Demographic explanations for the recent rise in European fertility

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Recent increase in period TFR in Europe

A first concerted rise in period total fertility across most developed regions
Explanations for recent fertility reversals
(Goldstein et al. 2009, Myrskylä et al. 2009, Hoorens et al. (RAND) 2011)

- The deceleration of the ‘postponement transition’: Diminishing tempo effects on the period TFR
- Improving economic conditions in 2000-2008
- New family-related policies, including pronatalist ones
- Influence of higher-fertility migrants
- Reversal of the negative association between development and fertility in the most affluent countries

Our contribution

- **Hypothesis**: Reduction in the pace of the ‘postponement transition’ had a key role
- **Examining a new indicator of fertility**, the tempo- and parity-adjusted total fertility ($TFRp^*$, Bongaarts and Feeney 2004)
Outline

1. Postponement transition
2. Period vs. cohort changes in fertility
3. Measuring tempo effects: The TFRp*
4. Tempo and quantum effects in the recent TFRp* rise
   - Detailed analysis for 4 countries (Czech Republic, the Netherlands, Spain, and Sweden)
   - Selected analysis also for Austria, Estonia, Finland, Russia, Denmark, France, Italy and UK
   - Source: mostly HFD, also Eurostat & national stat. offices

Focus on the period through 2008, before the economic recession began biting…
1. Postponement transition
The postponement transition

Kohler, Billari & Ortega (2002): Shift from an early to a later timing of childbearing

Mean age at first birth, 4 analysed countries
Simulated course of the postponement transition

Parameters: Transition over 50 years (1965-2015), rise in the mean age at childbearing from 25 to 30, constant cohort quantum (0.9)
Simulated course of the *postponement transition*

**Parameters:** Transition over 50 years (1965-2015), rise in the mean age at childbearing from 25 to 30, constant cohort quantum (0.9)
2 Period vs Cohort changes in fertility
Findings from the past studies

- Ryder (1990): “in the model of reproductive behavior, the driving force is change in cohort fertility”

- Ní Bhrolcháin (1992): “period is unambiguously the prime source of variation in fertility rates.”

- Brass (1974): “cohort completed fertility sizes reveal no significant feature that distinguishes them from time averages”

- Ward and Butz (1980): “completed family size is an outcome of a sequence of period-specific decisions” where “couple’s plans are revisable”

- More nuanced cohort view: period matters for the ‘postponement’ stage, but cohort-driven ‘recuperation’ at later ages (Lesthaeghe, Frejka, Goldstein…)}
Simulated period- and cohort-driven increase in fertility (a period view, 1990-2010)

- Constant variance
- Rising mode
- Constant shape

- Rising variance
- Constant mode
- Changing shape
Observed age-specific fertility changes at birth order 1

Czech Republic

Netherlands

Spain

Sweden
3 Measuring tempo effects:
The *tempo and parity-adjusted total fertility, TFRp*
## Analysed measures of fertility quantum

<table>
<thead>
<tr>
<th>Rates</th>
<th>Rates of the 2nd type (incidence rates)</th>
<th>Rates of the 1st type (hazards, probabilities)</th>
<th>Rates of the 1st type (hazards)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exposure population</strong> (births of birth order i at age x)</td>
<td>Women aged x (all parities)</td>
<td>Women aged x at parity i-1</td>
<td>Women aged x at parities &lt; i</td>
</tr>
<tr>
<td><strong>Observed indicator</strong></td>
<td>TFR</td>
<td>PATFR</td>
<td>TFRp</td>
</tr>
<tr>
<td><strong>Tempo adjusted indicator</strong></td>
<td>TFR* (Bongaarts-Feeney)</td>
<td>PATFR* (Kohler-Ortega)</td>
<td>TFRp* (Bongaarts-Feeney, Yamaguchi-Beppu)</td>
</tr>
<tr>
<td><strong>Fertility table</strong></td>
<td>(sum of rates by age &amp; birth order)</td>
<td>Increment-decrement (Births renewable)</td>
<td>Decrement (Births nonrenewable)</td>
</tr>
</tbody>
</table>
Observed and tempo-adjusted TFRs (Sweden)
Observed and tempo-adjusted TFRs (Sweden)

Mean 1980-2006
TFR 1.75
TFR* 1.99
PATFR* 1.93
TFRp* 1.99
## Comparing period and cohort measures (1)

Completed fertility in the 1967 (68) cohort compared with four indexes of period fertility (mean for a 5-year period)

<table>
<thead>
<tr>
<th>Country</th>
<th>CFR</th>
<th>TFRP*</th>
<th>TFR*</th>
<th>PATFR*</th>
<th>TFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>1.90</td>
<td>1.95</td>
<td>1.85</td>
<td>1.80</td>
<td>1.80</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>1.85</td>
<td>1.90</td>
<td>1.80</td>
<td>1.75</td>
<td>1.75</td>
</tr>
<tr>
<td>Sweden</td>
<td>1.95</td>
<td>2.00</td>
<td>1.90</td>
<td>1.85</td>
<td>1.85</td>
</tr>
<tr>
<td>Spain</td>
<td>1.80</td>
<td>1.85</td>
<td>1.75</td>
<td>1.70</td>
<td>1.70</td>
</tr>
</tbody>
</table>

*CFR: Completed Fertility Rate, TFRP*: Total Fertility Rate (Period), TFR*: Total Fertility Rate, PATFR*: Partial Fertility Rate, TFR: Total Fertility Rate
Comparing period and cohort measures (2)

Mean difference between completed cohort fertility (CFR) and period fertility by birth order, cohorts 1960-67 (average for 4 countries)

- **TFRp***: Remarkably good correspondence
- *Largest mismatch at higher-order births*
4 Tempo and Quantum effects in the recent TFR increase
Can declining tempo effects explain recent TFR upturns?

- **Czech Republic**
  - Adjusted Total Fertility Rate (adj TFRP*)
  - Tempo effect

- **Sweden**
  - Adjusted Total Fertility Rate (adj TFRP*)
  - Total Fertility Rate (TFR)

- **Spain**
  - Adjusted Total Fertility Rate (adj TFRP*)
  - Total Fertility Rate (TFR)

Graphs showing trends from 1999 to 2009.
Estimated portion of TFR increase due to tempo effect

<table>
<thead>
<tr>
<th>Country</th>
<th>Period</th>
<th>Abs. TFR increase</th>
<th>Percent TFR increase due to tempo effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>TFR*</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1999-2008</td>
<td>0.37</td>
<td>56</td>
</tr>
<tr>
<td>Estonia</td>
<td>1998-2006</td>
<td>0.26</td>
<td>3</td>
</tr>
<tr>
<td>Finland</td>
<td>1998-2007</td>
<td>0.14</td>
<td>13</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>1996-2003</td>
<td>0.22</td>
<td>24</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>1999-2007</td>
<td>0.25</td>
<td>41</td>
</tr>
<tr>
<td>Spain</td>
<td>1998-2005</td>
<td>0.19</td>
<td>100</td>
</tr>
<tr>
<td>Spain</td>
<td>1998-2007</td>
<td>0.24</td>
<td>93</td>
</tr>
<tr>
<td>Sweden</td>
<td>1999-2006</td>
<td>0.35</td>
<td>14</td>
</tr>
</tbody>
</table>
Conclusions
The new indicator (TFRp*): Main advantages

- High stability from one year to the next
- Remarkably good match between period and cohort fertility
- Also excellent fit at higher birth orders

*BUT: more testing needed*

Substantive conclusions on the postponement transition (*conditional*)

- Tempo-free fertility higher than previously thought at the time of TFR reaching troughs
- Stable fertility quantum: less decline in the 1990s, smaller or no increase in the 2000s
- Prominent role of tempo effect: 57% (Estonia) to 100% (Czech Republic, Spain) of the observed TFR increases