

# The role of involuntary factors in explaining the gap between desired and realized fertility in European countries. An analysis using a microsimulation model

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# Abstract

- **Desired family size** in low fertility countries is generally higher than the **Total Fertility Rate**, even after accounting for tempo changes that currently bias the period fertility levels downward.
- I use Bongaarts' framework to analyze the role of involuntary factors in the explanation of this gap. Two kinds of factors will be studied:
  - **Biological** factors (sterility, low fecundability, risk of miscarriage, etc.).
  - **Social** factors associated with family formation and separation risks.
- I use a **microsimulation** model in order to estimate the role of these involuntary factors in the **explanation of the gap** between observed and desired fertility levels.

# Bongaarts' framework for the relationship between observed and desired fertility

$$TFR = DFS \cdot Fu \cdot Fg \cdot Fr \cdot Ft \cdot Fi \cdot Fc$$

*Fu*: unwanted fertility (+)

*Fg*: gender preference (+)

*Fr*: child replacement (+)

*Ft*: tempo changes (+/-)

*Fi*: involuntary family limitation factors (-)

*Fc*: competing preferences (-)

In post-transitional societies, when fertility levels are lower, Bongaarts' framework can be simplified

$$\frac{TFR}{Ft} = DFS \cdot \cancel{Fu} \cdot \cancel{Fg} \cdot \cancel{Fr} \cdot \cancel{Ft} \cdot Fi \cdot Fc$$

*Fu*: unwanted fertility (+)

*Fg*: gender preference (+)

*Fr*: child replacement (+)

*Ft*: tempo changes (+/-)

*Fi*: involuntary family limitation factors (-)

*Fc*: competing preferences (-)

In post-transitional societies, when fertility levels are lower, Bongaarts' framework can be simplified

$$TFR^* = DFS \cdot Fi \cdot Fc$$

*Fi*: involuntary family limitation factors (-)

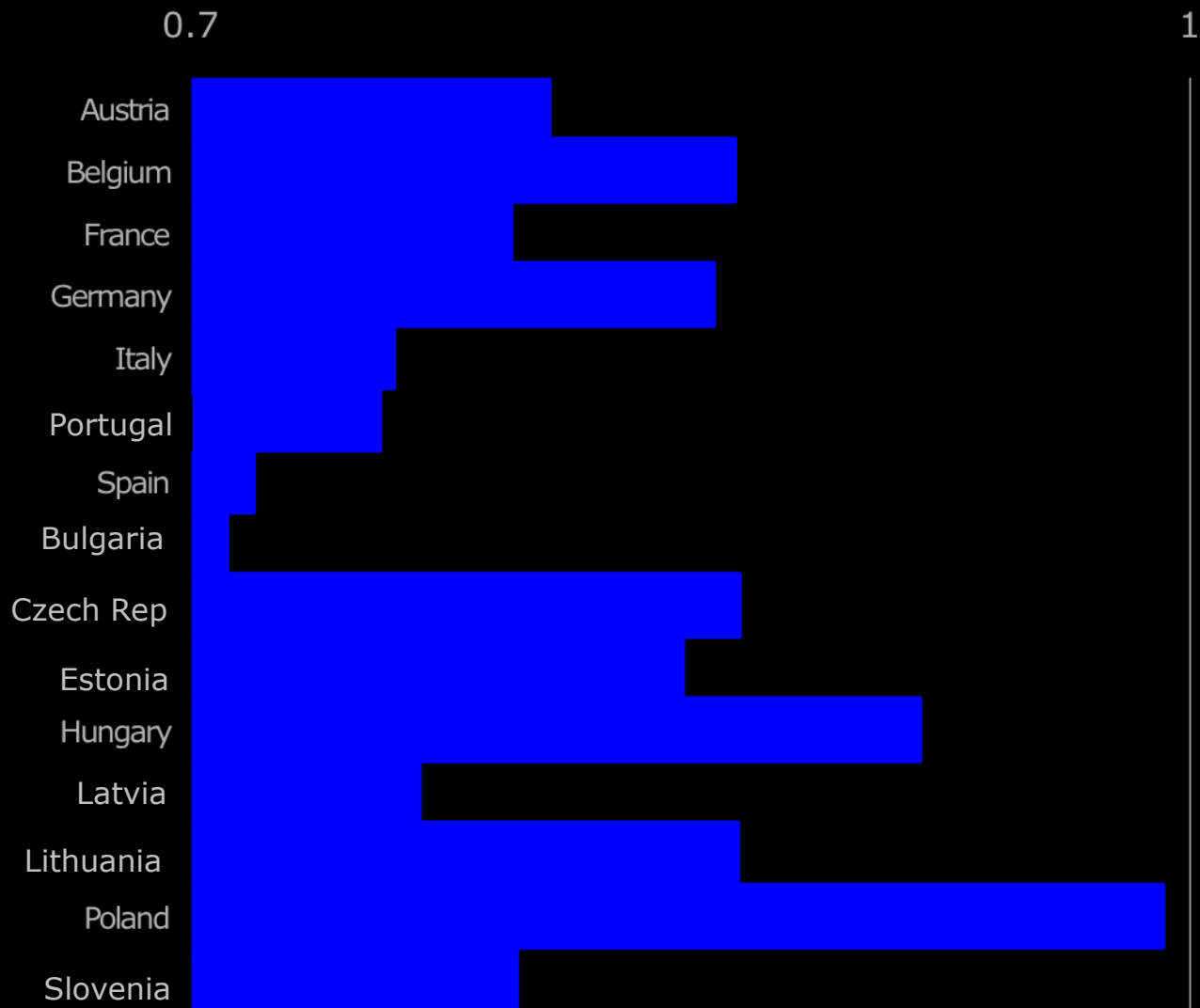
*Fc*: competing preferences (-)

In low fertility societies, only factors that have a negative effect on the **gap** between TFR and DFS remain.

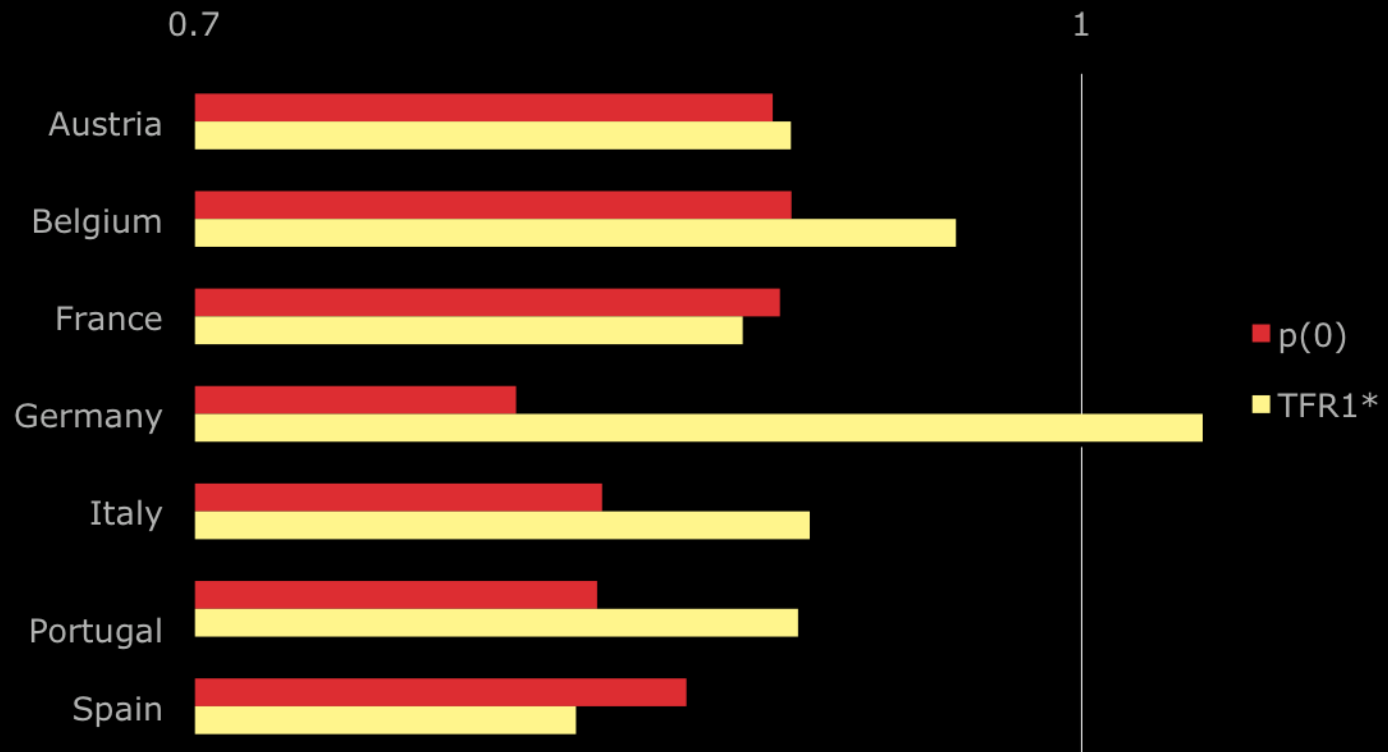
# Measurement issues

- We use Fertility and Family Surveys (FFS) from 15 European Countries (data from the years 1990s).
- **Observed** fertility is measured from the FFS data computing period parity progression ratios. The estimates are then reasonably free of tempo effects (We also take an average of the last five years).
- **Desired** fertility is measured from answers on question on 'More children intended?' using methodology by Rodriguez and Trussel (1981). More accurate results than those from FFS Standard Country Reports.
- Observed and desired fertility are compared both at the **parity** and at the **total** levels.

# The gap for **total** fertility: observed relative to desired

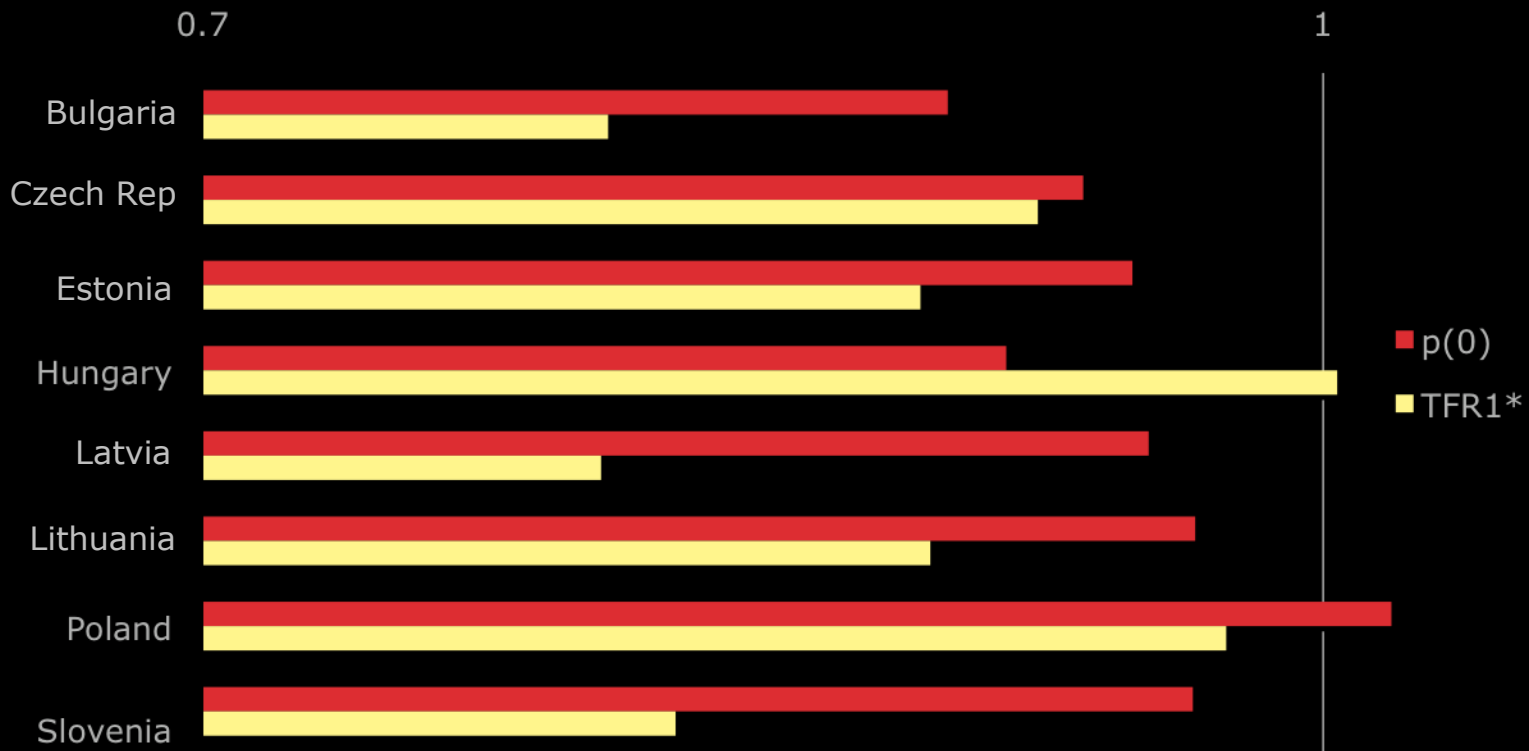


# The gap at the parity level: West European countries



$p(0)$ : progression ratio from women at parity 0.  $TFR1^*$ : mean number of children for mothers (women with at least one child). The data represented are observed relative to desired levels.

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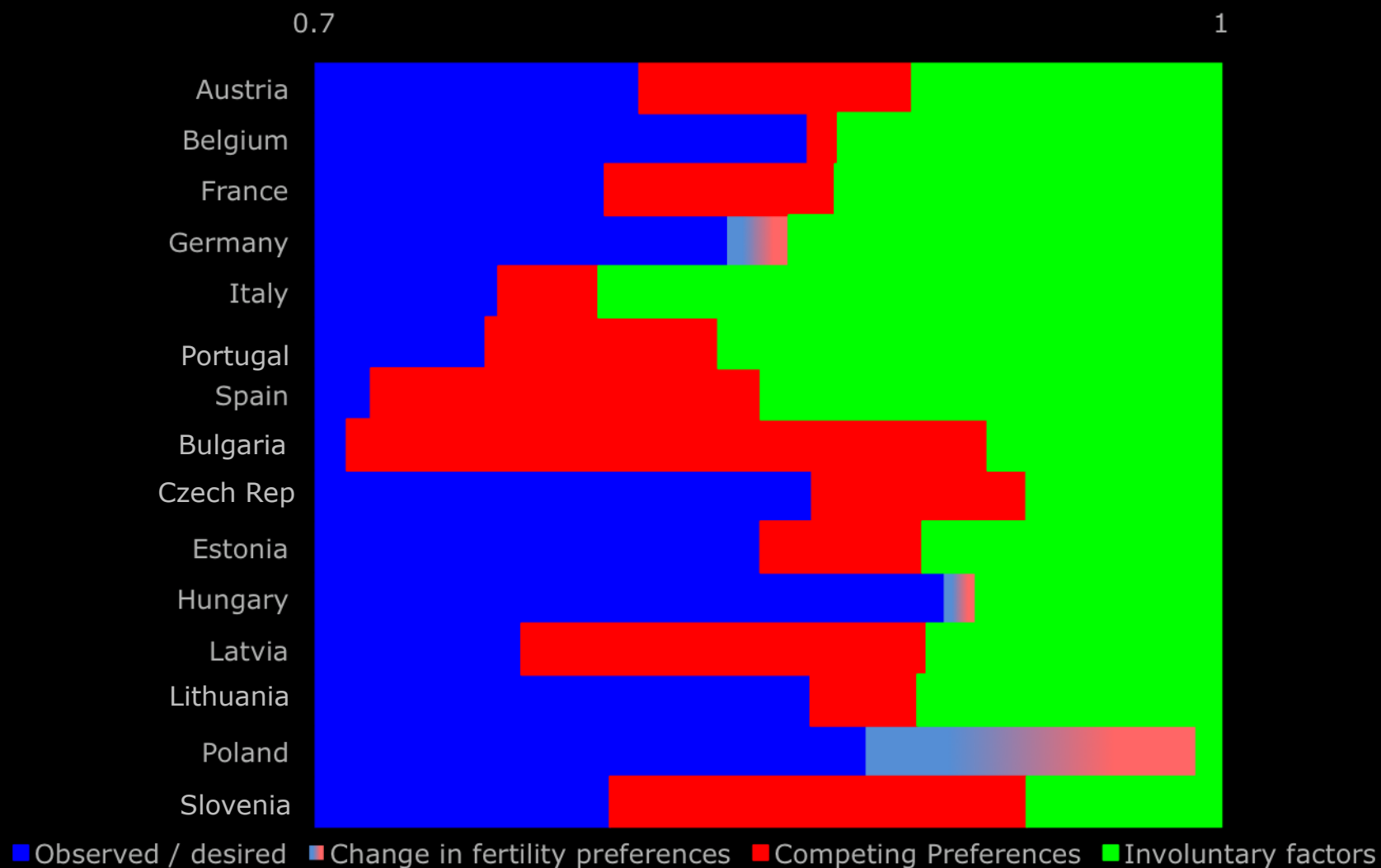
**Inputs** of the microsimulation model to estimate fertility based on FFS data: **desired parity progression ratios**

	$p_{0 \rightarrow 1}$	$p_{1 \rightarrow 2}$	$p_{2 \rightarrow 3}$	$p_{3 \rightarrow 4}$	$p_{4 \rightarrow 5}$	$p_{5 \rightarrow 6}$	$p_{6 \rightarrow 7}$	$p_{7 \rightarrow 8}$
France	0.952	0.840	0.527	0.396	0.500	0.541	0.389	0.083
Germany	0.933	0.789	0.353	0.241	0.076	0.500		
Italy	0.966	0.828	0.348	0.286	0.301	0.367	0.636	0.667
Hungary	0.990	0.859	0.301	0.270	0.265	0.400	0.286	
Latvia	0.988	0.809	0.385	0.298	0.455	0.409	0.111	
Poland	0.933	0.862	0.466	0.338	0.407	0.358	0.444	0.571

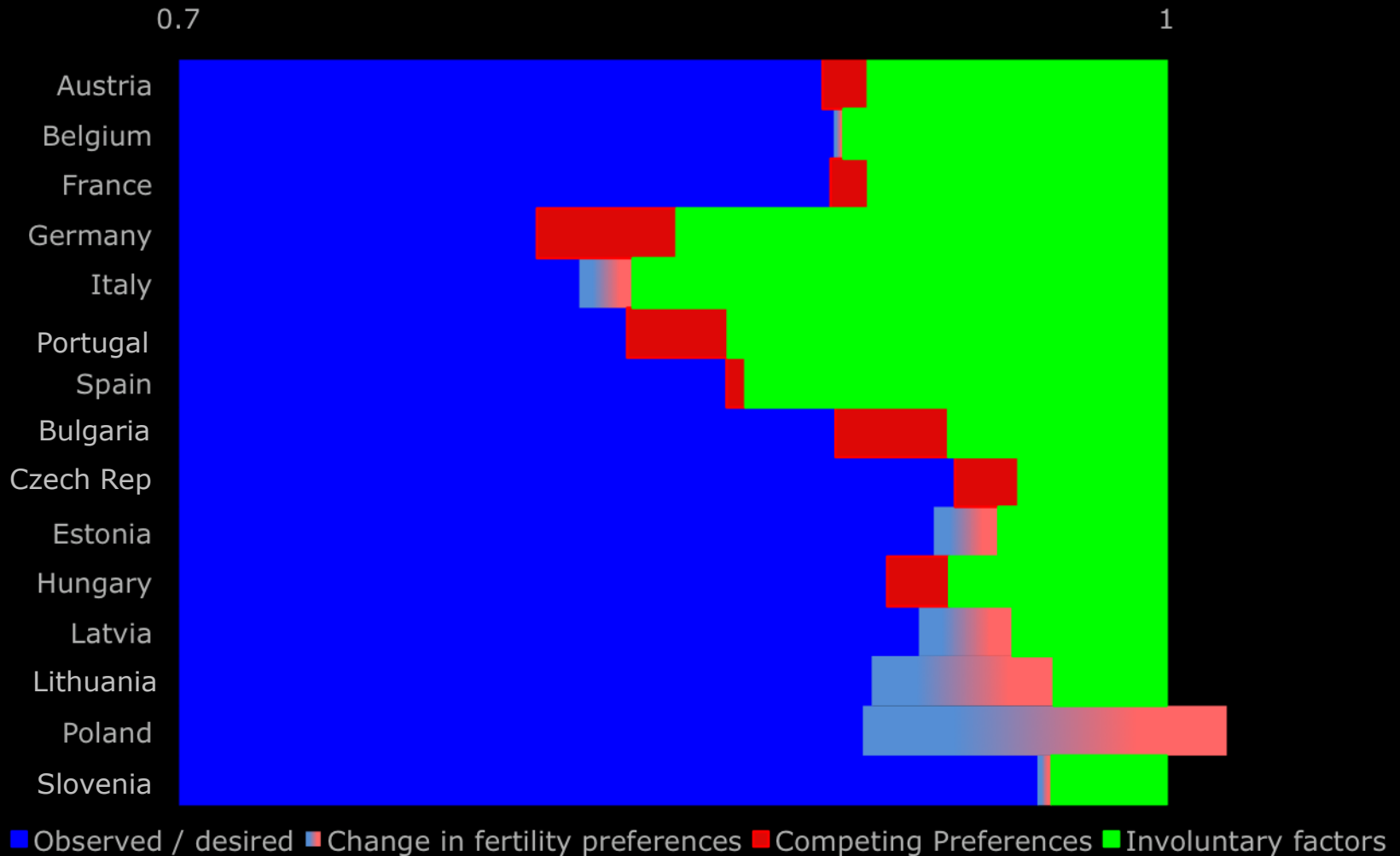
## Inputs of the microsimulation model to estimate fertility based on FFS data: union formation and dissolution and other risks

Countries	Mean age at first union formation (in years)	Proportion not in union at age 50 (%)	Proportion of mothers who never enter a co-resident union (%)	Time of contraception use in union before pregnancy (in years)	Proportion of first unions that by separation after 15 years of union (%)	Proportion entering another union, after 10 years of separation (%)
France	23	5	3.6	0.875	41	47
Germany	23.8	15	7.7	0.875	42	61
Italy	26.9	9	1.6	0.25	14	35
Hungary	21	3	0.6	0.25	30	68
Latvia	22.1	4	1.5	0.125	47	60
Poland	24	8	5.4	0	9	38

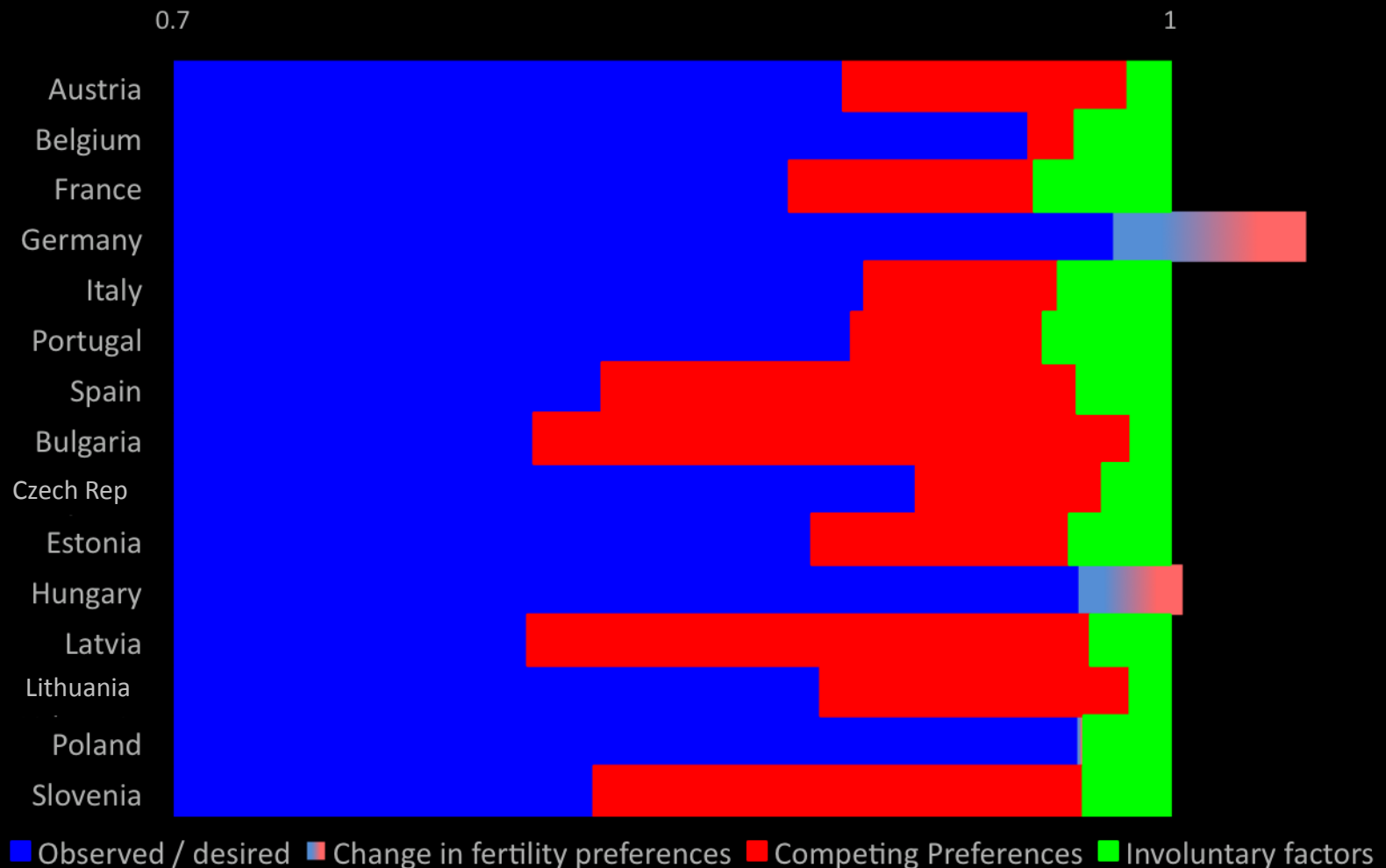
# Results: observed and simulated relative to desired levels: total fertility ( $TFR^*$ ).



# Results: observed and simulated relative to desired levels: fertility of childless women ( $p_{0 \rightarrow 1}$ ).



# Results: observed and simulated relative to desired levels: fertility of mothers ( $TFR1^*$ ).



# Conclusions

- Significant gap between observed and desired fertility levels in European countries (around -20% in Western and -15% in Eastern countries).
- More than half of this gap is explained by involuntary factors in West European countries.
- The gap is almost entirely explained by involuntary factors at parity 0 (childless women).
- For mothers (women with at least one child) the gap is explained mostly by preferences factors.