Financial Liberalization, Debt Mismatch, Allocative Efficiency and Growth

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Can one make the case for Financial liberalization?

- Our answer: a qualified yes
- Provided regulation imposes limits on the type of issuable liabilities
Financial liberalization may enhance growth and consumption possibilities because it improves allocative efficiency:

- By allowing for new financing instruments and the undertaking of risk, liberalization relaxes financing constraints.
- Sectors more dependent on external finance can invest more and grow faster.
- The rest of the economy benefits from this relaxation of the bottleneck via input–output linkages.
However,

- The use of new financial instruments
  - a riskless economy is transformed into one with systemic-risk
  - ↑ Incidence of crises
  - → Bailout costs

- ↑↓ Consumption opportunities

- We derive a condition for gains from growth that we bring to the data
Model


- Two-sectors:
  - Input (N) sector
  - Final goods (T) sector
  - T-good is numeraire → $p_t = \frac{p^n_t}{p^T_t}$

- N-sector uses its own goods as capital
  - $\phi$: share of N-output commanded by the N-sector for investment.
  - $\phi$ determines production efficiency and GDP growth.
Agents:

- Risk-neutral investors, opportunity cost $1 + r$
- Workers (T-sector): supply inelastically $l_t^T = 1$, wage $v_t^T$
- Entrepreneurs (N-sector): supply inelastically $l_t = 1$, wage $v_t$
- OLGs, linear preferences over consumption of T-goods $c_t + \frac{1}{1+r}c_{t+1}$
T-sector

- Produce T-goods using N-inputs

\[ y_t = d_t^\alpha (l_t^T)^{1-\alpha}, \quad \alpha \in (0, 1). \]

- Representative T-firm maximizes profits taking as given the price of N-goods \( p_t \) and standard labor wage \( v_t^T \)

\[
\max_{d_t, l_t^T} \left[ y_t - p_t d_t - v_t^T l_t^T \right]
\]
N-sector

- Produce N-goods using entrepreneurial labor \((l_t)\), and capital \((k_t)\).

\[
q_t = \Theta_t k_t^{\beta} l_t^{1-\beta}, \quad \Theta_t = \theta k_t^{1-\beta}, \quad k_t = I_{t-1}
\]

- Budget constraint

\[
p_t I_t + s_t \leq w_t + B_t, \quad w_t = v_t.
\]

- Can issue two types of one-period bonds
  - N-bonds promise to repay in N-goods.
  - T-bonds promise to repay in T-goods.

- Profits

\[
\pi(p_{t+1}) = p_{t+1} q_{t+1} + (1+r) s_{t} - v_{t+1} l_{t+1} - (1+\rho_t) b_t - p_{t+1} (1+\rho^n_t) b^n_t.
\]
Production Efficiency

Central Planner allocates supply of inputs \((q_t)\) to final goods production \((d_t = [1 - \phi_t]q_t)\) and to input production \((I_t = \phi_t q_t)\).

\[
\max_{\{c_t, c_t^e, \phi_t\}_{t=0}^{\infty}} W^{po} = \sum_{t=0}^{\infty} \delta^t [c_t^e + c_t], \quad \text{s.t.} \quad \sum_{t=0}^{\infty} \delta^t [c_t + c_t^e - y_t] \leq 0, \\
y_t = [1 - \phi_t]^{\alpha} q_t^{\alpha}, \quad q_{t+1} = \theta \phi_t q_t.
\]
Optimality $\rightarrow$ maximizes PV of final goods (T-)production $(\sum_{t=0}^{\infty} \delta^t y_t)$

- $\uparrow \phi$ today
  - $\downarrow$ today’s T-output by $\alpha (1 - \phi)^{\alpha-1} q_t^\alpha \partial \phi$
  - $\uparrow$ tomorrow’s N-output by $\theta q_t \partial \phi$
  - $\uparrow$ tomorrow’s T-output by $\alpha [(1 - \phi) \theta \phi q_t]^{\alpha-1} \theta q_t \partial \phi$
  - Intertemporal rate of transformation

\[
M = \frac{\alpha [(1 - \phi) \theta \phi q_t]^{\alpha-1} \theta q_t}{\alpha (1 - \phi)^{\alpha-1} q_t^\alpha} = \theta^\alpha \phi^{\alpha-1}.
\]

- Set $M = \delta^{-1}$

\[
\phi^{cp} = (\theta^\alpha \delta)^{\frac{1}{1-\alpha}}, \quad \text{if} \quad \delta < \theta^{-\alpha}.
\]
Imperfections

*Contract Enforceability Problems.* If at time $t$ the entrepreneur incurs a non-pecuniary cost $H[w_t + B_t]$, then at $t + 1$ she will be able to divert all the returns provided the firm is solvent (i.e., $\pi(p_{t+1}) \geq 0$).

*Systemic Bailout Guarantees.* If a majority of firms become insolvent, then a bailout agency pays lenders the outstanding liabilities of each non-diverting firm that defaults.

*Bankruptcy Costs.* If a firm is insolvent ($\pi(p_{t+1}) < 0$) a share $1 - \mu_w$ of its revenues is lost in bankruptcy procedures. The remainder is paid as wages to the young entrepreneurs.
Regulatory Regimes

*Financial Repression.* Can issue only one-period standard bonds with repayment indexed to the price of N-goods that it produces.

*Financial Liberalization.* Can issue one-period standard bonds with repayments denominated in N- or T-goods.

*Anything Goes.* Can also issue option-like catastrophe bonds.
**Symmetric Equilibrium**

Given prices, N-sector firms and creditors set \((I_t, s_t, b_t, b_t^n, \rho_t, \rho_t^n)\); the T-sector demand for N-input \(d_t\) maximizes T-firms’ profits; factor markets clear; and the market for intermediate goods clears

\[
d_t(p_t) + I_t(p_t, p_{t+1}, \bar{p}_{t+1}, \chi_{t+1}) = q_t(I_{t-1}).
\]

\[
p_{t+1} = \begin{cases} 
\bar{p}_{t+1} & \text{with probability } \chi_{t+1} \\
\underline{p}_{t+1} & \text{with probability } 1 - \chi_{t+1}
\end{cases} \quad \chi_{t+1} = \begin{cases} 
1 & u \in (0, 1).
\end{cases}
\]
Allocation under Financial Repression

There exists an SSE if and only if \( H \in (0, 1), \beta \in (H, 1) \) and the input sector productivity \( \theta > \theta^s \equiv \left( \frac{1}{\beta \delta} \right)^{\frac{1}{\alpha}} \left( \frac{1-\beta}{1-H} \right)^{\frac{1-\alpha}{\alpha}} \).

- Debt is hedged and crises never occur \((\chi_{t+1} = 1)\).
- Input sector debt
  \[ b_t = \frac{H}{1-H} \nu_t \]
- Investment Share
  \[ I_t = \phi^s q_t, \quad \phi^s = \frac{1-\beta}{1-H}. \]
Bottleneck:

- Under financial repression the investment share is below the Central Planner’s optimum: \( \phi^s < \phi^{cp} \)

- Why? \( \phi^s < \phi^{cp} \) can be rewritten as \( \theta \geq \left( \frac{1}{\delta} \right) \frac{1}{\alpha} (\phi^s)^{\frac{1-\alpha}{\alpha}} \equiv \theta' \),

- An equilibrium exists only if \( \theta > \theta^s \equiv \left( \frac{1}{\beta} \right) \left( \frac{1}{\delta} \right)^{\frac{1}{\alpha}} (\phi^s)^{\frac{1-\alpha}{\alpha}} \).

- Since \( \beta \in (0, 1) \rightarrow \theta^s > \theta' \).
Allocation under Financial Liberalization

- Systemic risk: a sunspot can induce a sharp fall in the input price that bankrupts all input sector firms and generates a systemic crisis, during which creditors are bailed out.
- There exists an RSE for any crisis’ financial distress costs $l^d \in (0, 1)$ if and only if

$$H \in (0, 1), \quad u \in (H, 1), \quad \beta \in \left(\frac{H}{u}, 1\right), \quad \theta \in (\theta, \bar{\theta})$$

- Debt is risky: $b_t = H/u \frac{1-H/u}{w_t}$

- Input sector’s investment ($I_t = \phi_t q_t$) ($\tau_i$ denotes a crisis time):

$$\chi_{t+1} = \begin{cases} 1 - u & \text{if } t \neq \tau_i; \\ 1 & \text{if } t = \tau_i; \end{cases} \quad \phi_t = \begin{cases} \phi^l \equiv \frac{1-\beta}{1-H/u-1} & \text{if } t \neq \tau_i; \\ \phi^c \equiv \frac{\mu w}{1-H} & \text{if } t = \tau_i. \end{cases}$$
Lemma 3.2 (Bottleneck)
In both safe and risky symmetric equilibria, input production is below the central planner's optimal level, i.e., there is a "bottleneck":

\[ s < l < cp \]

To derive this result, note that

\[ s < cp \]

can be rewritten as

\[ \frac{1}{1 - \phi} \]

and recall that a SSE exists only if

\[ s > 0 \]

Since

\[ 2(0, 1) \]

it is easy to see that the bound

\[ s \]

is greater than

\[ 0 \]

In other words, if an SSE exists, then

\[ s \]

and so

\[ s \]

is necessarily lower than

\[ cp \]

To show that

\[ l < cp \]

notice that the N-investment share along a tranquil path

\[ l \]

is lower than

\[ cp \]

if and only if

\[ \frac{1}{1 - \phi} \]

Recall that an RSE exists only if

\[ \phi \]

is greater than the lower bound

\[ 0 \]

We show in the appendix that the lower bound

\[ 0 \]

is greater than

\[ 0 \]

for all parameter values for which an RSE exists, i.e., for all

\[ (H, u, \phi) \]

that satisfy (11).

Therefore, if an RSE exists,

\[ l \]

is necessarily lower than

\[ cp \]

We are grateful to the Editor, John Leahy, for pointing this result to us.

\[ Figure: \text{Market Equilibrium for Input} \]
Bottleneck II:

- Under financial Liberalization the investment share is below the Central Planner’s optimum
  \[ \phi^l < \phi^{cp} \iff \theta > \left( \frac{1}{\delta} \right)^{\frac{1}{\alpha}} \left( \phi^l \right)^{\frac{1-\alpha}{\alpha}} \equiv \theta''. \]
- A risky equilibrium exists only if \( \theta > \theta. \)
- Can show that \( \theta > \theta'' \) for all \((H, u, \beta, \delta)\) for which an RSE exists.
GDP Growth

\[ gdp_t = p_t I_t + y_t \]

Equilibrium N-sector investment, T-output, and prices:

\[ I_t = \phi_t q_t, \quad y_t = [ (1 - \phi_t) q_t ]^\alpha, \quad p_t = \alpha [ (1 - \phi_t) q_t ]^{\alpha - 1}. \]

Substituting

\[ gdp_t = q_t^\alpha Z(\phi_t), \quad Z(\phi_t) \equiv \frac{1 - (1 - \alpha) \phi_t}{(1 - \phi_t)^{1 - \alpha}}. \]

▶ Repressed Economy

\[ 1 + \gamma^s \equiv \frac{gdp_t}{gdp_{t-1}} = \left( \theta \frac{1 - \beta}{1 - H} \right)^\alpha = (\theta \phi^s)^\alpha. \]
Liberalized economy

- Tranquil times

\[ 1 + \gamma^l \equiv \frac{gdp_t}{gdp_{t-1}} = \left( \theta \frac{1 - \beta}{1 - Hu^{-1}} \right)^\alpha = (\theta \phi^l)^\alpha. \]

- Crises can occur.

- In equilibrium, 2 crises cannot occur consecutively \( \rightarrow \) average growth in crisis episode

\[ 1 + \gamma^{cr} = \left( (\theta \phi^l) \alpha \frac{Z(\phi^c)}{Z(\phi^l)} \right)^{1/2} \left( (\theta \phi^c) \alpha \frac{Z(\phi^l)}{Z(\phi^c)} \right)^{1/2} = \left( \theta (\phi^l \phi^c)^{1/2} \right)^\alpha. \]

- Loss in GDP growth stems only from the fall in the N-sector’s average investment share \((\phi^l \phi^c)^{1/2}\).
\[ \log(gdp_t) - \log(gdp_{t-1}) \text{ follows a 3-state Markov chain:} \]

\[
\Gamma = \begin{pmatrix}
\log\left(\left(\theta \phi^l\right)^\alpha\right) \\
\log\left(\left(\theta \phi^l\right)^\alpha \frac{Z(\phi^c)}{Z(\phi^l)}\right) \\
\log\left(\left(\theta \phi^c\right)^\alpha \frac{Z(\phi^l)}{Z(\phi^c)}\right)
\end{pmatrix}, \\
T = \begin{pmatrix}
u & 1-u & 0 \\
0 & 0 & 1 \\
u & 1-u & 0
\end{pmatrix}.
\]

\[ \text{The mean long-run GDP growth rate} \]

\[
E(1 + \gamma^r) = (1 + \gamma^l)^\frac{u}{2-u}(1 + \gamma^{cr})^{1-\frac{u}{2-u}} = \theta^\alpha (\phi^l)^{\frac{1}{2-u}} \alpha (\phi^c)^{\frac{1-u}{2-u}} \alpha
\]
Growth Enhancing Liberalization

\[ E(\gamma^r) > \gamma^s \iff \log(\phi^l) - \log(\phi^s) > [1 - u] [\log(1 - \beta) - \log(\mu_w)] \]

where \( \phi^c \equiv \frac{\mu_w}{1 - H} = \frac{\mu_w}{1 - \beta} \phi^s \).

- Liberalization Enhances Long-run mean GDP growth iff
  - Benefits of higher leverage and investment in tranquil times \((\phi^l > \phi^s)\) compensate for the
  - Shortfall in credit and investment in crisis times \((\mu_w < 1 - \beta) \times\) frequency of crisis \((1 - u)\).

Let \( u \uparrow 1 \rightarrow \) gains for all admissible \( 1 - u \)
Figure: Growth Gains from Liberalization
Proposition (Liberalization and Growth)

If financial liberalization generates systemic risk and makes the economy vulnerable to self-fulfilling crises and the financial distress costs of crises \( l^d \equiv 1 - \frac{\mu \nu}{1-\beta} \) are lower than a threshold

\[
l^d < \bar{l}^d \equiv 1 - e^{-\frac{H}{1-H}}, \quad \text{then:} \quad (1)
\]

1. **Liberalization increases long-run mean GDP growth.**
2. **Liberalization increases the long-run mean N-investment share bringing it nearer to—but still below—the central planner’s optimal level, i.e.,** \( \phi^s < E(\phi^r) < \phi^{cp} \).
3. **The gains from liberalization are increasing in the crisis probability, within the admissible region (i.e.,** \( 1 - u \in (0, 1 - H) \)).
Replacing $\phi^l$ by $\frac{1-\beta}{1-Hu^{-1}}$ and $\phi^s$ by $\frac{1-\beta}{1-H}$,

$E(\gamma^r) > \gamma^s$ becomes equivalent to $l^d < 1 - \left(\frac{1-Hu^{-1}}{1-H}\right)\frac{1}{1-u}$.

Then $\lim_{u \uparrow 1} \left(\frac{1-Hu^{-1}}{1-H}\right)^{\frac{1}{1-u}} = e^{-\frac{H}{1-H}}$. 
What does the data say: \( l^d < \overline{l^d} \equiv 1 - e^{-\frac{H}{1-H}} \)?

- Get estimates of \( H \).
  - \( b = \left( \frac{1}{1-H} - 1 \right) w \rightarrow H = \frac{b}{b+w} \cdot u \)
- Estimate \( \frac{b}{b+w} \) from firm-level balance sheet info for 23 emerging markets 1990-2013, Thomson Worldscope data set.
- \( u \) use estimates in literature
- Compare \( \overline{l^d} \) with data on crisis GDP losses
Estimates of Crisis Probability \(1 - u\)

- Schularick-Taylor (2012): 14 countries over 1870-2008
- Unconditional crisis probability: GO: 3%, ST: 5%
- Conditional Probabilities (logit): ST, five lags of credit growth; GO credit-to-GDP.
- Distribution of Predicted crisis probabilities by percentile of country-years:

<table>
<thead>
<tr>
<th>Percentile of country-years</th>
<th>5%</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schularick-Taylor, 2012</td>
<td>1.47</td>
<td>2.54</td>
<td>3.48</td>
<td>4.82</td>
<td>8.55</td>
</tr>
<tr>
<td>Gourinchas-Obstfeld, 2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>—Full specification</td>
<td>0.37</td>
<td>1.47</td>
<td>2.96</td>
<td>5.70</td>
<td>17.74</td>
</tr>
<tr>
<td>—Credit/GDP only</td>
<td>1.8</td>
<td>2.91</td>
<td>3.57</td>
<td>4.44</td>
<td>7.76</td>
</tr>
</tbody>
</table>
Estimation of Upper Threshold for Financial Distress Costs

\( \bar{l}^d = 1 - e^{-\frac{H}{1-H}} \)

- Use Thomson Worldscope data set.
- We bias downwards \( \hat{H} \) by assuming all countries are in a risky equilibrium.
- \( \frac{\text{debt}}{\text{assets}} = 0.542, \text{s.e.} = 0.0049 \)

<table>
<thead>
<tr>
<th>Crisis Probability ((1 - u))</th>
<th>0.05</th>
<th>0.1</th>
<th>0.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \hat{H} = u \cdot \left( \frac{\text{debt}}{\text{assets}} \right) )</td>
<td>0.515</td>
<td>0.488</td>
<td>0.434</td>
</tr>
<tr>
<td>( \bar{l}^d \equiv 1 - e^{-\frac{H}{1-H}} )</td>
<td>0.654</td>
<td>0.614</td>
<td>0.535</td>
</tr>
</tbody>
</table>
Upper Bound on GDP Losses During Crises.

- Financial distress costs do not have a direct counterpart in the data.
- In equilibrium they are closely linked to GDP losses during a crisis (data exists):

\[ S \equiv \frac{GPD^{trend} - GDP^{crisis}}{GPD^{trend}} = 1 - \frac{(1 + \gamma^{cr})^2}{(1 + \gamma^{l})^2} = 1 - \left( \frac{\phi^{c}}{\phi^{l}} \right)^{\alpha} \]

- Substituting the upper bound \( \bar{l}^{d} \) for \( l^{d} \), the largest crisis GDP loss consistent with liberalization gains is

\[ \bar{S} = 1 - \left( \frac{1 - Hu^{-1}}{1 - H} \cdot e^{-\frac{H}{1-H}} \right)^{\alpha} \]

- Setting \( \alpha = 0.34 \), its average for 7 countries in Emerging Asia:

<table>
<thead>
<tr>
<th>Crisis Probability ((1 - u))</th>
<th>0.05</th>
<th>0.1</th>
<th>0.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \hat{H} )</td>
<td>0.515</td>
<td>0.488</td>
<td>0.434</td>
</tr>
<tr>
<td>( \hat{S} ) (Upper Bound GDP Losses)</td>
<td>31.6%</td>
<td>28.9%</td>
<td>24%</td>
</tr>
</tbody>
</table>

- Annualized crisis GDP losses average 10.68%
- 90th percentile crisis annualized GDP losses is 23.1%
- Only two crises exhibit losses greater than 30%.

\[ \hat{S} > 10.68\% \rightarrow \text{financial distress costs are below the growth enhancing threshold } \bar{l}^d \]

\[ \Rightarrow \text{Across emerging markets over the period 1970-2012, the direct positive effect of financial liberalization—due to a relaxation of borrowing constraints—dominates the indirect negative effect due to a greater incidence of crises.} \]
Consumption Possibilities

- FL → Systemic Risk → Relax BC → ↑ Investment
- Crises → Bailouts

- Expected discounted value of consumption

\[ W = E_0 \left( \sum_{t=0}^{\infty} \delta^t (c_t + c^e_t) \right) = E_0 \left( \sum_{t=0}^{\infty} \delta^t [1 - \alpha] y_t + \pi_t - T_t \right). \]
In repressed economy

\[ W^s = \sum_{t=0}^{\infty} \delta^t y_t^s = \frac{1}{1 - \delta(\theta \phi_s)^\alpha} y_o^s = \frac{1}{1 - \delta (\theta \phi_s)^\alpha} (1 - \phi^s)^\alpha q_0^\alpha. \]

In liberalized economy

\[ W^r = E_0 \sum_{t=0}^{\infty} \delta^t \kappa_t y_t, \quad \kappa_t = \begin{cases} \kappa_c \equiv 1 - \frac{\alpha}{1 - \phi_c} [1 - \mu_w] & \text{if } t = \tau_i, \\ 1 & \text{otherwise}; \end{cases} \]

\[ W^r = \frac{1 + \delta(1 - u) \left( \theta \phi^l \left( \frac{1 - \phi_c}{1 - \phi^l} \right) \right)^\alpha \left( 1 - \frac{\alpha [1 - \mu_w]}{1 - \phi_c} \right)}{1 - [\theta \phi^l]^\alpha u \delta - [\theta^2 \phi^l \phi_c]^\alpha [1 - u] \delta^2} (1 - \phi^l)^\alpha q_0^\alpha. \]
Figure: Consumption Gains from Liberalization
Example: Anything Goes Regulatory Regime

- Alternative (inferior) technology for producing final T-goods using only T-goods

\[ y_{t+1} = \varepsilon_{t+1} I_t^\varepsilon, \quad \text{where} \quad \varepsilon_{t+1} = \begin{cases} \bar{\varepsilon} & \text{with probability } \lambda, \\ 0 & \text{with probability } 1 - \lambda \end{cases} \]

\[ \bar{\varepsilon} \leq 1 + r. \]

- Catastrophe bonds w/no collateral are allowed:

\[ L_{t+1}^c = \begin{cases} 0 & \text{if } \varepsilon_{t+1} = \bar{\varepsilon}, \\ (1 + \rho_t^c) b_t^c & \text{if } \varepsilon_{t+1} = 0. \end{cases} \]

- Bailout up to an amount \( \Gamma_t \) is granted to lenders of a defaulting borrower if majority of borrowers defaults.
- The negative NPV $\varepsilon$-technology may be funded
- Catastrophe bonds $\rightarrow$ all repayments shifted to the default state
- Borrowing determined by expected bailout rather than by equity
  \[ b^c_t = [1 - \lambda] \delta \Gamma_{t+1} \]
- Average growth may be higher than under F. repression, but losses during crises more than offset private profits.
This example helps rationalize contrasting experiences:

- Emerging markets’ booms have featured mainly standard debt
  - Systemic risk taking has been, on average, associated with higher long-run growth.
- Recent US boom featured a proliferation of uncollateralized option-like liabilities
  - Supported funding of negative net present value projects.
Conclusions

- Liberalization has led to more crisis-induced volatility
- Liberalization per-se is bad for either growth or production efficiency.
- Policies intended to eliminate financial fragility might block the forces that spur growth and allocative efficiency.
- At the other extreme, the gains can be overturned in a regime with unfettered liberalization where option-like securities can be issued without collateral.
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Baseline Value</th>
<th>Range of Variation</th>
<th>Target / Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability of crisis</td>
<td>$1 - u = 0.05$</td>
<td>$[0, 0.1]$</td>
<td>Schularick-Taylor (2012), Gourinchas-Obstbeld (2012)</td>
</tr>
<tr>
<td>Intensity of N-inputs in T-production</td>
<td>$\alpha = 0.34$</td>
<td>$[0.2, 0.4]$</td>
<td>Input-Output Tables for Emerging Asia Source: ADB (2012)</td>
</tr>
<tr>
<td>Financial distress costs</td>
<td>$l^d = 24%$</td>
<td>$[18%, 76.6%]$</td>
<td>Laeven and Valencia (2013)</td>
</tr>
<tr>
<td>Contract enforceability</td>
<td>$H = 0.515$</td>
<td></td>
<td>Debt-to-Assets in Emerging Countries Source: Thompson Worldscope</td>
</tr>
<tr>
<td>N-sector Internal Funds</td>
<td>$1 - \beta = 0.33$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-sector Productivity</td>
<td>$\theta = 1.6$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The discount factor is set to $\delta = 0.85$ to satisfy $\delta < \theta^{-\alpha}$, so that $\phi^{cp} < 1$. 