Reversal of the Kuznets curve:
Study on the inequality–development relation using top income shares data

Elina Tuominen, University of Tampere, Finland (elina.tuominen@uta.fi)

Introduction

- Kuznets (1955) proposed that the evolution of inequality resembles an inverse-U curve in the course of economic development. He described this process using a shift from agriculture toward other sectors. Since the 1970s, empirical studies have presented contradictory results on the inequality–development association. In these studies, development has been measured simply using GDP (per capita).

- The existing empirical literature has been limited by availability and quality of inequality data. Also chosen functional forms and discussion on sectoral shifts deserve more attention.

- This study uses new inequality series, namely top 1% income shares in 26 countries (Alvaredo et al., 2013). The data allow studying the whole 20th century, but the focus is on the 'advanced' countries due to data availability. Moreover, flexible estimation methods are used to address the issue of the functional form. Also sectoral shifts are studied in the spirit of Kuznets.

Empirical framework

- Additive models are used in estimation (see: Wood, 2006). Smooth functions are used to approximate the association between *top1* and different covariates, and the preferred specifications have the following structure:

$$top1_{it} = \alpha + f_1(ln(GDP\ per\ capita)_{it})$$
$$+ f_2(urbanization_{it}) + f_3(service\ sector_{it}) + u_i + \epsilon_{it},$$

  where α is constant, functions $f_{\bullet}$ are smooth functions (f can be linear, too), i refers to country, t refers to time, $\epsilon_{it} \sim N(0, \sigma^2)$ is the error term, and u_i are country effects. Both fixed-effect (FE) and random-effects (RE) specifications for u_i are studied.

- *urbanization* is the percentage of urban population, *service sector* is the employment in services (% of total employment).

Conclusions

- Results show that the reversal in the top1–log(GDP per capita) relationship holds at later stages of development even if one controls for two sectors, namely urbanization and services.

- It is found that sectoral changes are related to the evolution of the top 1% income shares. However, it must be noted that these shifts are not an exhaustive explanation to changes in inequality.

- The overall shape of the Gini–log(GDP per capita) association in Frazer (2006) resembles findings in the current study.

Main results

- First, annual series without controlling for sectors were studied (years 1900–2010). Results on 'lower' levels of development are not robust as the number of 'less-advanced' countries in the sample is small (7 out of 26), but estimates support a reversal of the Kuznets process at later stages of development. Results also show that different groups of countries are in different phases of the process according to the level of economic development.

- Controlling for two sectors does not alter the main finding of a reversal in the inequality–development association. Example of results (5-year-averaged data, years 1980–2009):

$$\widehat{top1}_{it} = -0.48 + \hat{f}_1(ln(GDP\ per\ capita)_{it})$$
$$+ \hat{f}_2(urbanization_{it}) + 0.15 service\ sector_{it} + \hat{u}_i,$$

  where *service sector* enters linearly and u_i are random effects. Figure 1 below illustrates f_1 and f_2 in this specification.
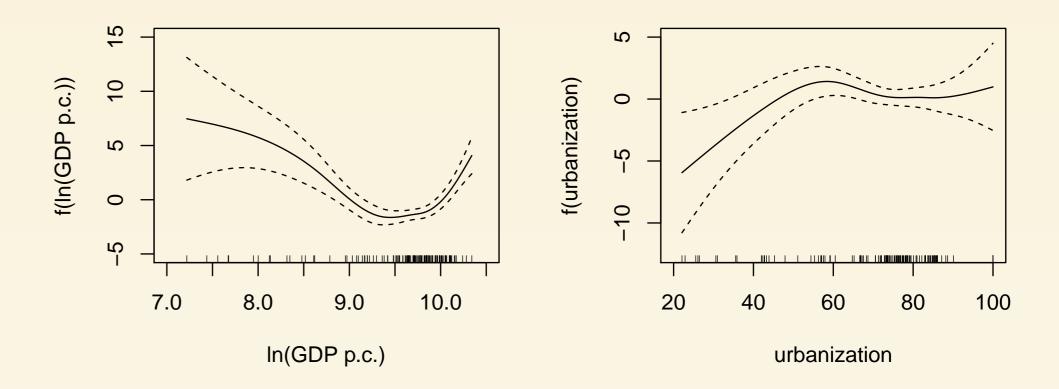

Figure 1: Model with RE specification (5-year data, 1980–2009): estimates (solid) and 95% Bayesian credible intervals (dashed).

- The main findings are: **(1)** the *top1–ln(GDP per capita)* relation shows $\cup$ shape at later stages of development, and the overall shape resembles Frazer's (2006) findings although he used Gini coefficients to measure inequality; **(2)** the *top1–urbanization* association shows signs of $\cap$ shape which is in line with the Kuznets hypothesis; **(3)** the *top1–services* relation is positive, and one can speculate whether a new shift is taking place.

References

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