

Examples of MAMS results: the experience of the MDG project for Latin America and the Caribbean

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Introduction

- UNDP/UN-DESA/World Bank Project “Public Policies for MDGs in Latin America and the Caribbean”
 - 19 countries
 - Project at final stage
 - Comprehensive macro-micro methodological framework
 - MAMS
 - Microeconomic analysis of determinants and costing analysis of access to schooling, infant and maternal mortality, etc.
 - Microsimulation methodology for income distribution analysis.
 - Goals:
 - MDG 1: headcount poverty rate (\$1PPP) – extreme poverty goal
 - MDG 2: primary school completion rate (share of population in age cohort)
 - MDG 4: under-5 mortality rate (per 1,000 live births)
 - MDG 5: maternal mortality rate (per 100,000 live births)
 - MDG 7a: access to safe drinking water
 - MDG 7b: access to safe sanitation

- Key questions:
 - Will the MDGs be achieved with “business as usual” public policies?
 - How much additional public spending is needed to achieve the MDGs if “business as usual” is insufficient?
 - Are alternative financing strategies feasible? Which seems best?
 - What are the trade-offs associated with alternative financing strategies to reach the MDGs?
 - Would achievement of goals in education, health, and water & sanitation contribute to reaching the extreme poverty goal?

- Lessons from this project may benefit the new project for Arab countries

Costa Rica and Ecuador

- Two middle-income countries with large differences in terms of MDG achievement
- Costa Rica is on track
 - Has achieved the goals in access to water and sanitation
 - Close to achieving extreme poverty target
 - Satisfactory evolution towards the achievement of health-related goals
- Ecuador faces bigger challenges
 - Seems on track for health-related goals
 - Off track for other goals

Will MDGs be achieved with business-as-usual policies?

- In MAMS, this is answered by analyzing the results of a business-as-usual (BAU) scenario:
 - identifies the economic trajectory from the base year to 2015
 - assumes that MDG-related government spending continues to grow at past trends
 - assumes that all other policy variables remain unchanged.
- Labor market structure (employment + income) of the BAU scenario is imposed on a micro data set to identify if the extreme poverty goal (MDG 1) is achieved.

MDG achievement in the BAU scenario (percentage)

Costa Rica	2002	2005	2010	2015	Target
MDG 1: Extreme poverty ^{1/}	2.8	2.6	2.5	2.5	1.7
MDG 2: Primary school completion rate	88.9	90.5	94.9	99.1	100.0
MDG 4: Child mortality (per 1,000 live births)	9.6	9.1	8.1	7.0	6.0
MDG 5: Maternal mortality (per 100,000 live births) ^{2/}	41.0	37.9	31.7	25.4	20.0
MDG 7: Drinking water supply coverage	78.4	78.7	79.4	80.5	79.6
MDG 7: Sanitation coverage	93.4	93.4	93.5	93.5	93.5

Ecuador	2001	2005	2010	2015	Target
MDG 1, Extreme poverty ^{1/}	17.0	13.7	10.4	9.4	7.7
MDG 2, Primary school completion rate	76.4	82.7	91.4	95.4	100.0
MDG 4, Child mortality (per 1,000 live births)	23.5	20.7	17.6	15.7	14.3
MDG 5, Maternal mortality (per 100,000 live births)	87.3	67.2	46.6	36.0	29.3
MDG 7, Drinking water supply coverage	77.6	79.1	81.6	83.6	89.0
MDG 7, Sanitation coverage	46.3	50.0	56.0	60.9	73.0

^{1/} Poverty results are estimated after applying a microsimulation methodology.

^{2/} A less ambitious national target for maternal mortality is used.

How much additional public spending is needed to achieve the MDGs?

- Answer requires running “MDG scenarios” in which achievement of MDGs is deliberately targeted using alternative financing strategies.
 - One at the time (MDGs 4 & 5 respond simultaneously to increased health expending)
 - All goals simultaneously
 - Synergies
 - MDG1 is not targeted

Simulated additional costs of achieving the MDGs

(Annual average MDG spending in MDG scenario with increased taxes compared to BAU scenario, % of GDP)

	Costa Rica (2002-2015)	Ecuador (2001-2015)
Primary education	0.34	0.81
- Current spending	0.22	0.68
- Investment	0.12	0.13
Health	0.87	0.38
- Current spending	0.68	0.20
- Investment	0.19	0.18
W&S	0.14	0.35
- Current spending	0.06	0.08
- Investment	0.08	0.27
TOTAL	1.35	1.54

Unit costs in specific MDG-related sectors (i.e. wages) and synergies for countries off track explain differences in extra costs across countries.

Ecuador: Cost-reducing synergy among MDGs, 2001-2015
(Annual average MDG spending in MDG scenario with increased taxes
compared to BAU scenario, % of GDP)

	Only MDG2	Only MGD4&5	Only MDG7	All MDGs
Primary education	0.83	0.00	0.00	0.81
- Current spending	0.70	0.00	0.00	0.68
- Investment	0.13	0.00	0.00	0.13
Health	0.00	0.60	0.00	0.38
- Current spending	0.00	0.31	0.00	0.20
- Investment	0.00	0.30	0.00	0.18
W&S	0.00	0.00	0.34	0.35
- Current spending	0.00	0.00	0.08	0.08
- Investment	0.00	0.00	0.26	0.27
TOTAL	0.83	0.61	0.34	1.54

1.78

Are alternative financing strategies feasible? Which seems best?

- Four alternative financing strategies:
 - Foreign grants - aid (fg)
 - Foreign borrowing (fb)
 - Direct taxes (tax)
 - Domestic borrowing (db)
- Relevance depends on country-specific context
 - Is the country eligible for receiving grants (ODA)?
 - Fiscal space
 - Is the domestic capital market developed?
 - Scope for increasing the tax burden

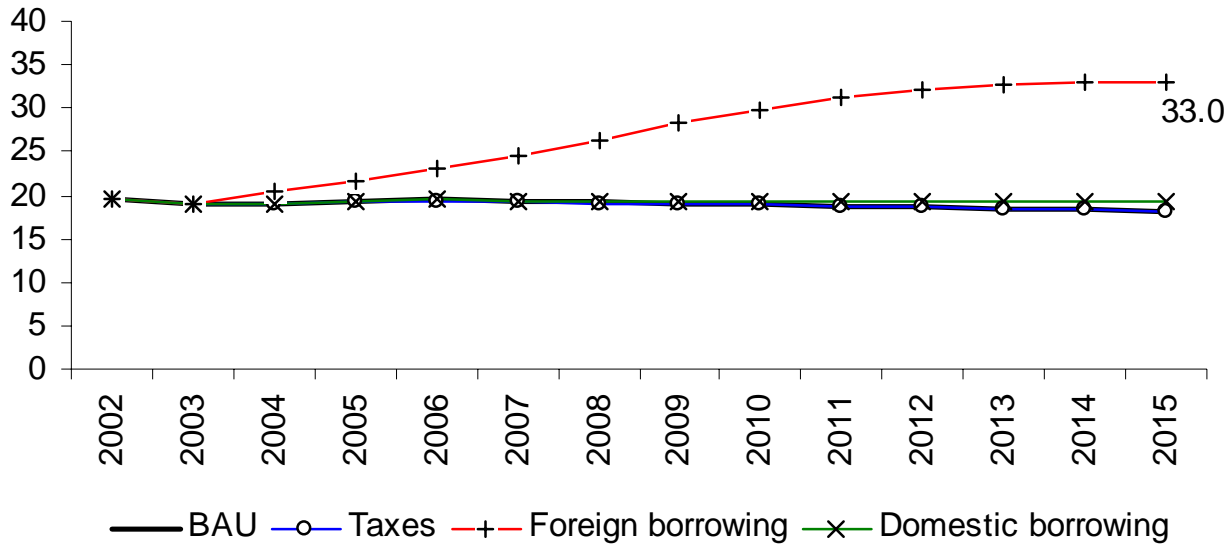
Simulated additional costs of achieving the MDGs

(Annual average MDG spending in MDG scenarios with alternative financing strategies compared to BAU scenario, % of GDP)

	Costa Rica (2002-2015)				Ecuador (2001-2015)			
	fg	tax	fb	db	fg	tax	fb	db
Primary educ.	0.34	0.34	0.26	0.32	0.73	0.81	0.73	0.76
- Current spending	0.23	0.22	0.15	0.21	0.61	0.68	0.61	0.64
- Investment	0.11	0.12	0.11	0.11	0.12	0.13	0.12	0.12
Health	0.88	0.87	0.77	0.95	0.29	0.38	0.29	0.33
- Current spending	0.76	0.68	0.60	0.75	0.14	0.20	0.14	0.17
- Investment	0.13	0.19	0.17	0.20	0.15	0.18	0.15	0.16
W&S	0.13	0.14	0.09	0.13	0.33	0.35	0.33	0.35
- Current spending	0.07	0.06	0.03	0.07	0.07	0.08	0.07	0.08
- Investment	0.06	0.08	0.06	0.06	0.26	0.27	0.26	0.27
TOTAL	1.35	1.35	1.12	1.40	1.35	1.54	1.35	1.44

Fg and fb appear to be less costly. Is foreign borrowing a feasible strategy from a macroeconomic point of view? Are the other options feasible?

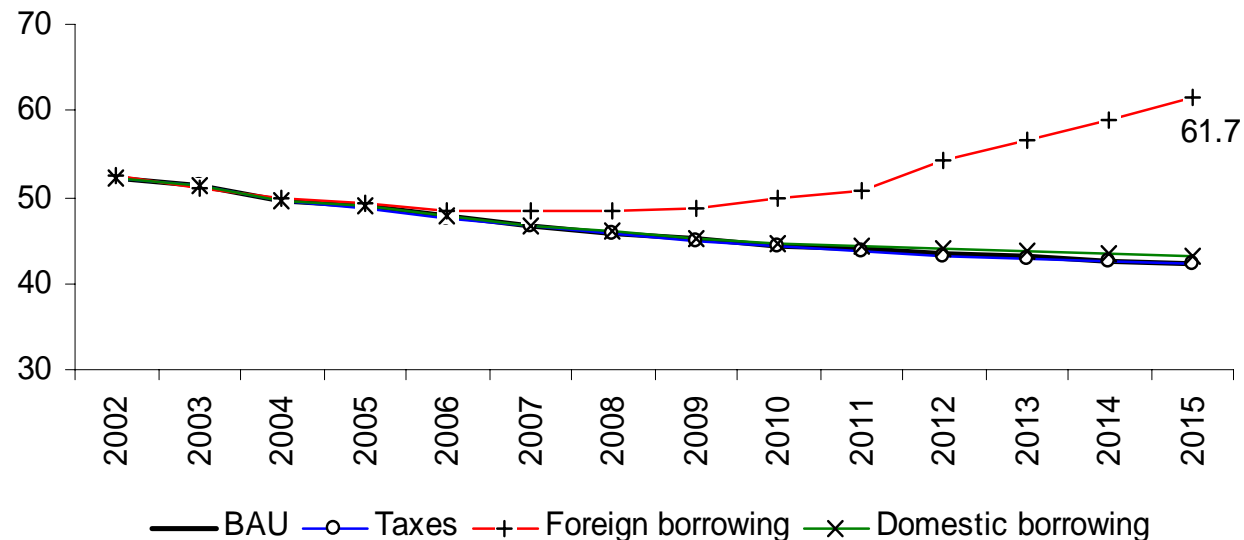
Costa Rica



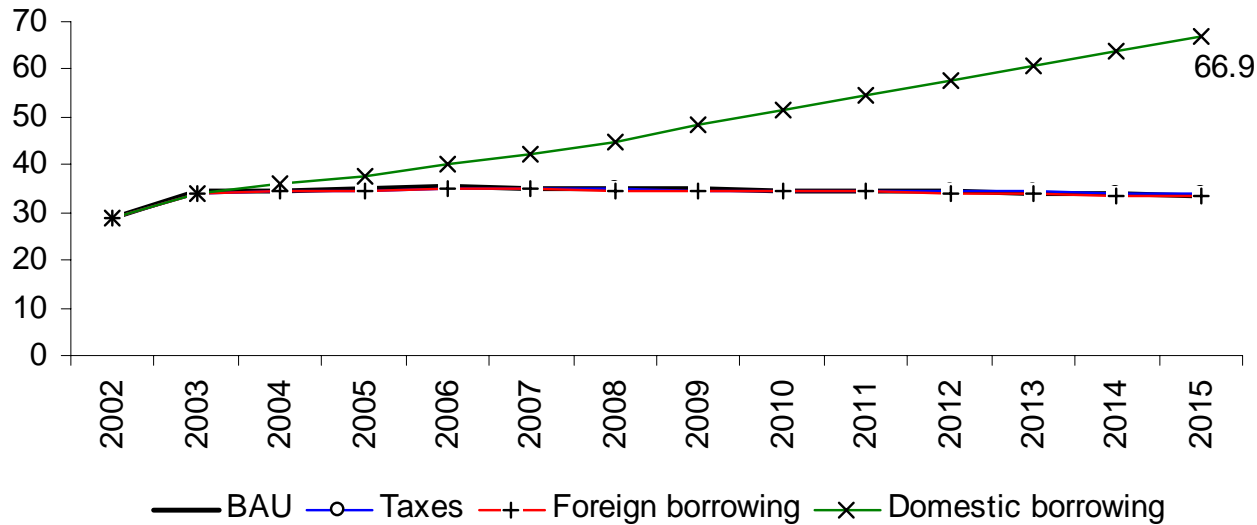
External public debt under the BAU and alternative MDG financing scenarios (percentage of GDP)

Foreign financing would lead to a substantial increase in foreign debt, though likely staying below critical levels in Costa Rica - and not in Ecuador.

Ecuador



Costa Rica

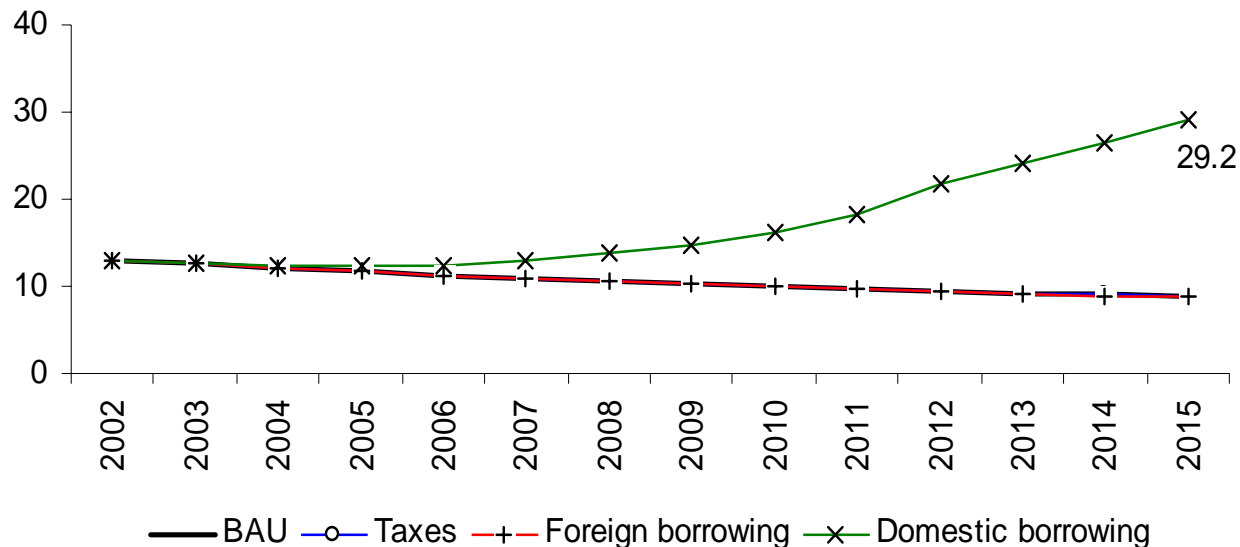


Domestic public debt under the BAU and alternative MDG financing scenarios (percentage of GDP)

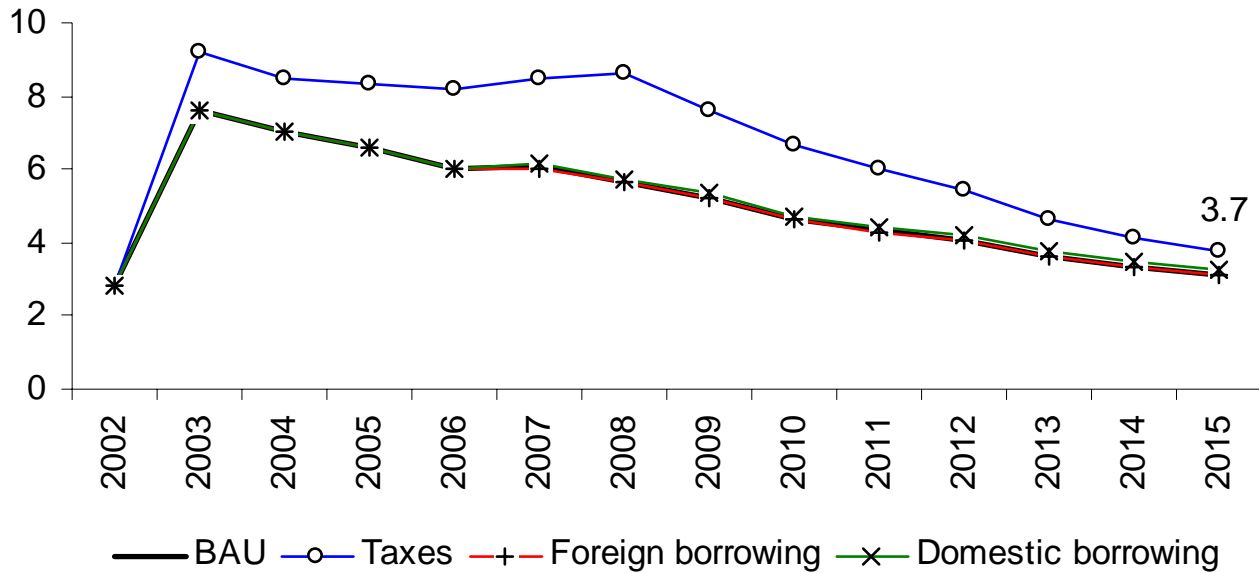
Domestic borrowing would lead to a substantial increase in domestic debt, in both cases considered to be above critical levels.

In Ecuador, this is in part because of the underdeveloped domestic capital market and the government would only be able to issue bonds at very high interest rates.

Ecuador



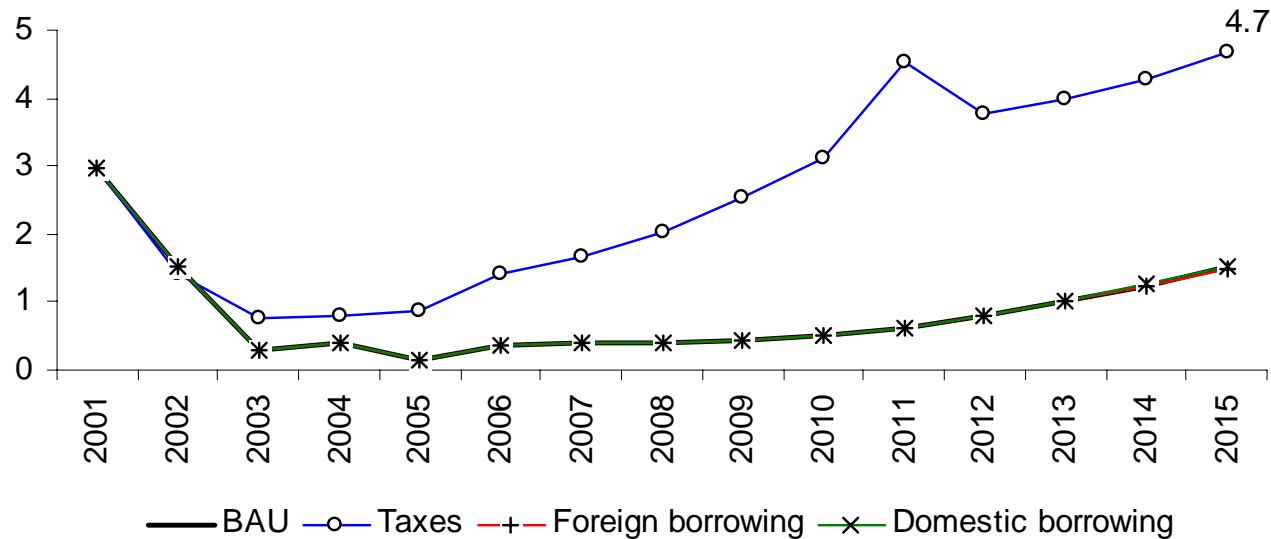
Costa Rica



Direct income taxes under the BAU and alternative MDG financing scenarios (percentage of GDP)

Ample scope for further tax reforms. Fiscal sustainability of the MDG strategy seems best preserved when recurring to tax financing, albeit at the cost of slower private investment and consumption growth (that is, trade-offs).

Ecuador

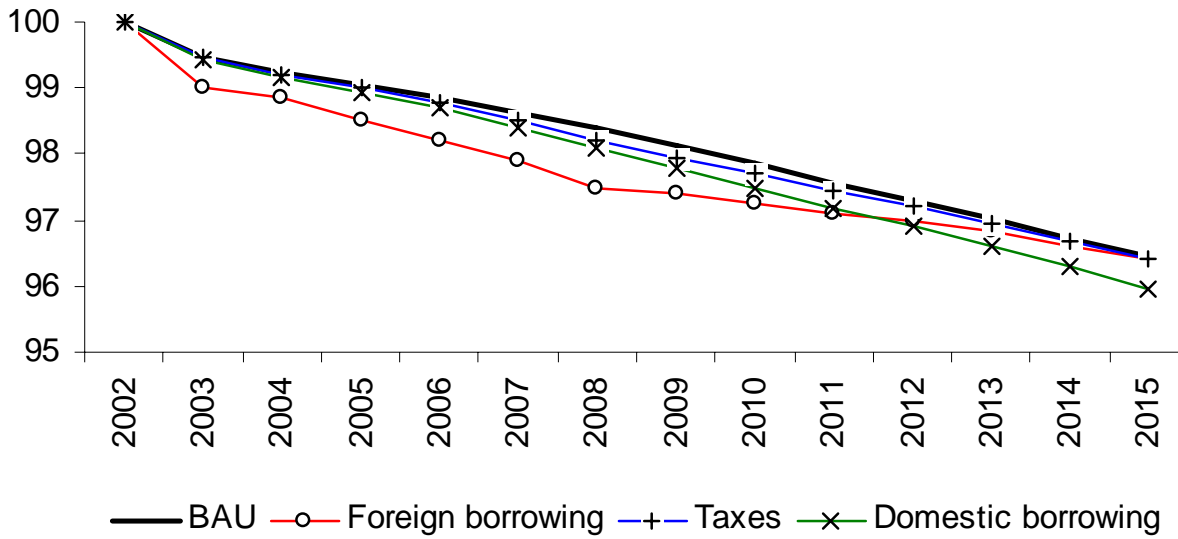


What are the trade-offs associated with alternative financing strategies?

- They do explain differences in additional spending under alternative financing strategies.
- Appreciation of the real exchange rate (RER)
 - Relative price of “tradables” to “non-tradables”
 - Government services are considered non-tradables.
 - A large shift in domestic spending in MDG-related services will push up demand for non-tradables.
 - More teachers and medical personnel are needed and their wages may increase if they are in short supply.
 - Rising costs of non-tradable services will shift relative prices against tradables, thus inducing an RER appreciation - no matter how the new spending is financed.
 - Aid flows or foreign borrowing will exert additional upward pressure on the RER.

- Effects of financing the MDGs on the RER will depend on:
 - Impact on import demand and import intensity of MDG expenditures
 - Existing production capacity
 - Is the country export-oriented?
 - Exchange rate regime and access to foreign borrowing
 - Growth and productivity externalities of MDG achievement and infrastructure investment
- Loss of competitiveness of exports and import-competing firms.
- May have important implications for long-term growth if the export sector is an important contributor to aggregate growth.
- If so, there are potential dynamic spill-over effects into the economy at large.
- Dutch disease effect if the relative price shift leads to a resource allocation away from export industries resulting in an undesirable structural change away from dynamic production activities.

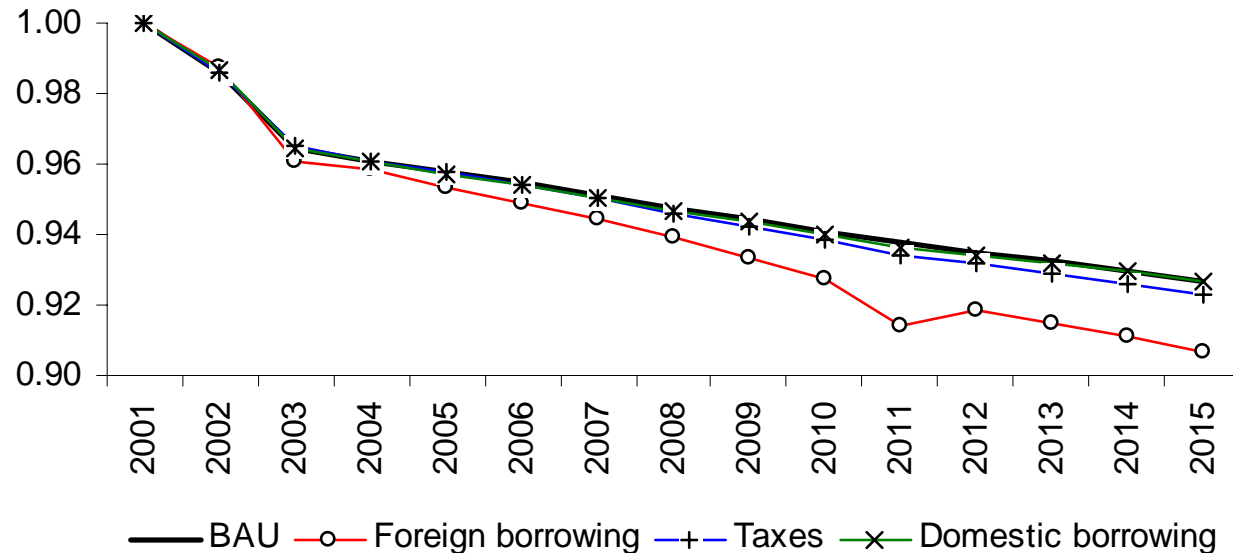
Costa Rica



Real exchange-rate appreciation under the BAU and alternative MDG financing scenarios (index, base year = 100)

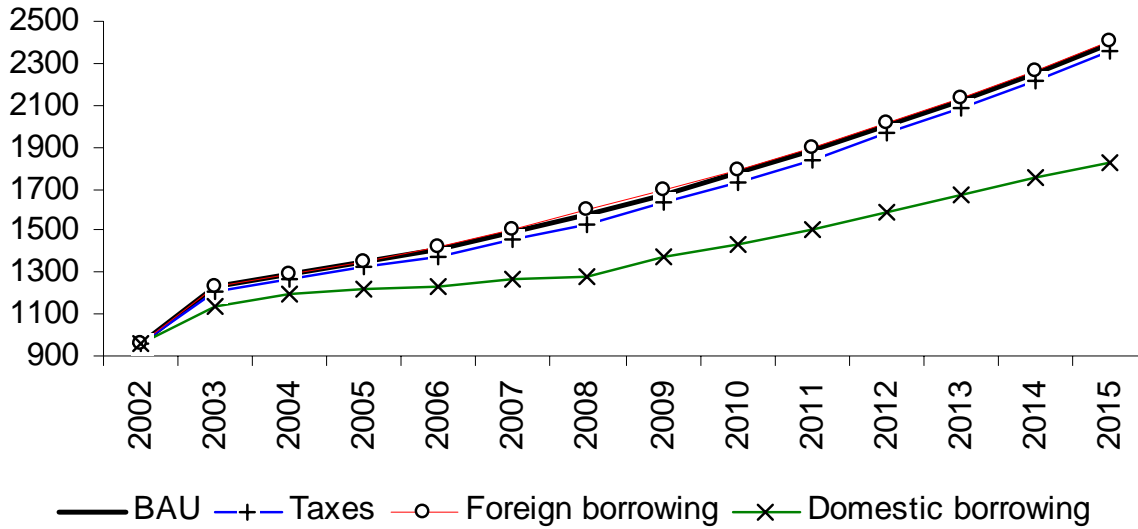
RER appreciation is most important with foreign borrowing

Ecuador



- Crowding out of private investment
 - Government borrowing means there is more demand for private savings.
 - Tax financing means there is less available income for increasing private savings.
 - In both cases, private savings are reduced and less domestic credit becomes available for private investors.
- Both the RER appreciation and the impact on private investment affect export supply.
 - Especially in an export-oriented economy.

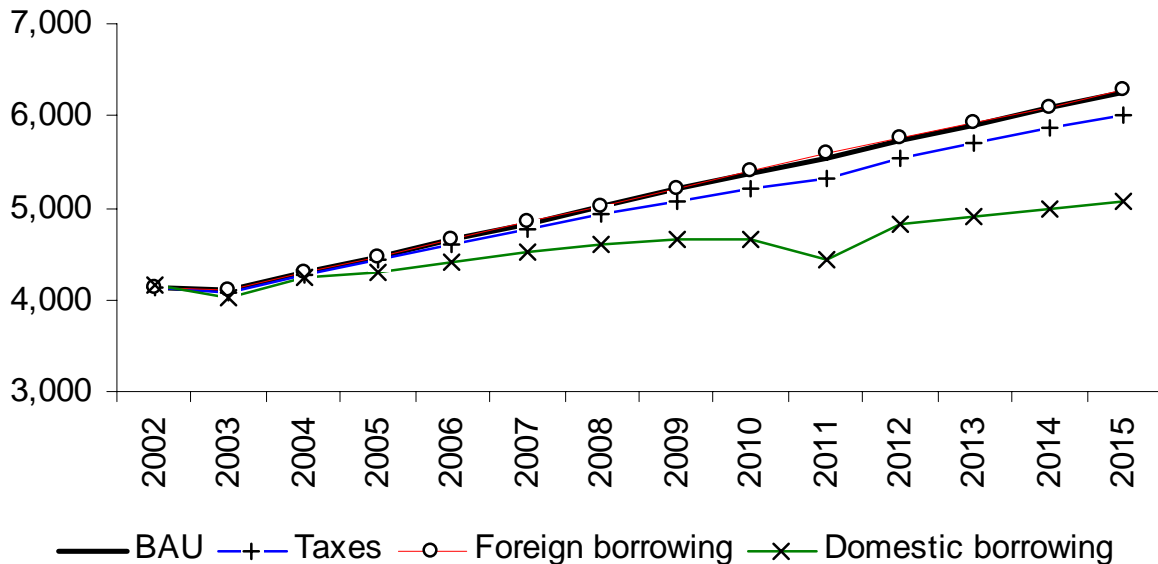
Costa Rica



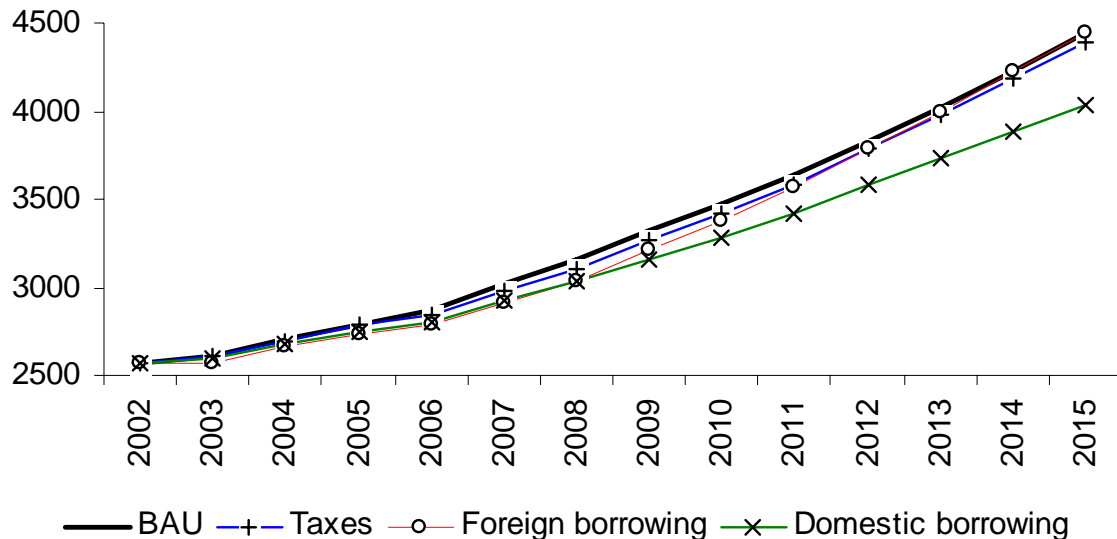
Private investment in the BAU and alternative MDG financing scenarios (millions of LCU at constant prices)

Crowding out of private investment

Ecuador



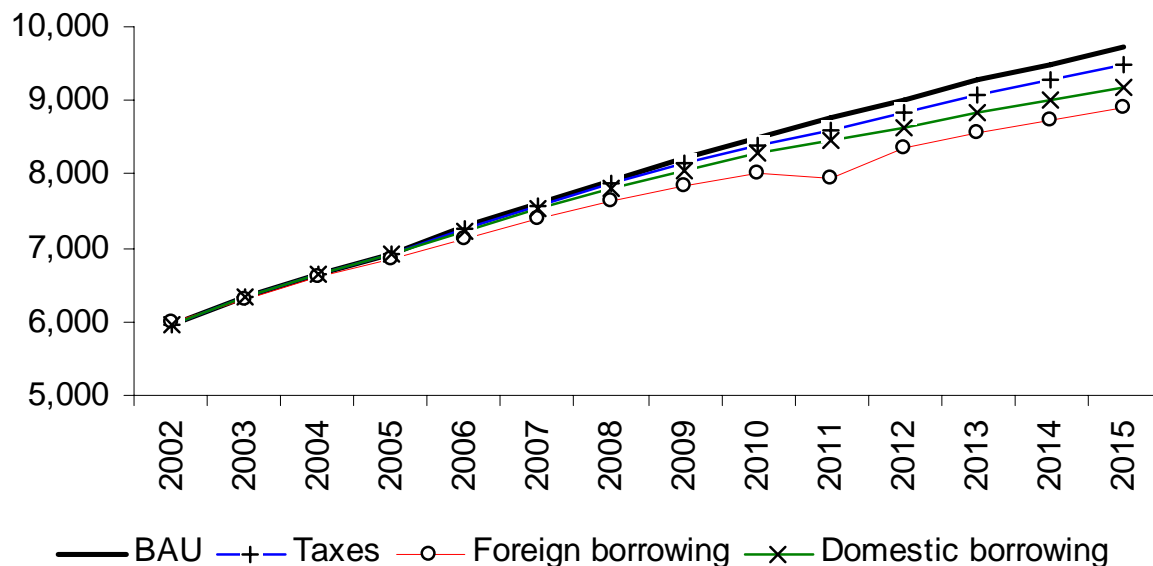
Costa Rica



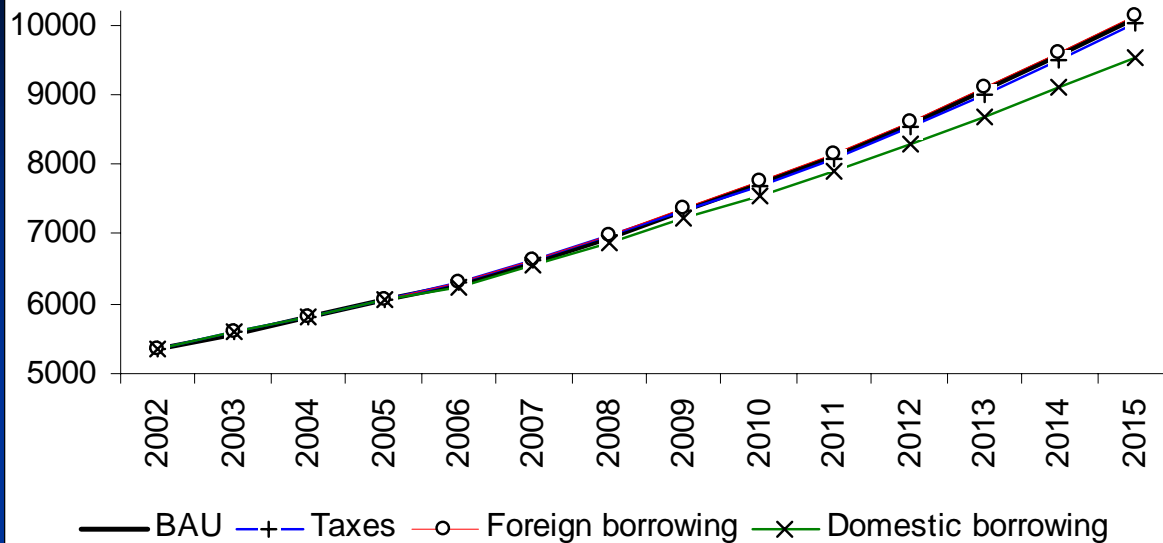
Export volume in the
BAU and alternative
MDG financing scenarios
(millions of LCU at
constant prices)

*RER appreciation
harms exports in
both countries.
Since Costa Rica
has an export-led
economy, crowding
private investment
out means crowding
the export sector out.*

Ecuador



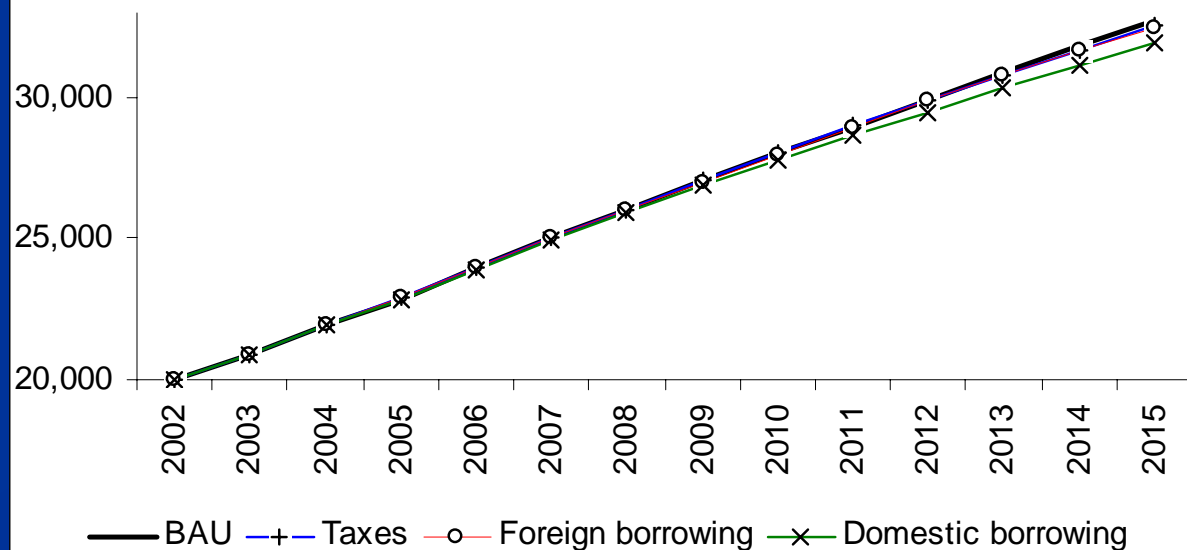
Costa Rica



Real GDP in the
BAU and
alternative MDG
financing scenarios
(millions of LCU at
constant prices)

*Public financing of MDGs
may be at the cost of less
growth, unless productivity
improves with the growth of
the educated population and
improvements in public
infrastructure.*

Ecuador

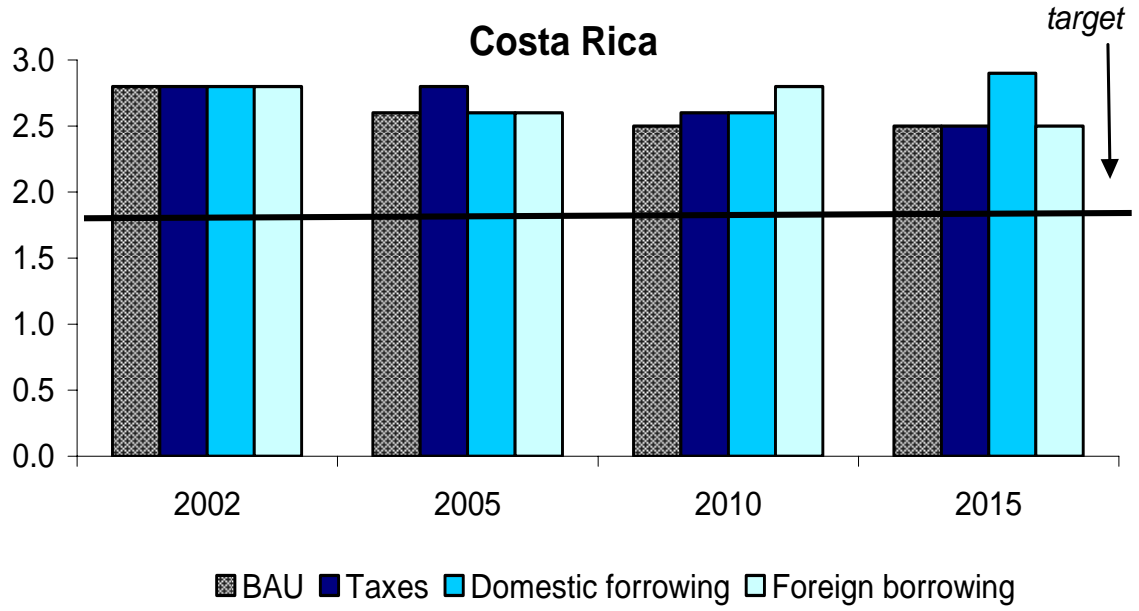


Would achievement of MDGs 2, 4-5, and 7ab contribute to reaching MDG1?

- CGE models, like MAMS, can typically only specify a limited number of representative households
 - Insufficient detail regarding changes in the distribution to be able to make robust statements regarding the poverty outcomes.
- MAMS is complemented with a method of microsimulations
 - Labor market outcomes (relative remunerations, employment, changes in skill level) from MAMS are applied to a micro data set to obtain the required details about income distribution for the poverty analysis.

- Improvements in education lead to increased supplies of semi-skilled and skilled workers under the BAU scenario but more importantly under the MDG scenarios.
- The composition of labor demand does not change commensurately.
- Hence, each of the scenarios shows rising real labor incomes for unskilled workers (who start running in short supply) and the wage premium for better-educated workers falls.
- Both the rise in average real wages and the drop in wage inequality help reduce extreme income poverty.

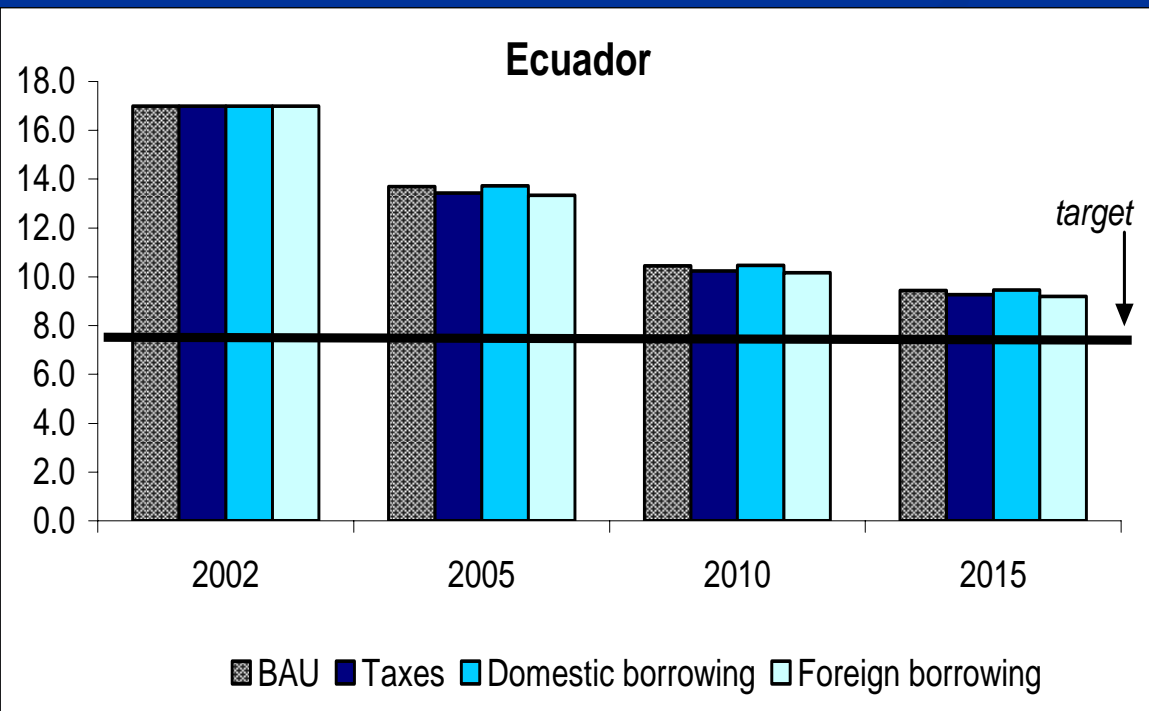
Costa Rica



Incidence of extreme poverty under the BAU and alternative MDG financing scenarios (percentage)

Unskilled workers gain the most in Ecuador where lower income inequality reduces extreme poverty more than in Costa Rica. MDG scenarios do not improve the degree of poverty reduction in Costa Rica due to the trade-offs and little change in inequality. They do somewhat in Ecuador in some scenarios. MDG1 is not achieved!

Ecuador



Conclusions and policy lessons

- Even in a middle-income country like Costa Rica, where the MDGs are within near reach, non-negligible macroeconomic trade-offs exist.
- In an export-oriented economy such as Costa Rica economic growth and reduction of income poverty may be slowed down by:
 - Dutch Disease effects on account of RER appreciation
 - Tax increases that affect disposable incomes
 - Domestic government borrowing that crowds out private investment
- Achieving the MDGs is not merely a matter of looking at aid effectiveness and effective social sector strategies and targeted poverty reduction programs.
- It is critical to adopt macroeconomic policies that are consistent with poverty-reduction goals.
- The MAMS framework identifies the main trade-offs
 - Identification of trade-offs has limitations: driven by model assumptions
 - Even so, such analysis can help us better inform policy makers regarding how to conduct macroeconomic policies consistent with long-term development goals.