Human development and economy-wide modeling

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Successful and ongoing capacity development projects

- Uganda
  - Support to the National Development Plan (Planning)
  - Support to MDG report (Finance and Planning, UNDP)
  - Support to assess the impact of the fall in foreign aid (Planning)
- Kyrgyzstan
  - Public investment strategy
    - Impact on growth and poverty
    - Impact on macro-economic balances
    - Impact on MDGs
- Jordan, Philipines
  - Training phase

Successful and ongoing capacity development projects LAC

- Bolivia (UDAPE-Planning)
  - Remittances
  - Food price volatility
  - MDGs to 2015, 2020 and 2025
- Nicaragua
  - Impact of pests on productivity in coffee plantations and the economy (Treasury)
  - Fall in foreign aid (Office of the President)
  - On time primary school completion (Education)
- Costa Rica
  - MDG education (on time completion (Education)
  - Macro-economic impact of government debt in international markets and alternative use of resources (Finance & Parliament)
  - Impact of income tax rebates (University and Parliament)

MAMS

- MAMS (*Maquette* for MDG Simulations) is a dynamic Social Accounting Matrix based economy-wide model developed at the World Bank to analyze
  - strategies for achieving MDGs
  - country-level, medium-to-long-run policy analysis
- Micro-simulations to analyze the effects, throrugh the labour market, on poverty and income distribution of policies and shocks to the economy
- MAMS has been applied, tested and extended through UN-DESA capacity development projects.
  - approximately in 30 countries

Structure of MAMS

- activities
- households
- government
- rest-of-the-world
- private investment financing
- domestic commodity markets
- factor markets
- dynamics
- MDG production
- education
- government policy tools

MAMS: features common to most economy-wide (CGE) models with one distinction

- ***Computable*** □ solvable numerically
- ***General*** □ economy-wide
- ***Equilibrium*** □ agents find optimal solutions subject to constraints; quantities demanded = quantities supplied; macroeconomic account balance
- Most features of standard open-economy, dynamic-recursive CGE models.
  - Producers use factors and intermediates as inputs.
  - Imperfect transformability/substitutability in foreign trade.
  - A "real" model: only relative prices matter; no modeling of inflation.
  - The solution in any time period depends on current and past periods.
- Distinctively, it has a dynamic MDG block
  - Typically covers a number of MDGs
  - Assess trade-offs of alternative financing strategies and accounts for synergies during MDG achievement

Determinants of MDG outcomes in MAMS

MDG	**Service per capita or student**	**Consump-tion per capita**	**Wage incen-tives**	**Public infra-structure**	**Other MDGs**
2–Primary schooling (outcomes)	x	x	x	x	4
4-Under-five mortality	x	x		x	7w,7s
5-Maternal mortality	x	x		x	7w,7s
7w-Water	x	x		x	
7s-Sanitation	x	x		x	

Education

- MAMS tracks enrollment by education cycle (~primary, secondary, tertiary).
- Educational outcomes – for each cycle, rates of intake, promotion, repetition, and drop out (as functions of determinants e.g. services per student)
- The analysis uses a logistic function (informed limits, replicate base-year values and elasticities, calibrated to achieve MDGs, & assuming diminishing marginal returns to the inputs)

MDG "Production" and Education

- The analysis uses a logistic function that permits:
  - imposition of limits (maximum or minimum) given by logic or country experiences
  - replication of base-year values and elasticities
  - calibration of a reference time path for achieving MDGs
  - diminishing marginal returns to the inputs
- Two-level function:
  - constant-elasticity function at the bottom: $Z = f(X)$
  - logistic function at the top: $MDG = g(Z)$

Impact of policies achieving 3 MDGs (education, mortality, sanitation)