Cohort fertility decline in low fertility countries: decomposition using parity progression ratios

Kryštof Zeman, Éva Beaujouan, Zuzanna Brzozowska and Tomáš Sobotka
INTRODUCTION AND MOTIVATION

• Decline in cohort fertility since WWII cohorts
• Differences between the two stages of the fertility decline
• From birth cohorts closing the baby boom (1940) to the youngest birth cohorts who have finished their reproductive careers (1970)
• Clear regional patterns
• Mechanisms of decline?

So far no systematic study on how the changes in parity progression ratios (PPR) are related to the decline in completed fertility
RESEARCH QUESTION

1) What was the role of declining transitions to first, second and third birth, in driving the cohort fertility decline?

2) Are there systematic regional differences in parity-specific patterns of cohort fertility decline?

3) We pay particular attention to countries which experienced a fall of completed fertility below 1.75 children per woman.

Using data from the Human Fertility Database (HFD) and the Cohort Fertility and Education (CFE) database
PARITY PROGRESSION RATIO 0→1

- Low $PPR_{01}$ i.e. high childlessness in German speaking countries, Southern Europe, East Asia
- High $PPR_{01}$ i.e. Low childlessness in Central and Eastern Europe
- Later stage: $PPR_{01}$ and $PPR_{12}$ did not move or decline in tandem – huge differences through regions
PARITY PROGRESSION RATIO 1→2

- Low $PPR_{12}$ in Eastern Europe, Southern Europe
- Increasing proportion of 1-child families
PARITY PROGRESSION RATIO 2→3

• Most of the fall before C 1955 was driven by $PPR_{23}$ and higher; and by increasing childlessness

• Continuing decline in East Asia and South Europe

• Stabilisation at different levels

• Big families more frequent in West
METHOD OF DECOMPOSITION OF CFR DECLINE INTO PPRs

- We interpret all changes in cohort fertility ($CFR$) in the terms of parity progression ratios ($PPR_{i-1,i}$).
- The sequential nature of childbearing as a chain of transitions across parities.
- Method developed by Ní Bhrolcháin (1987) and Pullum et al. (1989) and further utilised by Barkalov (1999) and extended by Andreev, Shkolnikov and Begun (2002).
- The parity progression ratios are stepwise fixed at the value of initial cohort (1940 or 1955 resp.), to estimate the effect of change in $PPR_{01}$, $PPR_{12}$, and $PPR_{2+}$ on the overall change in $CFR$ between cohorts 1940-1955 and 1955-1970.

\[
CFR^{c2} - CFR^{c1} = \sum_i (PPR^{c2}_{i-1,i} - PPR^{c1}_{i-1,i}) \frac{\partial CFR}{\partial PPR_{i-1,i}} = \sum_i \left[ \frac{CFR^{c2}_i}{CFR^{c1}_i} - \frac{CFR^{c2}_{i+1}}{CFR^{c1}_{i+1}} \right] \sum_j CFR_j
\]

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<th>PPR23+</th>
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DECOMPOSITION OF COHORT FERTILITY DECLINE INTO PARITY PROGRESSION RATIOS


- PPR01
- PPR12
- PPR2+

Effect of given PPR to overall decline in CFR

- Eastern Europe
- Central Europe
- Western Europe
- German speaking
- Southern Europe
- USA, AUS, NZL
- East Asia
DECLINE OF COHORT FERTILITY TO VERY LOW LEVELS

• Below 1.75: 12 countries
• No sign of CFR stabilisation
• The decline have continuing trend of ~0.1 children in 5-year-cohorts
• Germany longest track and recent slowdown
DECLINE OF COHORT FERTILITY TO VERY LOW LEVELS

• Very differing patterns of PPR effect:

• In Southern Europe, Germany and Japan childlessness is claiming 0.15-0.25 of recent drop below 1.75

• In Eastern Europe it is $PPR_{12}$ with numerical effect of 0.15 child decline; the childlessness here was not increasing

• Progression ratios to higher parities are responsible for significant CFR decline just in Italy
CONCLUSIONS AND DISCUSSION

Identification of two patterns of cohort fertility decline:

• FIRST pattern that is driven by weakening progression to first child, i.e. increasing childlessness, mainly in German speaking countries and East Asia

• SECOND pattern of fertility decline driven by decreasing progression towards second child, prevalent in Eastern Europe, and to lesser extent in Central Europe

• The special case of Southern Europe combines both these declines and even further decline of transition towards higher parities, resulting in the lowest cohort fertility levels in the world

• Parity progression ratios and the overall level of fertility are stabilised in Western Europe and English-speaking overseas, and to some extent in Central Europe.

Discussion on social, economic and institutional contexts behind these differing patterns ->VID WP

Likely future trends of cohort fertility?
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