

The Macroeconomics of Debt Overhang

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New Investment Opportunity (Myers 77)

- Cost 8, expected revenue 10, financed by junior debt
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 - Senior Debt: $95+3 = 98$
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 - Equity: $5-1 = 4$
- Conclusion: **Equity holders will oppose the project**

The Relevance of Debt Overhang

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 - Should governments bail out banks? How?
 - Should government force mortgage renegotiations? How?
 - Consequences of financial globalization?
- In 20 minutes and without complicated equations ...

- Closed economy
- Households

$$U = E \left[c_1 + \frac{c_2}{\delta} \right]$$

- Financial intermediaries

Fig 1: Timing, Technology and Balance Sheets

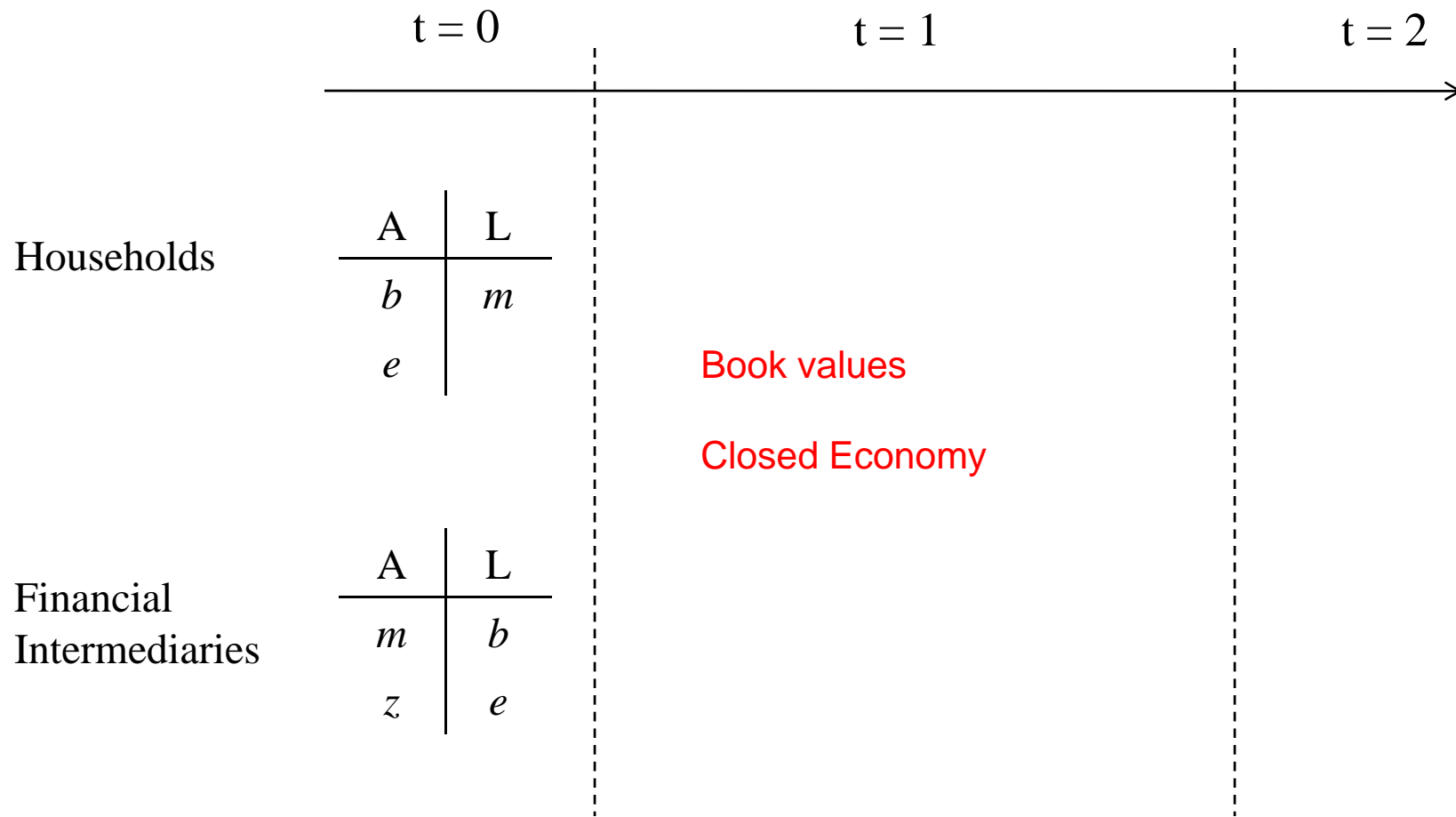


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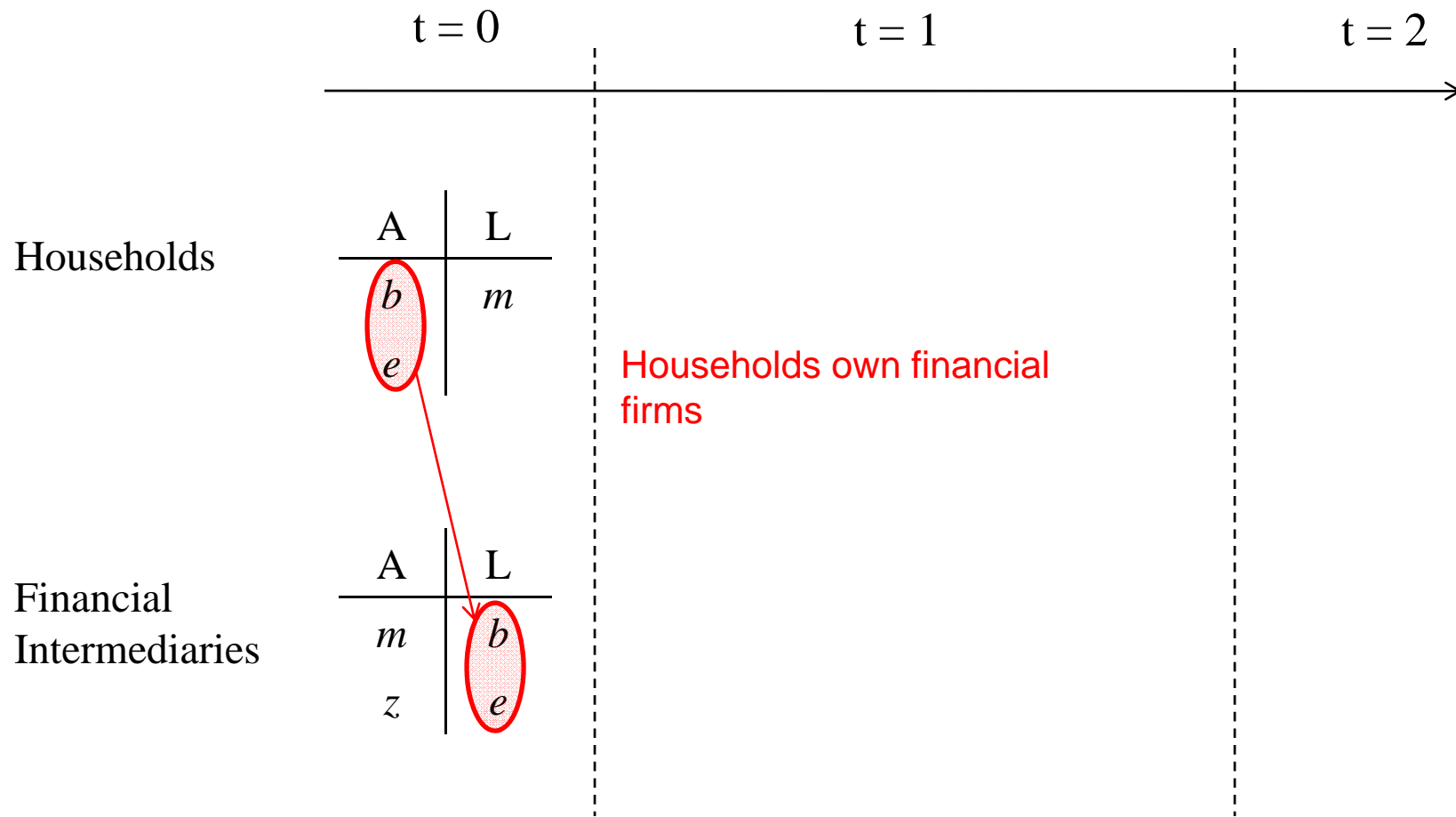


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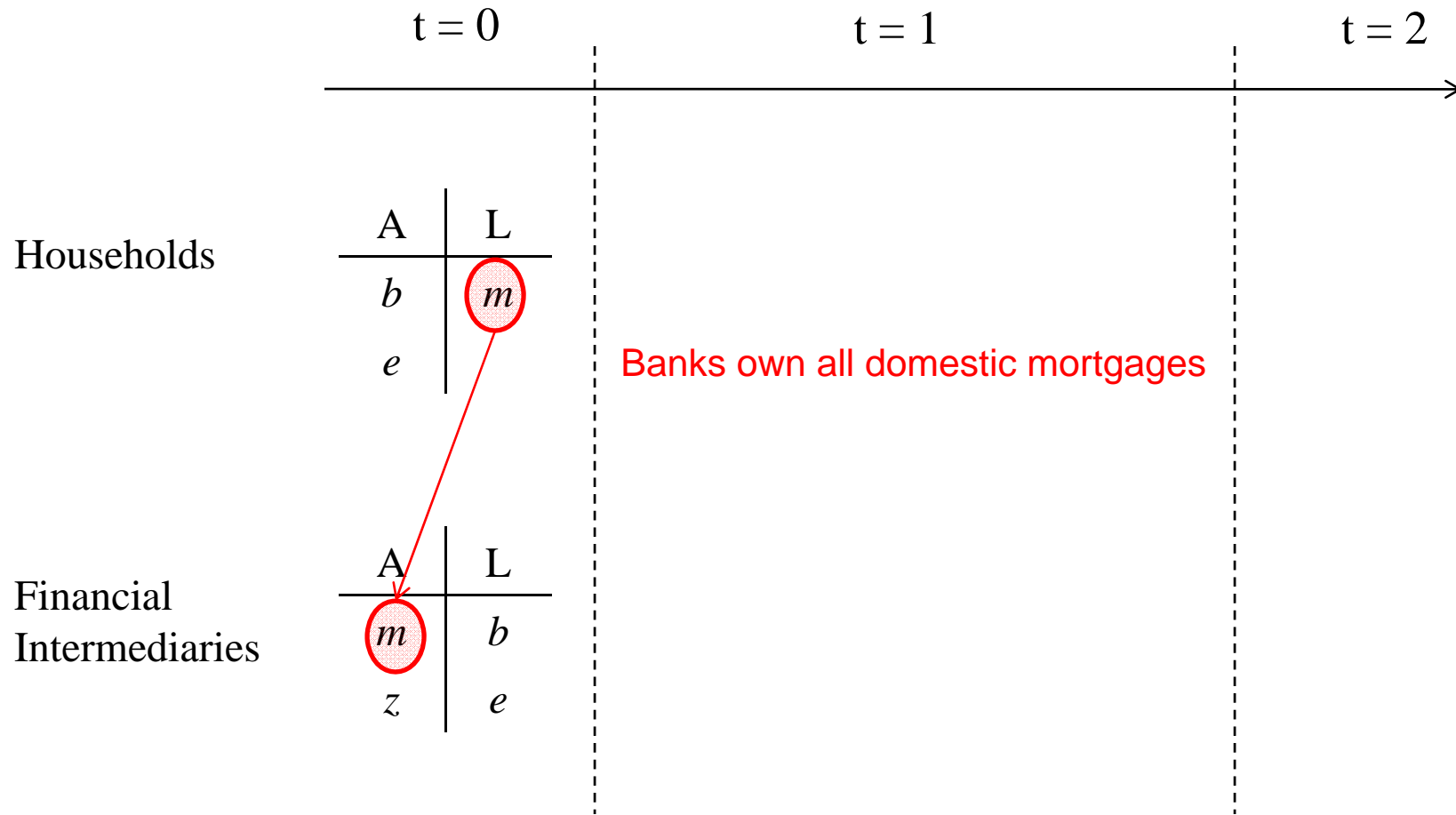


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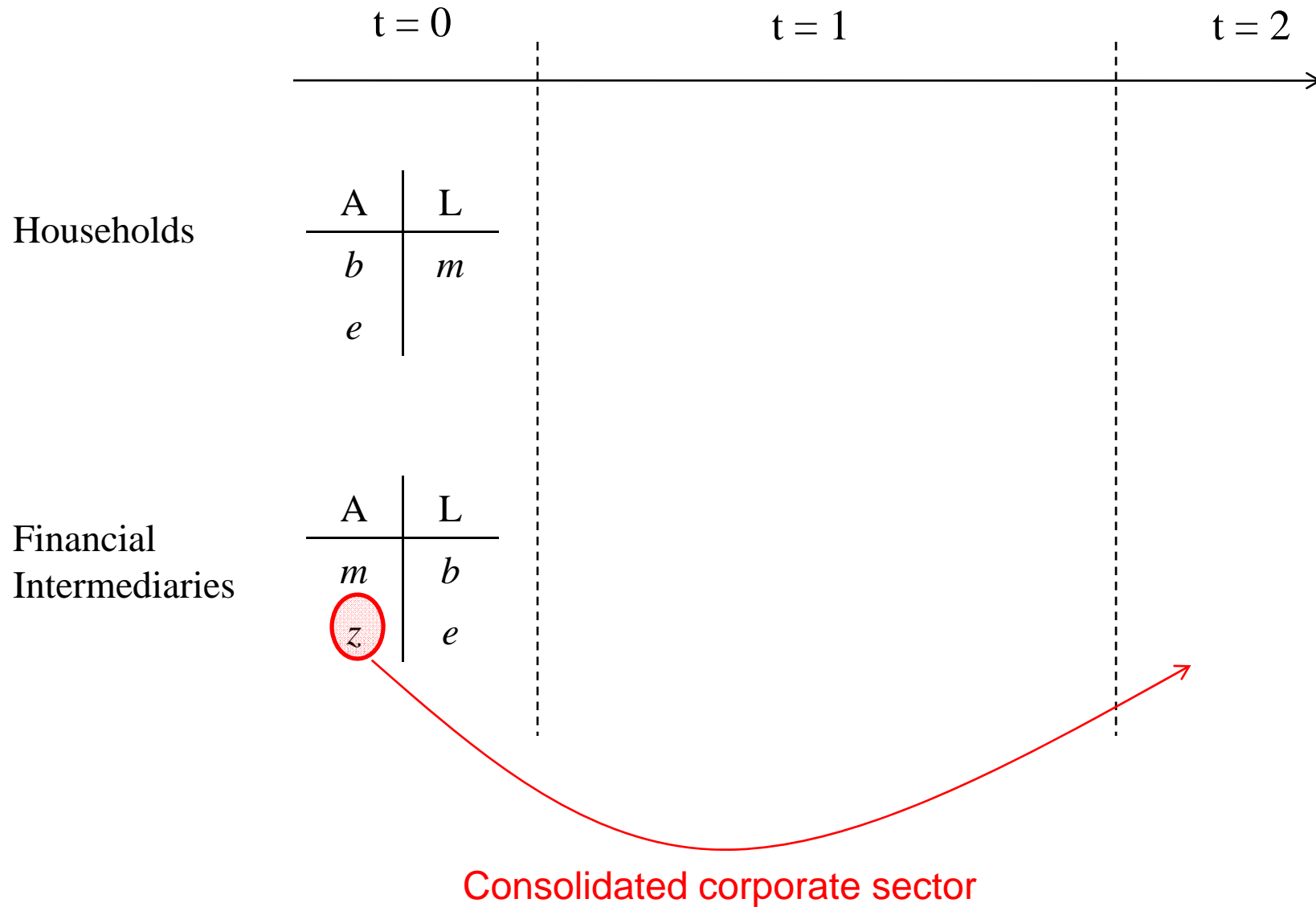


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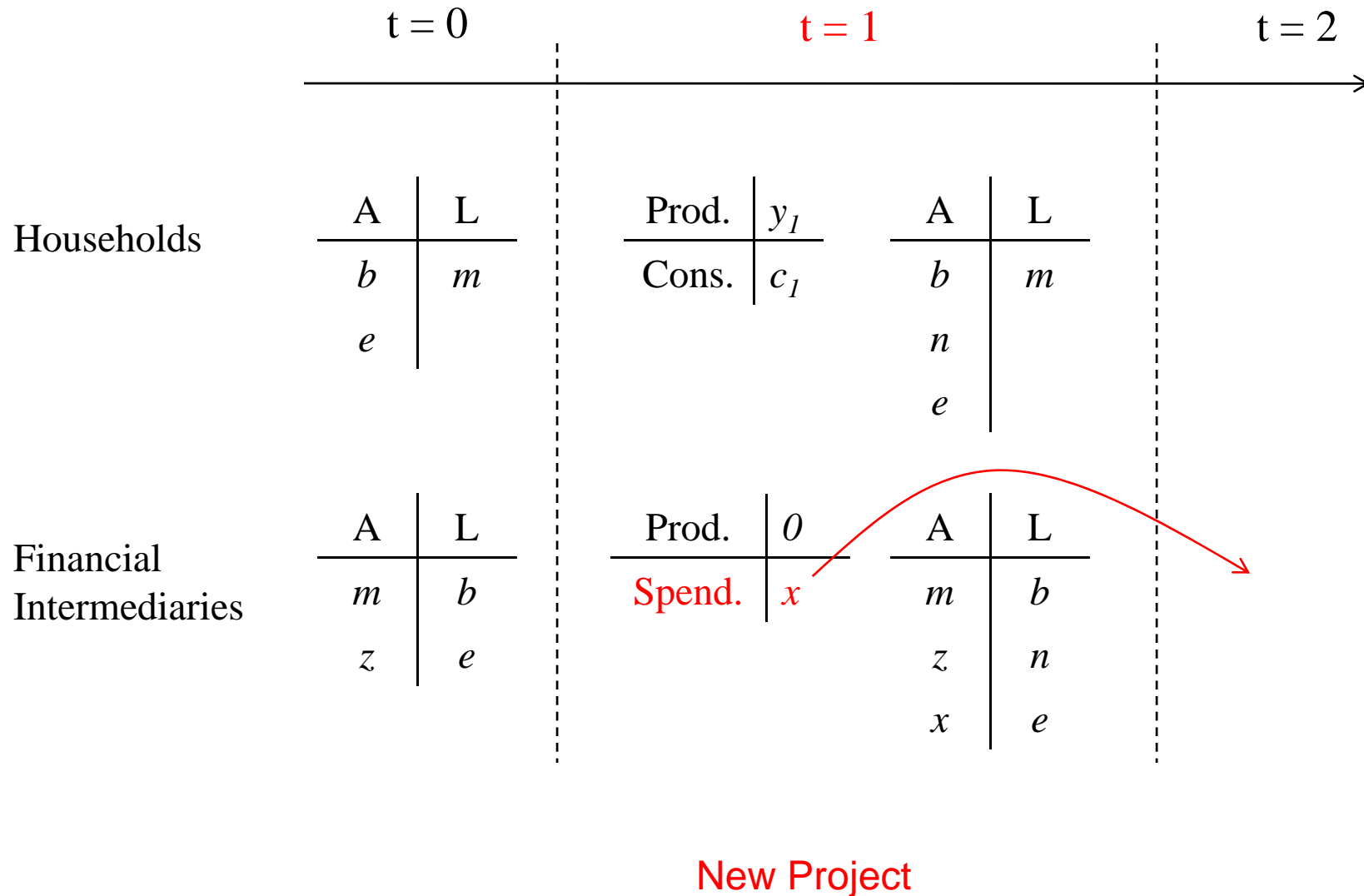


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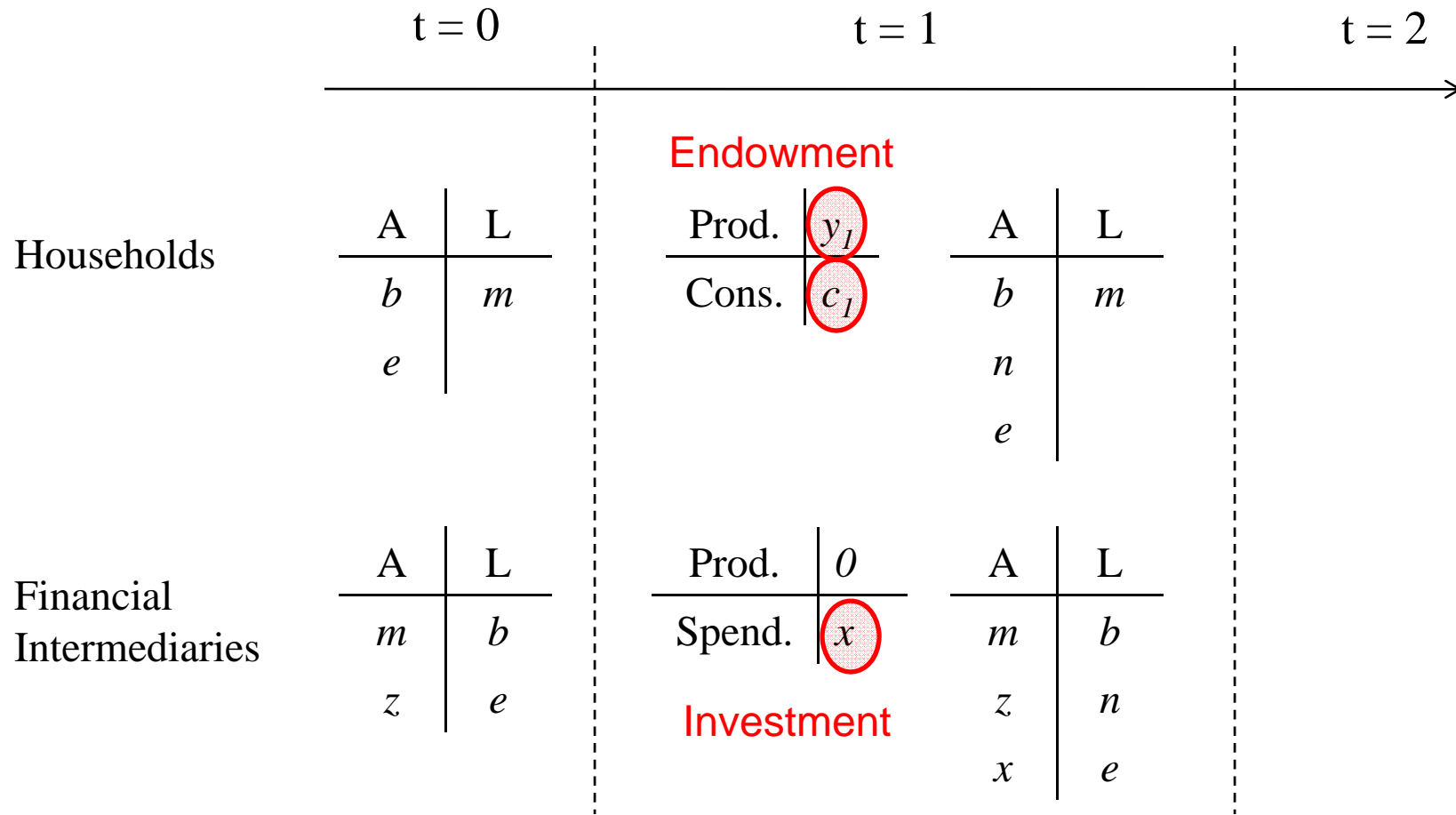


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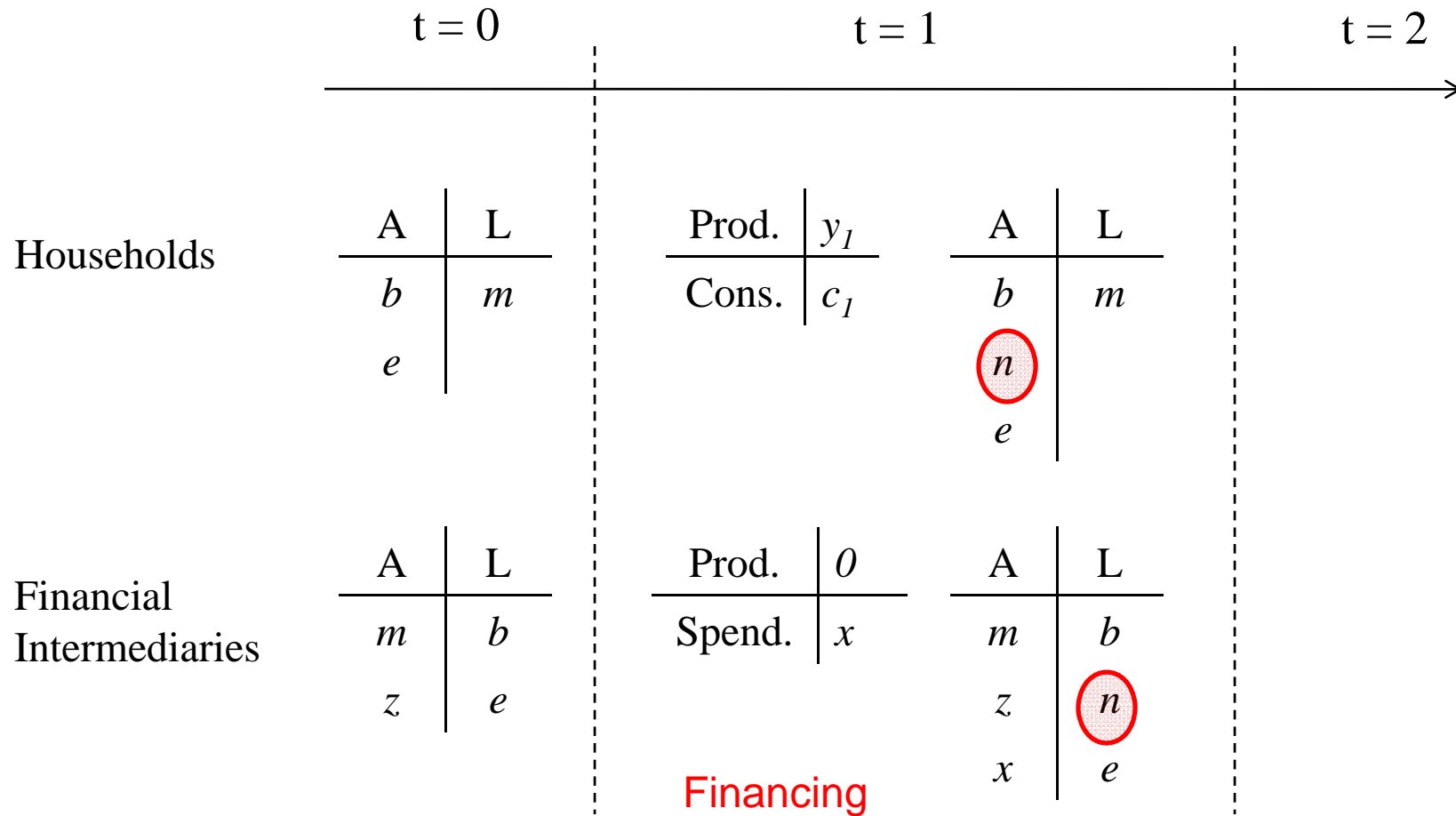
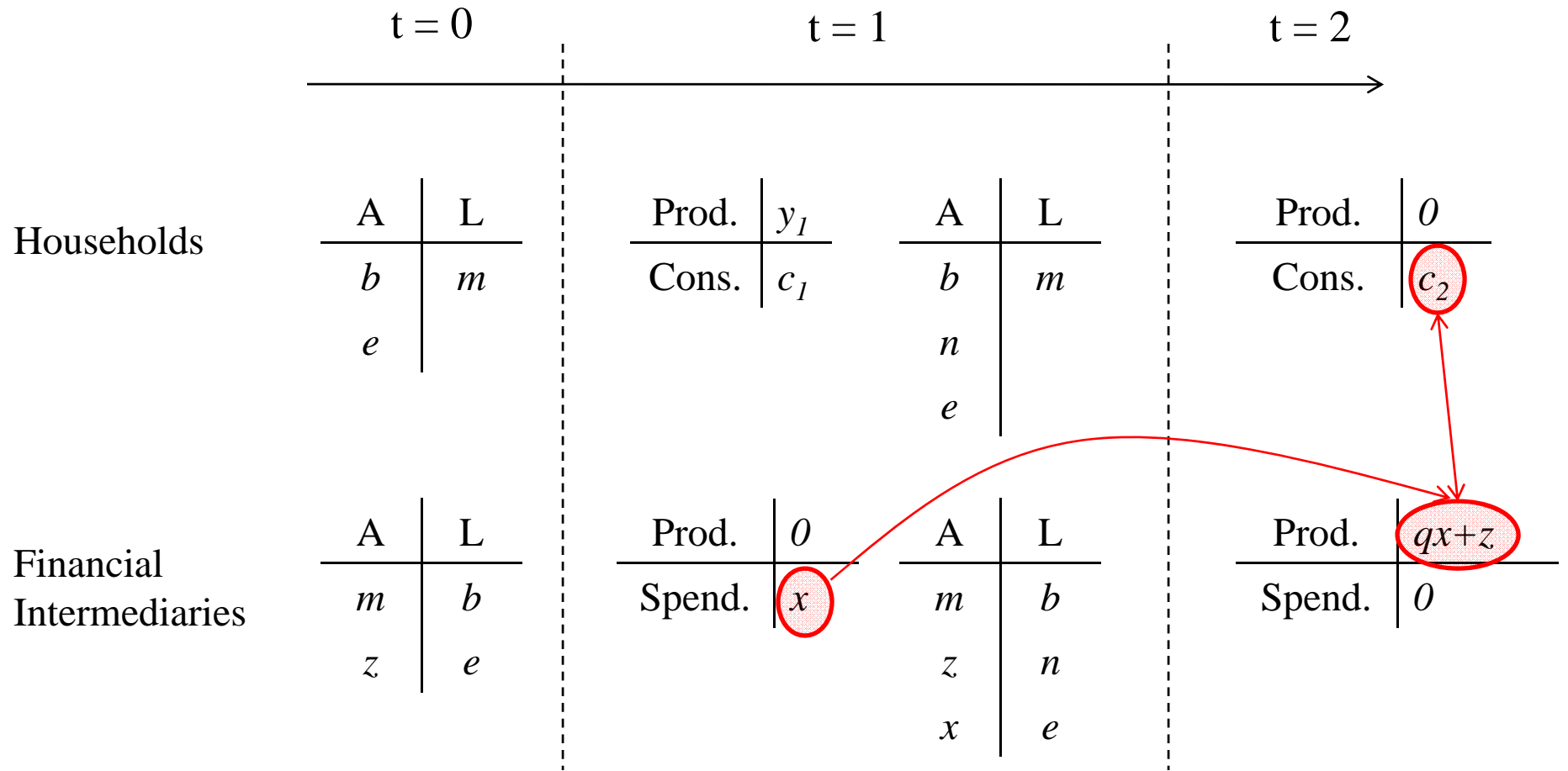


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Model: investment & first best

- Productivity q

$$y_2 = z + qx$$

with Leontieff technology

$$x \in \{0, X\}$$

First Best

- Since $q > \delta$, efficient to invest as much as possible
- Assume initial endowment large enough

$$\bar{x} = X$$

and

$$c_1 = \bar{y}_1 - X$$

Debt Overhang Assumption: *The initial banks' bonds b (resp. households' loans m) are senior to the claims that can issued at date 1.*

Household Debt Overhang: Saving Distortion

- Debt overhang makes maximization program convex: either save everything, or consume everything
- There exist a threshold \hat{m}

$$\hat{m} \equiv (r - \delta) \left(y_1 + \frac{\bar{\rho}_b + \bar{e}}{r} \right)$$

- Excessive short term consumption when $m > \hat{m}$
- Maximum saving when $m < \hat{m}$
- Depends on rate spread and wealth
- Bad macro performance, lower wealth, higher defaults

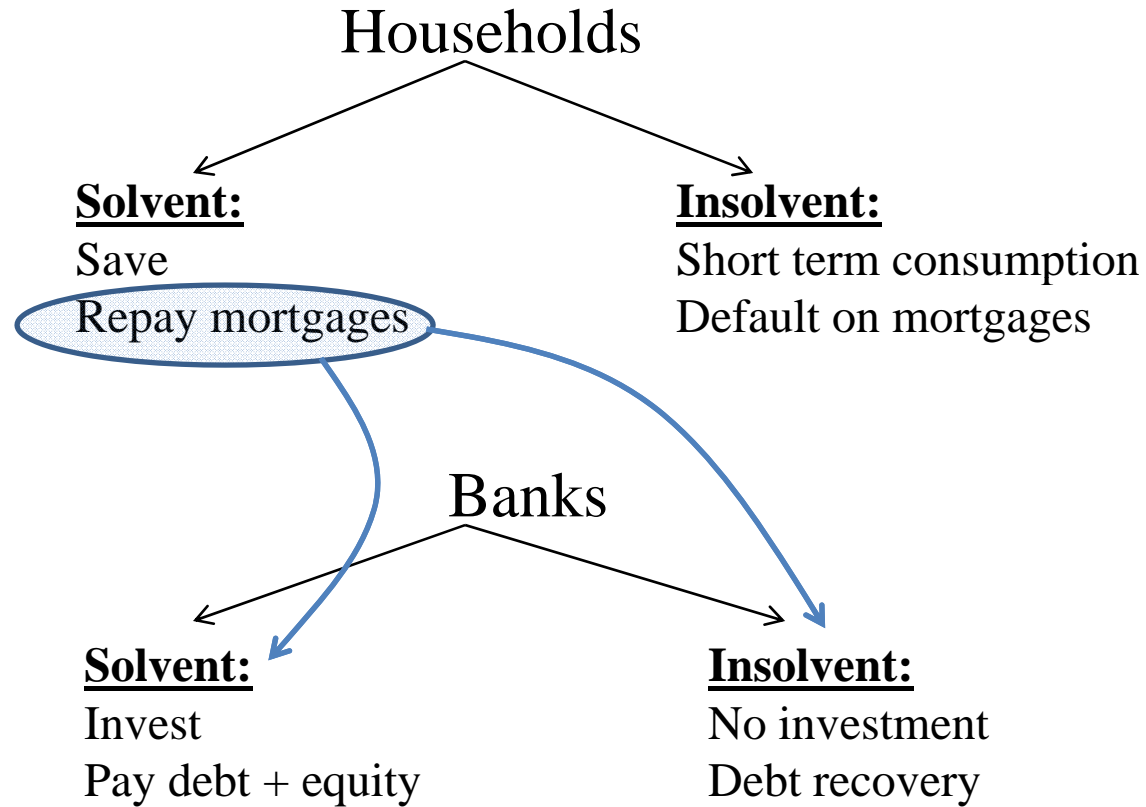
Bank Debt Overhang: Investment Distortion

- Same idea as in simple numerical example
- There is a threshold \hat{b}

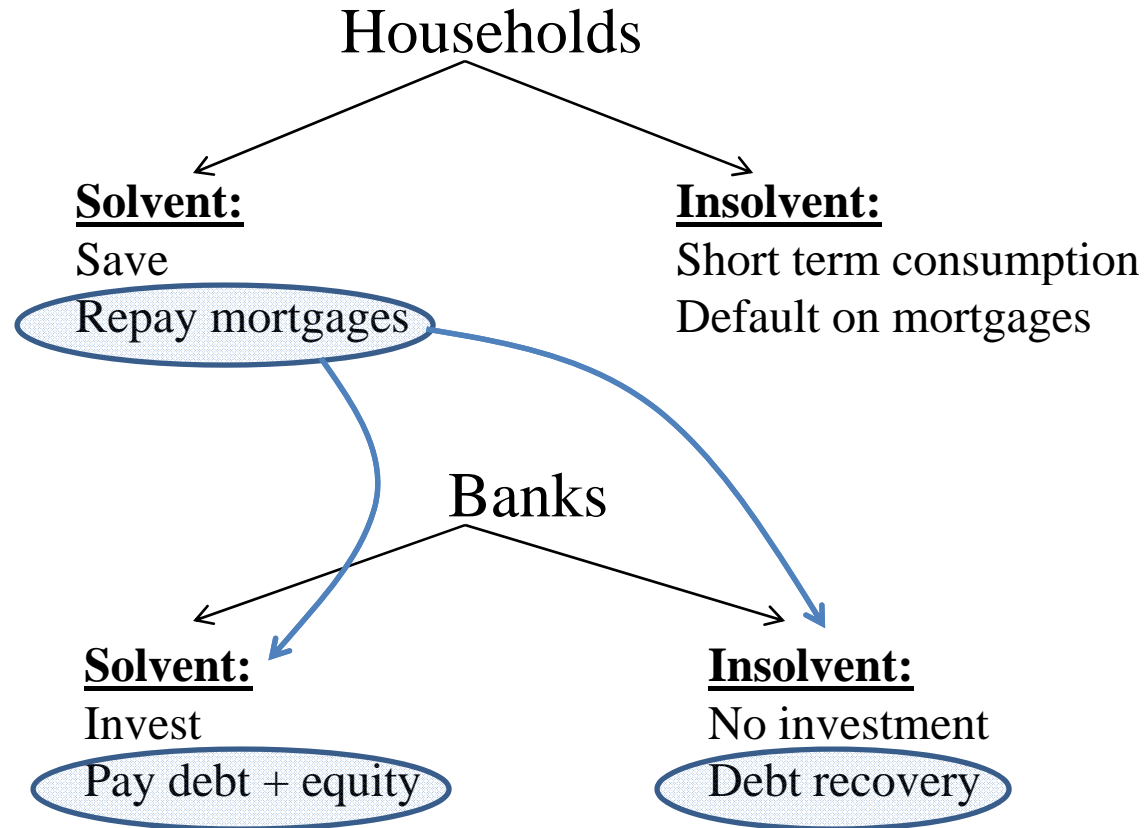
$$\hat{b} \equiv z + \bar{\rho}_m + (q - r) X.$$

- Banks with debt $b > \hat{b}$ do not finance new investments
- Threshold depends on performance of outstanding loans
- Expect non performing loans \rightarrow impaired balance sheet \rightarrow debt overhang \rightarrow less investment

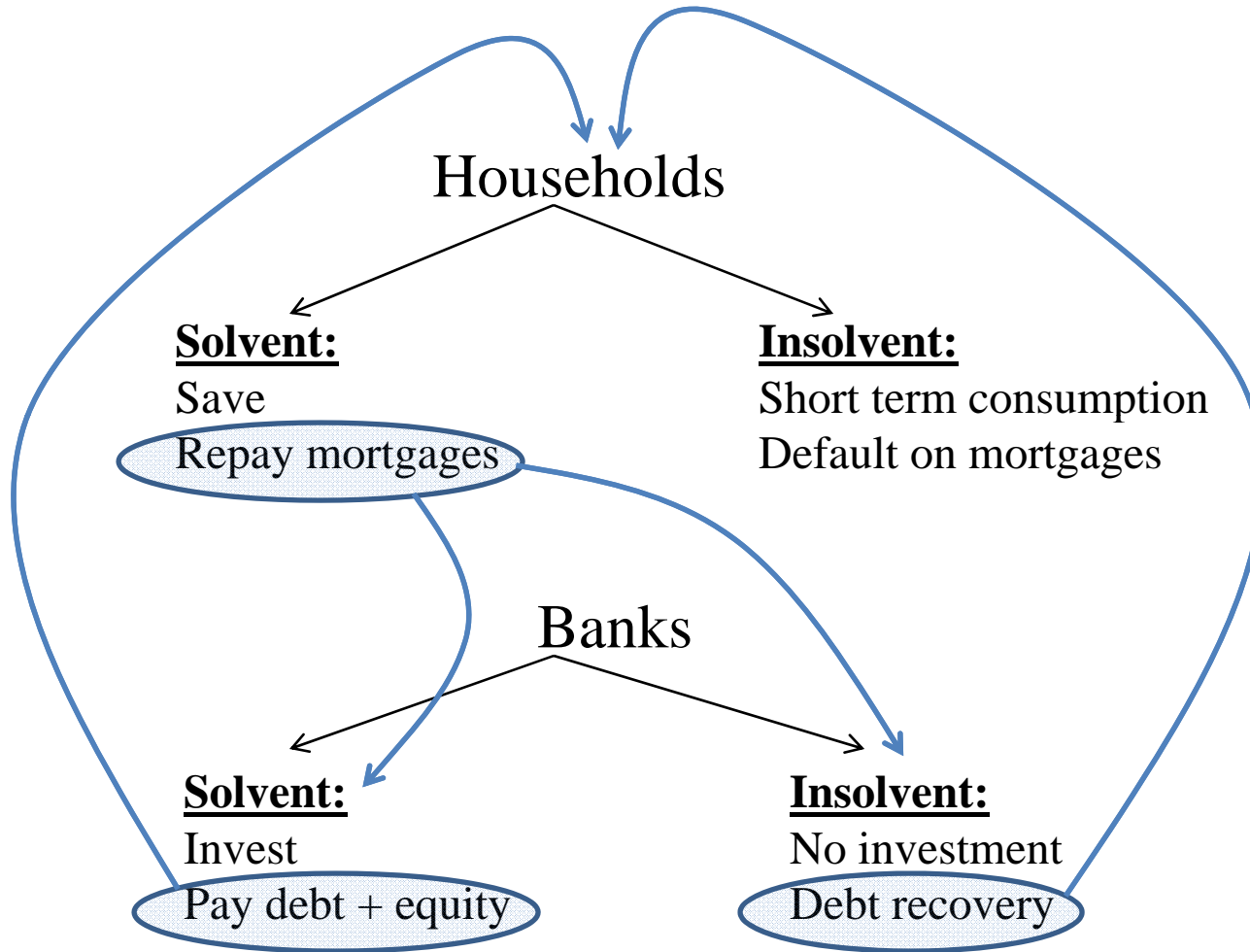
Mortgage Performance Cycle



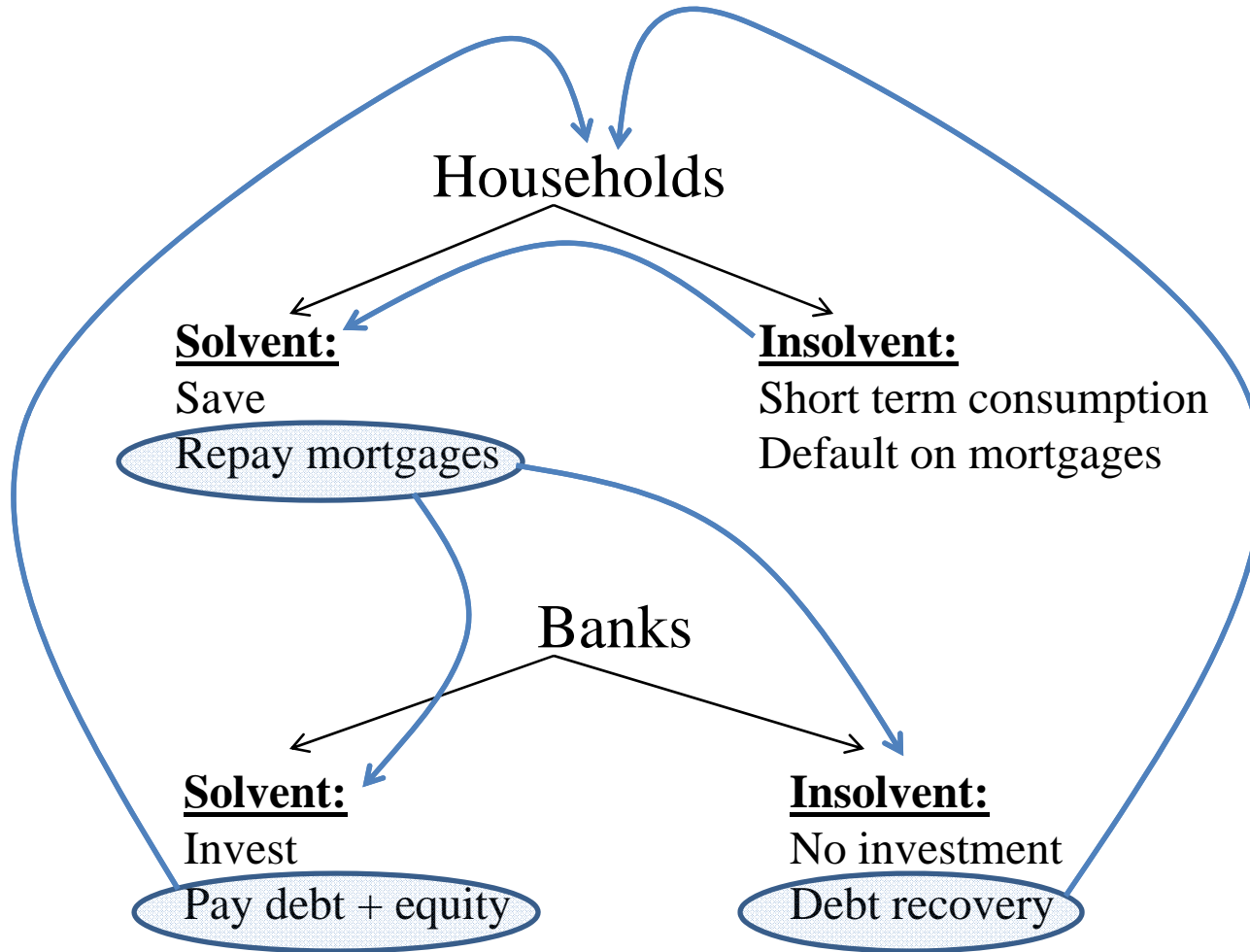
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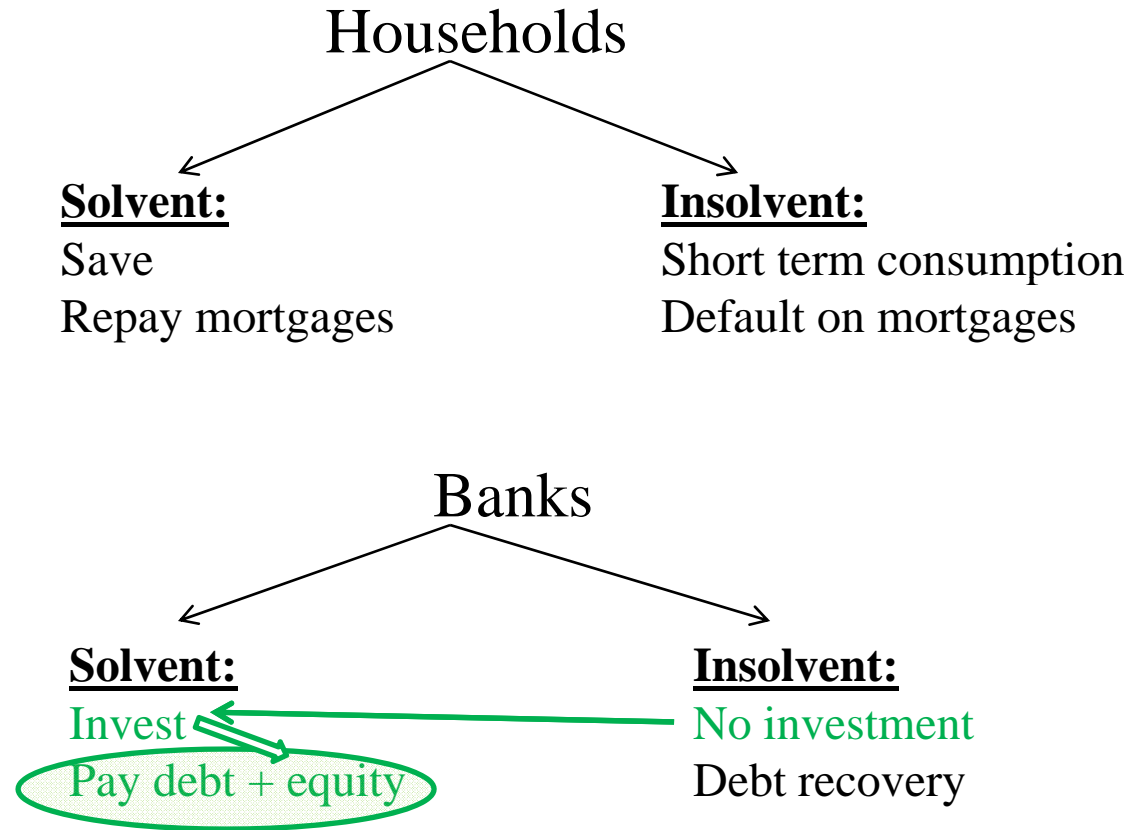
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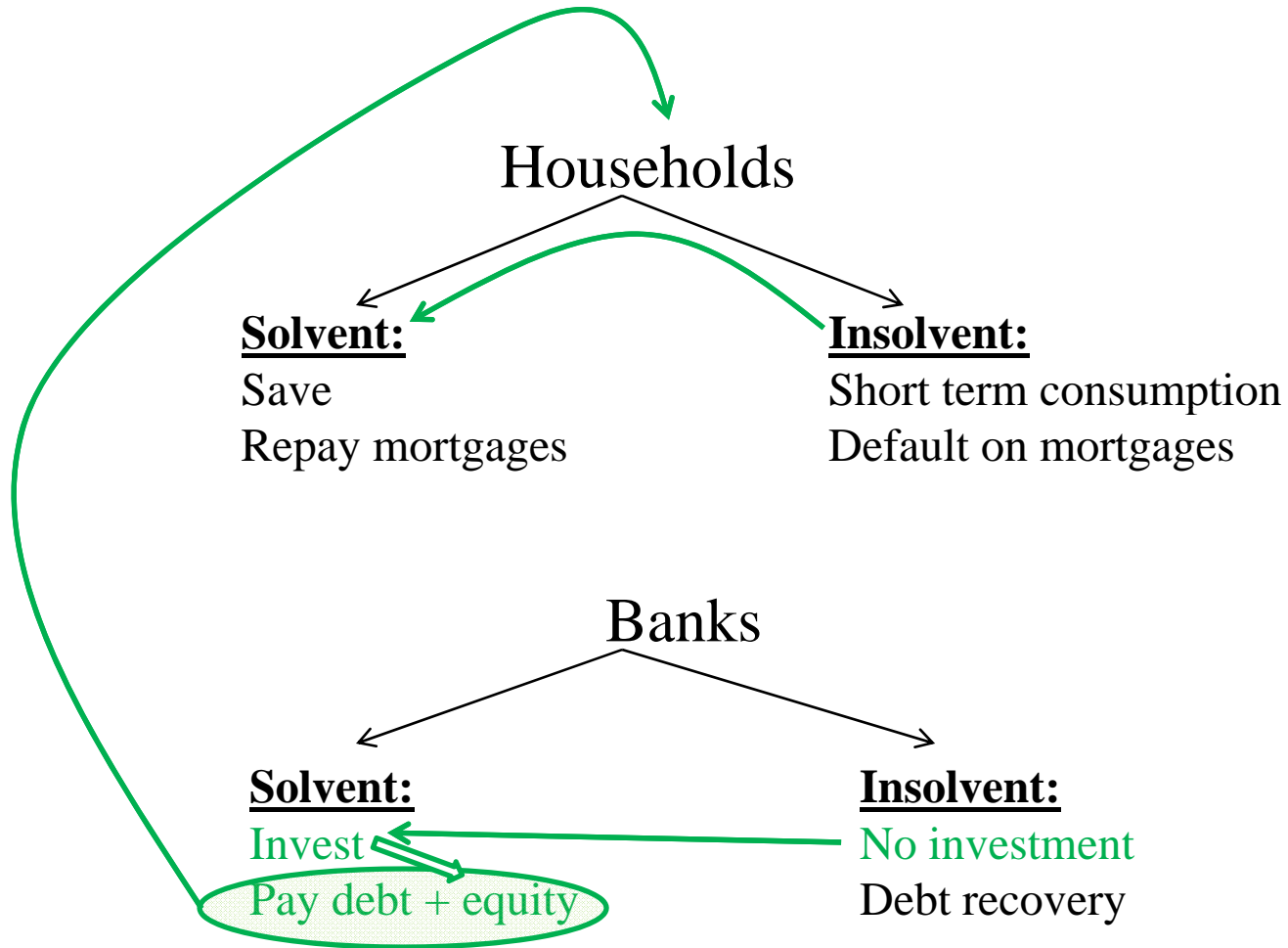
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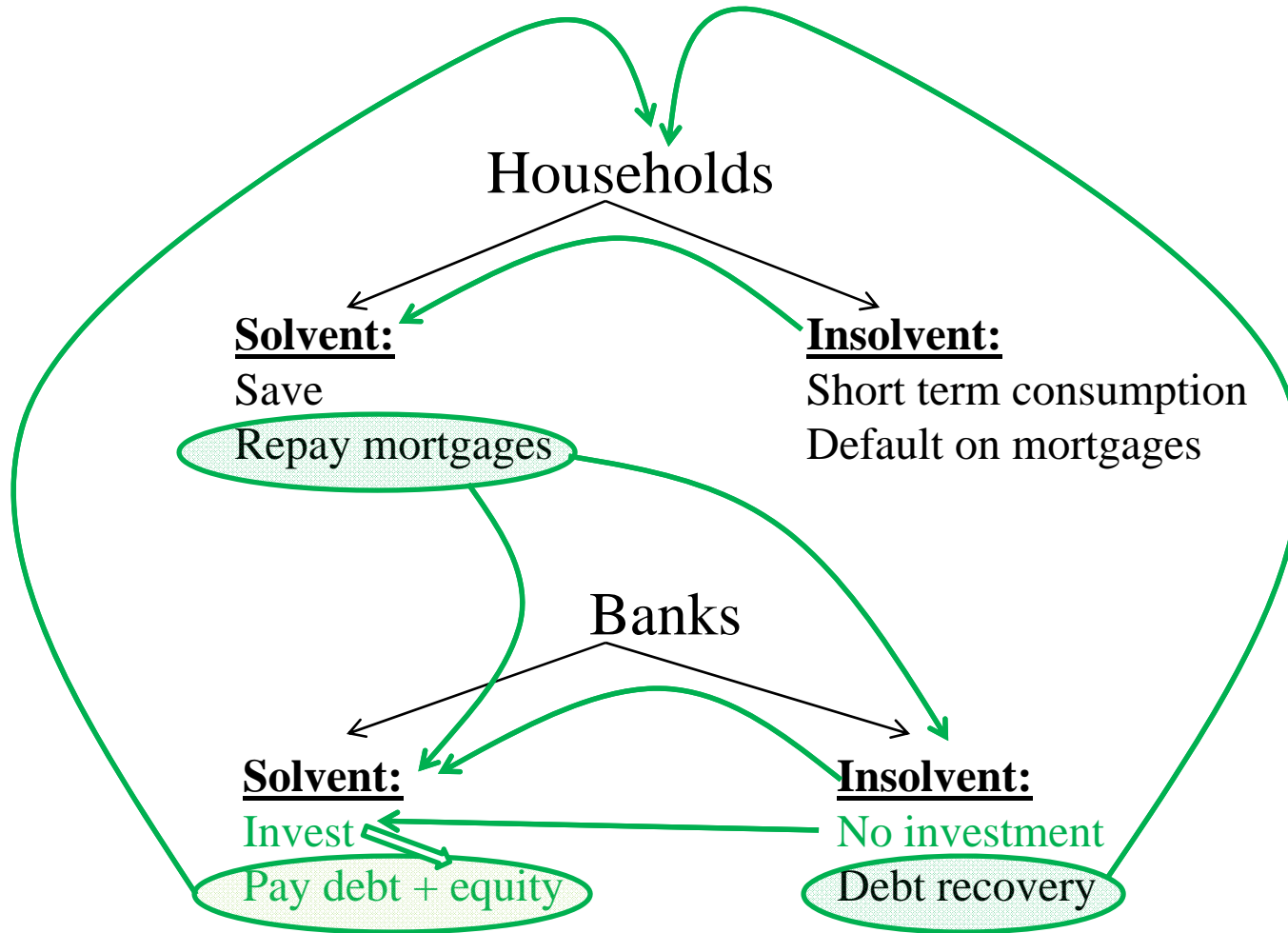
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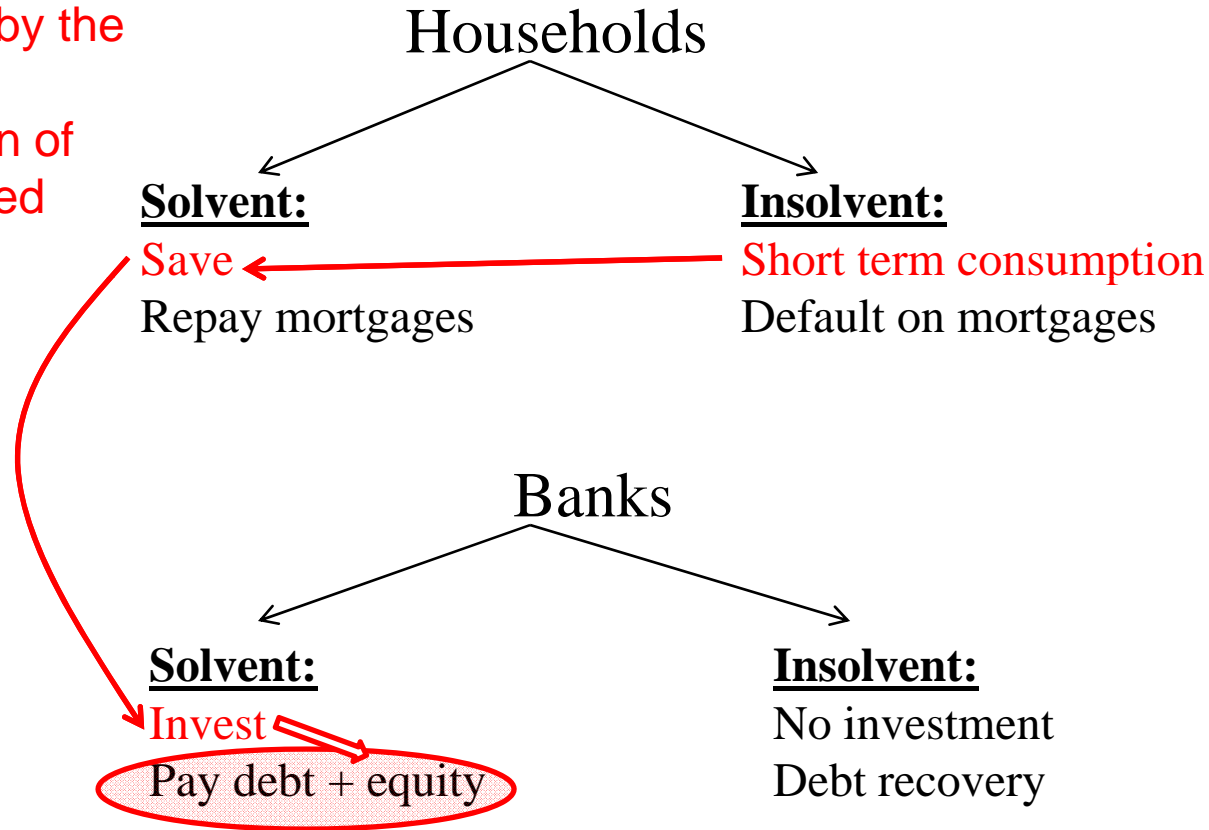


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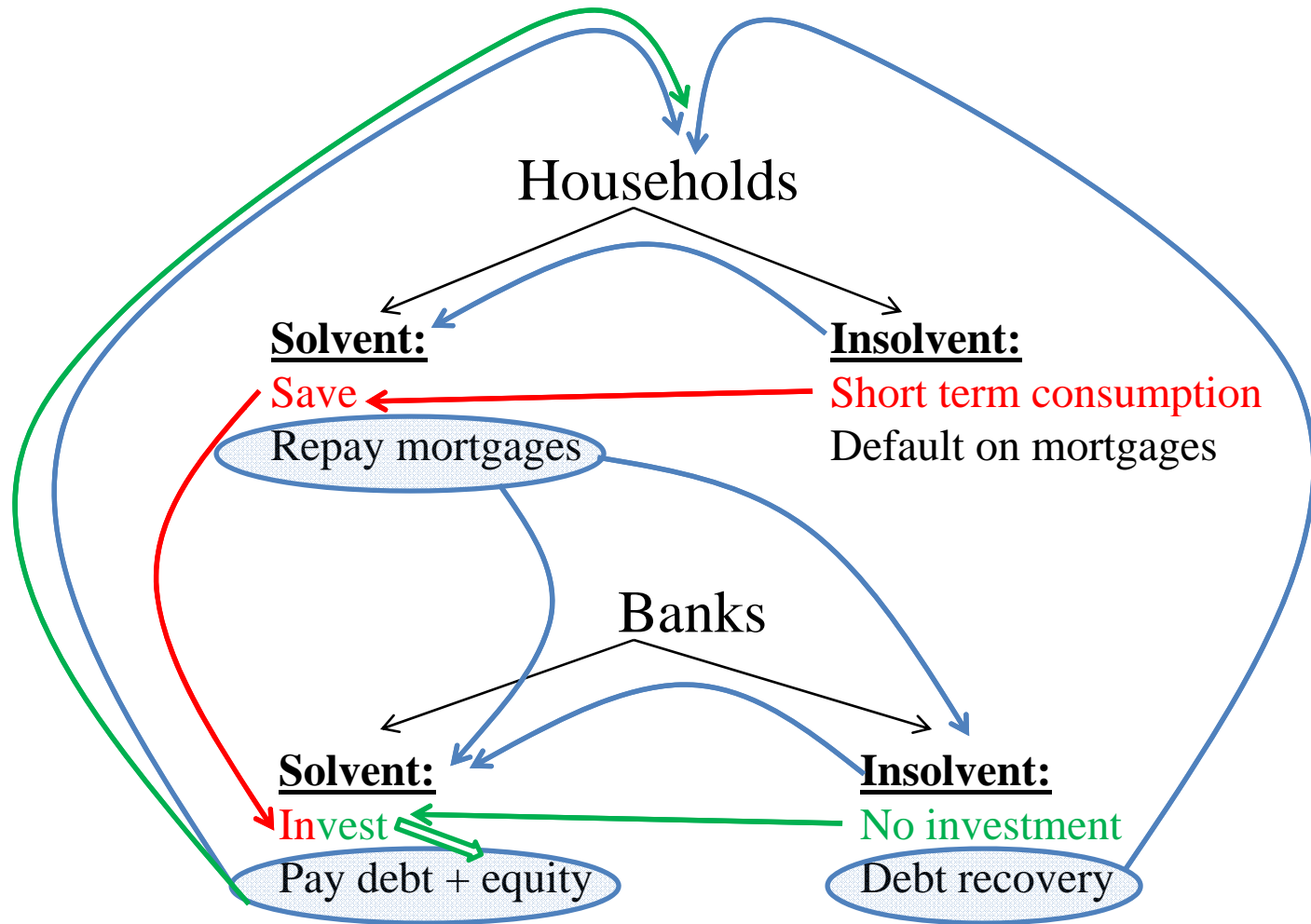


Complementarities: Savings

Closed economy:
crowding out of
investment by the
current
consumption of
highly levered
households



The Macroeconomics of Debt Overhang



At cost κ , renegotiation can take place. Nash bargaining (ex-post efficient).

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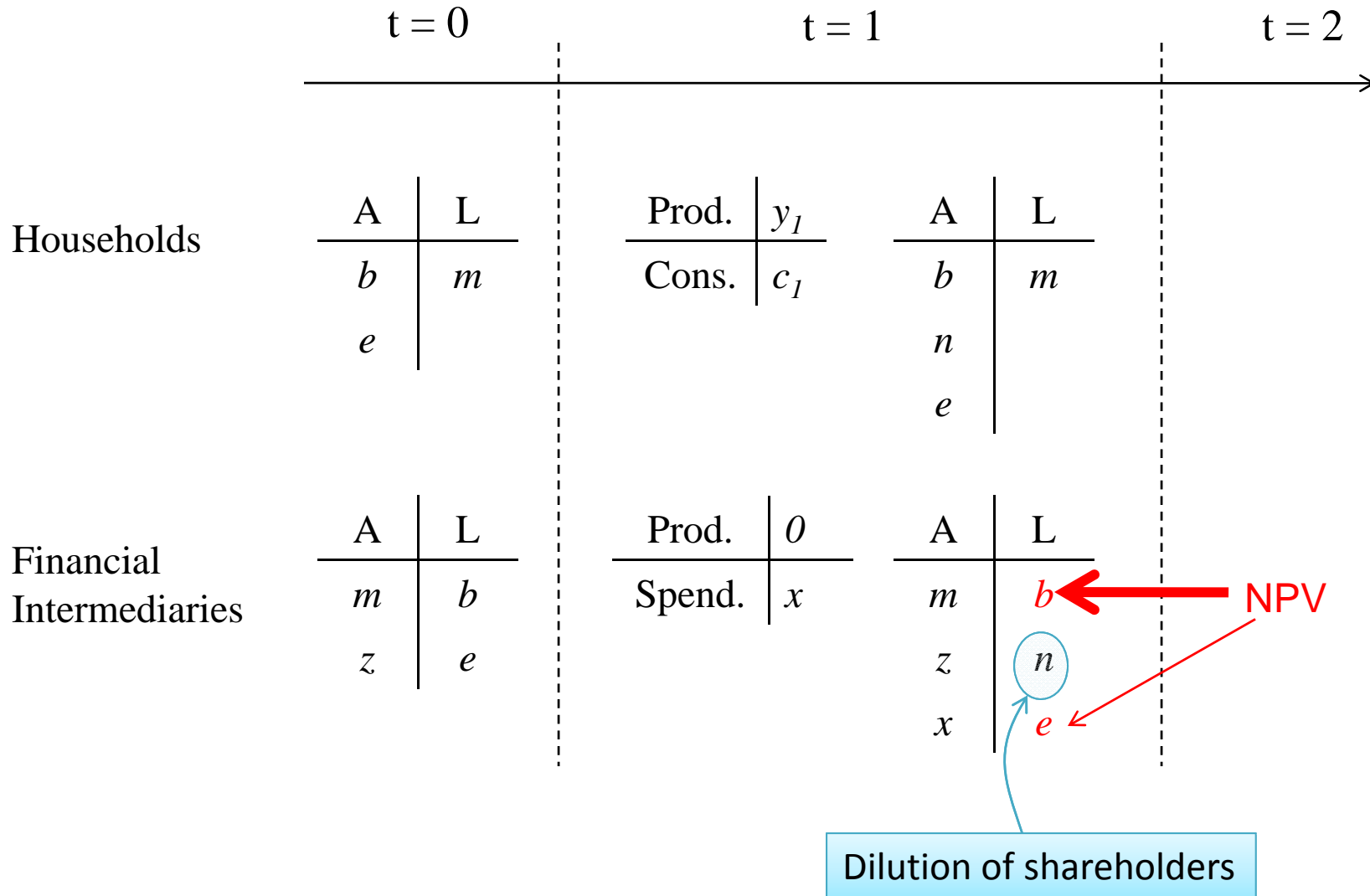
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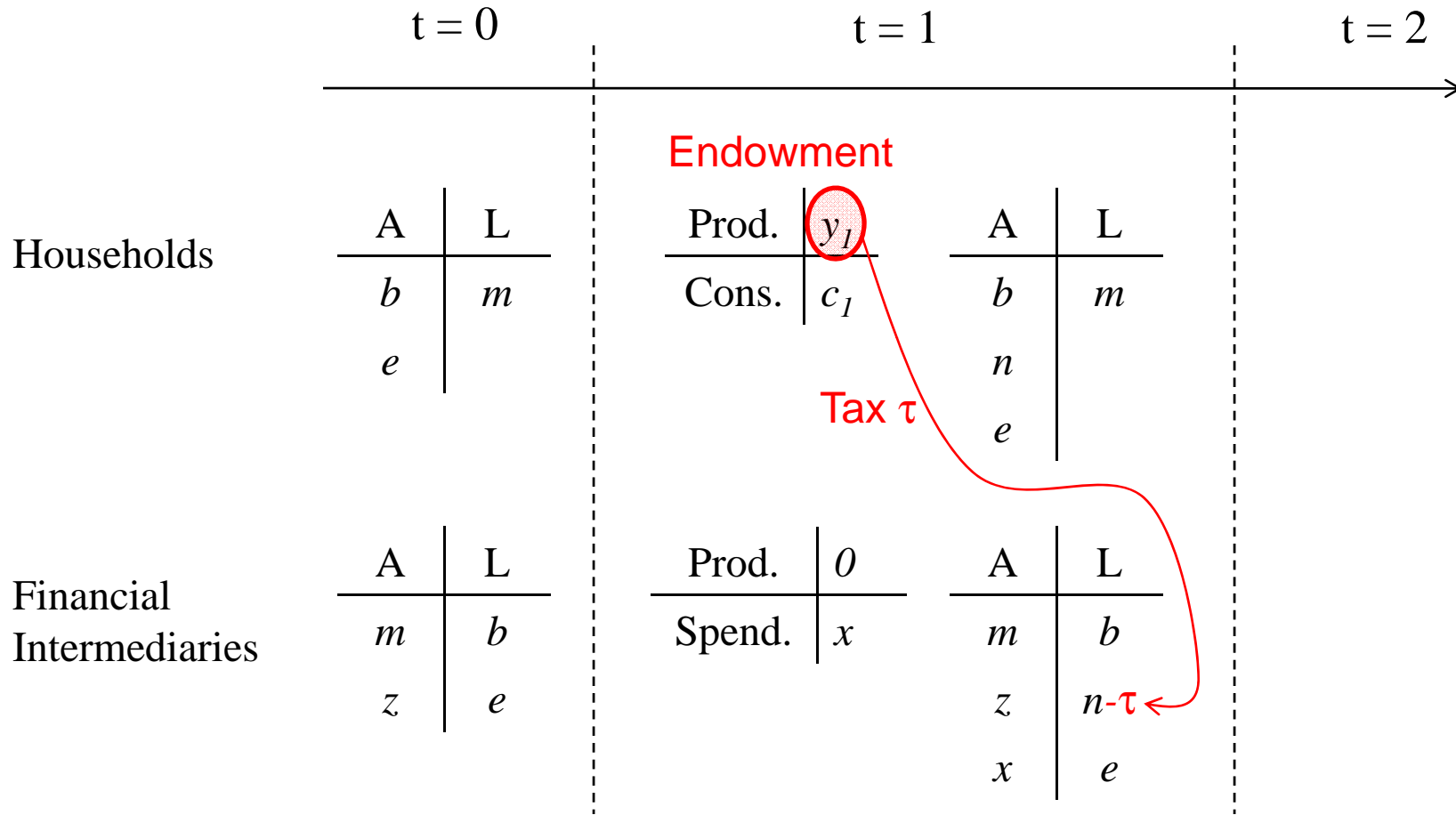
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 - Intuition: households are both bondholders and shareholders.

- Financial bailouts
 - Inject equity
 - Guarantee new debt
 - Buy back impaired assets
- Philippon & Schnabl (09): absent private information, all these programs are equivalent
 - Focus here on a pure cash transfer financed by lump-sum taxes

Bailouts



Bailouts

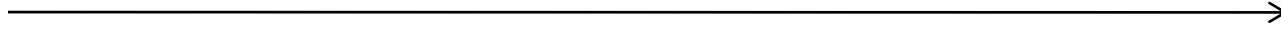


Proposition: *In a debt overhang equilibrium, financial bailouts increase welfare by increasing investment and increasing the fraction of solvent households.*

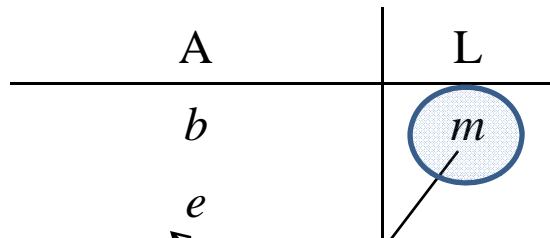
- Global bond and equity markets: α share of foreign assets in domestic households' portfolios.
- Integration of mortgage markets: β share of foreign mortgages in domestic banks' portfolios.
- Notes: direct or indirect. MBS bought by SIVs sponsored by European banks

Closed Economy

$t = 0$



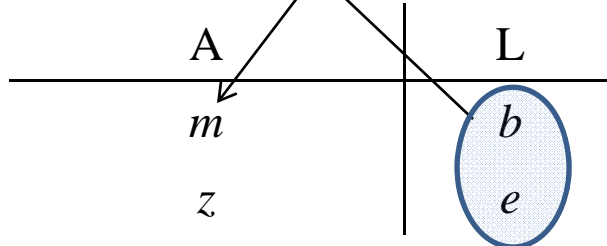
Households



e



Financial Intermediaries

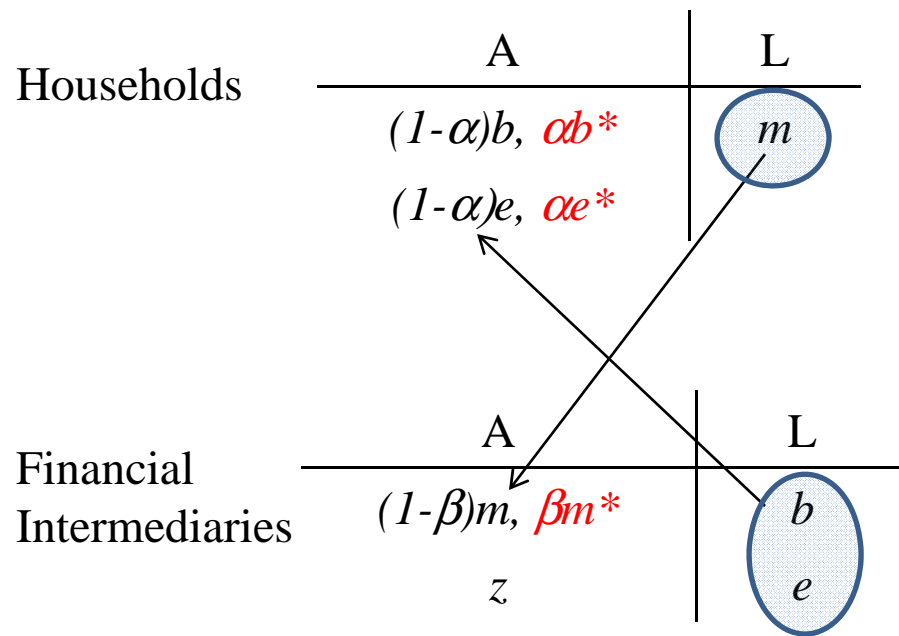
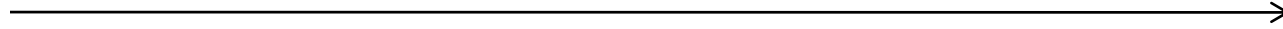


m

z

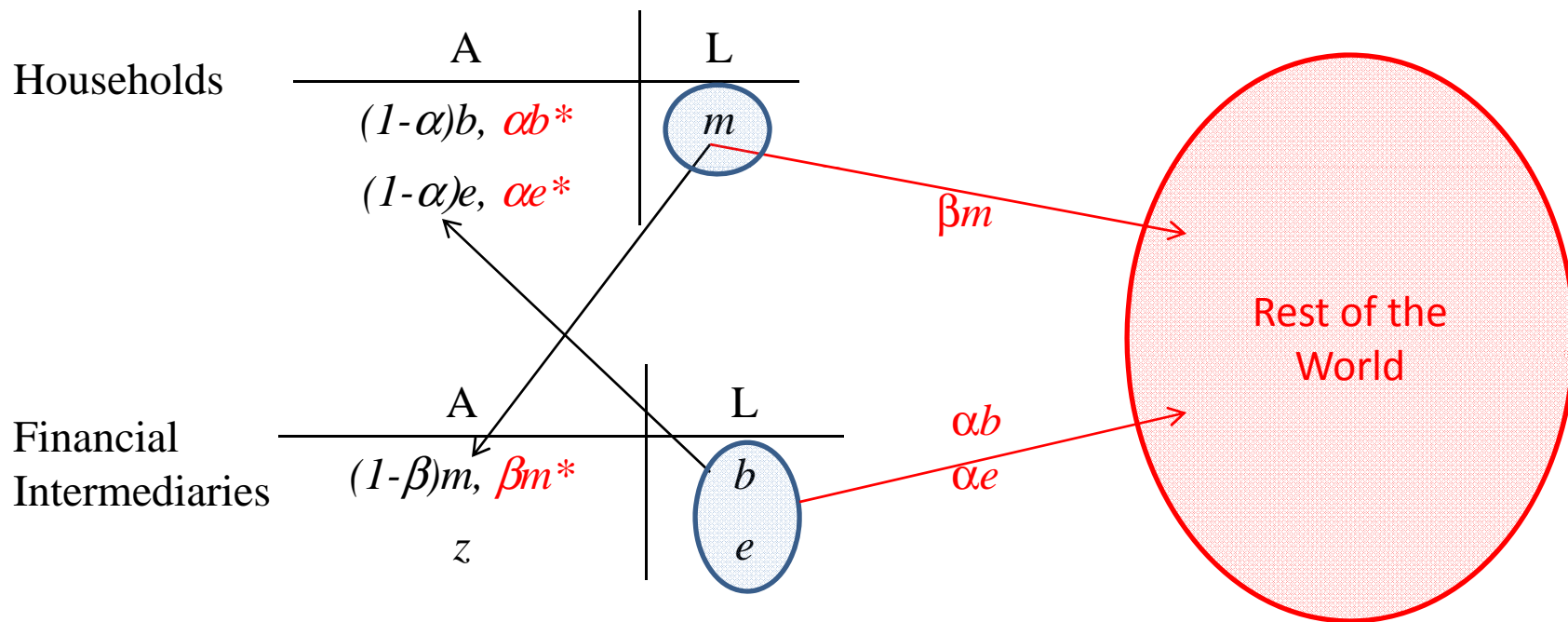
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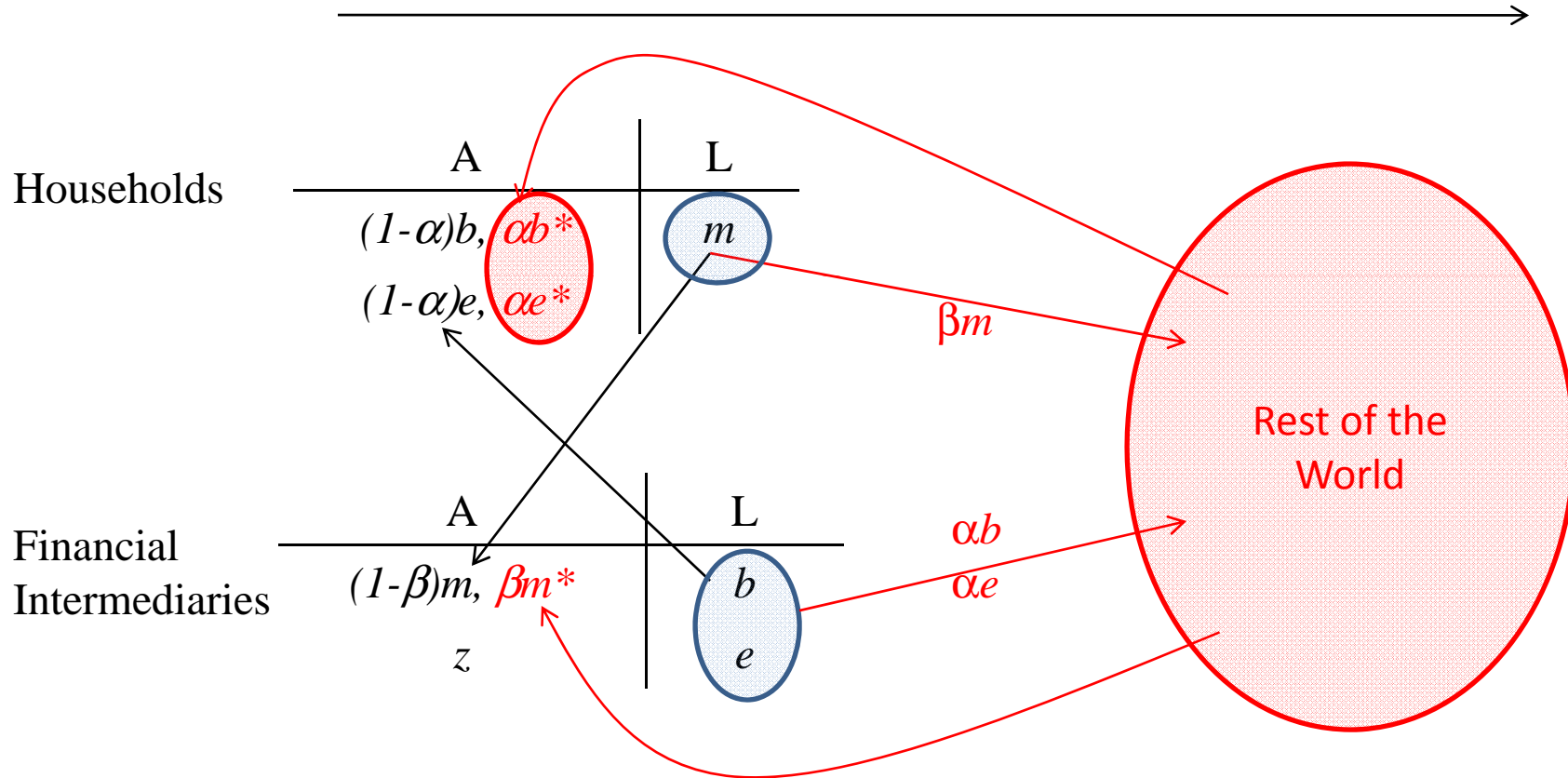
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Notice: Previous analysis applies to world economy. Bailouts improve macroeconomic outcome when there is debt overhang. However:

- **Proposition:** *Domestic financial bailouts are less attractive when banks operate internationally (β), and when households diversify their financial portfolios (α).*
- *When α is high, domestic bailouts increase mortgage defaults!*
- A new channel of international spillover
- Similar to fiscal policy in open economies
- **Corollary:** *Inefficient Nash equilibrium. Financial globalization creates the need for coordination in financial bailouts.*