

Rethinking the Estimation & Projection of Urban & City Populations

New Forecasting Methods

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Is the poor record of urban population projections due to a lack of data?

- **Truncated series**
 - => estimation for recent past = projection
 - => projection for future = ‘projection on projection’
- **Unequally spaced series**
 - => associated with disturbances (war, civil conflicts, economic crisis...).
 - => estimation & projection smooth irregularities
- **Undocumented changes in definition**
 - => major source of error in projection
 - => confusion with real disturbances



Is the poor record of urban population projections due to a lack of data? (cont'd)

- Lack of comparable data (standard definition)
 - => drawback for pooled projections
 - => but does not affect national projections
- Lack of detailed data (e.g. by city size)
 - => no projections at the infra-national level
 - => but less impact on national projections



Is the poor record of urban population projections due to inadequate models?

- ◆ Building comparable, reliable data
 - => should not delay model building
 - => much can be done using existing data
(after consistency check & control)
- ◆ WUP's upward bias is higher in MDC despite better data sources
- ◆ A reliable model could help to get better estimates when series are truncated or unequally spaced (if only there are no highly significant disturbances)



What distinctive contribution is made by international projections that adds value to local projections?

(Sorry, WUP are wrong. No offence intended!)

- ◆ **Benchmark for national projections**
 - => definition heterogeneity has little effect
 - => ‘world’ of possible alternatives
- ◆ **International projections = horizon for development?**
 - => highly correlated with HDI, GDP...
 - => saturation effect?
- ◆ **Autoregressive models are not explanatory**
 - => benchmark for local models adjustment
 - => justify hypotheses in local models



Could a taxonomy of city types (scale) help in preparing better urban projections?

- ◆ Most common taxonomy: city population size
 - => Use different, higher thresholds (500k, 100k, 50k, 20k using a list of cities) to get functions
 - => Model the relation between these functions to estimate lower levels (10k, 5k)
- ◆ Other taxonomies based on geographical, political, economic criteria
 - => far more difficult to implement
 - => examine the urban hierarchy/network



How should we forecast urban fertility and mortality inputs?

- ◆ Correlation between WUP and demographic inputs may just prove that both projection types are wrong (“WUP not a standard for comparison”)
- ◆ However, correlation consistent with formal mathematical relations (see Rogers)
- ◆ Correlation consistent with theory of mobility transition integrating migration into the theory of demographic transition (see Zelinsky)



Forecasting spatial extents

I reach here the limits of my competence!



Should projections of city populations be made independently (city by city) or jointly?

- ◆ System of relations between cities and with rural areas
 - => direct contribution of migration to city growth
 - => lasting effect through young age structure despite urban/rural fertility differential
- ◆ Cities form an interdependent urban network
 - => borders are not necessarily the limits (e.g. international migration)
 - => difficult to delimit (e.g. small countries, islands...)



What theory and methods would guide projections for sets of cities?



- ◆ To project urbanisation is to project urban systems
 - => geographical criterion (contiguity) is questionable
 - => confirmation of the centre-periphery (dependency) theory
- ◆ Compare projections at one level with projections aggregated at lower levels
 - => infra-national, country, regional, continental, and world
 - => infra-national and regional projections are not so common (e.g. state/province in large countries like China, India, USA, Brazil, etc.)

What theory and methods would guide projections for sets of cities? (cont'd)

- ◆ Spatial correlation is not a problem, spatial correlation is part of the solution
 - => help defining the extent of urban system
 - => tool to compare projections at different levels
- ◆ Urban systems
 - => 'Russian puppets' structures: the smaller the city or town, the smaller the urban system on which it depends
 - => non exclusive systems (multiple identities)

Make use of migration, commercial, investment, communication flows (matrices) to measure spatial correlation and define urban systems.

Do we need new measures of uncertainty to accompany new projection methods?


- ◆ Probabilistic methods are preferable
 - => check internal consistency (departure from past trends)
 - => check external consistency with models of projections for other demographic variables (fertility, mortality, migration)
 - => check external consistency with models of projections for non-demographic variables (education, health, economy...)
 - that often use demographic covariates (e.g. WB on China)
- ◆ Projection is complex
 - => may adjust well the reality but prove wrong theoretically (and adjust badly future trends)
 - => may prove right for past period but wrong for future periods in case of a reaction (change in the system)



Recommendations



- ◆ Limit tolerable uncertainty to the error term of the probabilistic projections models
- ◆ Keep or develop a high level of consistency check (computational artefact is no substitute to consistent theory)



*Many thanks
for your kind attention*