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Relationship between Economic Development and Age-Specific Fertility Rates in the European Union

INTRODUCTION

Recent empirical evidence suggests that fertility-development relationship among high-income countries may reverse from negative to positive at high level of development. Myrskylä et al. (2009) came to this evidence using Human Development Index (HDI) as measure of socioeconomic development. While development leads to decline in fertility among countries at low and medium levels of development, further increase in development leads to increase in fertility among countries with high levels of development. Myrskylä et al. (2011) argue that gender equality is critical for relationship to reverse. These findings are consistent with recently presented theoretical considerations which point improvements in gender equality as potential driver of rising fertility levels at high levels of development. Luci-Greulich and Thévenon (2014) determined a convex relationship between GDP per capita and fertility among OECD countries. However, the robustness of the turnaround in fertility-development relationship is still debated (Harttgen and Vollmer, 2014). The main question is whether the reversal is occurring due to increases in the size of fertility rates themselves (quantum effect), or whether it is due to end of a postponement period (tempo effect) (Bongaarts and Sobotka, 2012; Goldstein et al. 2009). Although Bongaarts and Sobotka (2012) argue that recent rises in fertility in highly developed countries are mostly driven by postponement effects, analyses of cohort fertility trends suggest that at least a part of the rising is attributable to true increases in the quantum of fertility (Myrskylä et al. 2013). Fox et al. (2019) examined fertility-development relationship reversal at the sub-national level, using NUTS 2 regions, and document a weakening of the negative relationship within many countries, and among some countries the emergence of a positive relationship.

The goal of this work is to continue examination of fertility-development relationship at the sub-national level and further, to examine a relationship between development and age-specific fertility rates within European Union countries. Fertility decomposition provides a new contribution to understanding the relationship between economic development and fertility.

METHODS

In this work, by conducting simple linear regression, we examine relationship between economic development, as measured by GDP per capita, and age-specific fertility rates using 5-years cohorts among European Union countries in 2015. A particular emphasis is placed on 20-39 years cohorts. The relationship is analyzed for each 5-years cohort and each of the 26¹ European countries individually, covering 1358 NUTS 3 regions.

RESULTS

Using NUTS 3 regions data we document a weak negative relationship between GDP per capita and TFR among most EU countries in 2015. In some countries, mainly Southern European, relationship is slightly positive. These findings are consistent with Fox et al. (2019). Although on the one-year data we cannot track long-standing relationship, fertility decomposition into age groups revealed that fertility-development relationship is generally formed by two opposite relationships. GDP per capita is in a negative relationship with age-specific fertility rates of the 20-24 age group. With the age group of 25-29 years a negative relationship is weakened. With the age group of 30-34 years a relationship reverses to weak positive, and with the group 35-39 years a positive relationship becomes strong and significant. Although there are a few exceptions, we can notice general a pattern – there is a negative relationship between GDP per capita and age-specific fertility rates until the age of 30. After the age of 30 a relationship is positive. Documented pattern is consistent with Myrskylä et al. (2011) who confirmed that the decline in fertility among the younger age groups has continued at high levels of development. Simultaneously, fertility above the age of 30 increases in all countries with very high development levels. Longitudinal trajectories that Myrskylä et al. (2011) presented confirm that the reversal of the development-fertility relationship can only be attributed to fertility at ages above 30.

In this paper we especially examine the Beta coefficient using simple linear regression. Figure 1. shows the dependence of Beta coefficients obtained from the sub-national relationship between economic development and age-specific fertility rates on national fertility rates. The scatter plot shows well separated age cohorts denoted by different colors and gives a contribution to understanding fertility-development relationship. The placement and grouping of points reveals an interesting trend in the fertility dynamics from young age to older age.

¹ Due to the small number of NUTS 3 regions, Cyprus, Luxembourg and Malta were excluded from the analysis. Also Norway was added.

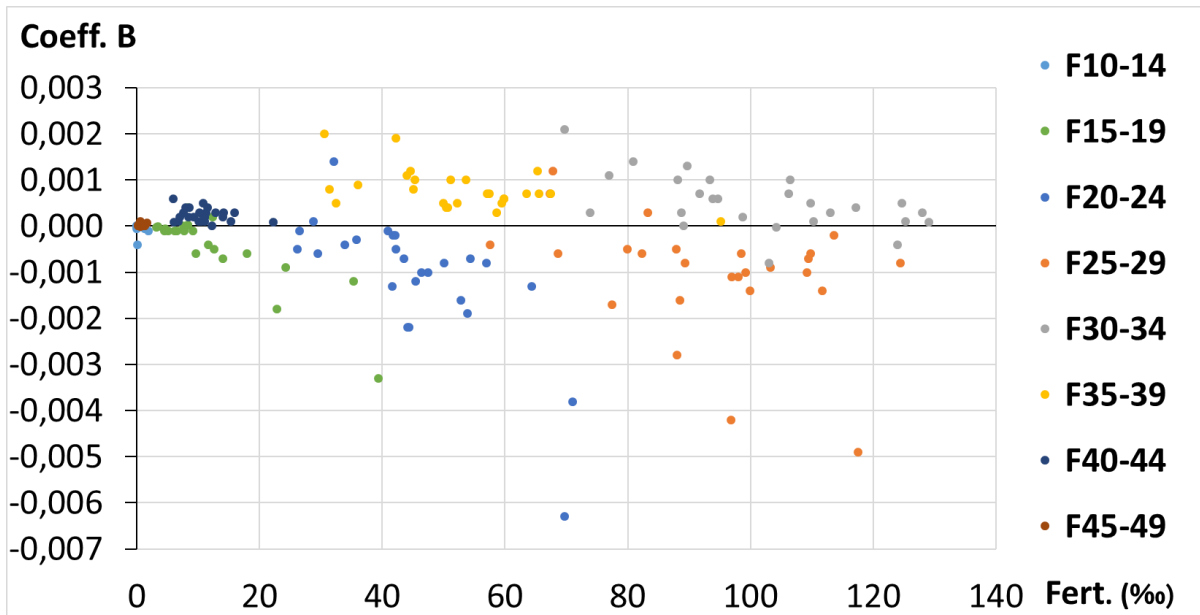


Figure 1. The dependence of Beta coefficient obtained from the sub-national relationship between economic development and age-specific fertility rates (y axis) on to national fertility rates (x axis) among 26 European countries in 2015.

Figure 2. shows the Beta coefficient obtained from the relationship between economic development and age-specific fertility rates in relation to GDP per capita focusing on 20-39 years cohorts. In all four age groups the results indicate that as national GDP per capita increases, impact of GDP per capita on specific fertility rates on sub-national level decreases. The strongest impact of GDP per capita on fertility rates is noticeable in younger cohorts in countries with GDP per capita lower than 20 000 Euros.

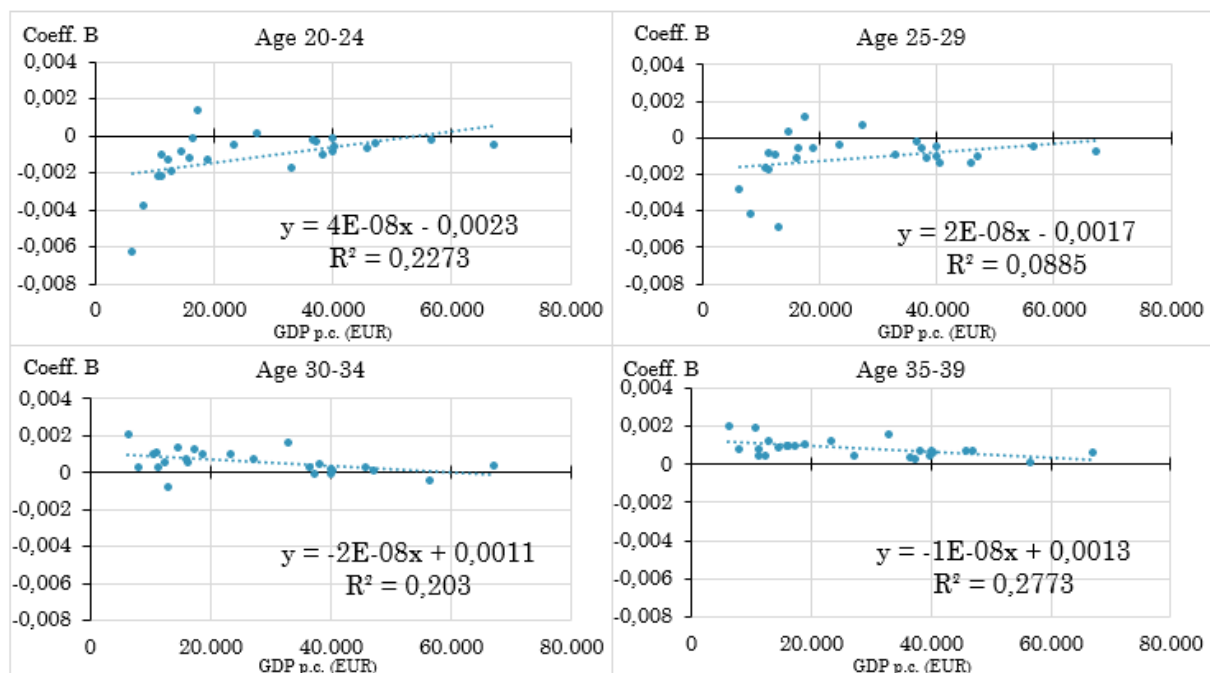


Figure 2. The Beta coefficient obtained from the sub-national relationship between economic development and age-specific fertility rates (y axis) in relation to national GDP per capita (x axis) among 26 European countries in 2015.

CONCLUSION

In younger cohorts and among less developed European Union countries, the impact of GDP per capita on age-specific fertility rates is greater. With the further economic development, the impact on age-specific fertility rates is diminishing. Since the relationship transition from negative to positive largely depends on births at later ages, countries with a higher share of births after 30 have a more positive relationship. Following such a finding, direction of the fertility-development relationship depends on share of birth of pre 30 subpopulation and after 30 subpopulation. For further research it would be interesting to examine the longitudinal relationship between economic development and age-specific fertility rates which would contribute to understanding of general fertility-development relationship.

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