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MAX PLANCK INSTITUTE FOR DEMOGRAPHIC RESEARCH

Fertility change in urban and rural areas of developing countries

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Seminar « Modern Demography »

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Introduction

Half of the world population is living in urban areas since 2007, and 68% are expected to do so in 2050

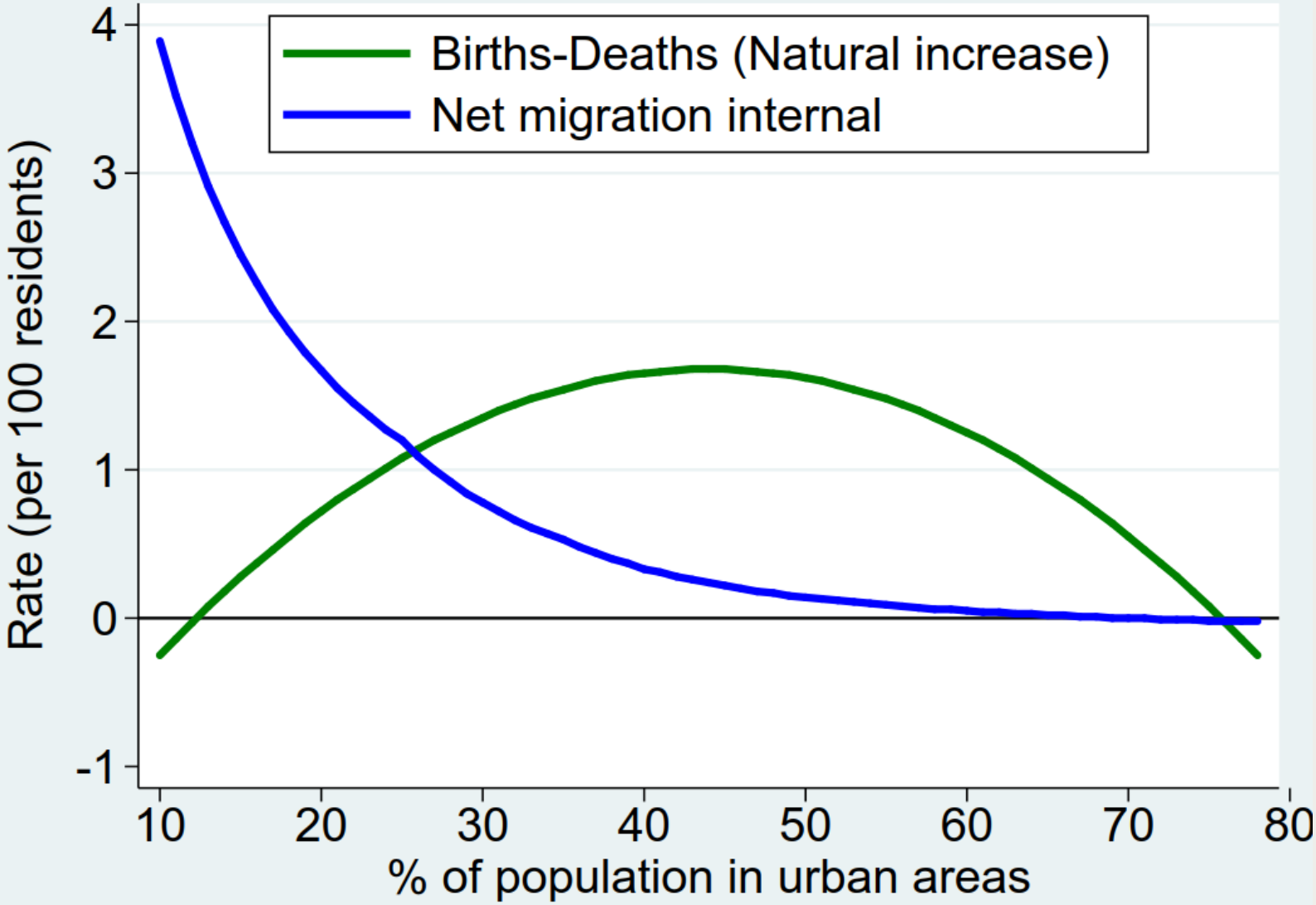
The urban population grew from 0.7 to 4.2 billion between 1950 and 2018; future growth (~2%/year) will be concentrated in less dev. countries

> Need to better understand the urbanisation process as an outcome of the demographic transition

Some world regions are still completing their fertility transition

> How does fertility decline diffuse from urban to rural areas?

The urban transition model: components of urban growth



Lerch 2014; de Vries 1990; Dyson 2011; stylized model

Are rural-urban differences in fertility relevant for understanding demographic change? Theory

First demographic transition: the small family ideal emerged in urban and industrial societies (Notestein 1953)

Economic perspective: R-U differences in fertility are merely spatial manifestions of differential paces of structural change in society (Galloway et al. 1998)

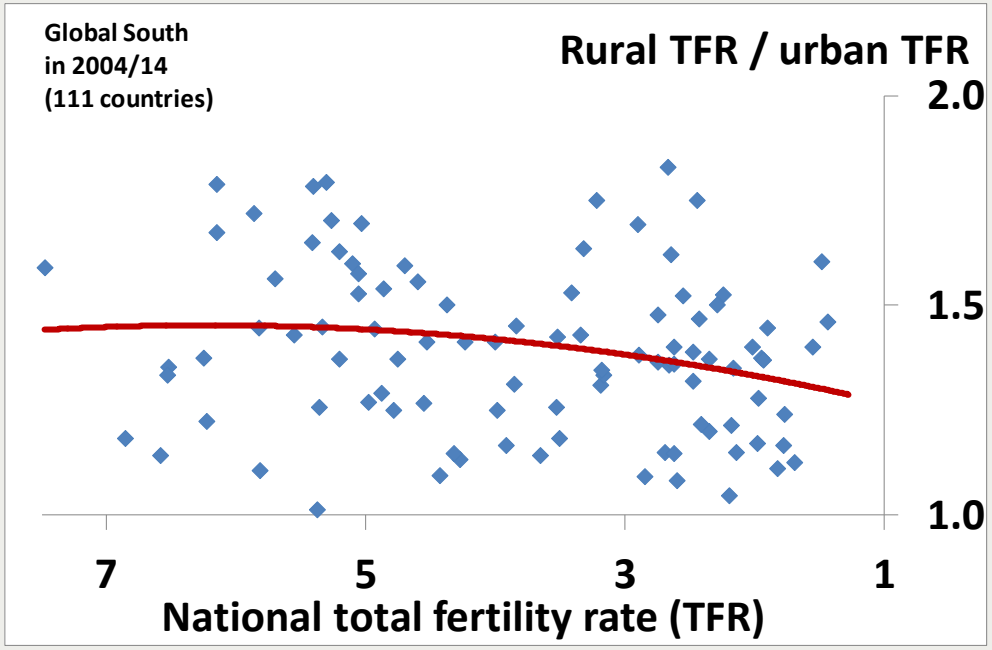
Culturalist perspective: R-U differences in fertility are secondary manifestations within homogeneous cultural regions, through which fertility decline diffuses (Sharlin 1986, Cleland and Wilson 1987)

Spatial diffusion: Centre-periphery diffusion of structural and ideational change (Hägerstrand 1952)

Prior evidence

Comparison between countries in a given year (cross-sectional):

- In the past: **Inverted U-shaped evolution** in rural-urban fertility differentials (Findley 1978; Shapiro/Tambashe 2000; United Nations 1987)
- But **not anymore!**



Population Reference Bureau (2015) UN WPP (2017)

Comparison of country-specific trends over the years (longitudinal): No patterned regularities!

(Montgomery et al. 2003: 228)

Reseach questions

Is the inverted U-shaped evolution in rural excess fertility confirmed from a longitudinal & long-term perspective in the global South?

- What are the **underlying dynamics** in the urban and rural fertility transitions?
- What **differences between** major world **regions**?
  - Asia,
  - Latin America and Caribbean (LACarr),
  - Middle East and Northern Africa (MENA),
  - Sub-Saharan Africa (SSA)

Adressing analytical challenges in previous research

Analytical challenges	> Research strategy
Country diversity in terms of demographic context	Comparing R/U gradients in countries **over the course of the national fertility transitions**
Country diversity in terms of urbanisation context, urban definitions and delineations	Focus on the **average within-country trend** (fixed effects model)
Disturbing effect of rural-to-urban migrants on urban and rural trends in period fertility trends	Cohort perspective Trends by migration status

Study population, data and definitions

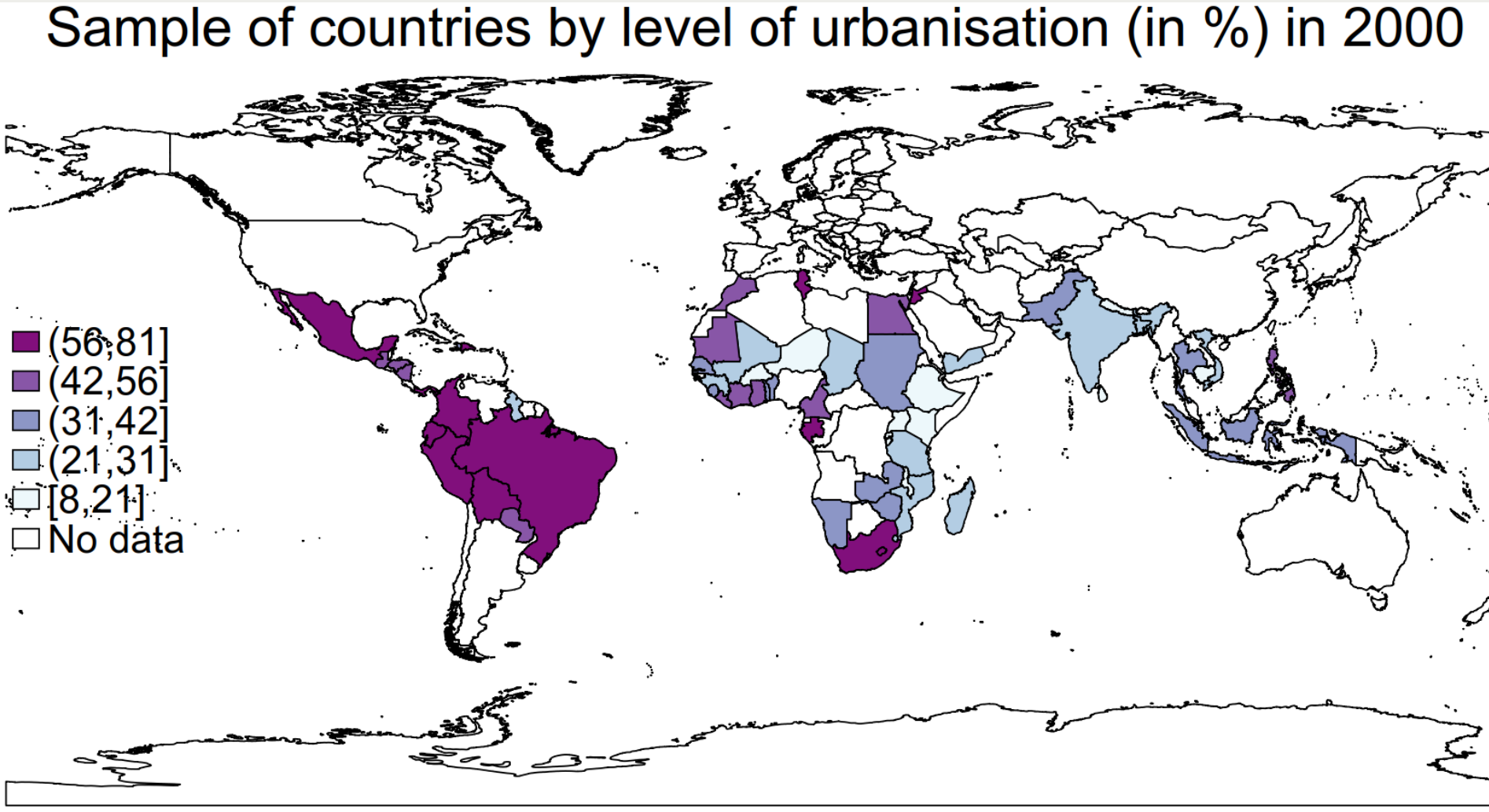
Universe: Cohorts of women born in 1898-1982
(aged 30-49 years at the date of data collection)
60 developing countries

Sources: 297
World Fertility Surveys (WFS),
Demographic and Health Surveys (DHS),
Multiple Cluster Indicator Surveys (MICS),
Public use samples of censuses (IPUMS)
(1 to 12 surveys/censuses per country)

Some information on migration: Urban/rural status of current, childhood (WFS, DHS) or previous (DHS) place of residence

National transition onset: year when TFR (UN WPP) peaked before the initial 10% decline (back-translated by the mean age at birth to get a cohort equivalent)

Data: cohorts 1896-1982 in 60 developing countries



Method: cohort total fertility (TF) estimated based on cohort parity progression ratios (PPRs)

***TF* = weighted average of the <u>parities attained</u>**, with the weights being the cohort parity distribution as implied by the chaining of *PPRs*

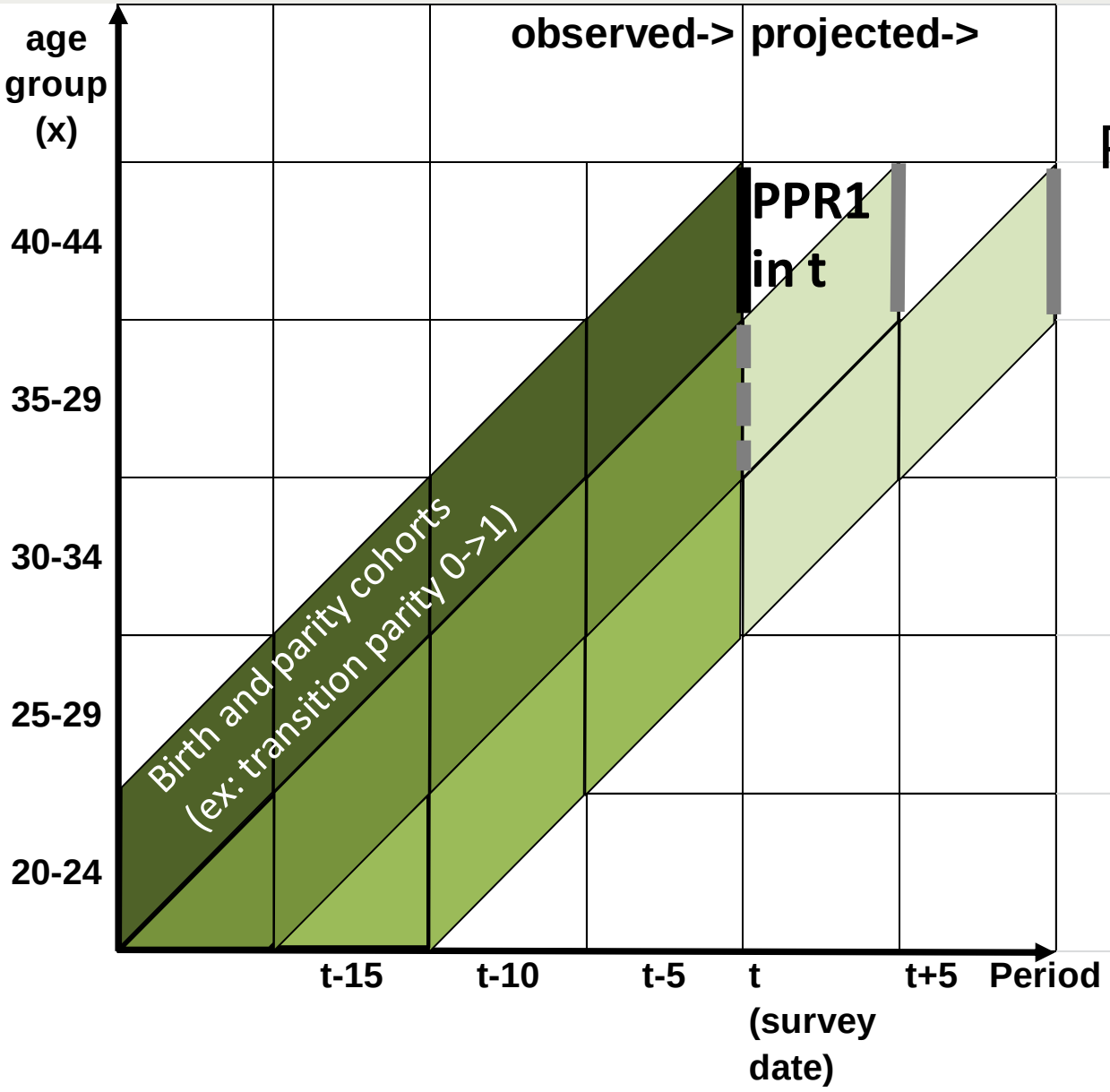
= **<u>1</u>***PPR1*(1-PPR2)* + **<u>2</u>***PPR1*PPR2*(1-PPR3)* + **<u>3</u>***PPR1*PPR2*PPR3*(1-PPR4)* …

(i.e. *PPR3* **=** # women with at least 3 births ***/*** # women with at least 2 births)

Older cohorts (40y +): estimation of *PPRs* based on the distribution of women by reported children ever born (CEB)

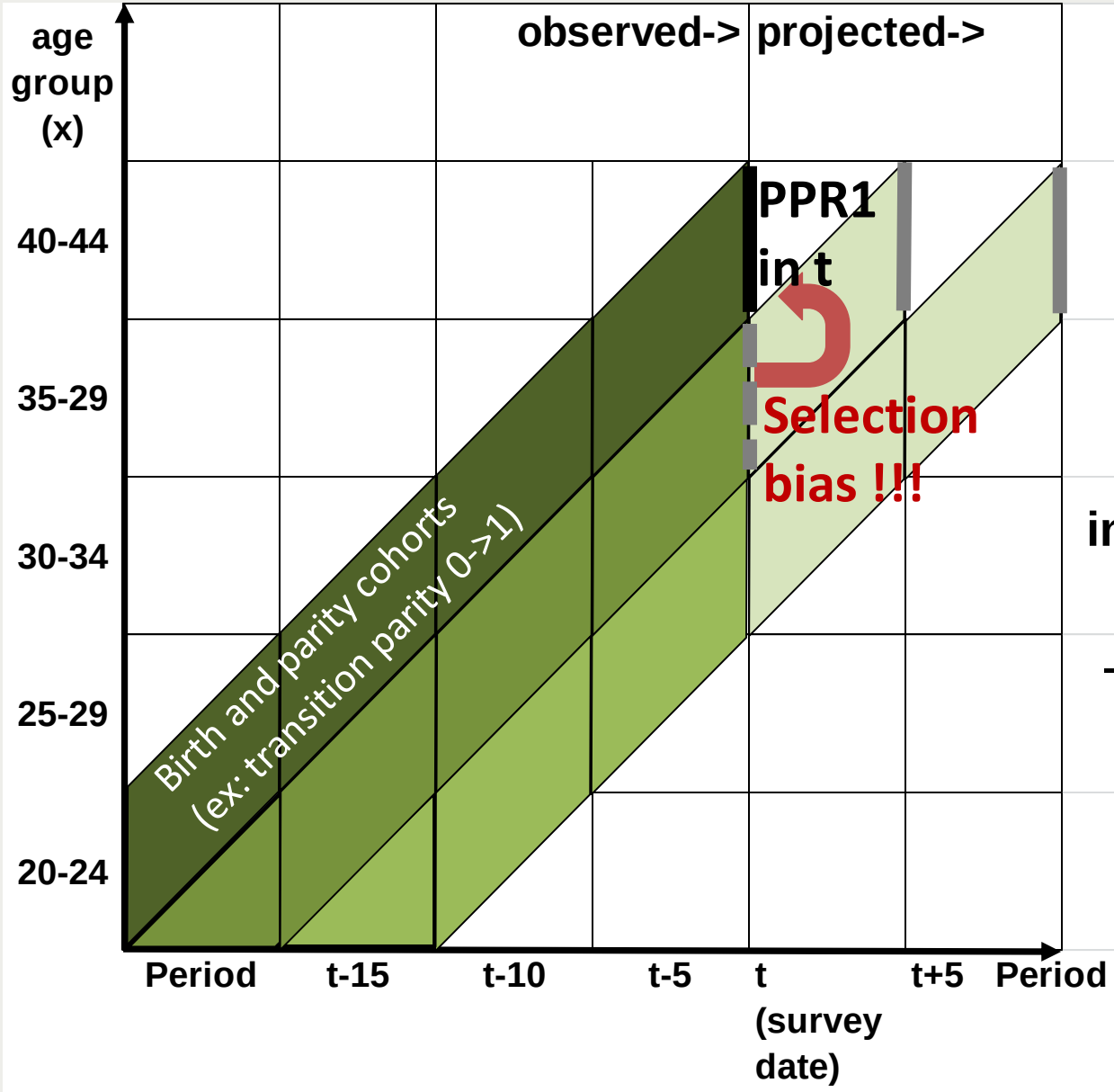
Younger cohorts (30-39y): projection of *PPRs* based on truncated estimates, using the *paired cohort comparison method* (Brass & Juarez 1984)

Brass-Juarez (1983) method of cohort PPRs projection I



Project PPR for younger cohorts up to age 40-44 by accounting for the recent differences in fertility between two adjacent cohorts

Brass-Juarez (1983) method of cohort PPRs projection II

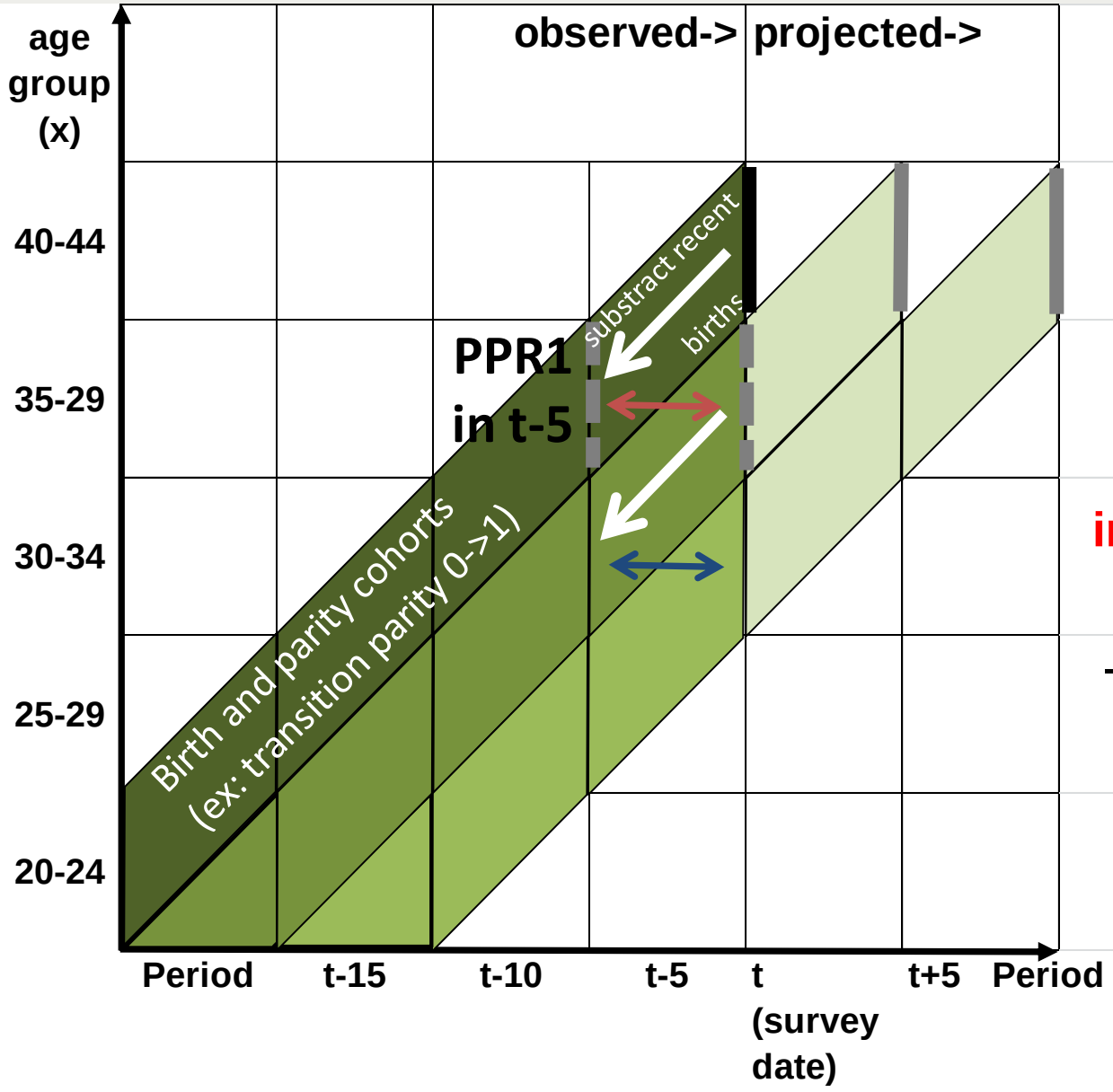


intercohort change rate

= $PPR1^{t}_{x}$ / $PPR1^{t}_{x-5}$?

- estimated at different ages ?

Brass-Juarez (1983) method of cohort PPRs projection III

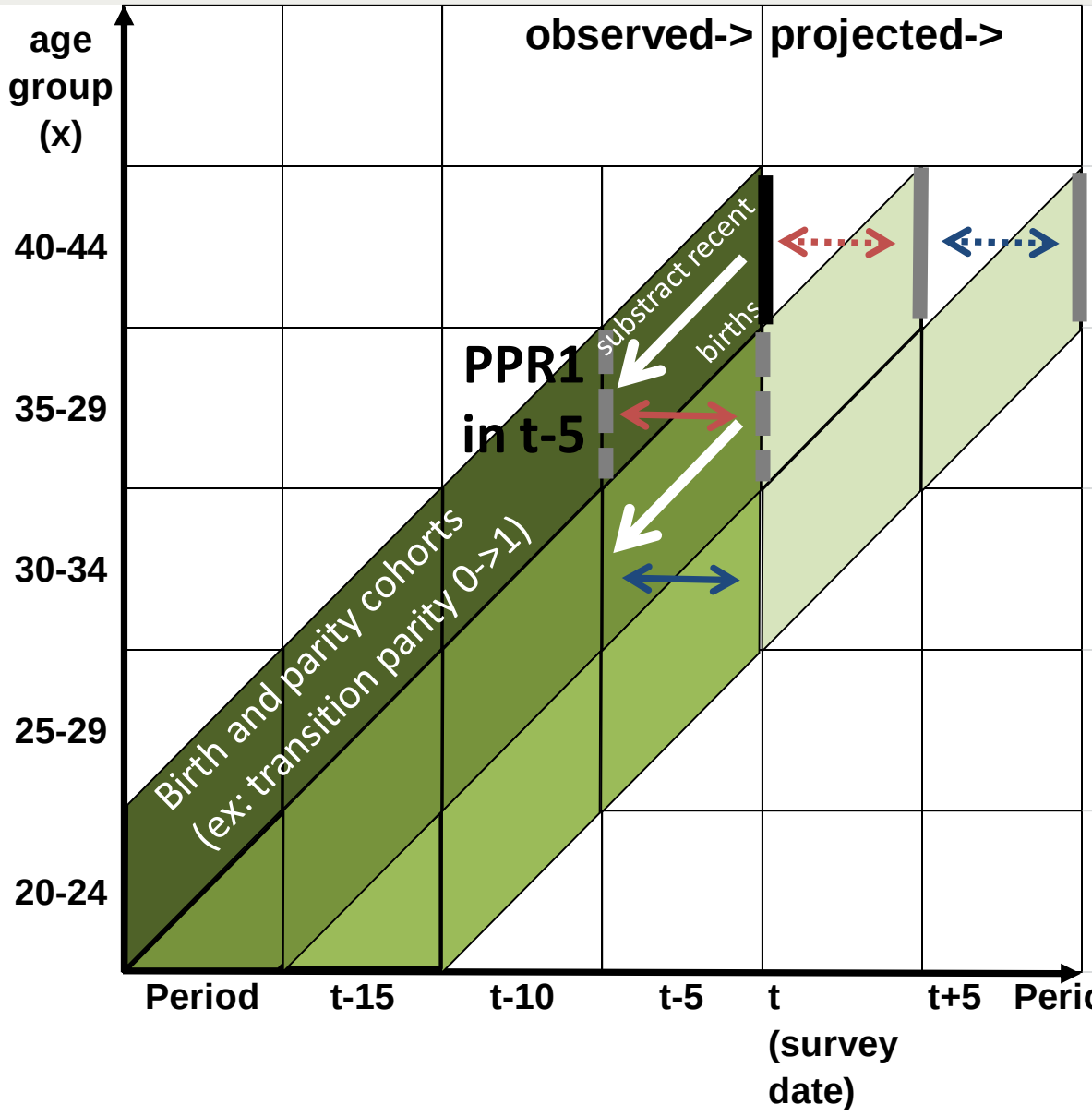


intercohort change rate

$k_x = PPR1^t_x / PPR1^{t-5}_x$

- estimated at same age !

Brass-Juarez (1983) method of cohort PPRs projection IV



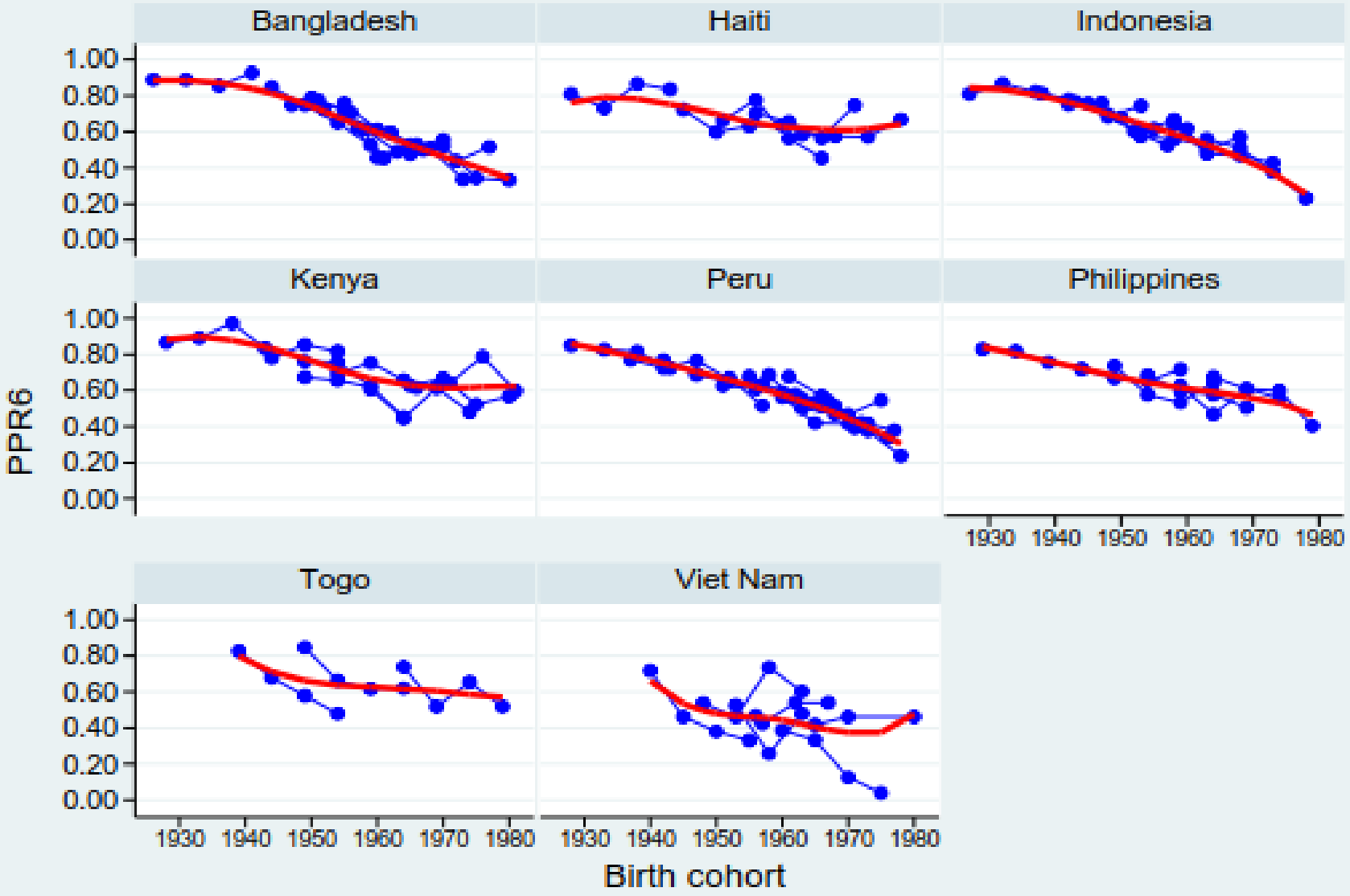
proj.PPR1(40-44) =
PPR1(40-44) * (k_{x-5}*k_{x-10})

intercohort change rate

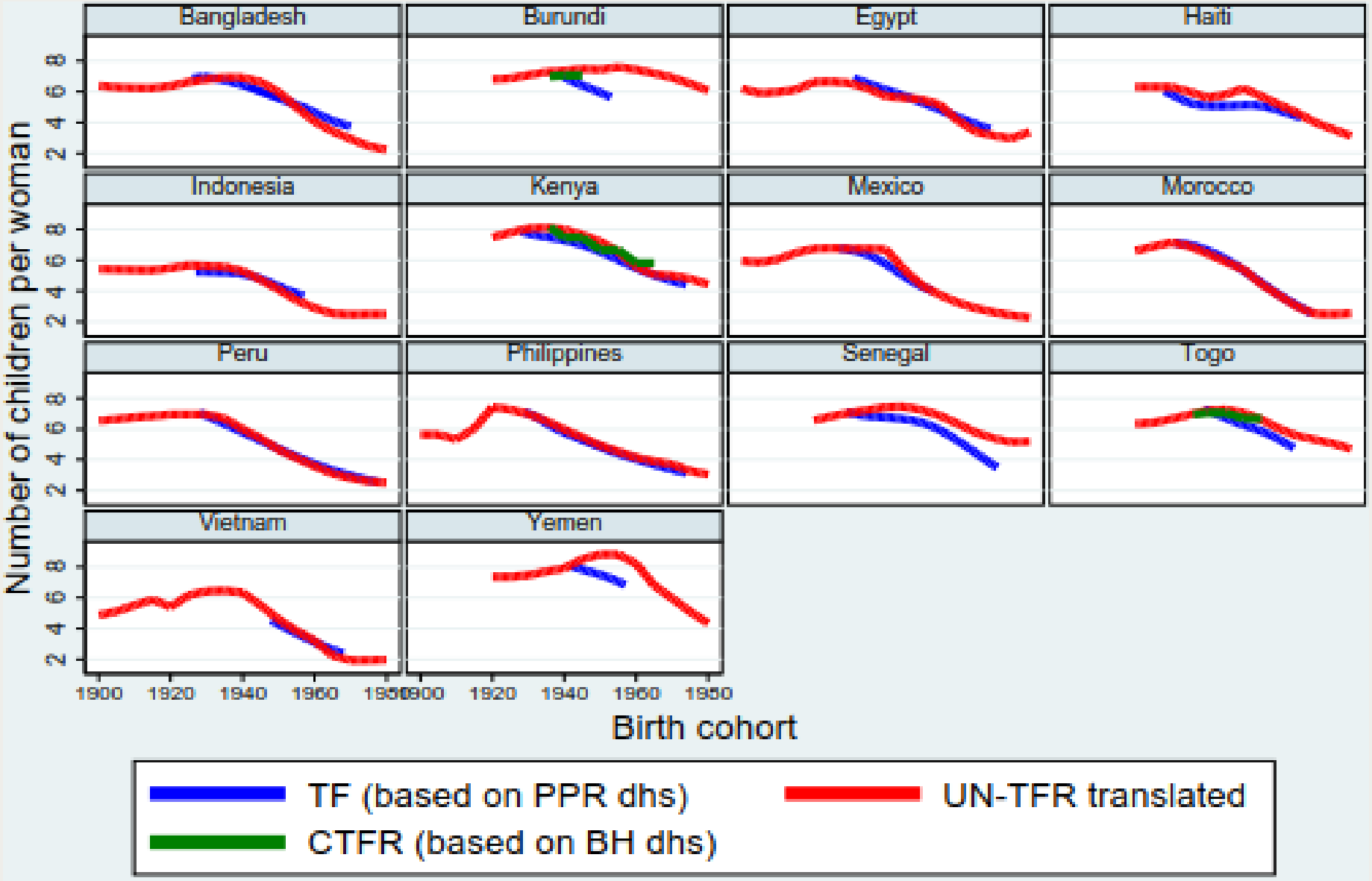
$k_x = PPR1^t_x / PPR1^{t-5}_x$

- estimated at same age !

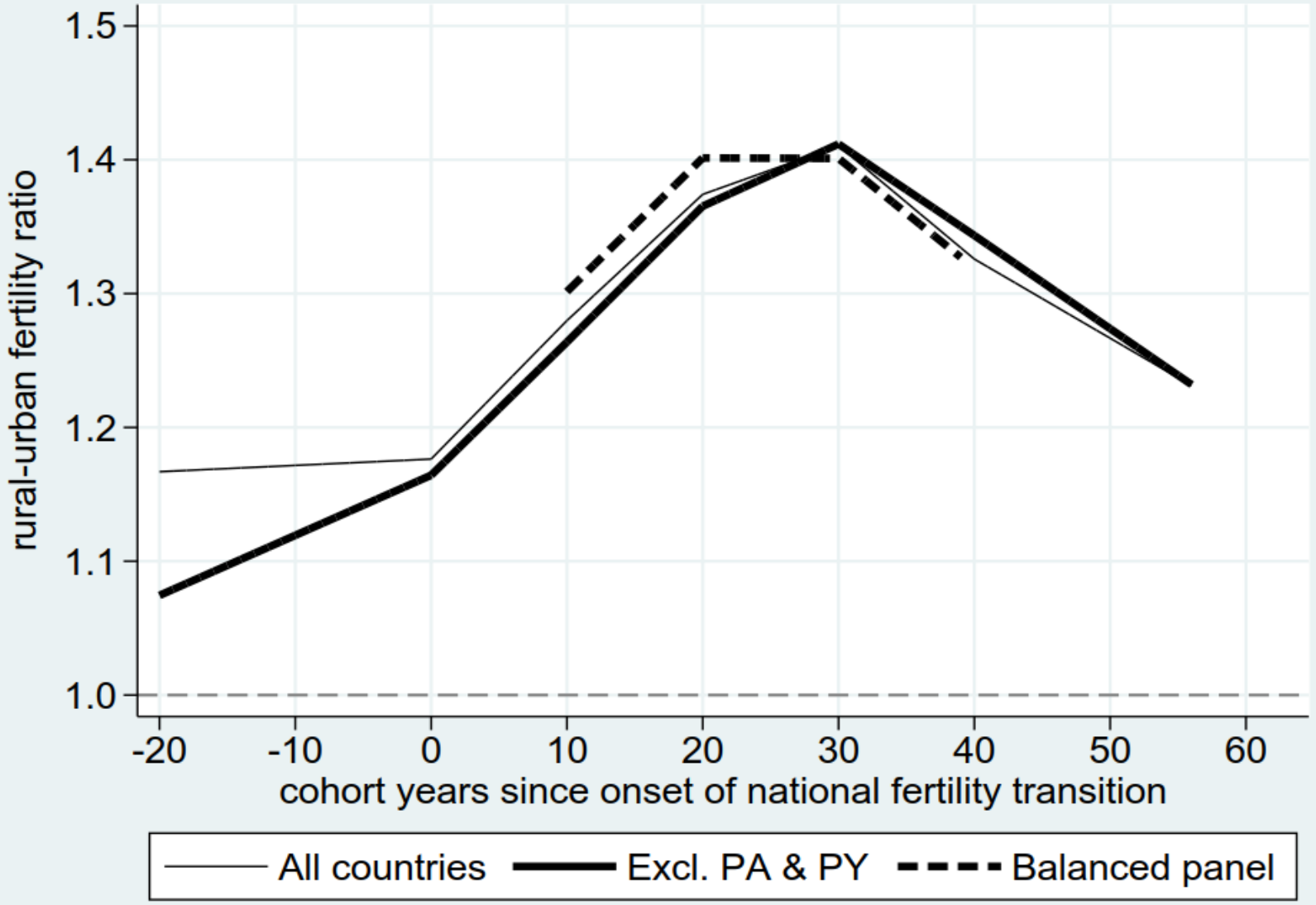
Internal validation: projection based on survey 1 vs estimation based on survey 2 (urban PPR6)



External validation: PPRs-based TF vs birth-history-based CTFR and translated PTFR



Trend in the R/U cohort fertility ratio in the global South (over the course of national fertility transition)



Average trends predicted from linear spline regressions with country fixed effects

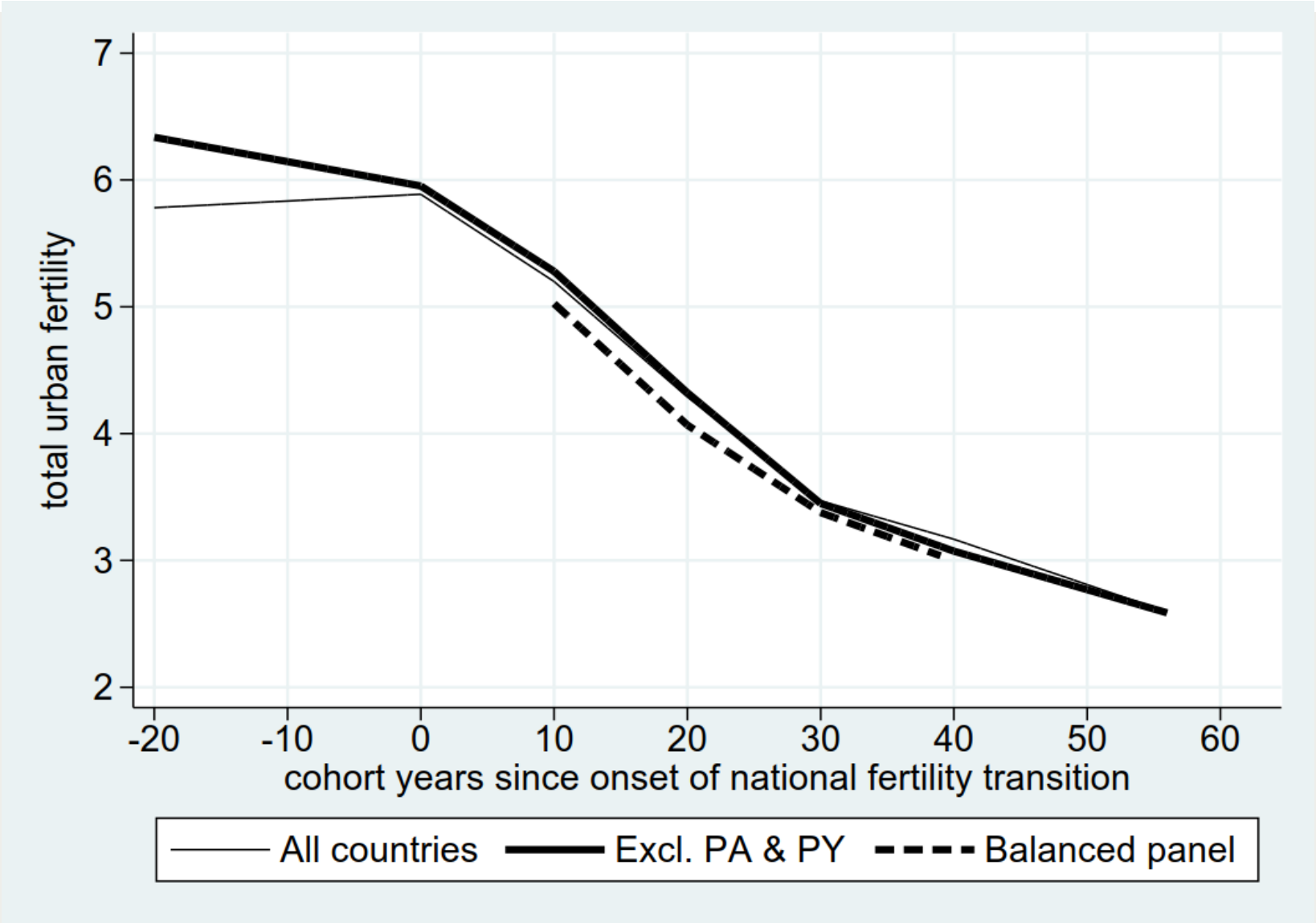
Dissecting the trend in the R/U fertility ratio:
The underlying dynamics in the sector-specific transitions

- Pace of urban fertility decline (esp. before the start in rural areas)

- Urban-to-rural lag in the onset of fertility decline

- Differential pace of fertility decline over the course of the sector-specific transitions

Trend in urban fertility in the global South



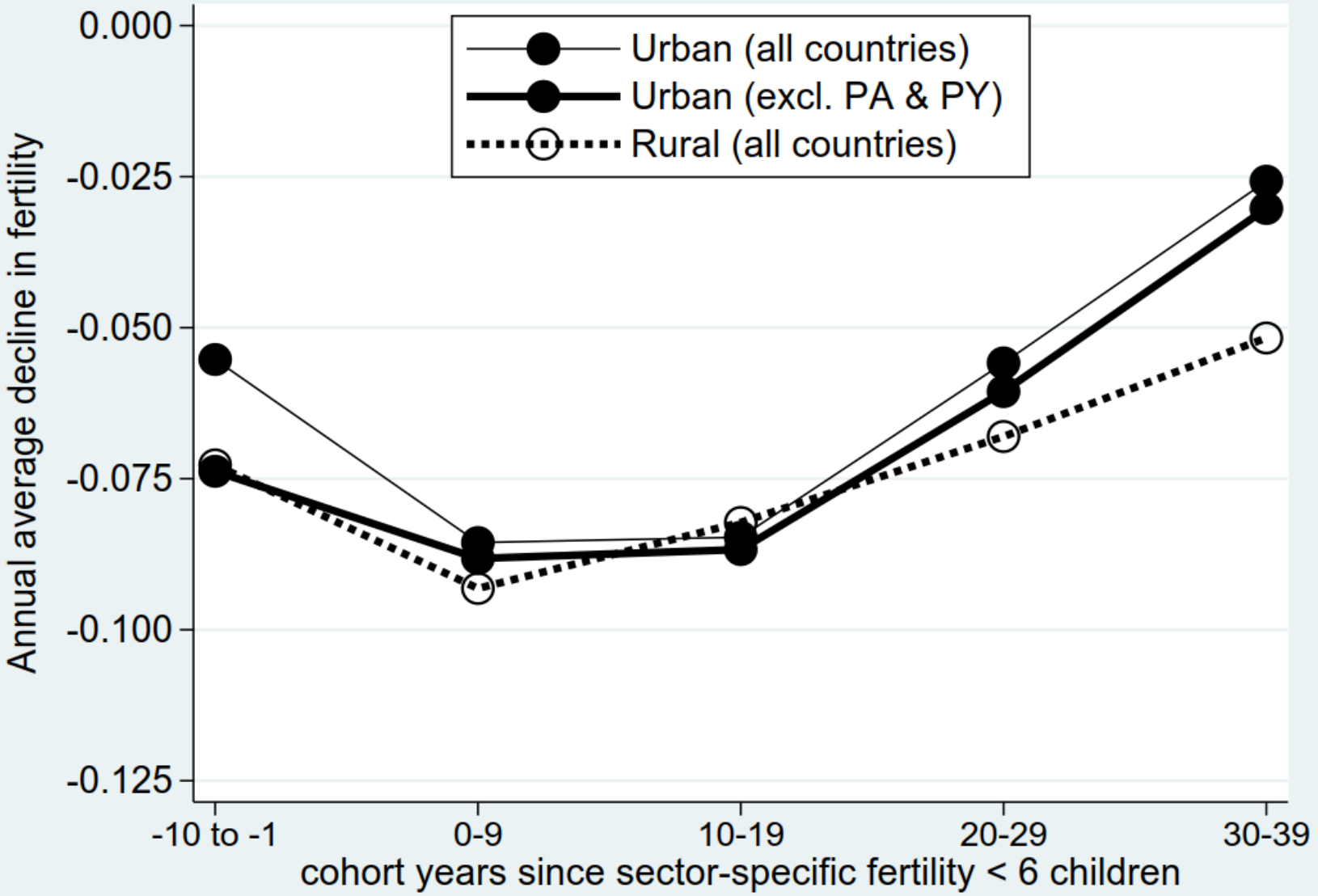
Average trends predicted from linear spline regressions with country fixed effects

Duration (in years) between the urban and rural onset of advanced decline (TF ~ 6) in the global South

World Region	Median lag	Variation (interquartile range)	Number of countries
Global South (all)	16	15	50

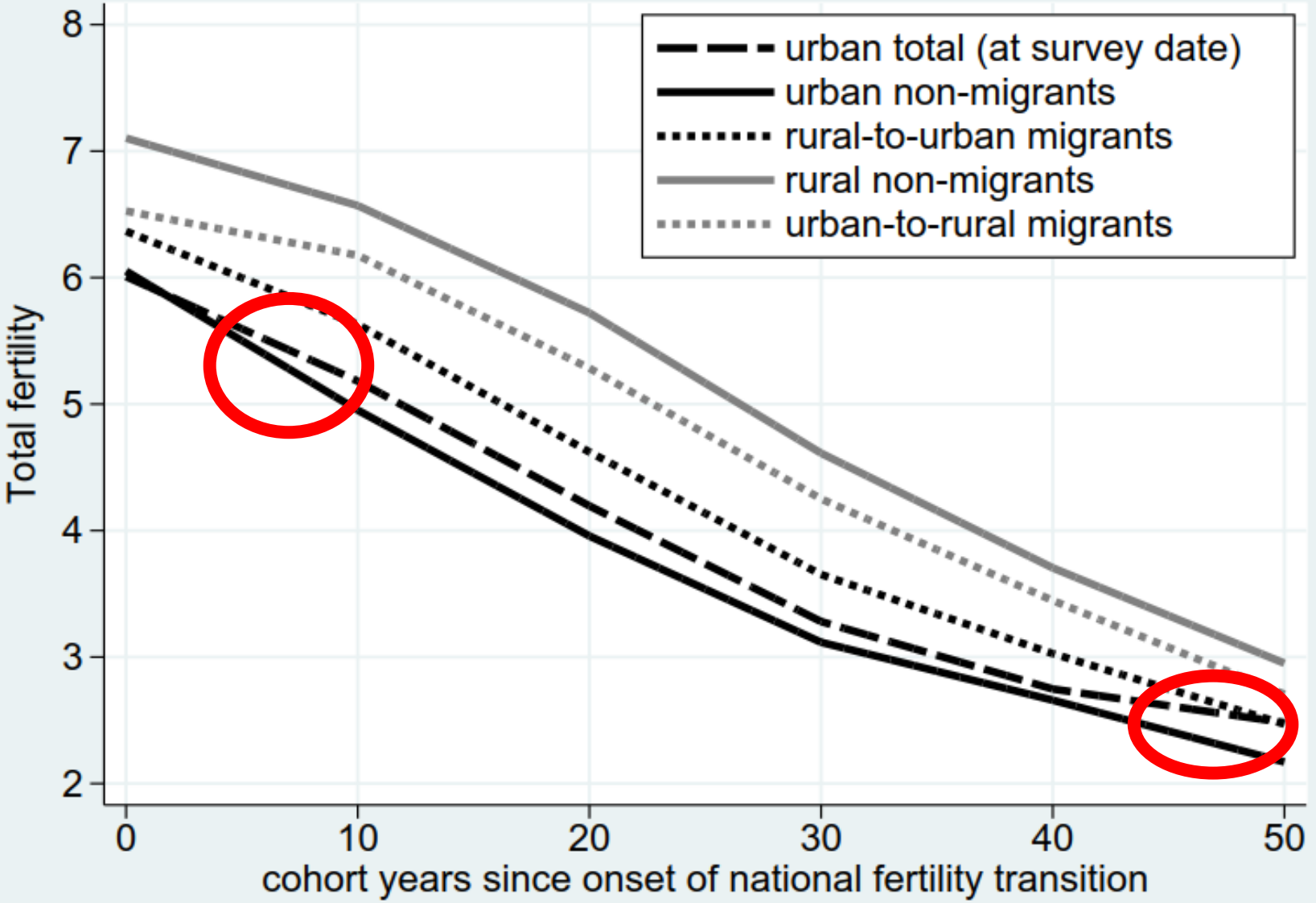
Median life table quartile duration (survival analysis)

Urban and rural paces of fertility decline in the global South



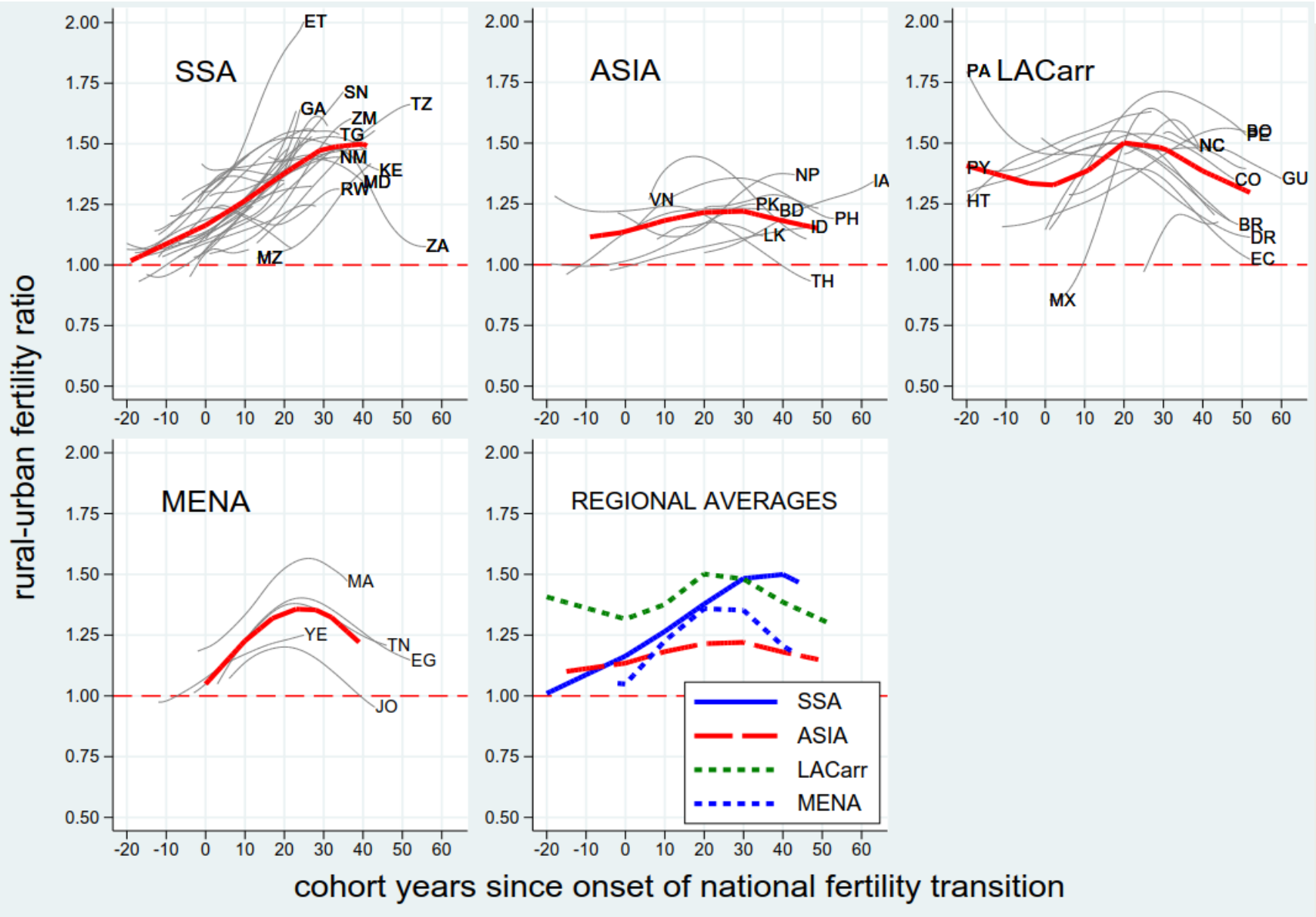
Coefficients from linear spline regressions with country fixed effects

The role of rural-to-urban migration



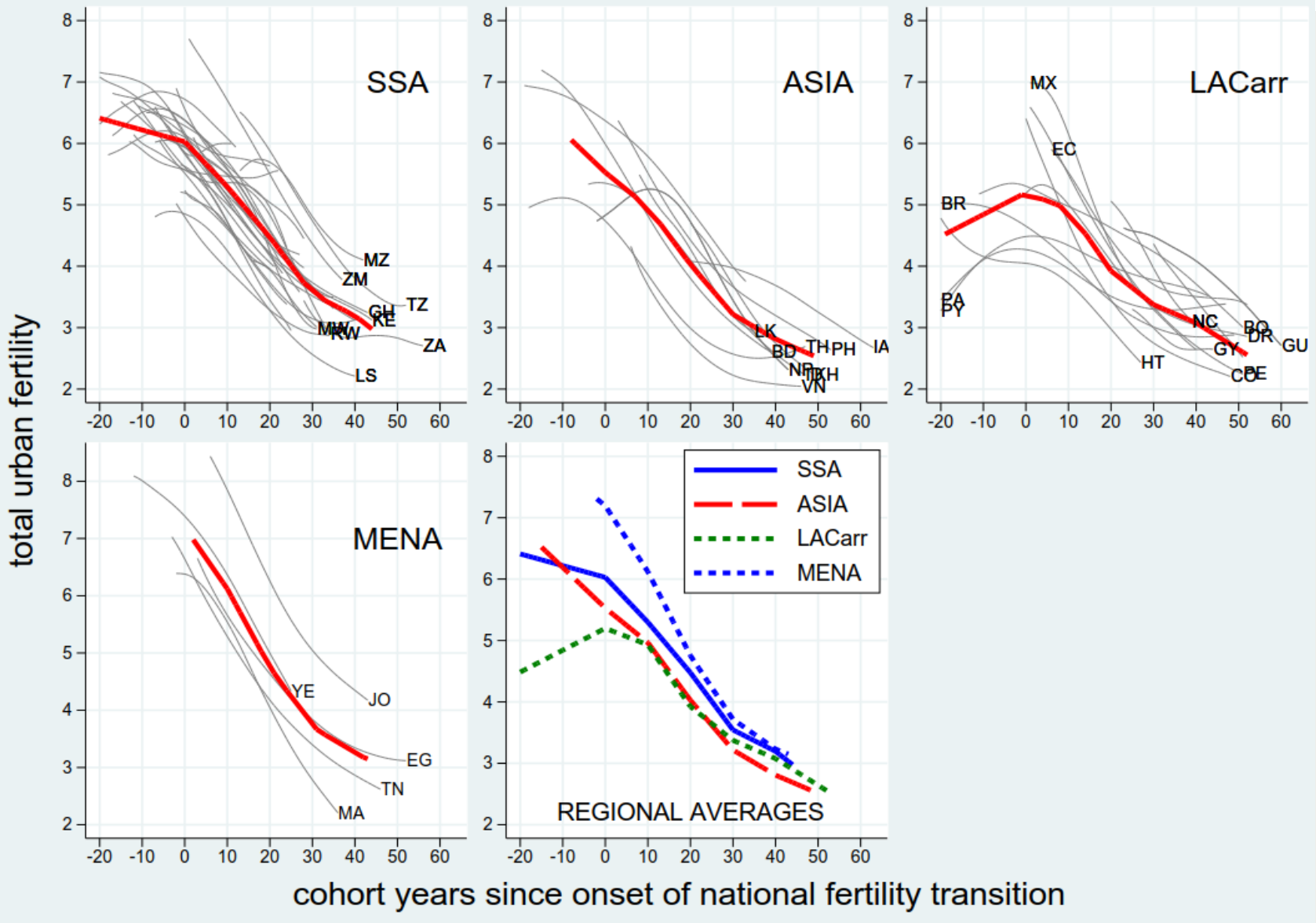
Regional differences

Trend in R/U cohort fertility ratio by world region



Average trends predicted from linear spline regressions with country fixed effects

Trend in urban cohort fertility by world region



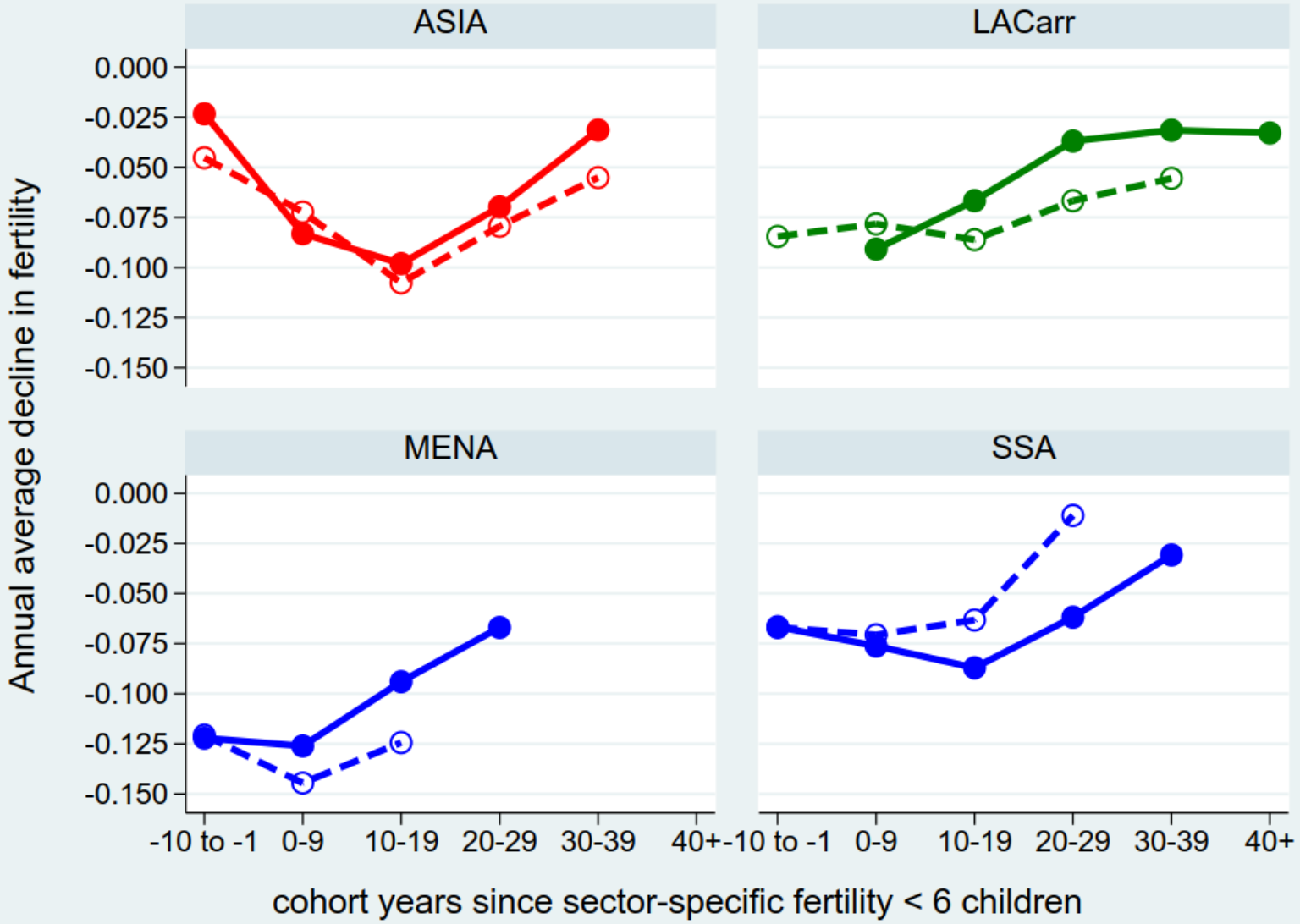
Average trends predicted from linear spline regressions with country fixed effects

Duration (in years) between the urban and rural onset of advanced decline (TF ~ 6) by world region

World Region	Median lag	Variation (interquartile range)	Number of countries
Global South (all)	16	15	50
ASIA	5	8	8
MENA	13	7	5
LACarr	16	12	10
SSA	21	14	27

Median life table quartile durations (survival analysis)

Urban and rural paces of fertility decline by world region



Coefficients from linear spline regressions with country fixed effects

Summary & discussion I

A major role played by the universal process of structural and ideational change in the fertility transition

- Fast pace of fertility decline in urban areas in all world regions

Implications for urban growth patterns:

- Direct and indirect effects of migration will increase

A primary role for the geographic spread of structural and ideational transformations

- inverted U-shaped evolution in rural excess fertility
- Its determination by the urban-rural lag in the transition onsets
- the similar trajectories of the transition in each type of residence locations

Summary & discussion II

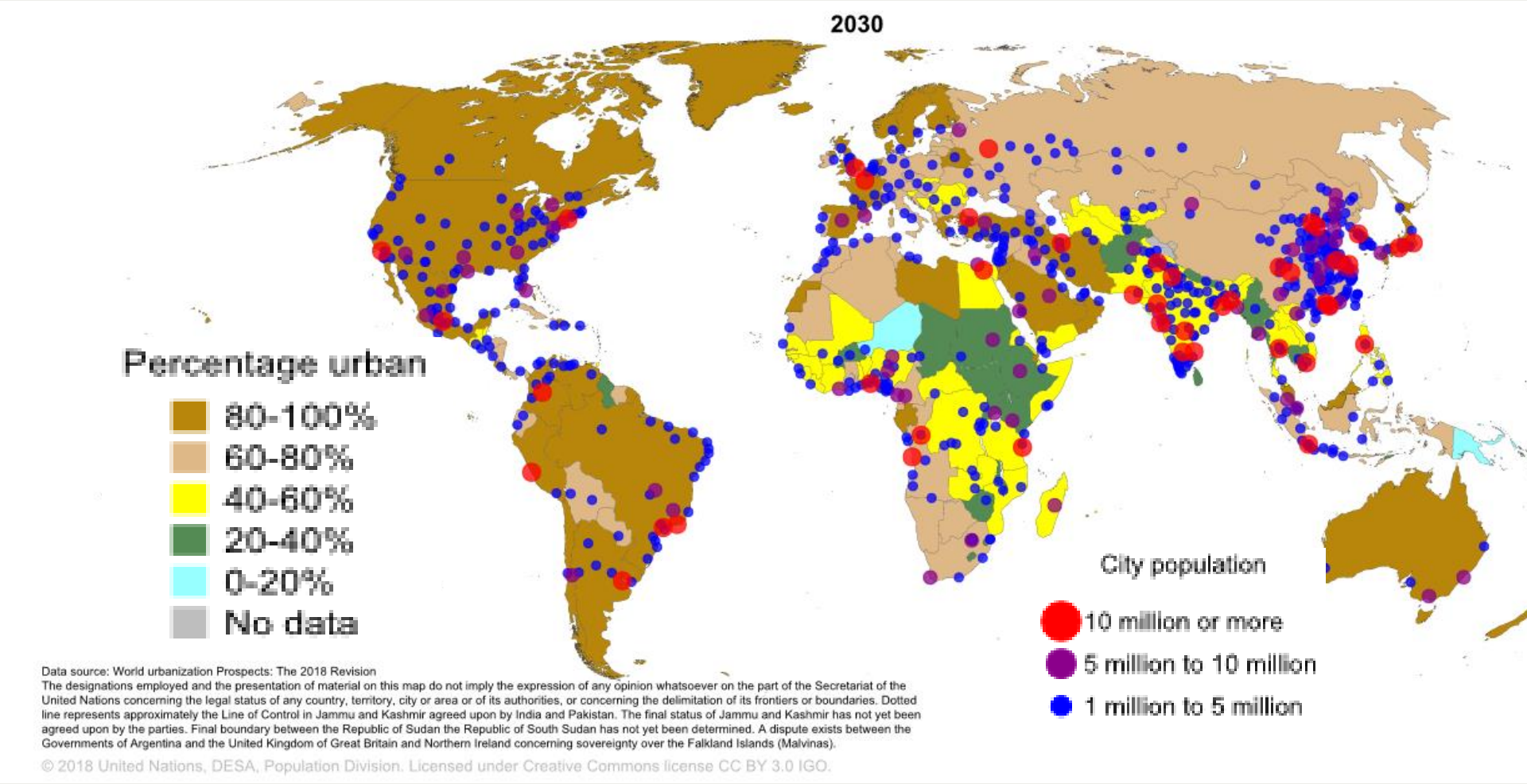
Substantial regional differences in terms of the peak level and later decline **in rural excess fertility**

- … explained mainly by different paces of diffusion of birth limitation from cities to the countryside

Implications for urban growth patterns and the completion of national fertility transitions:

- Population pressure for rural-to-urban migration in SSA
- Progress in the fertility transition will depend on whether the rural fertility decline speeds up
- Need to strengthen urban-rural interactions, and invest in family planning in rural areas

International diversity in the level of *urbanisation* (percentage of population in urban areas)



Data source: World urbanization Prospects: The 2018 Revision

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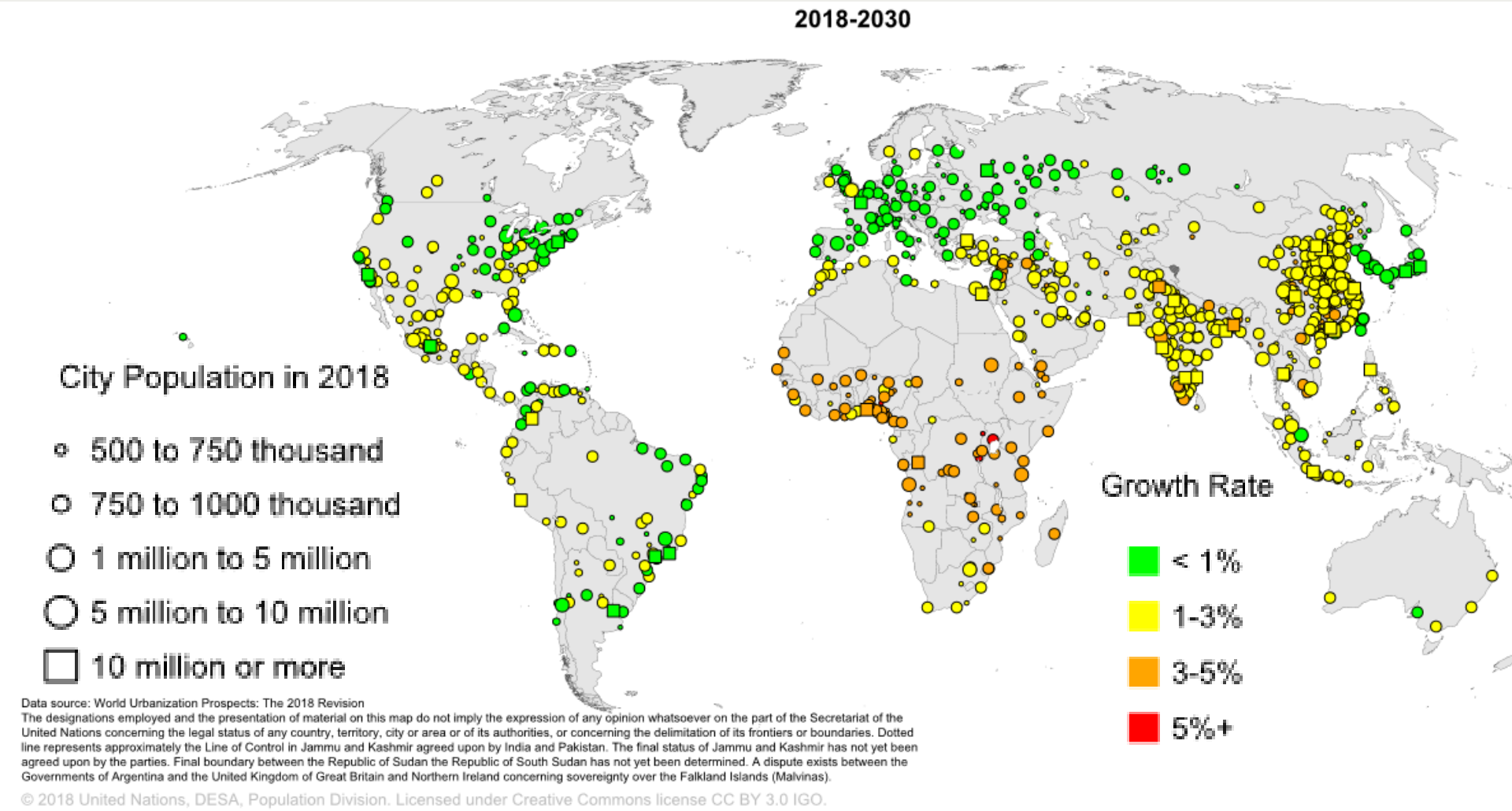
The distribution of the world‘s future *urban growth*



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Average and country-specific differences in the estimates of cohort fertility of all urban residents (at the time of the surveys) and among non-migrant women socialized in urban areas, over the course of the national fertility transitions (onset = year 0), cohorts 1925-1978 in African, Asian and Latin American countries