Postponement and Recuperation in Cohort Fertility: New Analytical and Projection Methods and their Application

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Period and cohort fertility dynamics in the developed world.
The first Human Fertility Database Symposium, 3-4 November 2011, MPIDR, Rostock
Cohort fertility developments in Europe among women born after World War II: Shift of childbearing towards later ages and a concomitant decline in fertility level.

This broad trend has been studied using the notions of fertility postponement (fertility decline across younger ages) and subsequent recuperation (a compensatory fertility increase at higher reproductive ages).

Past analyses predominantly focused on period trends
- Well-known problems with period approaches: tempo effects...
- Cohort approach studies the real quantum of fertility
- Internal consistency of cohorts
Cohort fertility postponement and recuperation

We apply order-specific data and extend and elaborate on two broad approaches to the process:

**Basic benchmark model** extensively used by Tomas Frejka and his colleagues

**Relational model** proposed by Ron Lesthaeghe (2001)

Three key indicators of the postponement transition:
- initial fertility level;
- absolute fertility decline at younger ages;
- relative degree of fertility ‘recuperation’ at older ages.

We demonstrate that each of these components is salient for explaining contemporary differences in cohort fertility.
Data sources

Eurostat, Statistics Austria, Czech Statistical Office, Human Fertility Database [www.humanfertility.org](http://www.humanfertility.org)

All calculations in R (script available on request)

Data for 4 countries used for illustration:

- Austria
- Czech Republic
- The Netherlands
- Spain
Basic benchmark model

Recuperation Index $RIc = \frac{Rc}{-Pc} = 88\%$
New features of our approach:

1) The choice of a benchmark cohort reflects aims of the analysis
2) Focus on order-specific differences
3) Specifying age at maximum cumulative fertility decline individually
Basic benchmark model: Recuperation Index

Identifying the regularities in postponement and recuperation
Country and parity specific developments in recuperation
Netherlands: Projecting *Recuperation Index* for first birth order using two scenarios (fixed, trend), and then recalculating back into CCFR40.
Transcribes the changing fertility of cohorts into *Postponement Ratio* and *Recuperation Ratio*. *Postponement* and *Recuperation* are relativised in respect to the *National standard schedule of deviations*. 
Relational model: Austria, 1st births

National standard schedule of deviations: Postponement Ratio (PR) = 1; Recuperation Ratio (RR) = 1

Younger cohorts: accelerating postponement (PR>1) later age at maximum of cum. fertility decline (RR at younger ages < 0) recuperation accelerating at ages>30
Projecting *Postponement Ratio* and *Recuperation Ratio* using different scenarios, and then recalculating back into CCFR40...

\[ pRR_{40} = \alpha \cdot PR_{m} + \beta + \epsilon \]

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RM Extension: Projecting completed cohort fertility

Projecting *Postponement Ratio* and then recalculating back into full fertility schedule (Czech Republic, cohorts 1965-85)

\[ pPR_c(x) = \alpha \cdot PR_c(x-1) + \beta + \varepsilon \]
Projections compared

<table>
<thead>
<tr>
<th>Country</th>
<th>First Birth</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Austria</td>
<td>0.77</td>
<td>1.55</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>0.86</td>
<td>1.72</td>
</tr>
<tr>
<td>the Netherlands</td>
<td>0.85</td>
<td>1.71</td>
</tr>
<tr>
<td>Spain</td>
<td>0.68</td>
<td>1.23</td>
</tr>
</tbody>
</table>

Austria

Czech Republic

Graphs showing projections for Austria and Czech Republic.
The presented methods are useful for descriptive, analytical and projecting purposes

Recuperation is strongly differentiated by birth order (Austria, Spain)

Typically, low recuperation is associated with low completed fertility (Spain)

Postponement has come to an end in some countries (the Netherlands, Spain) around mid-1970s cohorts

Projections suggest stabilization of cohort fertility in countries where postponement process is advanced (Austria, the Netherlands)

Limitations: Useful only during postponement transition
Increasing projection uncertainty with continuing fertility aging
Relational model needs further testing and elaboration
Thank you for attention

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Short version forthcoming in Comparative Population Studies