Entrepreneurship, “Financiership”, and Selection

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In a nutshell

- We first take a standard model of entrepreneurs, outside investors and adverse selection
- Then we remove outside investors so that
  - all agents need to choose whether they invest their wealth as entrepreneurs or financiers
- We check out whether this mitigates adverse selection problem
  - It does

Motivation

- Huge literature has identified adverse selection as a major problem in financial markets
  - financial markets may collapse
  - equilibria that exist typically Pareto-inefficient
- In practice, financial markets exist and seem to work

- What kind of selection?
  - Adverse vs. advantageous?
- If adverse , when, and what are the policy implications?
- What is the role of initial wealth and storage technology?

- Massive evidence that insufficient wealth holds back entrepreneurship

  – presumably, due to adverse selection

  $\Rightarrow$ massive subsidies to entrepreneurship and their finance

- However, basic models yield excessive entrepreneurship and negative correlation between wealth and entrepreneurship

Main results

- Markets can be efficient simply because low types prefer financiership to entrepreneurship

- Wealth constraints not necessarily bad for the efficiency of financial markets

$\Rightarrow$ opening up financial markets to outside investors can reduce efficiency

$\Rightarrow$ insufficient entreprenerial wealth is not a reason to subsidize entrepreneurship or their finance

2. Related literature

- Partial equilibrium models of financial markets with asymmetric information: Stiglitz & Weiss 1981, De Meza & Webb, 1987
  - Assume entrepreneurs with a project but without funds; financiers with funds but without a project
  - The role of entrepreneurial wealth: De Meza & Webb, 1999
- An exception: Boyd & Prescott, 1986, with a genuine choice between entrepreneurship and financiership
  - Their decentralized market a special case

- Credit and macroeconomy:
  - Wealth effects: Bernanke & Gertler 1989, 1990, Holmström & Tirole 1997
  - Storage technology and economy-wide wealth constraints: Holmström & Tirole 1998, Caballero & Krishnamurthy, 2001
  - Endogenous liquidity & adverse selection over business cycle: Eisfeldt, 2004; House, 2006.
  - Financial liberalization: Aghion et al. 2004, Giannetti 2005

3. The Standard Model

- A unit mass of risk-neutral entrepreneurs
- Each endowed with wealth $A>0$ and a project that needs $I>A$
- Proportion h of entrepreneurs high types whose project succeeds with probability p_H and yields R_H
- Proportion 1- h low types whose project succeeds with probability p_L and yields R_L
  - $p_H R_H > I > p_L R_L$ and $R_L > R_H$

- Unlimited entry by rich outside investors
- Agent type private information
- Initial wealth and project success are verifiable
- Perfect storage technology

Timing of events:

1) Entrepreneurs choose whether to raise funds from outside or resort to storage

2) Entrepreneurs and financiers contract upon finance

3) Entrepreneurs execute their projects

4) Successful entrepreneurs compensate financiers. Consumption takes place

- Financial markets emerge if entrepreneurs' and financiers' IR constraints hold

- Entrepreneurs' IR constraints:
  - H-types: $\pi_H^e \equiv p_H(R_H - R_B) \geq A$
  - L-types: $\pi_L^e \equiv p_L(R_L - R_B) \geq A$

- R_B = the cost of capital, given by financiers' IR

- financiers' IR (zero-profit condition):

$$\overline{p} R_B = I - A$$

where

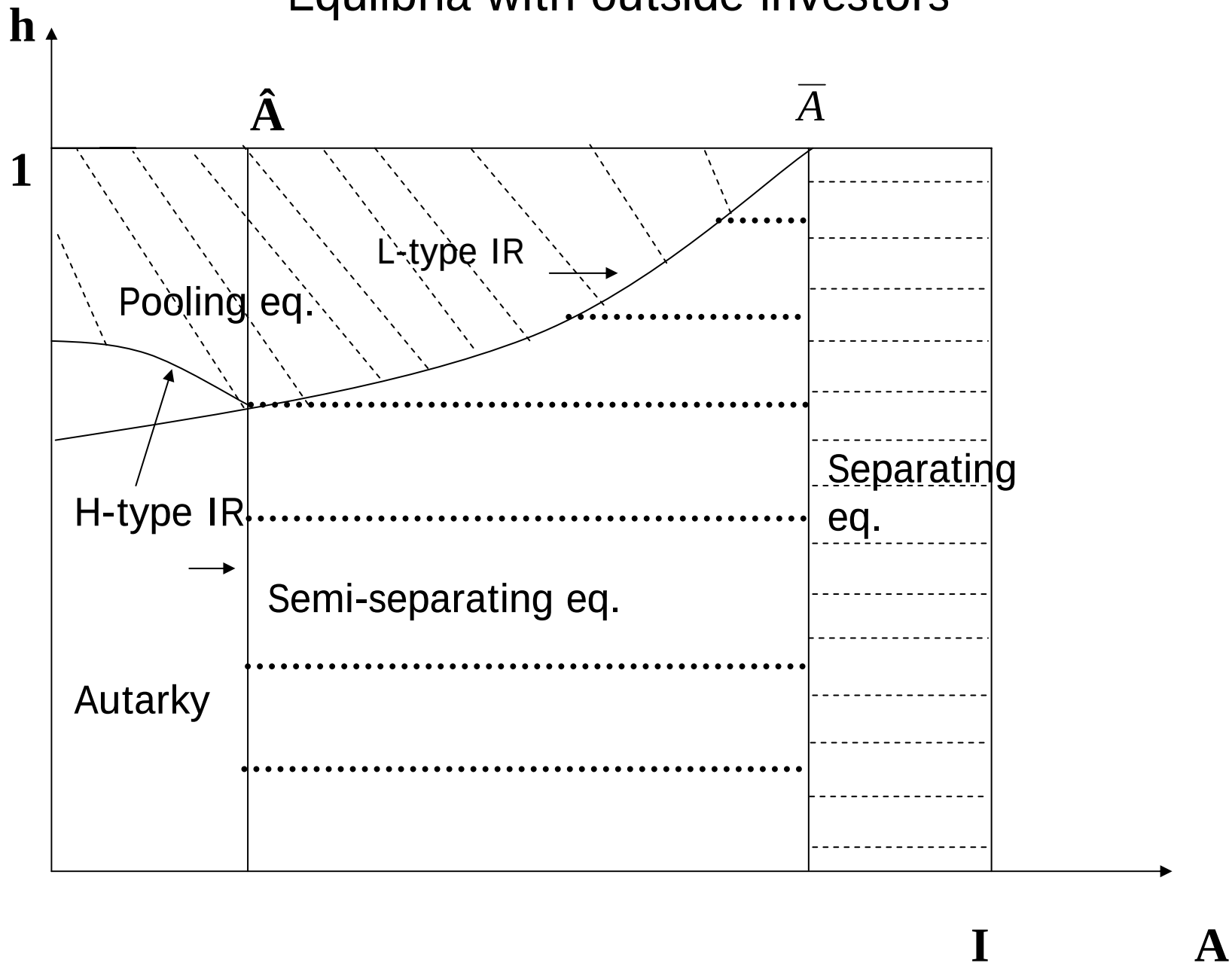
$\overline{p} = p_H$ in the separating equilibrium

$\overline{p} = hp_H + (1-h)p_L$ in the pooling equilibrium

$\overline{p} = \dfrac{hp_H + \mu_L(1-h)p_L}{h + \mu_L(1-h)}$ in the semi-separating equilibrium

where μ_L = proportion of L-type entrepreneurs

Equlibria with outside investors



4. The model without outside investors

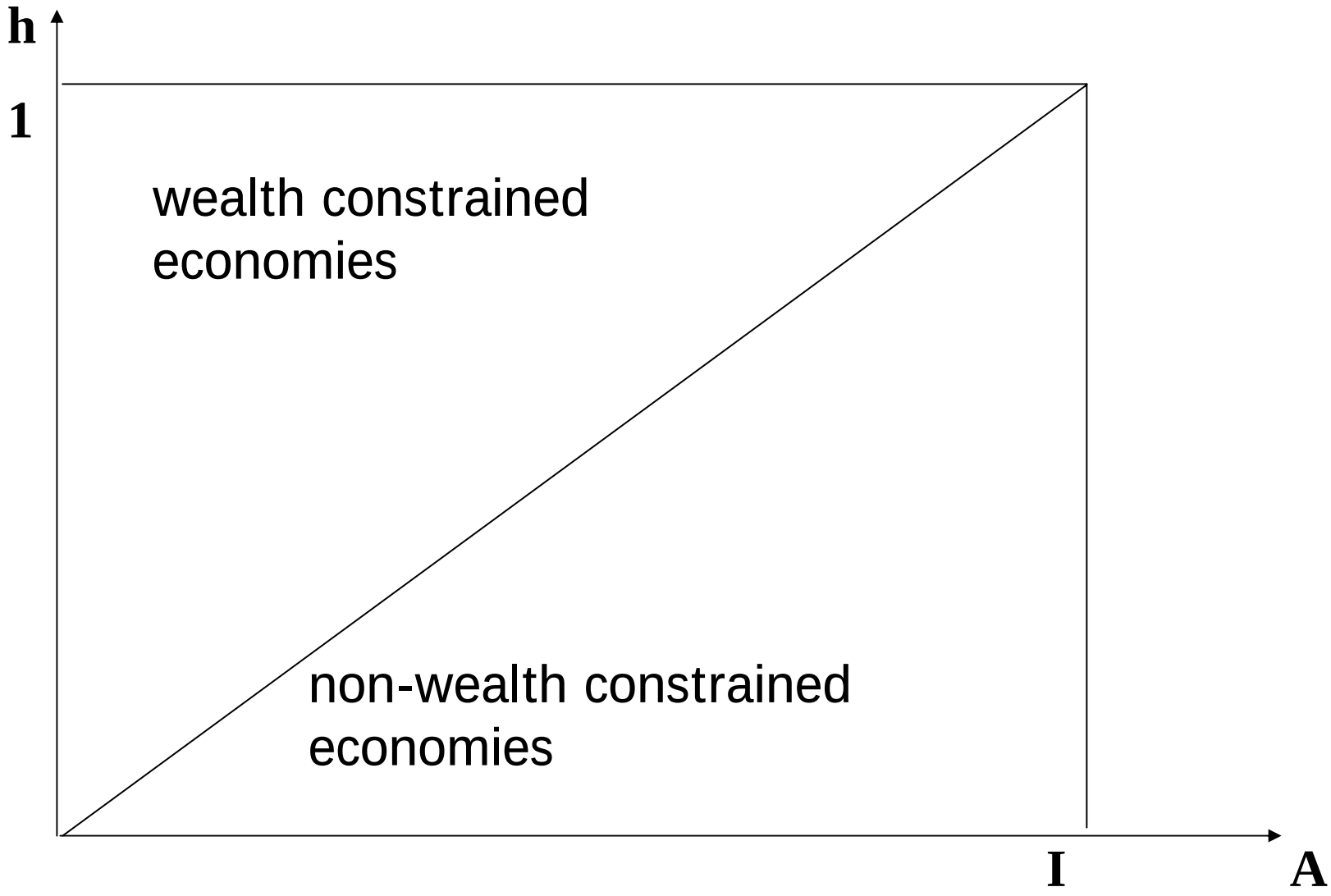
Timing of events:

1) Agents choose whether to invest as entrepreneurs or financiers, or resort to storage.

   - stages 2-4 as before

- Financial markets emerge if
  - agents' IR *and* IC constraints hold
  - demand and supply of funds are balanced (both amount and price)

Definition: An economy is **wealth constrained**, if the aggregate initial wealth is insufficient for all H-type projects



1) Entrepreneurs' IRs

- H-types: $\pi_H^e \equiv p_H(R_H - R_B) \geq R_F$
- L-types: $\pi_L^e \equiv p_L(R_L - R_B) \geq R_F$

where R_F = return on capital (invested as a financier)

2) Financiers' IR: $\pi^f \equiv R_F \geq A \equiv \pi^s$

3) Agents' IC: $\pi_i^{\,j} \geq \pi_i^{\,k} \;\; \forall i, j, k, \;\; i \in \{H,L\}, \;\; j,k \in \{e,f,s\}, j \neq k$

4) Demand and supply of funds (amount) :

$$(I\text{-}A)[\mu_H h + \mu_L(1\text{-}h)] = A[(1\text{-}\mu_H\text{-}\chi_H)h + (1\text{-}\mu_L\text{-}\chi_L)(1\text{-}h)]$$

5) Payments from entrepreneurs to financiers:

$$R_B[\mu_H h p_H + \mu_L(1\text{-}h)p_L] = R_F[(1\text{-}\mu_H\text{-}\chi_H)h + (1\text{-}\mu_L\text{-}\chi_L)(1\text{-}h)]$$

- μ_i = proportion of type ***i*** entrepreneurs
- χ_i = proportion of type ***i*** agents using storage technology

Example: H^eL^{ef} (μ_H=1, 0<μ_L<1, χ_H=χ_L=0)

1) $R_F > A$

- Both types participate

2) $P_H(R_H - R_B) > R_F$

- H-types prefer entrepreneurship to becoming a financier

3) $P_L(R_L - R_B) = R_F$

- L-types indifferent

4) $(I\text{-}A)[h+\mu_L(1\text{-}h)]=A(1\text{-}\mu_L)(1\text{-}h)$

- Aggregate supply of funds = aggregate demand

5) $R_B[hp_H+\mu_L(1\text{-}h)p_L]=R_F(1\text{-}\mu_L)(1\text{-}h)$

- interest charged from borrowers = interest paid to financiers

$\Rightarrow$ solve (1)-(5) to see where the equilibrium exist and what are endogenous variables R_B, R_F, μ_L

4) & 5) $\Rightarrow \boldsymbol{R_B}$ & $\boldsymbol{R_F}$ are linked

$\Rightarrow$ changes in exogenous parameters $\boldsymbol{A}, \boldsymbol{I}, \boldsymbol{h}, \boldsymbol{p_i}$ will have an impact on both sides of IRs and ICs

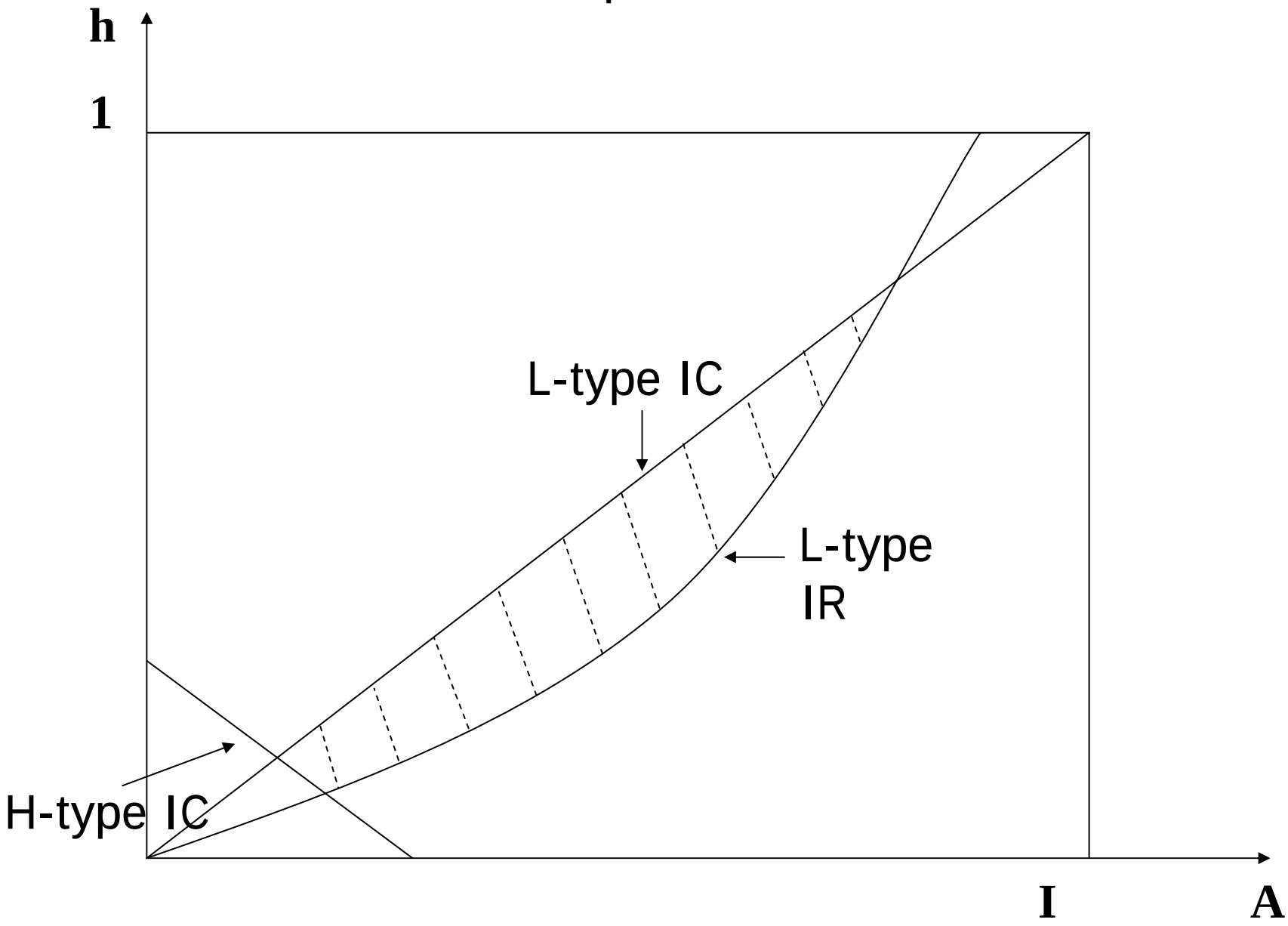
E.g., $\boldsymbol{A} \uparrow$

$\Rightarrow \boldsymbol{R_B} \downarrow \Rightarrow \boldsymbol{R_F} \downarrow$

$\Rightarrow$ entrepreneurship more attractive and financiership less attractive

$\Rightarrow \boldsymbol{\mu_L} \uparrow$

Equilbrium H^e L^{ef}



More generally: potentially 6 types of equilibria

Table 1
TYPES OF EQUILIBRIA

	$\mu_L = 0$	$0 < \mu_L < 1$	$\mu_L = 1$
$\mu_H = 0$	AUTARKY	Not possible	Not possible
$0 < \mu_H < 1$	$H^{ef}\, L^{f}$	$H^{ef}\, L^{ef}$	$H^{ef}\, L^{e}$
$\mu_H = 1$	$H^{e}\, L^{fs}$	$H^{e}\, L^{ef}$, $H^{e}\, L^{efs}$	Not possible

5. Findings

Efficiency:

- Low and high initial wealth like in the standard model

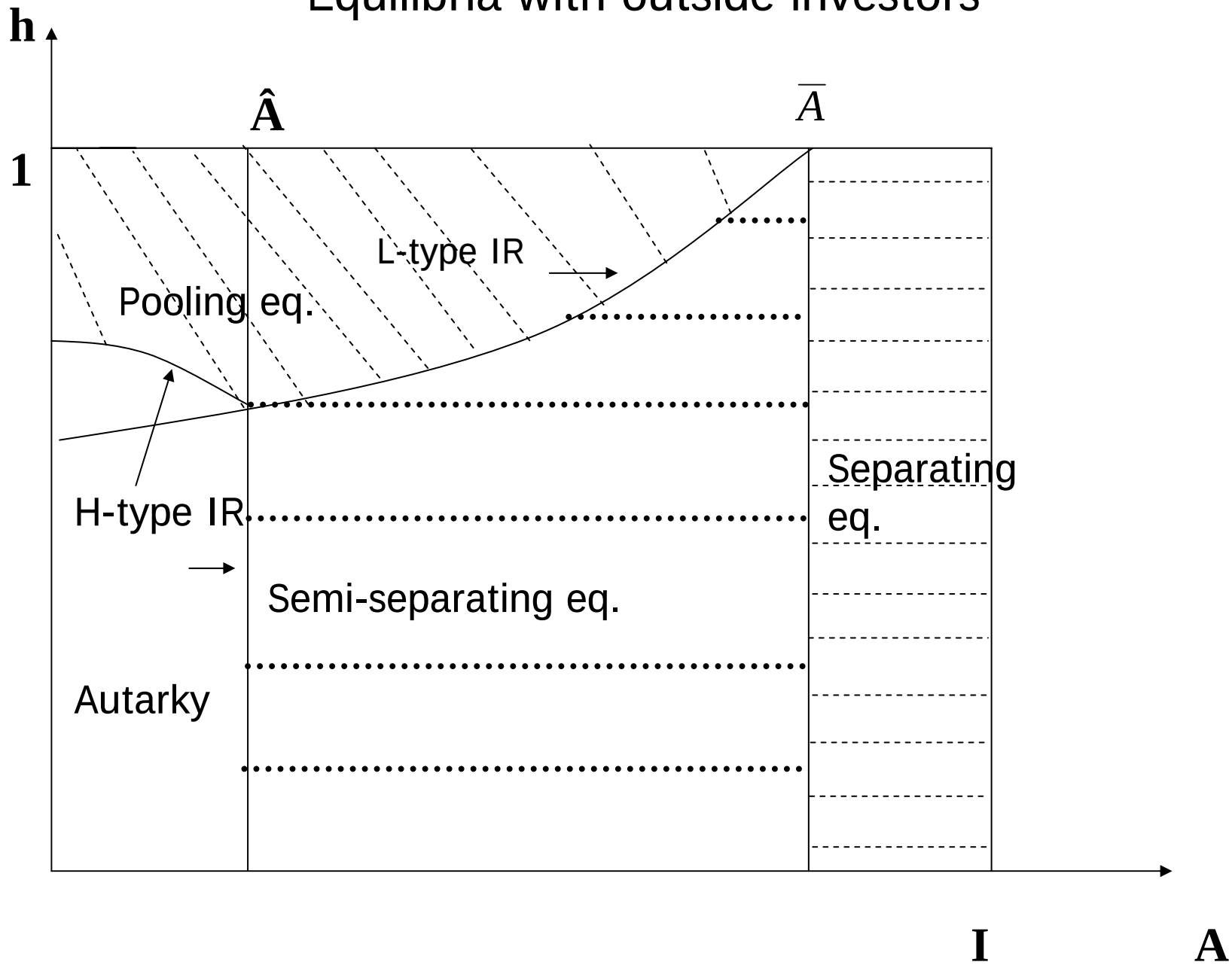
- Intermediate wealth: Pareto-efficiency if wealth constraints

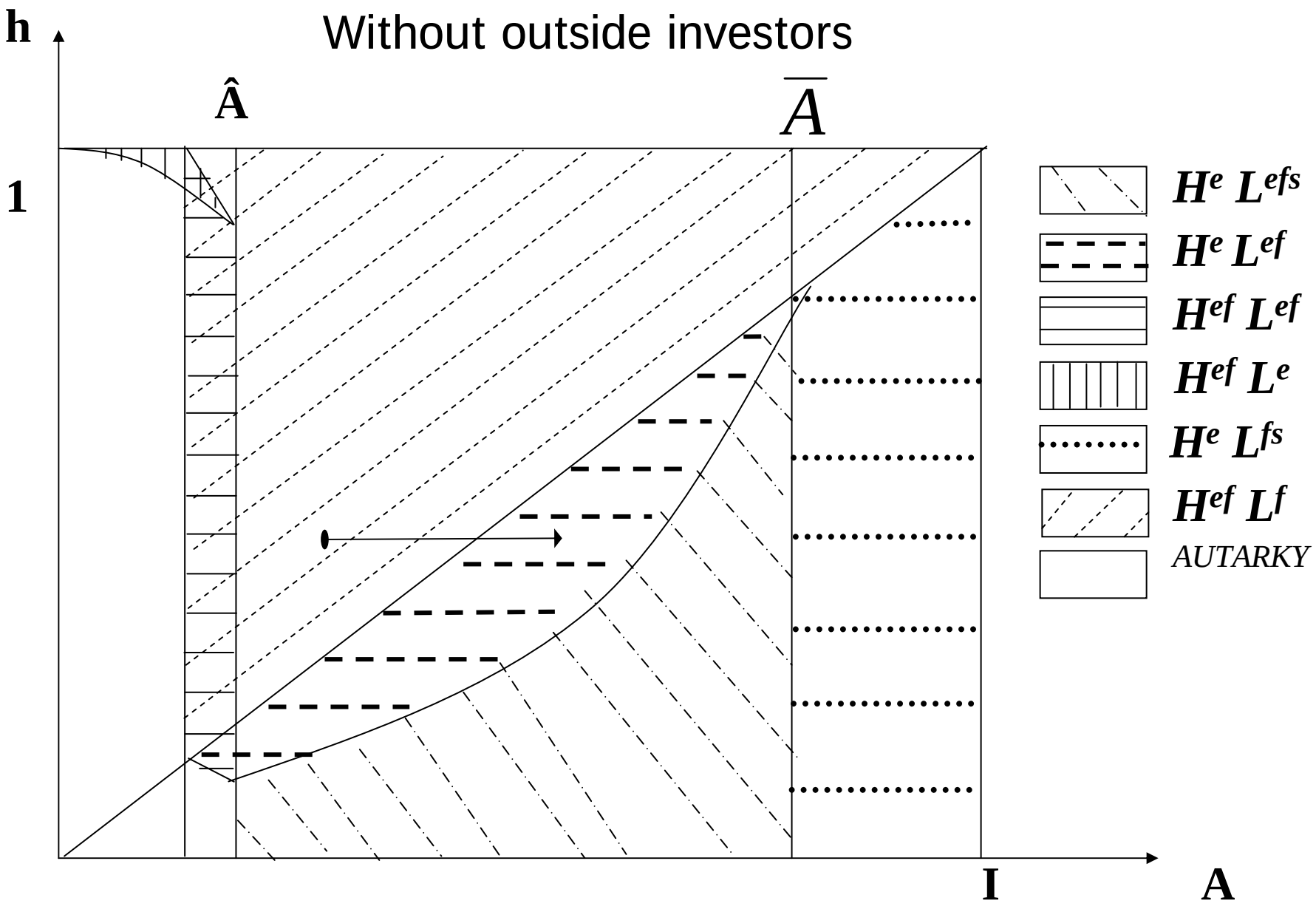
- funds are scarce $\Rightarrow$ the interest rate increases and bad projects become unattractive and financiership attractive

$\Rightarrow$ financial liberalization bad for economies with intermediate initial wealth

$\Rightarrow$ increasing liquidity can reduce efficiency

Equilibria with outside investors



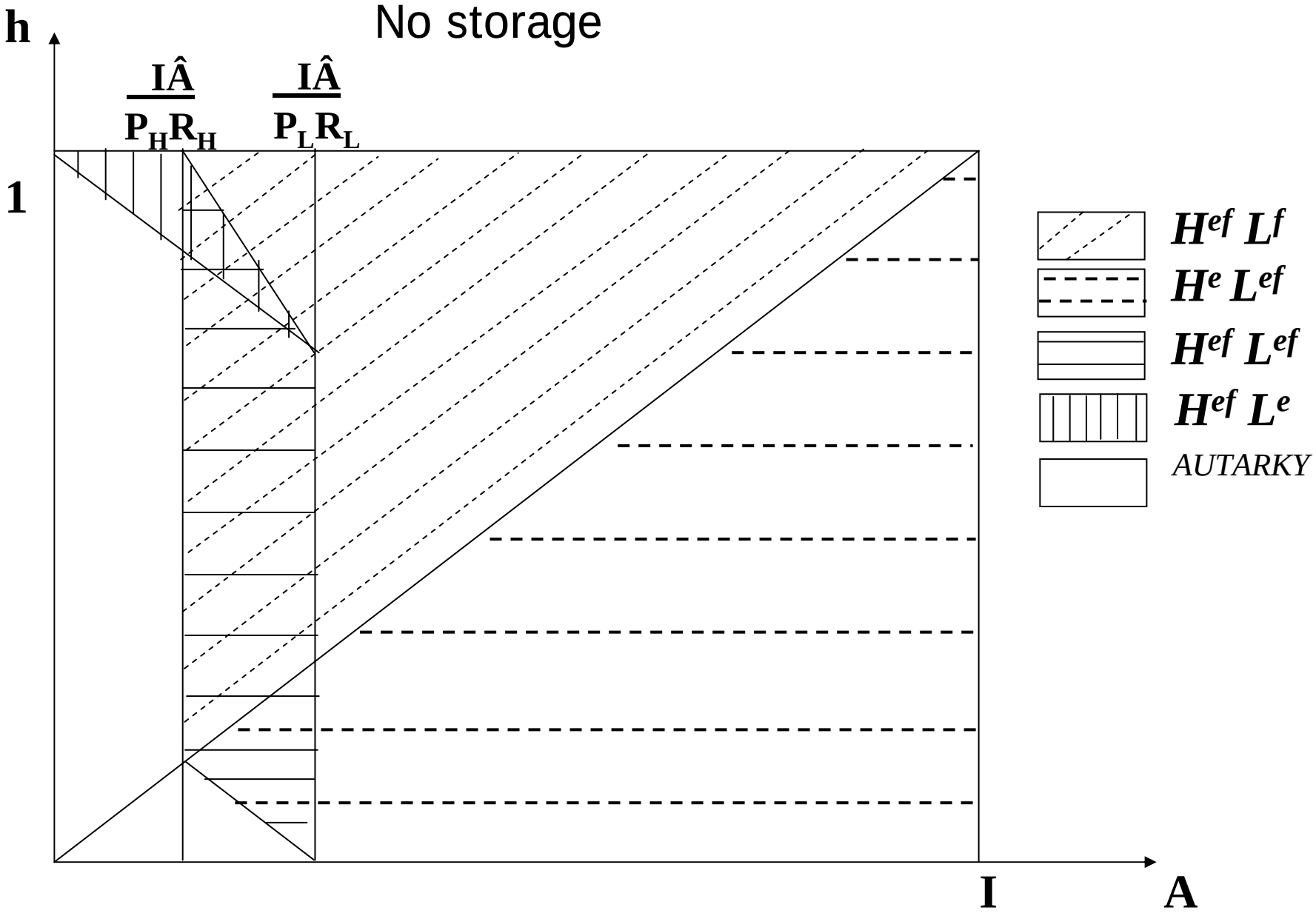

h
Without outside investors
Â
$\overline{A}$
1
$H^e\ L^{efs}$
$H^e\ L^{ef}$
$H^{ef}\ L^{ef}$
$H^{ef}\ L^e$
$H^e\ L^{fs}$
$H^{ef}\ L^f$
AUTARKY
I
A

Storage technology:

- Generally less used without outside investors
- Assume A depreciates (inflation) with rate $1-\delta$, let $\delta \to 0$

$\Rightarrow$ the efficient equilibrium in non-wealth constrained economies vanishes but little other effects

$\Rightarrow$ financial markets alone can take care of asset transformation


No storage
h
1
IÂ
P_H R_H
IÂ
P_L R_L
I
A
H^ef L^f
H^e L^ef
H^ef L^ef
H^ef L^e
AUTARKY

6. Conclusion

- Under private information, simple financial markets (even without storage) can work pretty well because of advantageous selection
- Financial liberalization or increases in liquidity can be harmful with intermediate initial wealth
- Insufficient wealth can hold back entrepreneurship and that is
  - efficient if lot of liquidity
  - inefficient if liquidity is scarce