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Does High Debt Cause a Loss in Growth Performance in Catching-up Economies?

Peter Benczúr

András Simon

Viktor Várpalotai

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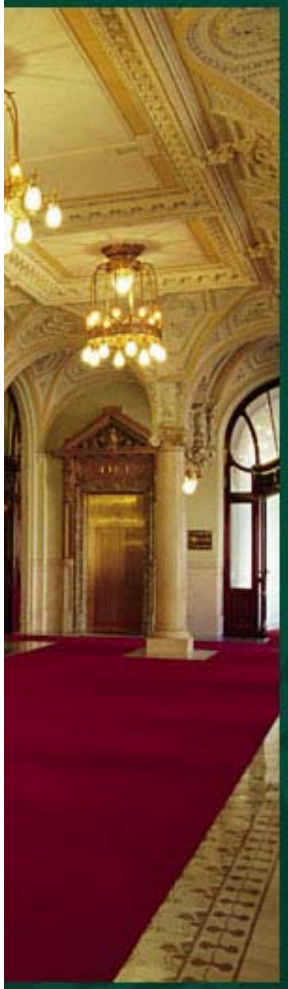

Outline

- The idea
- A closer look
- The saving-growth link in an open economy
- The model framework
- Key equations and calibration
- Results
- Sensitivity analysis
- Conclusions

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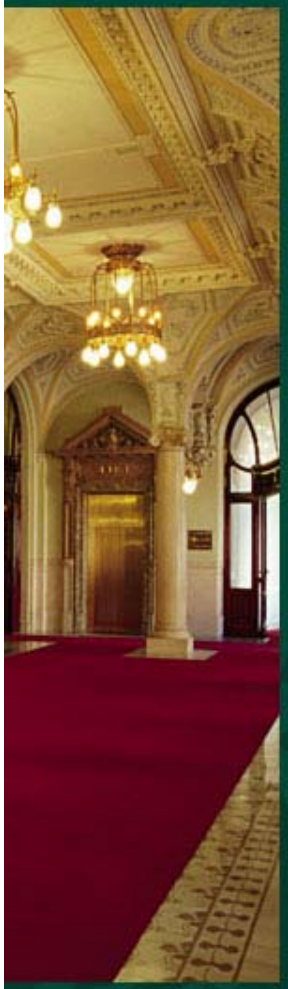
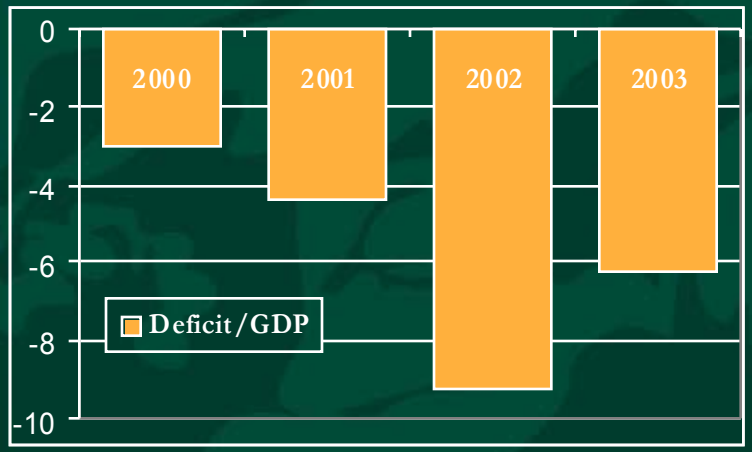
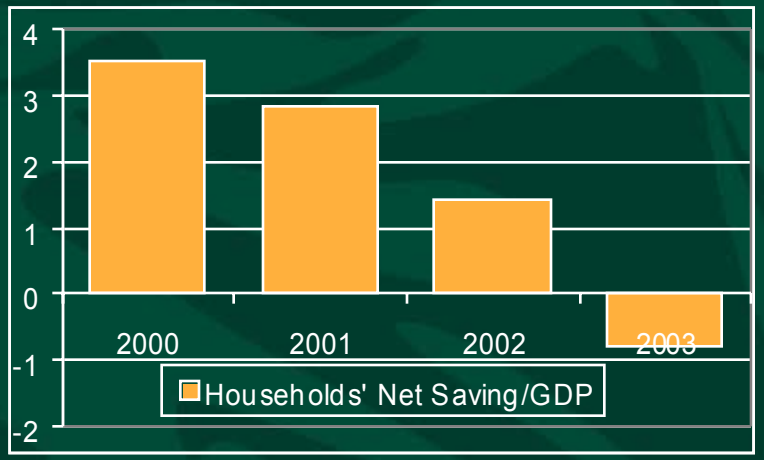
The Idea



- After a long period of transformational recession CEE countries seem to have entered a new phase of fast growth
- People and politicians think that this gives a chance to consume more than actual income, justifying it „consumption smoothing" between the present and the future
- In Hungary both budget deficit and private loans (consumption and morgage loan) are soaring generating excess consumption and foreign debt:





Is this really a justifiable intertemporal reallocation of consumption?

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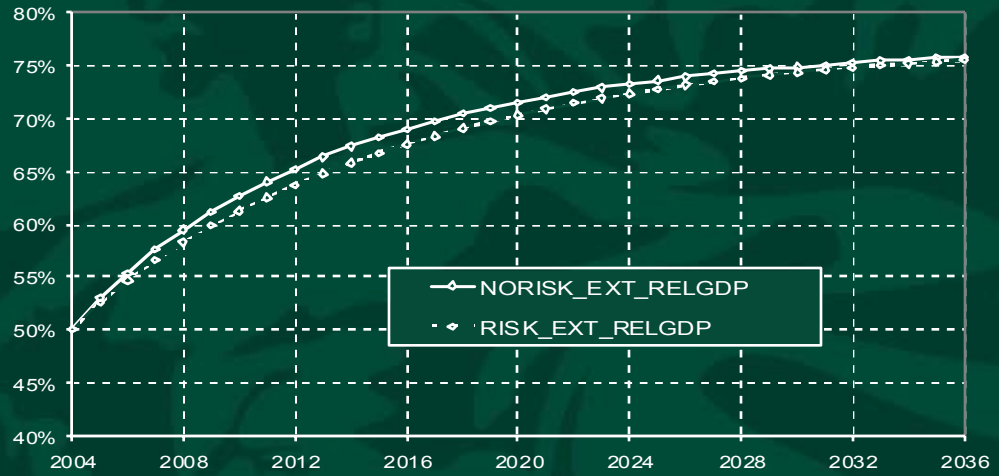
A Closer Look

- Catching-up is an adjustment (convergence) process towards the world productivity level.
- During the process growth is faster temporarily until it reaches the steady state world growth rate.
- The adjustment may be fast or slow.



- Main points considered in our paper:

1. saving behavior and the speed of catching-up are not independent
2. externalities call for a government savings policy

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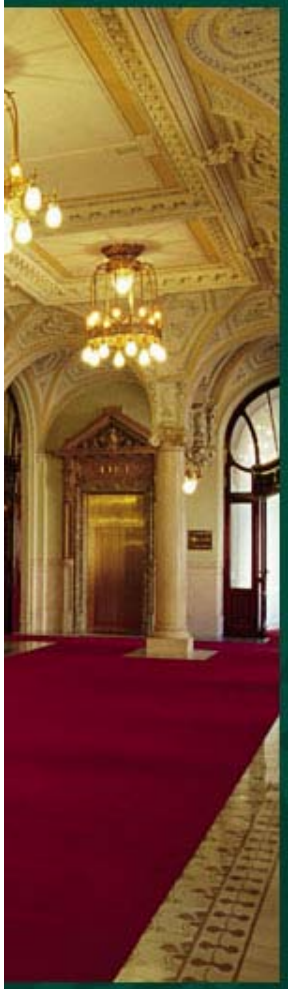
The saving-growth link in an open economy



In simple analyses catching-up is a process where capital (including human) accumulation reaches the steady state capital/output ratio from a starting position of an undercapitalized economy

In such a framework the process is independent from saving behavior:

- TFP is exogenous,
- the adjustment process of the capital stock is driven by the domestic return above the world rate which has no relation to the saving rate,
- The speed is solely determined by the inertia (adjustment costs) of investment
- there is no room for macroeconomic policy to influence the process.

This model seems to be at odds with observations

Highly indebted countries seem sooner or later to have growth problems unless they grow extremely fast with a high rate of investment. Growth in EEC-s is not extreme, neither investment ratios.

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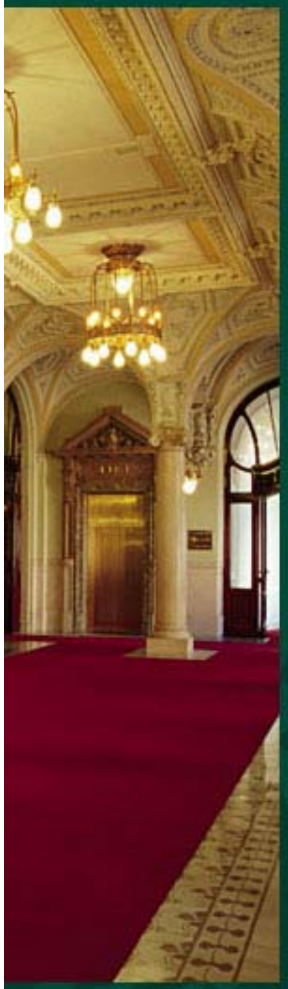
The saving-growth link cont'd



To reveal the importance of saving and savings policy in growth let us enrich the simple model:

- Part of TFP growth is endogenous

During the catching-up period foreign owned capital embodies know-how that spills-over to the rest of the economy. This externality feature justifies policy intervention (tax rebates, etc) and this intervention would effect the speed of convergence but the policy does not need to have the form of a savings (budget balance) policy.

- The level of the foreign debt ratio increases the country risk. Individual risk taking has an external effect by increasing country risk (Harberger)

This feature implies that the sum of savings behavior (in a representative agent model) would not lead to an optimal intertemporal allocation of consumption: governments have to run an active savings policy (even if we think in a representative agent model)

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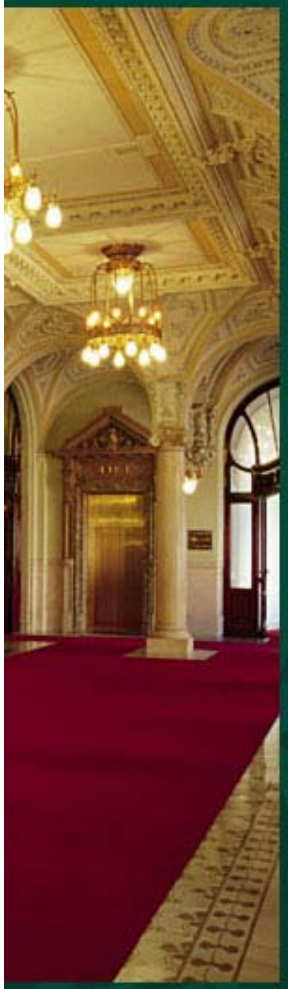
The model framework



- Classical small open economy model
- Two types (domestic and foreign) of capital
- Production externalities of foreign capital
- Capital accumulation depends on future profits (forward lookingness, q-theory)
- Virtually two sectors (traded vs. non-traded) to incorporate real exchange rate and Balassa-Samuelson effect
- Country risk depends on net foreign debt

Key equations and calibration

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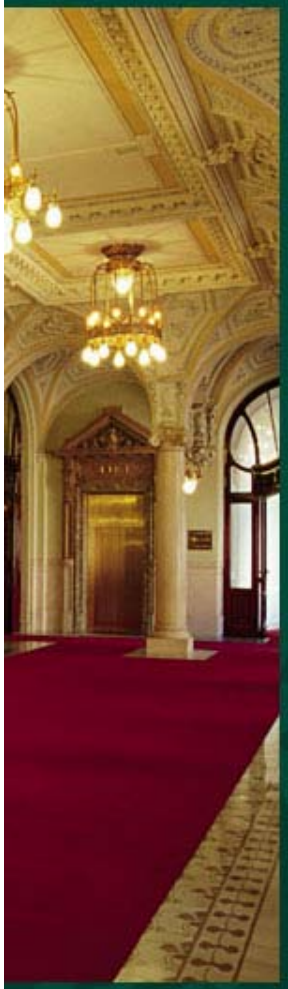

- **Assumption on risk premium sensitivity:**

$$\rho_t = \max\{0; -\beta_\rho nfa_t\}$$

where $\beta_\rho = 0.1$ using weak international evidence (Edwards 1984)

- **Investment behavior:**

$$i_t = \frac{\Pi_t}{\beta_k} + \frac{\delta + \bar{g}}{1 + \bar{g}} k_{t-1}$$

where the parameter that depends on adjustment costs is $\beta_k = 10$, using wide international empirical evidence

- **The rest of the parameters are mostly taken from standard international practice** (Cobb-Douglas parameters, etc) and/or they are less important in calculating the results.

Key equations and calibration cont'd

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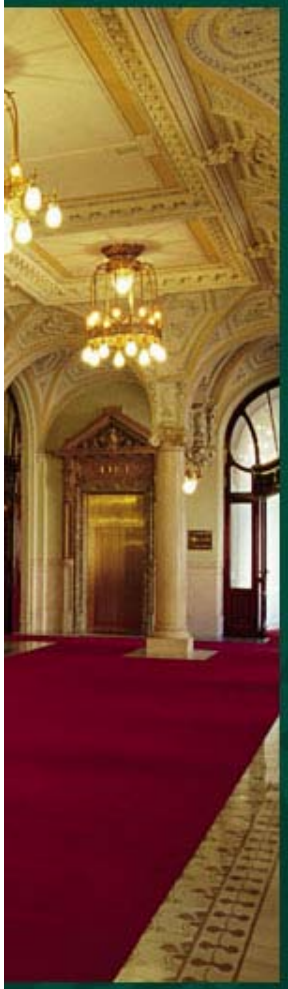

- **Assumption on productivity externality**

Output equations:

$$Y_t = A_t K_{f,t}^{\alpha_f} K_{d,t}^{\alpha-\alpha_f} L^{1-\alpha} \qquad A_t = A_0 (1+\mu^{tfp})^t e^{\gamma \frac{K_{f,t}}{Y_t}}$$

where $\gamma = 0.4$ to fit the 1991-2004 period with the rest of the structural assumptions

- Exogenous TFP growth exists
  but is not higher than the international rate (1.4%)
- Capital (total) intensity today is less than in the steady state (1.5–2.5) (empirical foundation)
- The rest of TFP growth depends on the foreign capital intensity, which increases to the assumed steady state level (0.4–0.8)
  (without empirical foundation)

The model structure

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Cobb-Douglas prod.f.:
$Y=f(K_d, K_f)$

Consumption
$C=f(YLAB,W)$

Capital
KF

Capital
KD

NFA

Investment
IF

Investment
ID

Risk

Two sector
CTR, CTR
INTR, INTR

Future profit
PF

Future profit
PF

REER

UIP:
IRATE

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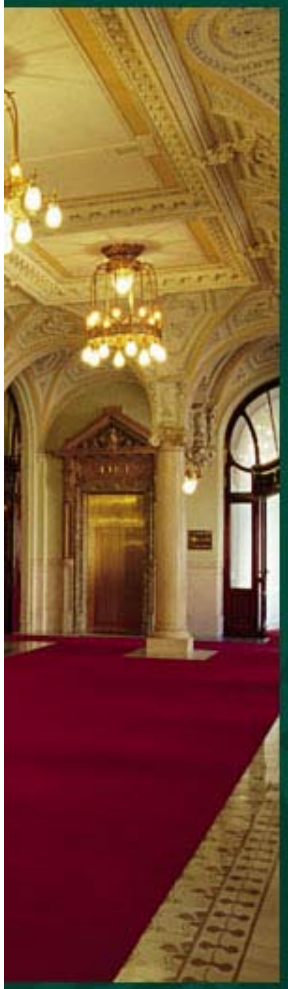
Simulation exercise



- Focus on the growth effects of a consumption shock (this shock can be triggered by government)
- We defined two types of shocks:
  - Transitory shock: Higher (+1%) consumption in period 1, and leaving unchanged steady state wealth position.
  - Permanent shock: Higher (+1%) consumption in period 1, decreasing the steady state wealth position by the same amount (-1%).
- We simulated these shocks using four different sets of assumptions:
  - With foreign capital externality and with risk premium
  - With foreign capital externality and without risk premium
  - Without foreign capital externality and with risk premium
  - Without foreign capital externality and without risk premium

IRFs of a trans. cons. shock

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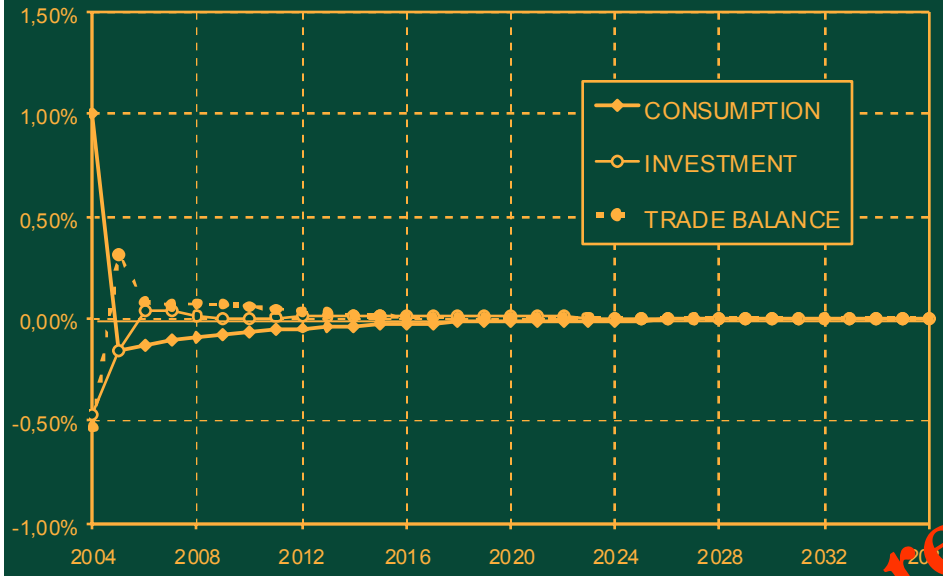

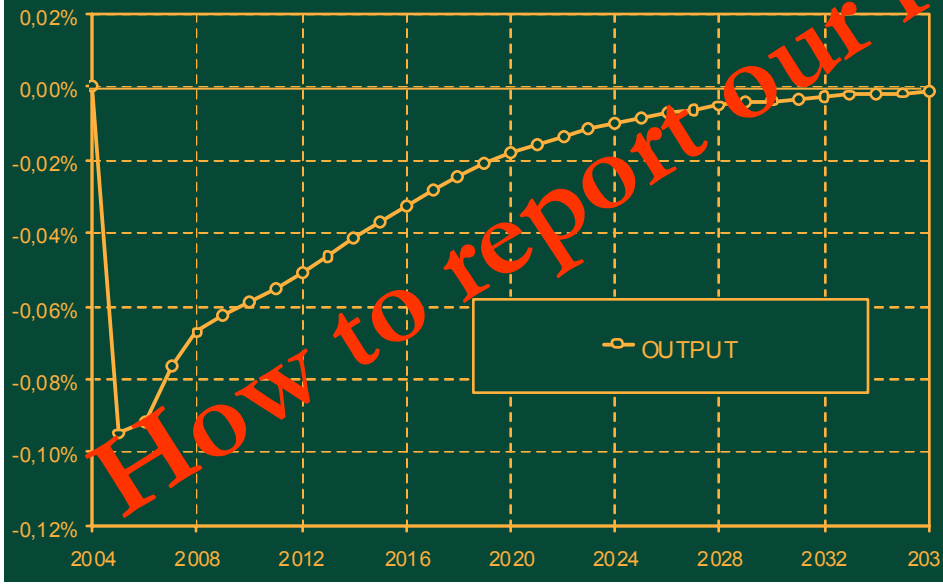

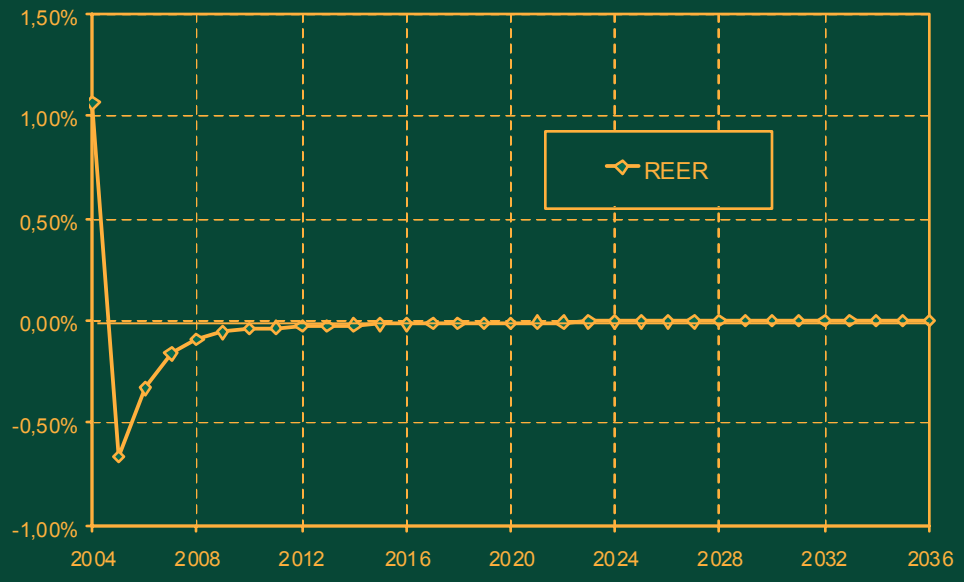

How to report our results in one number

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Summarizing the results

How much future income can be generated by additional saving?

The calculation is standard investment analysis: what is the internal rate of return that makes present foregone consumption equal to the present value of created future consumption?

Implicit interest cost (return of aggregate saving) at the present level of indebtedness

	With foreign capital externalities		Without foreign capital externalities	
	With risk premium	Without risk premium	With risk premium	Without risk premium
Transitory shock	17.2%	6.3%	10.0%	5.0%
Permanent shock	18.1%	5.1%	7.4%	4.2%

Transitory shock: Higher consumption in period 1, smoothing out later to arrive at an unchanged steady state wealth position.

Permanent shock: Higher consumption in period 1, decreasing the steady state wealth position by the same amount.

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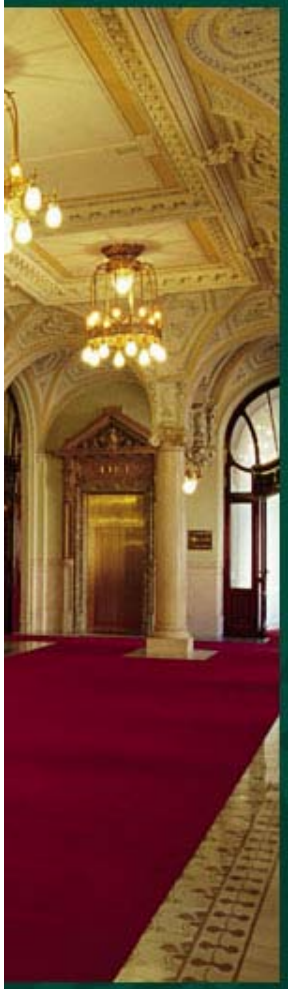
Sensitivity analysis



		Transitory shock				Permanent shock			
		With foreign capital externalities		Without foreign capital externalities		With foreign capital externalities		Without foreign capital externalities	
		With risk premium	Without risk premium	With risk premium	Without risk premium	With risk premium	Without risk premium	With risk premium	Without risk premium
$\eta = 10$	$\eta = 5$	-0.7%	1.1%	0.2%	1.4%	-0.7%	-0.1%	-0.6%	0.0%
	$\eta = 15$	0,4%	-0,5%	0,1%	-0,5%	0,3%	0,0%	0,4%	0,0%
$\gamma = 0,4$	$\gamma = 0.3$	-1.6%	-0.5%	0.1%	0.1%	-2.5%	-0.2%	0.0%	0.1%
	$\gamma = 0.5$	1,7%	0,6%	0,0%	-0,1%	2,6%	0,3%	0,0%	-0,1%
$\beta_{kf} = \beta_{kd} = 10$	$\beta_{kf} = \beta_{kd} = 5$	2.1%	1.3%	0.8%	0.1%	1.3%	0.5%	0.5%	0.0%
	$\beta_{kf} = \beta_{kd} = 15$	-1,4%	-0,5%	-0,6%	0,0%	-0,9%	-0,2%	-0,4%	0,0%
$\rho = 0,09$	$\rho = 0.08$	0.2%	0.1%	-0.1%	0.0%	0.6%	0.0%	-0.1%	0.0%
	$\rho = 0,10$	-0,2%	-0,1%	0,1%	0,0%	-0,5%	0,0%	0,1%	0,0%
$r_w = 0,04$	$r_w = 0,03$	-0,5%	-0,9%	-1,1%	-1,1%	-0,1%	-1,6%	-1,2%	-1,5%
	$r_w = 0,05$	0,6%	0,9%	1,1%	1,1%	0,2%	1,3%	1,2%	1,2%
$\beta_\rho = 0,1$	$\beta_\rho = 0.05$	-3.0%	0.0%	-1.6%	0.0%	-3.2%	0.0%	-1.1%	0.0%
	$\beta_\rho = 0.15$	2,2%	0,0%	1,4%	0,0%	2,0%	0,0%	0,8%	0,0%
$g = 0,02$	$g = 0,01$	-0,1%	0,1%	0,1%	0,2%	-0,1%	0,4%	0,2%	0,3%
	$g = 0,03$	0,1%	-0,1%	-0,1%	-0,2%	0,1%	-0,7%	-0,2%	-0,5%
$\beta_{bs} = 0,5$	$\beta_{bs} = 0,25$	0.3%	0.4%	0.3%	0.3%	0.0%	0.2%	0.1%	0.1%
	$\beta_{bs} = 0,75$	-0,3%	-0,5%	-0,3%	-0,3%	0,0%	-0,2%	-0,1%	-0,1%
$A^{ntr}/A^{tr} = 1$	$A^{ntr}/A^{tr} = 0.5$	-0.2%	-0.3%	-0.2%	-0.2%	-0.1%	-0.1%	0.0%	-0.1%
	$A^{ntr}/A^{tr} = 1.5$	0,2%	0,2%	0,1%	0,1%	0,1%	0,1%	0,0%	0,0%
$\beta_d = 2$	$\beta_d = 1$	-0,4%	-0,5%	-0,3%	-0,3%	-0,2%	-0,2%	-0,1%	-0,1%
	$\beta_d = 3$	0,3%	0,3%	0,2%	0,2%	-0,1%	-0,1%	0,0%	-0,1%
$\beta_s = -3$	$\beta_s = -4$	0,6%	0,8%	0,5%	0,5%	0,3%	0,4%	0,1%	0,1%
	$\beta_s = -2$	-1,1%	-1,4%	-0,9%	-0,8%	-0,4%	-0,5%	-0,2%	-0,2%
$\theta = 0,5$	$\theta = 0.25$	-1.4%	-1.7%	-1.1%	-1.0%	-0.7%	-0.6%	-0.2%	-0.2%
	$\theta = 0.75$	1,2%	1,4%	0,9%	0,8%	0,6%	0,7%	0,2%	0,2%
$\lambda_s = 0,87055$	$\lambda_s = 0,75786$	-0,1%	0,2%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
	$\lambda_s = 0,91172$	0,1%	-0,1%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%

Implicit interest costs of a unit change in consumption, difference from the baseline

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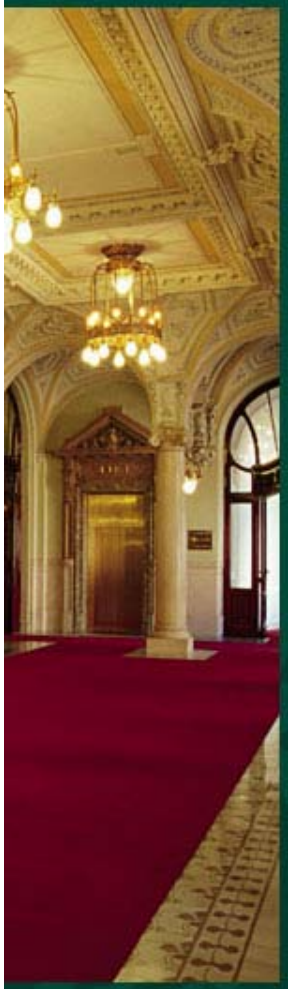
Conclusions



- Even in an open economy investment and growth is not independent from saving.
- Saving has externalities which calls for government intervention
- The effects of externalities are probably high, their neglect by present policies is equivalent of foregoing double digit investment returns for the sake of higher present consumption.
- Policies that result in high interest rates (and strong REERs) have not only transitory output gap effects, but make permanent losses in output.

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The End

Thank you for your attention

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Contribution to GDP growth of production factors, exogenous TFP and externalities (1996. = 100 %) according to the production function with calibrated parameters