

# Fertility trends after the financial crisis in Norway

Lars Dommermuth<sup>1</sup> and Trude Lappegård  
Research Department, Statistics Norway

*Extended abstract for the European Population Conference 2016*

*Session 5: Recession and fertility*

*Please do not cite without permission from the authors*

## **Abstract**

In research on fertility and family demography, the Nordic welfare states are often described as role models, as their active family and labour market policy supports couples to combine dual-earner careers with family life. The comparatively high and stable fertility rate in these countries is often seen as a positive result of various policy measures related to families and the labour market. Norway is one of the Nordic welfare states and profits in addition from a robust economy as an oil-exporting country. The global financial crisis of 2007-2008 led only to a slight increase in unemployment rates in Norway. Nevertheless, we could observe a constant decline in the total fertility rate (TFR) in Norway since 2010. While the TFR was at 1.98 in 2009, it dropped down to 1.73 in 2015. To increase our understanding of the recent decline of the Norwegian TFR, we decompose the annual TFR by age, parity and education. Our analyses are based on administrative register data, including all registered births in the period from 1990 to 2015. We observe a new postponement of first-births after 2009. Together with a long-term decrease in higher order birth rates, this led to the observed decline in the TFR since 2010. Second birth rates remained comparatively constant throughout the whole observed period. The decrease of first births and third birth rates occurs among all women independent of the level and field of education, but vary by women's age. In each age group, the decrease is strongest among those educational groups which contribute most to the specific fertility rate. In the younger age groups, the first and third birth rates went especially down among lower educated women, while the decline of older age groups was more pronounced among higher educated women.

---

<sup>1</sup> Corresponding author, Lars.Dommermuth@ssb.no

## Introduction

Compared with other European countries, the Nordic countries (Finland, Sweden, Norway, Iceland and Denmark) use a higher proportion of their GDP on public spending on families and especially provide comprehensive support to working parents with young children (Luci-Greulich & Thévenon, 2013; Thévenon, 2015). This includes paid paternity leave and universal access to public childcare for young children. At the same time, female labour market participation is comparatively high in the Nordic countries and they were among the first countries where more young women than men achieve a higher education. The relatively high fertility rate in the Nordic countries is often seen as a positive result of such an integrated family and labour market policy, allowing both parents to combine work and family life (Adserà 2004; McDonald, 2006). As an oil-exporting country, Norway and its citizens profit in addition from a robust economy. The global financial crisis of 2007-2008 led only to a marginal increase in unemployment rates in Norway. Nevertheless, we could observe a distinct decline in the total fertility rate (TFR) in Norway since 2010. While the TFR was at 1.98 in 2009, it dropped down to 1.73 in 2015. In this paper we focus on this decrease in the total fertility rate after the financial crisis in Norway. We decompose the annual fertility rates by age, educational background and parity for the period from 1990 to 2015. In addition, we estimate age specific fertility rates by parity and education for this period. Our analyses are based on Norwegian administrative register data, allowing us to include all resident women and registered births in the analyses. Thereby we can trace the development of the fertility behaviour of Norwegian women in this period and how this led to a decline in the TFR in the past years.

## Reasons for changes fertility rates

Age-specific fertility rates (ASFR) are the number of live births per 1000 women in a specific age group in a calendar year.

$$ASFR = \frac{\text{Number of live births to women in specified age group}}{\text{Number of women in same age group}} * 1000$$

ASFRs indicate how the likelihood of having a child varies by age and over time, if they are calculated for several years. To calculate the TFR, one sums the single years ASFRs. Thereby the TFR is the average number of children that would be born to a woman during her lifetime if she were to pass through her childbearing years having births according to the current schedule of ASFRs. This implies that changes in the fertility behaviour of women, including both the timing as well as the quantum, shape the TFR immediately. Since the 1960s the TFR declined in most European countries, but before the turn of the millennium one could observe a reversal in this trend. Between 1998 to 2008, Europe

experienced the first continent wide increase in the TFR since the 1960s (Bongaarts & Sobotka, 2012). Both the decline of the TFR and the partly reversal around the turn of the millennium are closely related to the postponement of childbearing in the past decades. Initially, the postponement led to a decrease of the fertility rates of younger women and thereby to a decline of the TFR. Some years later, the same cohorts of women became mothers and thereby the TFR increased again. Furthermore had the increase in childlessness and the long-term decrease in the completed total fertility rate (CTFR) – which is the total number of children of women by the end of their reproductive life – a negative long term impact on the TFR.

After increasing TFRs in the beginning of the 2000s, the rate fell again around 2008/09 in Norway and many other European countries. Can we expect a new reversal of this trend in the upcoming years? We examine this question for Norway, based on administrative register data including all registered births in the period from 1990 to 2015. For every year in this period we calculate the annual TFR and ASFRs, including all women aged 15-49 years and registered as resident in Norway at the end of each year. Via the birth register we can identify the parity of each birth, which allows us to calculate parity specific birth rates. In addition, we link information on educational attainment from the National Database on Education (NUDB) to our annual samples and identify the highest level of education and the field of education of all women, whereas those under education are treated as a separated group.

### **Changes in the TFR in Norway from 1990 to 2015**

Overall, the observed period consists of three trends with changing TFRs in Norway. To begin with, the TFR was comparatively high with 1.93 in 1990, but went down to 1.75 in 2002 (see Figure 1). Thereafter, we can observe a constant increase in the TFR up to 1.98 in 2009. Finally, this is followed by a drop of the TFR and in 2015 the TFR in Norway was at 1.73, which is the lowest TFR in Norway since 1987. A similar or even stronger fall of the TFR after the economic crisis in 2008 has been observed in many other European countries. A strong increase of unemployment rates and especially unemployment rates among young people is mentioned as one major cause for this development (Goldstein et al., 2013; Thévenon, 2015). But this conclusion seems less plausible for the Norwegian case, as female unemployment rates remained rather stable and comparatively low after 2009 (see Figure 1). Furthermore, data from the Labour Force Survey indicate no substantial increase in temporary jobs among young employed women after 2009 (Statistics Norway 2016c). Generally, young men and women had comparatively good prospects on the labour market in Norway throughout the whole observed period.

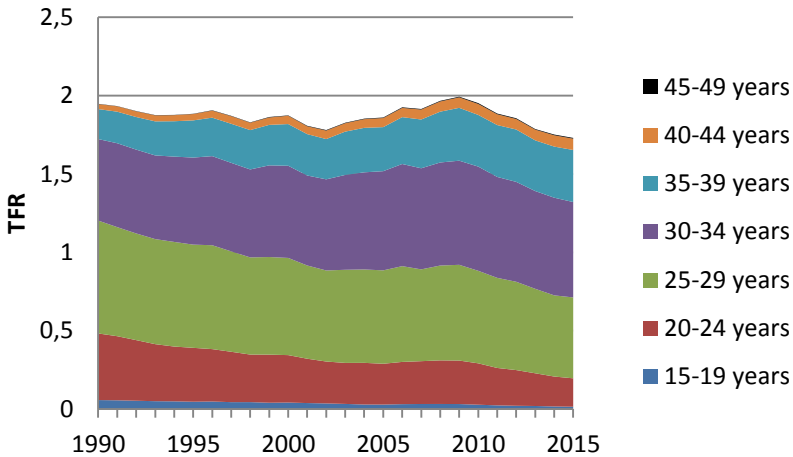
**Figure 1.** Total fertility rate and female unemployment, 1990-2015



Source: Statistics Norway 2016a, b.

As in most other countries, women’s age at first birth has increased in Norway during the past decades. In 2015, women’s mean age at first birth was 28,9 years, which is more than three years higher than in 1990 (Statistics Norway 2016d). Similarly, the mean age at second birth and higher order parities has increased. This means that the age composition of the TFR has changed. This shift becomes visible in Figure 2, where we have decomposed the TFR by women’s age. While in 1990 the bigger part of the TFR could be ascribed to births of women aged less than 30 years, the picture was opposite in 2015. Figure 2 also shows that the youngest women (aged 15 to 19 years) and those aged 40 years and older only contributed with few births to the TFR in Norway.

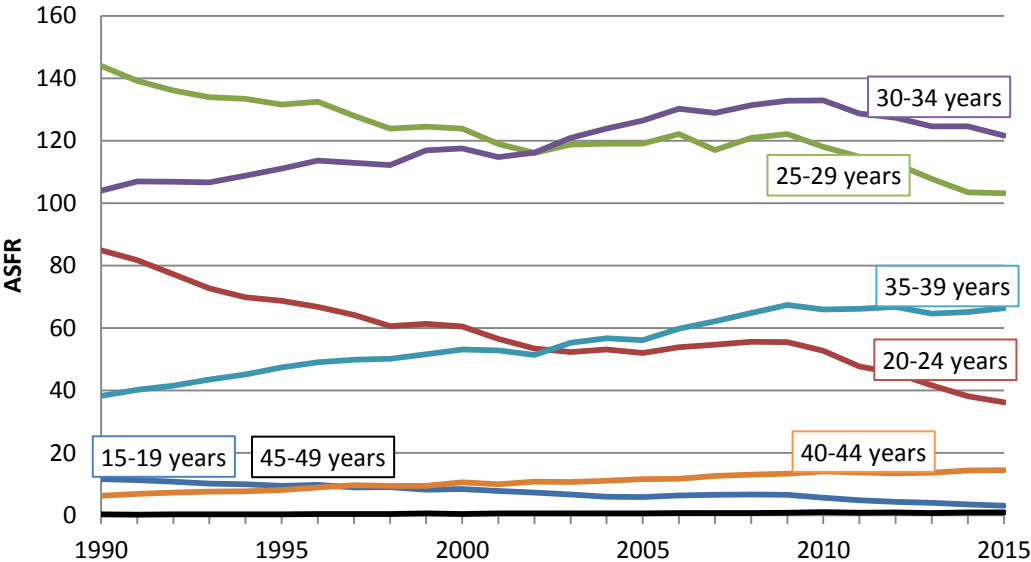
**Figure 2.** Total fertility rate 1990-2015, decomposed by women’s age



The increasing importance of older mothers for the TFR becomes even more evident in Figure 3, which consist of the ASFRs of Norwegian women from 1990-2015. In the beginning of the observed period, the ASFR of younger women (below 30 years) decreased substantially, while the ASFR of women 30 years and older increased to some degree. Taken together, this led to the observed fall in the TFR from 1990 to 2002.

In 2002 the ASFR of 30-34 old women crossed above the ASFR rate of 25-29 year old women and since this year this age group has the highest ASFR in Norway. Similarly, the ASFR of 35-39 year old increased in the period from 1990 to 2009 and crossed above the ASFR of 20-24 year old women in 2002.

**Figure 3.** Age specific fertility rates in Norway, women

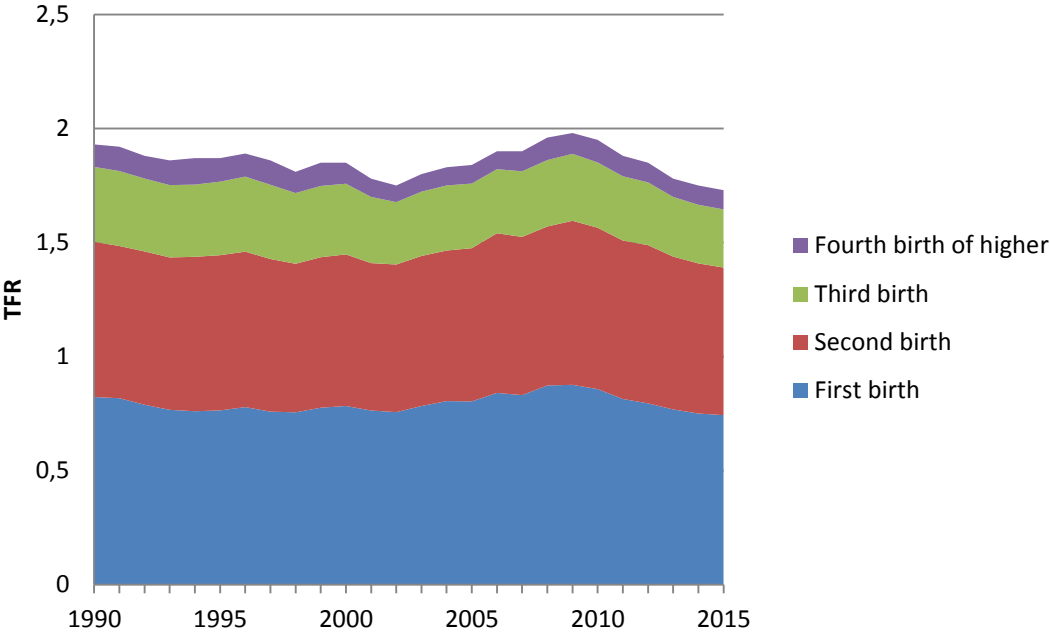


At the same time, also the ASFRs of younger women did not decrease further, but remained stable until 2009. Together with the increase of ASFRs of older women this led to the observed upturn of the TFR in this period (see Figure 1). But since 2010 the ASFRs indicate a new shift, as the ASFRs of women below 30 years decreased again (as before 2002) and the ASFR of 30-34 year old women peaks downward for the first time. Only the ASFRs of older women remained stable (35-39 years) or increased slightly on a relatively low level (40-49 years). This development results in the observed fall of the TFR since 2010 (see Figure 1).

Next, we investigate to which degree changes in parities are related to the observed ups and downs in the TFR. In Figure 4 we have decomposed the TFR by parity and this descriptive results show that first and second births resemble the corpus of the annual TFR in Norway. Throughout the whole period there has been a slight, but continuous fall in third births as well as higher parities. First and

second births rates contributed relatively stable to the TFR until the turn of the millennium, followed by an increase up to 2009. Thereafter, we can observe a comparatively strong decline of first births and a certain decrease of second births.

**Figure 4.** Total fertility rate 1990-2015, decomposed by parity

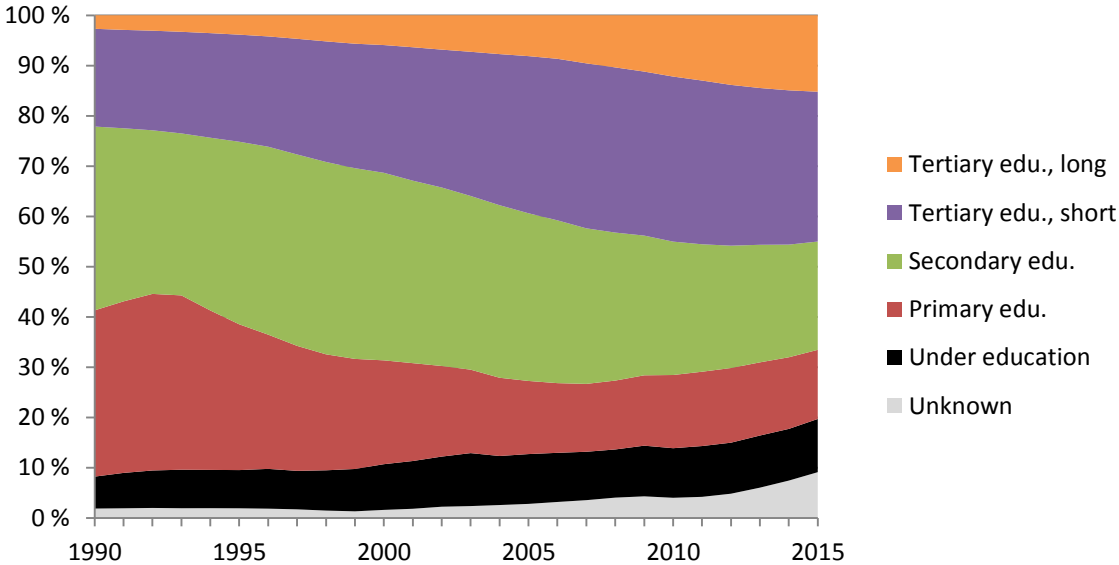


From an international perspective, the relatively high and constant proportion of second births throughout the observed period is remarkable. In European countries with lower fertility rates, there has been observed a strong decline in second births and of higher parities (Billari & Kohler, 2004).

**The impact of educational background on fertility rates in Norway**

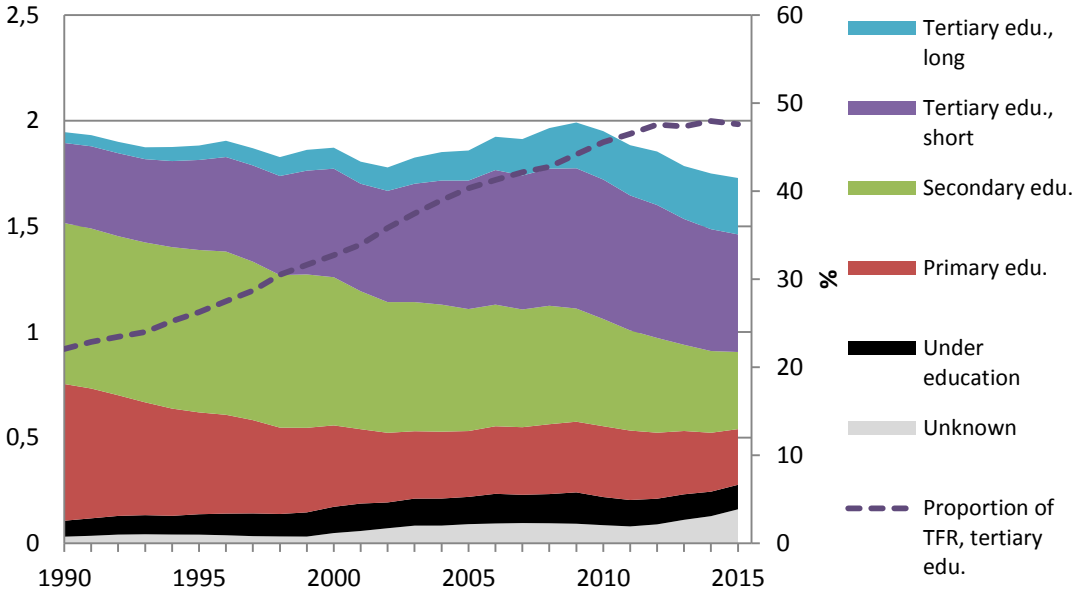
There has been an outstanding expansion of higher education among women in Norway. In Figure 5 we display the educational level of women aged 30-34 years throughout the observed period. The proportion of women with a tertiary education has increased from 22% in 1990 to 45% in 2010 and remained stable since then. Between 6 to 10% of the women in this age group were still under education in each given year. Earlier research has shown that educational attainment is a strong predictor for fertility. Current enrolment in education is associated with a lower likelihood of childbearing and thereby higher education is related to the postponement of first births (Lappegård & Rønson, 2005).

**Figure 5.** Women’s educational attainment at age 30-34 years



In Eastern and Southern Europe, women’s higher education is associated with a lower number of children and in some countries also with a higher degree of childlessness (Klesment et al., 2014). In Norway however, analyses of CTRs show that the differences in fertility rates by women’s education have decreased. Comparing women born 1945-49 with women born 1960-64, Lappegård et al. (2013) find that childlessness decreased among higher educated women. And in opposite to the general trend, the average number of children has increased among higher educated women (Lappegård et al., 2013). If this trend has continued among younger birth cohorts, has not been examined so far.

**Figure 6.** Total fertility rate 1990-2015, decomposed by level of education



The strong shift in women's education shapes Figure 6, in which we have decomposed the TFR by women's highest level of education. As the proportion of women with primary or secondary education falls, also their contribution to the TFR goes down. Since 2005, over 40% of all children are born by women with a tertiary education (see dashed trend line in Figure 6). Interestingly, the observed fall in the TFR after 2009 is especially visible among women with secondary and short tertiary education. Especially for the latter group, this is a new negative shift. Beside women with unknown education – which includes mostly immigrants – the TFR only increases among women with a higher tertiary education after 2009.

In further descriptive analyses, we decompose the TFR by the field of education, indicating in which branch a woman typically will be employed later on (results not shown). Such a link between educational field and the labour market has been applied in previous analyses of fertility behaviour in Norway (Lappegård & Rønsen, 2005) and Sweden (Hoem et al., 2006). Women with an education directed to an employment in the highly feminized public sector are here one of the most interesting groups. Typically this is an education within social work and care or as a teacher. Women with such an educational background had comparatively high and stable birth rates, even in times when the TFR was falling. Our results indicate however, that also the fertility rates of these women went down since 2010.

To get further insight into association between women's educational background and the development of the TFR, we decompose the ASFRs by parity and education. Figure 7 includes the ASFRs of first births by level of education for the three most important age groups. The scale for the ASFR on the y-axis is similar in the different diagrams of Figure 7, which allows us to compare the ASFRs between the different age groups. Among 20-24 year old women, the ASFR for first births falls from about 60 births per 1000 women in 1990 to about 25 births per 1000 women in 2015 (dotted line) and the ups and downs are mainly driven by women with primary or secondary education in this age group.

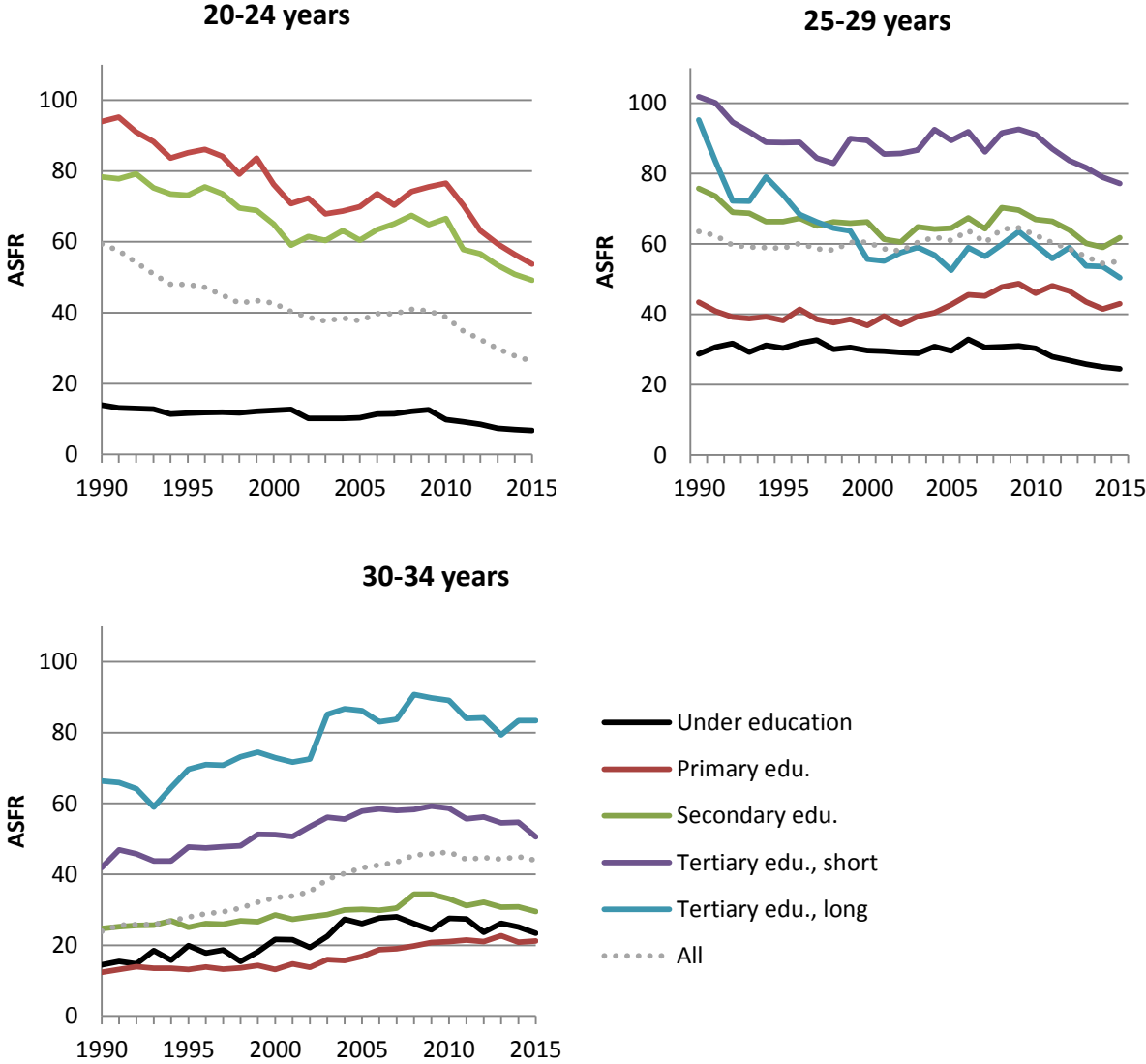
Among 25 to 29 year old women the ASFR is around 60 births per women across the whole observed period, with the highest level in 2009 (65 births per 1000 women) and a slight but continuous fall in the subsequent years (down to the lowest level of 55 births per 1000 women in both 2014 and 2015). In this age group, women with a short tertiary education have the highest ASFR for first births and it is in this educational group the decline after 2009 is strongest.

Among women aged 30-34 years (and older women, results not shown), the ASFR for first births increases from 24 births per 1000 women in 1990 to 46 births per 1000 women in 2009, which is in line with the general postponement of first births. Thereafter the rate remains almost stable, mainly because women with a primary education have increasing first birth rates in the older age group.



However, among women with a short and long tertiary education, which are the most important educational groups in this age range, the ASFR for first births falls after 2009.

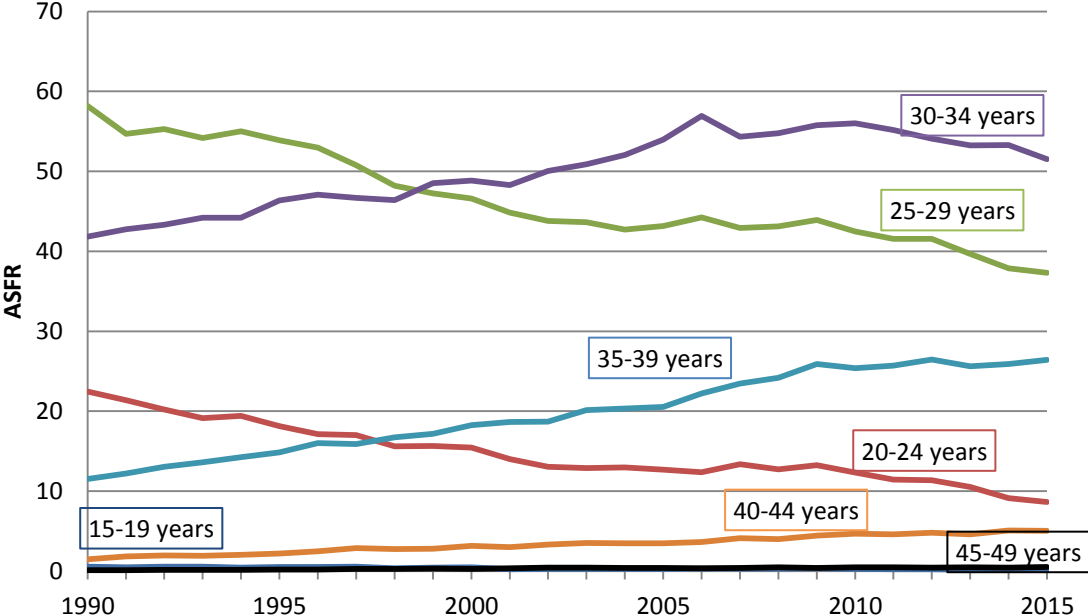
**Figure 7.** Age specific fertility rates of first births by level of education, 1990-2015



Summed up for the development after 2009 we find that the ASFRs for first births decreased especially among women below 30 years. Across all age groups, the decreasing trend is strongest among those educational groups which contribute most to the specific ASFR for first births. Compared with first births, the changes of the ASFRs for second births are rather small (see Figure 8). As expected due to the postponement of first births, age specific second birth rate decreased for women below 30 years throughout the whole observed period, while the opposite is true for women above 30 years. Especially the increase among 30-34 old women is strong, from 42 second births per 1000 women in 1990 to 56 second births per 1000 women in 2010. First thereafter the ASFR

decreases slightly for this age group. Against the general trend, age specific second birth rates continue to increase among 35-44 year old women also after 2009. Taken together, this leads to stable second births rates of Norwegian women aged 15-49 years, which is a remarkable result in itself. This underlines the strong importance of the two-child norm in Norway. Differences in second birth rates between the educational groups remain stable across the observed period, as they follow the same general trend in sub-group (results not shown).

**Figure 8.** Age specific fertility rates for second births, decomposed by women’s age

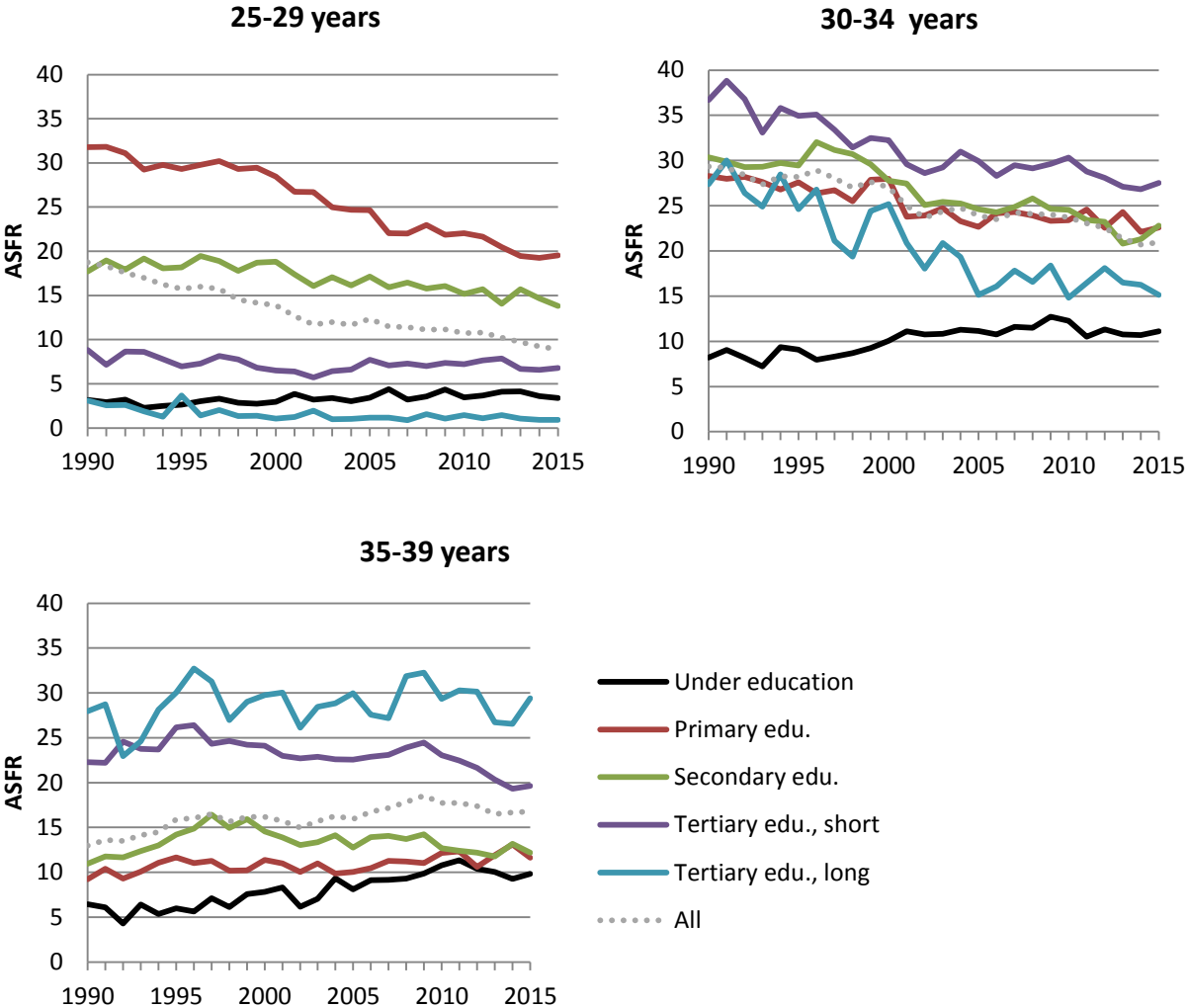


In contrast to this, we have observed a long term decline in third births and higher order births (see Figure 4). This becomes also visible in ASFRs for third births displayed in Figure 9, which includes both the general trend (dashed lines) and ASFRs by women’s level of education.

Focusing on the general trend in a first step, we observe falling third birth rates among women below 35 years from 1990 to 2002. Between 2002 and 2009 the rates are more or less stable in these age groups, but fall again thereafter. Among women aged 35 years or older, third birth rates increased until 2009, but went down thereafter. This is in contrast to second births, where the decline in the younger age groups is almost compensated by an increase in the older age groups. Furthermore, Figure 8 displays some interesting differences by education. The decline of third births rates among 25-29 year old women is mainly driven by primary educated women and to some extent by secondary educated women. Some of them get their third child at a higher age and thereby the third birth rates of primary educated women are relatively stable in the older age groups. Here the decline in third birth rates after 2009 is mainly driven by women with secondary education (30-34 years) and

women with short tertiary education (30-34 years and 35-39 years). As for first births, the decline in each specific age group is closely related to those educational groups which contribute substantially to the specific ASFR.

**Figure 9.** Age specific fertility rates of third births by level of education, 1990-2015



**Discussion**

The recent decline in first birth rates and the long lasting decrease in third-birth rates seem to be the main underlying factors for the fall in the TFR since 2010 in Norway. First in the upcoming years, we can evaluate if this development will lead to a decline in the CTFR or alter the social differences in the CTFR. But the decomposition of the fertility rates indicates already by today, that the prospects for a stable CTFR have worsened.

Also in the 1990s we observed a fall in the TFR in Norway, followed by an increase from 2002 to 2009. During the decrease in the 1990s, the ASFR of women below 30 years went down, while the ASFR of older women increased continuously. This means that the fall of the TFR in the 1990s was

closely related to a postponement among younger women and could be related to the increasing participation of women in higher education. In the past years, this trend with an increasing proportion of women with higher education stopped up more or less.

If we look at the decline in the TFR after 2009 we found that not only the ASFR of younger women, but also those of older women (30 years and above) have decreased for the first time. This means that the postponement has reached a new level (e.g. higher ages) and takes course among all educational groups. Especially the decline in age specific first birth rates of all women between 20-34 years makes it more likely that the CTFR will fall to some extent among younger cohorts in Norway. It needs further research to reveal the underlying causes for this recent trend shifts in the fertility behaviour of Norwegian women. As lined out at the outset of this paper, the Norwegian welfare state provides comparatively generous support to parents and families. However, the high labour market participation of its residents is the main paradigm of the Nordic welfare states. Also the family policies are subordinated this paradigm, as in practice most Norwegian family policies encourage young people to work before they get a child. Even though the global financial crisis in 2007/08 did not lead to a strong increase in unemployment rates in Norway, it may be possible that the on-going discussion about an economic crisis and worsen prospects have led to a higher level of perceived insecurity among Norwegian young adults. Further analyses of fertility trends in Norway should therefor include young women's transition into the labour market after their graduation.

## References

- Adserà, A. (2004). Changing fertility rates in developed countries. The impact of labor market institutions. *Journal of Population Economics*, 17(1), 17-43.
- Billari, F., & Kohler, H.-P. (2004). Patterns of low and lowest-low fertility in Europe. *Population Studies*, 58(2), 161-176.
- Bongaarts, J., & Sobotka, T. (2012). A Demographic Explanation for the Recent Rise in European Fertility. *Population and Development Review*, 38(1), 83-120.
- Goldstein, J. R., Kreyenfeld, M., Jasilioniene, A., & Örsal, D. K. (2013). Fertility reactions to the 'Great Recession' in Europe: Recent evidence from order-specific data. *Demographic Research*, 29(4), 85-104.
- Hoem, J. M., Neyer, G., & Andersson, G. (2006). Education and childlessness - The relationship between educational field, educational level, and childlessness among Swedish women born in 1955-59. *Demographic Research*, 14, 331-380.
- Klesment, M., Puur, A., Rahnu, L., & Sakkeus, L. (2014). Varying association between education and second births in Europe: Comparative analysis based on the EU-SILC data. *Demographic Research*, 31(27), 813-860.
- Lappegård, T. & M. Rønsen (2005). The multifaceted impact of education on entry into motherhood. *European Journal of Population* 21: 31-49
- Lappegård, T., T. Noack & M. Rønsen (2013). Changing fertility behaviour across two generations. The role of gender and class. In A.-L. Ellingsæter, A.-M. Jensen & M. Lie (Eds.), *The social meaning of children and fertility change in Europe*. (pp. 136-152), London/New York: Routledge.
- Luci-Greulich, A., & Thévenon, O. (2013). The Impact of Family Policies on Fertility Trends in Developed Countries. *European Journal of Population*, 29(4), 387-416.
- McDonald, P. (2006). Low Fertility and the State: The Efficacy of Policy. *Population and Development Review*, 32(3), 485-510.
- Statistics Norway (2016a). *StatBank Norway. Table: 04232: Total fertility rate, women.*  
<https://www.ssb.no/en/statistikkbanken>
- Statistics Norway (2016b). *StatBank Norway. Table: 08517: Unemployed persons, by age and sex.*  
<https://www.ssb.no/en/statistikkbanken>
- Statistics Norway (2016c). *StatBank Norway. Table: 05612: Employees with temporary jobs, by sex and age.* <https://www.ssb.no/en/statistikkbanken>
- Statistics Norway (2016d). *StatBank Norway. Table: 07872: Mean age of parent at first child's birth.*  
<https://www.ssb.no/en/statistikkbanken>
- Statistics Norway (2016e). *StatBank Norway. Table: 07870: Number of children distributed, by age and cohort of births of woman/man.* <https://www.ssb.no/en/statistikkbanken>
- Thévenon, O. (2015). Decreasing Fertility in Europe: Is It a Policy Issue? In K. Matthijs, K. Neels, C. Timmerman, J. Haers, & S. Mels (Eds.), *Population Change in Europe, the Middle-East and North Africa: Beyond the Demographic Divide* (pp. 81-115). London & New York: Routledge.