Growth or equality ?

Losers and gainers from financial reform

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Introduction – general view point

Trends towards less regulation of financial markets for household debt:

• Liberalization in the OECD in the 80s (e.g. higher loan-to-value ratio, competition between banks and mortgage institution)
• In Least Developed Countries (LDC), some argue that less regulation of financial sector could be good for growth. Promoting institutions that can lend to households.
• In Eastern Europe, financial reform is under way.

Question: What are the consequences of financial reforms ? What are the pros and cons ? Would any group of people object to such reforms ?

Introduction – what we do

Aim: To understand the welfare effects of liberalizing the market for household debt.

Method: Take a model economy where households are prevented from borrowing.
Liberalization amounts to an anticipated lifting of all borrowing constraints on households.

Look at the consequences on growth, inequality, and on the welfare of particular social groups indexed by age and ability.

Introduction – what we know already

Japelli and Pagano (QJE, 1994). The level effect of financial deregulation reduces *net* household saving, slows down physical capital accumulation, and raises yields.
Financial deregulation in the eighties has contributed to the decline in national saving and growth rates in the OECD countries.

De Gregorio (JME,1996). The growth effect refers to the rise in borrowing for investments in human skills, and the corresponding boost to long-run growth (in small open societies which rely on human capital as their growth engine).
Evidence for this channel appears to be mixed.

Introduction – specificity of our approach

Borrowing limits do not necessarily ration the poor, as it is assumed in the literature.
They ration instead the most efficient accumulators of human skills, that is, households with high potential income growth.

Physical and human capital need to be studied *jointly* both because they oppose each other (they compete for funding - if young households go to school longer, they will save less) and because they interact in subtle ways.

Introduction – the paper (1)

1. OLG model with heterogeneous households, one consumption good, and two reproducible inputs – physical capital and human capital.
+ Cobb-Douglas technology and logarithmic utility

2. Models with a perfect loan market and with credit rationing;

3. We prove that the return on capital is always higher in the economy with perfect markets.
Effect on output and inequality depends on how common credit rationing was before credit market liberalization;

Introduction – the paper (2)

4. Calibration in line with the long-run economic performance of a panel of less developed countries in the 1960's.
Dynamic simulation experiments of financial deregulation.

5. Robustness analysis to changes in technology (CES production).
Study whether lifting of borrowing constraints may redirect economic growth towards a poverty trap.

6. Conclusion: sums up the costs and benefits from financial reform.

The model – households (1)

Time is discrete and goes from 0 to $+\infty$.

Each generation consists in a continuum of households, with mass expanding at rate $n > -1$.

The households of the same generation differ in their innate ability to work when young, ε^{Y}, and when old, ε^{O}.

Each individual lives for two periods, youth and old-age. Their utility function:

$$\ln c_t + \beta \ln d_{t+1}, \qquad \beta \in \mathbb{R}_+.$$

The model – households (2)

Each young person studies a share λ_t of his/her time. First-period budget constraint:

$$\varepsilon^{\mathsf{Y}}(1-\lambda_t)w_t\bar{h}_t = c_t + s_t. \tag{1}$$

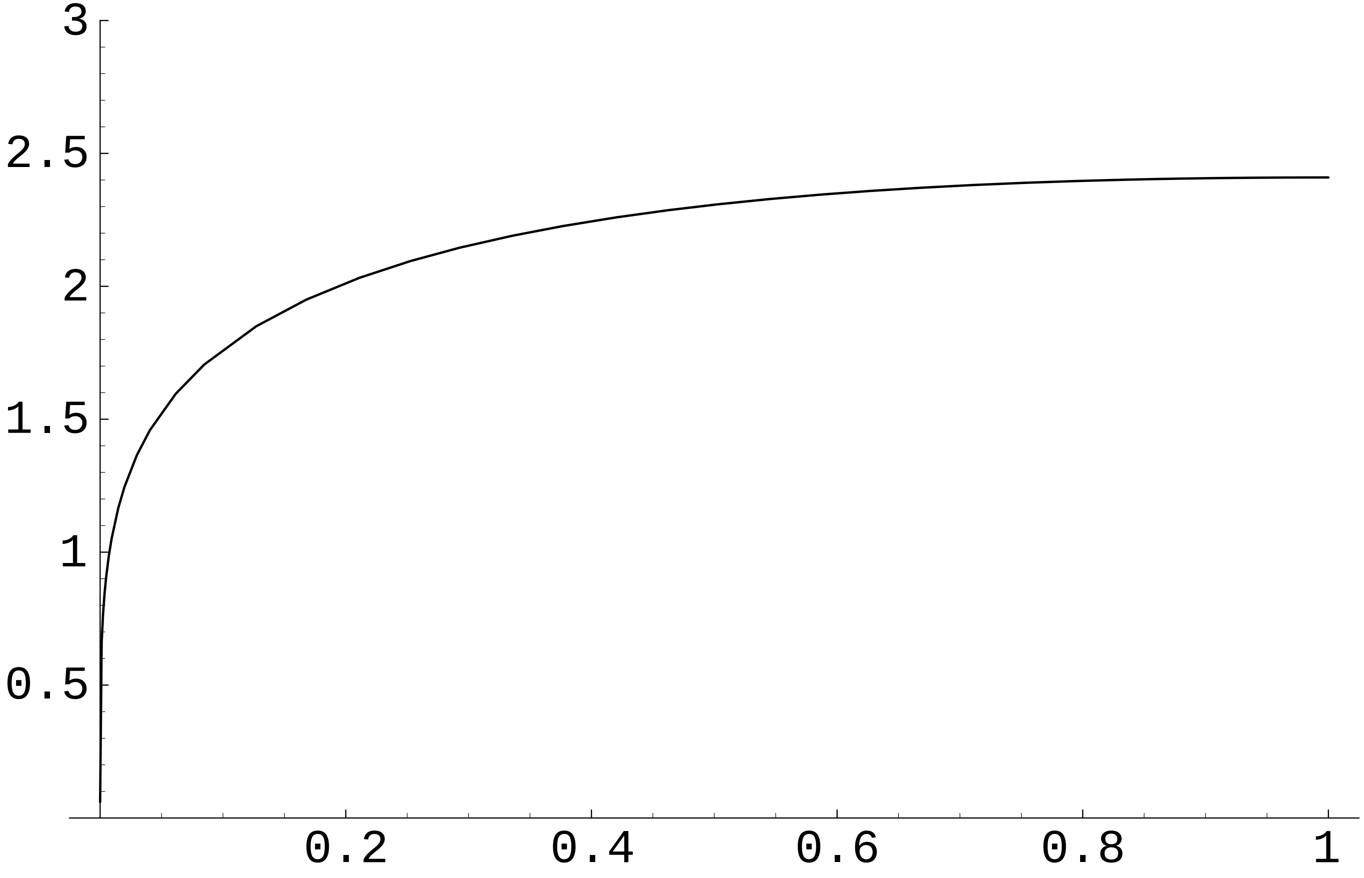
Old-age human capital:

$$h_{t+1} = \varepsilon^{\mathsf{O}}\psi(\lambda_t)\bar{h}_t, \quad \psi' > 0,\ \psi'' < 0. \tag{2}$$

Old agents consume both labor earnings and capital income:

$$d_{t+1} = R_{t+1}s_t + w_{t+1}h_{t+1}. \tag{4}$$

The model – households (3)



The model – notation

We denote the relative wage by:

$$x_t \equiv \frac{w_{t+1}}{w_t R_{t+1}}.$$

From (1), (2) and (4), lifecycle income is proportional to the inherited human capital $\bar{h}_t$:

$$\Omega_t = w_t \left[\varepsilon^{\mathsf{Y}}(1-\lambda_t) + x_t \varepsilon^{\mathsf{O}} \psi(\lambda_t) \right] \bar{h}_t.$$

We first consider the perfect market equilibrium

Perfect market equilibrium – optimal schooling

The optimal length of schooling maximizes lifecycle income:

$$\psi'(\lambda_t) = \frac{\varepsilon^{\mathsf{Y}}}{\varepsilon^{\mathsf{O}} x_t}. \tag{5}$$

Inverting equation (5) we obtain:

$$\lambda_t = \varphi(\varepsilon^{\mathsf{O}} x_t / \varepsilon^{\mathsf{Y}}), \qquad \varphi' > 0,\ \varphi(0) = 0.$$

From this we compute the growth rate of average human capital $g_p(x_t)$:

$$\frac{\bar{h}_{t+1}}{\bar{h}_t} = 1 + g_p(x_t) = \int_0^\infty \int_0^\infty \varepsilon^{\mathsf{O}} \psi(\varphi(\varepsilon^{\mathsf{O}} x_t / \varepsilon^{\mathsf{Y}}))\, \mathrm{d}G(\varepsilon^{\mathsf{Y}}, \varepsilon^{\mathsf{O}}). \tag{6}$$

Perfect market equilibrium – optimal saving

Optimal savings are computed by max utility s.t. budget constraints (1) and (4):

$$(1+\beta)s_t = \left(\beta\varepsilon^{\mathsf{Y}}(1-\lambda_t) - x_t\varepsilon^{\mathsf{O}}\psi(\lambda_t)\right) w_t\bar{h}_t. \tag{7}$$

Savings are positive if, and only if,

$$\beta(1-\lambda_t)\psi'(\lambda_t) > \psi(\lambda_t)$$

this inequality defines a critical value for schooling, $\tilde{\lambda}$, separating borrowers from lenders:

$$\lambda_t < \tilde{\lambda} \Leftrightarrow s_t > 0.$$

Perfect market equilibrium – the threshold

Since λ_t is a monotone function $\varphi(.)$ of ability, we can define the threshold as bearing on relative ability $\varepsilon^{\mathsf{O}}/\varepsilon^{\mathsf{Y}}$:

$$\frac{\varepsilon^{\mathsf{O}}}{\varepsilon^{\mathsf{Y}}} < \tilde{\mu}_t \Leftrightarrow s_t > 0.$$

with

$$\tilde{\mu}_t = \frac{\varphi^{-1}(\tilde{\lambda})}{x_t} \equiv \frac{B}{x_t}. \qquad (10)$$

Perfect market equilibrium – Aggregate savings

$$\bar{s}_t = \int_0^\infty \int_0^\infty s_t \, \mathrm{d}G(\varepsilon^{\mathsf{Y}}, \varepsilon^{\mathsf{O}}) = \frac{\beta}{1+\beta} \, w_t \bar{h}_t \mathcal{S}_p(x_t). \tag{11}$$

where the function $\mathcal{S}_p(x_t)$ is defined as:

$$\mathcal{S}_p(x_t) = \int_0^\infty \int_0^\infty \varepsilon^{\mathsf{Y}} \left(1 - \Phi(\varepsilon^{\mathsf{O}} x_t / \varepsilon^{\mathsf{Y}})\right) \, \mathrm{d}G(\varepsilon^{\mathsf{Y}}, \varepsilon^{\mathsf{O}}).$$

Perfect market equilibrium – firms

Constant return to scale technology $F(K_t, H_t)$
Capital – labor ratio: $k_t = K_t/H_t$
Intensive production function $f(k_t)$

Equilibrium factor prices:

$$\begin{aligned} w_t &= f(k_t) - k_t f'(k_t) = \omega(k_t), \\ R_t &= f'(k_t) = R(k_t). \end{aligned}$$

Relative wage x_t as a function of (k_t, k_{t+1}):

$$x_t = \frac{\omega(k_{t+1})}{\omega(k_t)R(k_{t+1})}. \tag{12}$$

Perfect market equilibrium – equilibrium

Average labor supply (per young person) H_t is obtained by averaging over young and old:

$$H_t = \mathcal{H}_p(x_t)\bar{h}_t. \tag{13}$$

where the function $\mathcal{H}_p(x_t)$ is defined as:

$$\mathcal{H}_p(x_t) = \frac{1}{1+n} + \int_0^\infty \int_0^\infty \varepsilon^{\mathsf{Y}} \left(1 - \varphi(\varepsilon^{\mathsf{O}} x_t / \varepsilon^{\mathsf{Y}})\right) \, \mathrm{d}G(\varepsilon^{\mathsf{Y}}, \varepsilon^{\mathsf{O}}).$$

Perfect market equilibrium – equilibrium

The equilibrium condition for financial market:

$$K_{t+1} = k_{t+1} H_{t+1} = \frac{\bar{s}_t}{1+n},$$

Using (6), (11) and (13):

$$\frac{(1+\beta)k_{t+1}}{\beta\omega(k_t)}\,\mathcal{H}_p(x_{t+1}) = \frac{\mathcal{S}_p(x_t)}{1+g_p(x_t)}\,\frac{1}{1+n} \tag{14}$$

Perfect market equilibrium – characterization

Given initial conditions $(k_0, \bar{h}_0)$, a perfect foresight equilibrium can be characterized by a non-negative sequence $(x_t, k_{t+1}, \bar{h}_{t+1})_{t \geqslant 0}$ which solves equations (6), (12) and (14).

Perfect market equilibrium – Cobb-Douglas

This dynamical system becomes recursive when the production function is Cobb-Douglas, $f(k_t) = Ak_t^{\alpha}$, with complete depreciation of capital.

$$\frac{k_{t+1}}{\omega(k_t)} = \frac{\alpha}{1-\alpha} \frac{\omega(k_{t+1})}{\omega(k_t)R(k_{t+1})} = \frac{\alpha}{1-\alpha}\, x_t,$$

Eq.(14) becomes a first-order difference equation in x_t:

$$\frac{(1+\beta)\alpha}{(1-\alpha)\beta}\, \mathcal{H}_p(x_{t+1}) = \frac{1}{x_t} \; \frac{\mathcal{S}_p(x_t)}{1+g_p(x_t)} \frac{1}{1+n}.$$

Equilibrium with credit rationing

Young households cannot credibly commit their future labor income as a collateral against current loans.

Individuals are allowed to borrow up to the point where they are indifferent between repaying the loans or defaulting.

Since everyone dies at the end of the second period, default is individually optimal since it carries no penalties. The borrowing constraint then takes a very simple form: $s_t \geqslant 0$.

Equilibrium with credit rationing – households (1)

Rationed households will not participate to the credit market, maximizing instead an autarkic utility function:

$$\ln(1-\lambda_t) + \beta \ln(\psi(\lambda_t)) + \text{constants.}$$

First order condition:

$$\psi(\lambda_t) = \beta\psi'(\lambda_t)(1-\lambda_t).$$

This defines a unique solution $\tilde{\lambda}$, which does not depend on prices, nor on ability type.
Same as the threshold $\tilde{\lambda}$ defined earlier.

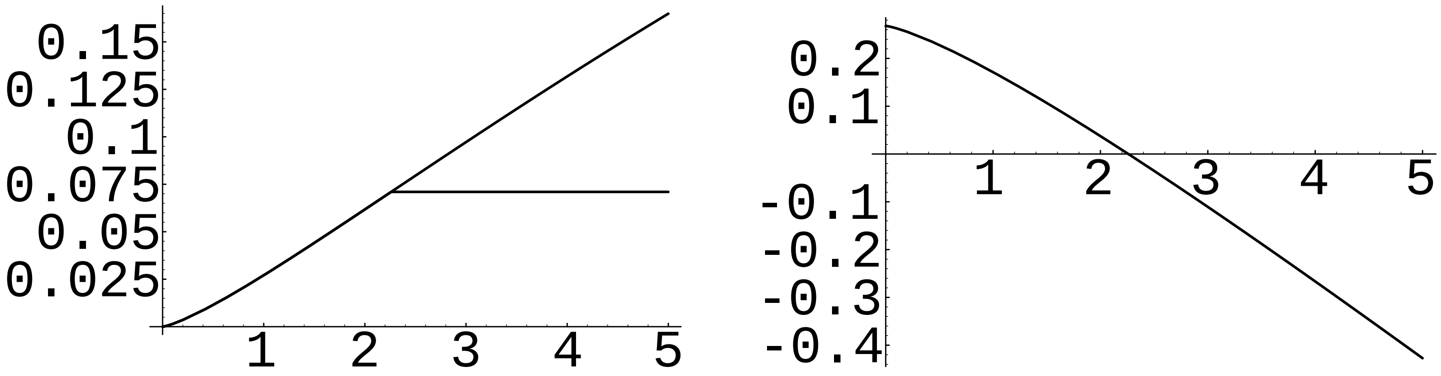
Equilibrium with credit rationing – households (2)

Proposition 1 *Households whose ability profiles do not rise fast, i.e.* $\varepsilon^{O}/\varepsilon^{Y} < \tilde{\mu}_t$*, save a positive amount given by equation (7); their investment in education* λ_t *equals* $\varphi(\varepsilon^{O} x_t/\varepsilon^{Y})$ *and depends positively on* $\varepsilon^{O}/\varepsilon^{Y}$*. Households with fast rising ability profiles, i.e.* $\varepsilon^{O}/\varepsilon^{Y} > \tilde{\mu}_t$*, are credit rationed, and invest the same amount in education, i.e.* $\lambda_t = \tilde{\lambda} = \varphi(\tilde{\mu}_t x_t)$.

Households with a steep potential earnings profile would like to borrow to afford to study longer, but credit rationing prevents then from doing so.

The threshold $\tilde{\mu}_t$ depends on prices through equation (10).
the proportion of rationed people depends on prices and varies over time.

The model – households (3)



Equilibrium with credit rationing – aggregation

Average human capital grows at the rate $\bar{h}_{t+1}/\bar{h}_t = 1 + g_c(x_t)$:

$$1 + g_c(x_t) = \int_0^\infty \int_0^{\frac{\varepsilon^{\mathsf{Y}} B}{x_t}} \varepsilon^{\mathsf{O}} \psi\left(\varphi\left(\varepsilon^{\mathsf{O}} x_t / \varepsilon^{\mathsf{Y}}\right)\right) \, \mathrm{d}G(\varepsilon^{\mathsf{Y}}, \varepsilon^{\mathsf{O}}) + \psi(\tilde{\lambda}) \int_0^\infty \int_{\frac{\varepsilon^{\mathsf{Y}} B}{x_t}}^\infty \varepsilon^{\mathsf{O}} \, \mathrm{d}G(\varepsilon^{\mathsf{Y}}, \varepsilon^{\mathsf{O}}). \tag{15}$$

Average saving is:

$$\bar{s}_t = \frac{\beta}{1+\beta} \, w_t \bar{h}_t \mathcal{S}_c(x_t),$$

where the function $\mathcal{S}_c(x_t)$ is defined as:

$$\mathcal{S}_c(x_t) = \int_0^\infty \int_0^{\frac{\varepsilon^{\mathsf{Y}} B}{x_t}} \varepsilon^{\mathsf{Y}} \left(1 - \Phi(\varepsilon^{\mathsf{O}} x_t / \varepsilon^{\mathsf{Y}})\right) \, \mathrm{d}G(\varepsilon^{\mathsf{Y}}, \varepsilon^{\mathsf{O}}),$$

Equilibrium with credit rationing – aggregation

Average labor supply:

$$H_t = \mathcal{H}_c(x_t)\bar{h}_t$$

where the function $\mathcal{H}_c(x_t)$ is defined as:

$$\mathcal{H}_c(x_t) = \frac{1}{1+n} + \int_0^{\infty} \int_0^{\frac{\varepsilon^{\mathsf{Y}} B}{x_t}} \varepsilon^{\mathsf{Y}} \left(1 - \varphi(\varepsilon^{\mathsf{O}} x_t / \varepsilon^{\mathsf{Y}})\right) \, \mathrm{d}G(\varepsilon^{\mathsf{Y}}, \varepsilon^{\mathsf{O}})$$

$$+(1-\tilde{\lambda}) \int_0^{\infty} \int_{\frac{\varepsilon^{\mathsf{Y}} B}{x_t}}^{\infty} \varepsilon^{\mathsf{Y}} \, \mathrm{d}G(\varepsilon^{\mathsf{Y}}, \varepsilon^{\mathsf{O}}).$$

Equilibrium with credit rationing – aggregation

Financial market equilibrium satisfies:

$$\frac{(1+\beta)k_{t+1}}{\beta\omega(k_t)}\,\mathcal{H}_c(x_{t+1}) = \frac{\mathcal{S}_c(x_t)}{1+g_c(x_t)}\,\frac{1}{1+n}. \tag{16}$$

Equilibrium with credit rationing – Cobb-Douglas

With the Cobb-Douglas, equilibria are solutions to the dynamical system:

$$\frac{(1+\beta)\alpha}{(1-\alpha)\beta}\,\mathcal{H}_c(x_{t+1}) = \frac{1}{x_t}\,\frac{\mathcal{S}_c(x_t)}{1+g_c(x_t)}\,\frac{1}{1+n}, \tag{17}$$

$$k_{t+1} = A\alpha x_t k_t^{\alpha}. \tag{18}$$

This system is recursive.

Equation (17) can first be solved for the path of x_t.

Equation (18) gives the evolution of the capital-labor ratio.

The growth rate of human capital is obtained from (15).

Equilibrium with credit rationing – Existence

Proposition 2 *The system (15)-(17)-(18) has a steady state* (x_c, k_c, g_c) *and equilibrium is unique in the neighborhood of that state.*

The same reasoning can be applied to the perfect market economy which also possesses a locally unique equilibrium in the neighborhood of the steady state (x_p, k_p, g_p).

Effect of financial reform on capital

Proposition 3 *Assume a unique steady state, the economy with perfect markets has a lower long-run capital-labor ratio than the one with imperfect markets.*

Effect of financial reform on long-term growth

$$g_p(x_p) \overset{?}{\gtrless} g_c(x_c)$$

Two opposite effects:

1. for the same long-run yield $1/x$, $g_p(x) > g_c(x)$. Indeed, some agents are constrained in the imperfect market economy, invest less than they want in education and growth is slower.

2. the yield is higher in the perfect market economy, $x_p < x_c$, agents are discouraged from investing in education.

The first effect will dominate if there are enough constrained agents in the economy with imperfect markets.

Effect of financial reform on short-term growth

First, since the forward-looking relative wage x drops when the reform is announced, investment in physical capital starts to fall immediately which is bad for short-term growth (level effect).

Second, the lifting of the borrowing constraints permits more investment in education, which is good for growth (growth effect).

Third, the labor-supply moves in opposite direction to the investment in education, which depresses short-run growth.

Last, there are additional dynamic effects when the reform is anticipated.

Calibration (1)

Assume that one period of the model is 25 years.

The production of human capital:

$$\psi(\lambda) = b\left(\frac{1}{\gamma}\lambda^{\gamma} - \lambda\right).$$

A can be normalized without loss of generality.

We next set two parameters on which a consensus exists:
The capital share parameter α is fixed to $1/3$.
The psy. discount factor is 3% per year: $\beta = 0.97^{25} = 0.467$.

Calibration (2)

The abilities index $(\varepsilon^{\mathsf{Y}}, \varepsilon^{\mathsf{O}})$ is distributed over the population according to a bivariate lognormal distribution; the mean and variance-covariance matrix of the underlying normal distribution are respectively $(0, 0)$ and

$$\Sigma = \begin{pmatrix} \sigma_{\mathsf{Y}}^2 & \varrho\, \sigma_{\mathsf{Y}}\, \sigma_{\mathsf{O}} \\ \varrho\, \sigma_{\mathsf{Y}}\, \sigma_{\mathsf{O}} & \sigma_{\mathsf{O}}^2 \end{pmatrix}$$

Variances should be set to match observed inequality index.
but how can we fix ϱ and $\sigma_{\mathsf{Y}}^2 / \sigma_{\mathsf{O}}^2$?

Little information $\rightarrow$ sensitivity analysis

Calibration (3)

Assume that ϱ and $\sigma_{\mathrm{Y}}^2/\sigma_{\mathrm{O}}^2$ are given.
There are four remaining parameters to calibrate:
the growth rate of population n
the productivity parameters b, γ
the variance parameter σ_{O}^2.

We chose these parameters so that the steady state with credit rationing matches some moments of a typical economy with imperfect credit markets.

This representative economy is obtained from averaging eight economies considered as having strongly imperfect credit markets in the sixties. These are Chile, Ghana, Indonesia, Korea, Malaysia, Mexico, Turkey and Zimbabwe.

Calibration (4)

n, b match the average growth rate of population and output (computed over the period 1960-70 using the GDP data of the Penn World Tables: annual growth rate of population of 2.73%,
long-term per capita growth rate of 2.903% per year).

γ set to match the share of time devoted to secondary and higher education: 2.901%
we assume that the first period of the model covers ages 12-37 and the second one corresponds to ages 37-62.
Doing so supposes that secondary and higher education are an alternative to working, but elementary education is not.

σ_{O}^2 set to match a Gini index of 0.458.

Calibration (5)

Rationed households (% of population)

ϱ	σ_Y^2/σ_O^2 0.2	0.4	0.6	0.8	1.0
0.0	14.2	15.8	17.2	18.1	18.8
0.2	12.4	13.6	14.6	15.6	16.3
0.4	10.3	10.8	11.6	12.4	13.1
0.6	8.0	7.6	7.7	8.3	8.9
0.8	5.4	3.7	3.1	3.0	3.4

never large; max: 19 %

Calibration (6)

Saving rate

	σ^2_Y/σ^2_O				
ϱ	0.2	0.4	0.6	0.8	1.0
0.0	9.4	9.6	9.7	9.8	9.8
0.2	9.3	9.4	9.5	9.6	9.7
0.4	9.1	9.3	9.4	9.5	9.6
0.6	9.0	9.1	9.2	9.4	9.5
0.8	8.8	8.9	9.1	9.2	9.4

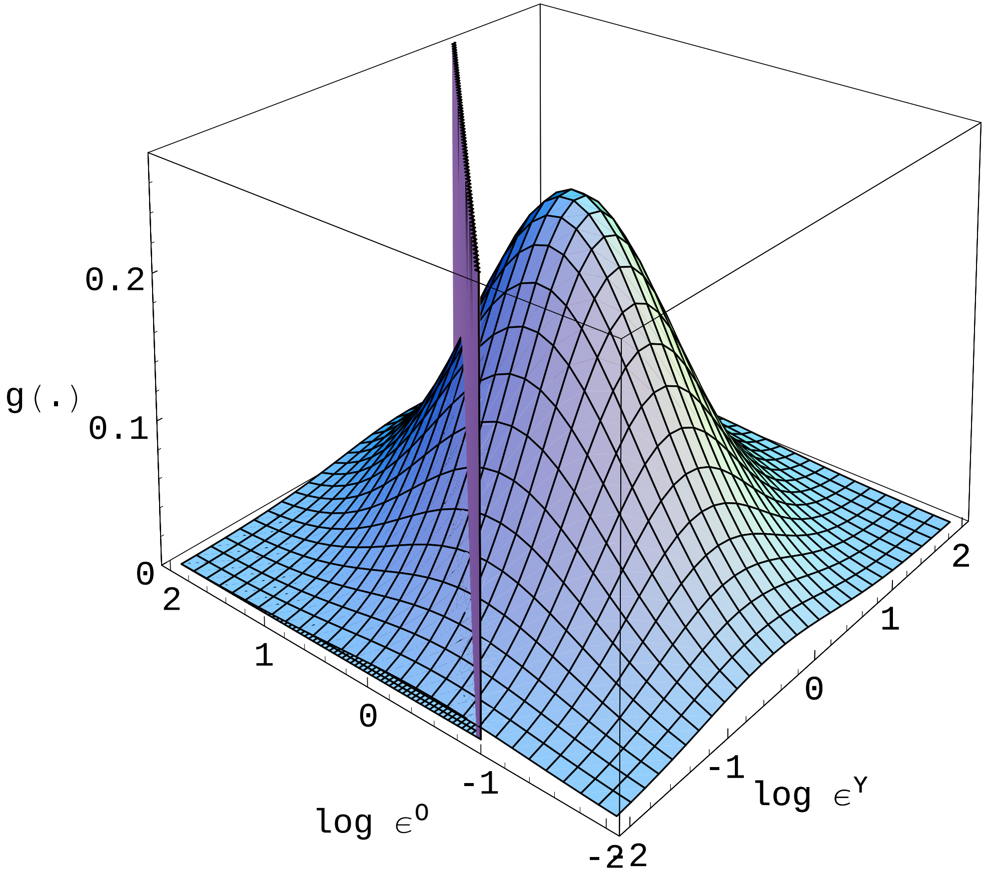
Calibration (7)

We chose to use in the sequel $\varrho = 0.2$ and $\sigma_{\mathsf{Y}}^2/\sigma_{\mathsf{O}}^2 = 0.8$.

A correlation of 0.2 seems reasonable given a span of 25 years.

A relative variance of 0.8 reproduces a ratio of Gini indexes of 0.42/0.53=0.79 which is close to US data.

The distribution of abilities and rationed households



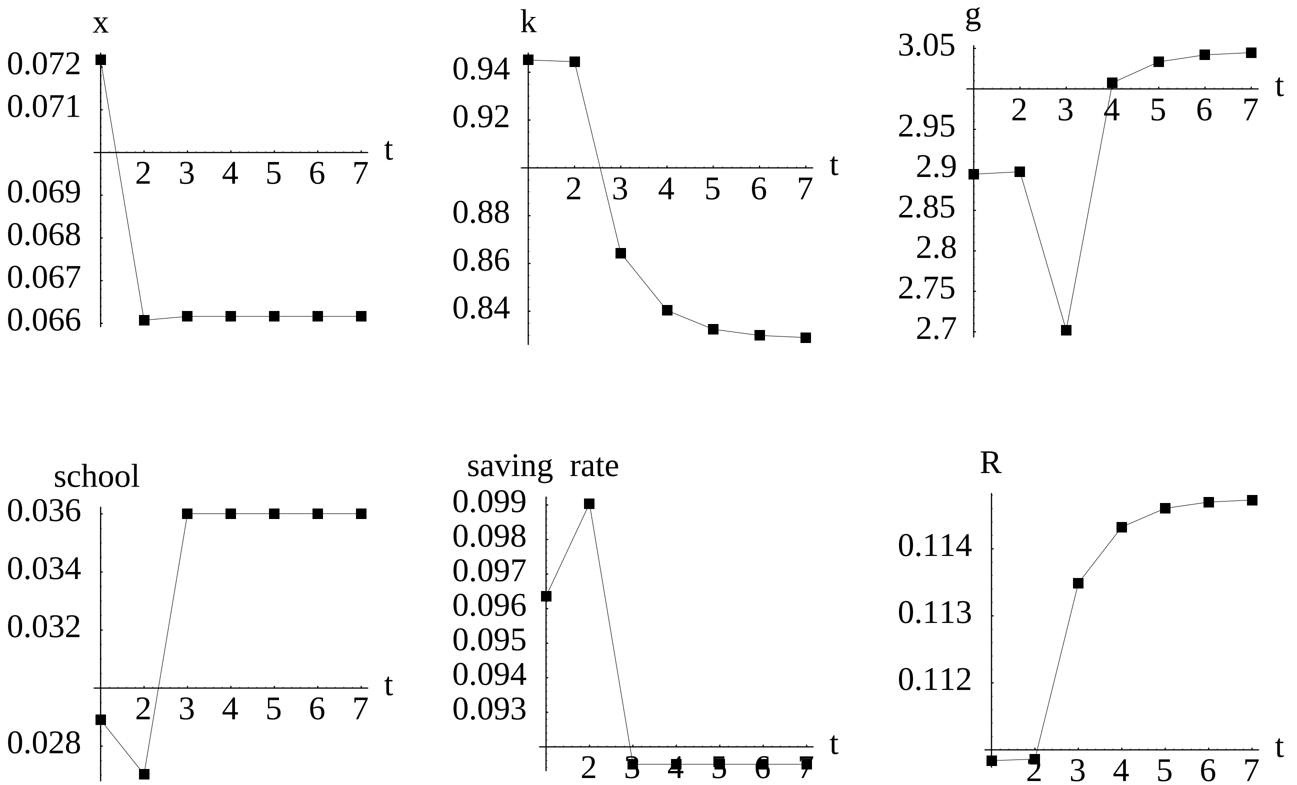
Response to reform – simulation

Transition from a steady state with credit rationing to the one in the perfect market economy.

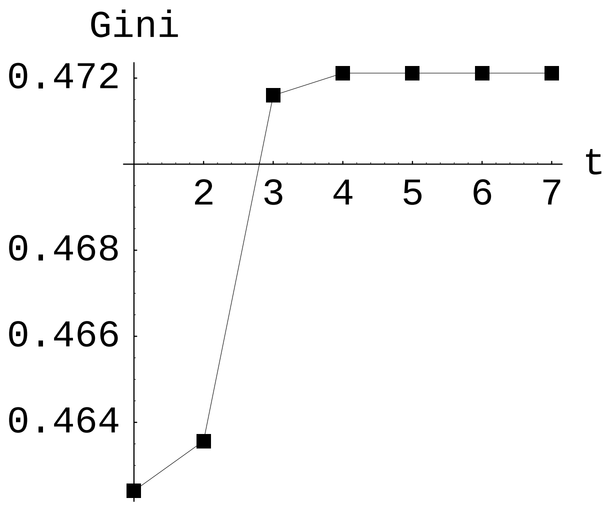
The relaxation of the borrowing constraints takes place at time $t = 3$ and is anticipated one period in advance.

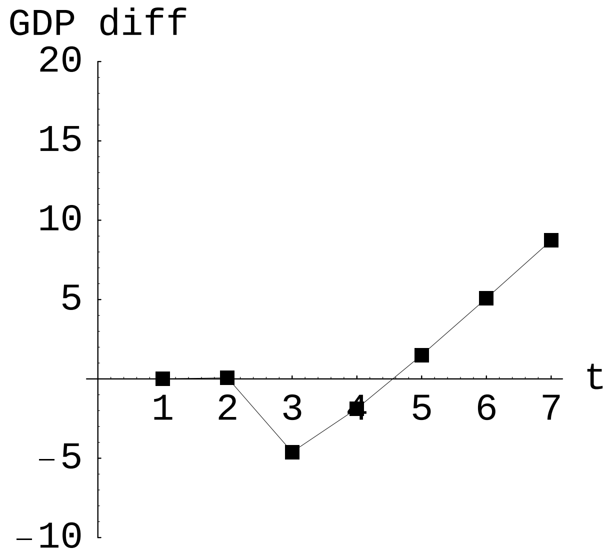
Time $t = 1$ represents the initial steady state with credit constraints.

Response to reform – graph



Cost of liberalization – graph





Cost of liberalization

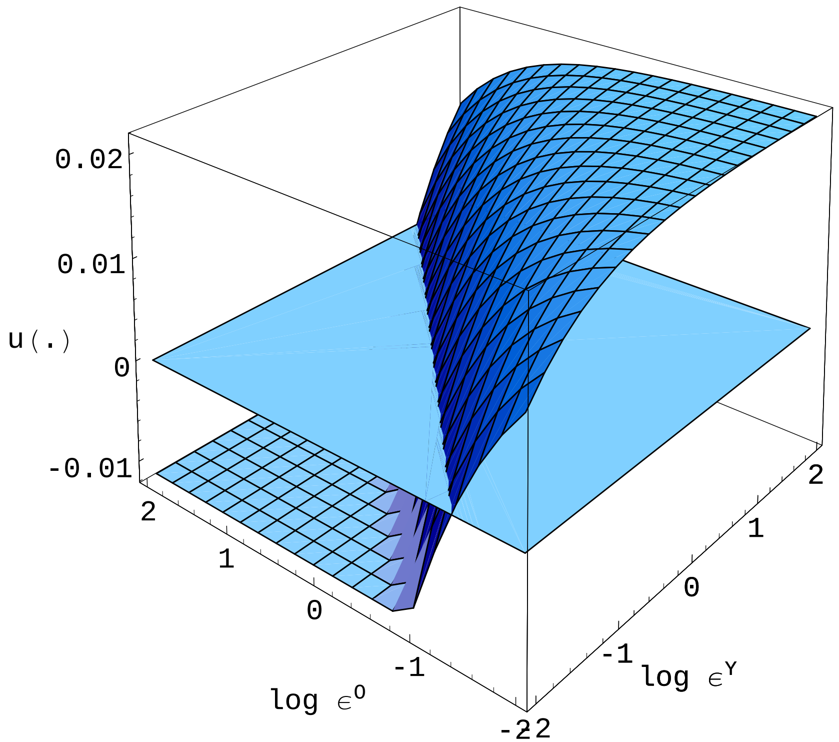
Inequality rises and stabilizes above its pre-reform level.

The loss of output linked to the fall in physical capital peaks at $t = 3$. It is around 5% at the time of the reform. It takes three periods to catch-up and then overtake the level without reform.

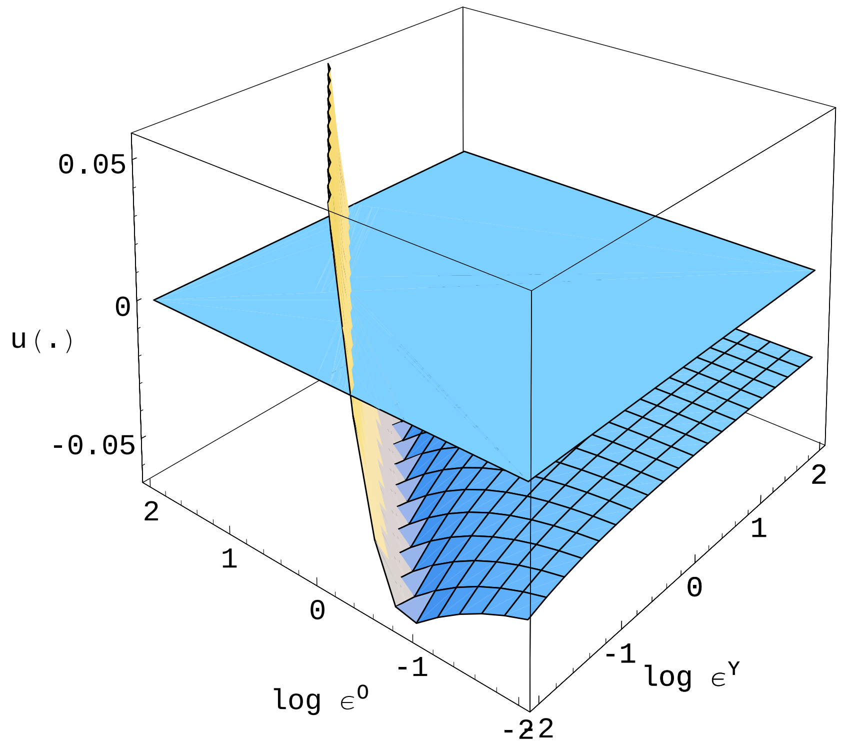
Note: only 15.5% of the population was constrained in the initial state

Losers and gainers – graph (1)

Cohort born at $t = 2$ (74% of gainers)

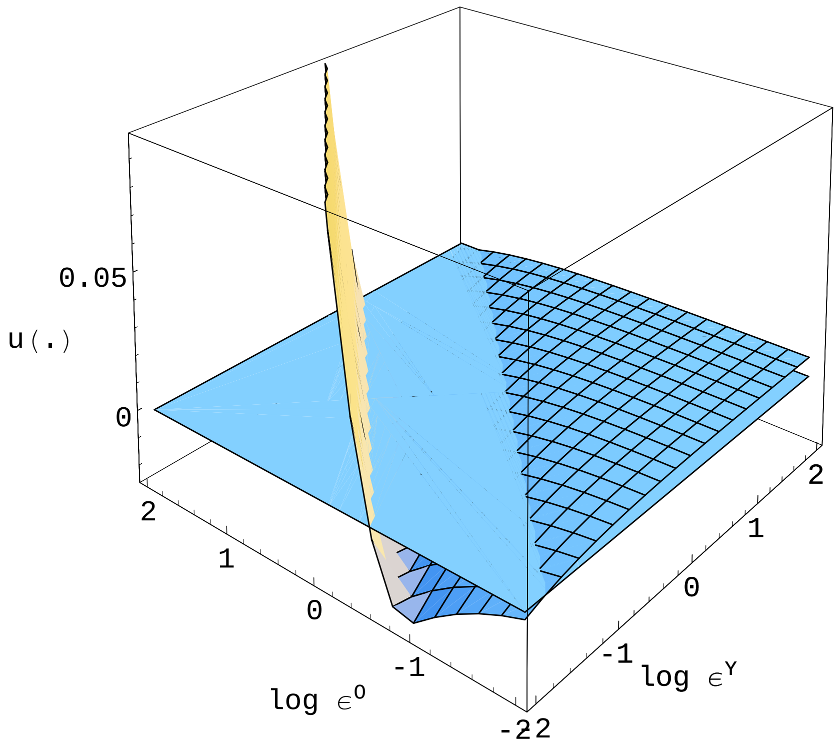


Cohort born at $t = 3$ (11% of gainers)

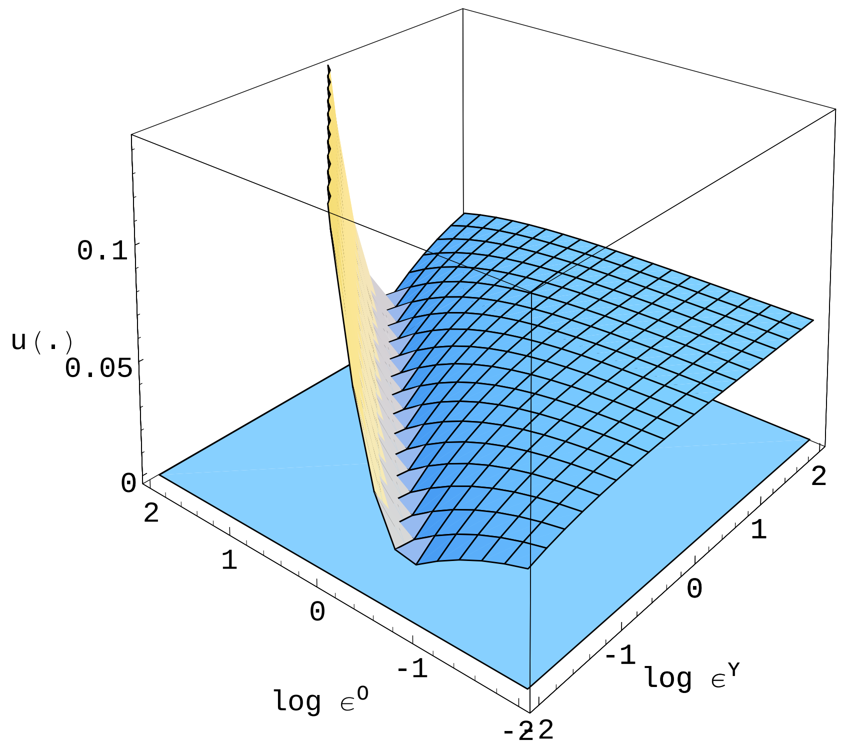


Losers and gainers – graph (2)

Cohort born at $t = 4$ (52% of gainers)



Cohort born at $t = 5$
(100% of gainers)



Losers and gainers

At the time of the liberalization, two gainers:

• The cohort born at $t = 2$ (old at $t = 3$) with low $\varepsilon^{\mathsf{O}}/\varepsilon^{\mathsf{Y}}$ gain from the higher interest rate at $t = 3$.

• The cohort born at $t = 3$ with high $\varepsilon^{\mathsf{O}}/\varepsilon^{\mathsf{Y}}$ gains from the lifting of the borrowing constraints.

But majority of young households born at $t = 3$ loses from liberalization because of lower wages.

32% of the total population living at $t = 3$ gains.

Looking at future generations, one out of two children of the generation born in $t = 4$ gain. One hundred percent of the grand-children gain.

Poverty traps

Elasticity of substitution $\simeq 1$ in developed countries, but much lower values have been found for LDC's.
– more limited technological options in emerging economies ?

Two reasons why lower substitution might matter:

1. it makes factor prices more sensitive to changes in k. $\rightarrow$ Liberalization is expected to increase yields in a stronger way $\rightarrow$ diminish the growth effect from human capital accumulation.

2. CES technologies are consistent with poverty traps in the basic overlapping generations model.
Financial reform tends to lower national saving and shrink the basin of attraction of the higher steady state.

Poverty traps – the CES

CES production functions:

$$f(k) = A\left(\alpha k^{\frac{\nu-1}{\nu}} + 1 - \alpha\right)^{\frac{\nu}{\nu-1}}$$

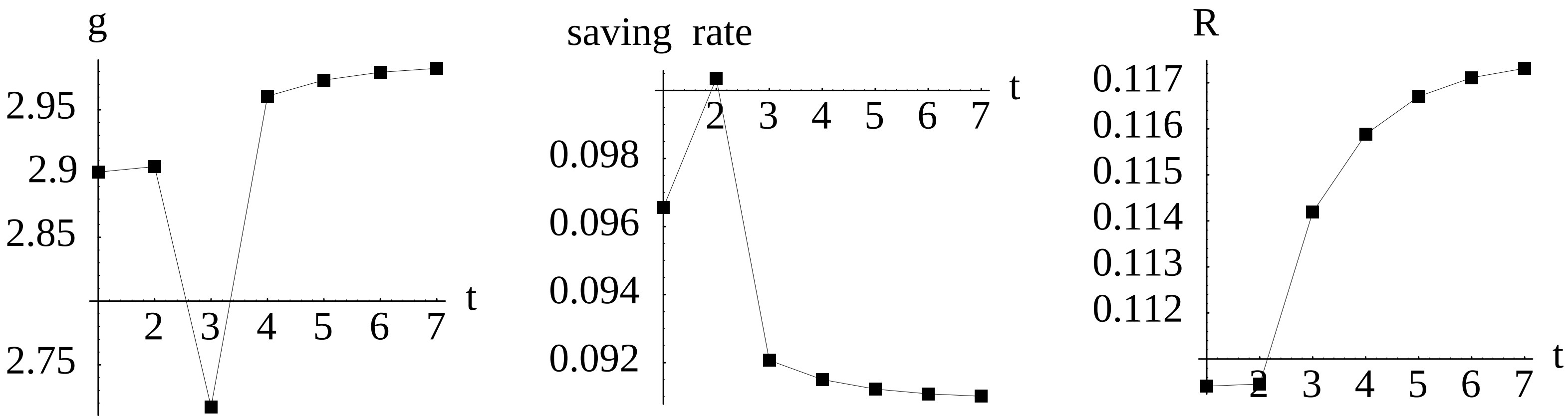
$\nu, A > 0$, $\alpha \in (0,1)$.

We set the elasticity of substitution $\nu = 1/2$, $\simeq$ lower bound on the actual elasticity.

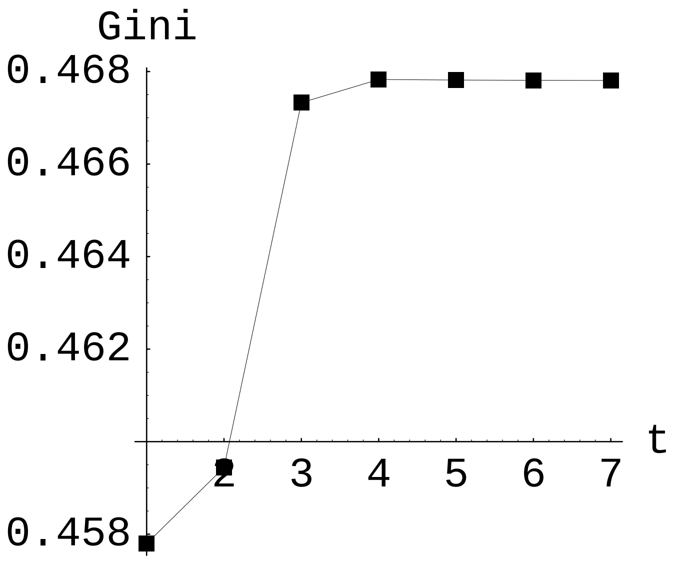
Parameters b, σ^2, β and γ keep the same value as in the Cobb-Douglas case.

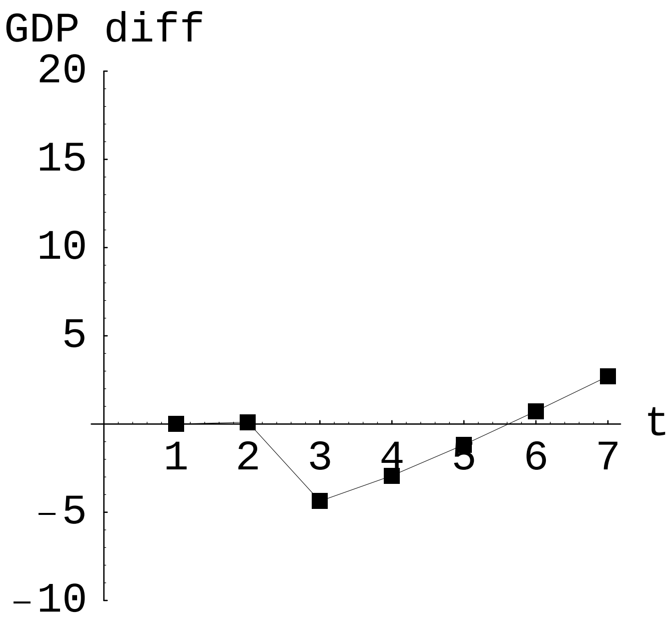
With $A = 53.5$ and $\alpha = 0.425$ we obtain a steady state with imperfect market displaying the same growth and capital share as previously.

Poverty traps – response to reform



Reforms and poverty traps – costs of liberalization





Poverty traps – differences with CES

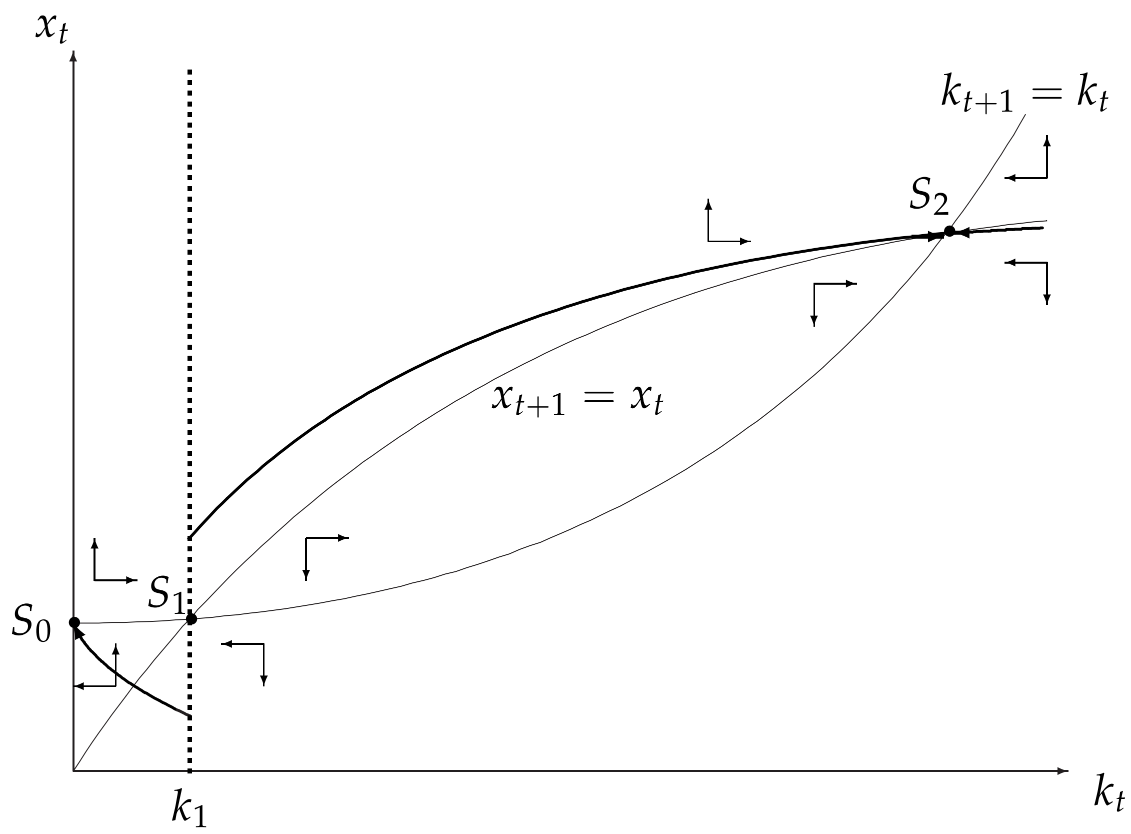
1. As expected, the effect on yields is stronger.

2. the drop in output at $t = 3$ is of the same magnitude as previously, but the long-run gain is *lower*.

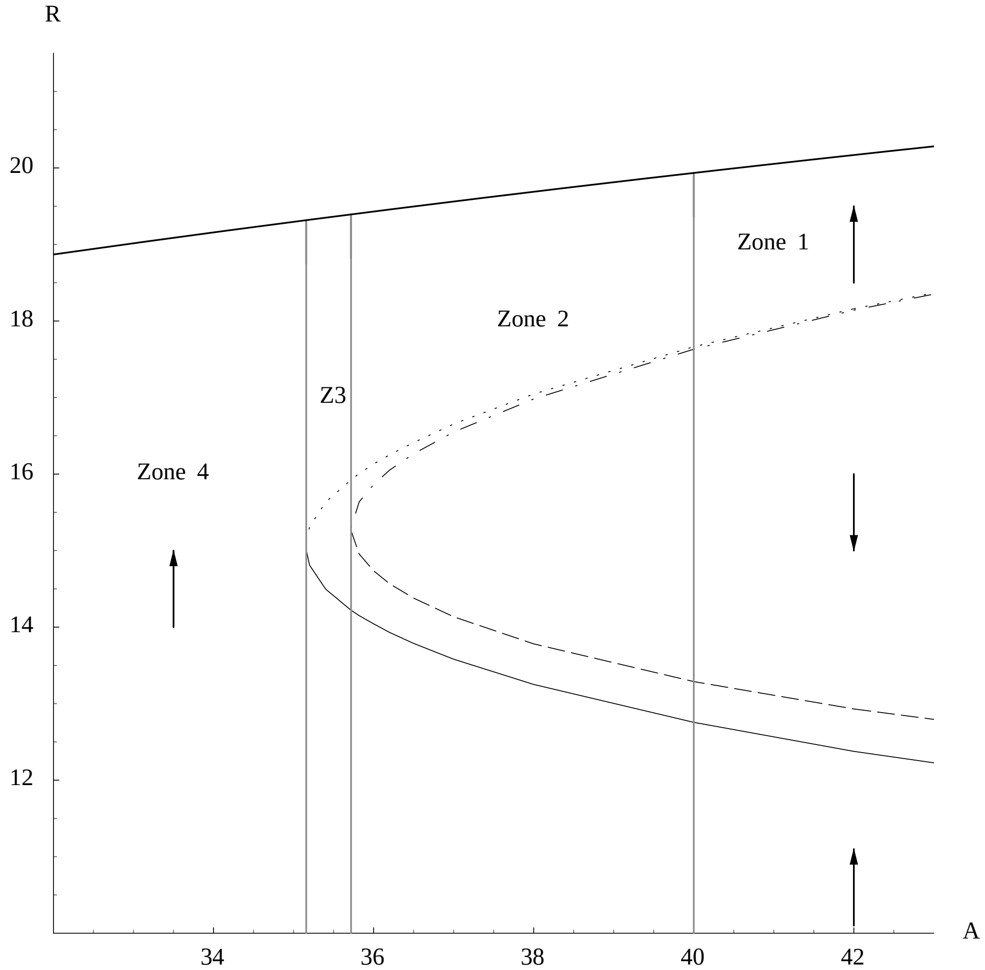
3. the gains from the reform take more time to materialize: GDP takes four periods instead of three to catch-up.

$\rightarrow$ long-term gains are much more modest: after 7 periods, GDP is 4% greater than it would be without reform, instead of 10% in the Cobb-Douglas case.

Poverty traps – phase diagram



Poverty traps – simulated bifurcation diagram



Poverty traps – four zones

Zone 1: liberalization affects the unstable steady state and the attraction basin very little. Yields are high and very few agents (less than 1%) are rationed.

Zone 2: liberalization shrinks the basin of attraction. If reform occurs when the economy is close to the low steady state $\rightarrow$ poverty trap.

Zone 3: *no* steady state with complete markets. Liberalization leads to the poverty trap for *any* initial value of the capital-labor ratio.

Zone 4: there is no positive steady state. The economy will converge to the poverty trap with or without reform.

Poverty traps – the perils of premature liberalization

The third zone describes a “premature” liberalization.

An economy with a total factor productivity in this range should first build up its TFP before attempting financial reform.

Note that this range does not correspond to unrealistic values of the endogenous variables.

For example, with $A = 35.4$, the steady state with imperfect markets has a return rate on capital of 14.5%, a capital share in output of 60%, and a growth rate of 2.28%.

Conclusion: the pros and the cons (1)

Financial reform:

Eases constraints on individuals with rising lifetime ability profiles (15% of the population), accelerating long-term growth by about 0.15 percent per year.

Reduces the household saving rate permanently, and lowers the GDP growth rate temporarily by 0.3% per year, relative to the no-reform path. Post-reform output does not recover fully until several periods later, when the impact of higher skills overcomes the weakness of aggregate savings.

Raises income inequality by a permanent margin.

Conclusion (2)

Lowers the lifecycle utility of nine out of ten people aged 12-37 at the time of reform as well as the ablest 25% among the older group aged 37-62. Without some type of compensation scheme, the losers from reform represent about two-third of all economically active households.

Improves the welfare of half the generation born at the time of the reform and of all members in all cohorts born later.

May permanently change for the worse the growth path of least developed economies, if it occurs prematurely, that is, before total factor productivity becomes large enough.