Asymmetric Information and Inventory Concerns in Over-the-Counter Markets

Julien Cujean
Smith School of Business
University of Maryland
jcujean@rhsmith.umd.edu

Rémy Praz
Swiss Finance Institute
EPF Lausanne
remy.praz@epfl.ch

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UNIVERSITY OF MARYLAND
ROBERT H. SMITH SCHOOL OF BUSINESS

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

Mandatory (post-trade) transparency

Several OTC markets recently subject to **mandatory transparency**

- corporate bonds, agency/asset-backed securities (TRACE)
- CDS, interest rate swaps, CDO (Dodd-Frank Act)
- Similar regulatory reforms in Europe (MiFID II)

Regulatory Debate I

Benefits: improved market power, decreased price dispersion

"[Increased] market participation means more trading, more liquidity, and perhaps even new business for bond dealers."

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Evidence: transparency reduces transaction costs

- Bessembinder, Maxwell, and Venkataraman (2006)
- Goldstein, Hotchkiss, and Sirri (2007)
- Edwards, Harris, and Piwowar (2007)

Regulatory Debate II

Costs: dealers hold less capital in illiquid assets

Censoring trade size information *" [...] allows dealers [...] to reduce inventory imbalances [...] with less concerns that the size of a trade [...] will be used to the bargaining advantage of their next counterparties"*

Darrell Duffie (2012)

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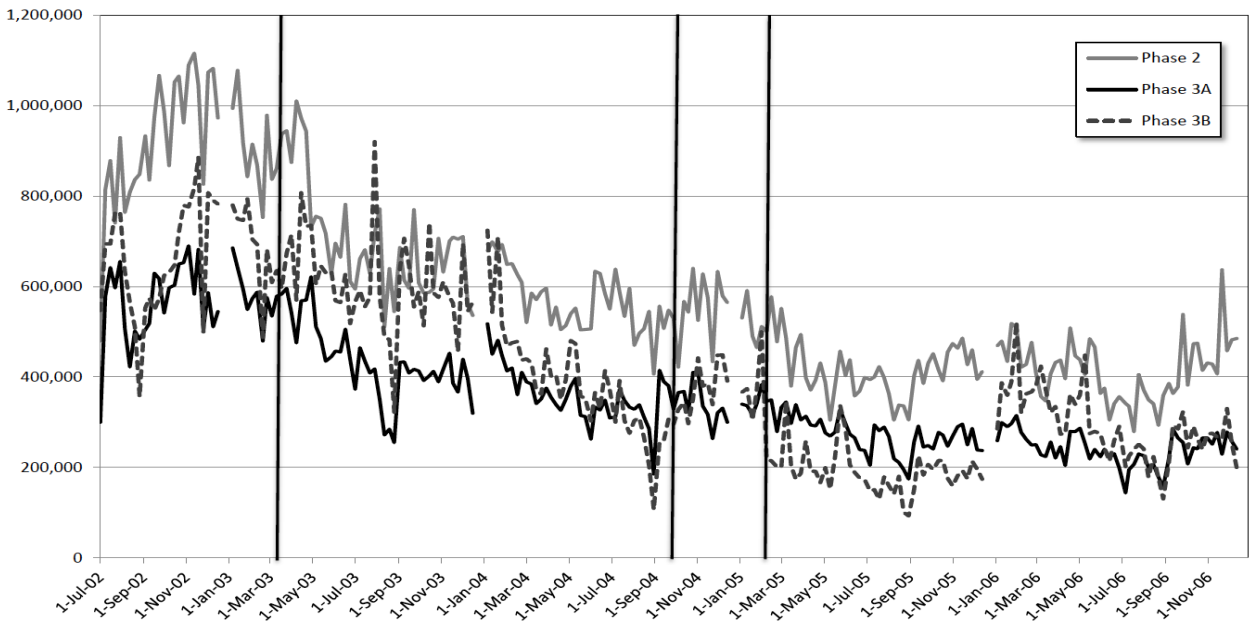
Evidence: drop in trading volume (Asquith et al. (2013))



What we do

We build a model of an OTC market with bilateral bargaining:

- Trade details unknown before execution (asymmetric info)
- Law of one price does not hold (continuum of types)

We find that transparency affects:

- allocative efficiency, inventory costs (↗)
- market participation and welfare (ambiguous)

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We find that transparency affects:

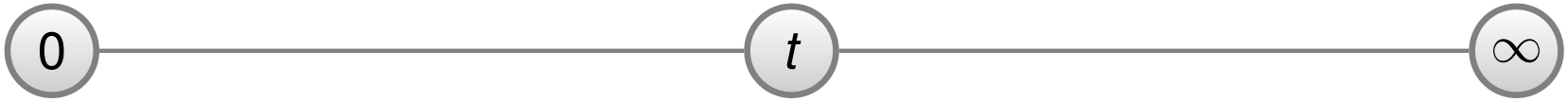
- allocative efficiency, inventory costs ($\nearrow$)
- market participation and welfare (ambiguous)

Outline

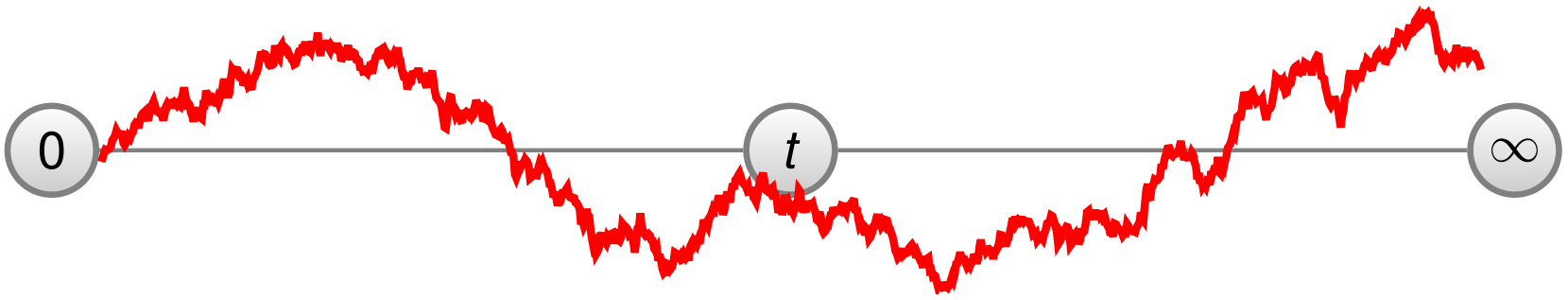
Model

Market participation

Setup



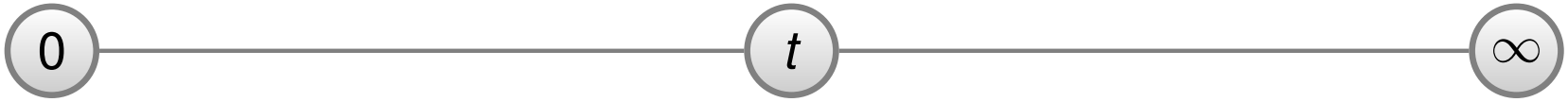
Setup: Assets



1. Risk-free rate $r > 0$
2. Risky asset with price P_d, paying dividends at the rate

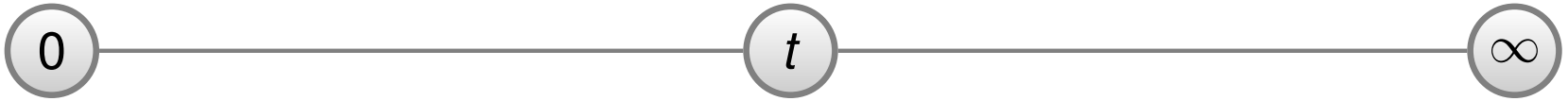
$$\mathrm{d}D_t = m_d \mathrm{d}t + \sigma_d \mathrm{d}B_t$$

Setup: Investors



Continuum of agents with CARA utility over consumption

Setup: Investors



Continuum of agents with CARA utility over consumption

- Endowment at the rate

$$\mathrm{d}\eta_t^a = Z_t^a \, \mathrm{d}D_t$$

- Time-varying exposures

$$\mathrm{d}Z_t^a = \sigma_a \, \mathrm{d}B_t^a$$

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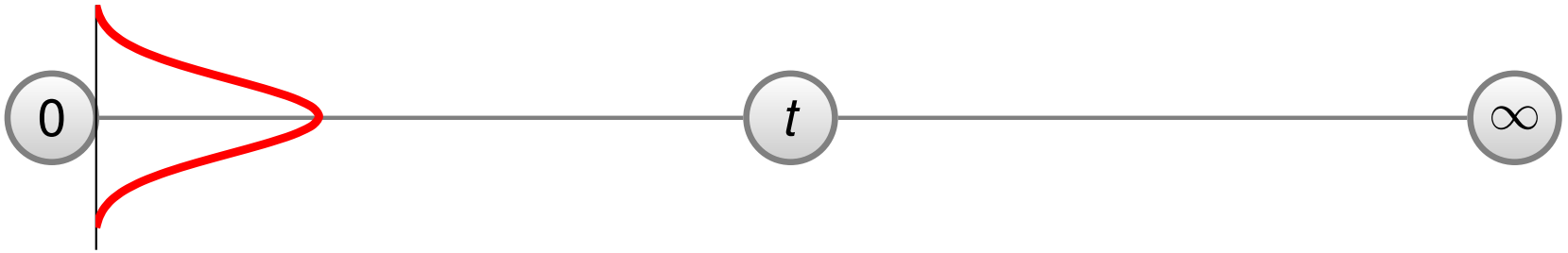

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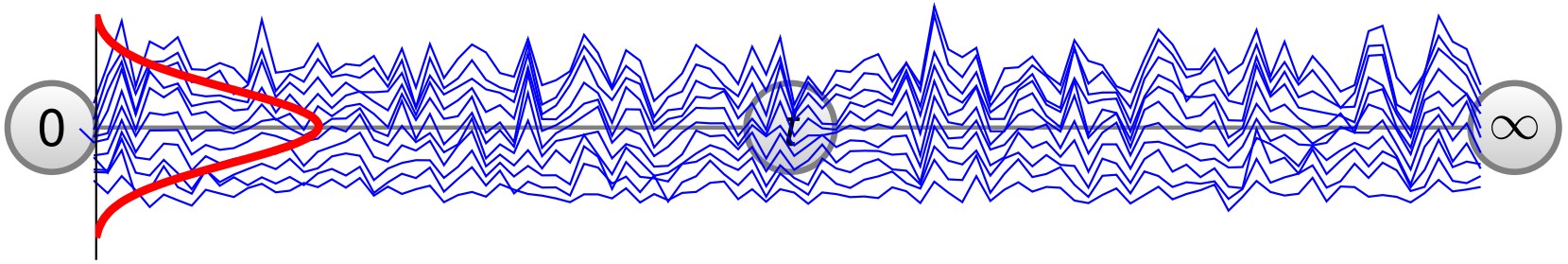

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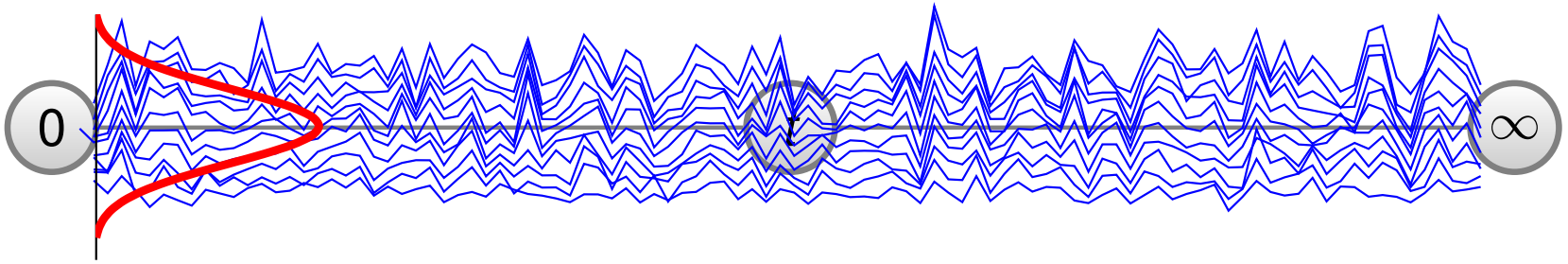

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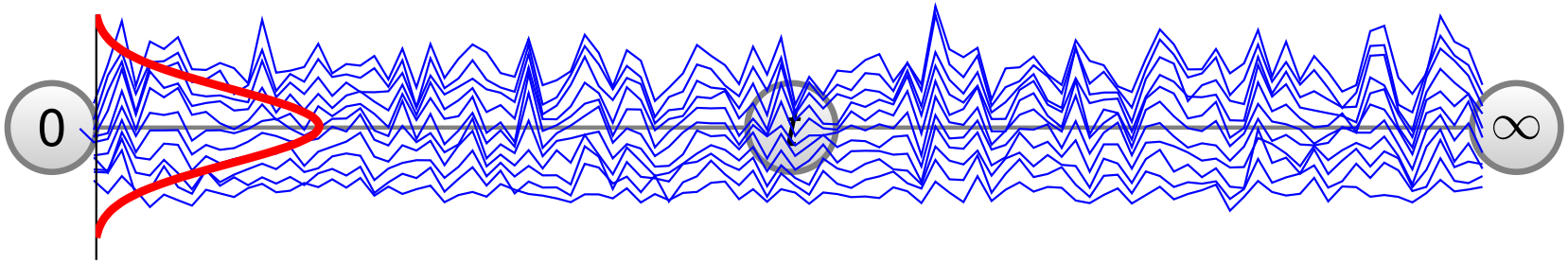

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trading

Total exposure $= \sigma_a B_t^a + \theta_t$

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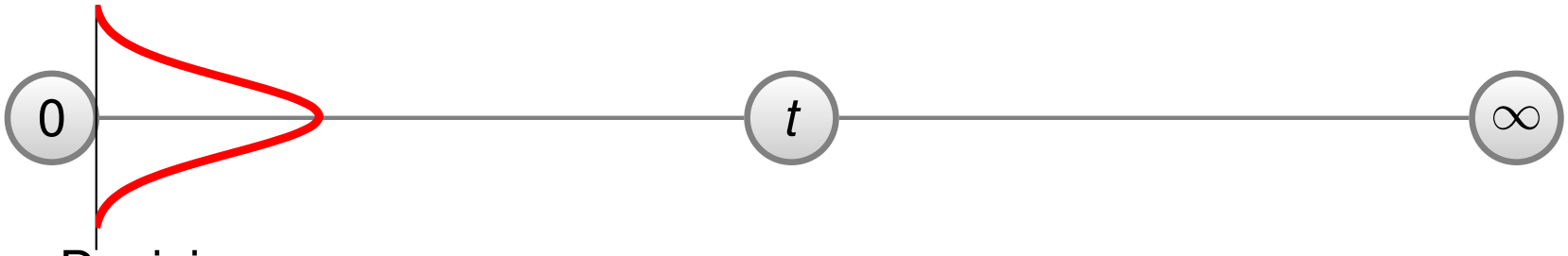
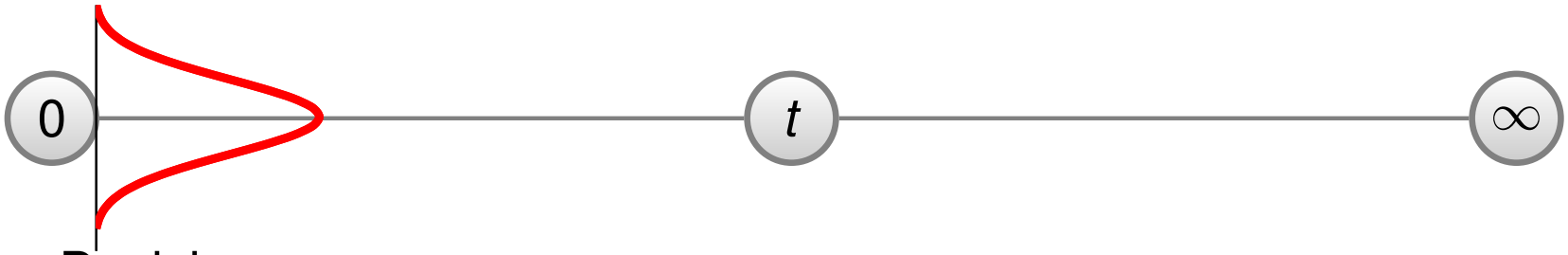


Entry Decision

- initial exposures
  $\sim \mu_a$
- Entry costs κ

Setup: Trading



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Risky asset traded on an OTC market

- Expected search time $\frac{1}{\lambda} = \frac{1}{\Lambda \cdot M_0}$
- Bargaining over θ and P

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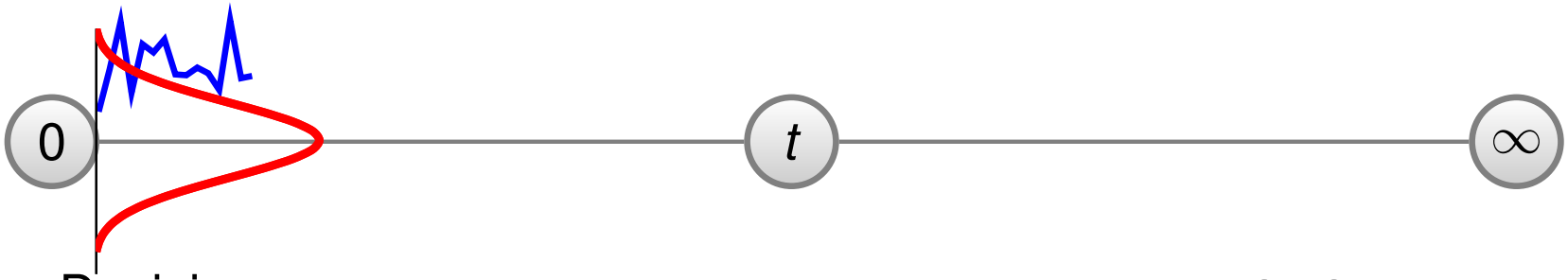

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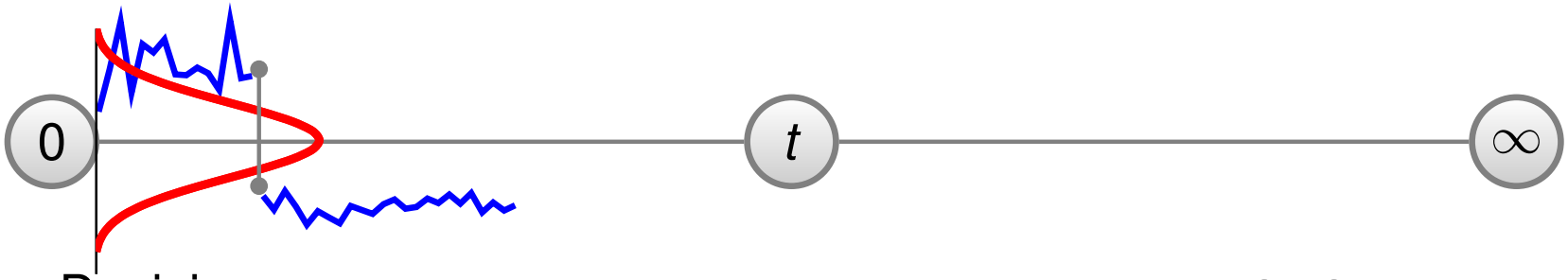

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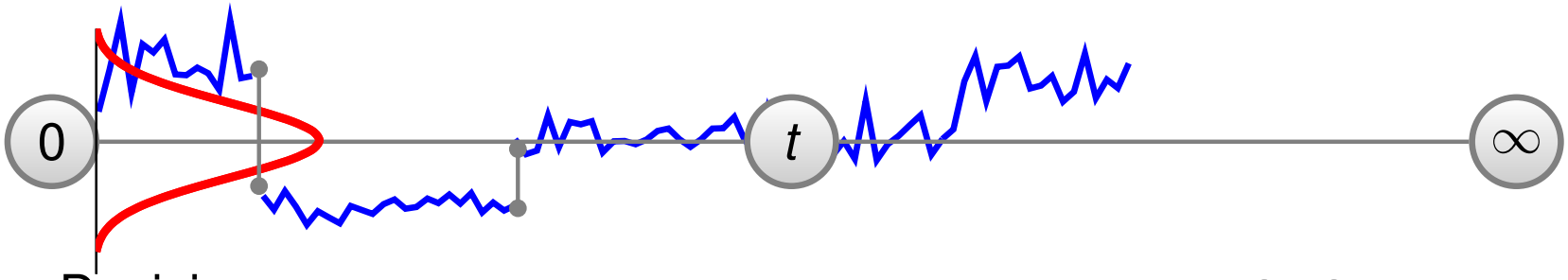

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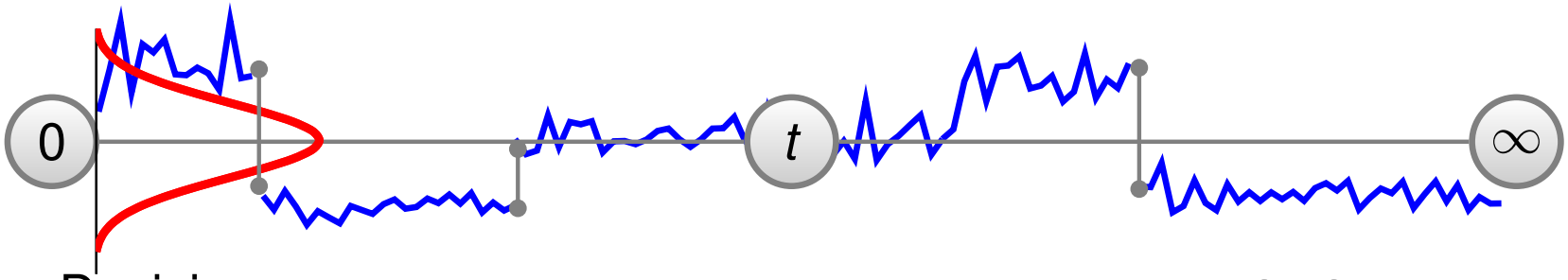

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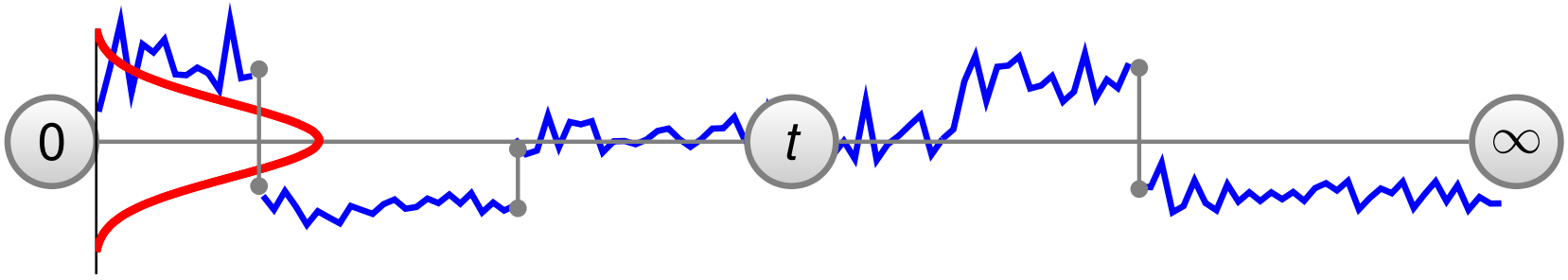
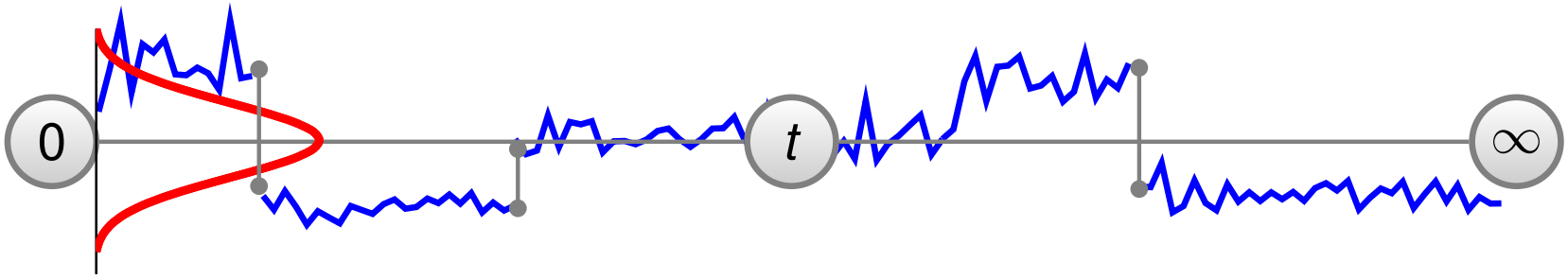


- Bargaining over θ and P

a

b

Setup: Trading



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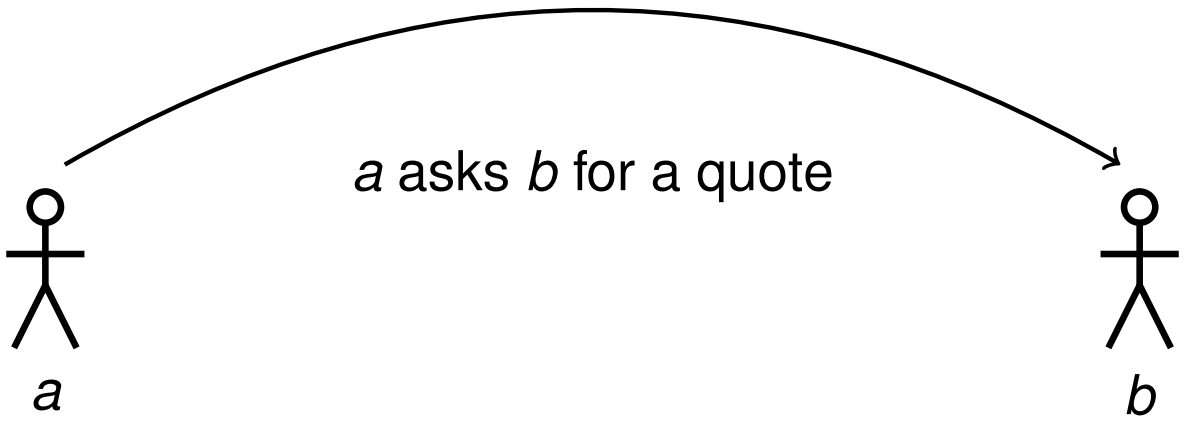

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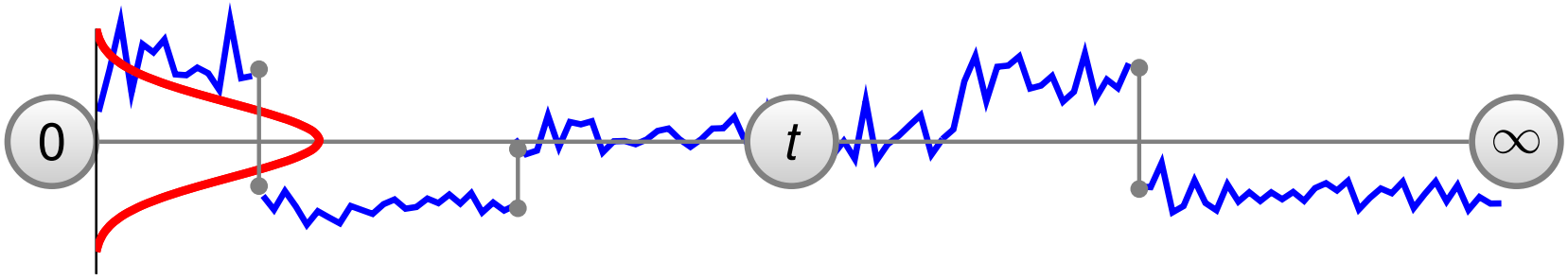

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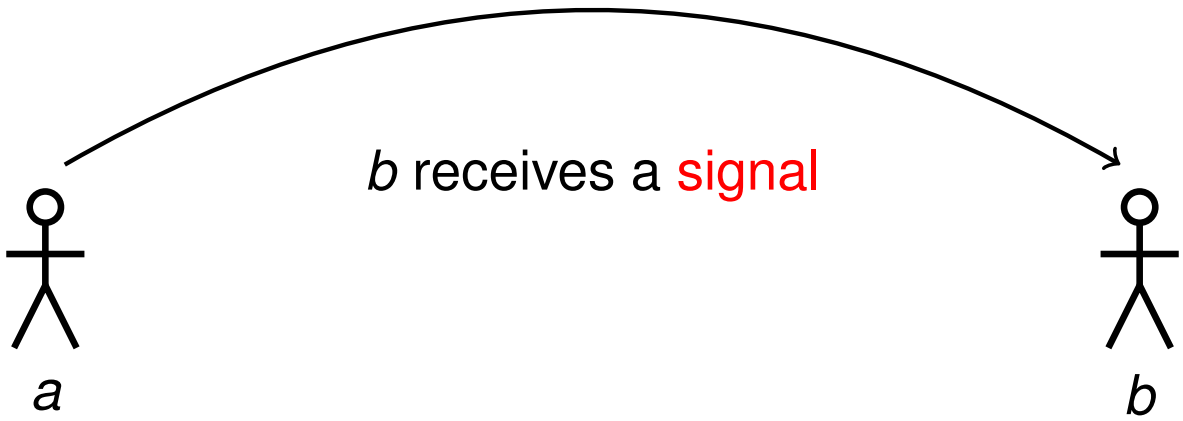

$s_a = Xz_a + (1 - X)\zeta,$

with $X \sim B(1, \tau)$,
$\zeta \sim \mu$

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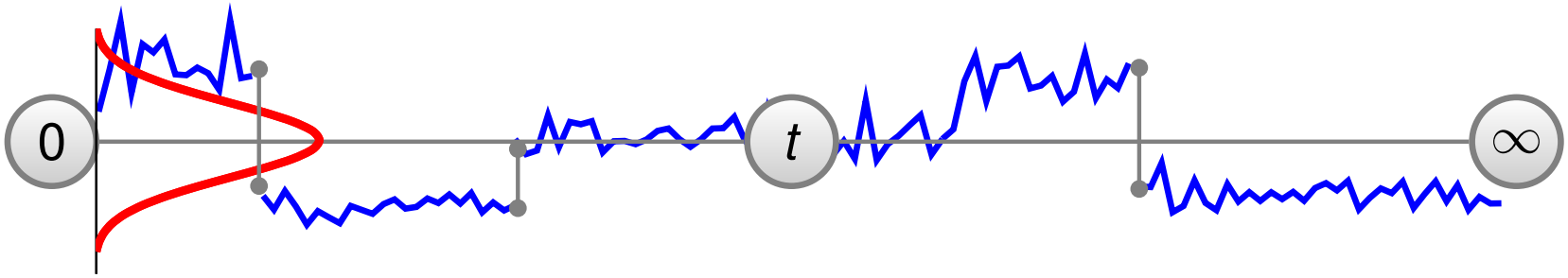

- Bargaining over θ and P

if b finds it optimal, she quotes a price
(in equilibrium: iff $\tau > \bar{\tau}$)

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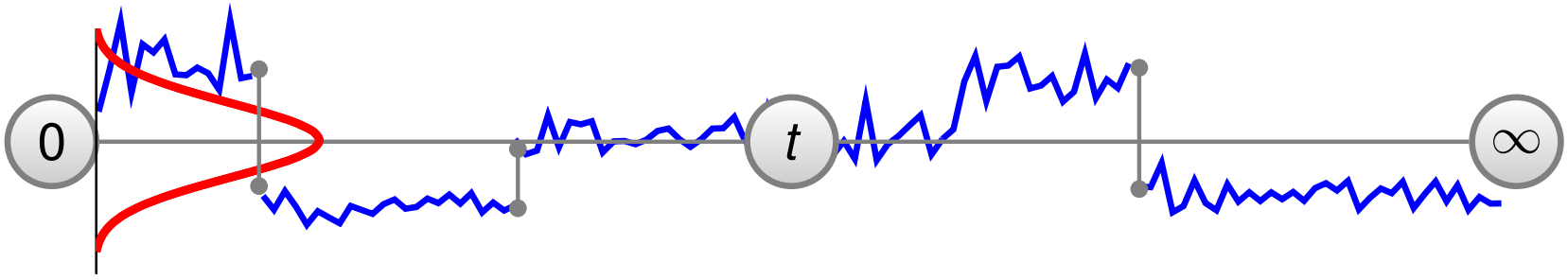

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a chooses a quantity

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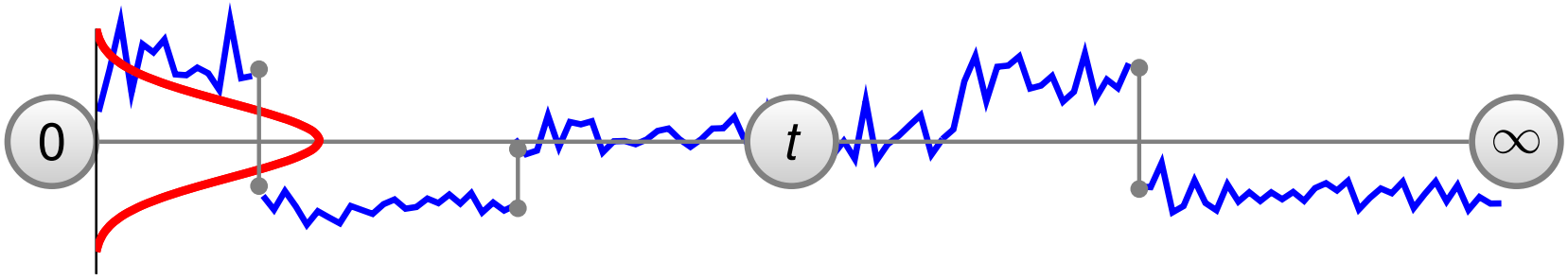

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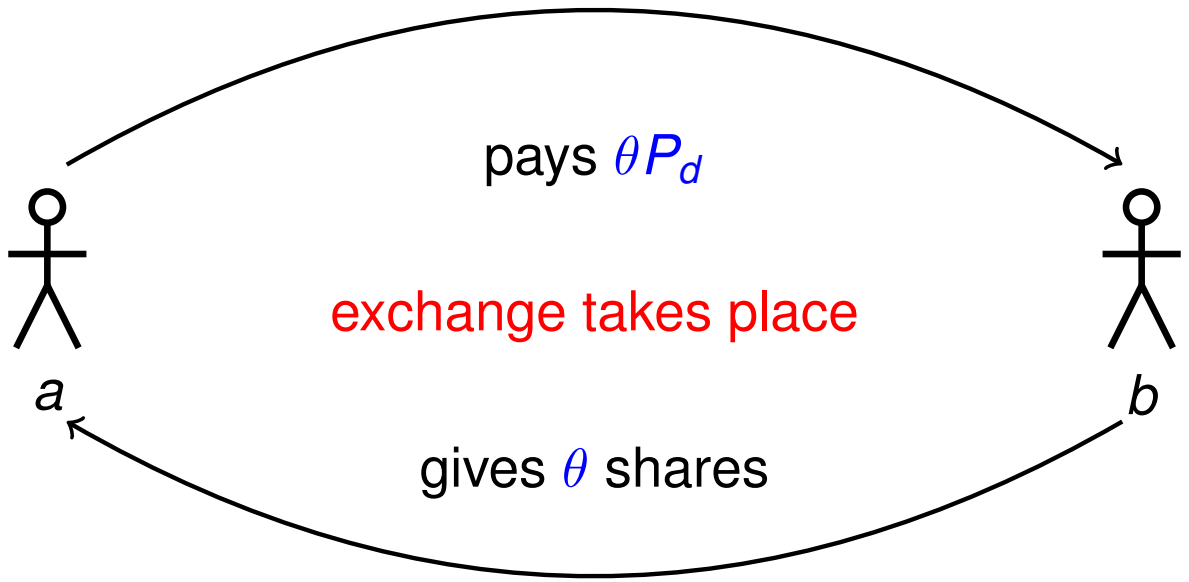
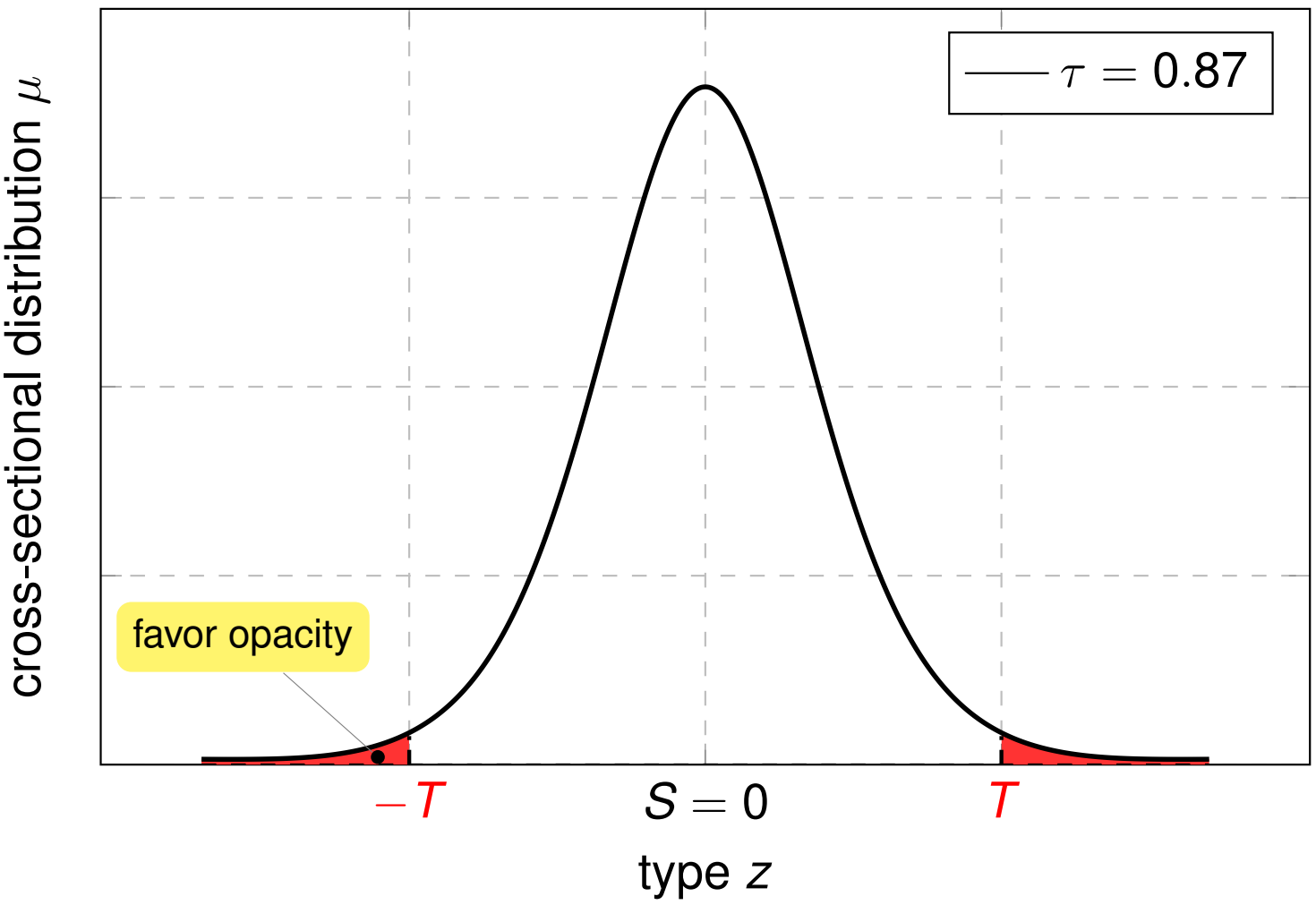


Large traders favor opacity



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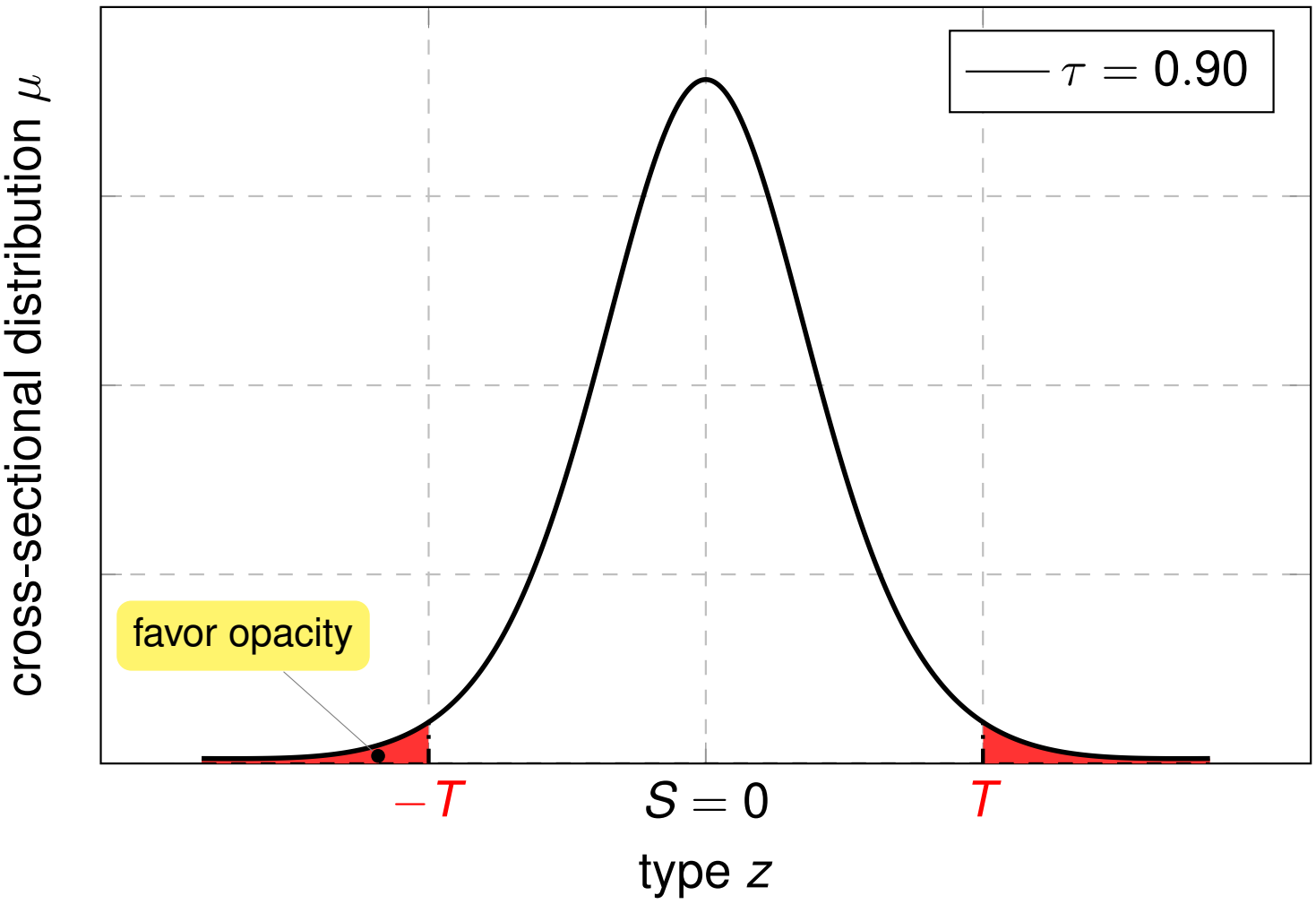

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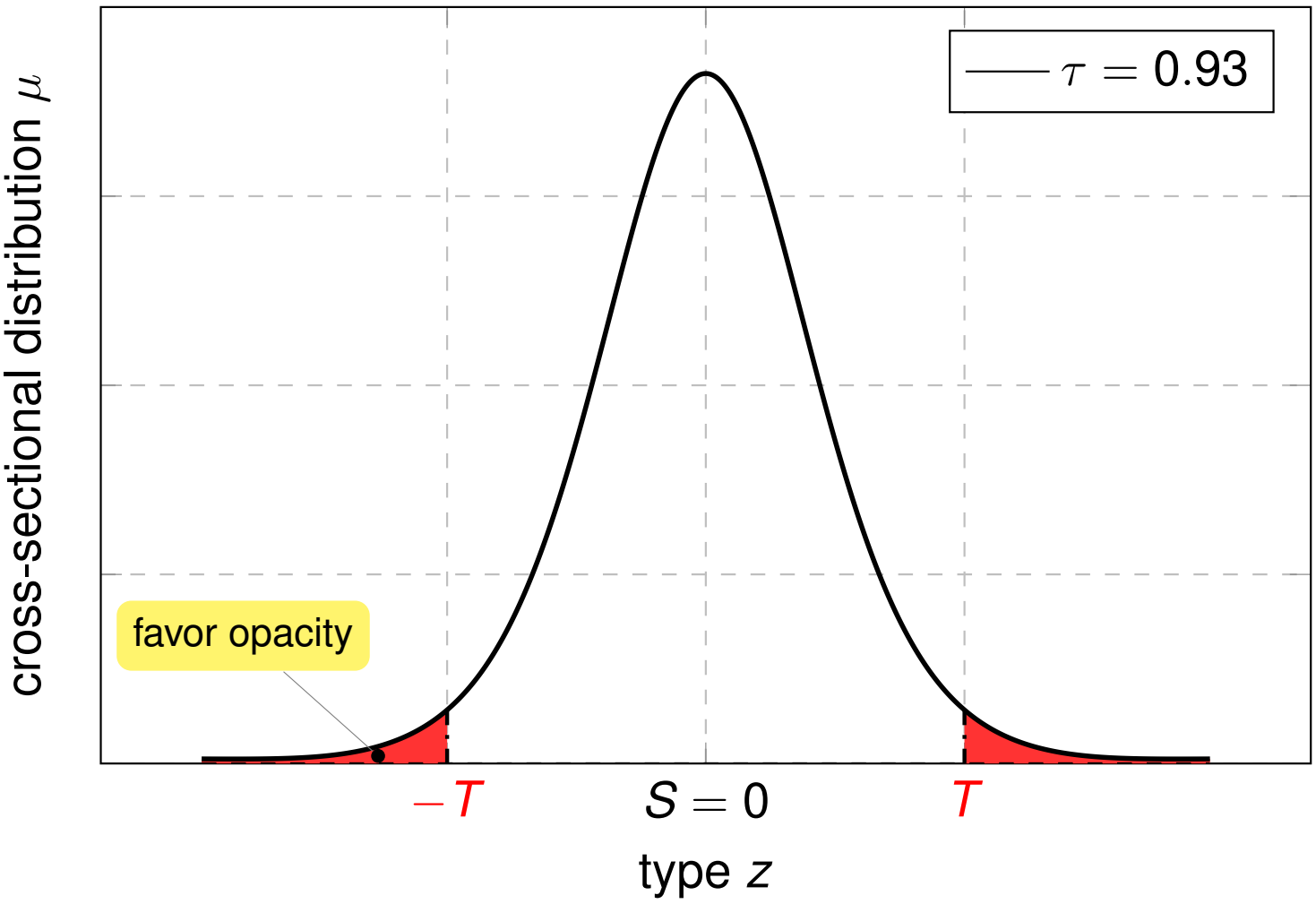

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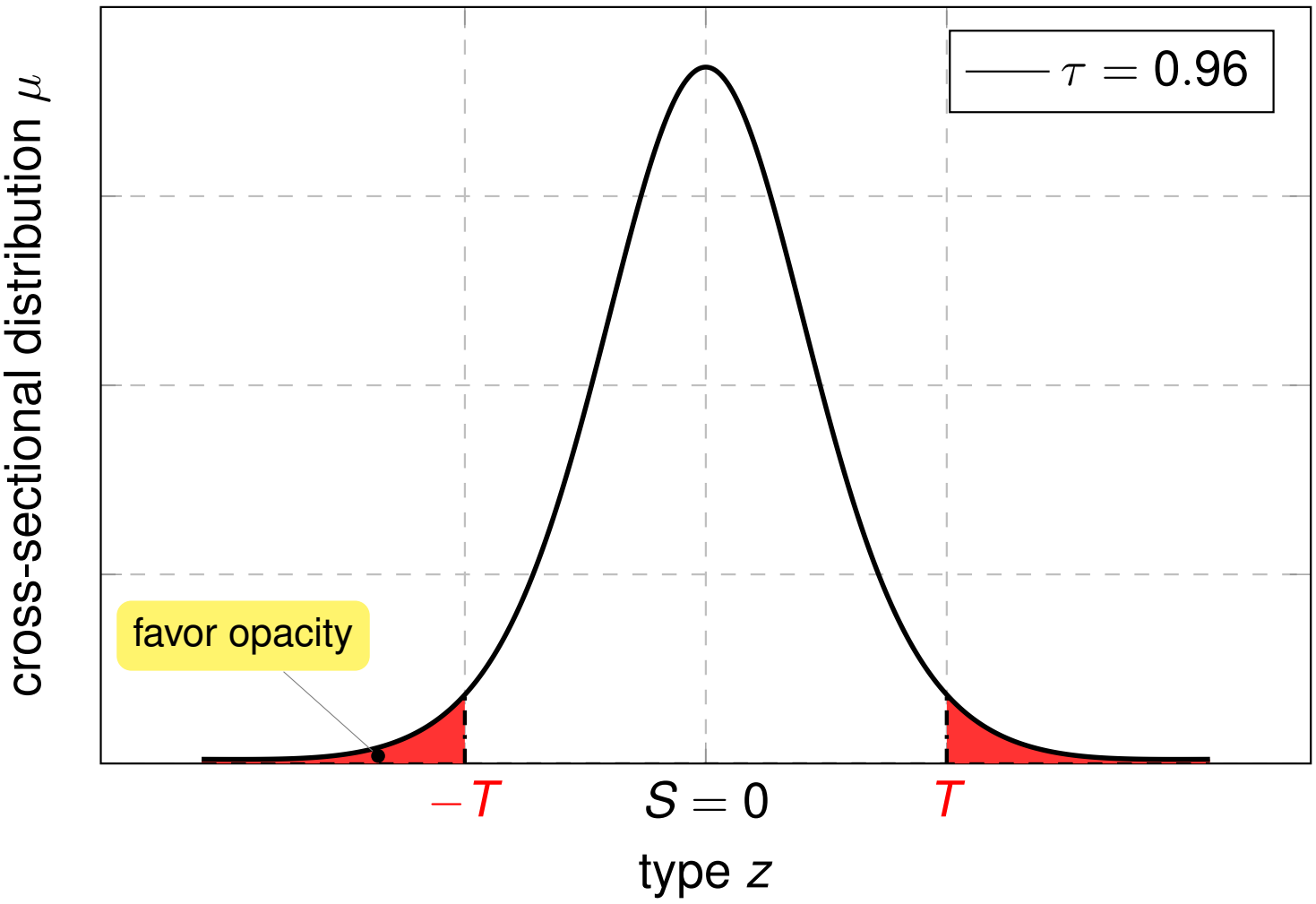

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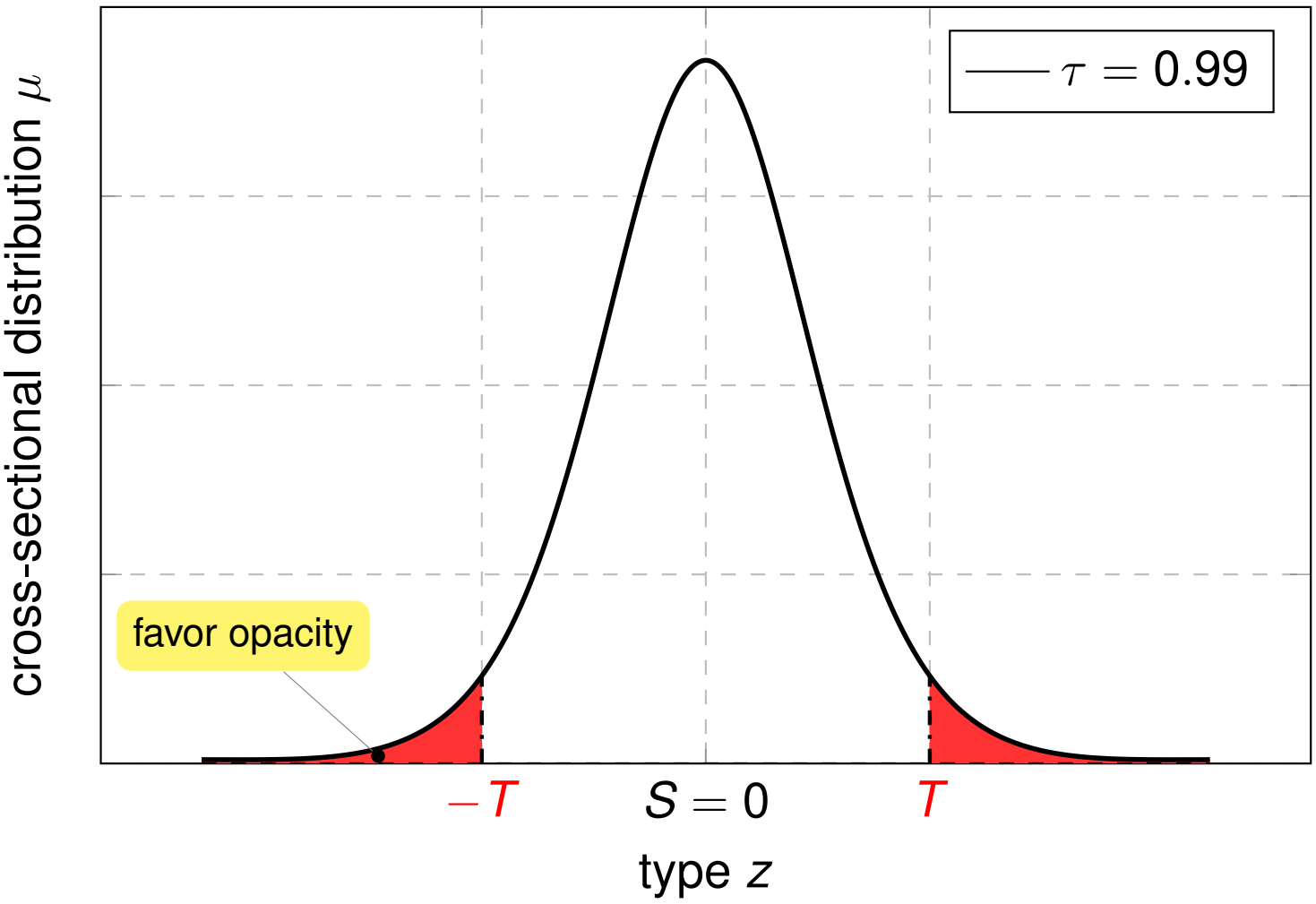

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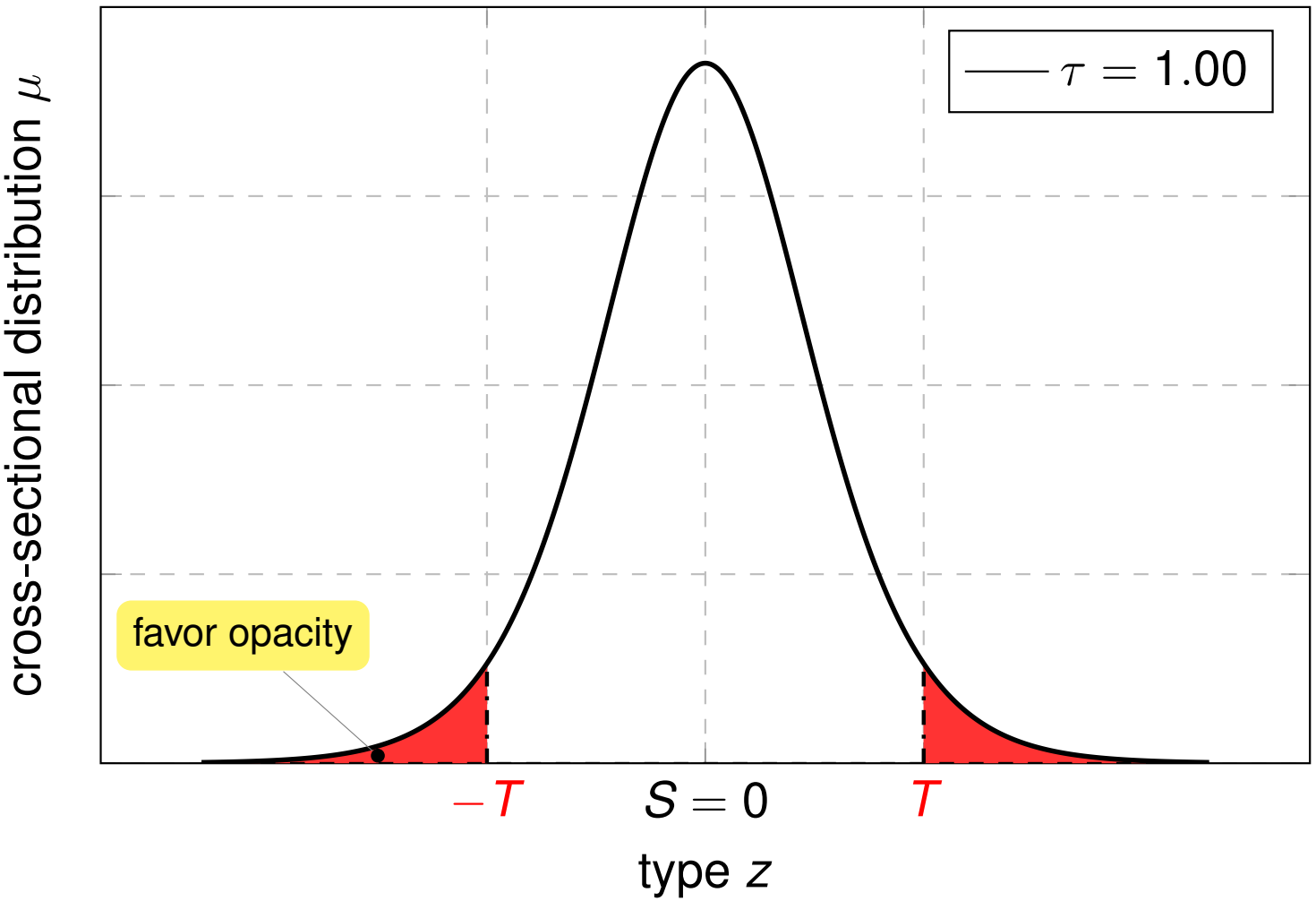

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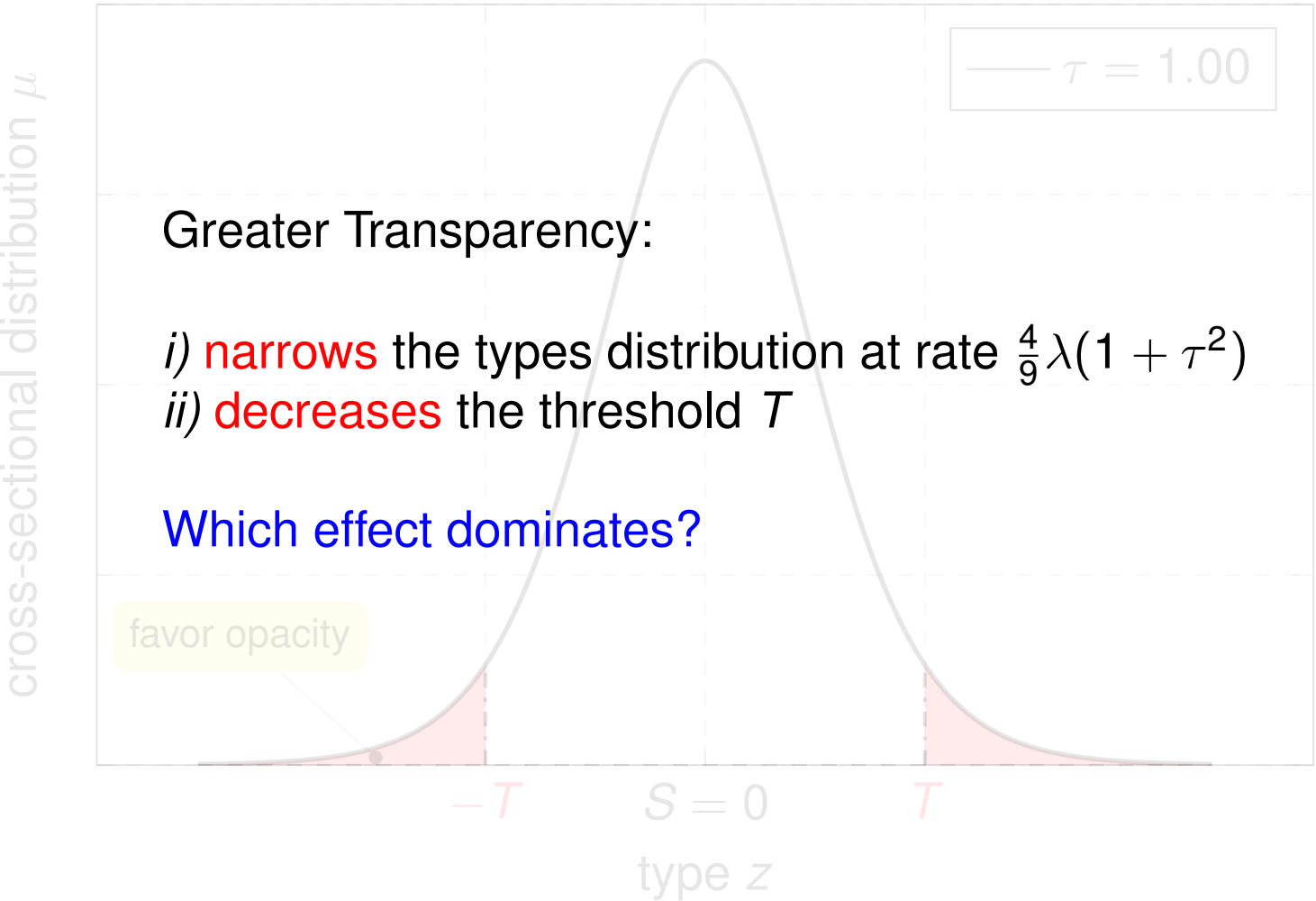

Greater Transparency:

i) narrows the types distribution at rate $\frac{4}{9}\lambda(1+\tau^2)$
ii) decreases the threshold T

Which effect dominates?

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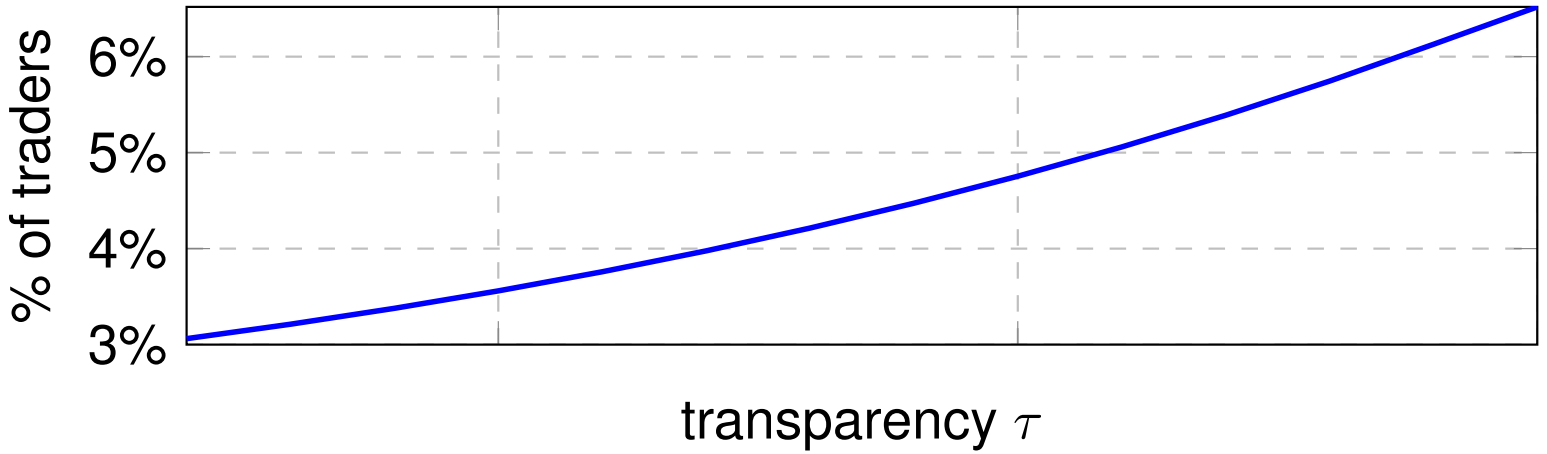
transparency increases the % of adversely affected traders



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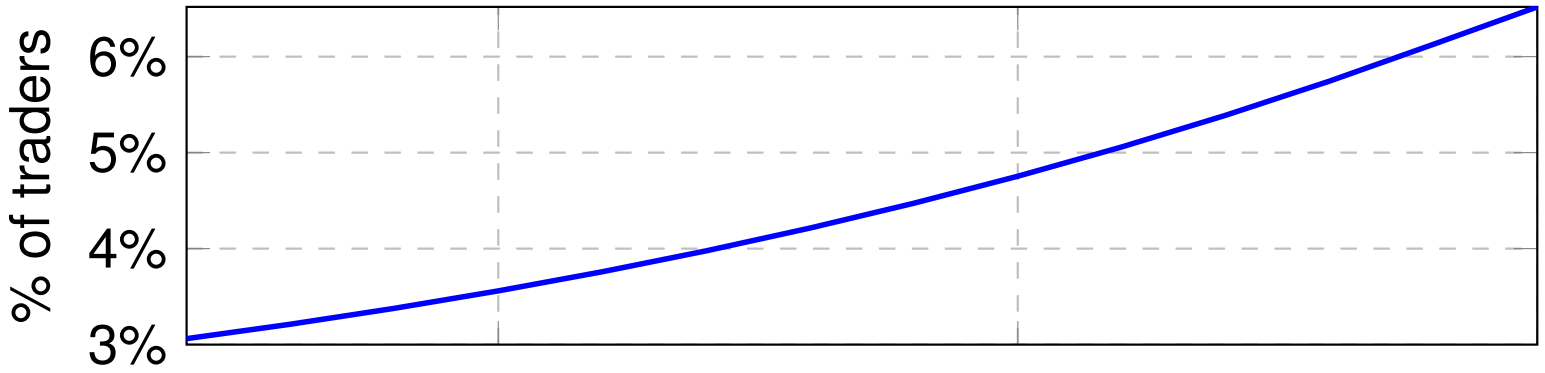
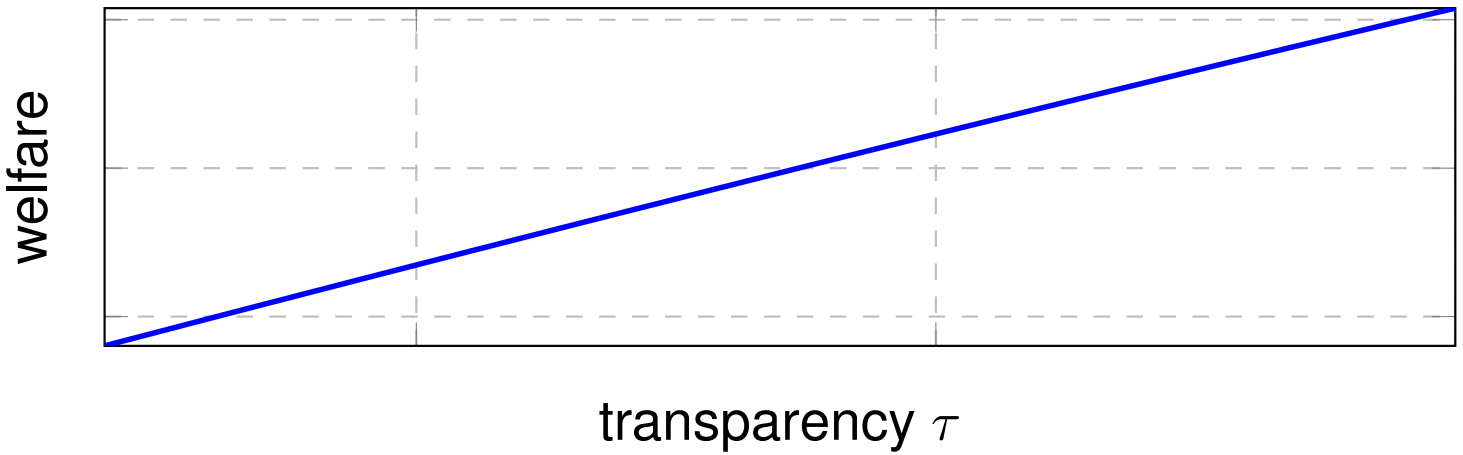


but increases welfare altogether



Outline

Who enters the market?

Gross benefits to entering the OTC market:

$$\beta(z) = \underset{(-)}{a(\tau)\left(z - \mathrm{E}\left[\tilde{z}_0\right]\right)^2} + \underset{(+)}{c(\tau)\,\mathrm{Var}\left[\tilde{z}_0\right]} + \underset{(+)}{b(\tau)\,\sigma_a^2}$$

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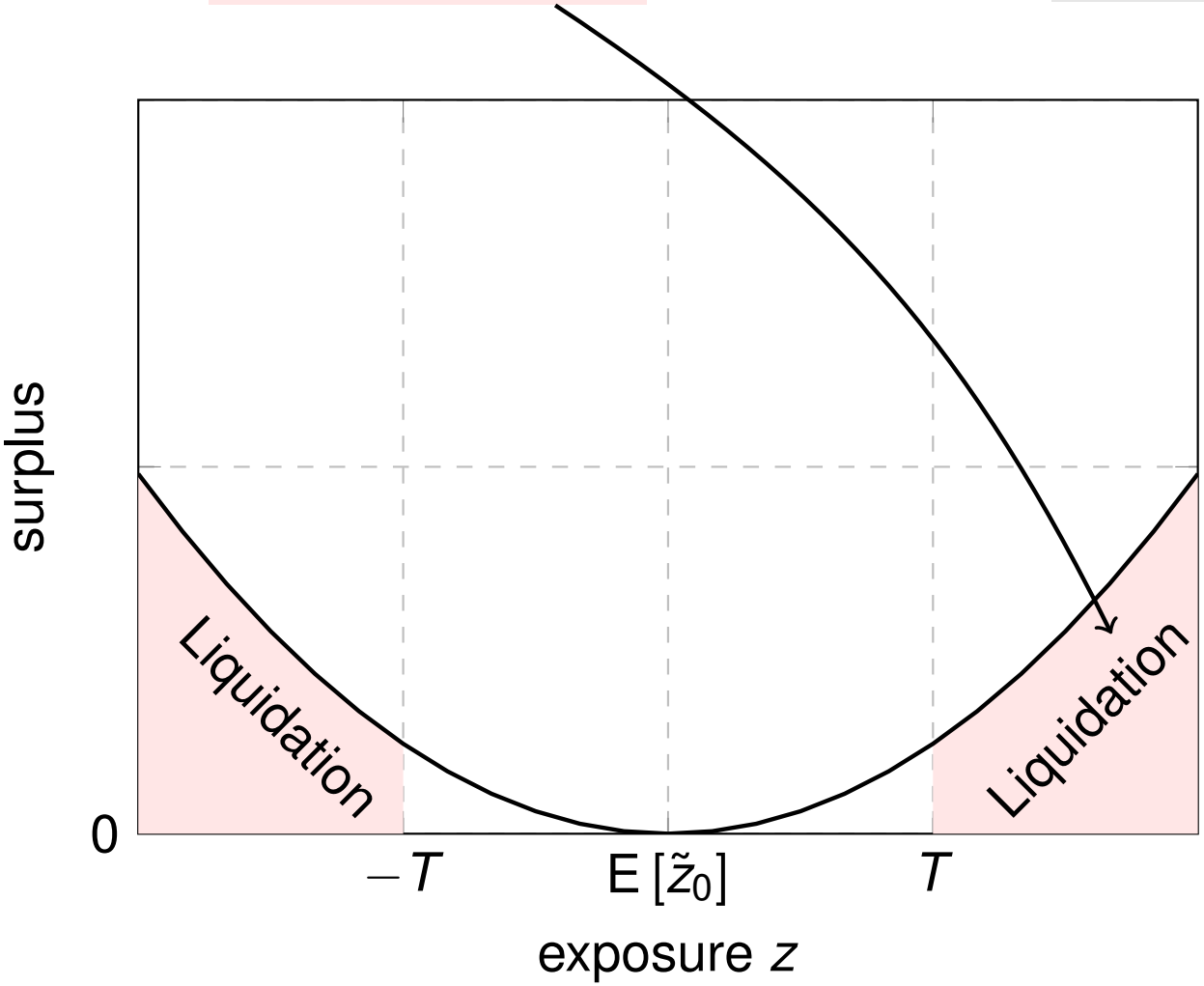

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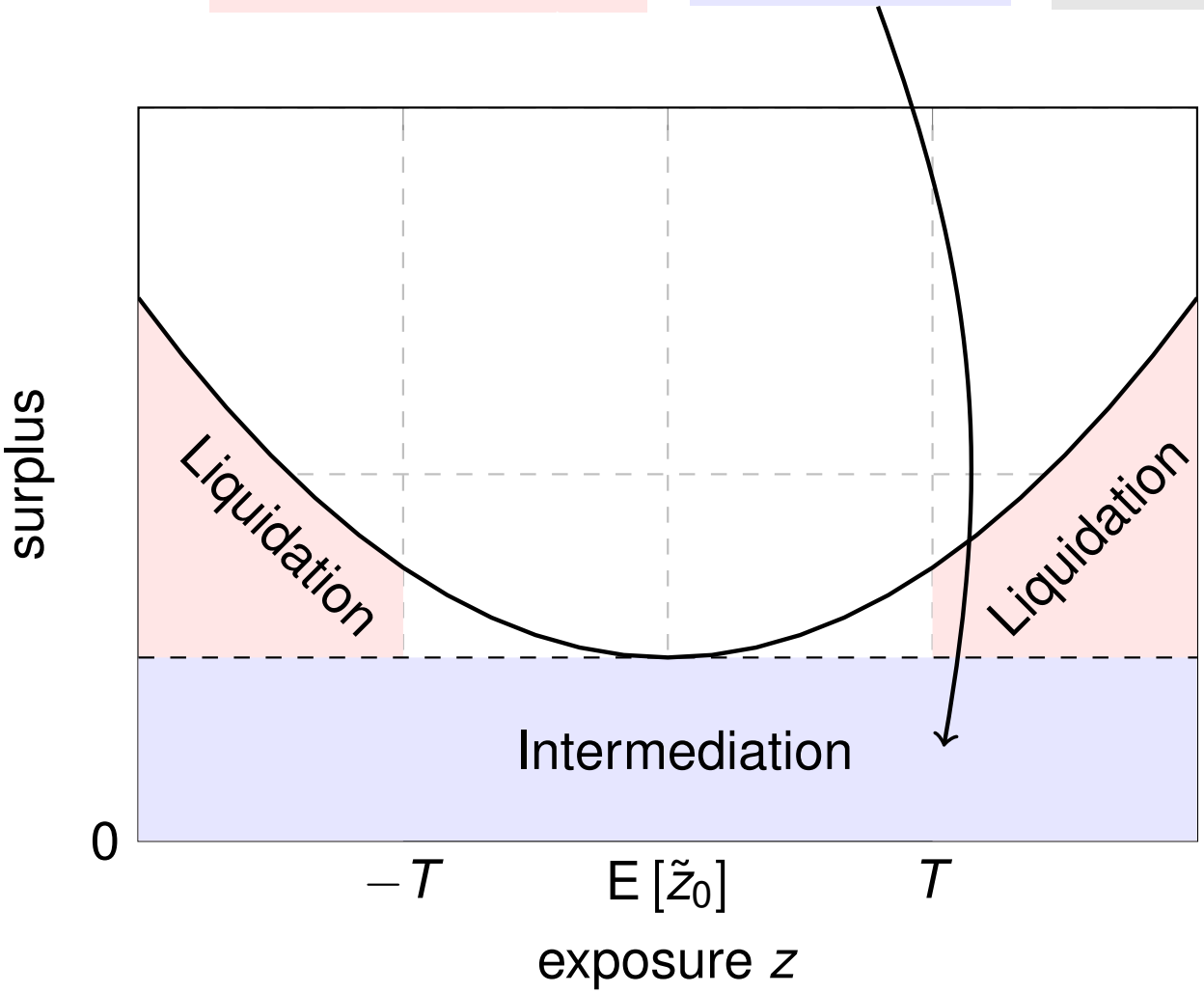

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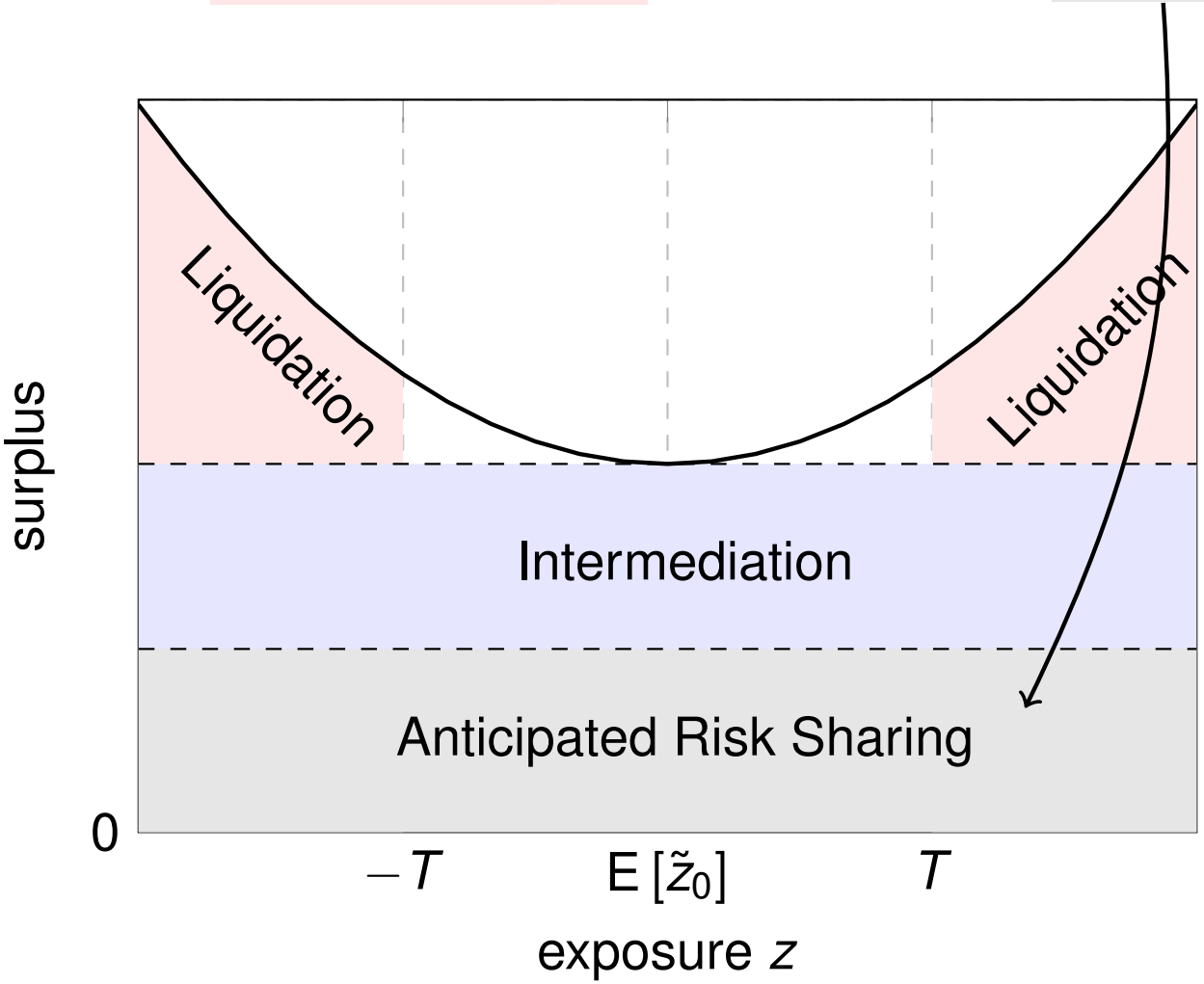

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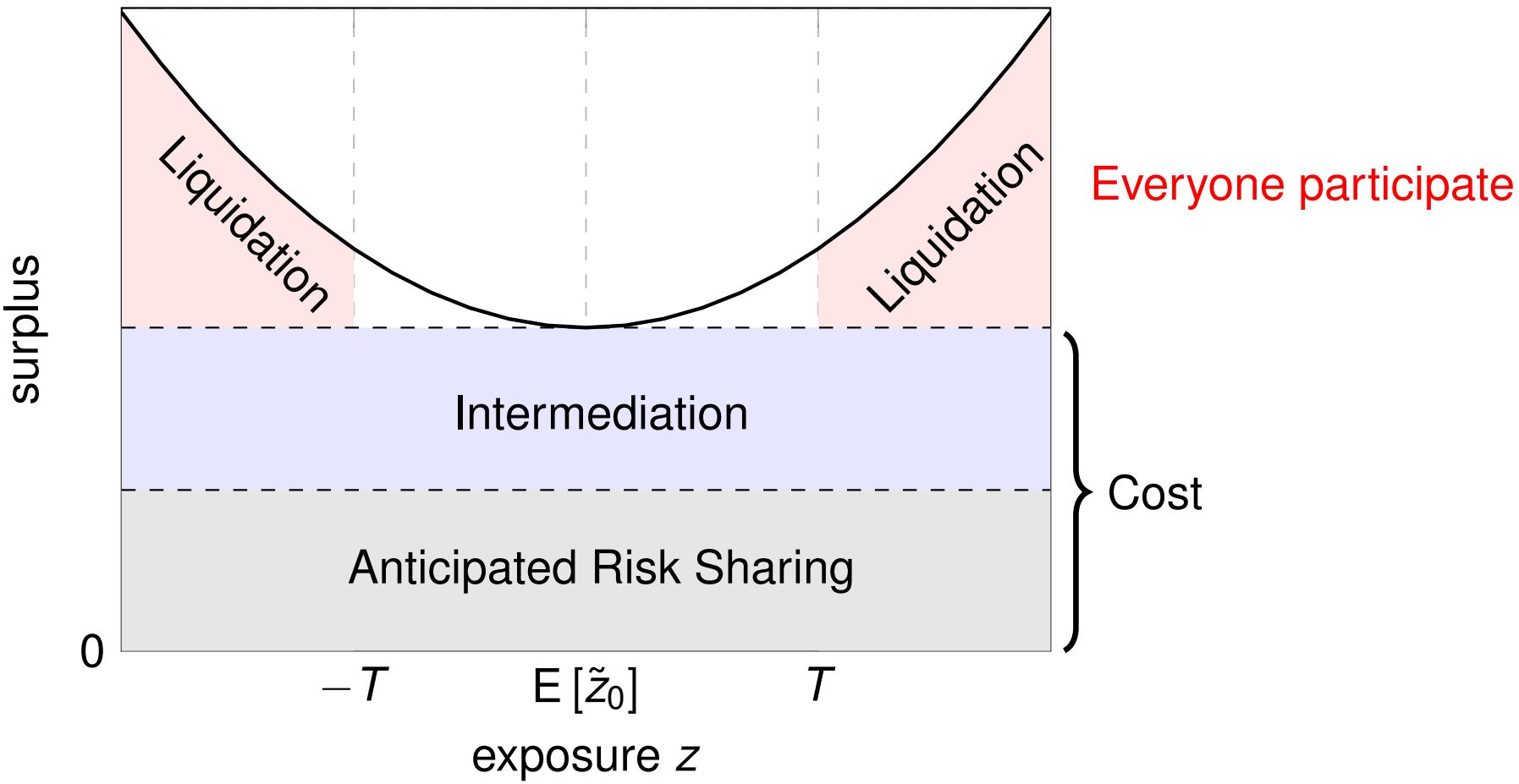

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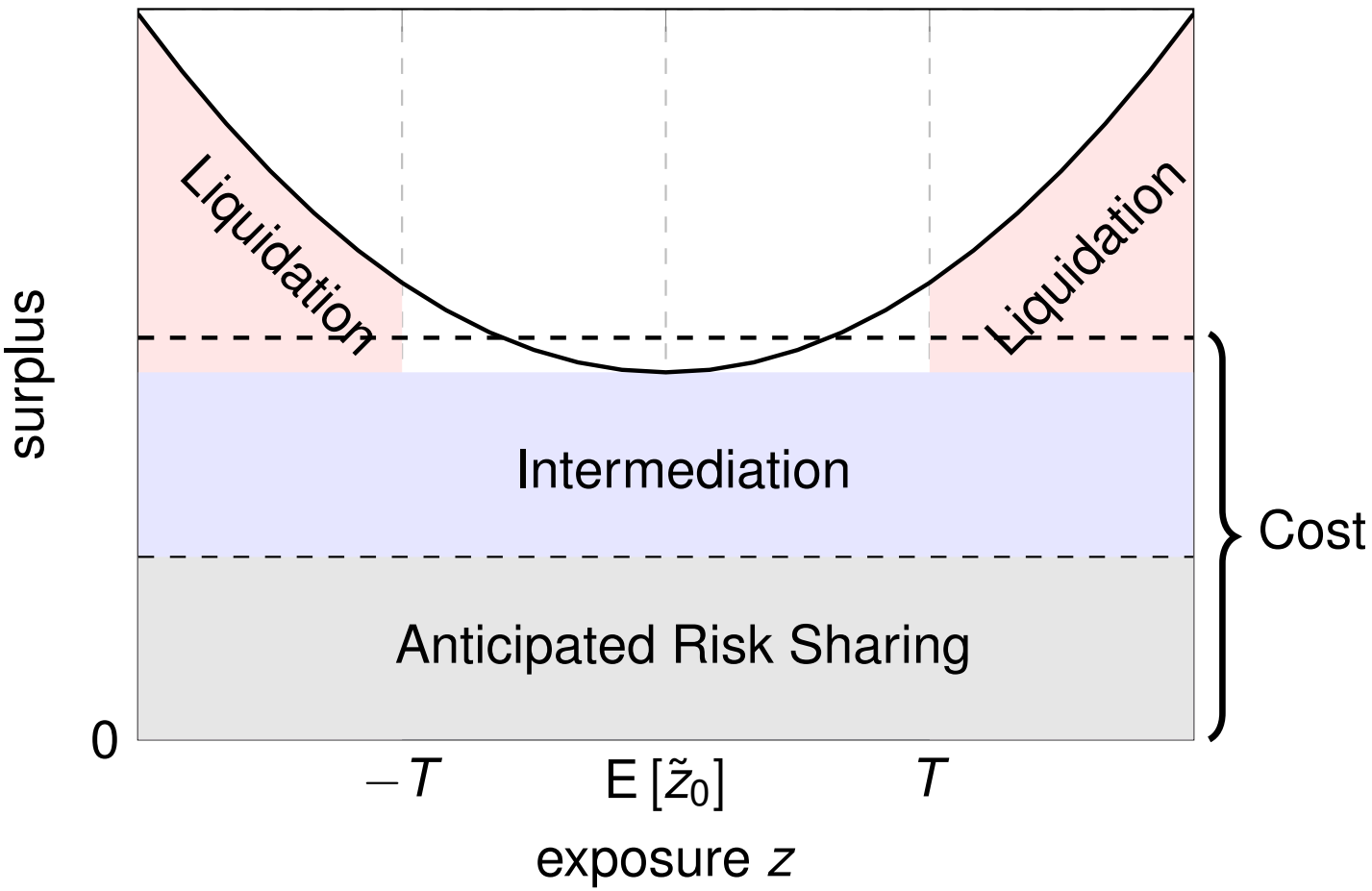

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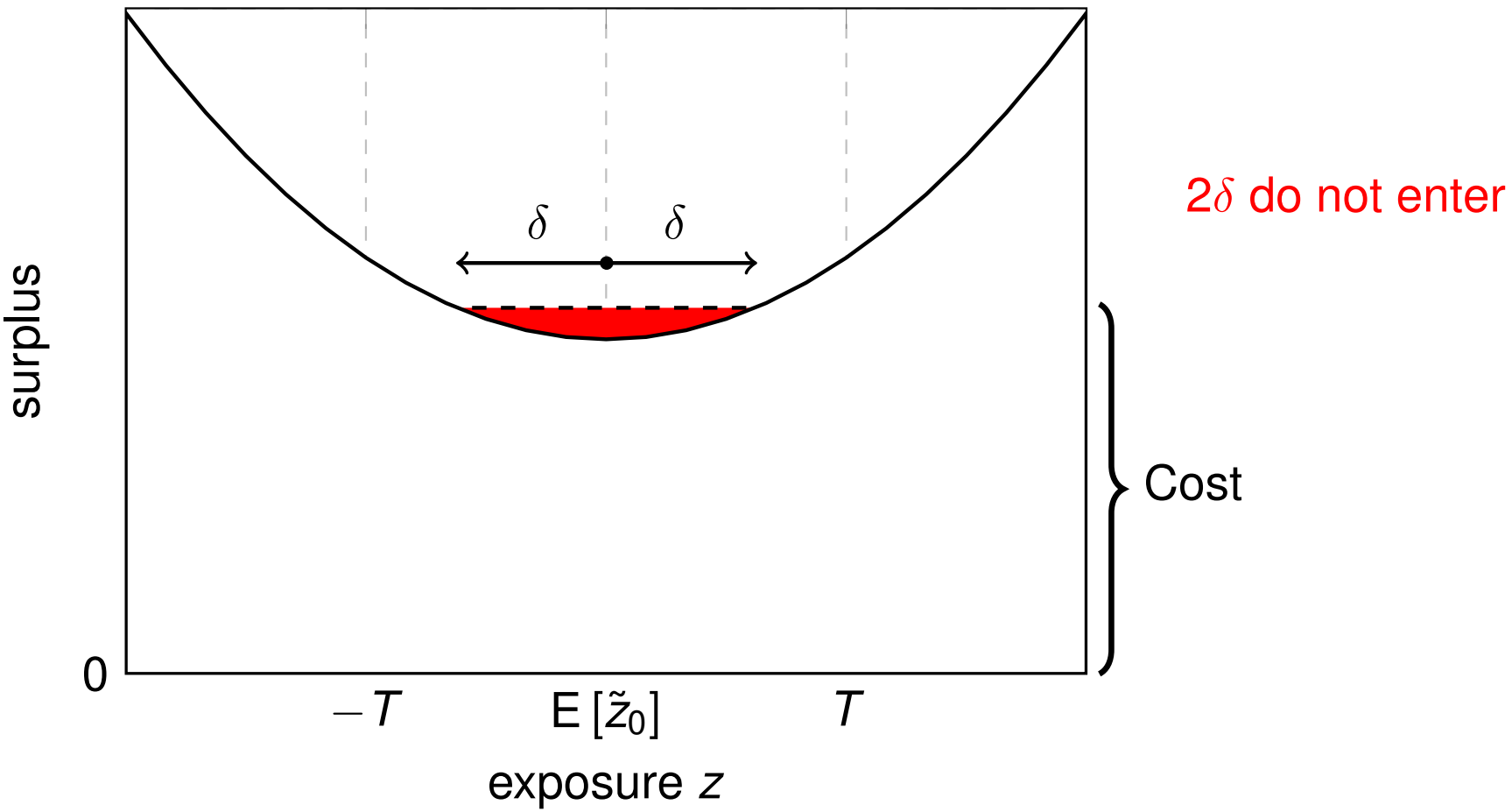

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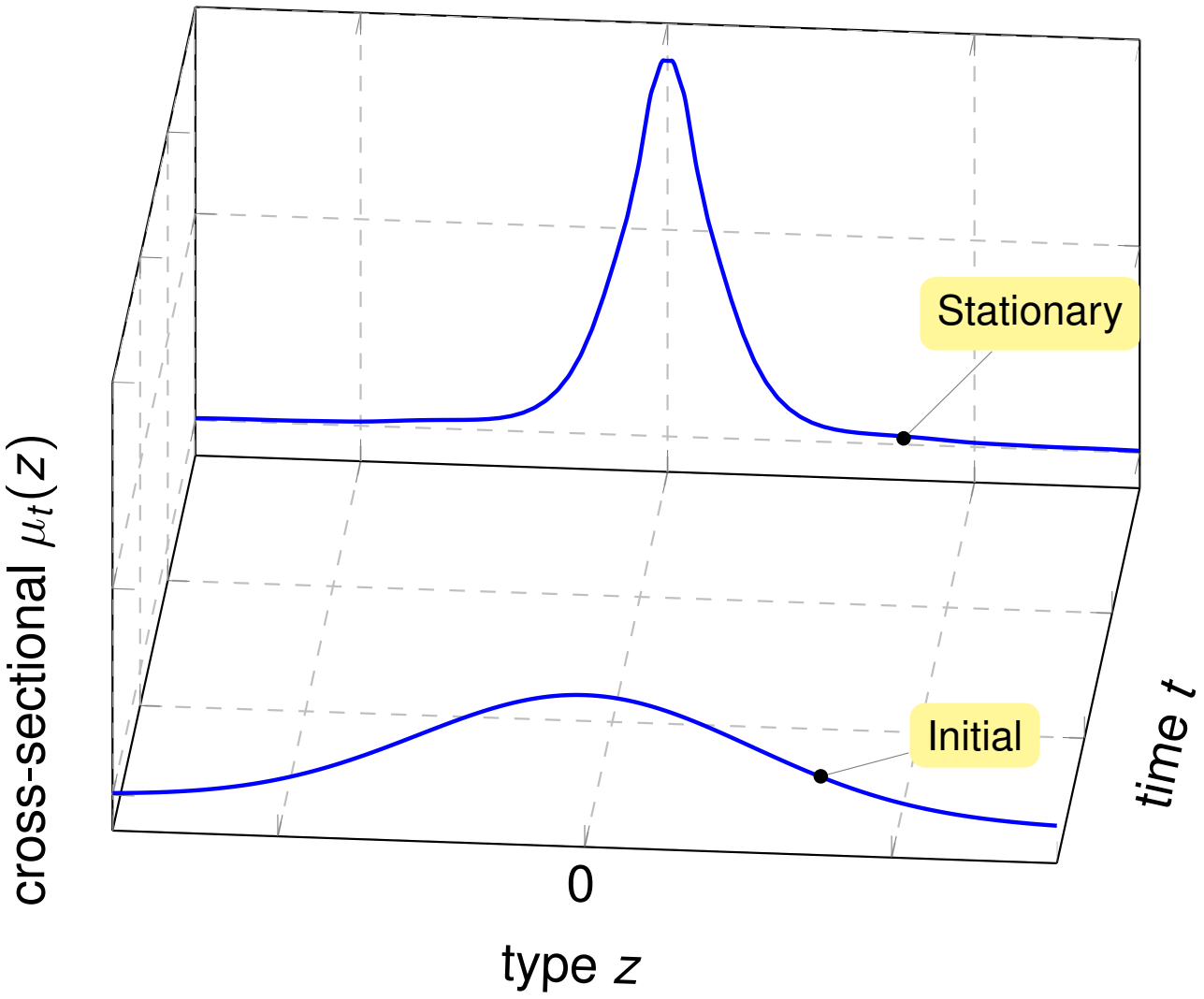

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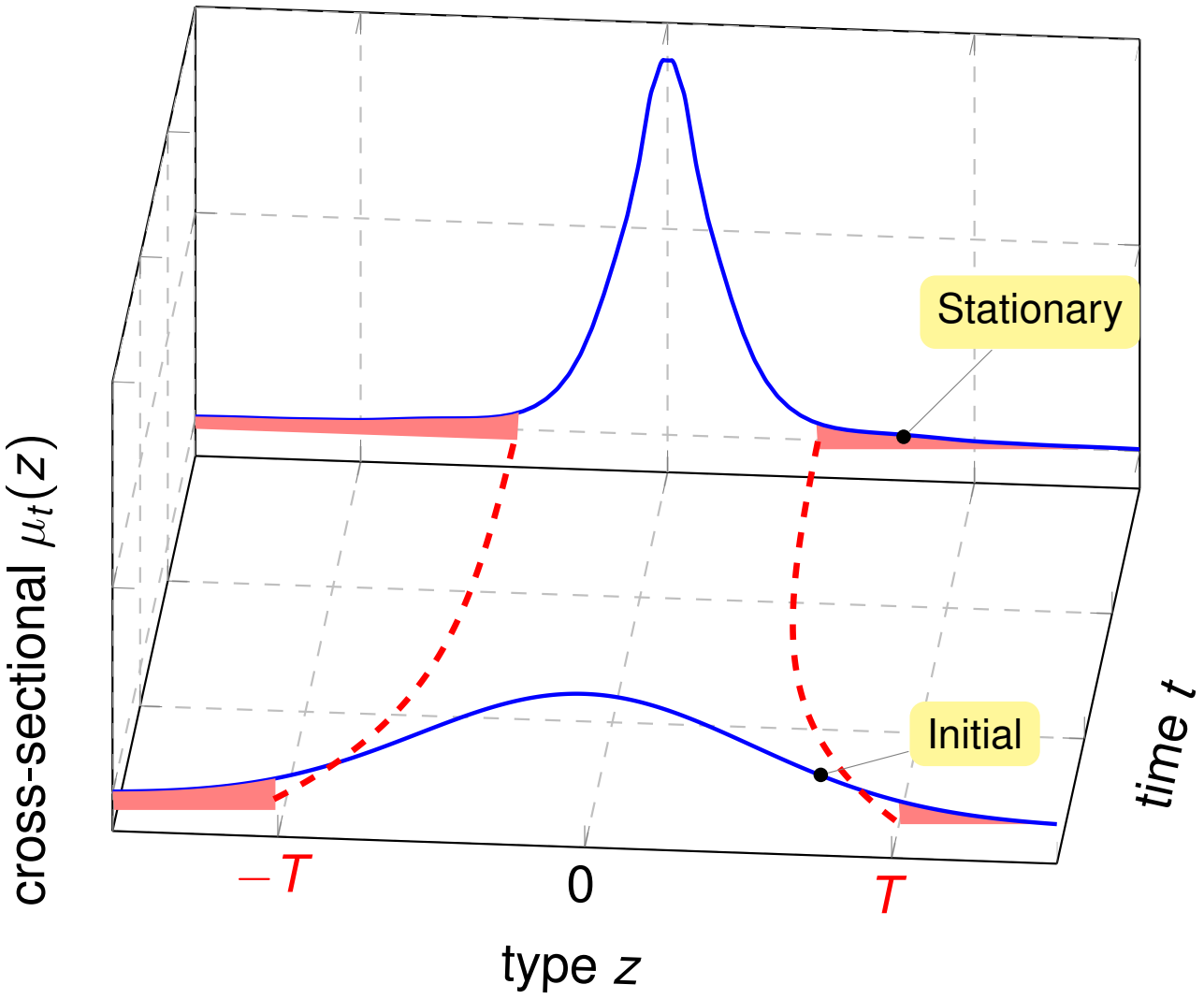

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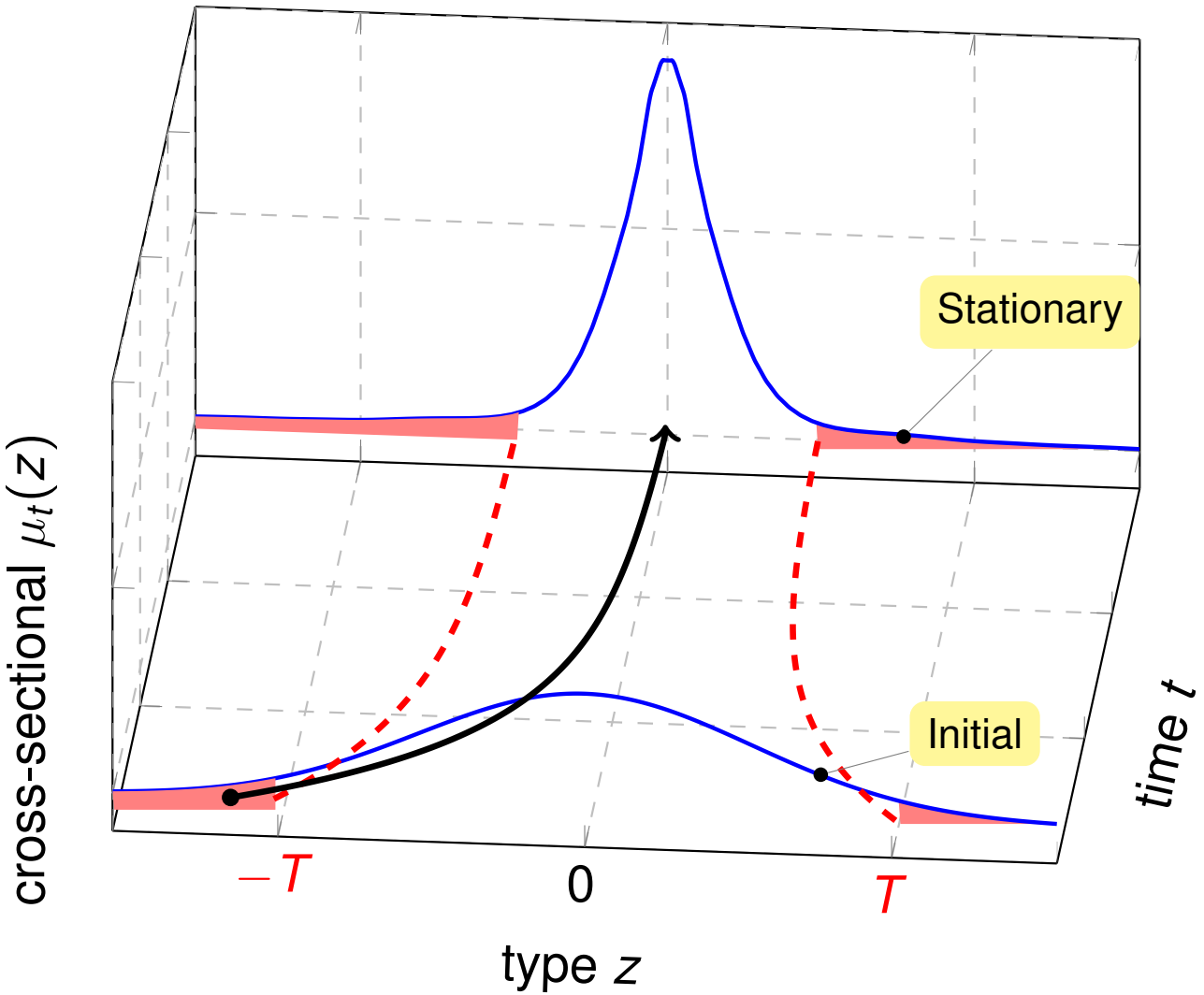

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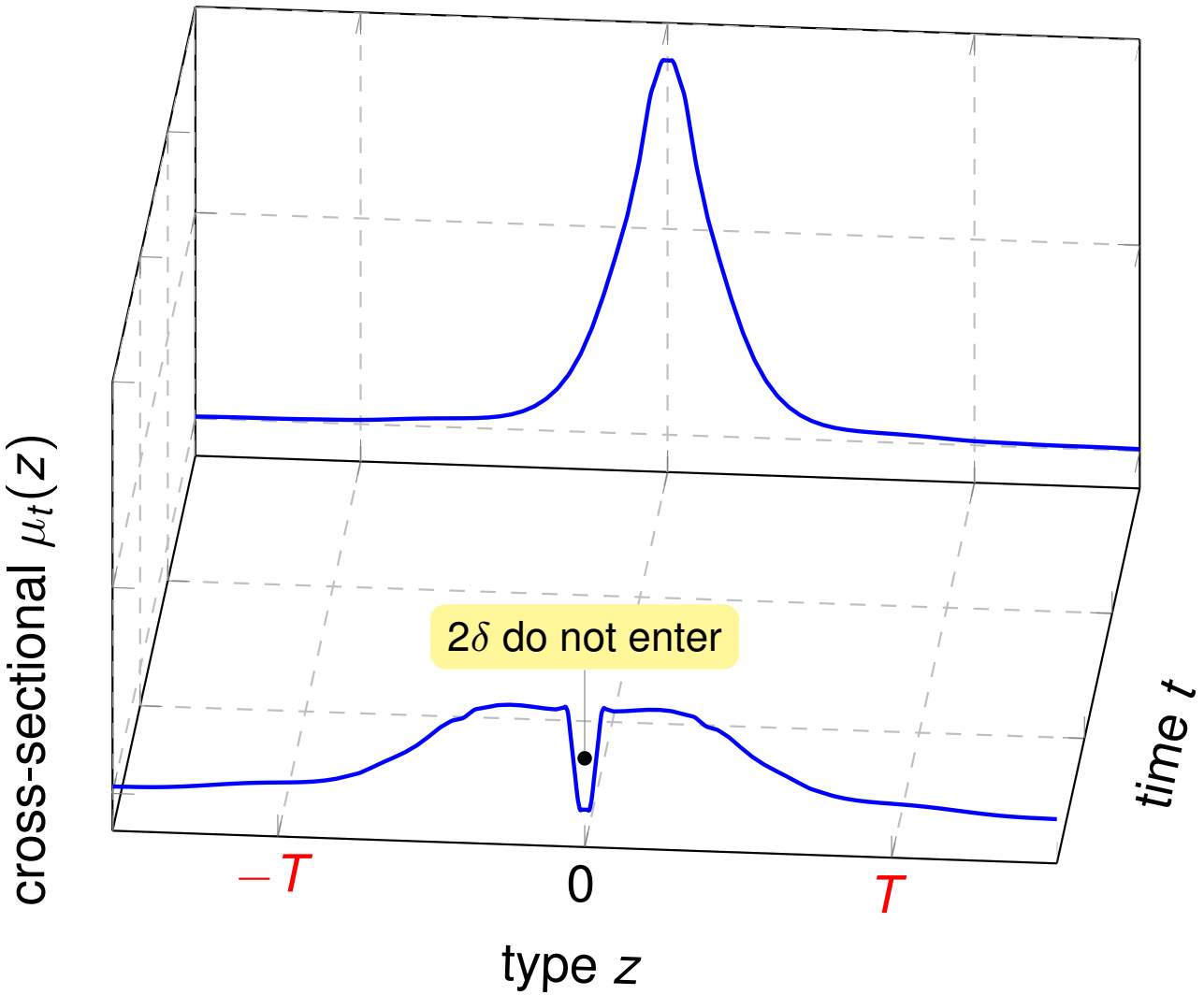

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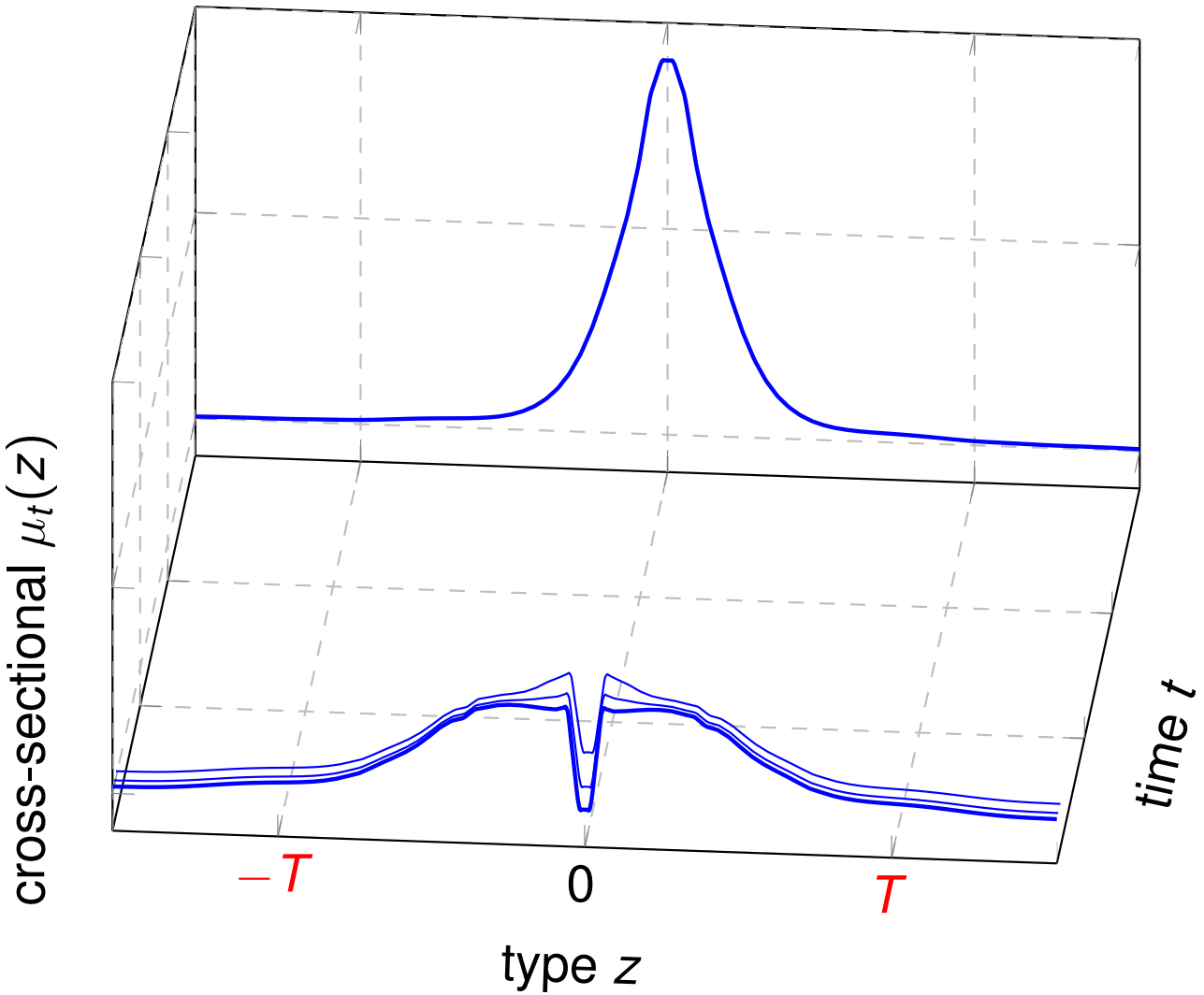

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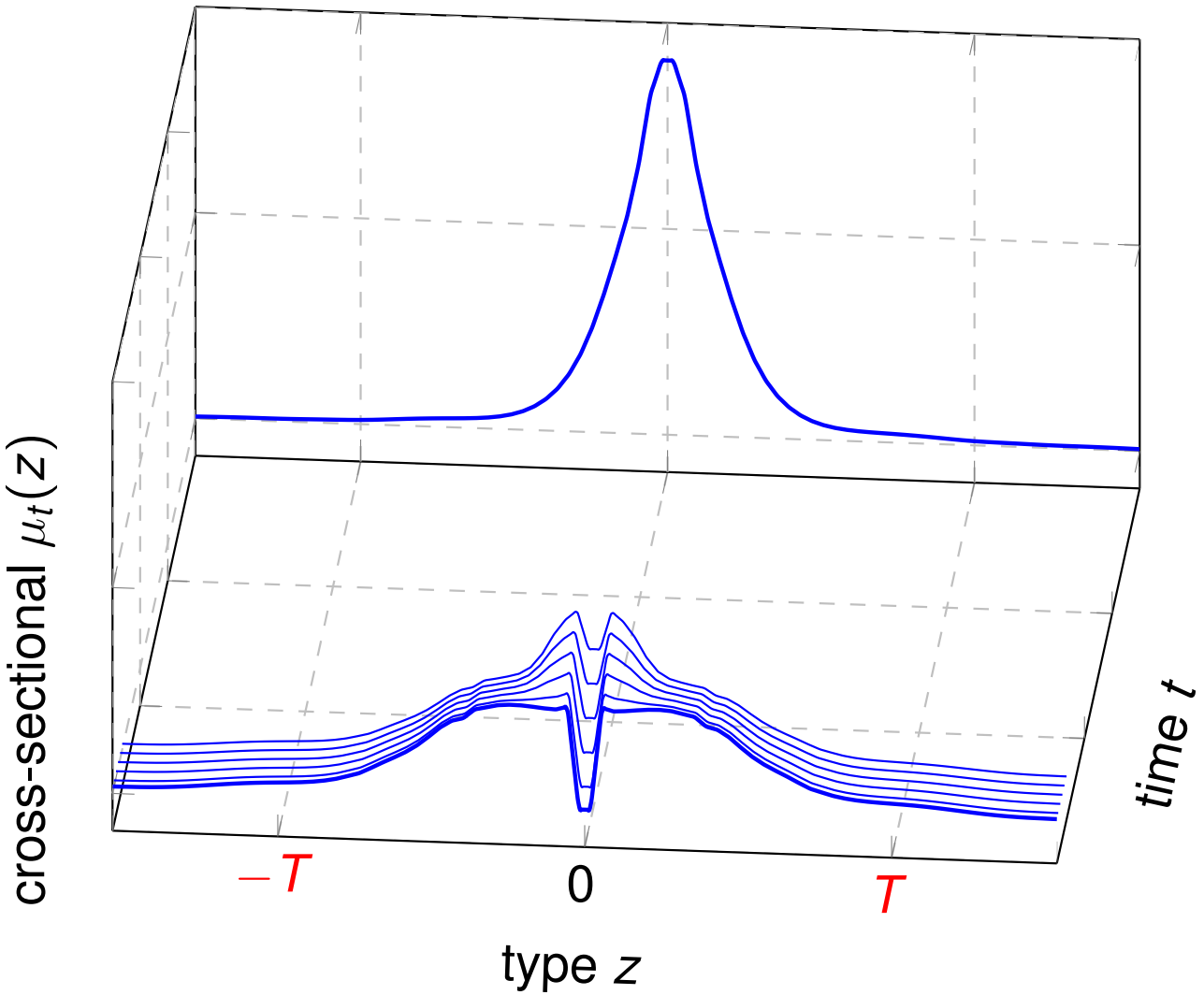

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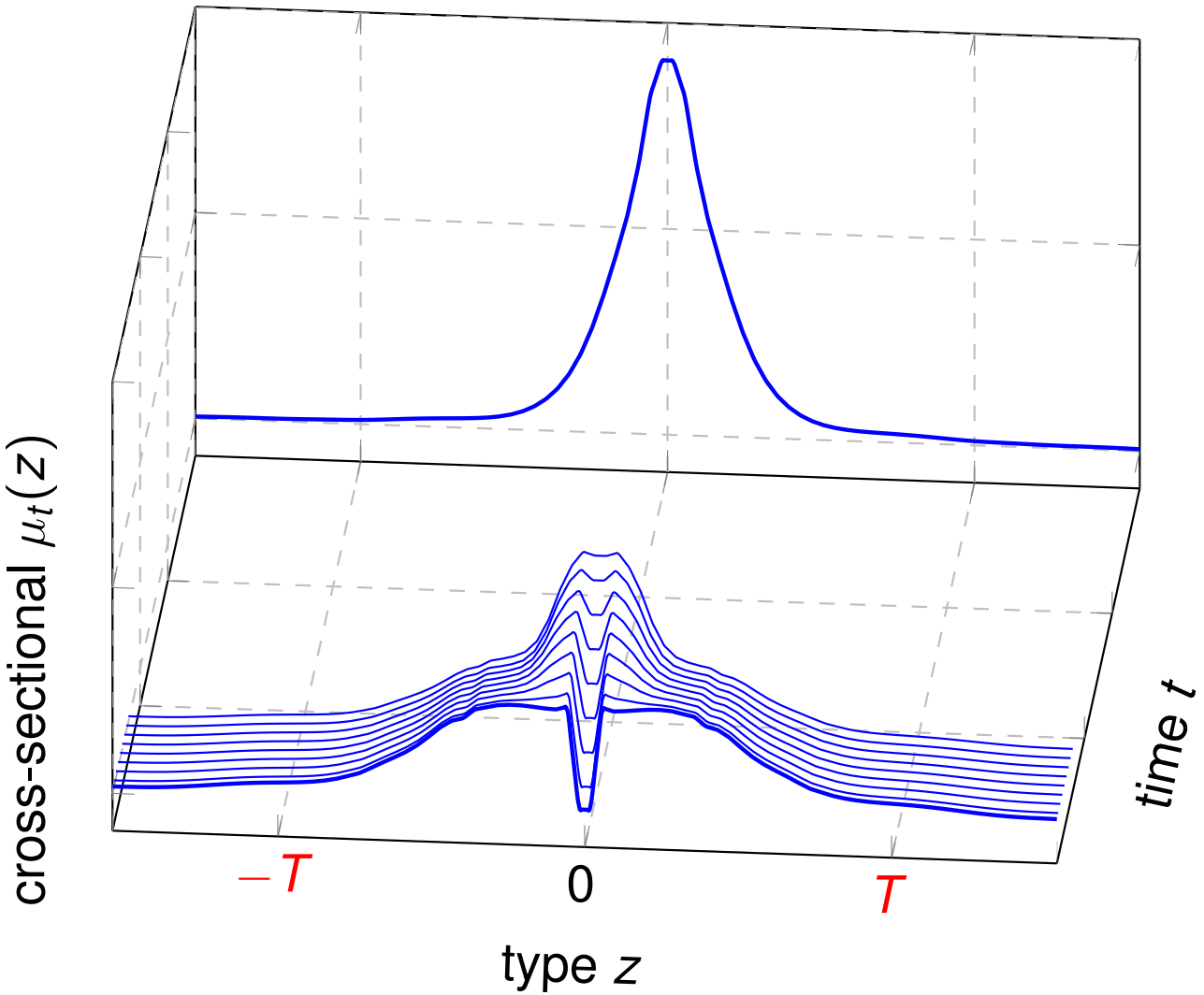

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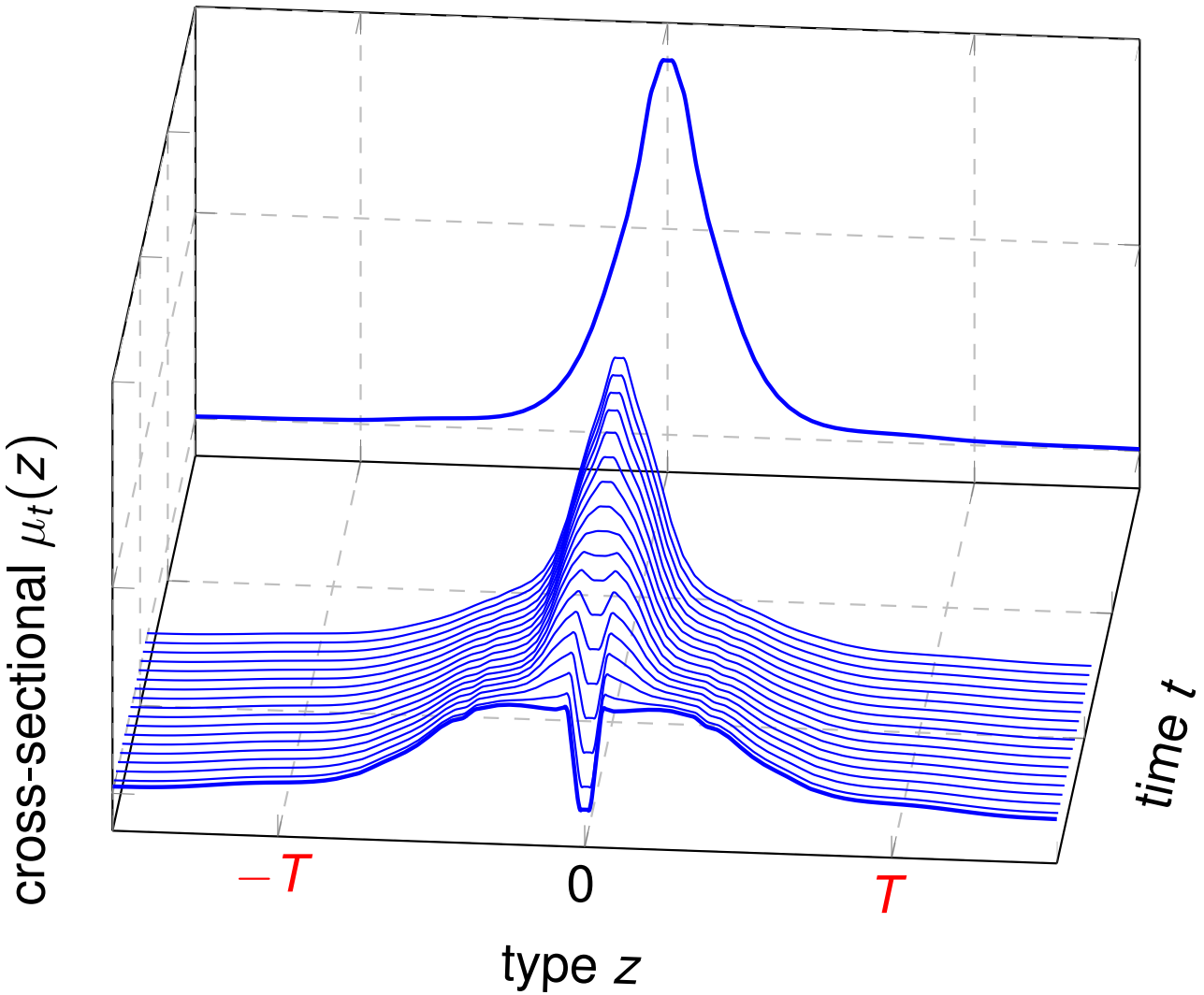

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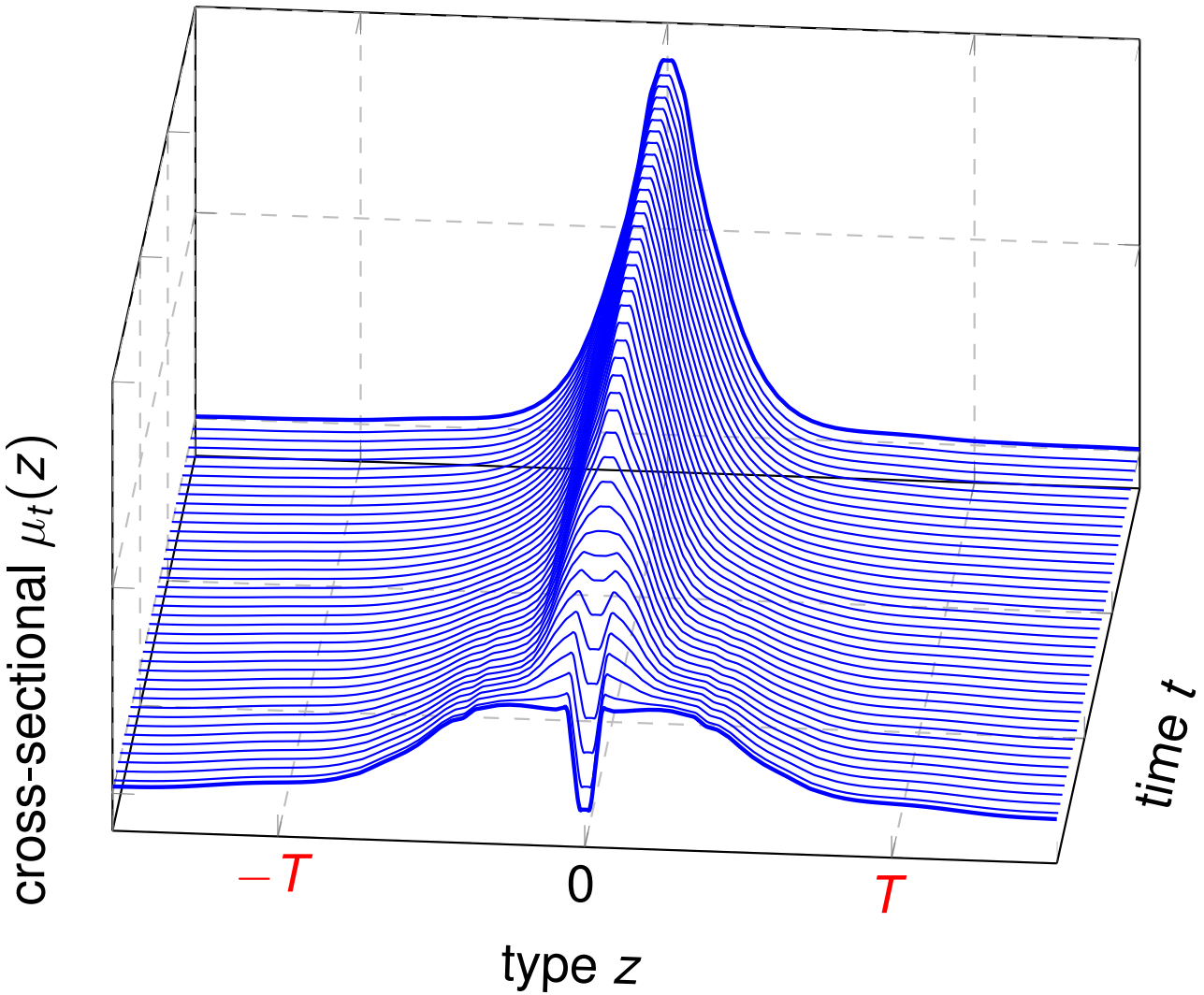
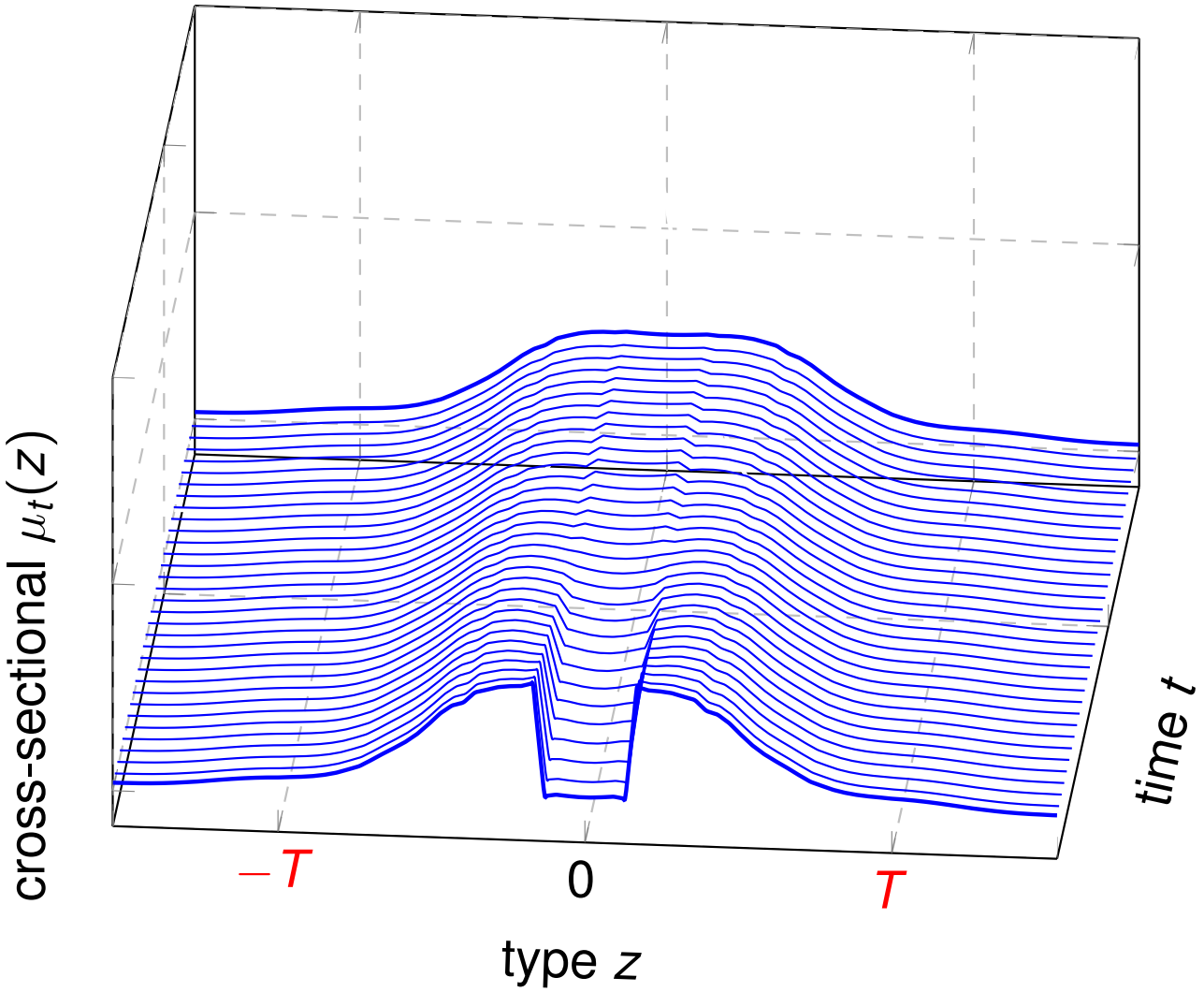
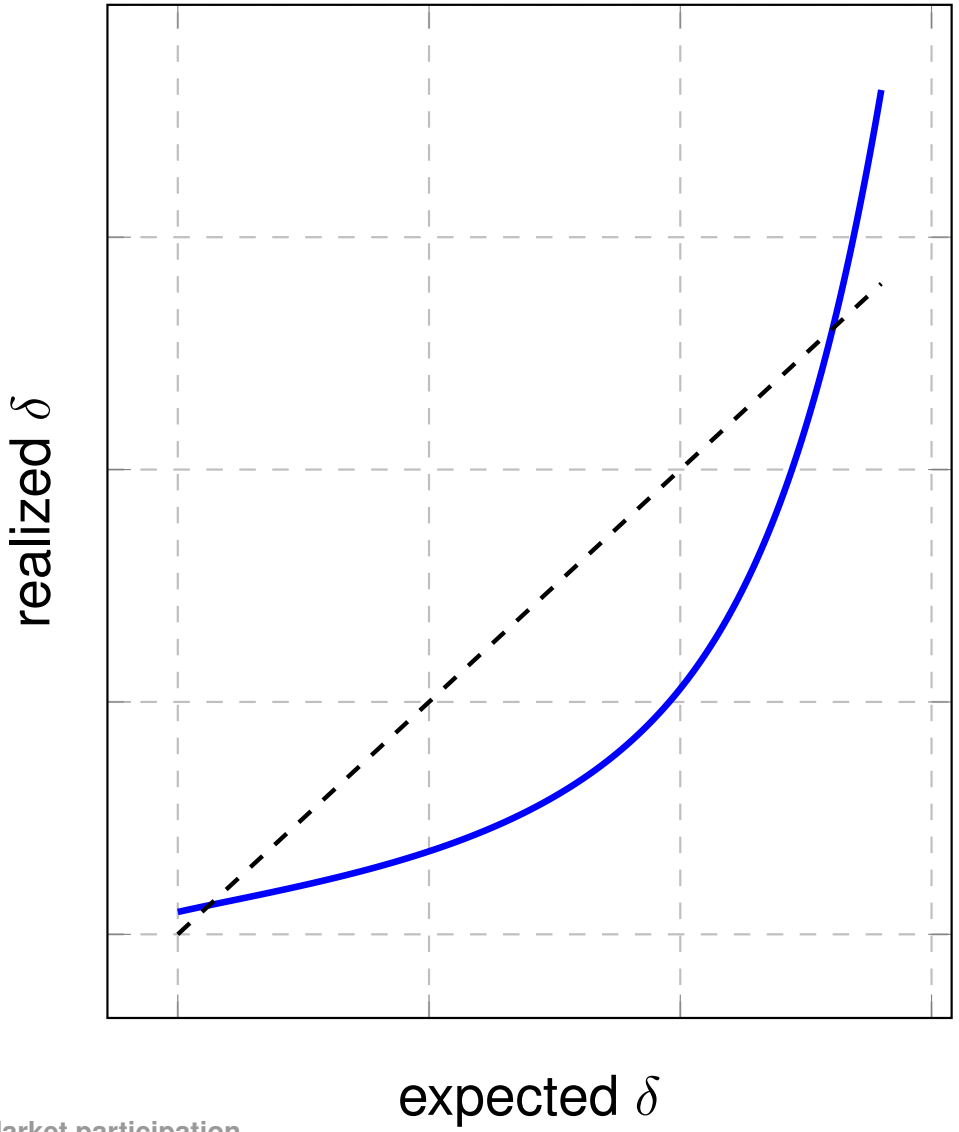


$\sigma_a^2 > C\,\mathrm{Var}[\tilde{z}_a]$: agents are strategic complements



$\sigma_a^2 > C\,\mathrm{Var}[\tilde{z}_a]$: agents are strategic complements

long-term risk sharing dominates: multiple equilibria



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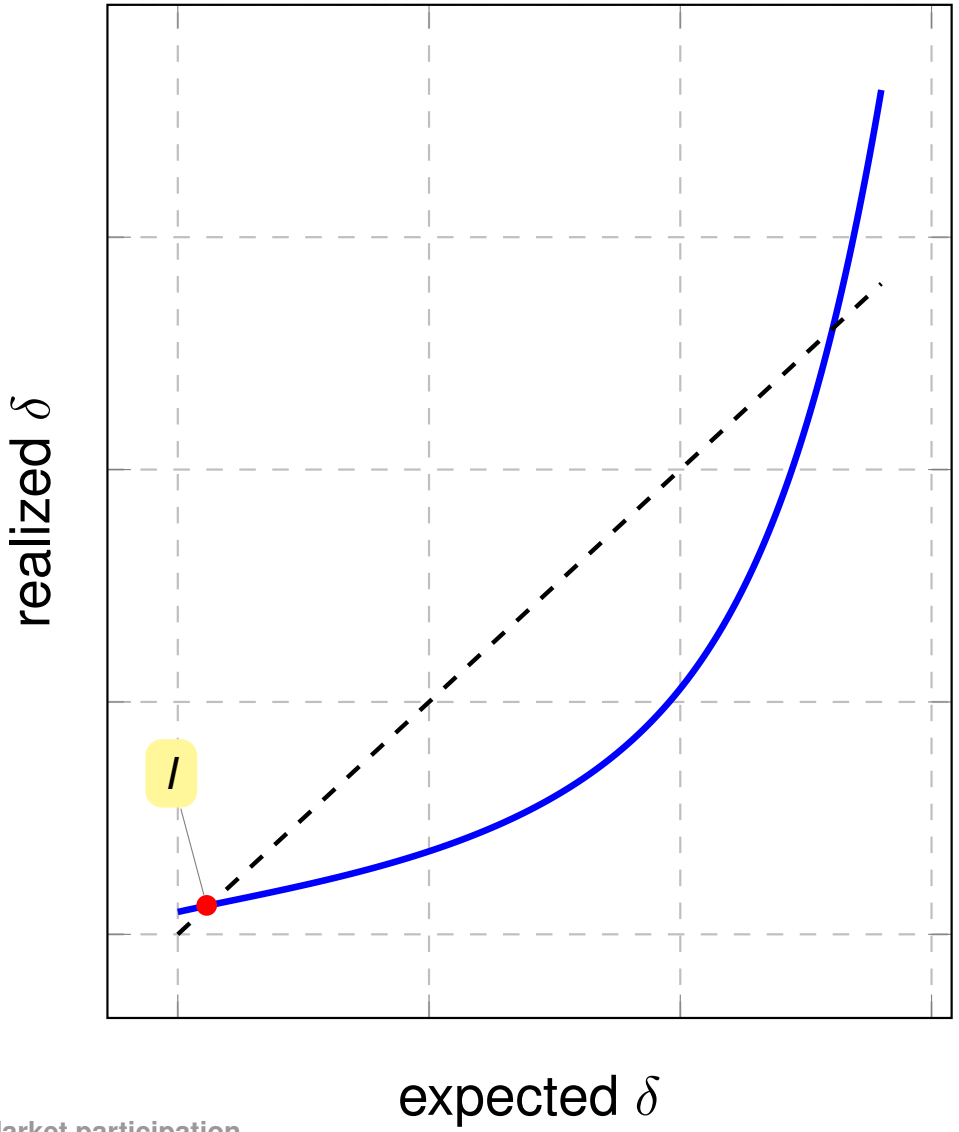

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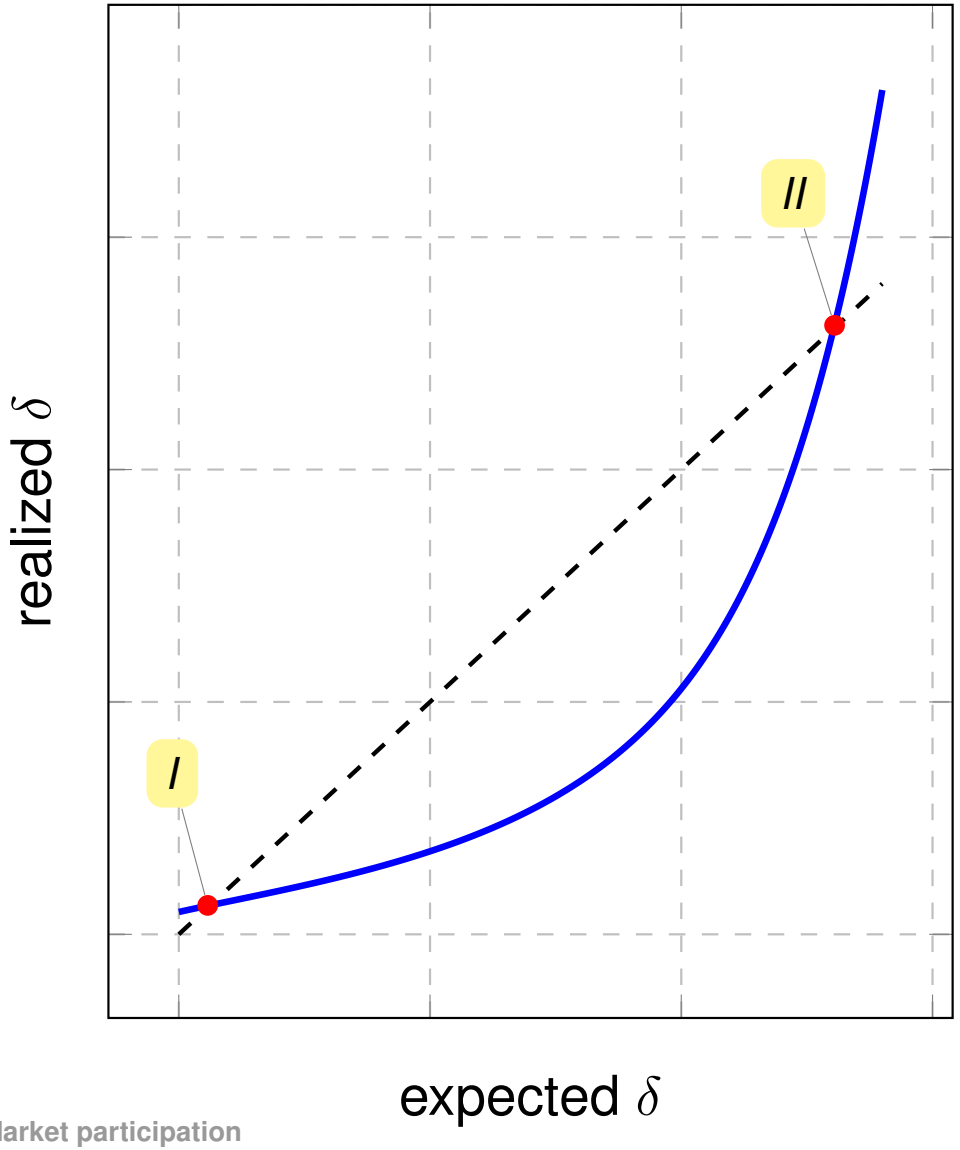

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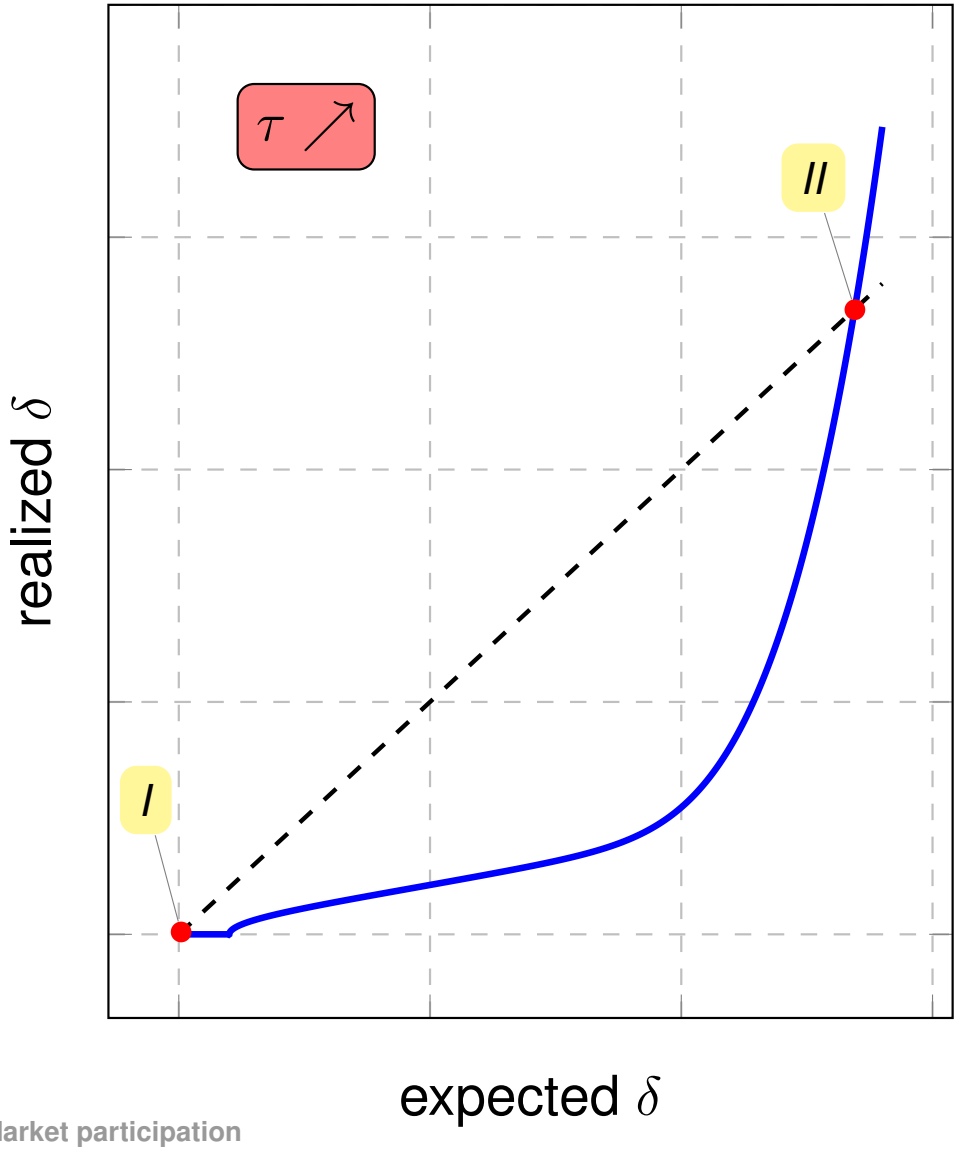

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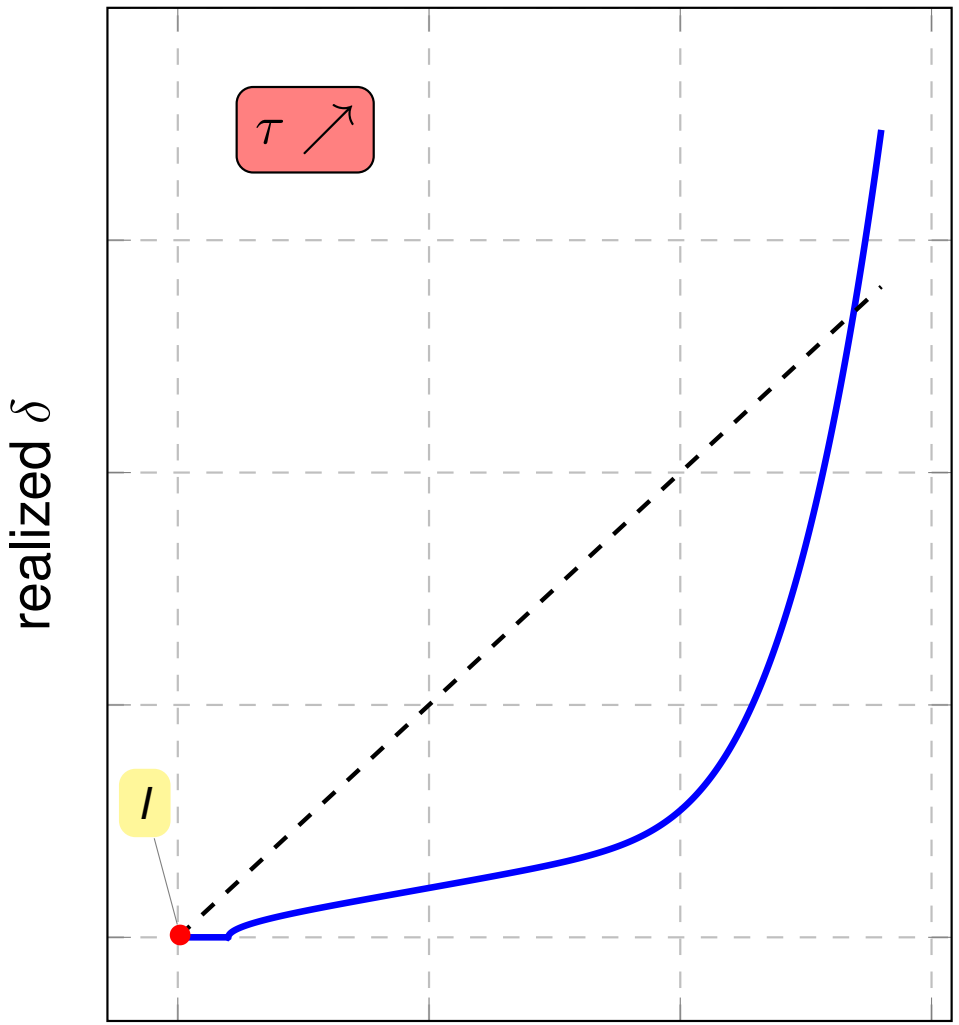
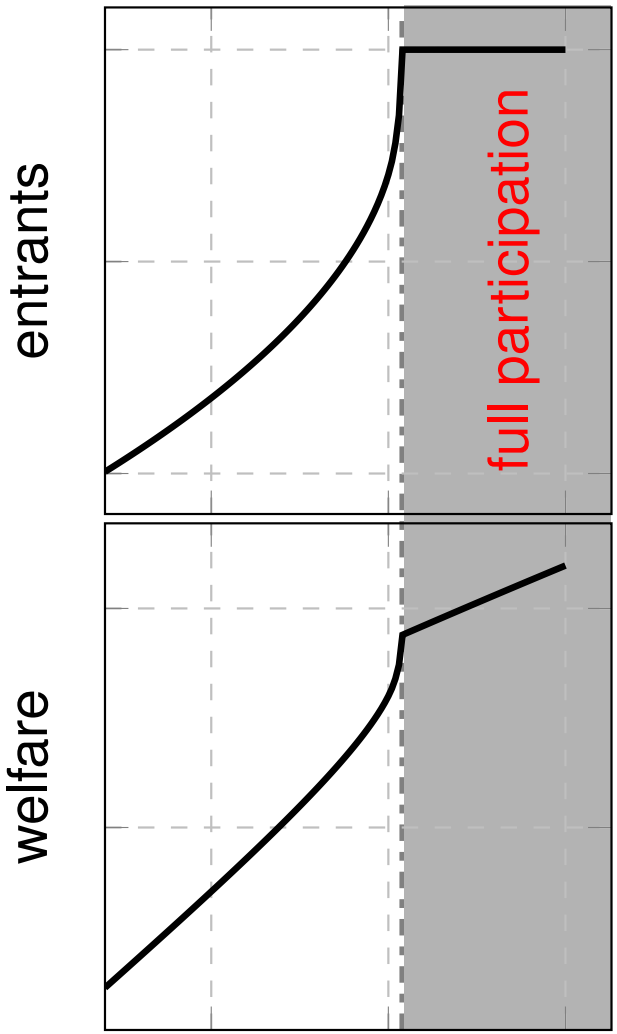
Eq. *I*: Transparency leads to full participation





$\sigma_a^2 > C\,\mathrm{Var}[\tilde{z}_a]$: agents are strategic complements

Eq. *II*: Transparency is welfare decreasing