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## Demographic Trends, Economic Growth, and Distribution Dynamics

### Abstract

The research proposed here will analyze the economic impacts of a delayed or a quickened decline in fertility rates in developing countries. Four hypotheses will be tested:

1. Delay of the decline in fertility rates will during the next two decades
2. Increase income inequality and slow poverty reduction;
3. Slow the increase in urbanization rates;
4. Strain education systems, making Millennium Development Goals more difficult to achieve.

The study will use a combination of macro models (economy-wide general equilibrium models) and micro models (based on household survey data). The main methodological contribution of the study will be the development of methods that make the macro and micro approaches more mutually consistent, which is a still under-researched area. The research will benefit from a global general equilibrium model (distinguishing some 80 countries or regions and some 40 sectors) and a global database with household surveys of 95 developing countries, both developed at the World Bank and applied in recent work carried out by the Development Prospects Group in the Bank

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### Countries where the research will take place

Global

### How does the research describe the impact of population/reproductive health on poverty reduction and/or economic growth?

This proposed research will undertake an integrated macro-micro analysis, following the approach started in World Bank (2006) to understand how changes in fertility affect growth and income distribution. The main contribution of the proposed research will be the development of methods to make

the expected future changes in household composition and household behavior in the micro approach mutually consistent with the expected future changes in savings, growth, wages and prices in the macro model. The methods will include ways to impose insights from the micro approach (like migration decisions, labor participation and schooling behavior) on the macro model and, conversely, to model future changes in household composition under the restrictions imposed by the macro model.

### How will the research address a policy need, and what kind of policy lesson is expected?

With the resulting consistent micro-macro framework different scenarios of future fertility rates will be analyzed. The hypotheses are that a *delay of the decline in fertility rates* might cause the following effects:

- An increase in income inequality and hence a slow down in the poverty reduction.
- An enlargement in the proportion of the population living in rural areas, and, thus a slower increase of the future urbanization rate (and possibly a slower increase in the proportion of people efficiently employed in non farm activities).
- A strain in the education systems, making Millennium Development Goals (MDG) more difficult to achieve.

### Methods used

An analytical framework linking macro and micro models is needed to evaluate the effects of demographic changes on economic performance, income distribution and poverty incidence. The macro model is represented by a computable general equilibrium (CGE) model that is used to estimate the general equilibrium effects—changes in relative prices, in sectoral employment and output levels—brought about by the *exogenous* demographic transition (i.e. the hypothetical delay in the reduction of fertility rates). The micro model is represented by a micro-simulation model that assesses the income distribution and poverty effects by taking into account how the same exogenous demographic changes and the relative prices, occupational changes estimated in the top model affect individual households.

Consistently linking the macro and micro approaches presents numerous difficulties. In particular this project aims at overcoming two sets of problems:

- The initial data in the macro and micro models are inconsistent. These inconsistencies need to be resolved, because otherwise it is difficult to pass information about future scenarios from one model to another. The study will explore the impact of different ways to reconcile the initial data sets on the economic outcomes of fertility shocks.
- Without imposing additional constraints, inconsistencies can easily arise between scenarios simulated in the macro and the micro model. Again, the study will explore the impact of different ways to keep simulations consistent and it will propose a preferable way for future applications.

## Data used

The research will be based on the GTAP<sup>1</sup> global macro-economic data, used in a global general equilibrium model (distinguishing 80 countries or regions and 40 sectors), and a global database with household surveys of 95 developing countries.

## Research product

“A New Dataset on Global Income Distribution,” by Charles Ackah, Maurizio Bussolo, Rafael E. De Hoyos, Francisco H. G Ferreira, and Denis Medvedev (2009).

<sup>1</sup> GTAP is an acronym for the Global Trade Analysis Program, a multi institutional research program whose goal is to improve the quality of quantitative analysis of global economic issues within an economy-wide framework.