Financial Innovation and the Inequality Gap

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Q: WHO BENEFITS FROM FINANCIAL INNOVATION?

Faster and cheaper computing has led to lower:
- Costs of stock market participation ↓
- Search costs for suitable funds ↓
- Information costs ↓

Yet, stock market participation has been declining since 2001.

A: The explosion of financial technologies for retail investors does not guarantee broad increases in household wealth. Instead, the sophisticated investors who already have relatively high levels of wealth are most likely to benefit from many of the new technologies.

Main Contribution

Contribution: Build a unified theory that reconciles financial innovation with the decrease in stock market participation and increase in inequality obs. In last decades.

Why? Because classical info-based theories have two flaws:
1) Ignore the possibility that investors can share the cost of research by investing in a fund
2) To generate an increase in inequality, they need to assume information costs have increased over time, but inconsistent with the stock market becoming more informative in the last decades

Theoretical Model

Model: Heterogeneous investors in wealth have a choice between not investing, investing uninformedly (avg. fund), or informedly (skilled fund)

Investors and Managers
- Heterogeneity in investor initial wealth, $W_{0j} \in [0, W_0^{max}]$
- Skilled managers (measure M) act in the best interest of investors

Asset market
- One riskless asset: r
- Asset payoff, z
  Noisy supply, x $\quad \begin{pmatrix} z \\ x \end{pmatrix} \sim N\begin{pmatrix} \mu_z & \sigma_z^2 \\ \mu_x & \sigma_x^2 \end{pmatrix}$

Fiction 1: Participation is costly: fee **F**

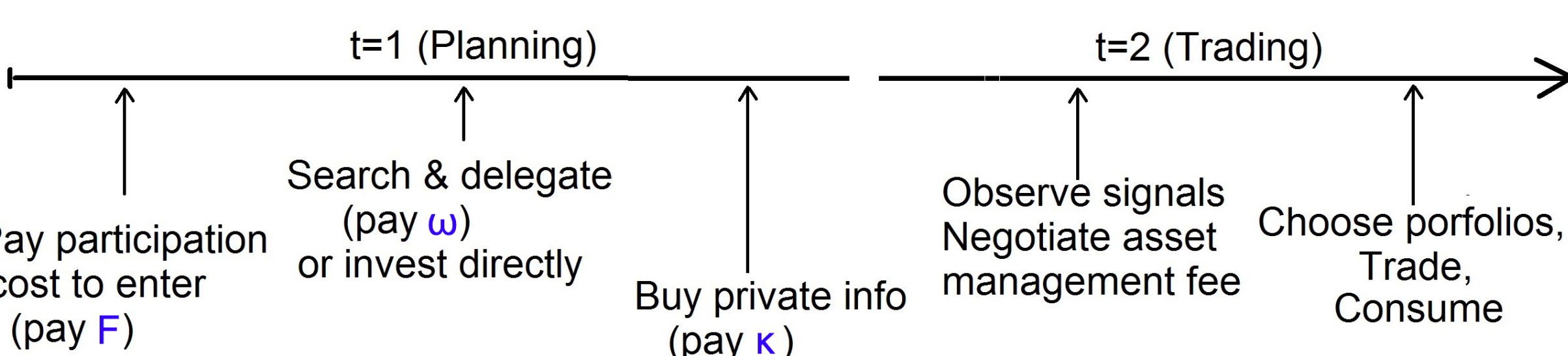**Friction 2**: Finding a suitable manager is costly, **ω**

When they meet, they negotiate a management fee, f_j

Friction 3: Information is costly, $\kappa(\sigma_s^{-2})$

Signals: $s_{j,m} = x + \epsilon_s$, where $\epsilon_s \sim N(0, \sigma_{s,j,m}^2)$

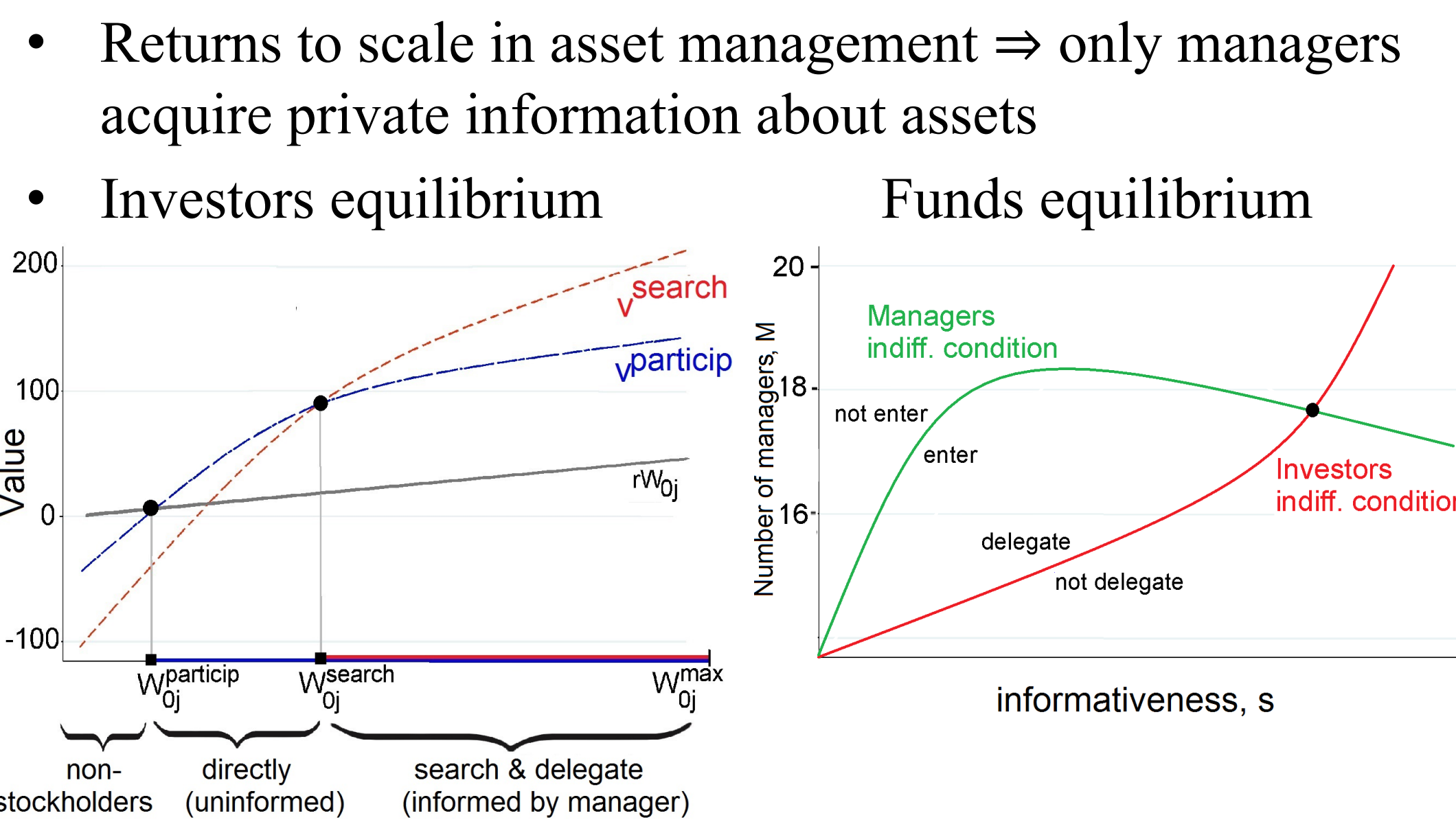Cost of information: $\kappa(\sigma_{s,j,m}^{-2}) = c_0 \sigma_{s,j,m}^{-2}$

Timeline

t=1 (Planning)
- Pay participation cost to enter (pay F)
- Search & delegate (pay ω) or invest directly
- Buy private info (pay κ)

t=2 (Trading)
- Observe signals Negotiate asset management fee
- Choose porfolios, Trade, Consume

Equilibrium

1. Portfolios: $\max_{q_j} E_j[W_{1,j}] - \frac{\rho(w_{0,j})}{2} Var_j[W_{1,j}]$

   $s.t. W_{1,J} = rW_{0,J} - F - \mathbb{1}[\omega - f_j] - q_j(z - rp)$

2. Asset markets clear: $rp = a + bz - cx$

3. Management fees determined through Nash bargaining:
   $\max(U_j^{info} - U_j^{uninfo} - f_j) \times f_j$

4. Managers optimally choose precisions:
   $\max_{\sigma_{s,j,m}^{-2}} \int_{W_0^{search}}^{W_0^{max}} f_j \, dF(W_{0,j})/M - \kappa(\sigma_{s,j,m}^{-2})$

5. Investors optimally choose between:
   $\max \{V^{not-particip}, V^{directly}, V^{search}\}$
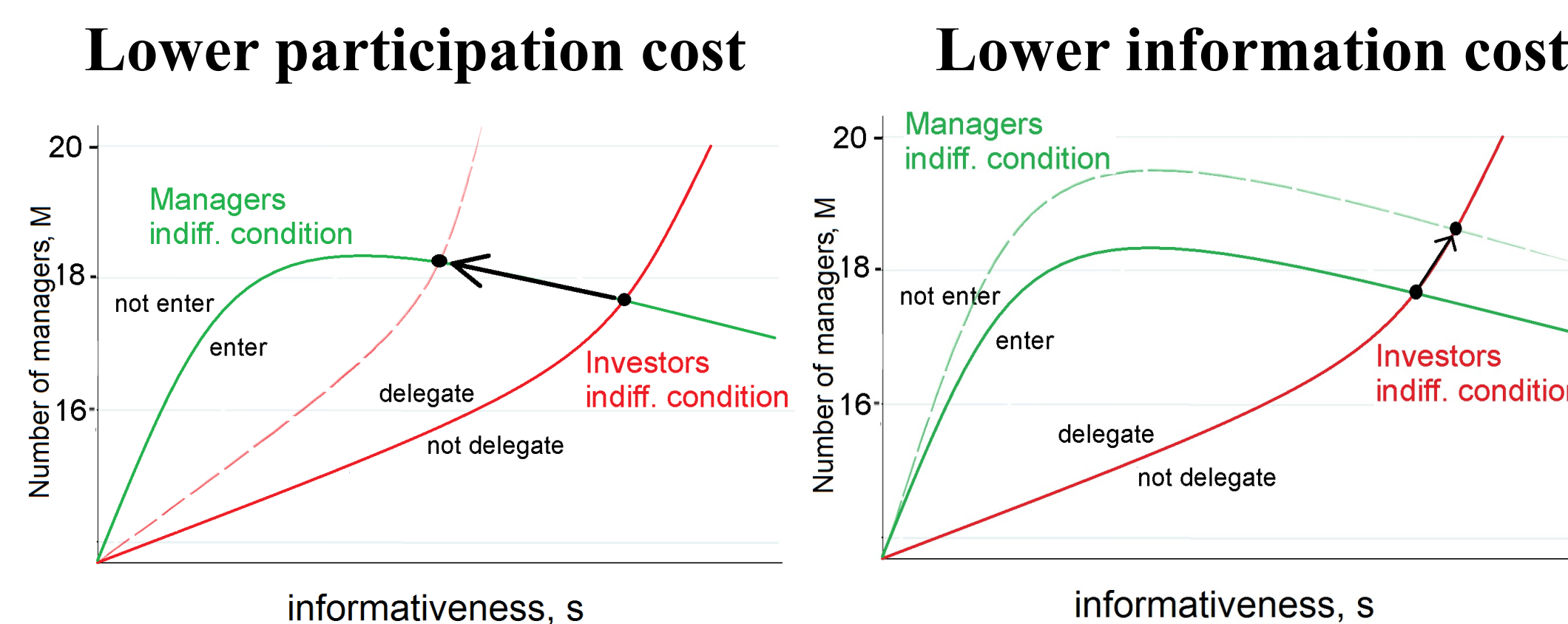
Equilibrium properties

- Returns to scale in asset management ⇒ only managers acquire private information about assets
- Investors equilibrium — Funds equilibrium

$t = \int_{W_0^{particip}}^{W_0^{max}} \frac{1}{\rho(w_{0j})} dF(W_{0j})$ **TOLERANCE**

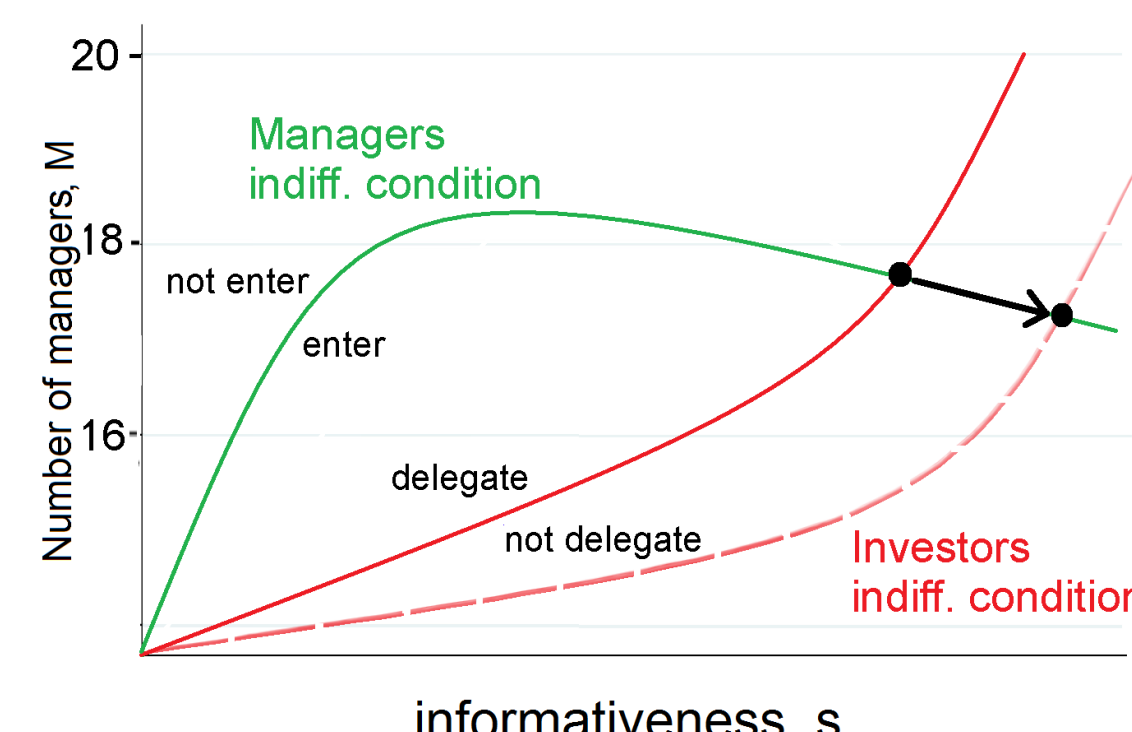$s = \int_{W_0^{search}}^{W_0^{max}} \frac{\sigma_{s,j,m}^{-2}}{\rho(w_{0j})} dF(W_{0j})$ **INFORMATION**

$M = \frac{s*D}{4\kappa'(\sigma_{s,j,m}^{-2})}$ **NR. OF MANAGERS**

- **Result from comparative statics exercise:** Opposing implications for participation, competition, inequality

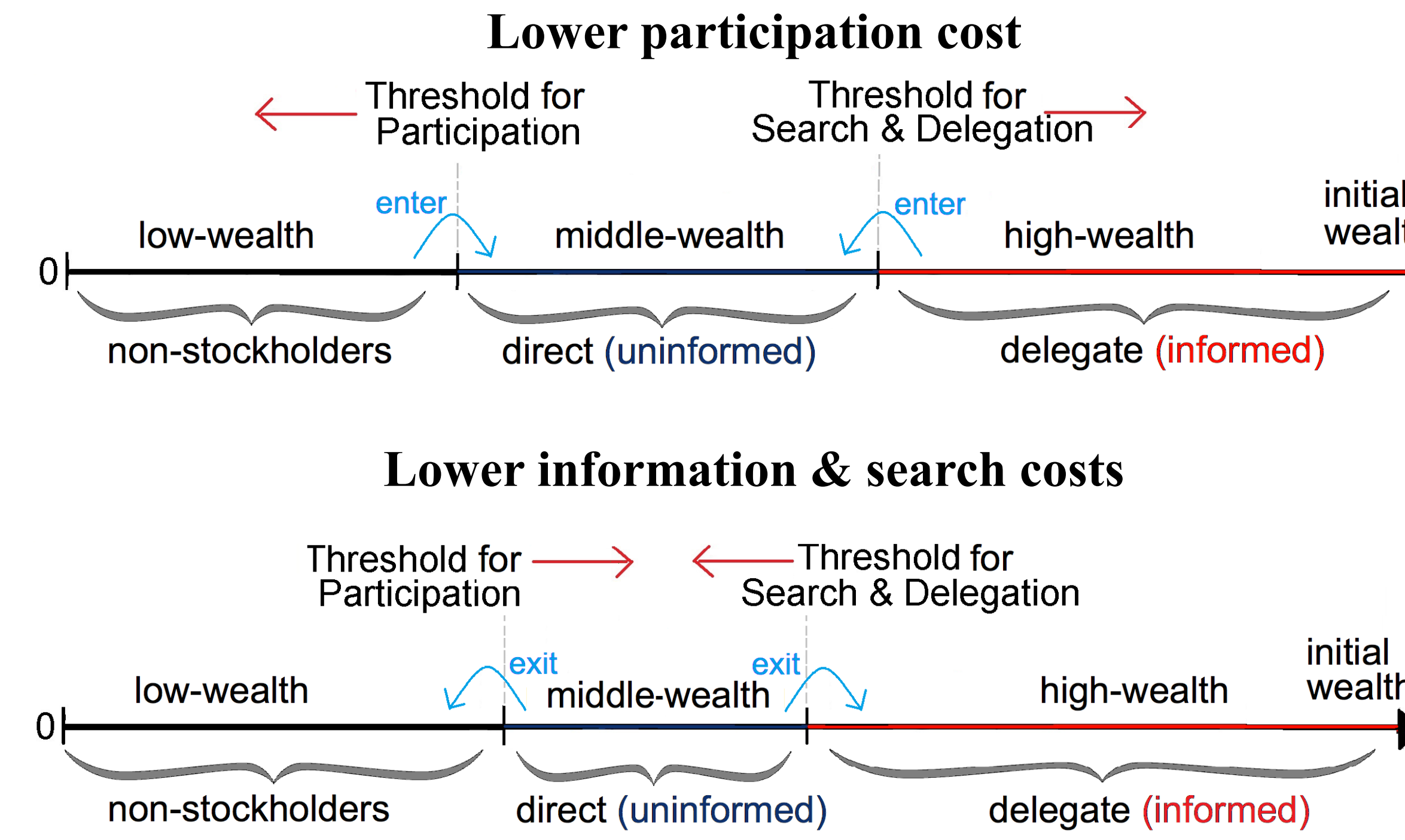### Impact on funds

Lower participation cost — **Lower information cost**

Lower search cost

Impact on investors

Lower participation cost

Threshold for Participation — Threshold for Search & Delegation — initial wealth

low-wealth | middle-wealth | high-wealth

non-stockholders | direct (uninformed) | delegate (informed)

Lower information & search costs

Threshold for Participation → ← Threshold for Search & Delegation — initial wealth

low-wealth | middle-wealth | high-wealth

non-stockholders | direct (uninformed) | delegate (informed)
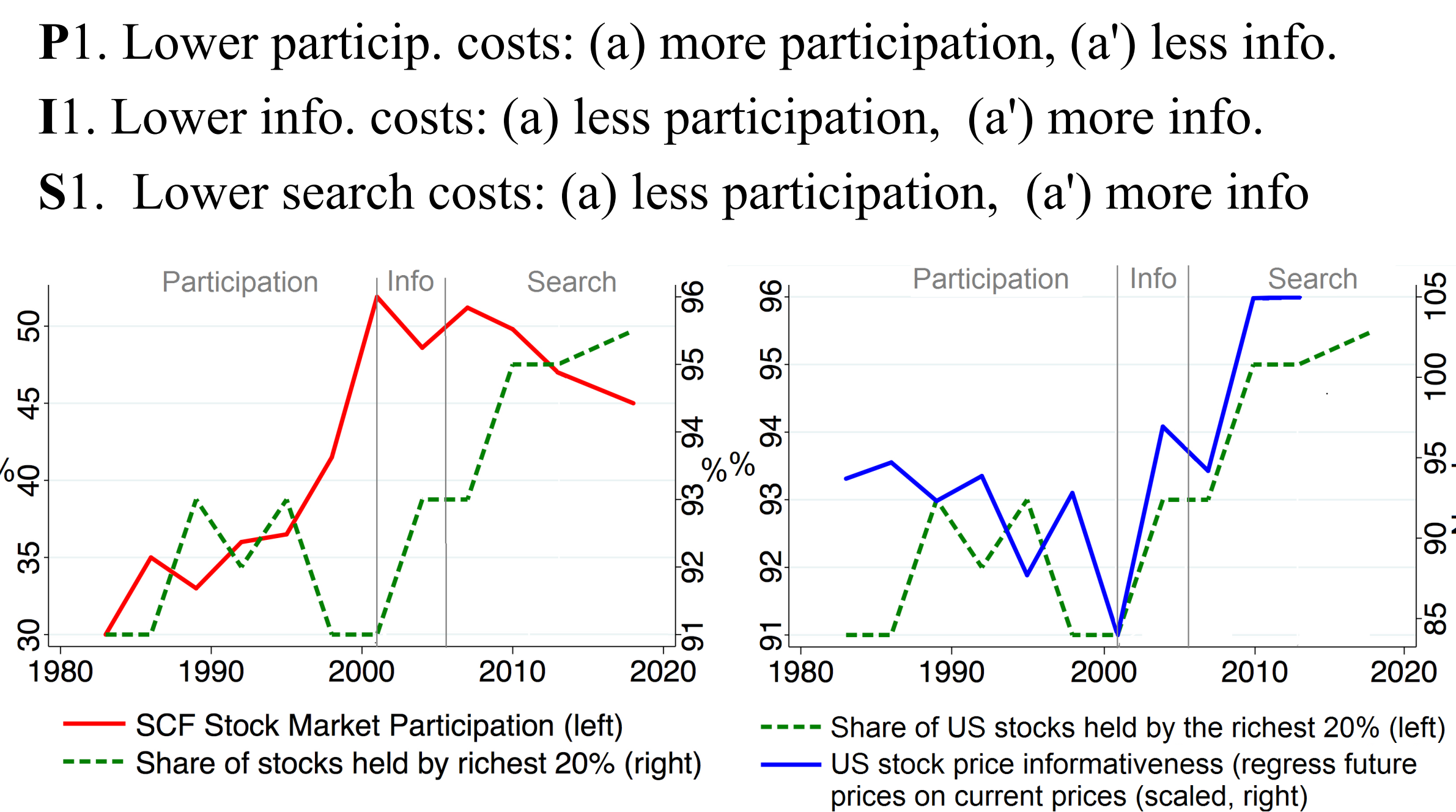
Theoretical predictions

Participation costs ↓ imply (1) more participation, less info, (2) more managers, higher fees, (3) lower inequality.

Information costs ↓ imply (1) less participation, more info, (2) more managers, lower fees, (3) higher inequality.
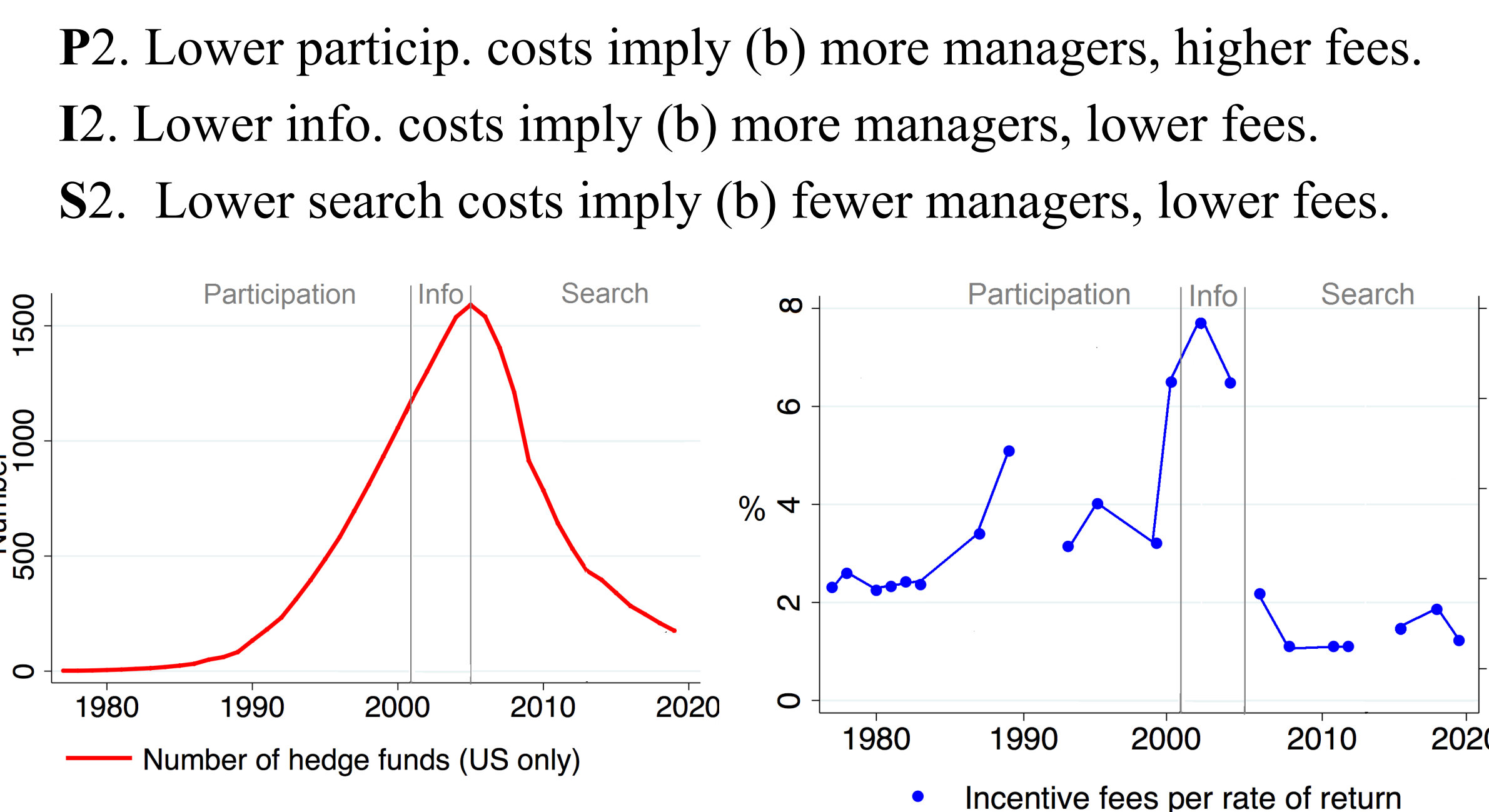
Search costs ↓ imply (1) less participation, more info, (2) fewer managers, lower fees, (3) higher inequality.

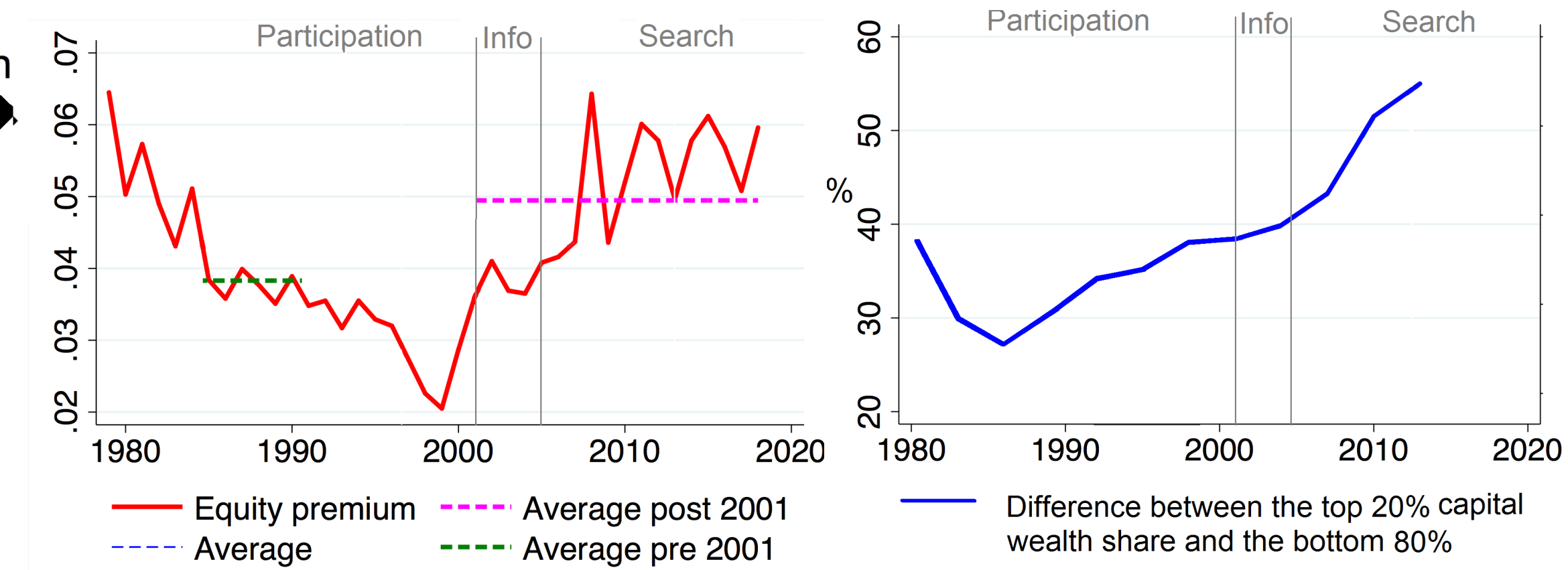### Identifying the effects in the data

PARTICIPATION AND PRICE INFORMATIVENESS

P1. Lower particip. costs: (a) more participation, (a') less info.
I1. Lower info. costs: (a) less participation, (a') more info.
S1. Lower search costs: (a) less participation, (a') more info

— SCF Stock Market Participation (left)
-- Share of stocks held by richest 20% (right)
-- Share of US stocks held by the richest 20% (left)
— US stock price informativeness (regress future prices on current prices, scaled, right)

COMPETITION AND FUND FEES

P2. Lower particip. costs imply (b) more managers, higher fees.
I2. Lower info. costs imply (b) more managers, lower fees.
S2. Lower search costs imply (b) fewer managers, lower fees.

— Number of hedge funds (US only)
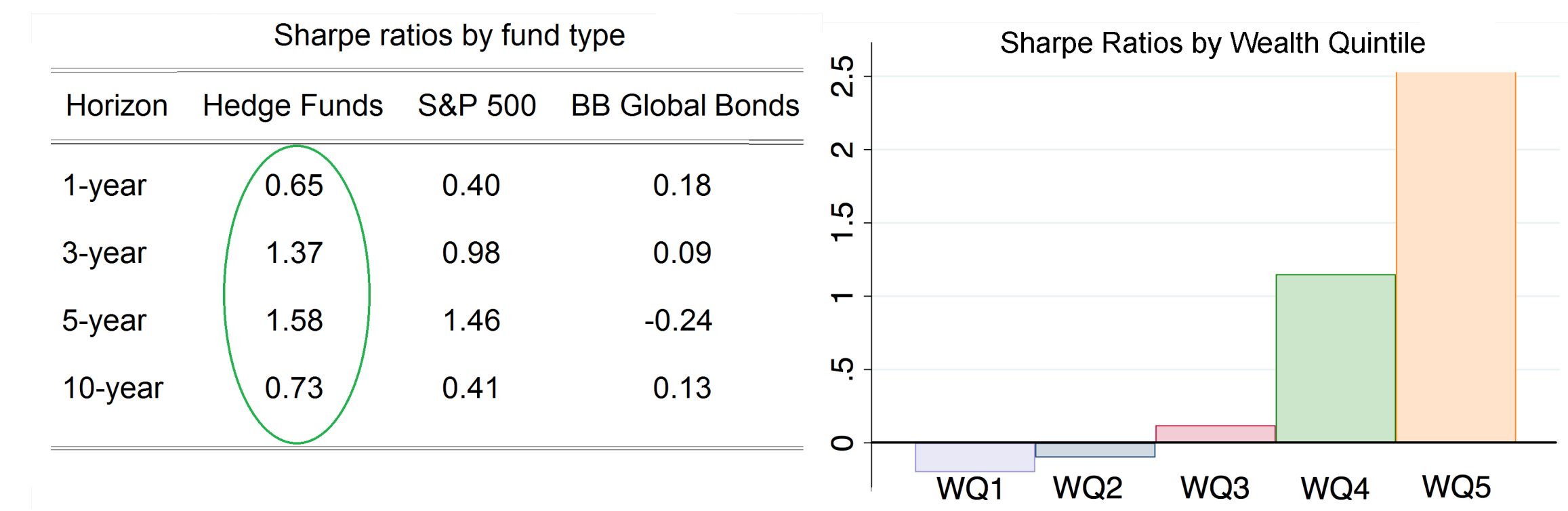• Incentive fees per rate of return

INEQUALITY AND THE EQUITY PREMIUM

P3. Lower particip. costs: (c) lower premium & inequality.
I3. Lower info. costs: (c) higher premium, higher inequality.
S3. Lower search costs: (c) higher premium higher inequality.

— Equity premium
-- Average post 2001
-- Average pre 2001
-- Average
— Difference between the top 20% capital wealth share and the bottom 80%

WHY DON'T FUNDS EQUALIZE RETURNS?

H1. Informed outperforms uninformed (before/after fees)
H2. Wealthy investors achieve higher Sharpe ratios.

Sharpe ratios by fund type

Horizon	Hedge Funds	S&P 500	BB Global Bonds
1-year	0.65	0.40	0.18
3-year	1.37	0.98	0.09
5-year	1.58	1.46	-0.24
10-year	0.73	0.41	0.13

Sharpe Ratios by Wealth Quintile — WQ1 WQ2 WQ3 WQ4 WQ5

Policy Implications

FinTech creates tradeoffs between equality & efficiency

+ Welfare perspective: effects are positive; the wealth is used most efficiently; but if planner cares about inequality, he needs to account for information externalities

+ Target both the margin for participation and the margin for informed (sophisticated) trading

+ Financial edu. is not enough to improve participation

+ Democratize access to data

+ Increase sophisticated fund fees (i.e., hedge fund fees)

Conclusions

Financial technology has heterogeneous benefits

Who benefits?

• **Before 2000, the gains were going to low-wealth investors** because lower participation costs allowed them to enter and benefit from the equity premium

• **After 2000, the gains started going to high-wealth investors.** Better data technologies disproportionately help wealthier investors.

• **And technologies that make it easier to search for funds do not solve the problem.** In fact, they amplify it.