Discussion on

Optimal External Debt and Default

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This paper

- Analyzes whether sovereign default can be interpreted as a contingency of optimal contracts
- Develops a small open economy model:
  - With capital accumulation
  - Without commitment
  - In which default generates permanent exclusion and permanent loss of output
- Model applied to the debt reduction obtained by Latin American countries within the Brady plan

Outline of this discussion

- Simple model to illustrate the mechanism
- Comment on theoretical results
- Comment on application to Brady plan
- No self-promotion

The Model

- Assume three-period world: $t = 0, 1, 2$
- Small open economy,
  - maximizing $u(c_2)$
  - with investment opportunities at $t = 0$ and at $t = 1$ such that

$$y_{t+1} = (I_t)^{\alpha}\text{, where } \alpha \in (0,1)$$

  - no endowments
- To finance investment, borrow from abroad
  - at $t = 0$, gross international rate is r
  - at $t = 1$, gross international rate is $\begin{cases} r_H & \text{with probability } \frac{1}{2} \\ r_L & \text{with probability } \frac{1}{2} \end{cases}$
- The country cannot commit to repay, whenever it defaults it
  - loses fraction γ of output from there onwards
  - financial autarky
- Everything is observable

Timeline

$t = 0$	$t = 1$	$t = 2$
country borrows and invests $D_0 = I_0$	$r_i,\ i \in \{L, H\}$ realizes and country may EITHER: **REPAY** - repays $I_0 r$ - borrows D_i - invests $(I_0^\alpha - I_0 r + D_i)$ **DEFAULT** - invests $(1-\gamma)(I_0^\alpha)$	country may EITHER **REPAY** - repays $D_i r_i$ - $c_2 = (I_0^\alpha - I_0 r + D_i)^\alpha - D_i r_i$ **DEFAULT** - $c_2 = (1-\gamma)(I_0^\alpha - I_0 r + D_i)^\alpha$

Equilibrium

- Assume borrowing constraints are always binding

- Assume repayment at $t = 1$ is NOT contingent

- Starting at $t = 2$, the IC constraint pins down D_i,

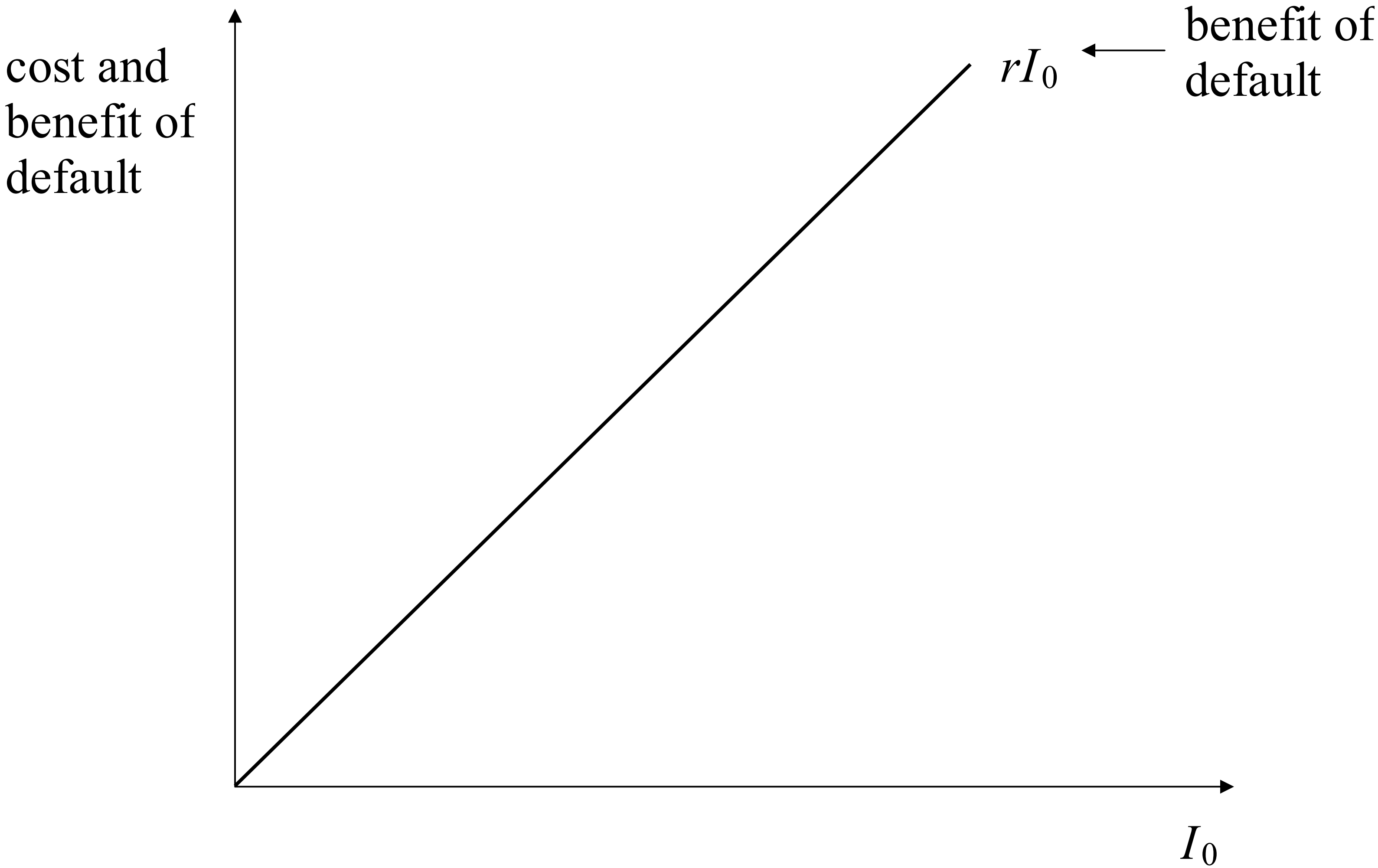
$$\gamma \cdot y_2 = \gamma \cdot (I_0^\alpha - rI_0 + D_i)^\alpha \geq r_i D_i$$

so that $D_L > D_H$

- Going back to $t = 1$, the IC constraint is that, for all $i \in \{H, L\}$

$$\begin{aligned} (1-\gamma) \cdot (I_0^\alpha - rI_0 + D_i)^\alpha &\geq (1-\gamma) \cdot ((1-\gamma) \cdot I_0^\alpha)^\alpha \\ &\Leftrightarrow \\ \gamma I_0^\alpha + D_i &\geq rI_0 \end{aligned}$$

- What goes on?
  - when $i = H$, IC binding (few fresh funds from abroad)
  - when $i = L$, country could pay back more (IC slack)


cost and
benefit of
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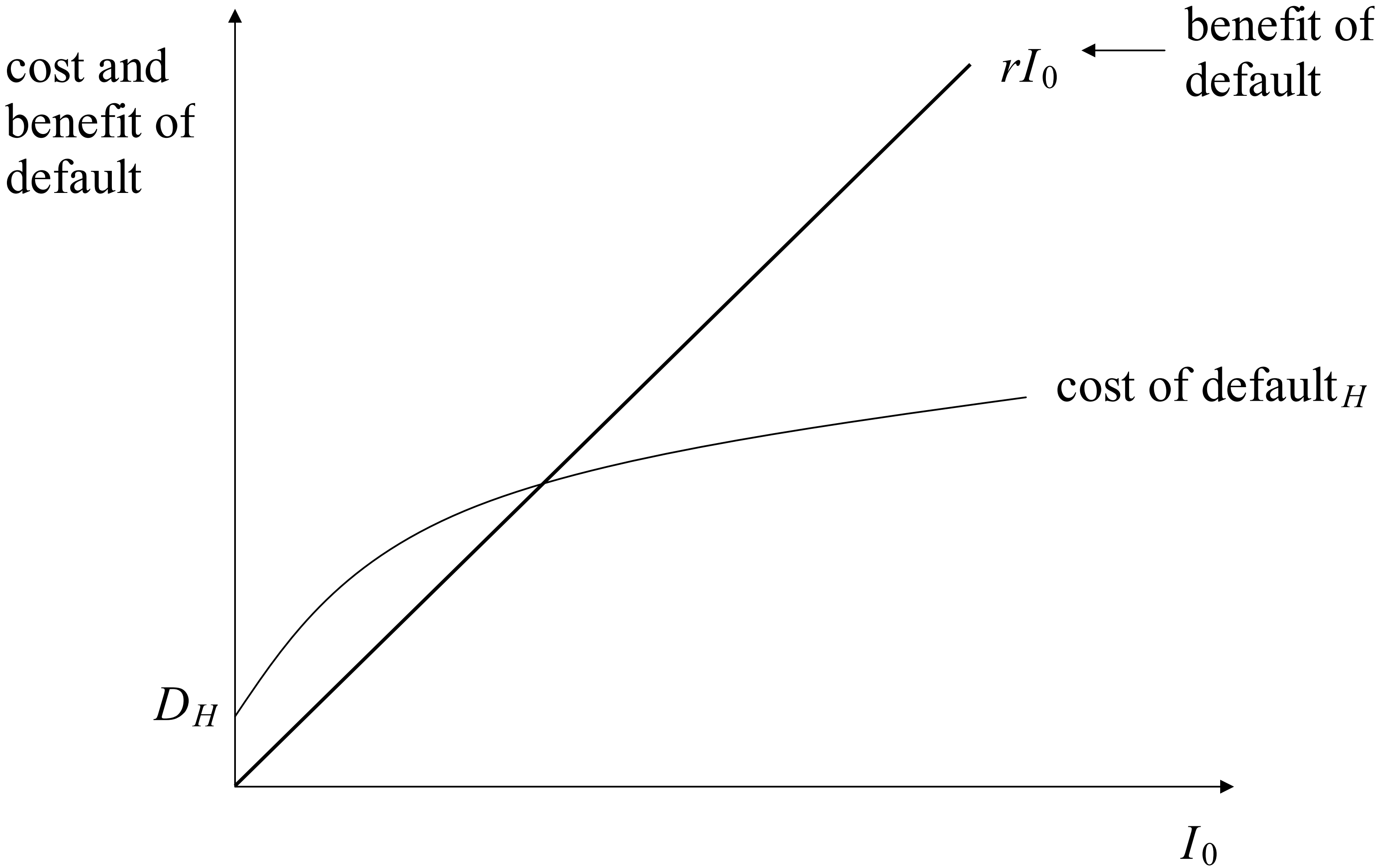
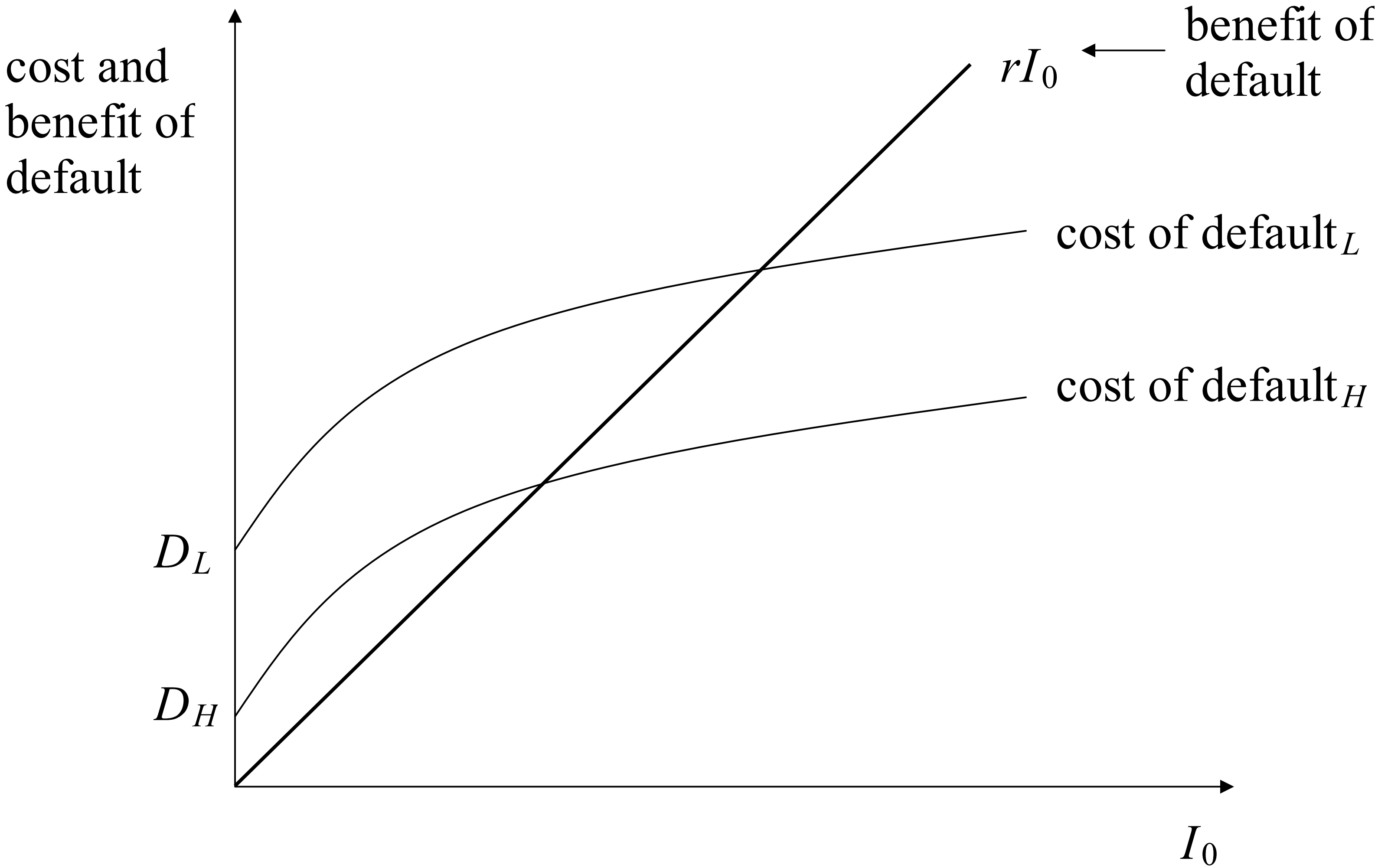

cost and benefit of default
rI_0
benefit of default
cost of default$_H$
D_H
I_0



cost and benefit of default
benefit of default
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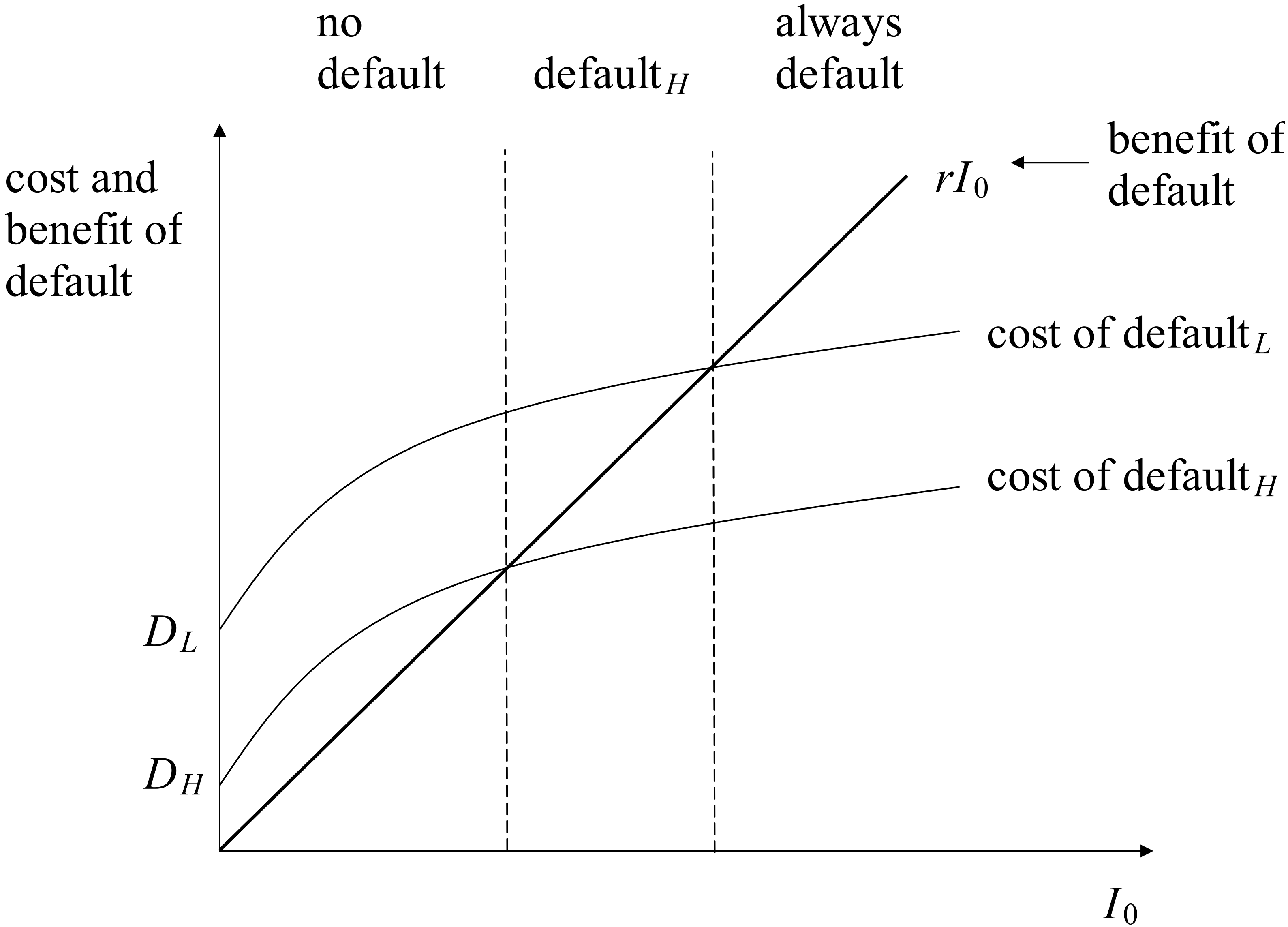
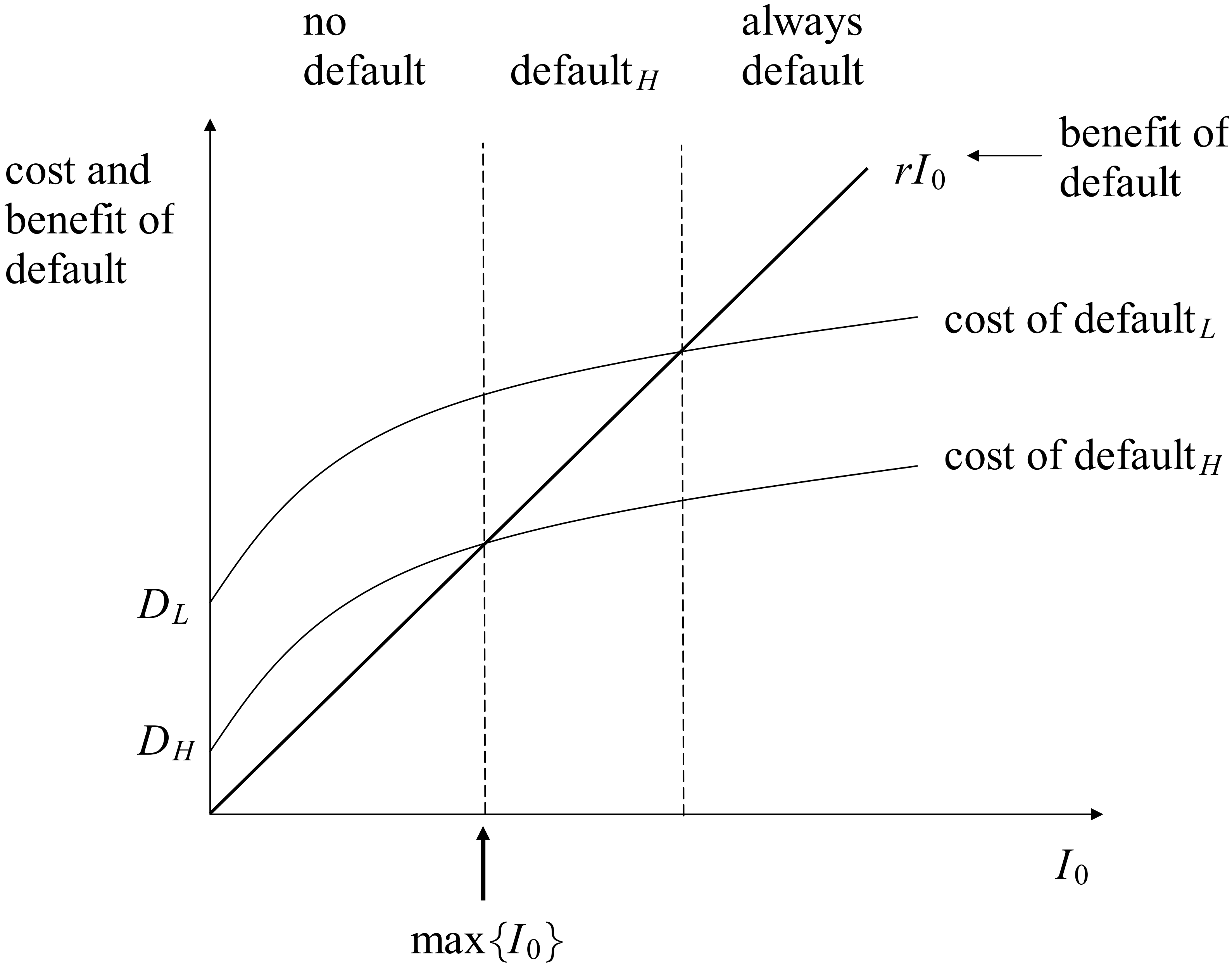
cost of default$_L$
cost of default$_H$
D_L
D_H
I_0



no default
default$_H$
always default
cost and benefit of default
rI_0
benefit of default
cost of default$_L$
cost of default$_H$
D_L
D_H
I_0



no default
default$_H$
always default
cost and benefit of default
rI_0
benefit of default
cost of default$_L$
cost of default$_H$
D_L
D_H
I_0
$\max\{I_0\}$

What can be done?

- Since the IC constraint binds when r is high, the country can:
  - promise to pay less ($I_H < rI_0$) when $i = H$
  - promise to pay more when ($I_L > rI_0$) $i = L$
  - while satisfying 0 profits for creditors

- I_0 expands until constraints bind in all states

- In this model, $I_L - I_H$,
  - increases with $r_H - r_L$ (which increases $D_H - D_L$)
  - increases with the persistence of the shock
  - the paper also analyzes the relationship with k which is ambiguous

- Bernardo considers shocks to productivity at $t = 1$, which are
  - qualitatively the same
  - quantitatively of a lower order of magnitude (not very clear why)

Application to Brady Plan

- The model is calibrated and predicts:
  - a reduction of approximately 18% in debt in response to
  - an increase of 4% in the real interest rate
- The paper claims that this is consistent with Brady plan
  - debt reduction of 29% for Latin America in 1989
  - "in response" to increase in r in early 80's

Application to Brady Plan: comment I

- Simple comments on the calibration:
  - More info on interest rate process (why average persistence of 10 years?)
  - Same for productivity shock (same persistence as interest rates?)

Application to Brady Plan: comment II

- From a broader perspective, Brady agreements implied many other things;
  - "commitment" to undertake reforms
  - change from bank- to market- based system of lending
- To interpret this debt reduction as optimal contract, the numerical exercise should be tighter
  - either tailor the model to Brady circumstances, or
  - look at other instances where debt reduction follows increase in r

Conclusions

- This is a very interesting paper
- The theoretical model is:
  - well-crafted and contains robust insights
  - it would be nice to deepen the analysis on interest rates vs. productivity shocks
- The application to the Brady debt reduction, though, I find less convincing:
  - more thorough numerical exercise
- Perhaps an interesting avenue to pursue is on the design of optimal indexed assets