Liquidity and the Threat of Fraudulent Assets

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fraudulent behavior in asset markets

in this paper:

with sufficient costly effort...

...individuals can sell, or borrow against, a "bad" asset

- Examples:
  - clipping of coins in ancient Rome and Medieval Europe
  - counterfeiting of banknotes during 1800-1850
  - identity theft
  - securitizing bad mortgages
  - cherry picking bad collateral to secure credit transactions

what we do

- Asset pricing with lack of recognizability due to the threat of fraud

  many assets differing in vulnerability to fraud

- Step 1: solve for terms of bilateral trades

  assets are used as collateral or means of payment

  different vulnerability to fraud $\Rightarrow$ different collateralizability

- Step 2: solve for asset prices

  assets with identical cash flows differ in prices

  assets differ in their sensitivity to policy intervention

    open market operations resembling Quantitative Easing

    regulatory measures resembling Dodd-Frank

  assets differ in their sensitivity to shocks

    generate "flight to liquidity"

related literature

- Macro models in which assets have limited re-salability

  Kiyotaki Moore (2001, 2005), Lagos (2010), Lester et al. (2011)

- Private information and money

  Williamson Wright (1994), Nosal Wallace (2007) among many others

- Asset pricing when moral hazard limits pledgeability

  Holmstrom Tirole (2011) among many others

- Asset pricing with adverse selection

  Rocheteau (2009), Guerrieri Shimer (2011) among many others

the economic environment

a model with monetary frictions

- Two periods, continuum of risk neutral agents, discount $\beta \in (0, 1)$:

  measure one of buyers, measure one of sellers

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- $\underline{t = 1}$: buyers and sellers trade goods in a decentralized market

  a buyer is matched with a seller with probability σ

  the buyer likes goods that the seller can produce

  but lack of commitment

  $\Rightarrow$ no unsecured credit

  $\Rightarrow$ assets become useful as means of payment or collateral

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- $\underline{\text{End of } t = 1}$: assets pay off their terminal value

assets and the threat of fraud

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- terminal value normalized to 1

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  at $t = 0$ at fixed cost $k(s)$, can create type–s fraudulent assets

  have zero terminal value zero

  are undistinguishable from genuine ones

  can only be used in decentralized trades

  high cost $k(s) \Longrightarrow$ low vulnerability to fraud

some interpretations

in the paper, we provide explicit models supporting these interpretations

- Counterfeiting of money or bond
- Creating and cherry picking bad collateral

  mortage fraud: houses used as collateral in consumer loans

  assets used as collateral for credit derivative contracts

- Securitization fraud

  bad mortgages bundled inside mortgage-based securities

  buyers are securitizers, sellers are final investors

mortgage fraud

bilateral trade under the threat of fraud

the bargaining game

For now take asset prices $\phi(s) \geq \beta$ as given

- $t = 0$: buyer chooses a portfolio of assets

  genuine assets of type s at price $\phi(s)$

  fraudulent assets of type s at fixed cost $k(s)$

- $t = 1$: buyer matches with seller and makes an offer specifying that

  the seller produces q units of goods for the buyer

  the buyer transfers a portfolio $\{d(s)\}$ of assets to the seller

- The seller accepts or rejects. If accepts:

  the buyer enjoys the utility $u(q)$

  the seller suffers a production cost equal to q

equilibrium concept and refinement

- Perfect Bayesian equilibrium

  sellers' beliefs about buyer's portfolio are not pinned down

  ... lots of equilibria, some of them arguably unreasonable

- Refinement: Inn and Wright's (2011) "reverse order game"

  the buyer post an offer $(q, \{d(s)\})$ at $t = 0$

  then the buyer chooses:

    how much genuine and fraudulent assets to bring

    subject to offer $\{d(s)\}$ being feasible

- Note: there is a proper subgame after any offer $(q, \{d(s)\})$

  the Nash Equilibrium of the subgame pins down beliefs

equilibrium asset demands and offers

After an equilibrium offer:

- the buyer brings genuine assets with probability one
- the seller accepts the offer with probability one

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Equilibrium asset demands and offers maximize buyer's utility subject to

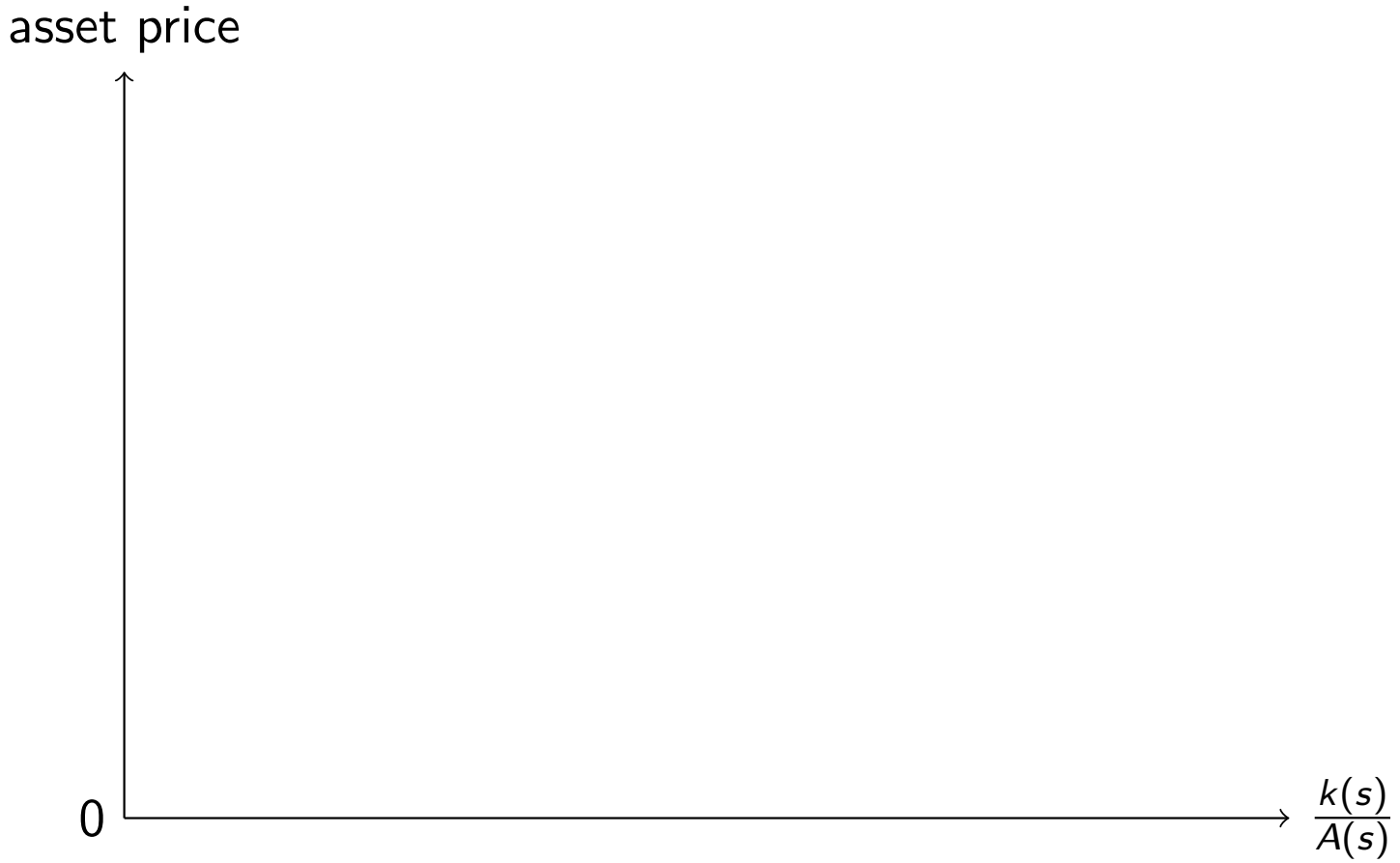
- seller's individual rationality, offer feasibility
- buyer's no-fraud IC constraint

$$\underbrace{\Big[\phi(s) - \beta(1-\sigma)\Big] d(s)}_{\text{net cost of offering } d(s) \text{ genuine assets}} \quad \leq \quad \underbrace{k(s)}_{\text{cost of fraud}}$$

  - asset specific
  - limits resalability
  - depends negatively on price

asset prices and liquidity

asset prices at $t = 0$



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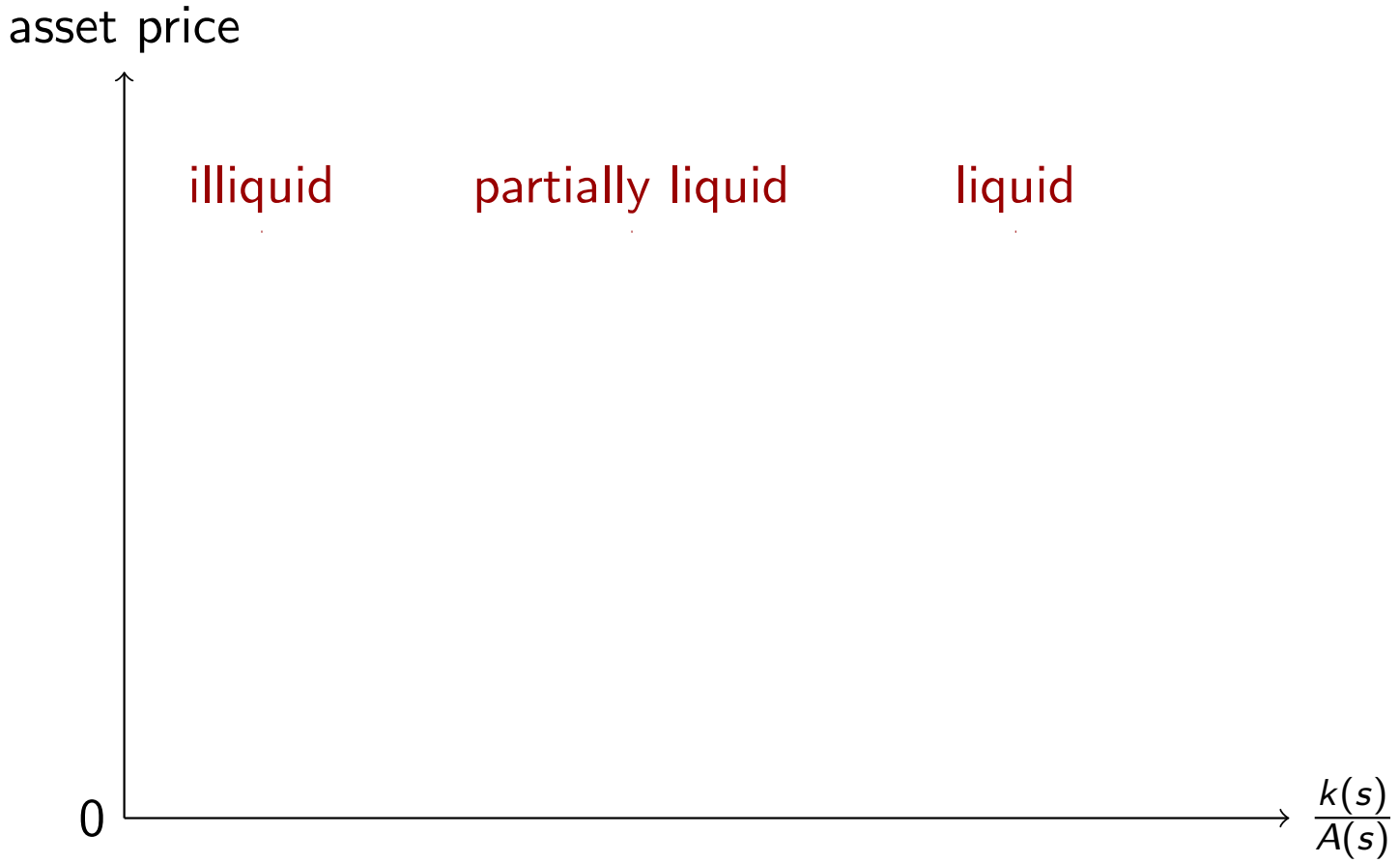

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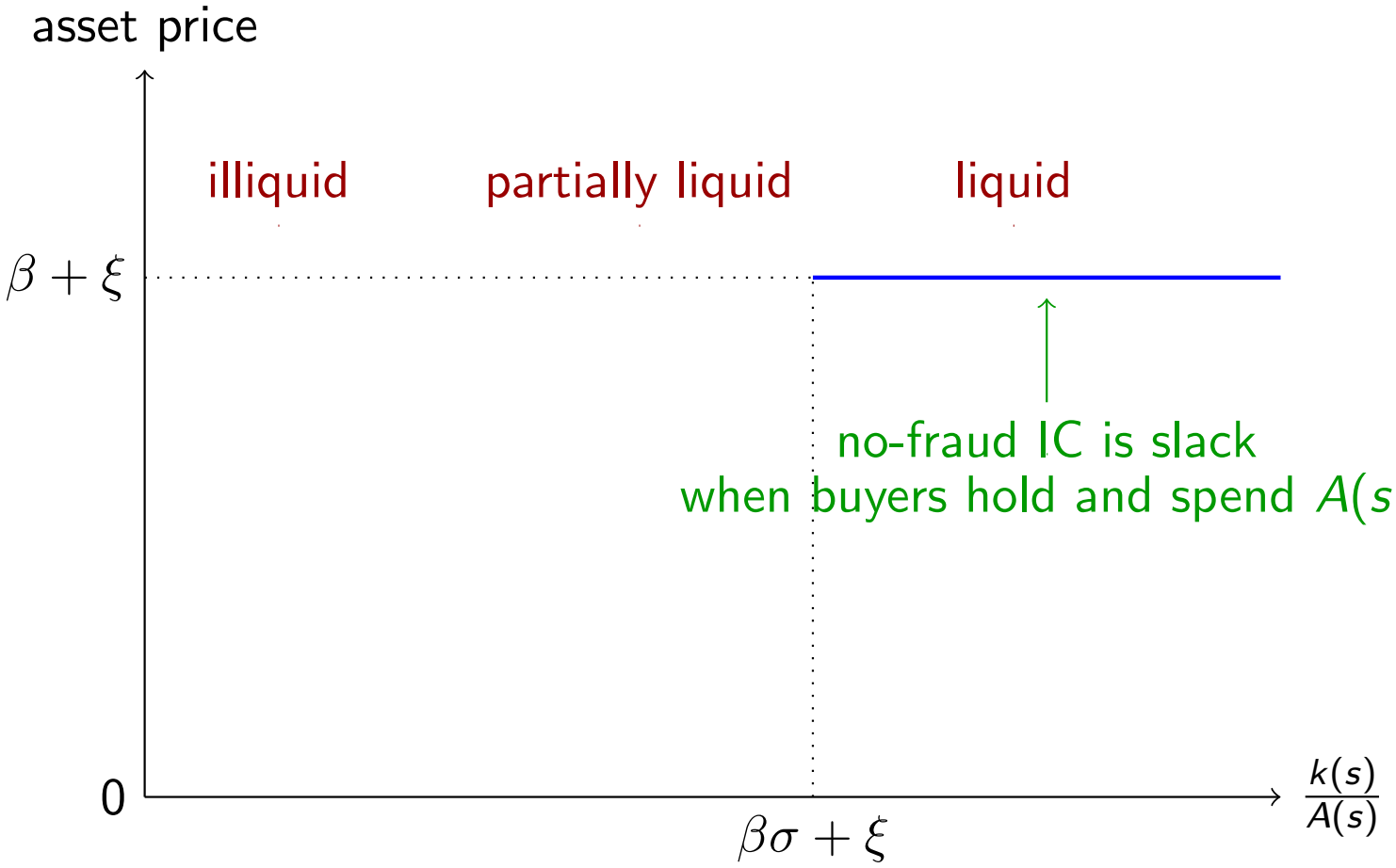

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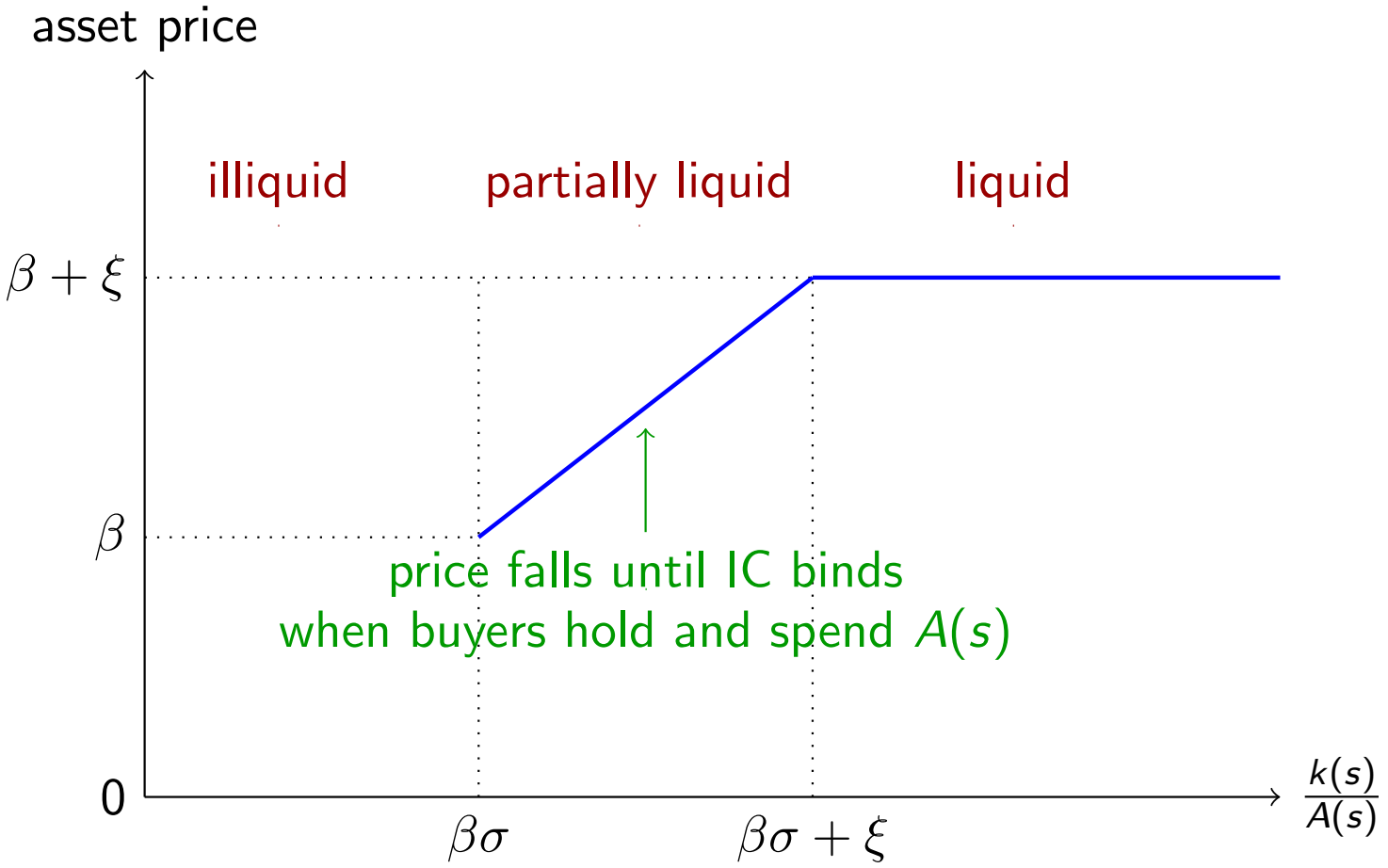

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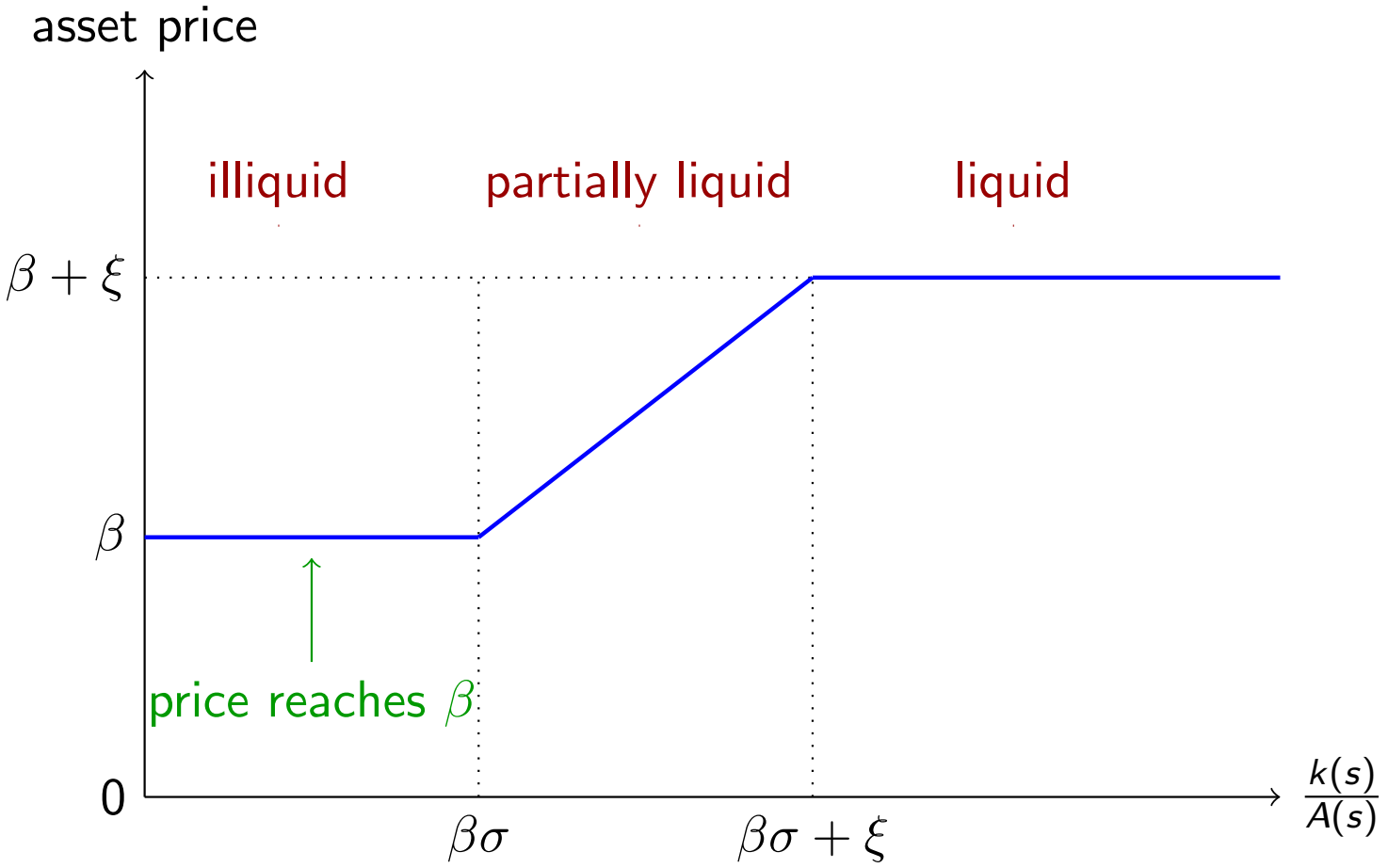

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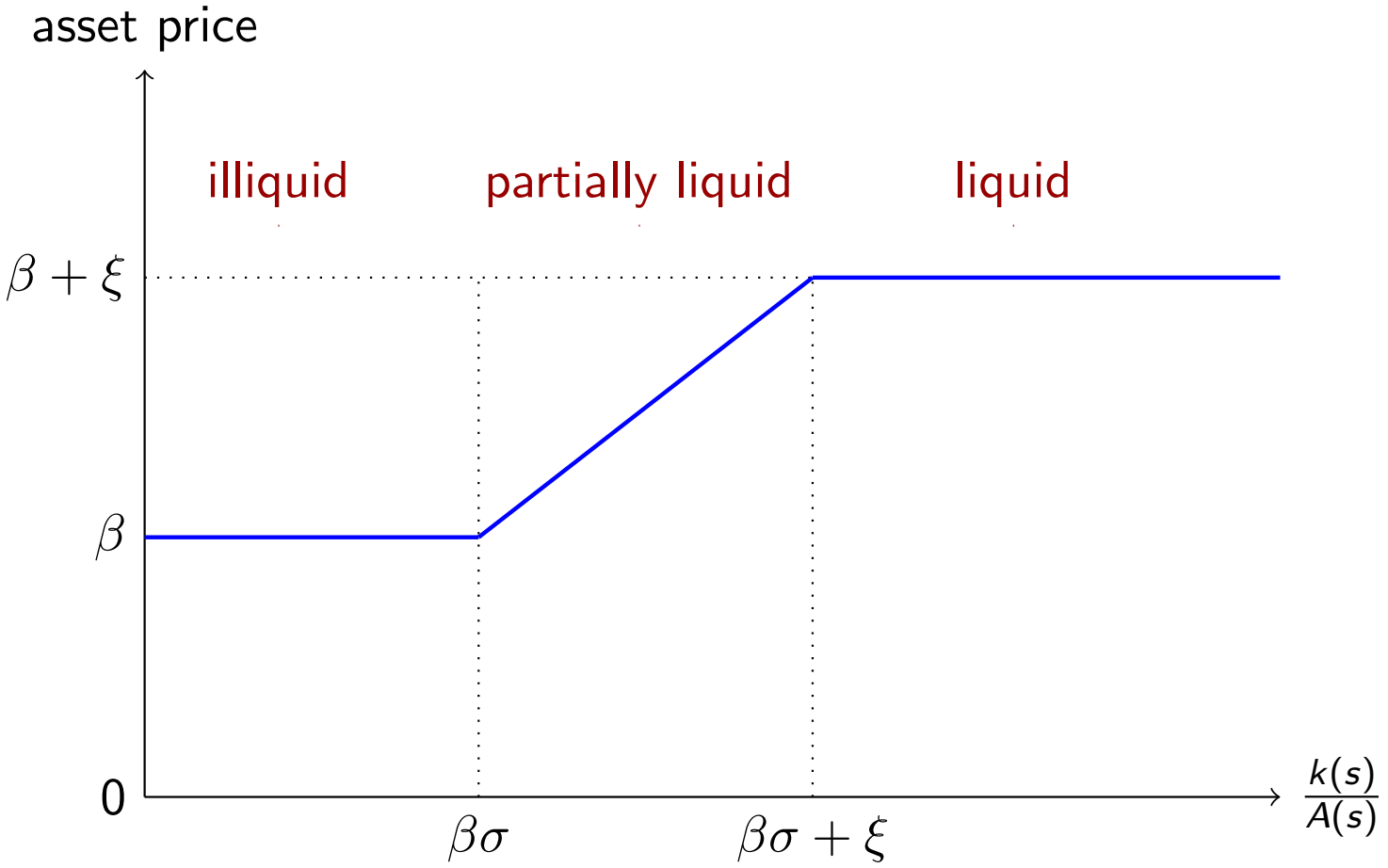

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output $=$ aggregate liquidity, $L \equiv \sum_{s \in S} \theta(s) A(s)$

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- Illiquid assets: $\theta(s) < 1$

  IC constraint binds

  buyers hold $A(s)$ but find it optimal to spend less

partially liquid assets

- Have the same $\theta(s)$ as liquid assets!
- Yet, they have a lower price

partially liquid asset prices $<$ marginal social value of their liquidity services

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Why?

- Because: pecuniary externality running through the IC constraint

  a high price reduces asset demand in two ways

  through the budget constraint (as usual)

  through the IC constraint, b/c raise incentive to commit fraud

two applications

(more in the paper)

budget balanced open market operations

e.g., selling Treasuries to purchase MBS

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- Using liquid assets to purchase illiquid assets

  difference in $\theta(s)$ large enough

  L, q, interest rates, and welfare go up

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concentration of demand towards liquid assets, widening of yield spreads

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  interpretation: collateral is more needed

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- The set of liquid assets shrinks

  The set of partially liquid and illiquid assets expands

conclusion

- A fraud-based model of liquidity
- An explanation for price and liquidity differences
- Applications

  open-market operations

  flight to quality

  regulatory measures (in the paper)

  time varying liquidity (in the paper)