REPORT

Resilience as a theoretical foundation for fertility dynamics

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Introduction

There are significant differences in fertility dynamics observed between European countries in the 21st century. The crises, including the great recession in 2008-2009, as well as the COVID-19 pandemic with the stringency measures introduced by many European countries, led to the rising concerns about the job loss, illness or a loss of a family member, potentially resulting in a decrease of income. In this paper we formulate an analytical approach to analyse resilience as a theoretical foundation for fertility dynamics.

In particular we focus on the following questions:

- How did fertility dynamics in European countries change during the periods of crises and did it recuperate?
- What are the factors that affect resilience related to childbearing decisions at micro, meso, and macro levels?

Low and, in many European countries, declining fertility is one of the important challenges for European and national policies. In the FutuRes Policy Lab, experts discussed on the need to build resilience of individuals, families and societies that supports their family development through adequate European, national and local policies.

These considerations are then used to propose an analytical framework that will be applied to further analytical work, including, among others, the data from Generations and Gender Survey, as well as relevant contextual data on meso, and macro levels.

The working paper is structured as follows. In the first section, we define resilience in the context of fertility, as well as potential measures that can be used to assess resilience and/or vulnerability related to fertility and childbearing decisions.

In the second section we present the fertility developments in the European Union countries through two major crises – the Great Recession and the COVID-19 pandemic, from the perspective of number of births, total fertility rate, and the mean age of birth. This data indicates differences between the societies related to fertility resilience.

In the third section we present the literature review focusing on fertility resilience at macro, meso and individual levels, especially in relation to the past crises and shocks.

In the fourth section we present the analytical framework that will be used to investigate resilience as a foundation for fertility dynamics in Europe.

1. Resilience and fertility dynamics

1.1. Defining resilience in the context of fertility

In recent years, especially after the COVID-19 crisis, resilience became an important policy perspective in Europe. In its foresight report (European Commission, 2020), defines resilience as "*the ability not only to withstand and cope with challenges but also to undergo transitions in a sustainable, fair and democratic manner*". The strategic foresight agenda focuses on the four dimensions of resilience: social and economic resilience, geopolitical resilience, green resilience, digital resilience. Within social and economic resilience dimension, according to the European Commission, "*resilience refers to the ability to tackle economic shocks and achieve long-term structural change in a fair and inclusive way. It means building the social and economic conditions for a recovery geared towards the transitions, promoting social and regional cohesion, and supporting the most vulnerable in society, while taking into account demographic trends, and in line with the European Pillar of Social Rights.*"

In the working paper, we focus on fertility as a symptom of social resilience in EU countries, which are facing below-replacement fertility since the 1990s. Moreover, some countries persistently show low fertility levels. The effects of that fertility change in terms of advanced population ageing, labour force shrinking and a population decline shape long-term demographic trends, increasingly recognised a pivotal factor for developments of human capital necessary to ensure long-term structural change in Europe. Consequently, fertility is located in the centre of debates how to build social and economic resilience.

Resilience was initially viewed as an individual personality trait, understood as personal, social and environmental characteristics which confer resilience (Fonagy et al, 1994). In the second wave of resilience research focused on individuals, families and communities, and their ability to translate protective factors into positive outcomes. The research conceptualised resilience as a process (Richardson, 2002). Resilience is generally conceived as having two components: (i) the presence of some risk or adversity, and (ii) the individual or family manages to make a positive adaptation in the face of this challenge (Rutter, 2012). As stated at the beginning of this section, resilience is becoming seen as an important feature of economies and societies.

In this working paper, we follow the theoretical framework of resilience conceptualised in (Aassve & Bastianelli, 2024). They define resilience on the individual level as 'the ability to maintain desired outcomes by accessing resources through various life course capitals in order to meet changing resource needs or cope with reduced resources when facing disturbances' (p.6). and frame the resilience process within three interlinked parts: (i) disturbances, (ii) life-course capitals and resources, and (iii) behavioural outcomes, captured at the three levels: macro, meso, and micro. The individual resilience, life-course capital and resources is therefore a process shaped by the capital at individual level, meso level (social networks) and macro (public institutions), which with changing need for resources, leads to the behaviours that indicate individual's resilience or vulnerability.

Under the sub-replacement fertility regime and persisting low fertility in some countries we understand desired fertility outcomes as close to intended fertility. Moreover, we assume that it will contribute to fertility recovery, particularly in low fertility countries. Our main goal is to

develop this framework from the perspective of fertility outcomes observed at macro (national), meso (regional), and individual levels, and the impact of individual resources (such as human capital, occupation and income, housing situation), social and family networks, as well as public institutions and policies focused on the family.

1.2. Measures of resilience in the context of fertility dynamics

Intended and actual fertility

Many studies emphasise the difference between fertility intentions and actual fertility behaviour, depicted at the aggregated level by the fertility gap being country-specific (Spéder and Kapitány, 2014; Dommermuth et al., 2015; Beaujouan and Berghammer, 2019). Spéder and Kapitány (2014) point out that certain difference between fertility intentions and behaviour always exists. However there are regional differences in this gap especially regarding the intentions and behaviour between Western European and post-communist countries. The study of the aggregate gap between intended and actual fertility in 19 European countries and the US revealed that in all countries, women had, on average, fewer children than the earlier expectations in their birth cohort, and more often than intended, they remained childless (Beaujouan and Berghammer, 2019). Moreover, distinct regional patterns were observed, which were most apparent for childlessness. The largest difference between intended and actual childlessness levels was observed in Southern and German-speaking European countries, and the smallest in Central and Eastern European countries. However, no studies analyse the extent to which these differences may stem from varying resilience to unexpected events, both at the micro and macro levels.

The issue that requires attention is also childlessness and intentions not to have children at all. Tocchioni et al. (2022) based on the analysis of lives of childless women in 4 countries argue that childlessness in not only linked to being single but is also defined by different sets of interactions between various life areas such as relationships, education, and employment in the life course. They also found that the pathways of childless women were country-specific but also shared some cross-country similarities e.g. group of single working childless women, and the group of childless women who prolonged their education were present in all analysed countries

Fertility dynamics

Another symptom of fertility resilience is the dynamics of births and fertility during the times of crisis. Economic and social stress, related to the crises, can influence observed fertility levels, as families can decide to postpone or foregone their fertility plans. As a result, the total number of births declines. Billari (2005) underlines, that employment instability, which particularly emerges during the crises, may discourage individuals from long-term commitments, and force them to postpone establishing a family and having children. (Alderotti et al., 2021) note that the persistence—or even the escalation—of employment instability levels during crises hampers fertility with growing intensity, in institutional contexts that failed to adapt to the aforementioned in economic and social conditions. Employment instability may also be important for transitioning to higher order births. Stable employment contract is crucial for enlarging the family.

It should be noted that the number of births is also dependent on other factors, such as the number and age structure of women in the childbearing age.

2. Fertility developments in the European Union after 2007

In this section, we analyse of the fertility development in the European Union after 2007. In this time two major crises – the Great Recession of 2008-2009 as well as the COVID-19 pandemic of 2020-2021 occurred.

In order to compare fertility dynamics, we compare the national (and in some cases regional) changes in the number of births, total fertility rate and the mean age of birth in the EU countries.

2.1. Live births

When we look at the dynamics of live births in the EU countries, taking 2007 (that is the pre-crisis year) as a reference. As shown in Table 1, between 2007 and 2019 the number of live births in Europe declined, particularly in Southern countries (Portugal, Greece, Bulgaria, Romania), as well as the Baltic states (Latvia, Estonia), as well as Finland. These are countries, where economies and labour markets were particularly hit by the Great Recession.

Between 2007 and 2021, the number of live births declined further, with more than 30 p.p. decline in Spain, more than 20 p.p. decline in Italy, Latvia, Greece, Portugal, Lithuania, and Bulgaria, and more than 10 p.p. decline in Estonia, Finland, Ireland, Poland and Croatia.

Table 1. Live births dynamics in the EU countries (2007=100)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Change 2007-2021
EU 27	102,7	101,6	101,2	96,8	96,0	93,5	94,7	94,1	95,1	94,0	92,2	90,5	88,4	88,8	-11,2
CZ	104,3	103,2	102,2	94,8	94,7	93,1	95,8	96,6	98,3	99,8	99,5	97,9	96,1	97,5	-2,5
RO	103,3	103,6	98,8	91,4	93,7	87,8	92,6	94,1	95,8	98,1	94,4	93,0	92,4	90,0	-10,0
SK	105,4	112,5	111,0	111,7	102,0	100,7	101,1	102,2	105,8	106,5	105,9	104,8	104,1	103,9	3,9
HU	101,6	98,8	92,5	90,2	92,5	91,7	95,6	94,4	97,7	97,0	95,8	95,4	96,1	96,3	-3,7
SI	110,1	110,3	112,7	110,7	110,7	106,5	106,8	104,1	102,6	102,1	98,8	97,5	94,7	95,8	-4,2
DE	99,7	97,1	99,0	96,8	98,3	99,6	104,4	107,7	115,7	114,6	115,0	113,6	112,9	116,2	16,2
AT	102,0	100,1	103,3	102,4	103,5	104,0	107,2	110,7	115,0	114,9	112,2	111,4	109,6	112,9	12,9
HR	104,4	106,4	103,5	98,3	99,7	95,3	94,4	89,5	89,6	87,2	88,2	86,2	85,5	87,1	-12,9
BE	102,5	102,5	104,8	103,7	103,2	101,2	100,7	98,5	98,2	96,5	95,3	94,8	92,1	95,4	-4,6
LV	101,8	92,0	82,6	78,6	83,0	86,0	90,8	91,7	91,7	86,9	80,6	78,4	73,3	72,7	-27,3
EL	105,7	105,4	102,5	95,1	89,7	84,1	82,3	82,1	83,0	79,1	77,2	74,8	75,7	76,3	-23,7
PL	106,9	107,7	106,6	100,1	99,6	95,3	96,7	95,2	98,6	103,6	100,1	96,7	91,6	85,5	-14,5
LT	105,0	107,1	102,2	100,8	101,5	99,6	101,2	104,8	102,0	95,6	93,8	91,2	83,8	77,7	-22,3
PT	102,1	97,1	98,9	94,5	87,7	80,8	80,4	83,4	85,0	84,1	84,9	84,5	82,5	77,6	-22,4
CY	107,3	112,0	114,3	112,2	118,5	108,9	108,0	106,9	110,3	107,6	108,8	111,3	115,8	120,2	20,2
EE	101,6	99,9	100,3	93,1	89,1	85,8	85,9	88,2	89,1	87,4	91,1	89,4	83,7	84,1	-15,9
NL	101,8	102,0	101,7	99,3	97,0	94,5	96,6	94,0	95,1	93,7	92,9	93,6	93,0	99,0	-1,0
DK	101,5	98,0	99,0	92,1	90,4	87,2	88,7	90,8	96,1	95,8	95,9	95,5	95,1	99,0	-1,0
FR	101,2	100,7	101,7	100,6	100,3	99,1	100,0	97,6	95,7	94,0	92,6	92,0	89,8	90,6	-9,4
IT	102,3	100,9	99,6	96,9	94,7	91,2	89,1	86,1	84,0	81,2	78,0	74,5	71,8	71,0	-29,0
ES	105,6	100,5	98,8	95,8	92,3	86,4	86,8	85,2	83,2	79,7	75,5	73,0	69,4	68,6	-31,4
SE	101,8	104,1	107,7	104,0	105,4	105,7	107,0	106,9	109,3	107,4	107,8	106,6	105,3	106,4	6,4
BG	103,1	107,4	100,2	94,0	91,7	88,4	89,7	87,5	86,2	84,9	82,5	81,7	78,4	77,9	-22,1
MT	106,6	107,0	103,5	110,6	109,7	107,1	111,3	114,9	118,9	114,7	118,0	115,5	117,2	116,7	16,7
IE	105,3	105,8	105,3	103,7	100,4	96,6	94,3	91,8	89,4	86,6	85,5	83,1	78,4	84,8	-15,2
LU	102,2	102,9	107,2	103,0	110,0	111,6	110,8	111,6	110,5	112,7	114,6	113,7	117,9	122,1	22,1
FI	101,4	102,9	103,8	102,1	101,3	99,0	97,5	94,5	89,9	85,7	81,0	77,7	79,1	84,4	-15,6

Source: Authors' analysis based on Eurostat data

In 2020-2021, that is in the period of COVID-19 pandemic, in several countries the number of births increased (Germany, Austria, Belgium, Cyprus, Sweden, Luxembourg, Finland), which may reflect different developments of pandemic, as well as stringency measures and uncertainty experienced by the societies.

When looking at the development of fertility dynamics by countries, there are several distinct patterns that can be observed after 2007. It should be noted that the change in the number of births is also influenced by the change in the number of women in the childbearing age, and their age composition therefore, it is an indicative measure of potential resilience related to fertility, that needs to be further verified.

Decline, recuperation and further decline

The first pattern, which characterises Portugal, Baltic countries, Poland and Croatia shows a decline in childbirth dynamics during the Great Recession, followed by some recuperation after 2011, followed by further decline observed in 2017 and later.

This pattern “mimics” the economic and labour market development, indicating that the societal and individual resilience is lower during the crisis, but with improved socio-economic conditions, families may decide to return to their postponed intensions related to childbearing decisions.

Continuous decline

Second pattern shows a continuous decline of the live births, observed for the entire analysed period, which is observed in Southern countries: Spain, Italy, Greece and Bulgaria. Such pattern might indicate that the shock caused by the Great Recession led to permanent fertility decline, that was further strengthened by the COVID-19 crisis.

Decline followed by the increase

In the third group of countries, the initial decline in the number of births is followed by an increase. In this group, there is a visible increase in the number of births in 2021, that is during the pandemic. One of the potential hypotheses is that the lockdown periods could be associated with stronger family connections that led to the realisation of fertility intentions. Such patterns were observed for example in Denmark, the Netherlands, Hungary, Belgium, France, Croatia, Ireland and Finland. Yet, the fertility recuperation did not lead to the number of births observed during the pre-crisis time.

Stable increase

Finally, the fourth pattern that is observed for example in Luxembourg, Switzerland, Malta, Germany, Austria and Sweden, shows a stable increase of the number of births. These are the countries that despite the observed crises maintained stable level of births, therefore, they can be potentially seen as examples of countries that create resilient conditions at the macro level.

2.2. Total Fertility Rate (TFR)

Another measure used to assess fertility developments is the TFR, which is a cross-sectional measure indicating the total number of children that would be born to each woman if she were to live to the end of her child-bearing years and give birth to children in alignment with the prevailing age-specific fertility rates in a specific year. Between 2007 and 2021 the EU-wide fertility rate did not change much. At the same time, there are significant differences between countries (Table 2).

After the Great Recession, the TFR fell in 11 countries, with the most pronounced decline in Estonia, Latvia, Denmark, Greece, Spain, Lithuania and Portugal. By 2021, the TFR fell in Finland, Luxembourg, Ireland, Malta, Belgium, Sweden, Spain, Italy – countries representing different welfare regimes and also development levels. In the Baltic countries, Latvia and Lithuania, the temporary increase of the TFR was observed around 2013-2017, but it fell again since then.

The decline of the TFR is particularly worrying in countries with already low fertility levels (Portugal, Spain, Malta, and Italy). Furthermore, the decline of fertility in Nordic countries (Sweden, Finland), which fell from moderately high to low values, also should be further investigated.

Table 2. TFR in the EU countries. 2007-2021

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Change 2007-2021
EU 27	1,52	1,57	1,56	1,57	1,54	1,54	1,51	1,54	1,54	1,57	1,56	1,54	1,53	1,51	1,53	0,01
CZ	1,45	1,51	1,51	1,51	1,43	1,45	1,46	1,53	1,57	1,63	1,69	1,71	1,71	1,74	1,83	0,38
RO	1,45	1,60	1,66	1,59	1,47	1,52	1,46	1,56	1,62	1,69	1,78	1,76	1,77	1,80	1,81	0,36
SK	1,27	1,34	1,44	1,43	1,45	1,34	1,34	1,37	1,40	1,48	1,52	1,54	1,57	1,59	1,63	0,36
HU	1,32	1,35	1,32	1,25	1,23	1,34	1,35	1,44	1,45	1,53	1,54	1,55	1,55	1,59	1,61	0,29
SI	1,38	1,53	1,53	1,57	1,56	1,58	1,55	1,58	1,57	1,58	1,62	1,60	1,61	1,59	1,64	0,26
DE	1,37	1,38	1,36	1,39	1,39	1,41	1,42	1,47	1,50	1,60	1,57	1,57	1,54	1,53	1,58	0,21
AT	1,38	1,42	1,39	1,44	1,43	1,44	1,44	1,46	1,49	1,53	1,52	1,47	1,46	1,44	1,48	0,10
HR	1,48	1,55	1,58	1,55	1,48	1,51	1,46	1,46	1,40	1,42	1,42	1,47	1,47	1,48	1,58	0,10
BG	1,49	1,56	1,66	1,57	1,51	1,50	1,48	1,53	1,53	1,54	1,56	1,56	1,58	1,56	1,58	0,09
LV	1,54	1,58	1,46	1,36	1,33	1,44	1,52	1,65	1,70	1,74	1,69	1,60	1,61	1,55	1,57	0,03
EL	1,41	1,50	1,50	1,48	1,40	1,34	1,29	1,30	1,33	1,38	1,35	1,35	1,34	1,39	1,43	0,02
PL	1,31	1,39	1,40	1,41	1,33	1,33	1,29	1,32	1,32	1,39	1,48	1,46	1,44	1,39	1,33	0,02
LT	1,36	1,45	1,50	1,50	1,55	1,60	1,59	1,63	1,70	1,69	1,63	1,63	1,61	1,48	1,36	0,00
PT	1,35	1,39	1,34	1,39	1,35	1,28	1,21	1,23	1,31	1,36	1,38	1,42	1,43	1,41	1,35	0,00
CY	1,44	1,48	1,47	1,44	1,35	1,39	1,30	1,31	1,32	1,37	1,32	1,32	1,33	1,36	1,39	-0,05
EE	1,69	1,72	1,70	1,72	1,61	1,56	1,52	1,54	1,58	1,60	1,59	1,67	1,66	1,58	1,61	-0,08
NL	1,72	1,77	1,79	1,79	1,76	1,72	1,68	1,71	1,66	1,66	1,62	1,59	1,57	1,54	1,62	-0,10
DK	1,84	1,89	1,84	1,87	1,75	1,73	1,67	1,69	1,71	1,79	1,75	1,73	1,70	1,68	1,72	-0,12
FR	1,98	2,01	2,00	2,03	2,01	2,01	1,99	2,00	1,96	1,92	1,89	1,87	1,86	1,83	1,84	-0,14
IT	1,40	1,45	1,45	1,46	1,44	1,43	1,39	1,37	1,35	1,34	1,32	1,29	1,27	1,24	1,25	-0,15
ES	1,38	1,45	1,38	1,37	1,34	1,32	1,27	1,32	1,33	1,34	1,31	1,26	1,23	1,19	1,19	-0,19
SE	1,88	1,91	1,94	1,98	1,90	1,91	1,89	1,88	1,85	1,85	1,78	1,76	1,71	1,67	1,67	-0,21
BE	1,82	1,85	1,84	1,86	1,81	1,80	1,76	1,74	1,70	1,68	1,65	1,62	1,60	1,55	1,60	-0,22
MT	1,35	1,43	1,42	1,36	1,45	1,42	1,36	1,38	1,37	1,37	1,26	1,23	1,14	1,13	1,13	-0,22
IE	2,01	2,06	2,06	2,05	2,03	1,98	1,93	1,89	1,85	1,81	1,77	1,75	1,71	1,63	1,78	-0,23
LU	1,61	1,61	1,59	1,63	1,52	1,57	1,55	1,50	1,47	1,41	1,39	1,38	1,34	1,36	1,38	-0,23
FI	1,83	1,85	1,86	1,87	1,83	1,80	1,75	1,71	1,65	1,57	1,49	1,41	1,35	1,37	1,46	-0,37

Source: Authors' analysis based on Eurostat data

TFR changes also indicates that many countries that suffered more from the crises (Southern European countries, Baltic countries) also experienced declines in the TFR. At the same time, there are countries that managed to rebuilt or increase their fertility rates.

The decline of the TFR in the analysed period was more frequently observed among countries that had relatively high TFR levels in 2007, in particular Finland, Ireland, Belgium, Sweden, France and Denmark. One of the striking examples is Finland, the TFR declined from one of the highest levels among the EU countries below the average EU-27 level, which is also combined with the drop in the number of live births.

2.3. Mean age at birth

The third indicator reflecting changes in fertility behaviour is the mean age of childbearing. In all EU countries, the mean age of mothers increased between 2008 and 2021, which is presented in Table 3. The increase was the smallest in Slovakia and Slovenia (0.6 years) and the largest in Lithuania and Estonia (2.3 years). In 2021, in all but three EU countries, the mean age of childbearing was equal or above 30 years.

Table 3. Mean age of childbearing in the EU countries. 2008-2021

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Change 2008-2021
EU-27	29,8	29,9	30,0	30,2	30,2	30,3	30,4	30,5	30,6	30,7	30,8	30,9	31,0	31,1	1,3
CZ	29,3	29,4	29,6	29,7	29,8	29,9	29,9	30,0	30,0	30,0	30,1	30,2	30,2	30,4	1,1
RO	26,7	26,8	27,0	27,1	27,2	27,4	27,5	27,6	27,7	27,9	28,0	28,1	28,2	28,2	1,5
SK	28,3	28,5	28,6	28,9	28,7	28,8	28,8	28,8	28,8	28,8	28,8	28,8	28,9	28,9	0,6
HU	28,9	29,1	29,3	29,4	29,4	29,5	29,5	29,6	29,6	29,8	29,8	29,9	29,9	30,0	1,1
SI	29,9	30,0	30,1	30,1	30,1	30,1	30,2	30,2	30,3	30,3	30,4	30,5	30,4	30,5	0,6
DE	30,1	30,2	30,4	30,5	30,6	30,8	30,9	30,9	30,9	31,0	31,1	31,2	31,3	31,5	1,4
AT	29,5	29,7	29,8	30,0	30,2	30,3	30,4	30,6	30,6	30,7	30,9	31,0	31,0	31,2	1,7
HR	28,7	28,9	29,2	29,3	29,4	29,6	29,8	29,9	30,1	30,3	30,4	30,5	30,6	30,7	2,0
BE	29,6	29,6	29,8	29,8	30,0	30,2	30,3	30,4	30,5	30,6	30,7	30,8	30,8	31,0	1,4
LV	28,1	28,4	28,6	28,7	28,8	29,0	29,2	29,4	29,6	29,7	29,9	30,0	30,0	30,2	2,1
EL	30,2	30,4	30,4	30,5	30,7	30,9	31,1	31,3	31,3	31,4	31,5	31,7	31,7	32,1	1,9
PL	28,5	28,6	28,8	28,9	28,9	29,0	29,1	29,2	29,4	29,5	29,6	29,7	29,8	29,9	1,4
LT	28,1	28,5	28,9	28,9	29,0	29,2	29,4	29,5	29,7	29,8	30,1	30,2	30,4	30,4	2,3
PT	29,6	29,7	29,8	30,1	30,2	30,4	30,7	30,9	31,1	31,2	31,4	31,4	31,6	31,8	2,2
CY	30,1	30,3	30,4	30,5	30,6	30,8	31,0	31,3	31,4	31,4	31,5	31,7	31,7	31,8	1,7
EE	28,7	28,9	29,2	29,5	29,6	29,5	29,6	29,9	30,2	30,4	30,5	30,6	30,7	31,0	2,3
NL	30,7	30,7	30,8	30,9	30,9	31,0	31,1	31,2	31,3	31,4	31,5	31,6	31,7	31,8	1,1
DK	30,4	30,5	30,6	30,7	30,7	30,8	30,9	31,0	31,0	31,1	31,2	31,3	31,4	31,6	1,2
FR	29,8	29,9	30,0	30,0	30,1	30,2	30,3	30,4	30,5	30,6	30,6	30,7	30,8	31,0	1,2
IT	31,1	31,2	31,3	31,4	31,4	31,5	31,5	31,7	31,8	31,9	32,0	32,1	32,2	32,4	1,3
ES	30,8	31,0	31,2	31,4	31,6	31,7	31,8	31,9	32,0	32,1	32,2	32,3	32,3	32,6	1,8
SE	30,6	30,7	30,7	30,8	30,9	30,9	31,0	31,0	31,1	31,1	31,1	31,3	31,3	31,5	0,9
BG	26,5	26,7	27,0	27,1	27,1	27,1	27,3	27,4	27,6	27,6	27,7	27,8	27,8	27,9	1,4
MT	29,2	29,2	29,4	29,8	29,8	30,0	30,1	30,3	30,6	30,5	30,8	30,7	30,7	30,9	1,7
IE	31,3	31,4	31,4	31,5	31,5	31,7	31,8	31,9	32,1	32,1	32,2	32,4	32,6	32,7	1,4
LU	30,5	30,7	30,8	30,8	31,0	31,3	31,4	31,5	31,7	31,9	32,1	32,3	32,3	32,5	2,0
FI	30,1	30,1	30,2	30,3	30,4	30,5	30,5	30,6	30,8	30,9	31,0	31,1	31,2	31,4	1,3

Source: Authors' analysis based on Eurostat data

3. Literature review: resilience in the context of family and fertility

In this section we present the review of literature concerning resilience in the context of fertility. The review is concentrated around the disturbances affecting fertility on three levels: macro, meso, and micro. The disturbances include economic crises and unemployment, the COVID-

19 pandemic, climate change, shift in social norms concerning parenthood, and lowered reproductive capacity.

The concept of the second demographic transition (STD), formulated by Ron Lesthaeghe and Dirk van de Kaa almost 40 years ago (Lesthaeghe and van de Kaa, 1986), referred to interrelated changes in fertility and partnership behaviour, which started in the late 1960s in countries of Northern and later in Western Europe. They claimed these changes reflected the fundamental shift in values.

Under the STD an increase in premarital intercourses was accompanied by declining age at first sexual intercourse. In parallel, the advances in contraceptive technology were observed. Altogether, these developments weakened the relationship between marriage and childbearing (Zaidi and Morgan 2017). In result, a traditional, marriage-based family was changing gradually its position while cohabitation was getting its importance (Aassve et al. 2024).

The demographic and societal characteristics related to the SDT (Table 4) may also indicate those characteristics that are related to the fertility resilience, or its lack, observed at the macro, meso or micro levels.

Table 4. Overview of demographic and societal characteristics related to the second demographic transition (SDT) in Western countries

• Fall in proportions married, rising ages at first marriage
• Increasing cohabitation, both pre- and postmarital
• Rise in divorce, earlier divorce
• Decline in remarriage rates, LAT relationships instead
• Fertility postponement: increasing mean ages at parenthood, structural subreplacement fertility
• Efficient contraception
• Rising nonmarital fertility, parenthood outside marriage (among cohabiting couples, single mothers)
• Rising definitive childlessness among women ever in a union
• Rise of “higher order” needs: individual autonomy, expressive work and socialization values, self-actualization, grass-roots democracy, recognition; tolerance a prime value
• Disengagement from civic and community-oriented networks
• Retreat of the state, second secularization wave, sexual revolution, refusal of authority, political “depolarization”
• Rising symmetry in sex roles, rising female education levels, greater female economic autonomy
• Flexible life-course organization, multiple lifestyles, open future

Source: (Lesthaeghe, 2014)

In the sub-sections below, we present the relevant literature findings on macro, meso, and individual level factors that need to be considered when studying fertility resilience.

3.1. Macro-level disturbances affecting fertility behaviours

Economic crisis and unemployment

Many researchers link fertility trends with business cycle – the temporary decline of fertility during recession is followed by a compensation in times of economic prosperity. This pro-cyclical relationship is usually small and short in duration therefore it can be “overshadowed

by long-term secular trends in fertility caused by factors other than economic recession" (Sobotka et al. 2011).

The uncertainty surrounding employment is a collection of expectations related to the labour market, utilised to comprehend future developments (Vignoli et al., 2022). Gatta et al. (2022) in a study of employment uncertainty and fertility intentions operationalize employment uncertainty through two indicators of future economic prospects and distinguish the perceived stability of employment and the perceived resilience to potential job loss. They defined resilience perception as "respondents' perceived uncertainty with regard to the ability to recover from negative shocks, such as a job loss".

According to Gatta et al. (2022), the perceived ability to withstand job loss appears to be particularly significant for fertility planning, surpassing uncertainties associated with the stability of one's current employment. The subjective perceptions of uncertainty are influenced by individual attitudes to risk, thus is important to examine this effect on fertility after accounting for person-specific risk attitudes (Gatta et al., 2022). It can be supposed that perceived resilience to potential job loss depends on previous professional experience too. Therefore, there remains an open question about the impact of factors such as the time of looking for the first job or the next one on fertility intentions and outcomes.

The macro-level analysis by Fahlén and Oláh (2018) revealed a negative association between increasing societal economic uncertainty, with respect to increasing unemployment rates and decreasing employment protection, and the intentions to become a parent, especially among men.

Del Bono et al. (2008) emphasises the importance of professional carries for the female workers in view of their fertility decisions. In this context labour market shocks can lead to delays or reductions in fertility. This is especially evident in the case of job loss by white-collar workers whereas blue-collar workers who have limited opportunities of job advancement do not seem to be affected by job loss in terms of fertility.

Recession and fertility.

Already in the past, the recessions were associated with fertility declines and postponement of childbearing decisions (Sobotka et al. 2011; Cherlin et al. 2013). In particular, an increasing risk of unemployment reduced fertility, often with some time lag (Simó Noguera et al. 2005; Berkowitz King 2005; Aaberge et al. 2005; Adserà 2005, 2011; Neels et al. 2013).

In recent years, the impact of the Great Recession on fertility was extensively analysed in the scientific literature. The fertility decline was more pronounced in countries and regions that experienced stronger economic downturns and faster increases in unemployment, especially in Southern Europe (Lanzieri 2013). Yet, fertility decline could be also seen in Nordic countries, which experienced rather mild economic decline during the crisis of 1990s as well as the Great Recession (except in Denmark), and which continued providing extensive welfare and family policies (Comolli et al. 2019).

(Matysiak et al., 2021) analyse links between economic conditions and fertility rates, focusing on the period of the Great Recession in Europe at a regional level. They find that the country

context played a dominant role in recession-related fertility declines. In most countries, the regional variation in recession-related fertility change was relatively low. Yet, there was a notable regional variation in several countries, including Greece and countries in Central Europe. Their results show that across Europe, both between-country and within-country variations in economic conditions are relevant for understanding fertility dynamics.

The impact of short-term shocks, such as changes in economic or epidemiologic conditions, on reproductive outcomes on a population level is well documented and studied. A good example is the study of Hispanic flu in years 1918-1920 (Boberg-Fazlic et al. 2021), or the impact of great crisis in US, where total fertility rate has dropped from 2.5 in 1929 to 2.2 in year 1939 (Comolli 2017). The effects of more recent economic shocks from 2008 in Europe and US were studied by different researchers (Sobotka et al. 2011, Matysiak et al. 2021; Comolli et al., 2021). These studies show that uncertainty induced by economic or epidemiologic instability might have different effects with respect to age, educational attainment, type of residence and other factors. Commoli et al. (2021) observed that the fertility changed differently during the 1990s crises and Great Recession in Nordic countries. In the case of first births: highly educated women were least affected by the 1990s crisis. Their first-birth risks slightly increased (Finland), remained stable (Denmark and Norway), or declined much less (Sweden) than the first-birth risks of low- and medium-educated women. After 2008, such educational differences in the development of first-birth risks no longer existed; the relative risks of entering parenthood declined at the same pace in each educational group. However, after 2014 primary educated women register a steeper continued drop in their relative risk of becoming a mother. In the case of second births educational differences after 1990 were only visible in Finland and Denmark. After 2008, the changes in second-birth risks across educational groups was more homogenous in all countries, but primary educated women displayed a more negative trend. Jalovaara et al. (2018) show that the postponement effect has been particularly strong among childless women with some exception of Nordic countries. These results highlight the importance of studying the effect of changes in social, economic and epidemiologic conditions on fertility outcomes especially with respect to age.

COVID-19 pandemic

The worldwide Covid-19 pandemic has been a global factor that influenced many demographic outcomes including reproductive behaviour. During the pandemics and shortly after, many scholars already analysed its effect on reproductive outcomes (Qu 2021; Luppi, Arpino and Rosina 2022; Emery and Koops 2022; Aassve et al. 2020; Aassve et al. 2021; Pomar et al. 2022; Sobotka et al. 2021; Sobotka et al. 2023; Du et al. 2023). These studies were mostly focused on time series analysis of monthly fertility rates to account for any irregularities and deviations from observed long term trends. Most of these studies show that pandemics coincides with a significant decrease in monthly fertility rates. Estimated effect of pandemic on monthly fertility rates varies from very strong (-14% as estimated by Pomar et al. 2022), to moderate (between -5% to -11% as estimated by Aassve et al. 2021). Some studies show ambiguous effect of the Covid-19 pandemic initial decrease in fertility rates followed by increase in fertility rates (Sobotka et al. 2023; Du et al. 2023).

The negative consequences of Covid-19 pandemic on fertility are mainly associated with increasing social and economic uncertainty, changes in work-life balance (due to forced home-office) and anticipated limited access to health care and assisted reproductive technologies (Aassve et al. 2020; Bujard and Andersson 2024). All these factors might translate into lowered

reproductive intentions and further postponement of decisions concerning reproduction. What is more, they are of rather hypothetical nature since there are very few studies that survey individual fertility plans and motivations during pandemics.

One of the few survey studies related to impact of pandemic on fertility intentions has been carried out by (Mynarska et al., 2021), and (Raybould et al., 2023). These studies show that a substantial share of surveyed individuals have had postponed or foregone their fertility intentions because of COVID-19 pandemic. Main factors affecting postponement decisions were related to the lowered sense of financial security and worse mental well-being in the COVID-19 pandemic. Additional qualitative research shows that women interviewed expressed fears of giving birth alone in hospitals due to stricter hygiene regulations during the COVID-19 pandemic. Similar results were reported in an international comparative study carried out by Luppi et al. (2020).

Finally, the delayed impact of COVID-19 pandemic on reproductive health must be considered while discussing the change in the observed fertility rates. Some studies show that the Covid-19 infection might have severe the long-term consequences on both male and female reproductive health, which in turn might result in the lowered observed number of children born (Madaan et al. 2022, D'Ippolito et al. 2022).

Climate change

Natural disasters, including the extreme weather conditions, can have a significant impact on fertility-related behaviours, however the impact of those occurrences on the fertility behaviour, depending on the type of disaster and the world region. What is more, the growing world population, the 2022 UN population projection indicates that by the end of 21st century it will reach almost 10,5 billion (United Nations, 2022), will also exert large pressure on the natural environment. The above leads to a conclusion that when investigating demographic processes, it is important to include environmental variables and similarly when researching climate change demographic variables cannot be omitted (Rzeżutka 2021).

Current climate changes and associated threats such as pollution growth are increasingly observed worldwide. Emerging threats to health, vegetation and even life may force families to leave their homes and, as a consequence, may lead to a change in the family's lifestyle. Moreover, poor environmental conditions also have a direct negative impact on mortality and morbidity through extreme events such as hurricanes, or floods. It is essential to develop various strategies aimed at strengthening adaptive capacities to cope with the climate changes. Muttarak and Lutz (2014) reveal that when faced with natural or climate-related threats, educated individuals, households and societies have a greater ability to adapt, respond to disasters, prepare for them, and mitigate the impacts of calamities. Moreover, in countries where awareness of ongoing climate change increases, people may respond by adopting more responsible behaviours and attitudes.

Some researchers focus their interest on the influence of high temperature on birth rates. Several studies have shown no relationship between high temperatures and sexual activity (for example: Hajdu & Hajdu 2019) therefore the fall in birth rates 8 to 10 months after unusually hot days is probably connected to worse reproductive health (Barreca et al. 2018). What is more, studies show that infant health is worse because of increased exposure to hot weather

in the third trimester causing a decrease in birth weight and an increase in the probability of low birth weight (Deschenes et al. 2009).

It should also be mentioned, that the climate change also affects migrations, and the migrant population can influence the fertility patterns observed in receiving countries.

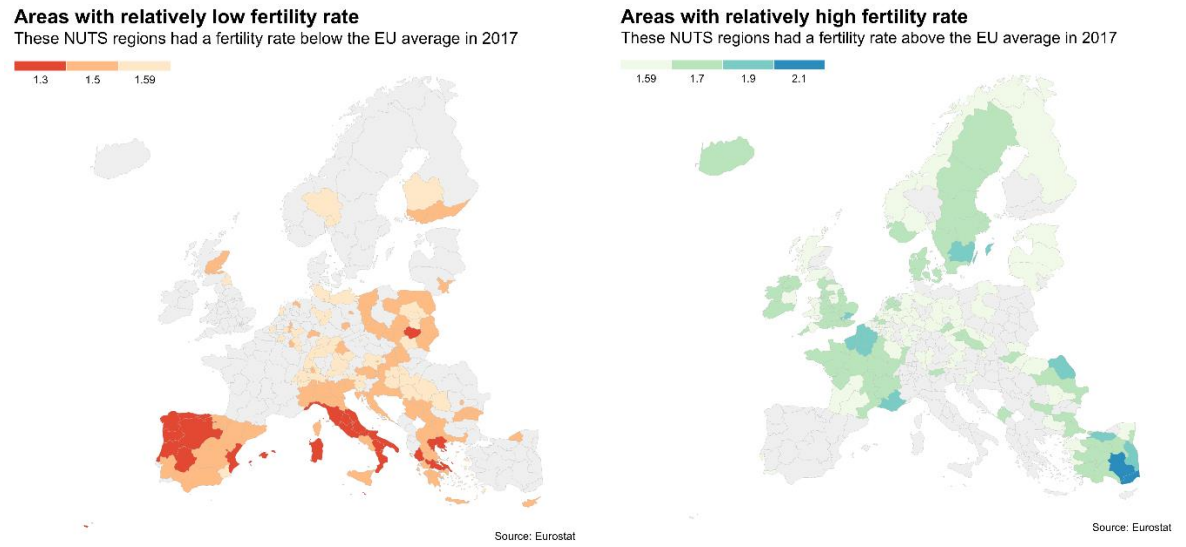
Welfare state

Fertility resilience is supported by the public policies and welfare state. (Bernardi & Klaerner, 2014) underline that people who live in strong welfare states may perceive their children as likely to provide mainly in terms of psychological assistance and psychological well-being at older ages. On the other hand, people who live in places where the welfare state is an imperfect substitute for family care may have additional motivations for having children, such as a desire to build a larger family network which would function as economic and health insurance when they reach old age.

3.2. Meso level

Fertility developments also differ at sub-national levels. The Eurostat data before the COVID-19 pandemic in 2017 already indicated that in some countries there were significant regional differences in fertility rates in some countries. The lowest fertility rates were observed in Southern and Eastern European countries, but also in some regions in Germany, while the highest fertility rates were observed in France, Sweden, Ireland, Iceland and the UK.

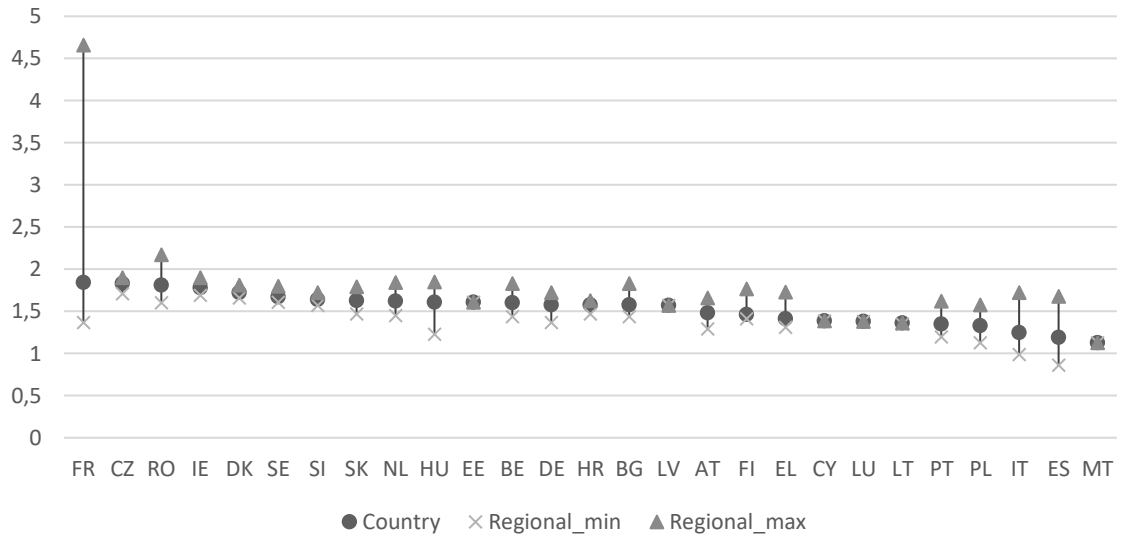
Figure 1. Regions with low and high fertility rates in 2017



Source: EUROSTAT after https://www.newsworthy.se/artikel/33891/fertility-rates-in-abruzzo-extremely-low?token=e7d85003-9892-4575-a5e9-40349d6eaf63

Similar patterns remained in 2021, including French overseas Department of Mayotte in the northern part of the Mozambique Channel with the highest fertility rate. Large regional disparities are also observed in Spain, Italy, Hungary and Romania (Figure 2).

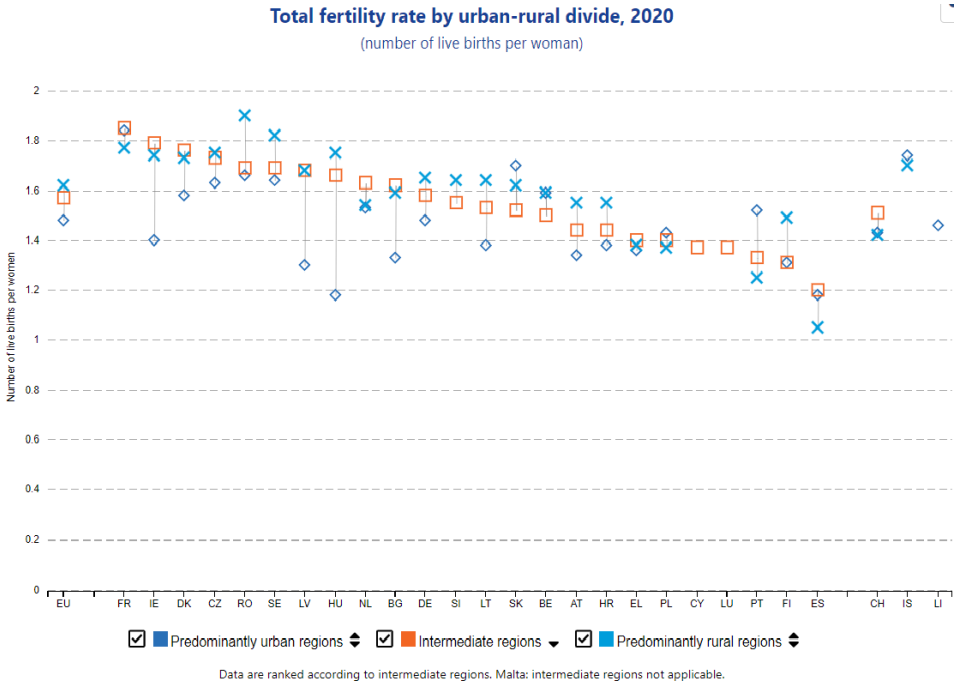
Figure 2. National and regional fertility rates in 2021



Source: EUROSTAT, Fertility indicators by NUTS 2 region [demo_r_find2__custom_9947758]

Another important difference is also a rural-urban divide (Figure 3). In the EU in 2020, the fertility rate in urban regions was 1.48, in intermediate regions 1.57 and in rural regions 1.62 (Eurostat, 2022). However, noticeable differences exist among individual countries, which may stem from varying pro-family policies as well as be influenced by factors such as access to the job market or education. Riederer and Buber-Ennser (2019) examined the fulfilment of fertility intentions across 11 European nations, exploring the influence of contextual variables. Their findings reveal a lower realisation rate in urban areas compared to rural regions. Moreover, within cities, delaying childbirth is notably more prevalent. Nonetheless, the resilience to the same factors in individual countries may vary.

Figure 3. Total fertility rate by urban-rural divide, 2020



Source: Eurostat
https://ec.europa.eu/eurostat/cache/digpub/demography_2022/bloc-3d.html?lang=en

Social norms concerning parenthood

As Bernardi and Klärner (2014) indicate the childbearing is “a social act” therefore decisions to become a parent are shaped by social interactions and structures. Individuals learn and integrate such factors as family values, labour market conditions or the availability and quality of childcare during interactions with social network members (Rossier and Bernardi 2009). The structure of social network conditions the speed of behaviour change - dense and homogeneous network exert more pressure on its members to accept the values already shared by the group whereas heterogeneous networks facilitate the exchange of information and give space for social learning of new ideas (Bernardi and Klärner 2014).

Aassave et al. (2024) argue that even if ideals are shared across societies, the trade-offs between different family dimensions vary depending on local economic, social, and institutional settings. In particular, good communication between family members and grandparents, enjoying respect in local communities are highly valued, and can be seen as factors contributing to the fertility resilience. Their results suggest that fertility decisions are also linked to general respect families command in the larger communities in which they are embedded.

The intention to have a child, the value attributed to children, the norms regulating appropriate parenthood, the support available to parents, and all of the other elements involved in childbearing decision-making are created, diffused, and transformed by social interaction (Rossier and Bernardi 2009). The social embeddedness of human actions is the basic axiomatic assumption of the social networks approach (Granovetter 1985).

As summarised by (Bernardi & Klaerner, 2014), demographers have turned to theories of social interaction to expand their range of explanations of observed fertility behaviour, as well as of individual childbearing. According to these approaches childbearing is a social act, and that individual beliefs and behaviours are interdependent and are moderated by social interactions and social structures. Mechanisms such as social learning, social pressure, social contagion, and social support have been included in fertility models. They also claim that the decision to have a child, as a social act involves not only the child’s parents and grandparents, but also as a background siblings, friends, and institutions. This awareness is likely to influence them not only in the decision about whether to have a child, but also the timing of births and the number of births.

Local labour market conditions

On the top of the overall labour market situation, the local labour market conditions at the meso level can also influence fertility behaviour. Recent study of (Cavallini, 2024) sheds light on the heterogeneous response to changes in unemployment rates across different regions in Italy. The findings indicate consistent signs but notable variations in magnitudes across regions, with the South displaying lower responsiveness in both fertility and abortion outcomes to changes in the unemployment rate. In England (Aksoy, 2016), also provides evidence for the impact of local unemployment on fertility behaviour. On the other hand, (Matysiak et al., 2021) in their analysis after the Great Recession find that country context played a dominant role in recession-related fertility declines, as fertility change was highly differentiated across countries and in most countries the regional variation in recession-related fertility change was relatively small.

Extreme weather events

Climate change affects various aspects of everyday life of individuals and society, including fertility behaviour. Rose and Testa (2015) examined the impact of environmental conditions on human reproductive behaviours in highly industrialised countries. They observed that people's intended number of children is not strongly correlated with their concerns about climate change. Interestingly, they found that the greater the concerns, the higher the intended number of children. Consequently, they conclude that the desire for a pleasant and healthy environment for future generations does not deter people from planning large families.

While extreme weather events are not yet common in European countries, it is also worth noting that these have impact on fertility behaviour. Nobles et al. (2015) observed a sustained increase in fertility at an aggregated level after the 2004 Indian Ocean tsunami. Firstly, mothers who lost one or more children in the disaster were much more likely to give birth to additional children. Additionally, women without children before the tsunami initiated family-building earlier in communities where mortality rates due to the tsunami were higher. The observed rise in fertility following the disaster likely resulted from the concurrent operation of various mechanisms such as entering into new marital relationships, the desire to contribute to the rebuilding of families and communities, as well as the desire to have another child following the loss of a child (Nobles et al., 2015)

Similar results are found by (Davis, 2017), who analysed the effect of hurricane exposure on fertility in the affected regions in Nicaragua. The study's findings show that Hurricane Mitch, had a stimulative effect on fertility in the 2-year post-storm period. There were significantly higher odds of child being born in areas with higher mean precipitation.

3.3. Micro-level

At the micro-level (individuals and families), the factors that affect fertility resilience stem both from the individual and family capital, but also individual responses to the uncertainty, stemming from macro and meso-level factors.

Economic uncertainty

The subjective perception of employment uncertainty may change over time, both due to one's own experience and ongoing economic and political changes.

Vignoli et al. (2020) argue that in the last 40 years such consequences of globalisation and technological change as competitive prices, wider choice of goods and services, liberalisation of industries and markets impede individual decision making. The unprecedented speed, dynamics and volatility of these phenomenon increase the economic uncertainty. Many researchers have studied the significance of objective economic uncertainty indicators e.g. unemployment, temporary contract, job displacement or low income to fertility. For example, employment instability may discourage individuals to undertake long-term commitments and family formation which in turn lead to smaller family size or even childlessness (Alderotti et al. 2021).

Gatta et al. (2022) analysed the perceived stability of employment and perceived resilience to potential job loss as two essential dimensions of employment uncertainty related to fertility decision-making. They found that the perception of resilience to job loss is a strong predictor of fertility intentions, whereas the perception of employment stability has only a limited impact. Considering the macroeconomic context moderating the relationships between these two indicators of perceived employment uncertainty and fertility intentions they found that a strong relationship between resilience and fertility intentions did not depend on the unemployment rate or the share of fixed-term contracts in the place of residence.

There are also links between economic uncertainty and subjective perceptions. Alderotti et al. (2020) analyse the job instability in relation to subjective well-being and prove that the negative influence of job with uncertaHin conditions on fertility is found only when the life satisfaction is relatively low. Del Bono et al. (2015) show that employment effects are largest in the first year after job loss and rapidly decrease in subsequent years. Job loss leads to substantial reductions in fertility which appear to be stable at least over a horizon of 6 years.

The association between a change in subjective employment uncertainty and fertility intentions and behaviour were studied by Hanappi et al. (2017). They tested two situations: a rise in employment uncertainty and a decline in employment uncertainty. The findings reveal pronounced gender-specific impacts of alterations in employment uncertainty on the reconsideration of reproductive choices within the highly educated population (Hanappi et al., 2017). The impact of changes in employment uncertainty on the revision of fertility decisions pointed out by Hanappi et al. (2017) is in line with the findings that the study of fertility intentions should be conducted in the short term because the short-term intentions of a person are more accurate than their long-term ones (Philipov, 2009). Furthermore, survival models using both time-invariant and time-variant variables are worth considering in this context. (Hosmer & Lemeshow, 1999).

Fahlén and Oláh (2018) analysis at the micro level based on the European Social Survey show that the importance of men's labour market position for the fertility intentions was confirmed across all regimes, while women's perceived job security matters only at young ages and mostly in post-socialist and familialistic welfare regimes, but hardly in the liberal regime, which indicates the interplay between micro and macro factors.

Lowered reproductive capacity

The ongoing debate about postponement of childbearing and its consequences for achieving fertility intentions refers often to reproductive capacities which decline with increasing age of women. Greil et al. (2024) consider the increasing age at which women have first births a key source of the fertility gap in industrialised countries. Because fecundity among women decreases with age delaying childbearing diminished the chances of becoming a parent. The postponement in childbearing also results in greater rates of "women who complete their reproductive years having fewer children than they desired" (Greil et al. 2024).

Many policies have been designed to counteract this negative phenomenon, among others providing subsidised access to the assisted reproductive technology (ART) (Greil et al. 2024). ART is also discussed in the context of rising infertility, regarded by WHO as a relevant component of public health. Therefore, infertility adequate treatment by relevant policies and services are recommended to reduce its negative impacts on human reproduction (WHO,

2023). The use of ART in developed countries has increased in the last 40 years (Goisis et al. 2020) and has influence on childbearing trends – e.g. the ART has risen the number of women having children at very late childbearing age and due to the practice of using two or more embryos in one procedure has risen the proportion of multiple births (Sobotka et al. 2008; Kocourková et al., 2023; Lazzari et al., 2023). Habbema et al. (2009) argues that *in vitro* fertilisation is not only a solution to infertility problems of individuals but also has potential to boost national fertility rates. The postponement of parenthood and the increasing number of ART use suggest that the assisted reproductive technology will become more and more important in developed countries to support women's fertility plans at later age. Nevertheless, ART is not an egalitarian procedure - a study on Nordic countries highlights the persisting inequalities in the use of ART as the parents who conceive through ART had high income and education levels (Goisis et al. 2020). Another study in Denmark showed that the highly educated are the most likely to be successful in ART procedures (Groes et al. 2017).

Religion

Another individual-level factor discussed in the literature are links between religion and fertility behaviours. (Kolk & Saarela, 2024) use longitudinal data from Finnish national register on religious affiliation in Finland to examine childbearing behaviour of people born in 1956-1975. They identified higher fertility according to parity among members of the Evangelical Lutheran state church and other Protestant churches, and lower fertility among individuals with no religious affiliation. Most other religious groups— Orthodox Christians, Jews, Muslims, and adherents of Eastern religions had intermediate levels of fertility. (Stonawski et al., 2016) study the fertility behaviour of Muslim immigrants and find out that immigrant and socio-economic status of this population are more important than religion in terms of explaining their high fertility.

Family-level factors, lifestyles and attidutes

Family-level factors also play a significant role in fertility-related decisions. (Aassve et al., 2024) results suggest that fertility decisions are not made independently of other priorities, such as a fair division of labour within the family, egalitarian gender roles, and quality of relationships among family members.

Fertility behaviours on micro level depend on trade-offs with other dimensions of family life such as material and social constraints. They are not independent of other priorities, such as an equal division of labour within the family, egalitarian gender roles or quality of relationships among family members (Aassve et al. 2024).

Educational attainment

Grzenda (2019), while analysing the determinants of childbearing among women in Poland based on data from the Generations and Gender Survey (GGS) of 2014 and 2015, also investigated the influence of mothers' educational attainment on the women's likelihood of giving birth. She found that women whose mothers had at least higher education had a 52.31% lower chance of having a child compared to women whose mothers had a different level of education. Beaujouan and Berghammer (2009) also indicate the negative influence of education level on fertility as educated women show the largest gap between intended and realised fertility.

A study in Nordic countries analysed cohort fertility developments based on education and gender (Jalovaara et al., 2018) showed a change in cohort fertility with respect to education level - the negative educational gradients in fertility evident among the older cohorts of women has disappeared in the younger cohorts. In Denmark, Norway and Sweden young women's fertility was not determined by education level. What is more, there has been a reversal of the educational gap in childlessness among younger cohorts of women in these countries: childlessness among low-educated women has surpassed the levels of highly and medium-educated women (Jalovaara et al., 2018).

However, some researchers argue that a positive relationship between education and age at first birth may be partly spurious because of family background factors that cannot be controlled for in most research designs (Felix et al, 2017). Therefore, they have implemented a novel analytical approach using identical twin and biometric models. Their findings show that one year of additional schooling is associated with a later age at first birth of 1.5 months, in case of the within for the within-identical twin model controlling for all shared family background factors (genetic and family environmental). Biometric analyses reveal that it is mainly influences of the family environment not genetic factors that cause spurious associations between education and age at first birth.

Subjective measures of insecurity

Recently, subjective measures of insecurity such as trust, well-being, risk aversion, and time-discounting preferences have been considered by researchers as explaining fertility behaviour (Vignoli et al. 2020). Schmidt (2008) in his analyses shows that risk preferences play a role in fertility timing and differ the incidence of infertility problems.

4. Resilience as a foundation for fertility dynamics: defining an analytical framework

In this section, we propose how the theoretical framework of resilience proposed by Aassve and Bastianelli (2024) can be applied to the process of making fertility decisions (Table 5). At the macro, meso, and micro levels, disruptive factors determine fertility-related behaviours at the individual level. Meanwhile, aggregating behaviours at the individual level allows for concluding resilience at the meso and macro levels.

Table 5. Resilience framework in fertility behaviour

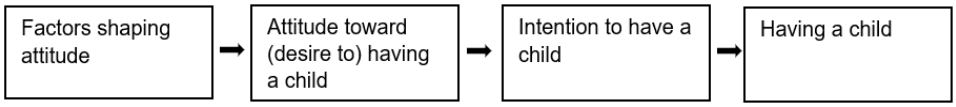
Level	Disturbances	Life-course capital and resources	Outcomes
Macro	Climate change COVID-19 pandemic Economic crisis/ Recession Shift in social norms concerning parenthood	Comprehensive healthcare reproductive health services (pre-natal care, infertility diagnosis and access to ART) Well-developed early childcare and education full-time schools parental leave policies flexibility in terms of time and place to work 'gender egalitarian' policies Work-life balance policies	Macro-level fertility trends
Meso	Changes of local labour markets Changes in local governance and policies Natural disaster at the local level Shift in social norms concerning parenthood	heterogeneous social networks density of the social network social integration Local family policies Access to childcare Quality of educational institutions Family arrangements Kinship networks	Fertility-related behaviour at the family and societal levels
Micro	Job loss Health status/infertility risk Income instability Dissolution of partnership	Capital: economic, social, human and institutional: educational attainment, health status, household composition, household wealth, housing situation	Individual fertility behaviour

Source: Authors' own elaboration

A schematic presentation of such fertility decision-making is presented in Figure 7. At each of the mentioned stages, disturbances may occur that will influence the final decision regarding parenthood. The starting point is the analysis of factors shaping attitudes towards children. These factors include personal characteristics, institutional policies, and societal values (Ajzen & Klobas, 2013). These attitudes are a person's internal evaluation whether having a child will be positive or negative experience (Mencarini et al., 2015). Equally significant are the normative beliefs and expectations of either a group or an individual, which exert social pressure. At this stage, various factors are taken into consideration, which may either facilitate or hinder the ability to perform a given behaviour. Life-course capital and resources are significant, alongside a subjective assessment of the material resources, the childcare possibilities, as well as the presence of a suitable partner. An affirmative assessment of these possibilities shape fertility intentions. The emergence of disturbances at this stage may disrupt

the formation of a favourable fertility intentions. The next stage involves the transformation of intentions into fertility behaviours. At this final stage, it is expected that fertility intentions will result in either having or not having a child to the extent that individuals are truly capable of achieving their goals (Ajzen & Klobasa, 2013). However, unexpected events, both at the individual and global levels, may disrupt the transformation of fertility intentions into behaviours.

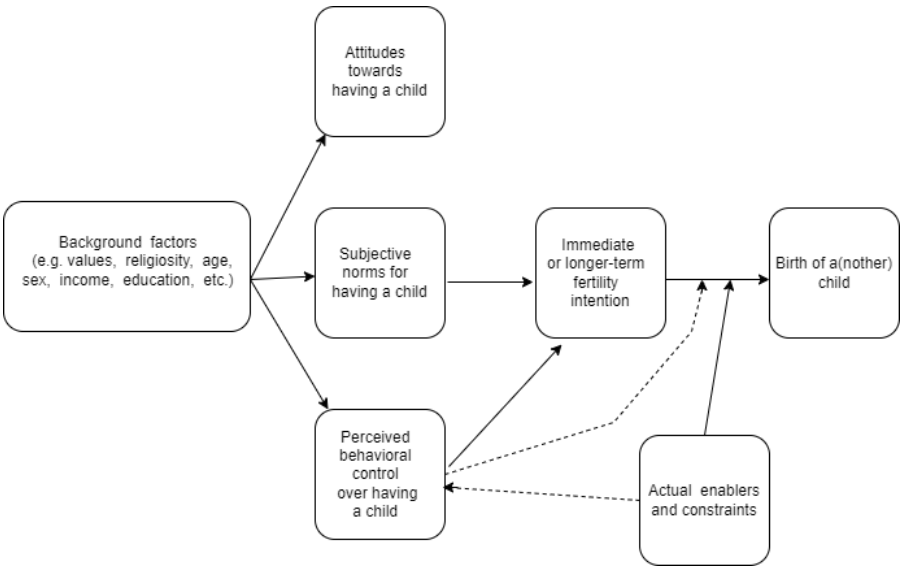
Figure 7. A general schematic presentation of the fertility decision-making



Source: Authors' own elaboration

To describe the path leading to fertility behaviour the Theory of Planned Behaviour (Ajzen, 1991, Ajzen & Klobas, 2013) is often used. Mencarini et al. (2015), examining fertility intentions and their outcomes according to the Theory of Planned Behaviour (TPB), locate "actual enablers and constraints" between the moment of fertility intentions declaration and their subsequent realizations. However, they emphasize that these factors were insufficiently taken into account in their study due to data limitations. Dommermuth et al. (2015), utilizing the TPB as a theoretical framework in research on the realization of positive fertility intentions (Figure 8), at the same stage as Mencarini et al. (2015), indicate the potential actual enablers and constraints. Dommermuth et al. (2015) indicated that fertility intention's time frame is relevant for childbearing behaviour. Moreover, childless people were less likely to realize their fertility intentions than parents. Thus, both the time frame and whether one already has children or not may influence resilience to unexpected events in the context of fertility behaviours.

Figure 8. A schematic presentation of the fertility decision-making process according to the Theory of Planned Behaviour



Source: Dommermuth et al. (2015)

The analysis of fertility should be rooted in life-course research, which focuses on how various aspects of life interact to shape individual life trajectories (Vignoli et al., 2022). At each stage of shaping fertility decisions, unforeseen adversities may arise. For example, economic instability might not only result in delaying or avoiding fertility but also in postponing marriage or entering into relationships (Vignoli et al., 2016). How an individual manages to achieve positive adaptation in the face of such challenges reflects their resilience to such phenomena.

Therefore, in the analytical framework in the FutuRes project we plan to follow the life-course approach based on the GGS data. Using the sequence analysis, we will aim at identifying groups that have different life-course patterns and see how these are linked to fertility motivations, as presented in the Box 1 (Mynarska & Raybould, 2020), as well as observed fertility patterns.

Box 1. Fertility motivations in the experimental module of Generations and Gender Survey

Positive motivations	Negative motivations
There are many reasons why people decide to have a child. Please indicate how important is each of them to you personally? Completely unimportant, rather unimportant, neither important nor unimportant, rather important, strongly important. 1. Strong maternal / paternal instincts 2. Having a child makes the parents' relationship stronger 3. Having a child parents fulfil their religious values about family life 4. Having a child brings lifelong happiness 5. The child is a confirmation of the parent's fertility 6. Guiding and teaching your* child is greatly satisfying.	There are many reasons why people decide not to have a child. Please indicate how important is each of them to you personally? Completely unimportant, rather unimportant, neither important nor unimportant, rather important, strongly important. 1. Pregnancy and delivery are strenuous for women. 2. Being responsible for your* child is very difficult. 3. Raising a child limits parents' freedom to do other things. 4. Raising a child is a great burden on parents' time and energy 5. It is difficult to combine work and childrearing. 6. Having a child adds strain to the relationship between the parents.

Source: Mynarska & Raybould, 2020

Using the harmonised GGS data we plan the identify differences in early adult life-course patterns, in particularly related to fertility. Logistic regression models will be used to analyse the statistical relationship between life-course patterns, fertility patterns, and childbearing history and selected resilience stressors and markers, such as labour market uncertainty, health, educational attainment, that are identified in this working paper. We will analyse data from the harmonised Wave 2 of GGS in selected countries, distributed geographically, with different welfare regimes and fertility developments (Czechia, Finland, Austria, Croatia, Denmark) and analyse the regression results with the contextual information related to the socio-economic situation and characteristics of the welfare state and family policies.

Furthermore, we plan to implement regression models with the focus on fertility intentions, with multi-level framework, with the goal to estimate the role of the markers in fertility resilience.

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