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ABSTRACT

FERTILITY DECLINE AMONG YOUNG ADULTS IN THE BELGIAN REGIONS, 2010-2017

Between 2010 and 2017, a drop in the number of live births was observed in Belgium (8% decline and its regions (BRU: -5%; FLA: -8%; WAL: -9%). This is reflected in a clear decline of the (period) total fertility rate: TFR for Belgium goes down from 1.85 in 2010 to 1.64 in 2017. In the regions, parallel drops are signalled (BRU: 2.03 and 1.80; FLA: 1.81 and 1.62; WAL: 1.85 and 1.63).

A steady rise in the mean age of the mother at childbirth was also observed. For Belgium, this goes from 29.8 years in 2010 to 30.6 years in 2017, which reflects the evolution in each of the regions (BRU: 30.7 and 31.7; FLA: 29.7 and 30.5 years; WAL: 29.5 and 30.4). A closer look reveals that this rise is particularly explained by a drop of the fertility rates at younger ages.

A focus on the recent evolution of TFR within broad nationality groups of the mothers shows that the drop in TFR is highest within Belgian and Non-EU nationals, whereas it remains more limited in Other EU-nationals. Likewise, a drop in TFR was observed in High and Medium educational groups in FLA.

It is concluded that the economy does not explain everything of the recent fertility decline among young adults. The postponed timing of new household formations is possibly key. A further contraction of the childbearing period, particularly among the higher educated women, in the age span 30 to 39 years is expected.

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Introduction

Between 2010 and 2017, a gradual drop in the number of live births was observed in Belgium, from around 129 000 to 119 000, which is a drop of 8%. The fertility decline was observed in each of the Belgian regions: a drop of 5% in the Brussels Capital Region (BRU), 8% in the Flemish Region (FLA) and 9% in the Walloon Region (WAL). The aim of this article is to explore how these figures translate into changing fertility rates over time and how the changes in total fertility vary within broad categories of nationality or educational level of the region's female population.

Material and methods

Data on the population in general and on the live births in particular were derived from Statbel, the Belgian statistical office. On a yearly basis, a copy of these data – comprising encrypted information on the personal unit level – is provided to Statistics Flanders.

Data from Statbel cover all the live births from mothers that belong to the 'legally resident' population, i.e. the population that has a legal right to stay and settle in Belgium and have their official place of residence in a Belgian municipality. This place of residence also defines the regional belonging of the child at birth (BRU/FLA/WAL). Excluded are live births among the non-legal population (e.g., live births from mothers applying for asylum); included are live births with a place of birth in a foreign country but from mothers having their official place of residence in Belgium. This marks a difference with Eurostat, aimed at the recording of the 'usually resident' population.

The *age-specific fertility rate f(x)* is understood to be the ratio of the number of live births of women with age *x* (numerator) and the average female population 'at risk' with age *x* (denominator) in the observation period – to be expressed in person-years.

In this study, fertility rates per observation year were calculated with age *x* of the mother at the child's birth according to her last birthday, which is the option recommended by Eurostat (also labelled as '*age completed*'). In population projections by contrast, it is customary to define the age of the mother according to her year of birth – in view of population projections for birth cohorts on January, 1st. The choice is not without consequences, for it defines the way the rates are calculated (both with respect to the selection of events in the numerator and corresponding populations at risk in the denominator).

Missing values for the mother's age were redistributed according to the known distribution for valid cases. For the calendar years 2010-2016, the share of missing values in this respect per region does not exceed 0.5% of the total of live births in the legal resident population. For 2017, a higher share is recorded for FLA (0.8%) and BRU (1.3%), which is explained by the fact that the 2017-data are still in need of additional checks (i.e. match between data in the National Register and data in the official birth certificates).

The *(period) total fertility rate* (TFR) is the sum of the age-specific fertility rates. It represents the number of children a woman will get at the end of her childbearing years provided that the observed age-specific fertility rates do not change over time. TFR and other fertility indicators (e.g., mean age of the mother at birth) were calculated for the age span 15-49 years.

The mother's current nationality – at the moment of the child's birth – comprises 3 main categories: Belgian, Other EU-national (U.K. included) and Third Country National (TCN) from outside the EU. The recording of this item was almost complete for 2010 (share of missing values less than 0.5% in each region) but higher again in 2017 (1.3% in BRU, 0.8% in FLA, 0.4% in WAL). It was considered plausible to attribute the cases with missing values to the TCN-category. Note incidentally that in case of inconsistency between the information from the birth certificates and from the National Register, credibility is imparted by Statbel to the National Register since 2010.

The mother's educational level also comprises 3 main categories: Low (highest certified educational qualification is less than higher secondary level = ISCED 0-2), Medium (higher secondary level = ISCED 3-4) and High (above higher secondary level = ISCED 5-8). This variable however contains quite a lot of missing values. In the recordings of live births for 2010, this amounts to 9% of the recorded live births for BRU, 6% for FLA and 23% for WAL; for 2016 – the final year with validated data on this variable at our disposal –, this is 8%, 7% and 20% respectively. In the calculation of TFR, the missing values were redistributed in a disproportionate way, with some overweight credited for the Low educational level (2 times the weight as recorded for the valid cases, per region), and underweight for the High educational level (half the weight), leaving the remaining share for the Medium level group. The rationale for this option is the idea that underreporting is disproportionally higher in lower educational categories.

Unlike age or nationality, the level of education is not a standard characteristic in general population statistics. The population distribution however can be assessed, either based on findings in the National Census (year 2011) or on estimates derived from other surveys. We used the yearly estimates of the Labour Force Survey (LFS) for Belgium and its regions, more particularly for the female population in the age span 15-49. The outcome of this was used as the correspondent population denominator in the calculation of TFR by educational level.

Results

1. Total fertility rate

Figure 1. Total Fertility Rate by region, female legally resident population, 1990-2017
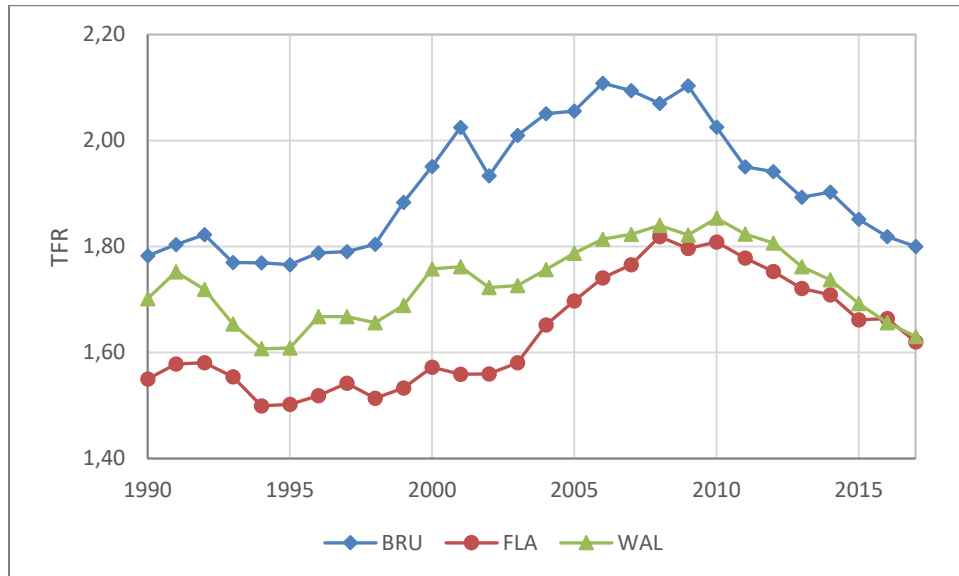
* Values for 2017 are provisional.
SO: Statbel, Statistics Flanders

Figure 1 clearly displays the recent decline in (period) TFR in all three Belgian regions. This decline started in 2009 in the Brussels Capital Region with TFR going down from 2.10 in 2009 to 1.80 in 2017. In the Flemish Region, a decline is observed between 2010 and 2015, and then onwards in 2017, with a drop from 1.81 in 2010 towards 1.62 in 2017. In the Walloon Region, a gradual drop is observed between 2010 and 2017 – from 1.85 towards 1.63.

TFR remains highest in BRU but tends to come much closer to the FLA/WAL-levels in the years after 2010 than was the case in the years between 2000 and 2010. Likewise, TFR for WAL has recently come very close to TFR for FLA.

In the broader picture, recent TFR-levels for BRU and WAL resemble those of the 1990s; recent TFR-levels for FLA however have not yet fallen below 1.60.

2. Age-specific fertility rates

Figure 2. Fertility rates by age, Belgium and its regions, legally resident population, 2010 and 2017
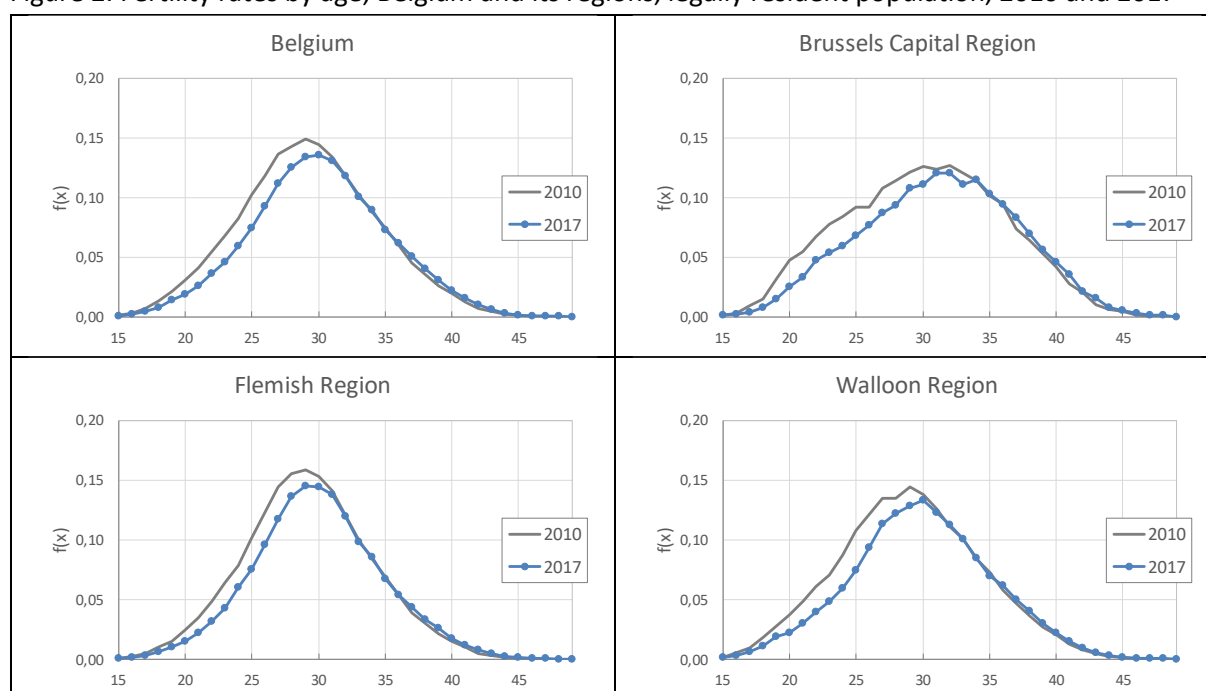
SO: Statbel, Statistics Flanders

Figure 2 displays the fertility curves by age for the calendar years 2010 and 2017, in Belgium and its regions. The predominant feature that catches the eye in each of the figures is the selective drop in fertility levels at the younger ages – i.e. at ages ≤30 in FLA/WAL & ≤33 in BRU.

The fertility curves on display for FLA and WAL are similar in shape. The FLA-curves however are a little more peaked and show smaller variation, which is reflected in its smaller standard deviations (table 1). FLA also shows a somewhat sharper rise over time in fertility levels above age 35 compared to WAL.

Typically, the fertility curve for BRU is broader and much less peaked than in FLA/WAL. Also, some rise in fertility rates between 2010 and 2017 at ages 35 and over is visible.

Table 1. Key fertility parameters, Belgium and its regions, legally resident population, 2010 and 2017

Region	2010			2017		
	TFR	Mean age	SD	TFR	Mean age	SD
BRU	2.03	30.7	5.90	1.80	31.7	5.77
FLA	1.81	29.7	4.76	1.62	30.5	4.76
WAL	1.85	29.5	5.27	1.63	30.4	5.21
Belgium	1.84	29.8	5.09	1.64	30.6	5.07

* Mean age and SD are weighted based on the age-specific fertility rates.
SO: Statbel, Statistics Flanders

Table 1 summarizes basic findings displayed in figure 2. The drop in TFR between 2010 and 2017 is similar over the regions (drop of 0.20 on average). BRU has the highest mean age, which moreover has

risen strongest between 2010 and 2017 (+1.07 years). FLA and WAL have lower and comparable mean ages, as well as more similar rises over time (+0.72 years for FLA; +0.88 years for WAL).

3. Total fertility levels within nationality groups

Table 2. Share of live births (LB) and Total fertility rate (TFR) by nationality group of the mother & region, legally resident population aged 15-49, 2010 and 2017

Region	Nationality of mother	Share in total LB (%)		TFR		Δ_TFR(2017-2010)	
		2010	2017	2010	2017	Absolute	Relative (%)
BRU	Belgian	52.6	48.0	1.87	1.63	-0.24	-12.8
	Other EU	20.2	24.8	1.58	1.55	-0.03	-1.9
	TCN	27.2	27.2	3.45	2.96	-0.49	-14.2
	Total	100.0	100.0	2.03	1.80	-0.23	-11.3
	N	18 608	17 699				
FLA	Belgian	84.5	78.4	1.72	1.48	-0.24	-14.0
	Other EU	6.2	9.4	2.04	2.00	-0.04	-2.0
	TCN	9.3	12.2	3.51	3.28	-0.23	-6.6
	Total	100.0	100.0	1.81	1.62	-0.19	-10.5
	N	70 065	64 490				
WAL	Belgian	84.8	81.8	1.79	1.54	-0.25	-14.0
	Other EU	7.3	8.0	1.82	1.75	-0.07	-3.8
	TCN	7.9	10.2	3.46	3.20	-0.26	-7.5
	Total	100.0	100.0	1.85	1.63	-0.22	-11.9
	N	40 464	36 876				

SO: Statbel, Statistics Flanders

Table 2 firstly shows a rise in the share of live births from mothers with a foreign (non-Belgian) nationality between 2010 and 2017 (BRU: from 47% to 52%; FLA: from 15% to 22% ; WAL: from 15% to 18%). Mind however that this is different from the share of foreigners in the female (legally resident) population aged 15-49 (BRU: from 38% to 42%; FLA: from 8% to 12% ; WAL: from 11% to 12%).

Table 2 also shows that TFRs are lowest among Belgians – at least in FLA & WAL –, and definitely highest among TCN in all the regions. In BRU by contrast, TFR is lower in 'Other EU'-nationals than in Belgians. Mind also that in FLA, TFR-2017 has fallen below 1.5 which is the threshold for 'very low period total fertility' (Zeman et al., 2018).

The drop in relative terms of TFR between 2010 and 2017 is highest in Belgian nationals in FLA and WAL. In BRU, almost the same drop in relative terms is observed though starting from a higher level.

Among TCN, the sharpest relative drop is observed in BRU. We should however bear in mind that the fertility levels in this nationality group always remain much higher. By contrast, the observed fertility

decline between 2010 and 2017 is relatively small among 'Other EU'-nationals, particularly in BRU and FLA.

Figure 3. Fertility rates by age among Belgian nationals, Other EU and TCN, Belgian regions, legally resident population, 2010 and 2017
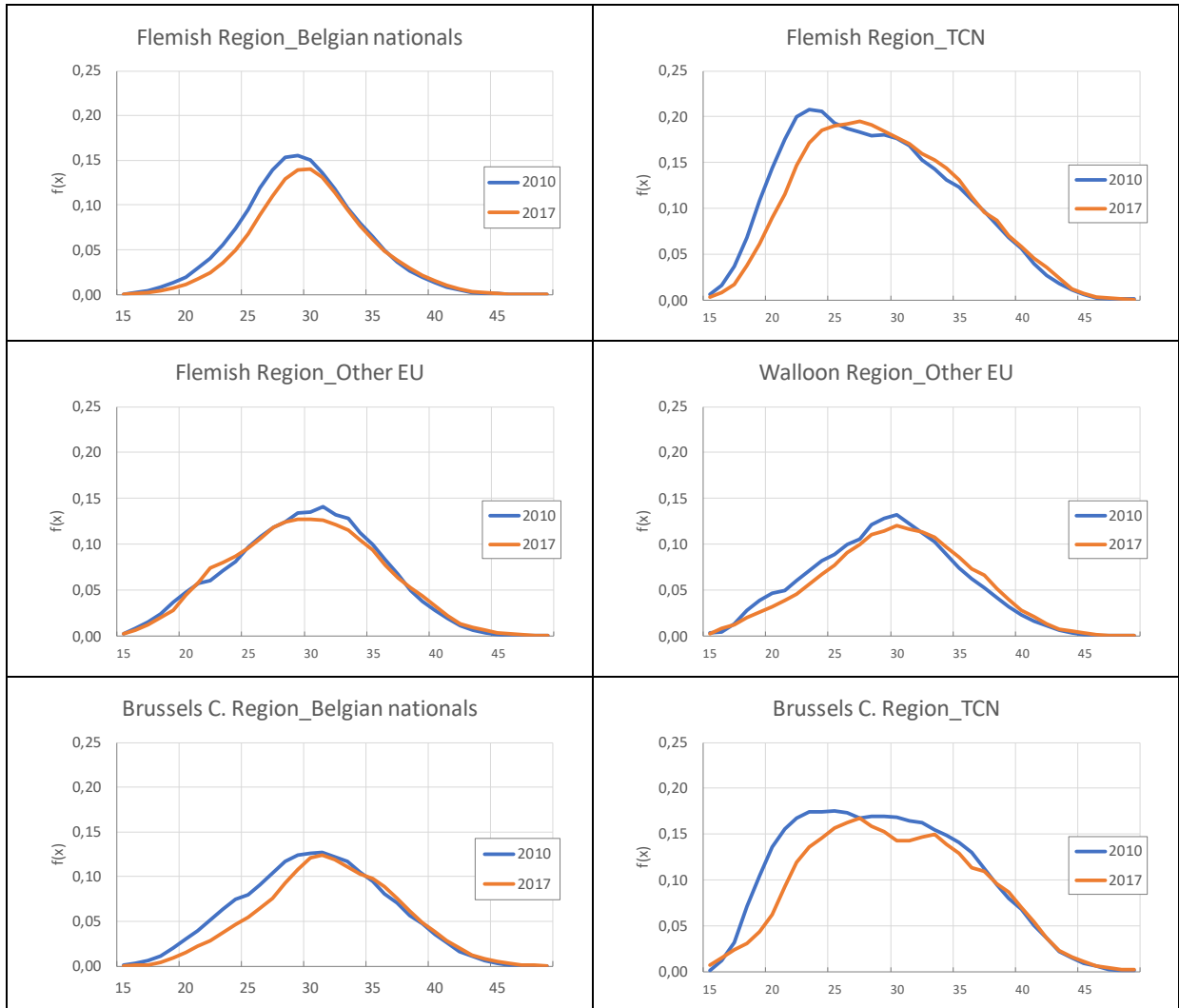
*Curves have been smoothed by moving averages over adjacent ages (k=3).
SO: Statbel, Statistics Flanders

Figure 3 provides some additional information on the fertility decline in recent years by age in Belgian nationals and foreigners.

For the Flemish Region, it is depicted that the fertility decline is particularly indicatedfor young adults in Belgian nationals (females below age 30) and in young TCN (below age 25); in 'Other EU'-nationals by contrast, fertility rates have foremost fallen back somewhat in the age group 30-34.

Basically likewise patterns by nationality group are observed for the Brussels Capital Region. Here also a clear fertility decline for young adults in Belgians (below age 30) and in TCN (below age 25) is depicted along with some minor changes in the fertility curve for 'Other EU'-nationals (with a drop in fertility rates in the age group 28-34).

The pictures for Belgians and TCN in the Walloon Region also come close to their counterpart in the Flemish Region (not shown). The greatest difference is reserved for 'Other EU'-nationals as in the Walloon Region, a drop in fertility rates at younger ages (between 20 and 30) and a marked rise at older ages (between 35 and 39) is depicted (figure 3, middle right).

4. Total fertility levels within educational groups

Results are only presented for FLA, i.e. the region with the largest number of live births and fewest share of missing values for the mother's reported educational level (6% in 2010, 7% in 2016).

Table 3. Share of live births (LB) and total fertility rate (TFR) by educational level of the mother, Flemish Region, legally resident population aged 15-49, 2010 and 2016

| Educational level of mother	Share in total LB (%)		TFR		Δ_TFR(2016-2010)	
	2010	2016	2010	2016	Absolute	Relative (%)
Low	12.9	13.4	1.81	2.08	0.27	14.9
Medium	39.5	38.6	1.90	1.81	-0.09	-4.7
High	47.6	48.1	1.71	1.48	-0.23	-13.5
Total	100	100	1.81	1.66	-0.15	-8.3
N	70 071	65 986				

SO: Statbel. Statistics Flanders

Table 3 firstly indicates a slight increase in the share of live births from mothers with a 'high' educational level between 2010 and 2016 in the Flemish Region (from 47.6% to 48.1%). This however is accompanied with a slightly higher share of mothers with a 'low' educational level (from 12.9% to 13.4%). Mind again that this is different from the distribution of the female (legally resident) population aged 15-49 according to the discerned level of education in both observations years (Low: resp. 23% & 19%; High: resp. 37% & 42%).

Table 3 foremost shows that in the Flemish Region, TFR in 2016 is lowest in the group with a 'high' educational level (High-group), which was also the case in 2010. By contrast, TFR in 2016 is highest in the Low-group. This however was not the case in 2010.

For both the Medium and the High-group, a drop in TFR between 2010 and 2016 is indicated. Mind that the relative decline is a lot more pronounced for the High-group. For the Low-group, a rise by contrast is indicated.

Figure 4. Change in overall fertility rates by educational level of the mother within selected age groups between 2010 and 2016. Flemish Region
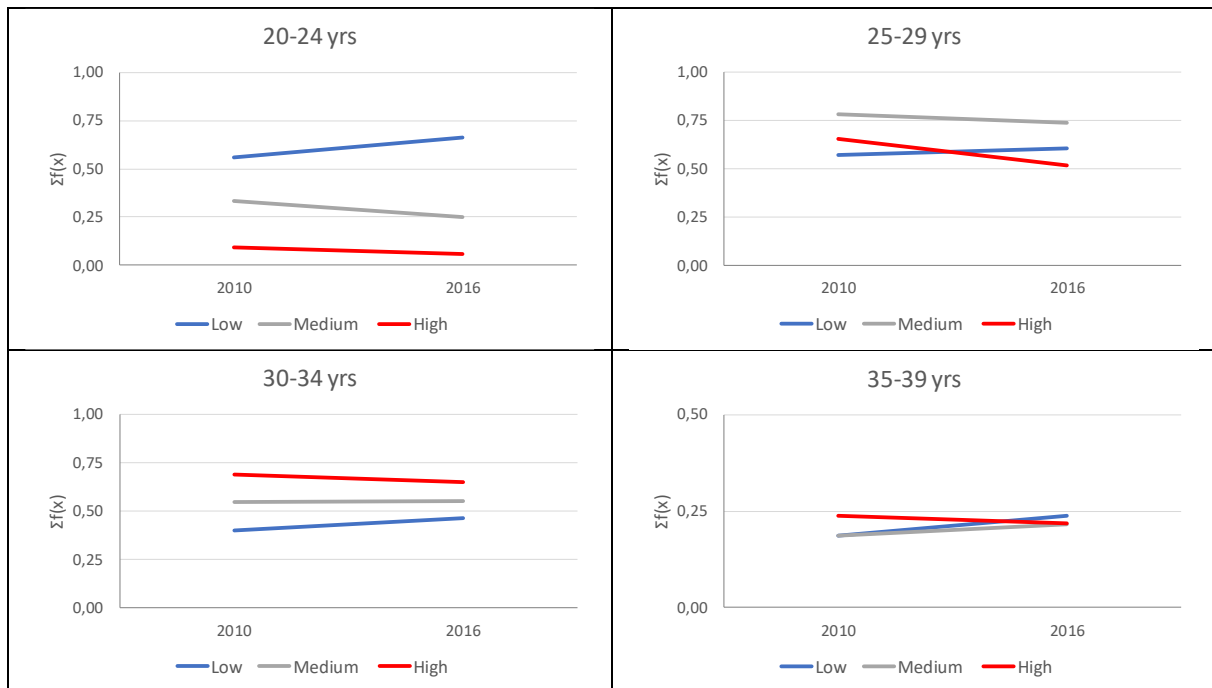
* The overall fertility rates displayed refer to the total of age-specific fertility rates within each age group. with age of the mother according to her last anniversary.

SO: Statbel. Statistics Flanders

From figure 4, it gets clear that the group of women with a recorded 'high' level of education (about half the female population) in the Flemish Region tend to have their children foremost in the age group 30-34 years, followed by the age group 25-29. In both these age groups, a decline in age group-specific fertility rates is indicated. This is most clear in the age group '25-29' (drop from 0.66 to 0.52), but it is also indicated in the age group '30-34' (drop from 0.69 to 0.65).

Women with a recorded 'medium' educational level (nearly 4 in 10 of the female population) predominantly have their children at the ages between 25 and 29 years. However, a slight decline in the age group-specific fertility rates is indicated as well (drop from 0.78 to 0.74). In the age group 30-34 years, the same fertility level is maintained in both observation years (0.55).

Women with a recorded 'low' level of education (about 1 in 8 of the female population) predominantly have their children in the age groups before age 30, particularly also before age 25. A rise in fertility levels is recorded within all selected age groups. This is most pronounced in the 20-24 age group (rise from 0.56 to 0.66).

Discussion

Fertility decline in young adults

Fertility decline between 2010 and 2017 has been recorded in all of the Belgian regions. The most striking feature is that the decline is most visible, if not exclusively indicated, in the age groups under age 30. Particularly the younger generations of women with a Belgian nationality – and along with them, their male partners – seem affected.

A similar shift was witnessed in the period 1990-1995 – at least in FLA & WAL –, but this was soon followed by a rise in the fertility rates at ages above 30. As the saying goes, all is not lost that is delayed. The result of these changes for the whole decade of the 1990s was a gradual shift (to the right) of the total curve toward older ages, with a rise in the mother's mean age at birth of about 1 year between 1990 and 2000 (e.g., from 27.8 to 28.8 years in FLA). The increased enrolment of young adult women in higher education and concomitant participation on the labour market during the decade seems a straightforward explanation.

In the following decade after the millennium change (2000-2010), a steady rise in TFR was witnessed (figure 1). The rise was again primarily observed at ages above 30. The fertility levels at younger ages either remained the same (FLA) or dropped somewhat (BRU & WAL). This however is not to exclude an occasional rise in the fertility rate at some younger age (e.g., the slight rise at age 27 in FLA-2008 compared to FLA-2007). Again, the mother's mean age at birth had risen with about 1 more year (e.g., from 28.8 to 29.7 years in FLA).

Compared to these previous periods, the exclusive and steady drop of fertility levels at younger ages together with stable (or some slightly rising) fertility levels at ages above 30 in 2010-2017, is a rather new combination. Consequently, the result again is a higher mean age of the mother at birth (e.g., from 29.7 to 30.5 years in FLA).

The economy is not the whole story

In the most recent publication of the Federal Planning Bureau (FPB) and Statbel on the demographic outlook for the period 2018-2070 (FPB & Statbel, 2019), a special focus is dedicated to the relationship between fertility levels and the general economic evolution. More particularly, reference is made to the publication of de Beer and Latten (2018) on the relationship between TFR and the consumer confidence index (CCI) in the Netherlands. A clear relation for the years following the financial crisis of 2008 between both indicators was demonstrated, albeit with a lag of about 2 years for TFR – at least until 2014.

A recast of this finding by the FPB for Belgium has demonstrated that the 2008-financial crisis has resulted in a drop in CCI in 2008 and 2009, which indeed was followed by a drop in TFR from 2010 onwards. Soon after, CCI has risen again (although with a new slump in 2012), but TFR has not duly followed. Admittedly, CCI is but one conjunctural indicator (and somewhat flawed on a yearly basis), not really meant to grasp the deeper economic transitions.

A recent study that compared changes in childbearing risks in five Nordic countries in the aftermath of two economic crises, i.e., the 1990-1992 and the 2008-2010 recessions, showed that a heterogenous response across the countries linked to their specific economic situation was indeed displayed in the

1990s but not so after the 2008-2010 recession. Despite the fact that the 2008 crisis was milder than in the 1990s and hit the different Nordic countries asymmetrically, it was observed that the consequences in terms of fertility rate developments were surprisingly negative and more uniform across the five countries. According to the authors, the findings suggest the need to expand the theoretical framework explaining the cyclicality of fertility towards the perception of economic and welfare uncertainty. In the much more interconnected world, perceived changes on the global level come in play as well, irrespective of the state of the economy or the welfare arrangements in one's own country (Comolli, Neyer, Andersson et al., 2019).

In line with this study, we think that the perceptions of uncertainty due to developments on a broad scale may indeed have more impact on young adults (with moreover a time frame still enabling the postponement of having children) than on the more settled, somewhat older generations. Many perceived uncertainties – think also on the booming attention for climate change risks – may indeed come together here. Findings however show that the impact of such perceptions is more clear on someone's judgement on the ideal number of children per family (social norm) or someone's personal intentions in this regard than on the actual fertility rates, and moreover has a tendency to fade away with time (Sobotka *et al.*, 2011; Van Peer, 2019).

A difficult housing market for young adults

Changes in the household composition may shed some more light. Most strikingly is the rising proportion between 2010 and 2018 of women aged 25-29 still living in the parental home based on household statistics from Statbel (BRU: from 12% to 17%; FLA: from 19% to 21%; WAL: from 18% to 25%). It is tempting to link this with a difficult housing market for young adults in the country. One explanation is a growing disparity between what is on offer and rising quality aspirations of young adults (Vandorpe *et al.*, 2007). This social factor by itself may explain the (temporary) postponement of having children.

Postponement of adulthood?

The basic finding of our results on the evolution of TFR in the Flemish Region between 2010 and 2016 by broad educational level is that a drop is indicated for the High & Medium-groups, not so for the Low-group. The largest drop is observed in the High-group, particularly in the age group 25-29. This contradicts the intuitive expectation that effects of economic conditions will be sharpest for the Low-group, and much less so for the High-group. Again, something else must be at play.

From household statistics, it is observed that less women aged 25-29 in recent years do live together with a partner (BRU: from 47% in 2010 to 42% in 2018; FLA: resp. 61% & 58%; WAL: resp. 56% & 51%).

A possible explanation is that young – and to a large extent highly educated - people today experience a broad scheme of choices and versatile opportunities (notably also on the labour market!), which may add to the postponement of making life-lasting decisions, particularly in getting related. If the assumption is correct, we may expect a further contraction of the child bearing years among higher educated women in the age group 30-39, with some recuperation of fertility, provided high levels of gender equality, childcare coverage and policies promoting the work-family balance are in place (Testa, 2014; Zeman *et al.*, 2018).

In line with this, Neels et al. (2013) observed that after age 30, effects of the economic context do not affect first birth hazards among women. It was also found that recuperation is further associated with access to labour markets and - indeed - entry into cohabiting unions.

A caveat however is in place with respect to our registration of the mother's educational level. First, quite a lot of missing values were recorded in the birth certificates (with a variation between 6% and 23% over the regions). Apart from that, we may not expect the administrative birth certificates to be an optimal source for the recording of the mother's educational level (lest the father's). Secondly, the recording of the educational level of the (female) population was assessed by a survey (LFS), which remains rather crude to determine the denominator for – in this regard quite sensitive – fertility rates. The better alternative indeed is to assess differences between educational groups with respect to completed cohort fertility among women at the end of the child bearing life period (say 45 and over) based on targeted surveys on the subject (Zeman *et al.*, 2018). Actually, in the end it is always completed cohort fertility that will tell us the whole story.

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