Fertility, Gap Between Ideal and Reality: Cross-Sectional Analysis of Fertility Decline in 17 High-Income Countries

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ABSTRACT

To maintain the current population of a country in the long run, the key threshold of the fertility level is 2.1 births per women. Among the approximately 80 countries that so far have reached this so-called replacement level fertility, almost all have not stabilized fertility at this level. Instead, their fertility has moved below the 2.1 replacement rate (United Nations, 2017; World Bank, 2019). We define the end of the demographic transition as the period when the fertility rate reaches 2.1 births per women, and label what follows as a "post-transition period", which, if they continue, will result in a decline in the native-born population. This thesis investigates the trends of actual fertility measured by TFR and CFR and compares with variation of the ideal number of children (fertility ideal) in 17 high-income countries that are in the post-transition period. First, the analysis of actual fertility using TFR and CFR measures indicated a general downward trend of fertility among 17 high-income countries under study. We find the fertility trend of post-transition countries is quite established as either having "moderately low" or "very low" fertility regardless of which fertility measure we use. Second, using the cross-sectional data derived from the ISSP 2012, the analysis of expressed fertility ideal shows that the perceived fertility ideal in all the countries under study is higher than the actual fertility rates. Moreover, the fertility ideal is higher than the replacement level of 2.1 in 16 out of the 17 countries under study. Our analysis further reveals that the gap between actual fertility and expressed ideal fertility is smaller in countries where the level of individualism and realized gender equality are known to be high. We argue that the prevalence of individualism that support gender equality may contribute to the decline of fertility ideal because individuals' goals and achievements, regardless of gender, are encouraged in individualistic societies. In such a society, the gap between actual and ideal fertility, however, may become smaller as people are better able to realize fertility ideal because individualistic societies may put larger efforts in creating social settings such as generous family-friendly policies, where the childrearing does not constrain one's goals and achievements.

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LIST OF ABBREVIATIONS

TFR	Period Total Fertility Rate
CFR	Cohort Fertility Rate
ASFRs	Age-Specific Fertility Rates
ISSP	International Social Survey Programme

CHAPTER 1

Introduction

To maintain the current population of a country in the long run, the key threshold of the fertility level is 2.1 births per women. The average fertility level must be slightly above 2, since some children die before they themselves reach the beginning of their reproductive cycle (i.e. puberty). In ever-more countries, however, it is observed that fertility level falls below this so-called "replacement level" of 2.1 births per woman. According to the United Nations Population Prospects 2017 (United Nations, 2017), 83 countries have fertility below the replacement level during 2010-2015 and a third of these countries have even lower fertility, below 1.5 births per women. Fertility decline, however, has been widely acknowledged as a fate of population development, possibly applicable to every country that goes through the demographic transition.

The demographic transition is a generalized statistical tendency that describes a demographic shift of a society over time based on changes in the balance between mortality and fertility rates (Lindstrand, 2006). It is important to differentiate between the demographic transition as a statistical tendency, which is by now a well-established empirical tendency that can be observed, so far, in all countries where fertility data are available, and theories about why this statistical tendency exists. The classical demographic transition model includes four stages (Sloggett, 2015). In stage 1, which is associated with pre-modern societies, mortality and fertility are equally high. Given that a size of the population is determined by a balance between mortality and fertility, the population remains stable. In stage 2, mortality start to decline while fertility remains high. Because there are more births than deaths, a society experiences a phase of rapid population growth in this period. In stage 3, fertility also starts to decline while the mortality remains low and stable. The pace of population growth slows down in this stage while the gap between the number of births and deaths narrows. In stage 4, the population gradually become stable again, with equally low mortality and fertility.

Although there may be a significant difference in its timing, pace and leading causes across countries when the transition occurs, the statistical study of the demographic transition implies that global population development keeps on a converging trend with regard to both mortality and fertility decline.

Demographers have proposed possible trajectories following stage 4 (Esping-Andersen & Billari, 2015; Lesthaeghe, 2010). Is the demographic transition finalized when a country reaches replacement level? Or does the demographic transition continue also after an average of 2.1 children per woman is reached? So far no consensus has been made in regard to this question. In this thesis, we define the end of the demographic transition as the period when the fertility rate reaches 2.1 births per women, and label what follows as a "post-transition period"; considering that the classical demographic transition projects the population to be stable in stage 4 and that 2.1 births per women is the fertility level necessary for the native population not to contract at some point in the future. With this definition, the post-industrial societies that presently have below-replacement fertility levels are located in the post-transition period, which, if they continue, will result in a decline in the native-born population. That is, without substantial net immigration, the population of the country will at some point start to decline.

Among the approximately 80 countries that so far have reached replacement level fertility, almost all have not stabilized fertility at this level. Instead, their fertility has moved below the 2.1 replacement rate (United Nations, 2017; World Bank, 2019) .

Persistent below-replacement fertility is not only a demographic concern but also entails various social and economic consequences. Firstly, the projected reduction of the working age population may induce significant shortage in labor supply which influence the growth rate of GDP and GDP per capita, which may result in losing national strengths and their positions as relatively wealthy countries with high industrial and human capital development (Rindfuss & Choe, 2016). Secondly, declining fertility rates results not only in population shrinkage, but also in a more aged population. A reduction in the number of the working age may lead to the decrease of tax revenue to fund the social security system including old-age pension and healthcare, which affects the sustainability of the current social security systems in the long run (Kurjak, Stavljenic Rukavina, & Stanojevic, 2012; Rindfuss & Choe, 2016; Takayama & Werding, 2011)

The topic for this master thesis is to investigate what happens once a country crosses the threshold to below-replacement fertility. The investigation includes two perspectives – actual fertility rates and perceived fertility ideal (ideal number of children) and the thesis is divided

in two parts accordingly. These are questions to be elaborated in Chapter 2 in the thesis: 1) Do countries with below-replacement fertility converge on similar (below-replacement) fertility levels, or is there persistent variation between countries with "far below" replacement fertility levels, versus "close to" replacement fertility levels? 2) Further, is the trajectory after having moved below 2.1 births per woman similar or different between below-replacement fertility countries (for example, more or less steep)? 3) Do such countries at some point reach a stable (so far) below-replacement fertility level, or is there persistent volatility (up/down movements) in their fertility level? These are questions to be elaborated in Chapter 2 in the thesis.

Further research questions, to be addressed in Chapter 3, concerns if the population in below-replacement fertility countries have adjusted their perception of an "ideal fertility level" to the actual fertility levels. To which extent this is the case (or not), may indicate the eventual potential for future changes in fertility levels. Follow-up research questions include: 1) Is an eventual discrepancy between perceived ideal fertility and actual fertility larger in some countries than others? 2) Does the ideal fertility level vary within countries, for example between men and women or between birth cohorts? Investigating to which extent below-replacement fertility trajectories corresponds with what the population in a country regards as "ideal" fertility levels, may shed light on an important debate involving demographic as well as family-policy research: Could there be a pent-up demand for policies that may result in higher actual fertility levels in the future, or is there no indications of widespread dissatisfaction with present fertility levels and trajectories?

CHAPTER 2

Investigating Trends of Actual Fertility in 17 High-Income Countries

1. Fertility Measures: Total Fertility Rate and Cohort Fertility Rate

One of the difficulties that fertility research faces is the choice of the fertility measure. Which fertility measures best reflect the fertility trend of a society? Do women in a society with a fertility rate of 1.3 actually give 1.3 births in average? And can an observed fertility decline be an artefact of the fertility measure used? To investigate this issue, two measures of fertility were compared – the Period Total Fertility Rate (TFR) and the Cohort Fertility Rate (CFR).

The first measure is the most commonly used. However, as we will further elaborate in this chapter, an eventual decline in TFR may not be due to declining fertility as such – a theoretical alternative is that it may simply reflect that women give birth to children later in life than earlier. The CFR, by contrast, measures fertility at the end of the reproductive cycle of a birth cohort of women. A decline in CFR cannot be "explained away" as possibly only being due to delaying births. By comparing how countries score on TFR and CFR, including studying the trends, we investigate if countries who have all reached the end of the demographic transition (defined as crossing the threshold to below reproduction fertility), experience similar or different post-transition fertility trends. To begin with, we will first present the strengths and weakness of the two most widespread fertility measures.

1.1. Total Fertility Rate (TFR)

The period total fertility rate (TFR) is the most common measure of fertility based on period data (for example, a year, or a five-year period), which indicates the number of children a woman would have at the end of her reproductive period if she was to pass through the Age-Specific Fertility Rates (ASFRs) that existed in the year for which the period TFR was calculated (Rindfuss & Choe, 2016; Wachter, 2014).

The ASFRs refer to simple fertility rates of specified ages or age groups, constructed by the annual number of births to women of a specific age in a stated period divided by the number of women of the same age in the same period. In short, the period TFR is a sum of ASFRs through the reproductive age of a stated year (Delamater & Poston Jr, 2019; Sloggett, 2015).

The TFR is the most widely used measures of fertility due to its intuitiveness, comparability and timeliness (Delamater & Poston Jr, 2019; Sloggett, 2015; Wachter, 2014). Firstly, often described in an easily understood metric such as the average number of children per woman, the TFR provides a powerful yet simple interpretation of fertility of a society. Secondly, because the TFR is calculated with the ASFRs which depict the average number of births by age or age group, the TFR is a standardized measure that have removed irregularities that may have occurred due to different age distribution of the population. This enables us to compare the TFR internationally without concern about the different population structures of countries. Unlike the study on cohort fertility data (to be discussed further below), which

requires for birth cohorts in question to have complete their reproductive years, the TFR provides insights in today's fertility based on current age-specific fertility rates.

Reflecting the fact that increasing number of countries experience fertility decline and that a degree of the decline varies from country to country, demographers have established thresholds to group countries according to the levels of fertility. The replacement level fertility - a TFR of 2.1 births per women, has been commonly used as an upper threshold of entering "low" fertility (Morgan, 2003). While a TFR below 1.5 births per women is often used as a threshold of "very low" fertility (McDonald, 2006). Therefore, in this thesis "moderately low" fertility is defined as a TFR of 1.5 and above up to 2.09, while "very low" fertility is defined as a TFR below 1.5.

Although the TFR serves as the most widely used international standard measure of fertility, the TFR cannot be more than a hypothetical measure of fertility because it is based on an assumption that the current ASFRs across age groups will stay unchanged in the future (Wachter, 2014). Moreover, the TFR can fluctuate considerably by changes in the timing of birth. This so-called "tempo effect" occurs if women in a given age group (birth cohort) give birth at either earlier or later ages than women in similar age groups (birth cohorts) did in previous years/time periods (Bongaarts & Feeney, 1998; Delamater & Poston Jr, 2019). Hence the TFR can decrease across time either because overall fertility declines, or because women increasingly postpone when in their reproductive life cycle they give birth to children; or due to a combination of the two. It is thus important to understand that the TFR is sensitive to changes in the timing of births. In short, the fluctuation of the TFR does not necessarily mean that women from later birth cohorts are having less (or more) births throughout their lives than women who belong to birth cohorts born earlier. It may alternatively mean that they postpone when to have their children more (or less) than women born earlier. To be able to differentiate these two tendencies, we may study changes in another measure of fertility, the total cohort fertility rate.

1.2. Total Cohort Fertility Rate (CFR)

In contrast to the TFR which is sensitive to eventual changes of timing of birth, the total cohort fertility rate (CFR), also known as completed cohort fertility rate, provides reliable

fertility trends reflecting the actual number of births through women's reproductive years. The CFR represents the average number of children born to women in a specified birth cohort at, or close to, the end of their reproductive cycle (usually measured at 40, 45 or 50 years of age). It has the benefit of high degree of reliability and stability (Delamater & Poston Jr, 2019; Rindfuss & Choe, 2016). However, the CFR has a limitation to explain the most recent changes in fertility trends because it can only be computed for women who have reached the end of their reproductive histories, which may take nearly 50 years. For instance, as of 2020, the latest cohort that have completed their reproductive years would be those who were born in 1970 (when measured at 50 years old). Given that data for the 1970 birth cohort is the latest, we can only acquire the fertility trend of older birth cohorts born in and before 1970, who consequently may have different fertility behaviors than younger birth cohorts still in the middle of their fertile period.

There is also variation of the CFR observed across countries. Unlike the TFR, a commonly accepted dividing line between "moderate low" and "very low" fertility is not defined by many authors in the research literature. However, recent studies on the CFR adopted a CFR of 1.75 as a threshold to group countries with "very low" cohort fertility (Myrskylä, Goldstein, & Cheng, 2013; Zeman, Beaujouan, Brzozowska, & Sobotka, 2018). This thesis also adopts a threshold of 1.75 and label a CFR below 1.75 as "very low" birth cohort fertility, while a CFR of 1.75 and above up to 2.09 is defined as "moderate low" birth cohort fertility.

With the above presentation of strengths and weaknesses of TFR and CFR as measures of changes in fertility levels, let us move on to investigate how countries place themselves according to these measures, limited to countries that have moved below a TFR of 2.1 children per woman threshold (defined above as post-transition countries).

2. Analysis of Actual Fertility Using TFR and CFR Measures

2.1. Choice of Countries

Our first selection criteria was to limit the countries under study to those that had reached the threshold of 2.1 children per women or below, defined as post-transition countries. Among 83 countries that have TFR fertility below the replacement level during 2010-2015 (United

Nations, 2017), countries to be studied were further limited to high-income countries for the following reasons:

First, high-income countries are expected to share economic, social and environmental commonalities which standardize the state of development. Being high-income countries, these states should also have the fiscal capacity to introduce and fund various types of family-friendly policies, if they wish to do so. Further, high-income countries are characterized by its high proportion of female students who enrolled in tertiary education, which has been even higher than male students since 1990 (World Bank, 2020c). Considering that the level of education is known to be strongly related to income, this implies that a large number of women in high-income countries have high earning potentials. Finally, the child mortality rate has been extremely low and stable in high-income countries, compared to middle- and low-income countries, owing to their highly improved living conditions including access to clean water, developed infrastructure and high level of medical care. Very low child mortality is not only a pre-condition to empirical tendency of the demographic transition but also an indication of similarly high level of living environment in high-income societies.
Countries were categorized as high-income countries as defined by the World Bank: A country with a gross national income (GNI) per capita of $12,376 or more (World Bank, 2020a). Countries that have a GNI above this threshold are expected to share the above commonalities in terms of economic, social and environmental aspects that indicate a similar state of development.

In addition, high-income countries with a population lower than 2 million were excluded, because they may be atypical in various ways due to their extremely limited populations, thus "similar state of development" as discussed above may not be relevant.

Finally, the choice of high-income countries to study was limited by data availability. The high-income countries to be studied were limited to those where we have comparable data availability of both TFR and CFR (to be used in this chapter) and also with regard to the ISSP dataset to be used in Chapter 3.
For data used in this chapter, there is one exception. We included CFR data for South Korea (Korea), even though it was retrieved from a different database from the others due to data unavailability. The reasons for adding Korea in our analysis are that we wanted to have

regional variation in our sample, and that Korea is at demographically unique position for recording the lowest fertility rate in the world as of 2018 (World Bank, 2019).
For data used in Chapter 3, in order to have comparable data, the number of countries singled out for study using the ISSP data set were narrowed down further based on these criteria; The total number of respondents in the ISSP sample is at least 1000; and the gender ratio in the country sample does not exceed 6:4 (ideally 5:5). These additional selection criteria were used to ensure a balanced sample in terms of the total number and gender ratio, to enhance the reliability of the results.
Although Spain met these ISSP criteria, Spain was not included in the analysis because answer categories in many questions in the Spanish questionnaire differed from the ISSP standard, thus the results from Spain could not be compared with the other ISSP countries in a straightforward manner.

Based on the reasons and selection criteria above, the following 17 countries were selected for our analysis: Austria, the Czech Republic, Denmark, Finland, Germany, Hungary, Japan, Korea, Lithuania, the Netherlands, Norway, Poland, Portugal, Slovakia, Sweden, Switzerland and the United States.

2.2. Trend of the TFRs in 17 High-Income Countries

The TFR was retrieved from the World Bank database. Considering the fact that TFR can change from year to year due to random fluctuations as well as the tempo effect, comparison of the TFR between individual years was avoided. Instead, the average TFR in each decennial period, named D1-D5 between 1968 to 2017 was compared. In this section, we investigate the trend of the TFRs for last 50 years with addressing the three questions raised in chapter 1; if a below-replacement fertility is a permanent characteristic of the chosen high-income post-transition countries; if the high-income post-transition countries follow the similar or different trajectories; if the fertility level of the high-income post-transition counties has stabilized at some point.

First, the average TFRs of the latest decade D5 (2008-2017) in table 1 show that all of the countries have fertility well below the replacement level necessary to maintain the current population of a country in the long run, ranging from the lowest 1.20 of Korea to the highest 1.90 of Sweden.

Then, when did these countries cross the 2.1 threshold? Looking at the transition of the average TFRs since 1968-77 in table 1, 9 countries out of the 17 countries under study - Austria, Denmark, Finland, Germany, Hungary, Japan, Sweden, Switzerland and the United States, already had the TFRs below the replacement level in D1 (1968-1977). Further, in the Czech Republic, Lithuania, the Netherlands, Norway and Portugal, the below replacement TFR level was observed in D2 (1978-1987). Finally, the rest of the countries - Korea, Poland and Slovakia, entered the post-transition period in D3 (1988-1997). Although there is a difference in the timing when a country crosses the threshold of 2.1 births per woman, no country among the countries under study that has crossed the threshold of 2.1 births per woman, has so far reached the replacement level again.

Second, although all countries presently have the below-replacement fertility, their post-transition pattern is not identical (Figure1). In countries such as Korea and Portugal, the TFR have continued to decline since they have entered the post-transition period while the rest of the countries have experienced an increase in at least one of the periods since they have entered the post-transition period. More precisely, the TFR of countries such as Austria, the Czech Republic, Hungary, Japan, Lithuania, Poland, Slovakia, and Switzerland saw a recovery in the latest decade of D5 after several decades of continuous decrease. Further, the TFR of Denmark, Finland, the Netherlands and Norway have increased since D3. The TFR of Sweden and the United States showed rather unique trajectories but their TFR have never reached “very low” fertility level (TFR <1.5).

The “steepness” of decline is another factor to analyze in the fertility trajectories of post-transition countries. However, because the TFR is sensitive to tempo effect and it can considerably fluctuate year to year as discussed earlier, comparing the steepness of the fertility decline using differences between periods is avoided. Nevertheless, considering its change from having the highest fertility rate in D1 to having the lowest fertility rate in D5, we can conclude that Korea’s fertility decline, in particular, has been proceeding with an outstanding speed.

Third, the fertility level of 14 out of the 17 countries under study have stabilized between D4 and D5, yet at rather different levels: moderate low fertility level (1.5≤ TFR <2.1) in Denmark, Finland, the Netherlands, Norway, Sweden and the United States; very low fertility level (TFR <1.5) in Austria, Germany, Hungary, Japan, Korea, Poland, Portugal and

Slovakia. The fertility level of the other three countries - Czech Republic, Lithuania and Switzerland fluctuated between moderate low and very low level between D4 and D5.

The analysis of TFR in the high-income post-transition countries in table 1 and Figure 1 shows that there are no countries whose TFR have reached back to the replacement level once it was crossed. Further, the different post-transition trajectories may have led to bipolarized patterns of present (D5) level of TFRs. 6 out of the 9 countries that presently have moderate low TFR level such as Denmark, Finland, the Netherlands, Norway, Sweden and the United States have not reached very low TFR level (<1.5) in the last five decades[1], even after they entered the post-transition period. In contrast, the TFR of 8 countries that presently have a very low TFR level, have continued to decline to reach very low fertility level. Although a recovery in TFR was observed in 6 out of the 8 of the countries in D5, their TFRs still stays below 1.5.

Table 1 *TFR Average and Gap in Decennials between 1960 and 2017 (ordered by smallest to largest value of TFR in D5)*

	a. Avergae					b. Gap between periods			
	D1 1968-1977	D2 1978-1987	D3 1988-1997	D4 1998-2007	D5 2008-2017	D2-D1	D3-D2	D4-D3	D5-D4
Korea	3.95	2.19	**1.62**	1.26	1.20	-1.77	-0.57	**-0.36**	**-0.06**
Portugal	2.88	**2.01**	1.51	1.44	1.32	-0.88	**-0.49**	**-0.07**	**-0.12**
Poland	2.25	2.28	**1.87**	1.30	1.36	0.04	-0.42	**-0.57**	**0.06**
Hungary	**2.09**	1.87	1.69	1.31	1.38	**-0.22**	**-0.18**	**-0.38**	**0.07**
Slovakia	2.49	2.30	**1.82**	1.26	1.41	-0.20	-0.47	**-0.56**	**0.14**
Japan	**2.04**	1.76	1.50	1.32	1.41	**-0.28**	**-0.26**	**-0.18**	**0.09**
Germany	**1.76**	1.39	1.34	1.35	1.45	**-0.37**	**-0.05**	**0.02**	**0.10**
Austria	**2.06**	1.56	1.46	1.38	1.46	**-0.50**	**-0.10**	**-0.08**	**0.08**
Switzerland	**1.88**	1.53	1.53	1.44	1.52	**-0.35**	**0.00**	**-0.10**	**0.09**
Czech Republic	2.17	**2.04**	1.60	1.23	1.52	-0.13	**-0.44**	**-0.38**	**0.30**
Lithuania	2.26	**2.06**	1.78	1.33	1.59	-0.21	**-0.27**	**-0.45**	**0.26**
Netherlands	2.11	**1.54**	1.57	1.71	1.72	**-0.57**	**0.03**	**0.14**	**0.01**
Finland	**1.73**	1.65	1.78	1.76	1.74	**-0.08**	**0.13**	**-0.02**	**-0.03**
Denmark	**1.93**	1.49	1.72	1.77	1.77	**-0.44**	**0.23**	**0.06**	**0.00**
Norway	2.28	**1.71**	1.88	1.83	1.83	-0.57	**0.17**	**-0.05**	**0.00**
United States	**2.07**	1.82	2.01	2.05	1.89	**-0.25**	**0.19**	**0.04**	**-0.16**
Sweden	**1.86**	1.68	1.90	1.67	1.90	**-0.18**	**0.22**	**-0.23**	**0.22**

a. Average: Figures in bold shows a period when countries entered the post-transition period (TFR<2.1)
b. Gap: Figures in bold shows gaps after countries enetered the post-transition period (TFR<2.1 in both comparing periods)

[1] Although Denmark once had a dip below 1.5 in D2 (1.49).

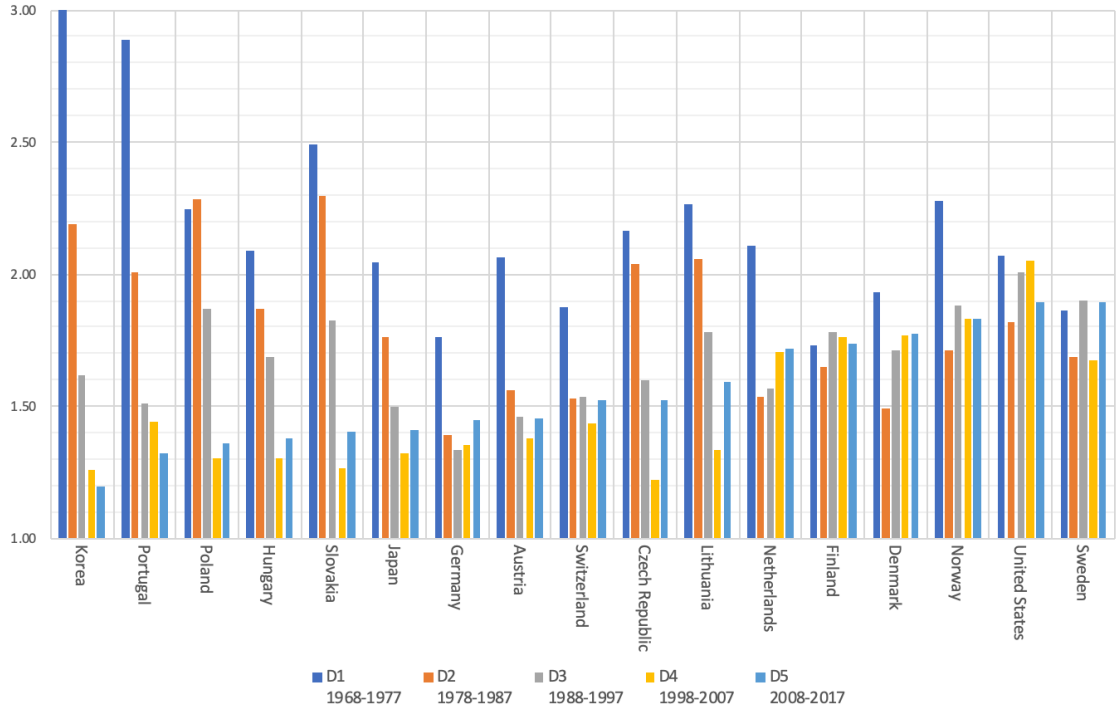

Figure 1 *TFR Average in Decennials between 1960 and 2017 (ordered by smallest to largest value of TFR in D5)*

2.3. Trend of the CFRs in 17 High-Income Countries

As stated earlier, a weakness with TFR as a fertility measure is that we cannot differentiate between a tendency that women born later have lower fertility overall, or if they only postpone their births till later in their life cycle than earlier birth cohorts of women (labelled the tempo effect). Previous research have revealed that women in most high-income countries do indeed postpone the birth of their first child till later in the life cycle, which is a tendency that corresponds to more women in later birth cohorts pursuing higher education and career (D'albis, Greulich, & Ponthière, 2017; Frejka & Sobotka, 2008; Mills, Rindfuss, McDonald, & te Velde, 2011). The question is if this "tempo effect" is the main, or only, reason why TFR drops in table 1, or if the later start of giving birth also goes together with a trend towards ending up with fewer children overall, at the end of the reproductive cycle (somewhere between age 40 and 50). To investigate this, we now turn to study the trends in cohort-fertility rates (CFR). Do they also slide downwards for most countries, or are they perhaps more stable than TFR rates – perhaps even reaching 2.1 children per woman on average?

The CFRs of the same 17 countries were compared. For all countries except for Korea, the CFRs were retrieved from the Human Fertility Database. This database has attained raw data from national statistics of each country and computed the CFRs with the highest age

available, but not lower than age 44, of women who belong to each birth cohort. For Korea, the CFR was retrieved form the Cohort Fertility and Education Database based on 2010 census since data for Korea was not available in the Human Fertility Database.

Although the CFR is more stable than the TFR as it reflects the actual number of births throughout the reproductive age, random fluctuations between years may occur. We thus computed the average CFR for 5 years between 1950 to 1974, labelled F1-F5. The reasons to apply 5-year span rather than 10-year span was due to limited and shorter duration of years in which CFR data was available. For some periods of some countries, particularly F1 and F5, data was not available for a full 5-year. In such periods, the average was computed with years in which CFRs were available. Here again, we investigate 1) if a below-replacement fertility is a permanent characteristic, 2) if the trajectory of fertility is similar between countries that crossed a 2.1 threshold, and 3) if the CFRs have stabilized at some point, in comparison with the TFRs.

As shown in table 2, data on the CFRs depicted a slightly different picture from the TFRs, but the general downward trajectory holds.

First, the CFRs of all the countries are below the replacement level of 2.1 as of the latest data in F5 (1970-1974), with the exception of the United States. When looking at the timing when they entered the post-transition period, 13 out of the 17 countries under study - Austria, Denmark, Finland, Germany, Hungary, Japan, Lithuania, the Netherlands, Norway, Portugal, Sweden, Switzerland and the United States, had a below-replacement fertility and entered the post-transition period already in F1 (1950-1954). The Czech Republic entered the post-transition period in F2 (1955-1959), Korea entered in F3 (1960-1964) and Poland and Slovakia entered in F4 (1965-1969). Further, as well as the TFRs, countries that had once passed the threshold to below-replacement CFR have so far ended up with a CFR below-replacement level, with the exception of the United States, where the latest CFR (in F5) is 2.17.

Second, Table 2 and Figure 2 show that the post-transition CFR fertility pattern varies somewhat across countries, although, as stated above, a declining trend is observed in 12 out of the 17 countries under study across time from F1 to F5. In 11 countries – Austria, the Czech Republic, Germany, Japan, Korea, Lithuania, the Netherlands, Poland, Portugal,

Slovakia and Switzerland, the CFR showed a continuous declining trend since they entered the post-transition period although its speed and degree of decline varies. For Hungary, the CFR started to decline in F4, which was after 3 periods (=15 years) since they had entered the post-transition period. Finland, Norway and Sweden have more or less maintained their CFR stable across time. Denmark and the United States were the only countries whose CFR has been increasing. Among them, only the United States has reached above the replacement level again.

To compare the "steepness" of decline, gaps between each period since countries have entered the post-transition period, were compared (Table 2b). Hungary, Japan, Korea, Lithuania, Poland and Portugal had a relatively large drop with more than 0.10 in at least one between-periods, which suggests a steep decline of the CFR. Considering that Japan and Portugal had the relatively large drops in two between-periods, we can assume that the CFR of Japan and Portugal has declined with highest steepness after they entered the post transition period. This may suggest that in particular women in these countries are not only delaying births to their later age, but are also increasingly having a smaller number of children throughout their reproductive ages. In contrast, gaps between each period were not below -0.05 across time in Denmark, Finland, the Netherlands, Norway, Sweden (Table 2b). These are simultaneously the countries that also have maintained their TFR above the moderate low level across time between D1 and D5 (Table 1a).

Third, the fertility level in 15 out of the 17 countries under study have stabilized between F4 and F5 at rather different levels: moderate low level (1.75≤ CFR <2.1) in the Czech Republic, Denmark, Finland, Hungary, the Netherlands, Norway, Poland, Slovakia and Sweden; very low level (CFR <1.75) in Austria, Germany, Japan, Lithuania and Switzerland. The United States is the only countries whose CFR have stabilized above 2.1 between F4 and F5. The fertility levels of the other two countries – Korea and Portugal moved from moderate low to very low level between F4 and F5.

Comparing Table 1 and Table 2, we found that the CFRs are generally higher than the TFRs, ranging from the lowest 1.45 of Japan to the highest 2.17 of the United States (Table 2a). This indicates that some of the steep decline in TFR observed in Table 1 is indeed due to women across countries generally have their first child later in their life cycle, and then to some extent manage to "make up for this later start" by having additional children before the

end of their reproductive cycle. However, with the exception of the United States, they have not been able to catch up all the way to the replacement level, at least with regard to the birth cohorts where CFR is available (cohorts born before 1974).

Table 2 *CFR in 5 Years Average and Gaps between 1950-1974 (ordered by smallest to largest value of CFR in F5)*

	a. Average					b. Gap between periods			
	F1 1950-1954	F2 1955-1959	F3 1960-1964	F4 1965-1969	F5 1970-1974	F2-F1	F3-F2	F4-F3	F5-F4
Japan	**1.98**	1.93	1.75	1.54	1.45	**-0.05**	**-0.18**	**-0.20**	**-0.09**
Germany	**1.69**	1.67	1.62	1.52	1.54	**-0.02**	**-0.05**	**-0.09**	**0.02**
Switzerland	**1.77**	1.75	1.74	1.66	1.64	**-0.01**	**-0.01**	**-0.08**	**-0.02**
Austria	**1.82**	1.73	1.67	1.63	1.64	**-0.09**	**-0.06**	**-0.04**	**0.01**
Portugal	**2.06**	2.00	1.88	1.79	1.67	**-0.06**	**-0.12**	**-0.09**	**-0.11**
Lithuania	**1.97**	1.96	1.79	1.74	1.72	**-0.02**	**-0.17**	**-0.05**	**-0.03**
Korea	2.49	2.10	**1.95**	1.88	1.73	-0.40	-0.15	**-0.06**	**-0.15**
Netherlands	**1.88**	1.87	1.83	1.77	1.76	**-0.01**	**-0.04**	**-0.05**	**-0.02**
Poland	N/A	2.20	2.11	**1.96**	1.76	N/A	-0.09	-0.15	**-0.20**
Hungary	**1.95**	2.00	2.03	1.95	1.82	**0.05**	**0.03**	**-0.07**	**-0.13**
Czech Republic	2.10	**2.06**	2.00	1.92	1.85	-0.03	**-0.06**	**-0.08**	**-0.07**
Finland	**1.86**	1.93	1.94	1.91	1.89	**0.07**	**0.02**	**-0.04**	**-0.01**
Slovakia	2.27	2.20	2.14	**2.01**	1.93	-0.06	-0.07	-0.13	**-0.08**
Denmark	**1.87**	1.86	1.92	1.95	1.96	**-0.01**	**0.06**	**0.04**	**0.00**
Sweden	**2.01**	2.05	2.03	2.00	1.97	**0.03**	**-0.01**	**-0.03**	**-0.03**
Norway	**2.05**	2.06	2.09	2.07	2.04	**0.01**	**0.02**	**-0.01**	**-0.03**
United States	**1.99**	1.99	2.04	2.10	2.17	**0.00**	**0.05**	**0.06**	**0.07**

a. Average: Figures in bold shows a period when countries entered the post-transition period (CFR<2.1)
b. Gap: Figures in bold shows gaps after countries enetered the post-transition period (CFR<2.1 in both comparing periods)

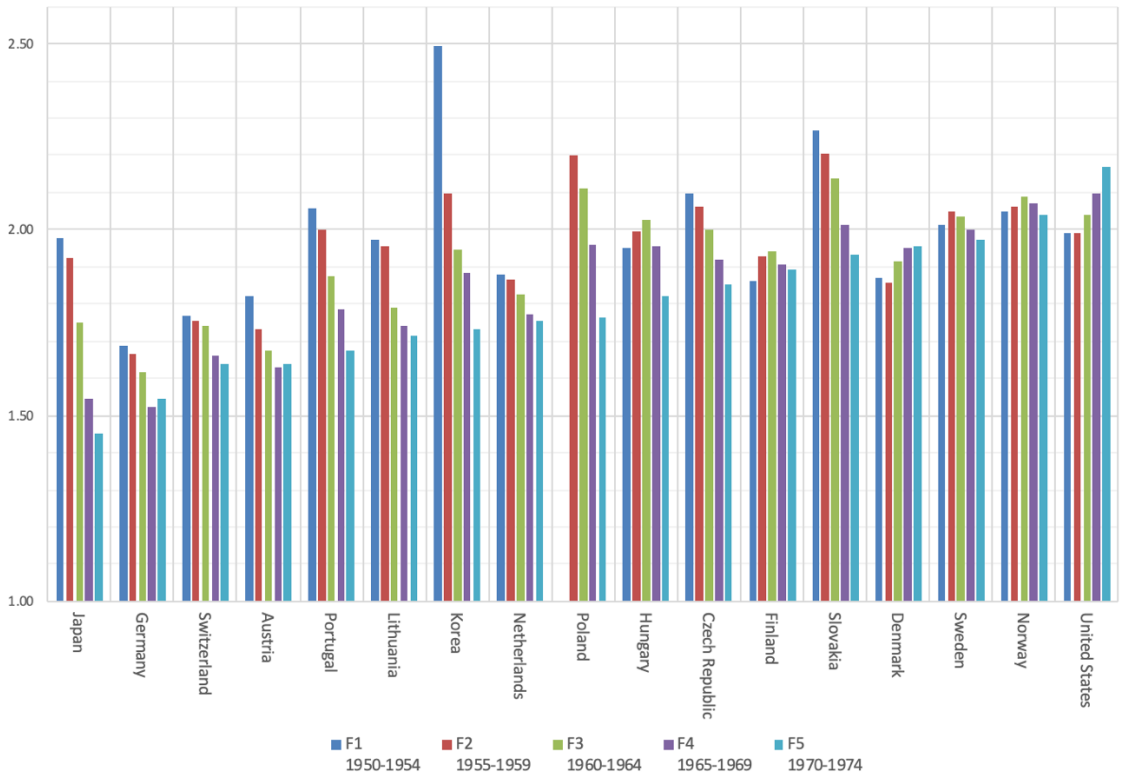

Figure 2 *CFR in 5 Years Average between 1950-1974 (ordered by smallest to largest value of CFR in F5)*

3. Findings When Comparing TFRs and CFRs

The analysis of the TFRs and the CFRs indicated a general downward trend of fertility among 17 high-income countries under study. The comparison of the trajectories between TFRs and CFRs enabled us to confirm the strength and weakness of both measures as well as to test a robustness of the fertility trends.

Firstly, the TFR provides a comparison of the fertility trend with a high degree of data availability. TFR data was available for more than 50 years across all the countries studied, which allow us to investigate when countries entered the post-transition period, what trajectories they followed after having completed the demographic transition, how steep was the decline, and when their fertility gradually become settled. This high data availability is a great advantage of the TFRs because the timing and the speed of transition differs across countries. However, because the TFRs are sensitive to the changes in the timing of births, the main driver of this decline – whether it is due to birth postponement (tempo effect) or decrease in actual number of births a woman give throughout her reproductive cycle, cannot be assessed.

Secondly, the analysis of CFR enables us to get an indication of the importance of the tempo effect. Unlike the TFR, there is no chance that part of a downward trend in CFR is due to a tempo effect – i.e. women give birth to their children later in their (reproductive) life cycle than before. In short, the advantage of the CFR is that we can be more certain that the downward trend across time in TFR is also due to declining fertility levels (not only a tempo effect). As mentioned earlier, however, a drawback of the CFR is that the CFR can only be calculated for birth cohorts who have now reached the end of their reproductive ages. In our data: up till birth cohorts born in 1974. Besides, as the availability of the CFR data varies from country to country, the data range in which complete data across all the countries studied was only available for 10 years. Therefore, we cannot be sure how much of the present drop in TFR will result to a corresponding further drop in CFR in the future. However, the tendency across time is clear with regard to both fertility measures: the trend is downwards both for TFR and CFR, for almost all countries, and for most of the time period under study – including the most recent time period.

Lastly, both the TFR and the CFR show quite similar differences across countries with regard to fertility. Applying thresholds (1.5 for TFR, 1.75 for CFR) to the latest average fertility of

each measure - D5 (2008-2017) for the TFR and F5 (1970-1974) for the CFR, countries were mapped in Table 3 to examine if the TFR and the CFR depict the trend of fertility similarly. Although alignment sequences are different, many of the countries that belong to groups of "very low" versus "moderate low" fertility according to the TFR measure, similarly belong to the same group if instead using the CFR measure. Hence, the fertility patterns using the TFR and the CFR are to a considerable extent overlapping.

More specifically, 5 countries - Japan, Germany, Austria, Portugal and Korea - belong to the "very low" fertility group both in the TFR and the CFR. Similarly, other 7 countries - the Czech Republic, the Netherlands, Finland, Denmark, Norway, United States and Sweden, belong to the "moderately low" fertility group both using the TFR and the CFR. Only 5 countries - Hungary, Poland, Slovakia, Switzerland, and Lithuania, have crossed position as simultaneously very low TFR and moderately low CFR, or moderately low TFR and very low CFR. The correlation coefficient, calculated with using the latest average fertility of TFR and CFR, was 0.67, which illustrates the moderate positive relationship between the two measures[2].

In sum, the fertility trend of post-transition countries is quite established as either having "moderately low" or "very low" fertility regardless of which fertility measure (TFR or CFR) we use.

Table 3 *Mapping of Countries using TFR Average of 2008-2017 and CFR Average of 1970-1974*

	Countries	TFR		Countries	CFR
Very Low	Korea	1.20	Very Low	Japan	1.45
(TFR<1.5)	Portugal	1.32	(CFR<1.75)	Germany	1.54
	Poland	1.36		Switzerland	1.64
	Hungary	1.38		Austria	1.64
	Slovakia	1.41		Portugal	1.67
	Japan	1.41		Lithuania	1.72
	Germany	1.45		Korea	1.73
	Austria	1.46			
Moderate Low	Switzerland	1.52	Moderate Low	Netherlands	1.76
(1.5≤ TFR <2.1)	Czech Republic	1.52	(1.75≤ CFR <2.1)	Poland	1.76
	Lithuania	1.59		Hungary	1.82
	Netherlands	1.72		Czech Republic	1.85
	Finland	1.74		Finland	1.89
	Denmark	1.77		Slovakia	1.93
	Norway	1.83		Denmark	1.96
	United States	1.89		Sweden	1.97
	Sweden	1.90		Norway	2.04
				(United States)	2.17

[2] The correlation coefficient was calculated with an excel formula CORREL.

4. Why Do Fertility Levels Fall?

In the introduction we made a distinction between the demographic transition as a statistical tendency, and theories of why this tendency exists. Here we review some of the general theories why fertility starts to decline in countries experiencing mortality decline (i.e. the demographic transition). Then, in Chapter 3, we go further into theories concerning why post-transition fertility dips even below 2.1 child per woman, and to which extent this corresponds to expressed fertility ideals in post-transition countries.

As presented in the introduction, the demographic transition is initiated with mortality decline followed by fertility decline. Due to a time lag between the mortality decline and the fertility decline, the population will eventually increase before it starts to decline. Why does this time lag occur? What is the implication of the mortality decline on the fertility decline? Previous research has explained the phenomenon of fertility decline in the light of both economic, cultural, social and political perspectives. We will give a brief review of these general theories of why fertility falls in countries experiencing mortality decline.

From an economic and social perspective, Caldwell (1976) highlighted a change in wealth flow between generations to explain the fertility decline that occur after mortality decline in the course of the demographic transition. In pre-modern traditional societies where agriculture was a dominant industry, it was an economically "rational" decision for parents to have a large number of children because each additional child implied positive economic benefits for the family; as labor inputs, caregiver for old parents, influencer to increase family position in a community, and successor of family name and tradition. That is, having a larger family was an advantage because wealth flew from younger (children) to older (parents) generations. High fertility can, therefore, be portrayed as the result of "rational" decisions in pre-modern society. However, as structural changes such as industrialization, urbanization and growth in schooling occurs, the flow of wealth changes from older to younger generations. In modern societies where parents do not gain economic benefits from children as in pre-modern societies, having only the minimum number of children that meet psychological dispositions and cultural pressure becomes a more "rational" decision for parents. Fertility thus declines in modern societies (Caldwell, 1976). Bryant (2007) supported the theory arguing that the economic incentives to have fewer children can be observed not only in modern societies, but also in some of pre-modern societies where educational investments for children is increasing.

Caldwell (1976)'s argument primarily focused on the economic rationality of parents. From a more cultural perspective, Cleland and Wilson (1987) argued that ideational change that increasingly accept a sense of self-control, could explain the fertility transition. According to their theory, in pre-modern societies people were rather passive to their life plans, including reproductive decisions, due to a characteristic of traditional family systems that places importance on a family's collective interest. However, changes in social structure, particularly the advent of compulsory education, served to create a ground to accept individual's choice and achievement in his/her life, rather than that of the family. Such ideational changes stimulated attitudes towards making explicit fertility decisions, and increased acceptance of smaller family, as well as birth control in a society (Cleland & Wilson, 1987). Furthermore, when child mortality was high, primarily women needed to spend their time intensively to take care of a large number of children for a long span throughout their reproductive ages, and the time spent often went in vain due to high probability of children's deaths. A decline in child mortality led to a decrease in such women's "lost" time because children grow up older without dying, to ages where they did not require mother's intensive care. In other words, women were increasingly liberated from intensive childcare that had constituted a large part of their time during their reproductive ages. Such "women's liberation" not only opened up their opportunities to the labor market but also led them to adopt conscious birth control, which led to fertility decline (Cleland & Wilson, 1987; Reher, 2011).

From a political perspective, others have emphasized the contribution of rapidly improved and diffused contraceptive methods and family planning programs. Potts (1997) argued that the key to the fertility decline was unconstrained access to fertility regulation methods including safe abortion, given that fertility decline experienced in industrialized countries did not mean that people stopped having sexual intercourse, but they stopped having many children. They managed to stop having many children because of easily available contraceptive methods. In other words, when self-regulatory access to contraceptive methods are widely available, fertility would decline regardless of the level of economic development. Chowdhury (1983) and Bongaarts and Casterline (2013) also argued for the decisive role of strong family planning programs to decline fertility, which can also serve to increase acceptance of the ideas to limit fertility and further change people's preferences toward smaller family.

As this brief review of fertility theories illustrates, fertility decline may be the product of complex intertwined various economic, social, cultural and political factors tied to structural changes such as industrialization, urbanization and legislation regarding to mandatory schooling. However, why does fertility continue to fall even to levels below 2.1 children per woman? An important follow-up question is if people have actually adjusted their fertility ideals so as to correspond to their practical life situation or not. Do they wish to have children, but they cannot realize their fertility goals due to various impeding factors? Or do people simply do not wish to have as many children as they used to? In Chapter 3, we now turn to address these questions.

CHAPTER 3

Investigating Trends of the Fertility Ideal in 17 High-Income Countries

1. Fertility Ideal as an Indicator of Fertility Trends

The classic demographic transition model projects that the fertility rate will decline in the course of the transition, and come to an end when the crude birth rate becomes equal to the crude death rate in the population, corresponding to an average fertility of 2.1 per woman. As the analysis of fertility rate in Chapter 2 shows, the fertility has declined below the replacement level of 2.1 in all countries studied, and such countries have entered a period of post-transition in which the native population of these countries is expected to fall in the future[3]. This means that population development is advancing below the situation postulated in the demographic transition. Why has fertility continued to fall, and so far, stabilized, below the replacement level?

The underlying question in this section is if the below-replacement fertility is a result of voluntary choice, or rather a compulsory choice. To which extent is there a discrepancy between perceived ideal fertility level and actual fertility level, may clarify the problem – the problem might be not only that the fertility rate is declining but that there are structural

[3] It takes several decades (at least 3-4 decades) before a fall in fertility below 2.1 results in a shrinking native population (i.e. before crude death rates start to exceed crude birth rates). This is because of the large number of women in reproductive years for a certain period of time, resulted from a history of high fertility in their mothers' generations. These daughters, being so many, give birth to many children (measured by the crude birth rate), although each of these new, young women sire fewer children during their life cycle than their mothers did (Blue & Espenshade, 2011).

factors that prevent people from realizing their fertility ideal. To investigate this, we now turn to analyze the levels of fertility ideal people in a society expressed.

Few researchers have focused on the fertility ideal in post-transition countries. However, the fertility ideal is possibly an important factor to understand fertility trends both from an economical, sociological and political perspective. From an economic perspective, stated fertility ideals may be an indicator of societal preferences: Do people manage to realize their preferences (with regard to having children) or not? From a sociological perspective, it may reflect normative values, including if such normative values shift in tandem with actual fertility changes. From a political perspective, investigating the fertility ideal and comparing it to actual fertility rates may suggest if there is pent-up frustration in the population with regard to family policies that makes it easier or more difficult to raise children. To highlight these issues, we raise two broad questions; (1) Does the fertility ideal vary across post-transition countries? And is there a relationship between such variation and variation in actual fertility levels? (2) Does the fertility ideal vary within countries? And do some social categories or groups have a higher fertility ideal than others?

As we have seen in Chapter 2, all the 17 high-income countries under study continue having below-replacement fertility, when measured by TFR, once they entered the post-transition period. To elaborate question 1, we will address the following sub-questions; Does the fertility ideal in these countries correspond with below-replacement fertility level? Is an eventual discrepancy between perceived fertility ideal and actual fertility larger in some countries than others?
For question 2, we will address if the fertility ideal level varies within countries, between men and women, between birth cohorts, and between education levels. Further, to investigate if economic, social and political factors to explain actual fertility decline also influence perceived fertility ideals, we will examine the relationship of the perceived fertility ideal with related variables such as perceived economic burden of childrearing, gender equality ideal index and individualism index.

2. Theory

As mentioned above, the fertility ideal can be an important factor to understand fertility trends. What should we expect as regards the relationship between actual fertility and the fertility ideals?

Cultural theory: The supposed rise of more individualistic norms

One possibility is that a shift in social practices and accompanying fertility preferences may be an explanatory factor of persistent below-replacement fertility. Lesthaeghe (2010) named the ongoing below-replacement-fertility observed in economically developed countries as the "second demographic transition (SDT)". He argues that the SDT is explained by ideational changes which affect preferences on fertility behaviors as well as preferences on family formation. In modern societies where basic material needs are met, younger cohorts may increasingly value individual choices as a way of self-realization including education achievements and career developments, while waiving parenthood. Indeed, a number of studies have confirmed that increasing number of women, particularly those who are highly educated, are delaying childbearing in all industrial countries (D'albis et al., 2017; Frejka & Sobotka, 2008; Mills et al., 2011). The emergence of individualistic norms may result in placing less values on marriage and conventional family models and adopting alternate forms of living arrangements such as cohabitation, single parenthood and childless families.

In line with the SDT theory, Inglehart, Ponarin, and Inglehart (2017) point out that an inter-generational shift from pro-fertility norms to individual-choice norms is rapidly occurring. They argue that this shift may be fueled by high level of existential security comprised of a country's long life expectancy, low infant mortality and high GDP/capita. An underlying argument of this theory is generational theory. Generations are groups of birth cohorts; a cohort born in the same time period and shares a series of experiences including social and economic conditions during their years of growth. These shared experiences collectively influence the birth cohort belonging to the same generational group and serve to shape their values, beliefs, motivations that are unique in their generations (Pendergast, 2009; Ryder, 1965). To sum, socially and economically higher level of security may have induced a shift to more individualistic values among younger cohorts, resulting in a lowered fertility ideal, which consequently leads to a general decline of actual fertility, even below the replacement level.

Concerning country differences, this theory leads to an assumption that the expressed ideal

number of children is lower in countries with very low actual fertility compared to countries with only moderately low fertility, if one can assume that very low fertility corresponds to widespread individualistic norms.
Concerning inter-country differences, the expressed fertility ideal may be lower in young birth cohorts who, presumably, were raised in a more individualistic culture compared to older birth cohorts who, presumably, were raised in a more traditional (less individualistic) culture.

Economic theory: Increased opportunity costs of childbearing and accompanying preference change

In a high-income society, the opportunity costs of childbearing increases, since "earnings foregone" when one chooses to have children is higher if one can earn a high-income than if one can only earn a low-income. The opportunity costs of childbearing represents the value of activities one miss out by being engaged in childbearing (Becker, 1991; Joshi, 1990; Willis, 1973). For example, a highly educated women carries a high earnings potential. However, she would lose the potential earnings when choosing to have children which, at least to a certain extent, limit her time that she could otherwise commit in a paid job. That is, she devotes her "expensive" time to childbearing and as a consequence, childbearing becomes an expensive activity. Such opportunity costs of childbearing were limited when employment opportunities for women were limited. A high-income society may thus result in having low fertility because people in a high-income society foresee higher cost of childbearing on each of their children pertained to higher opportunity cost of childbearing, compared to a lower-income society.

Concerning country differences, this theory leads to an assumption that the higher female labor force participation rate, the lower the fertility ideal is, and perhaps in particular a low preference for many children.
Concerning inter-country differences, the theory leads to an assumption that parents, and perhaps in particular mothers, with high education (a proxy for high average wages) state a preference for fewer children than parents, and perhaps in particular mothers, with low education.

Social theory (gender role theory): Discrepancy between economically necessary behavior and traditional social roles

A third theory emphasizes inconsistency between a change in women's perception and traditional cultural values in regard to gender roles. Unlike the past decades when the male breadwinner model was the prominent form of family and women were mainly engaged in domestic caregiving, women today have almost equal access to education and jobs as men. Their ambitions and motivations may have drastically changed, and they may no longer accept their conventional roles as well as the gender division of labor which refers to allocation of work between men and women according to what is socially considered suitable gender roles (UNESCO, 2003). As a consequence, this change in women's perception of their own social roles put them in a dually burdened situation between paid work and caregiving to family when the surroundings remain same as in previous times, which may lead a fertility decline (Chesnais, 1996; Esping-Andersen, 1999; McDonald, 2000).

For example, McDonald (2000) points out that countries that traditionally convey more conservative values in regard to marriage as well as the role of women - particularly mothers, such as Italy, Spain, Germany, Austria, Switzerland, Portugal and Japan, tend to have very low fertility (below 1.5); despite the fact that these are also among the countries that attach high values to family. Further, De Laat and Sevilla-Sanz (2011) found that the household division of labor was most unequally distributed between men and women in very low fertility countries such as Japan, Italy and Austria. Eastern European countries are also known for unequal distribution of household tasks between men and women although gender equality in the labor market in terms of employment rate and working hours, stemmed from the former socialist regimes, is maintained (van der Lippe, Jager, & Kops, 2006). Traditional gender division of labor and very limited household contribution of men are also prevalent in Korea (Lee & Choi, 2015), where its latest TFR (D5, 2008-2017) marks the lowest among the countries under study (Table 1). It is not difficult to imagine that in such countries where there is a strong cultural norm that women should provide domestic caregiving, women would face with a dilemma of "either-work-or-children" choices (De Laat & Sevilla-Sanz, 2011) even when they wish to pursue both. A strong cultural norm with regard to gender roles might explain the fertility decline below the replacement level.

With regard to country comparisons, this theory may suggest that countries with very low fertility may actually have a higher fertility ideal due to the dominance of traditional norms than other post-transition countries. However, the accompanying traditional cultural emphasis on stay-at-home mothers, combined with an economy that increasingly calls for two-income

families to get by, implies that this ideal cannot be realized in practice – ironically, perhaps primarily in countries with a high fertility ideal. We may thus assume that the gap between fertility ideal and actual fertility may be larger in countries where there are strong traditional norms in gender roles.

With regard to inter-county differences, the theory may possibly mean that men and women have different fertility ideals, if men and women to a varying extent adhere to traditional family norms. In particular, it is more likely that women express a lower fertility ideal because it is women who would primarily face the dilemma and make a painful choice between work and children. The theory further suggests that if such norms are stronger in older generations, it may indicate that the fertility ideal is higher in older birth cohorts.

Political-institutional theory: Lack of political response to fertility preferences

A fourth theory, related to the one above, is that the observed below-replacement-fertility may not be a consequence of people's preference to have less children (or more generally, a changed fertility ideal), but rather it may be a consequence of lack of political-institutional changes which aligns to the rise in the momentum to gender equity. As discussed above, childrearing has become a high-cost activity in a socioeconomically matured society especially when both parents are engaged in paid jobs due to high opportunity cost (Becker, 1991; Joshi, 1990; Willis, 1973). Even so, what if people want to achieve both - children and jobs? Esping‑Andersen (1999) highlighted the role of institutions to alleviate incompatibility between paid work and childbearing.

Esping-Andersen and Billari (2015) suggest that a majority of people – both men and women, wish to balance career and economic autonomy with parenthood, which entails a preference toward a more gender-egalitarian society that allow both genders to realize their wishes. They estimate that the fertility rate would recover when gender egalitarian norms become dominant in a society and family-friendly policies reflecting such norms are implemented. These theories emphasize the importance of institutional factors to impact people's fertility behaviors, which in turn means that a lack of institutional support to increase compatibility between childrearing and paid work may explain the below-replacement fertility observed in industrialized countries.

Certainly, a number of empirical studies have confirmed that so-called family friendly policies that allow women to fulfil both their career and childbearing such as childcare provision (Castles, 2003), financial compensation for maternity and parental leave (Ronsen & Skrede, 2010), flexible working hours and labor market (Castles, 2003; Rovny, 2011) and child benefits (Bonoli, 2008), give a positive impact on fertility rate. Thévenon and Gauthier (2011) emphasized that although such family-friendly policies do not always explicitly intend to increase fertility, they can influence individual's fertility behaviors such as strategic family planning with foreseeing supports or benefits to be entitled as well as smoother realization of their intentions, which may ultimately lead to raise fertility.

The political-institutional theory may be combined with gender role theory presented above. If adherence to traditional gender roles is widespread in a society, it may reduce the political pressure to install family-friendly policies (such as kindergartens, parental leave schemes, and flexible work schedules), since such policies may be perceived as running counter to a perception of men and women having different social roles. An unintended effect of this may be that women reduce fertility more in such societies, if they none the less are under economic-structural constraints to enter the formal labour force.

With regard to country differences, this theory would suggest that the discrepancy between the expressed fertility ideal and realized fertility levels may be less in countries that have introduced general family-friendly policies, assuming that such countries to a larger extent display "moderately low" rather than "very low" fertility.
With regard to inter-country differences, this theory may suggest that the stated fertility ideal may not drastically differ across gender and generations in countries that already have introduced general family-friendly policies, but may be found in countries where this is not the case.

3. Method

Data in this part are derived from the International Social Survey Programme (ISSP) Family and Changing Gender Roles module conducted in 2012. The ISSP, started in 1984, is a continuous cross-national survey program on various topics relevant for the social sciences based on voluntary co-operation of member countries covering diverse culture around the world (ISSP Secretariate, 2019). The overall theme of the ISSP Family and Changing Gender

Roles module is gender related issues, such as attitudes toward women's empowerment, marriage and partnership, household management and children.

Choice of countries

Among the 41 participating countries, the same 17 countries as Chapter 2 – Austria, the Czech Republic, Denmark, Finland, Germany, Hungary, Japan, Korea, Lithuania, the Netherlands, Norway, Poland, Portugal, Slovakia, Sweden, Switzerland, United States are selected. The total sample size for these 17 countries is 21,734 with the age 18 and older. The sampling procedures varies somewhat between countries as the ISSP participant countries partly use simple, and partly use multi-stage stratified random sampling (Brien & Beck, 2016). However, by limiting the countries to be analyzed to those with a sample size at least 1000 and not a very skewed gender balance, possible distortions due to different sampling methods are hopefully minimized. The detailed description of the sample by countries and gender are shown in Table 4.

Table 4 *Results of Crosstabulation of the Sample by Countries and Gender*

	Male (%)	Female (%)	Total
Austria	537 (45)	645 (55)	1182
Czech Republic	807 (45)	997 (55)	1804
Denmark	693 (49)	710 (51)	1403
Finland	514 (44)	657 (56)	1171
Germany	857 (49)	909 (51)	1766
Hungary	483 (48)	529 (52)	1012
Japan	541 (45)	671 (55)	1212
Korea	617 (44)	779 (56)	1396
Lithuania	493 (42)	694 (58)	1187
Netherlands	610 (46)	705 (54)	1315
Norway	690 (48)	754 (52)	1444
Poland	513 (46)	602 (54)	1115
Portugal	453 (45)	548 (55)	1001
Slovakia	523 (46)	605 (54)	1128
Sweden	485 (46)	574 (54)	1059
Switzerland	620 (50)	617 (50)	1237
United States	594 (46)	708 (54)	1302
Total	10030 (46)	11704 (54)	21734

Dependent variable

The main construct, perceived fertility ideal level, is measured by a variable labelled "Ideal number of children for a family". The respondents were asked the question "All in all, what do you think is the ideal number of children for a family to have?" The numbers the respondents answered directly correspond to values of the variable such as '0' as no children, '3' as 3 children.

During the quality check, the distribution of this variable was found to be very skewed and very peaked (Skewness = 7.659, Kurtosis = 151.670) with values ranging from 0 children to 32. Extreme outliers, e.g. answering 32 children as an ideal, may be non-serious responses. The threshold to meet statistical assumption as defined Skewness within ±2, Kurtosis within ±7, was up to 9, which covers 99.8% of the total responses. Therefore, values equal to or greater than 10 were dismissed and the variable was recoded into a new variable with values ranging from 0 to 9.

The strength as well as the construct validity of this variable lies in how questions is formed. By asking the ideal number of children 'for a family' rather than asking the ideal number 'for your family', the question reduces a potential effect of the respondents' personal conditions as well as their own fertility experiences that is otherwise likely to affect how they answer. For instance, when a respondent is a parent of 3 children, he/she would be likely to answer "3" to this question when asked a "for your family" question, because that is how it turned out for them. Similarly, when a respondent does not ever wish to have children, he/she would answer "0". Their answers may be different when instead asked a "for a family" question. In short, the question we use as a dependent variable reflects a general perception of ideal fertility levels in the society the respondents live in, regardless of their personal circumstances. We believe this is a better way to capture the perceived fertility ideal in a society, than to ask people about their personal preference for children[4].

Independent variables

The analysis includes 7 independent variables, namely, country, gender, birth year, education levels, perceived financial burden of childbearing, a gender equality ideal index and an individualism index. The first 4 variables encompass demographic information of the respondents while the last 3 variables encompass economic, cultural, social and political factors that may affect people's fertility behavior as presented above, as well as their perceived societal fertility ideal.

(1) Country

[4] It might have been interesting to compare how respondents answer to this question with how they answer to a question asking about their personal preference for children. However, the ISSP does not include such a question.

The data was extracted from the original dataset by selecting 17 countries – Austria, the Czech Republic, Denmark, Finland, Germany, Hungary, Japan, Korea, Lithuania, the Netherlands, Norway, Poland, Portugal, Slovakia, Sweden, Switzerland, the United States, to be studied. The country variable indicates countries where the survey was conducted. Because this is a categorical variable, dummy variables for each country were used for regression analysis.

(2) Gender

The variable displays the gender of respondents. This is a dichotomous variable containing two values (male and female). For regression analysis, the variable was recoded into a dummy variable (0 = male, 1 = female).

(3) Generation (Birth cohorts)

The original variable reflects respondent's year of birth ranging from 1910 to 1998. To analyze differences in perceived fertility ideal across birth cohorts, groups of births cohorts (generations) were created to make the variable ordinal in accordance with Pendergast (2009)'s classification and labelling of "generation". Pendergast uses a cultural approach to identify "generations" and distinguishes between the G.I. generation, the Silent generation, the Baby Boomer generation, Generation X and Generation Y. However, due to limited number of respondents who were born between 1910-1924 (labelled as the G.I generation) in our data (0.4 %), they were merged into next generation. The values of recoded variable therefore include; 1 (= 1910-1942, the G.I and Silent generation), 2 (= 1943-1960, the Baby boomer generation), 3 (= 1961-1981, the Generation X) and 4 (= 1982-1998, the Generation Y).

(4) Education levels

The original variable indicates respondents' highest completed degree of education ranging from 0 (= "No formal education") to 6 (= "Upper level tertiary (Master, Dr.)". However, due to the fact that all of the countries under study have adopted compulsory education at least for the period of 9 years (UNESCO, 2019), the distribution was imbalanced. For example, the cumulative percentage of the responses to 0 (= "No formal education") and 1 (= "Primary school") was only 6.6%. Given that the end of lower secondary education corresponds to the end of compulsory education in many educational systems (UNCESCO, 2012), the variable was recoded into three levels of educational attainments; compulsory education and lower,

high school and equivalent and university and upper. The values of the recoded variable then include 1 (= “Lower secondary and lower”), 2 (= “Upper secondary and post-secondary (non-tertiary))” and 3 (= “Tertiary (Bachelor, Master, Doctor)”).

(5) Perceived financial burden of childbearing

The variable is based on the survey question: “To what extent do you agree or disagree…[that] children are a financial burden on their parents”. The original variable was reversely recoded into values ranging from 1 (= “strongly disagree”) to 5 (= “strongly agree”).

The interpretation of this variable may differ if we study between-country differences or within-country differences. With regard to *between-country* differences in the perceived costs on parents, it is reasonable to assume that since all the countries in our sample are high-income countries, the cost of living tend to be high across countries; including the costs of childrearing. To the extent that children are none the less perceived (on average) as more of financial burden on parents in some countries than in others, it may reflect country differences in how the (high) costs of childrearing are dealt with politically: If the costs are borne mainly or only by the parents themselves, or if much of the costs are borne by the society and state, for example through generous parental leave and subsidized childcare arrangements. Thus, with regard to between-country variation in perceived costs of children for parents, average differences in the response to this question may be an indicator of the existence (or not) of policies aimed at alleviating the financial burden on parents. With regard to *within-country* differences, this reasoning does not apply. Here, differences in perceived costs must have other possible explanations, for example that respondents belonging to different socioeconomic groups may perceive these costs differently.

(6) Gender equality ideal index

This variable measures to which extent respondents regard “gender equality” as a normative ideal, or instead regard “traditional gender differences” as an ideal.

The variable was computed from the mean of four variables (a) A working mother can establish just as warm and secure relationships with her children as a mother who does not work, (b) A pre-school child is likely to suffer if his/her mother works, (c) Family life suffers when woman has a full-time job, and (d) Men's job is to earn money, women's job is to look after the home. The variable (a) was recoded reversely for a high (low) value in all variables

to indicate same direction of response. The Cronbach's alpha of the four variables was 0.765, which indicates a relatively high level of internal consistency. The original variables generally illustrate respondents' attitudes toward traditional gender roles, in contrast to the principle of gender equality in working life and family life.

We interpret expressing support for a high degree of a gendered division of labors (traditional gender roles) as low degree of support for gender equality norms. Further, decimals of the computed gender equality index were rounded to the nearest whole number (i.e. 1.33 to 1, 1.75 to 2) to make the variable interval. The gender equality ideal index then ranges from 1 to 5, with the higher values connotate higher degree of support for a gender equality ideal.

(7) Individualism index

The variable was computed from the mean of seven variables that deal with the perception toward marriage as well as acceptance of diverse forms of family such as cohabitation of unmarried couple, divorce, single parent, same-sex couple. More precisely, the questions include (a) Married people are generally happier than unmarried people, (b) People who want children ought to get married, (c) It is alright for a couple to live together without intending to get married, (d) Divorce is usually the best solution when a couple can't seem to work out their marriage problems, (e) One parent can bring up a child as well as two parents together, (f) A same sex female couple can bring up a child as well as a male-female couple and (g) A same sex male couple can bring up a child as well as a male-female couple. The variables (c), (d), (e), (f) and (g) were recoded reversely for a high (low) value in all variables to indicate same direction of response. The Cronbach's alpha of the seven variables was 0.800, which shows a high level of internal consistency.

We assume that the acceptance of non-traditional family formation implies individual autonomy to choose how they live, which is in line with social factors that may influence fertility, as presented above. Further, decimals of the computed individualism index were rounded to the nearest whole number to make the variable interval (i.e. 1.33 to 1, 1.75 to 2). The individualism index then ranges from 1 to 5 with the higher values indicate higher degree of expressed individualism.

Analytical Plan

As presented above, the analysis encompasses two broad question; (1) Does the fertility ideal vary across countries? (2) Does the fertility ideal vary within countries? The following results section consists of two parts according to these two questions. Further, various statistical analyses are conducted to investigate sub-questions for each question.

For question 1, we raised two sub-questions; a) if the perceived fertility ideal of the post-transition countries also display a below replacement fertility level, and b) if a discrepancy between perceived fertility and actual fertility is larger in some countries than others. To answer these sub-questions, we conduct a univariate analysis and one-way ANOVA and discuss the result with comparing the latest TFR (D5, 2008-2017, Table 1) roughly corresponding to the year the ISSP survey was conducted (in 2012).

For question 2, we conduct three patterns of two-way ANOVA to examine if the fertility ideal varies within countries, particularly among social categories such as gender, generations and educational levels. We further conduct a regression analysis to investigate the relationship between the perceived fertility ideal and social, economic and political factors that may explain actual fertility decline.

4. Results

4.1. Variation between Countries

Univariate distribution of fertility ideal across countries

Measures of central tendency as well as dispersion were computed to have an overview on distribution of fertility ideal across countries. The following are the results of this analysis; N = 20238, M = 2.38, *Median* = 2, *Mode* = 2, SD = .76. Taking mean as the central tendency, it appears that respondents in studied post transition countries generally think that fertility "above" the replacement level is ideal for a family. Besides, standard deviation is not large, which indicates that it is quite a peaked distribution around the central tendency. The frequency distribution on fertility ideal presented in Table 5 also shows that responses of 2 or 3 children as ideal dominates the distribution (nearly 90%). In short, people's perception on ideal number of children for a family is not very diverse across countries studied, despite the fact they belong to different cultures and countries with different actual fertility levels.

Table 5. Frequency distribution on fertility ideal

Response	Frequency (%)
No children	106 (0.5)
1 child	880 (4.3)
2 children	12035 (59.5)
3 children	5919 (29.2)
4 children	1038 (5.1)
5 children	179 (0.9)
6 children	56 (0.3)
7 children	10 (0)
8 children	10 (0)
9 children	5 (0)
Total	20238 (100)

Degree of correspondence between fertility ideal and actual fertility

A One-way ANOVA was conducted to test if there is a statistically significant difference between the countries' means of perceived fertility ideal. Table 6a shows the results that there was a statistically significant difference in fertility ideal among countries ($F(16,20221) = 79.372$, $p = .00$). To examine which specific countries differed, post hoc comparison using the Tukey HSD test was conducted (Table 6b). Taking Japan as a reference country, the post hoc Tukey HSD test showed that the mean of Japan's fertility ideal was statistically higher than 12 countries including Austria, the Czech Republic, Denmark, Finland, Germany, Hungary, Lithuania, the Netherlands, Portugal, Slovakia, Sweden and Switzerland ($p < .05$). There was no statistically significant difference with Korea ($p = 1.00$), Norway ($p = .183$), Poland ($p = .222$) or the United States ($p = .127$).

Descriptive results show that the mean of perceived fertility ideal ranges from 2.03 (Czech Republic) to 2.67 (Korea) with the average of all studied countries was 2.38 (Table 6c). Given that the actual fertility levels of all the 17 countries under study are below 2.1[5], this indicates that there is a discrepancy between the actual fertility level and perceived fertility ideal level[6]. In other words, people in all 17 countries seem to have fewer children than what they express to be an ideal for their societies.

Table 6a *One-way Analysis of variance of Fertility Ideal by Country*

Source	*df*	*SS*	*MS*	*F*	*p*
Between Groups	16	692.786	43.299	79.372	.000
Within Groups	20221	11031.047	.546		
Total	20237	11723.833			

[5] TFR, the average between 2008-2017. We do know for certain that a tempo effect is involved (see Chapter 2).
[6] Although the fertility ideal of the Czech Republic is below 2.1, it is still higher than its actual fertility.

Table 6b *Results of Tukey HSD: Multiple Comparison (Excerpt)*

		MD	*SE*	*p*
Japan	Austria	.44609*	0.03134	.000
	Czech Republic	.61441*	0.02768	.000
	Denmark	.21291*	0.02964	.000
	Finland	.13941*	0.03092	.001
	Germany	.40751*	0.02786	.000
	Hungary	.50955*	0.03236	.000
	Korea	-0.02615	0.0292	1.000
	Lithuania	.30832*	0.0317	.000
	Netherlands	.23274*	0.03105	.000
	Norway	0.08844	0.02946	.183
	Poland	0.09146	0.0313	.222
	Portugal	.40234*	0.03238	.000
	Slovakia	.28983*	0.03071	.000
	Sweden	.23642*	0.032	.000
	Switzerland	.27662*	0.03082	.000
	United States	0.09528	0.0303	.127

* The mean difference is significant at the 0.05 level.

Table 6c Mean of *Fertility Ideal in selected 17 High-Income Countries (Data retrieved from ISSP 2012)*

Country	Fertility Ideal	SD
Czech Republic	2.03	0.620
Hungary	2.14	0.690
Austria	2.20	0.717
Germany	2.24	0.629
Portugal	2.24	0.735
Lithuania	2.34	0.677
Slovakia	2.36	0.716
Switzerland	2.37	0.666
Sweden	2.41	0.686
Netherlands	2.41	0.792
Denmark	2.43	0.718
Finland	2.51	0.838
United States	2.55	0.901
Poland	2.55	0.721
Norway	2.56	0.678
Japan	2.65	0.706
Korea	2.67	0.994
Total	2.39	0.761

When compared to the actual fertility level presented in Table 3, however, perceived fertility ideal comparatively corresponds to differences in actual fertility. Countries with "moderate low" fertility levels both in terms of TFR and CFR such as Sweden, Denmark, Finland, Netherlands, Norway and the United States show relatively high fertility ideals (above 2.4), while countries with "very low" fertility levels such as Austria, Germany Hungary and Portugal display lower fertility ideals (below 2.3). This indicates that expressed fertility ideals, to some extent, corresponds to actual fertility levels – although in all countries, the fertility ideal is higher than the actual fertility level.

There are, however, three partial exceptions to the above pattern. The exceptions are the Czech Republic, Japan and Korea. The Czech Republic, which is among the moderate low fertility countries, shows the lowest fertility ideal. The expressed ideal is even below the

replacement level (although the fertility ideal is still higher than the actual fertility level). For Japan and Korea, the exception is in a different direction. Although they belong to the very low fertility group both with regard to the TFR and CFR measures, the fertility ideal of these two countries are among the highest.

To further quantify the discrepancy between actual and ideal fertility level, we have adopted the TFR as a measure of the actual fertility rate, instead of the CFR. As argued in Chapter 2, CFR is limited to a group of women born in a certain birth year. It is not fruitful to compare this cohort-specific fertility measure with a fertility ideal which is retrieved from a cross-section of the population across different age groups, at a specific point in time (2012). The TFR covers a broader age range and is an annual measure of fertility. Although TFR is limited to women of reproductive age, TFR is a better actual fertility measure to compare with the expressed fertility ideal in a population in a specific year.

Figure 3 shows the gap between fertility ideal and actual fertility rate - the latest TFR (D5, 2008-2017, Table 1) presented in Chapter 2. This confirms that the gap between fertility ideal and actual fertility rate is higher in countries where the level of TFR mark "very low (TFR <1.5)" such as Korea, Japan, Poland, Slovakia and Portugal than in countries with "moderate low (1.5≤ TFR <2.1)" TFR such as Norway, the Netherlands, Denmark, the United States and Sweden.

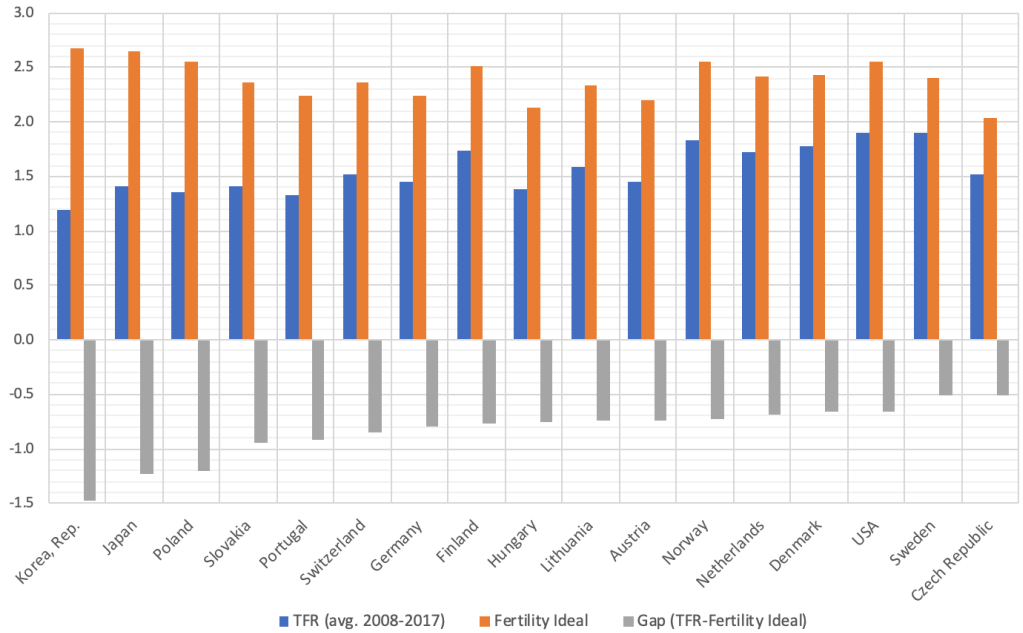

Figure 3 *Gap between Fertility Ideal and TFR (average 2008-2017), Ordered by Gap*

4.2. Variation within Countries

Fertility ideal with different social categories - Gender, Age and Education levels

We found in the previous sections that perceived fertility ideal differs across countries. However, the difference of fertility ideal in studied countries might be also related to differences in social categories of respondents within the country. To test if this is the case and if the variation is associated with country differences, three patterns of two-way ANOVA were conducted, with each of analysis includes gender, generations and education levels coupled with country differences. Table 7 shows the results of the three independent analyses.

(1) Gender

There were no statistically significant differences in fertility ideal between genders ($p > .05$). Descriptive analysis (table not shown) indicated almost the same level of expressed fertility ideal between male participants ($M = 2.37$, $SD = .76$) and female participants ($M = 2.39$, $SD = .76$). There was no statistically significant interaction between the effects of gender and country level on fertility ideal ($F(16, 20203) = 1.20$, $p = .263$). In other words, expressed level of fertility ideal is generally the same between men and women regardless of countries they reside.

(2) Generation

There was a statistically significant interaction between the effects of generation and country level on fertility ideal ($F(48, 20161) = 4.95$, $p = .00$). This indicates that the differences in fertility ideal between generations depend on the country. Simple main effects analysis (table not shown) further showed that there were no statistically significant differences in fertility ideal across generations in 6 countries – Austria, Denmark, Germany, the Netherlands, Norway and Switzerland ($p > .05$). The fertility ideal in these countries was somewhat stable in all birth cohorts. In contrast, statistically significant differences in fertility ideal across generations were found in the other 11 countries – the Czech Republic, Finland, Hungary, Japan, Korea, Lithuania, Poland, Portugal, Slovakia, Sweden and the United States. Among these 11 countries, a declining trend of fertility ideal along with generation was observed in 8 countries – the Czech Republic, Hungary, Japan, Korea, Lithuania, Poland, Portugal and Slovakia. In these countries, the difference between the oldest generation and the youngest generation was statistically significant ($p < .05$). This indicates that the effect of generational

differences on fertility ideal is limited to certain countries. In particular, such countries are mostly "very low" fertility countries. It is notable that many of the countries where the stated fertility ideal is rather stable are simultaneously the "moderate low" fertility countries.

(3) Education level

There was a statistically significant interaction between the effects of educational attainments and country level on fertility ideal ($F(32, 20097) = 5.55$, $p = .00$). This indicates that the differences in fertility ideal between educational attainments depend on the country. Simple main effects analysis (table not shown) further showed that statistically significant difference was not found in two thirds of the countries such as Austria, Denmark, Finland, Hungary, Japan, Lithuania, the Netherlands, Norway, Portugal Sweden and Switzerland, which indicates that the stated fertility ideal in these countries does not vary much between respondents who have completed mandatory education or lower, high school or university degrees. In other words, education attainments do not seem to affect perceived fertility ideal in these countries. While in other 6 countries – the Czech Republic, Germany, Korea, Poland, Slovakia and the United States - the difference in fertility ideal by education levels was statistically significant. Notably, in 4 out of the 6 countries - the Czech Republic, Korea, Poland and the United States, a common trend that fertility ideal declines as the respondents are better educated, was observed. To sum, the effect of educational attainments on stated fertility ideal is limited to certain countries.

Table 7 *Results of Two-way Analysis of Variance of Fertility Ideal by Different Social Categories within Countries*

Source	*df*	*SS*	*MS*	*F*	*p*	*Partial* η^2
(1) Gender						
Country	16	686.96	42.94	78.73	0.00	0.06
Gender	1	1.87	1.87	3.43	0.06	0.00
Interaction (Country * Gender)	16	10.42	0.65	1.19	0.26	0.00
Error	20203	11017.88	0.55			
Total	20237	11723.68				
(2) Generation						
Country	16	565.35	35.33	65.98	0.00	0.05
Generation	3	85.78	28.59	53.40	0.00	0.01
Interaction (Country * Generation)	48	127.25	2.65	4.95	0.00	0.01
Error	20161	10796.18	0.54			
Total	20229	126877.00				
(3) Education levels						
Country	16	529.44	33.09	61.46	0.00	0.05
Educational levels	2	37.33	18.66	34.67	0.00	0.00
Interaction (Country * Education levels)	32	95.65	2.99	5.55	0.00	0.01
Error	20097	10820.13	0.54			
Total	20148	126322.00				

Modeling fertility ideal in a country

A linear stepwise multiple regression was carried out to model the relationship between the stated fertility ideal and economic, social and political factors when demographic variables investigated above were also concerned. In this analysis, Japan was set as a reference country because it is one of the forerunners in the demographic transition model. Japan not only has a very low fertility rate, but its fertility rate has stayed low for so many years that its population as a whole has started to decline (United Nations, 2019). Three groups of variables – (1) country dummies, (2) gender dummy, generation and education levels, (3) perceived financial load on childrearing, gender equality ideal index and individualism index were added stepwisely. Table 8 shows the results of the regression analysis.

Model 1 shows the country variance of fertility ideal when compared to the reference country (=Japan). The model summary shows that the model explains 6.0% of the variance and that the model is a significant predictor of fertility ideal ($F(16, 19677) = 78.229$, $p = .00$). More precisely, only Korea does not have significantly different coefficients with Japan ($p > .05$). In contrast, all other countries have significantly different coefficients with Japan with all of them relating negatively ($p > .05$). These indicate that Japan as well as Korea have the highest level of fertility ideal among the countries under study. All of these confirm the result of one-way ANOVA presented above (Table 6).

Having demographic variables (gender, generation, education levels) added, the Model 2 shows a significant relation with fertility ideal ($F(19, 19674) = 76.325$, $p = .00$) with R square of .069, indicating that the Model 2 explains 6.9% of the variation in fertility ideal. Generation and education levels significantly contribute to the model ($p < .05$) while gender does not ($p > .05$), which confirms the results of a series of two-way ANOVA presented above (Table 7).

Lastly, perceived financial load on childbearing, gender equality ideal index, and individualism index are added in the Model 3, which shows a significant relation with the fertility ideal ($F(22, 19671) = 89.674$, $p = .00$). All of the three variables were found significantly contributing to the model ($p < .05$) and R square increased to .090, indicating that the Model 3 explains 9.0% of the variation in the fertility ideal. Model 3 also displayed that the individualism index had the greatest impact on the fertility ideal ($\beta = -.133$, $p < .001$)

followed by perceived financial load on childbearing (β = -.074, p < .001), besides the country differences[7].

Table 8 *Results of Linear Stepwise Regression (N = 19694)*

	Model 1			Model 2			Model 3		
Independent variables	B	SE	Beta	B	SE	Beta	B	SE	Beta
(Constant)	2.648***	0.022		2.872***	0.029		3.357***	0.038	
V4_dummy_ Austria	-0.443***	0.032	-0.13	-0.451***	0.032	-0.132	-0.390***	0.032	-0.114
V4_dummy_Czech	-0.615***	0.028	-0.229	-0.614***	0.028	-0.229	-0.608***	0.028	-0.227
V4_dummy_Denmark	-0.214***	0.03	-0.069	-0.181***	0.03	-0.059	-0.080**	0.030	-0.026
V4_dummy_Finland	-0.137***	0.032	-0.04	-0.120***	0.032	-0.035	-0.089**	0.031	-0.026
V4_dummy_Germany	-0.409***	0.028	-0.15	-0.400***	0.028	-0.147	-0.313***	0.028	-0.115
V4_dummy_Hungary	-0.510***	0.033	-0.142	-0.511***	0.033	-0.142	-0.430***	0.033	-0.120
V4_dummy_Korea	0.024	0.03	0.008	0.024	0.029	0.008	-0.047	0.029	-0.016
V4_dummy_Lithuania	-0.308***	0.032	-0.088	-0.300***	0.032	-0.086	-0.366***	0.032	-0.105
V4_dummy_Netherlands	-0.235***	0.032	-0.069	-0.235***	0.031	-0.069	-0.174***	0.032	-0.051
V4_dummy_Norway	-0.084**	0.03	-0.027	-0.061*	0.03	-0.02	-0.031	0.030	-0.010
V4_dummy_Poland	-0.094**	0.032	-0.028	-0.080*	0.031	-0.023	-0.088**	0.031	-0.026
V4_dummy_Portugal	-0.405***	0.033	-0.113	-0.409***	0.033	-0.114	-0.326***	0.033	-0.091
V4_dummy_Slovakia	-0.287***	0.031	-0.087	-0.302***	0.031	-0.092	-0.367***	0.031	-0.112
V4_dummy_Sweden	-0.255***	0.033	-0.07	-0.254***	0.033	-0.07	-0.170***	0.033	-0.047
V4_dummy_Switzerland	-0.282***	0.031	-0.086	-0.268***	0.031	-0.081	-0.208***	0.031	-0.063
V4_dummy_USA	-0.093**	0.031	-0.029	-0.075*	0.031	-0.023	-0.085**	0.030	-0.026
Gender_dummy				0.020	0.01	0.013	0.045***	0.010	0.029
Generation				-0.067***	0.006	-0.082	-0.040***	0.006	-0.049
Educational attainments				-0.034***	0.007	-0.034	-0.016*	0.008	-0.016
Perceived financial load on childbearing							-0.046***	0.005	-0.074
Gender equality index							-0.043***	0.006	-0.055
Individualism index							-0.110***	0.007	-0.133
R^2	0.06			0.069			0.091		

*p<.05, **p<.01, ***p<.001

5. Discussion

Using cross-sectional data derived from the ISSP 2012, Chapter 3 of this thesis examined variation in the expressed fertility ideal in 17 selected high-income countries which were all defined as post-transition countries. The analysis was conducted from two perspectives; variation in the fertility ideal between courtiers and within countries.

First, we found that the perceived fertility ideal varies between countries, ranging from 2.03 (Czech Republic) to 2.67 (Korea) with an average of 2.38 (Table 6c). This indicates that the perceived fertility ideal in the countries under study is higher than the actual fertility rates presented in Chapter 2. Moreover, the fertility ideal is higher than the replacement level of 2.1 in all countries except the Czech Republic. The results of the univariate analysis also showed that nearly 90% of the respondents answered 2 and 3 children as the ideal number of

[7] Gender became statistically significant in model 3. Considering that the gender difference in fertility ideal was very minor (*Male* = 2.37, Female = 2.39), this change may be due to the large total sample size (21734 respondents); Even marginal differences may become statistically significant.

children (Table 5). Taken together, these findings indicate that people across these countries generally have fewer children than what they express to be an ideal for a society.

Among the countries under study, Finland, USA, Poland, Norway, Japan and Korea had relatively high fertility ideals (> 2.5). Whereas the Czech Republic, Hungary Austria, Germany and Portugal showed somewhat lower ideals (< 2.3) (Table 6c).

Taking into account the increased opportunity cost of childbearing in a high-income society where an increasing number of women have high earning potentials, we previously assumed that the fertility ideal would be lower in countries where the female employment rate is high. According to the World Bank's World Development Indicators (World Bank, 2020b), the employment rate of the female population (among those older than 15 years in 2012) was highest in Norway followed by, Switzerland, Sweden, Denmark, the Netherlands, the United States and Finland, among the 17 countries under study. A high female employment rate is rather found in higher fertility ideal countries, which contradicts the initial assumption.

A possible explanation might be that the high opportunity cost of childbearing, which is assumed to lead to fertility decline, is modified in these countries, thanks to family policies or other policy measures. In countries that combine a high fertility ideal and a high percentage of women in the labor force, the working environment for women who otherwise would face an "either-work-children" choice might be arranged in a way that allow women to pursue both work and children without being constrained by the opportunity cost of childbearing. In other words, a high female employment rate, combined with a high fertility ideal, might possibly indicate that people are able to compensate the opportunity cost of childrearing in these countries.

Further, when the fertility ideal is compared with the actual fertility rate (Figure 3), we found that the fertility ideal generally corresponds to the actual fertility rate measured by TFR. More precisely, countries with moderate low actual fertility levels (1.5 >, TFR) such as Sweden, Denmark, Finland, the Netherlands, Norway and the United States, show relatively high fertility ideals (above 2.4); while countries with very low fertility levels (< 1.5, TFR) such as Austria, Germany, Hungary and Portugal, display relatively low fertility ideals (below 2.3). This is partly in line with our assumption based on Lesthaeghe (2010)'s

argument, that very low fertility countries would display lower fertility ideals. In other words, actual fertility rates reflect fertility ideals that indicate more individualistic norms.

However, this argument cannot explain the remaining gap between actual fertility and fertility ideals. As mentioned earlier, the expressed fertility ideal of all the countries were not lower than 2.1 in any countries, with the exception of the Czech Republic. If it is individualistic norms that drag down fertility rates below the replacement level, the expressed fertility ideal should arguably have been as low as the actual fertility rate. That is not the case: Even in countries where individualistic norms may dominate, people still express a fertility ideal higher than the actually realized fertility level (if measured by TFR).
In addition, the "individualism" theory cannot adequately account for countries such as Korea, Japan and Poland. These countries display very low actual fertility levels (TFR <1.5) while their expressed fertility ideals are among the highest. These countries also showed the highest gap between the actual fertility rate and the fertility ideal, with a gap larger than 1.0. (Figure 3). Rather, given that these three countries are known for their strong emphasis on traditional gender roles (Chung & van der Lippe, 2018; De Laat & Sevilla-Sanz, 2011; Lee & Choi, 2015; McDonald, 2000), our assumption of the impact of traditional cultural norms might explain this gap. As McDonald (2000) argued, countries that carries strong cultural norms with regard to gender division of labor presumably attach high values to family. This might be a reason why the fertility ideal is particularly high in these countries. However, these traditional norms, when combined with women none the less working, put women face to face with a dilemma of "either-work-or-children" choice. As a result of this incompatibility, their ideal ironically cannot be realized, and the gap between expressed fertility and actual fertility becomes larger in such countries.

The gap between fertility ideal and actual fertility is smaller in Norway, the Netherlands, Denmark, the United States, Sweden and the Czech Republic. Except for the Czech Republic, these countries are also countries with moderate low fertility (1.5≤ TFR <2.1). That is, both actual fertility and fertility ideal are relatively high in these countries. We suggest that this might be because, as we assumed earlier, family-friendly policies exist in these countries that help reduce incompatibility between childrearing and paid work. The Nordic countries in particular are known for their generous social welfare policies, that help parents combine childrearing and career opportunities (Bonoli, 2008; Ferragina, Seeleib-Kaiser, & Tomlinson, 2013; Ronsen & Skrede, 2010). In the Netherlands, people may have greater control over

their working hours thanks to its flexible labor market, supported by an employment-protection legislation, with plenty part-time work opportunities for both men and women while being entitled to the same benefits as full-time workers (Mills, 2015). The United States, although it is not particularly known for strong family-friendly policies, the private sector, combined with a low-wage economy for many service workers, may provide easily available, affordable childcare to many parents through private markets, which reflects the country's policy to encourage a market economy also with regard to services (Bonoli, 2008; Esping-Andersen, 1990). In short, countries where policies - whether explicitly or not - help parents reconcile work and family life, have higher fertility ideals, as well as a higher actual fertility rate.

Secondly, with regard to variation in the fertility ideal within countries, we found that the effect of gender on the fertility ideal was not strong[8]. This opposes our initial assumption that women would have a lower fertility ideal because it is mainly women who would confront the "either-work-or-children" dilemma. The finding may rather support Esping-Andersen and Billari (2015) argument that both men and women prefer to balance work and family life, rather than men and women choosing different "fertility strategies" when faced with a work-family life discrepancy.

Third, we found that the fertility ideal is significantly different between generations (birth cohorts) within some countries, but not in all of them. Particularly, younger birth cohorts displayed a lower fertility ideal than older birth cohorts in the Czech Republic, Hungary, Japan, Korea, Lithuania, Poland, Portugal and Slovakia. These are mostly countries with "very low" actual fertility levels. This finding is in line with our assumptions that the expressed fertility ideal may be lower in younger cohorts who presumably were raised in a less traditional culture than in older cohorts, who were presumably raised in a more traditional culture. The traditional culture may encompass norms related to gender differences and family formation. Given that many of these countries have traditional gender cultures that attach high value to family (Lee & Choi, 2015; McDonald, 2000; van der Lippe et al., 2006), ideational changes toward preferring smaller families, as Lesthaeghe (2010) argued, may be occurring among younger birth cohorts. However, it contradicts this

[8] Gender turned to be statistically significant in model 3 of the regression analysis, with women having a higher fertility ideal.

hypothesis that similar generational differences in fertility ideals were not observed in Austria, Denmark, Germany, the Netherlands, Norway and Switzerland; even though, in particular, Austria, Germany and Switzerland traditionally convey more conservative family values (McDonald, 2000). The stable expressed fertility ideal across generations may possibly indicate that traditional norms are no longer dominant in these countries. Alternatively, we previously assumed that fertility ideals may not drastically differ in countries that have introduced general family friendly policies, because such policies were expected to ease difficulties to pursue both a paid job and childrearing. A sense of security that people can balance job and childrearing, as well as social acceptance of such behaviors reinforced by family policies, might have reduced generational differences of fertility ideals. This possibility might be applicable to Denmark, the Netherlands and Norway, where policies that help reconcile job and childrearing were implemented earlier than in most other countries (Ferragina et al., 2013).

Fourth, we found a relationship between educational attainments and fertility ideals in some countries, but again not in all. In the Czech Republic, Korea, Poland and the United States, the fertility ideal was highest in the least educated group (mandatory education or below), while the lowest fertility ideal was found in the highest educated group (tertiary education). The finding conforms our assumption that people with higher education may express a lower fertility ideal due to higher opportunity cost of siring children. However, given that this relationship between education level and fertility ideal was not found in the other 13 countries, the effect of educational attainment on fertility ideals seems to be limited to certain countries.

Moving on to the results of the regression analysis, the analysis showed that variation in the expressed fertility ideal is related to perceived financial load on childbearing, the level of support for gender equality and the level of individualism in the society.

First, perceived financial load was negatively related to expressed fertility ideal, which indicates that the higher the level of financial load on childbearing people perceive, the lower fertility ideal people express. We assumed that a higher level of financial load on childrearing may stem from lack of institutional supports that mitigate high cost of childrearing, including opportunity cost when parents leave their jobs for raising children in high-income societies. If so, the finding implies that inadequate public financial supports on childrearing may lower

the expressed fertility ideal. As Esping-Andersen (1999); Esping-Andersen and Billari (2015) argued, this confirms the pivotal role of institutions to realize a high-income society where people can raise a number of children close to the expressed fertility ideal in their society.

Second, we found that the gender equality ideal index was negatively related to a high fertility ideal, which indicates that the higher the level of expressed support for a gender equality ideal, the lower is the expressed fertility ideal. A high support for a gender equality ideal can be contrasted to a traditional gender ideal, i.e. that expected behaviors deemed appropriate to each gender are different. Because a traditional gender ideal often involves familialistic values (McDonald, 2000), the contrasting gender equality-ideal may indicate less familialistic values, thus a lower fertility ideal. If this interpretation is correct, the finding supports Lesthaeghe (2010)'s argument that people in modern societies are becoming less familialistic in pursuit of self-realization, which negatively affect fertility. Notice, however, that countries such as Denmark, Finland, the Netherlands, Sweden and the United States, where the level of realized gender equality is known to be high (Esping-Andersen & Billari, 2015), are countries that have maintained moderate low actual fertility levels, rather than very low levels. We further found that the gap between fertility ideal and actual fertility in these countries were among the lowest. Taking all of these findings into account, they suggest that although the fertility ideal may decline when support for a gender equality ideal increases, the gap between fertility ideal and actual fertility simultaneously decreases, since parents are better able to actually realize what they perceive as the societal ideal. In this context also notice that even in countries with high adherence to a gender equality norm (ideal), the expressed fertility ideal stays about the replacement level (2.1 children per woman). In short, the dominance of gender-egalitarian norms in a society may help people realize their fertility ideal, which strengthens Esping-Andersen and Billari (2015)'s argument.

Third, the individualism index was negatively related to a high fertility ideal. The result indicate that the more people express individualistic norms, the lower is their expressed fertility ideal. The finding supports Lesthaeghe (2010)'s argument as referred earlier, that people in modern societies are becoming more individualistic (less familialistic) in pursuit of self-realization which negatively affect fertility. The finding on individualism index and gender equality ideal index taken together suggests that gender equality and individualism could both converge in the direction of preferring smaller families. A recent work by Davis and Williamson (2019) found a clear relationship between individualism and support of

gender equality. They found that individualism correlates with support for gender equality because individualistic values can weaken traditional gender norms, and instead serve to support autonomy and self-determination, including women's goals and preferences (Davis & Williamson, 2019). Our finding that the individualism index was the strongest explanatory variable on variation in expressed fertility ideal, strengthens this argument, if one can assume that support of individualism is a reason to (or related to) support of gender equality. A moderate positive correlation was found in our data between gender equality ideal index and individualism index, $r(21569) = -.39$, $p < .001$, two-tailed, which reinforces the argument.

To sum up the discussion, Figure 4 shows a tentative model to explain our main findings. The first junction is whether a society is individualistic or not. When individualistic values are widespread in a society, the level of adherence to gender equality also becomes high because individual autonomy is respected, which weakens traditional gender norms. In such a society, the expressed fertility ideal is likely to decline, as more people value self-determination towards their lives such as pursuing careers and academic attainments while placing less importance on traditional family formation. However, as far as the results of our analysis is a reliable guide, the (average expressed) fertility ideal seldom sinks below 2.1 child per woman. In comparison, when a society is collectivistic rather than individualistic, the level of support for gender equality is assumed to be lower. Conformity to social obligations and traditions are one of main characteristics of collectivism. Deviations to collective codes may evoke negative impressions such as confusion, anger and disgust (Triandis, 2002). In short, a collectivist mindset might go together with lower tolerance of individual autonomy, thus lower the level of support for gender equality. In a society where strong traditional gender norms are observed, the fertility ideal tend to be high, as people also attach a high value to the traditional family.

The second junction is whether there are adequate public supports for childrearing, since public interventions can mitigate the high cost of childrearing in high-income societies. With adequate public support, actual fertility is expected to be higher as the "price" of childrearing such as financial load and time spent is minimized by the supports, which results in a smaller gap between actual and ideal fertility. By contrast, if the public supports on childrearing is inadequate, actual fertility would become low because people would squarely face a choice between work and children. Because the fertility ideal is expected to remain well above 2.1, a lower actual fertility rate would lead a larger gap between actual and ideal fertility.

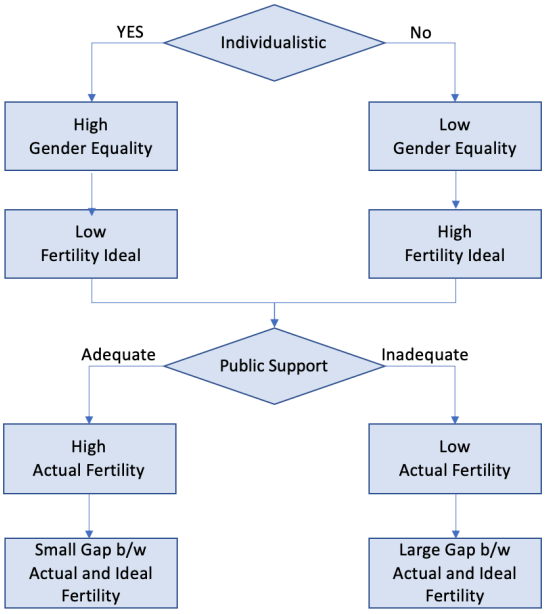

Figure 4 Relationship between Ideal and Actual Fertility in High Income Countries

CHAPTER 4

Policy Implications

The average decennial fertility level in all selected 17 high-income countries has been below the replacement level since 1998-1997 (D3, Table 1)[9], which is below the fertility level postulated as the end of the demographic transition. Some would think that the below-replacement fertility projects urgent issues related to population decline and resulting social system restructuring to adjust future population size. Others would think that population decline is rather a welcoming phenomenon in terms of mobility of a society (i.e. smoother policy implementation). Whether or not one is concerned about the prospects of future population decline, it is important to notice that people in almost all post-transition countries still holds a fertility ideal above the replacement level. This poses two implications. First, it indicates a possible scenario that actual fertility level may recover close to the replacement level if obstacles to its realization are resolved. Second, it suggests reformulation of problem understanding of fertility decline; the real problem may not be that fertility is declining but that people do not manage to have the number of children as they think ideal.

[9] When measured in TFR. The TFR of 9 countries had below the replacement level already in D1, and 4 countries in D2, it was D3 when all the 17 countries have become post-transition countries with TFR below the replacement level (Table 1)

Our analysis reveals that the gap between actual fertility and expressed ideal fertility is smaller in countries where the level of individualism and realized gender equality are known to be high. We argue that the prevalence of individualism that support gender equality may contribute to the decline of fertility ideal because individuals' goals and achievements, regardless of gender, are encouraged in individualistic societies. In such a society, the gap between actual and ideal fertility, however, may become smaller as people are better able to realize fertility ideal because individualistic societies may put larger efforts in creating social settings such as generous family-friendly policies, where the childrearing does not constrain one's goals and achievements.

We propose a tentative model that shows a relationship between ideal/actual fertility and individualism and public support, which were the most explanatory variables in our analysis (Figure 4). Although the model shows one-way relation, individualism (junction 1) and public support (junction 2) may be interlinked. In other words, precedent family-friendly policies may foster individualism in a society just as wide-spread individualism may motivate implementation of family-friendly policies. Although individualism may stem from cultural factor of a society, culture is dynamic as we have observed generational differences in values in regard to family formation in some countries. This may suggest that public policies play a crucial role to lead a change toward a more family-friendly society, particularly in countries with less individualistic culture where the gap between actual and ideal is presumed to be high.

In closing, we note some limitations of the study that could be addressed in future research. First, we adopted different database for TFR and CFR to compromise data unavailability of CFR. As it is expected that CFR data is to be accumulated in years to come, future analysis may use same database for TFR and CFR to have coherent data collection methods and eventually ensure research validity. Second, to strengthen the causal relationship between individualism and gender equality, further empirical studies may be required. Although our study suggests a possible causal relationship between the two variables, causality - that individualism promotes gender equality, was not investigated. Lastly, in connection with the second point, since the study uses cross-sectional data, generational differences on perceived fertility could not further identified if stemming from age, cohort or period effect. Future research may use longitudinal dataset to examine the trend of perceived fertility.

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