Missing values are flagged for *formal_childcare* in column 4.
*** p<0.01, ** p<0.05, * p<0.1

Table X - Random-effects, region-level regressions (ASFR 15-24)

Direct effects of culture absorbed by economic variables.

Dep. Var.: *ASFR 15-24*	(1)	(2)	(3)	(4)	(5)
pc_culture	-0.0394**	-0.0424**	-0.401	-0.465	-0.128
	(0.0175)	(0.0203)	(0.627)	(0.680)	(0.585)
Female tertiary education		-0.000705	-0.000390	-0.000474	-0.000506
		(0.000619)	(0.000376)	(0.000397)	(0.000409)
pc_culture*Female tertiary education			0.00131*	0.00128*	0.000183
			(0.000714)	(0.000686)	(0.000711)
lnGDPpc			-0.0860**	-0.0923**	-0.100***
			(0.0359)	(0.0384)	(0.0369)
pc_culture*lnGDPpc			0.0342	0.0399	0.0114
			(0.0639)	(0.0685)	(0.0596)
female unemployment				-0.000736	-0.000975*
				(0.000617)	(0.000526)
pc_culture*female unemployment				0.000728	0.000694
				(0.00184)	(0.00167)
formal childcare h					-0.000965
					(0.00156)
pc_culture*formal childcare					-0.000160
					(0.00176)
Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

Observations	2,504	2,385	2,352	2,324	2,324
Number of regions	170	168	168	167	167

Standard errors in parentheses, clustered at country level. Missing values are flagged for *formal_childcare* in column 4.
*** p<0.01, ** p<0.05, * p<0.1

Table X - Random-effects, region-level regressions (ASFR 25-35)

Dep. Var.: *ASFR 25-35*	(1)	(2)	(3)	(4)	(5)
pc_culture	-0.00307	-0.0570*	0.811**	1.115**	1.255**
	(0.0268)	(0.0336)	(0.366)	(0.531)	(0.507)
Female tertiary education		-0.000514	-0.000506	-0.000694	-0.000344
		(0.000633)	(0.000542)	(0.000513)	(0.000478)
pc_culture*Female tertiary education		0.00151*	0.00280***	0.00331***	0.00250***
		(0.000891)	(0.000674)	(0.000536)	(0.000488)
lnGDPpc			0.0157	-0.00835	-0.0129
			(0.0471)	(0.0469)	(0.0442)
pc_culture*lnGDPpc			-0.0919**	-0.123**	-0.137***
			(0.0363)	(0.0515)	(0.0499)
female unemployment				-0.00206	-0.00186
				(0.00129)	(0.00115)
pc_culture*female unemployment				-0.000997	-0.00175
				(0.00259)	(0.00200)
formal childcare h					-0.00407**
					(0.00169)
pc_culture*formal childcare					0.00689***
					(0.00204)
Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	2,417	2,310	2,277	2,249	2,249
Number of regions	170	168	168	167	167

Standard errors in parentheses, clustered at country level. Missing values are flagged for *formal_childcare* in column 4.
*** p<0.01, ** p<0.05, * p<0.1

Table X - Random-effects, region-level regressions (ASFR 36-50)

Here strange that the interaction culture*childcare matters, but consistent with FE regressions.

Dep. Var.: *ASFR 36-50*	(1)	(2)	(3)	(4)	(5)
pc_culture	0.0238	0.00810	0.0978	0.166	-0.0985
	(0.0146)	(0.0194)	(0.330)	(0.281)	(0.315)
Female tertiary education		-0.000609	-0.000423	-0.000501	-6.71e-05
		(0.000520)	(0.000413)	(0.000337)	(0.000320)
pc_culture*Female tertiary education		0.000498	0.000420	0.000574	-0.000777*
		(0.000373)	(0.000397)	(0.000357)	(0.000452)
lnGDPpc			-0.0354*	-0.0421**	-0.0609***
			(0.0215)	(0.0166)	(0.0176)
pc_culture*lnGDPpc			-0.00786	-0.0141	0.0185
			(0.0330)	(0.0278)	(0.0311)
female unemployment				-0.000566	-0.000555
				(0.000756)	(0.000706)
pc_culture*female unemployment				-0.00119	-0.00207**
				(0.000817)	(0.000890)
formal childcare h					-0.000791***
					(0.000236)
pc_culture*formal childcare					0.00108***
					(0.000365)

Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	2,443	2,333	2,300	2,272	1,165
Number of regions	170	168	168	167	139

Standard errors in parentheses, clustered at country level. Missing values are flagged for *formal_childcare* in column 4.

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

A.1 Stability of Generalized Morality

Approach we use to calculate pc_culture: we run the principal component analysis of trust, obedience, control and respect from the entire EVS sample, all waves jointly considered (we do not do it year by year nor country by country).

Then we extract the first component and name it pc_culture.

We average pc_culture by NUTS2 regions using only the last EVS wave (2008).

We use culture from 2008 only because:

- We do not have regional info for EVS waves 1 and 2
- In wave 3 we have 10 regions less than in wave 4
- Pc_culture wave 3 is on average similar to pc_culture wave 4

Paired t test

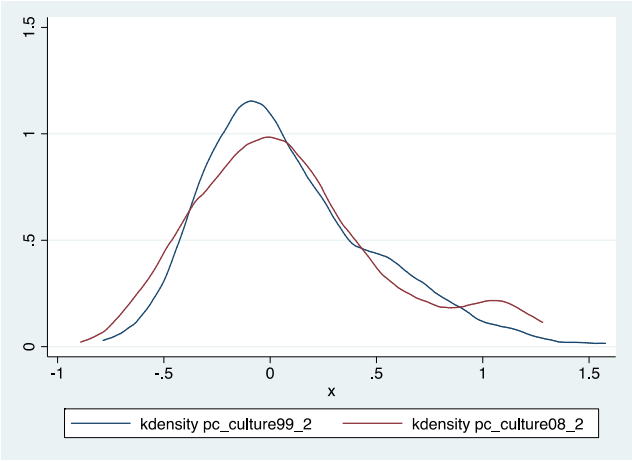
Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
pc_c~8_2	164	.0866714	.0329389	.4218235	.0216295	.1517133
pc_c~9_2	164	.0963098	.0313982	.4020933	.0343101	.1583094
diff	164	-.0096383	.0270276	.3461228	-.0630078	.0437311

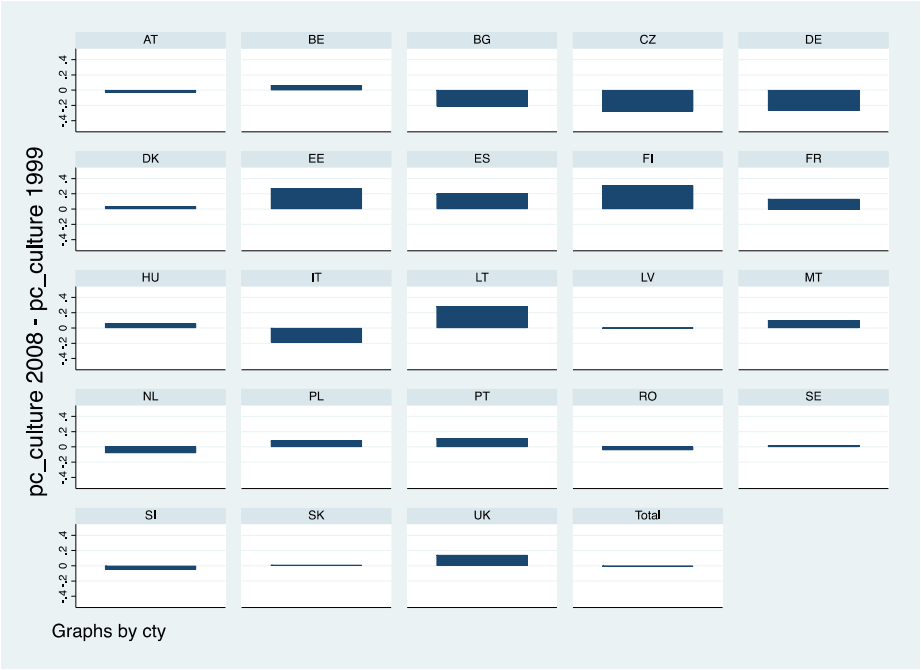
mean(diff) = mean(pc_culture08_2 - pc_culture99_2) t = -0.3566
Ho: mean(diff) = 0 degrees of freedom = 163

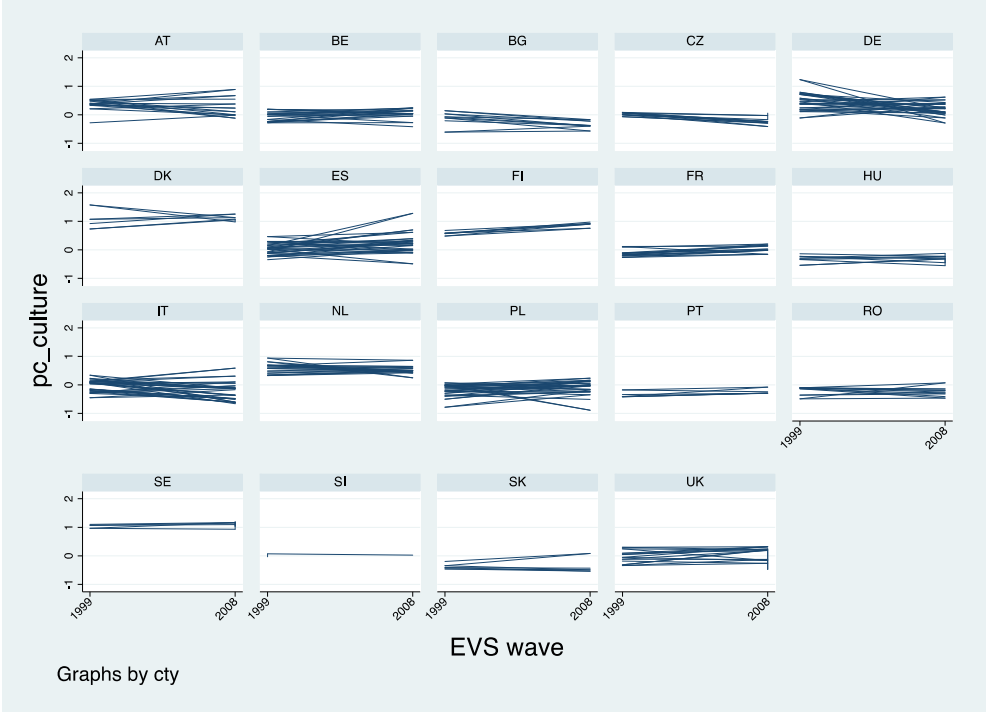
Ha: mean(diff) < 0 Pr(T < t) = 0.3609
Ha: mean(diff) != 0 Pr(|T| > |t|) = 0.7218
Ha: mean(diff) > 0 Pr(T > t) = 0.6391

Two-sample Kolmogorov-Smirnov test for equality of distribution functions

Smaller group	D	P-value
1999:	0.0580	0.572
2008:	-0.0770	0.373
Combined K-S:	0.0770	0.707


0
.5
1
1.5
-1
-.5
0
.5
1
1.5
x
kdensity pc_culture99_2
kdensity pc_culture08_2


pc_culture 2008 - pc_culture 1999
AT
BE
BG
CZ
DE
DK
EE
ES
FI
FR
HU
IT
LT
LV
MT
NL
PL
PT
RO
SE
SI
SK
UK
Total
Graphs by cty


pc_culture
AT
BE
BG
CZ
DE
DK
ES
FI
FR
HU
IT
NL
PL
PT
RO
SE
SI
SK
UK
1999
2008
EVS wave
Graphs by cty

- Going back in time, we have to compare countries and not regions because the first 2 waves of EVS do not have the region breakdown. Pc_culture at *country* level over time is very stable: