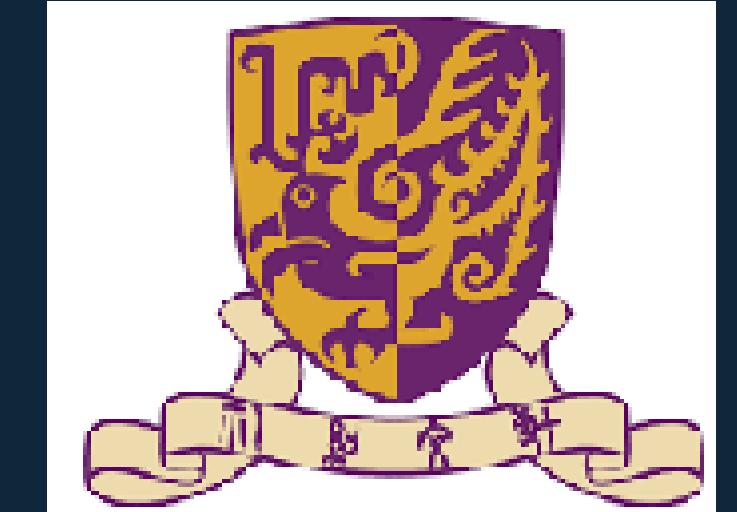


# Information Product Differentiation: Competition Over Variety and Quality



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## Highlights

We study the welfare implications of **financial production differentiation**. Financial intermediaries invest strategically along two dimensions: quality (portfolio characteristics) and non-quality attributes. Our analysis shows

- As competition intensifies—either through lower costs of enhancing quality or diminished investor preference for non-quality features—**information quality improves**, and disagreement across investors declines.
- Market equilibrium is **not socially optimal**.
- Producers engage in **excessive differentiation along non-quality dimensions** to secure market power, which leads to underinvestment in information quality.

This distortion generates an **oversupply of variety** but a suboptimal level of high-quality information.

## Backgrounds

The proliferation of financial products and services is a salient pattern

- Pros: heterogeneous tastes (Foerster et al., 2017)
- Cons: Lack of competition (Hortaçsu and Syverson, 2004)
- Research question
  1. Does the market achieve the socially optimal number of financial products?
  2. If not, what are the potential frictions causing this market inefficiency?

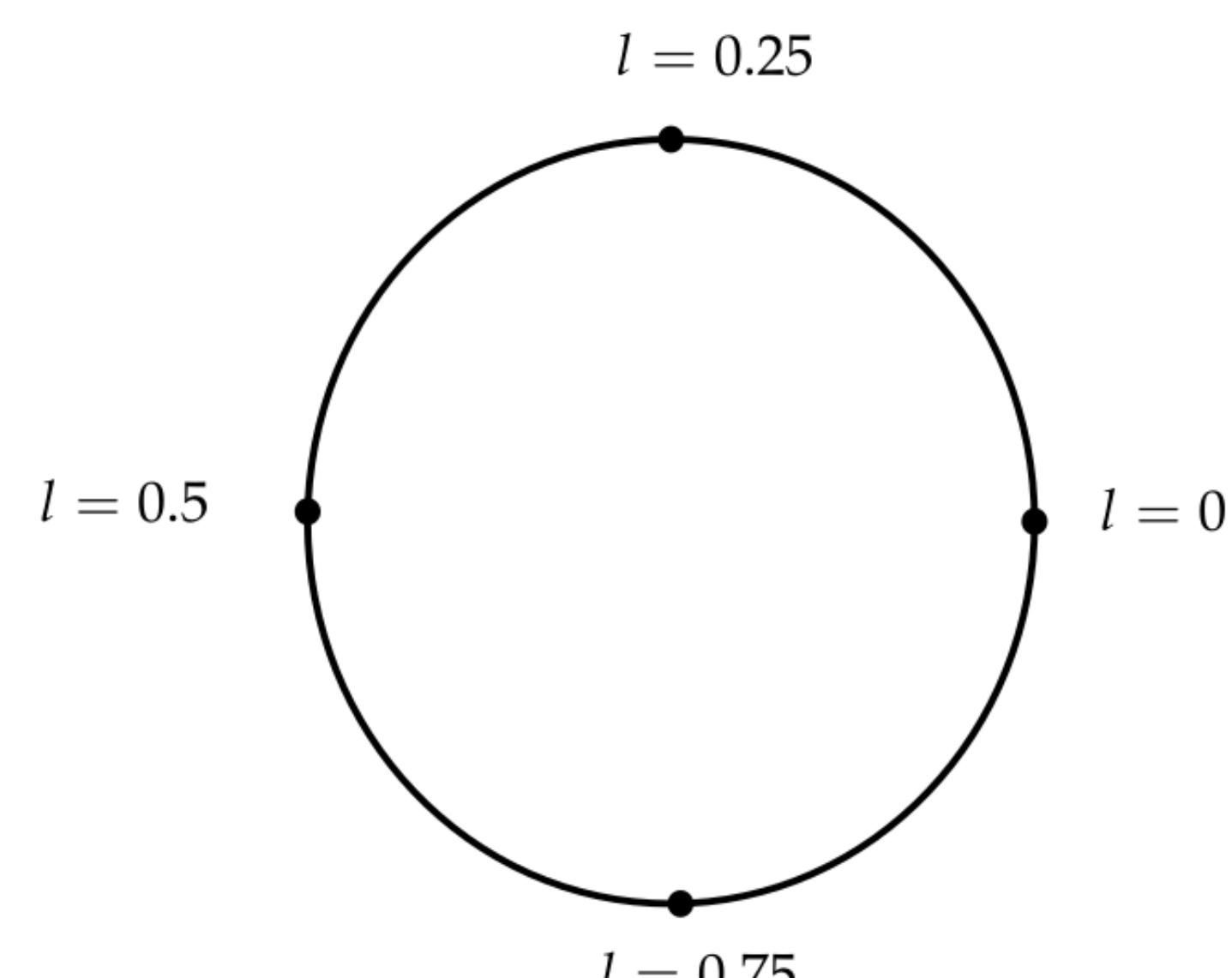
## Model Setup

- Dividend:

$$\frac{d\delta_t}{\delta_t} = \underbrace{\mu_\delta}_{\text{Unobservable growth rate}} dt + \sigma_\delta dZ_t, \quad (1)$$

- Household preference:

$$U(\{c_{j,t}\}_{t=0}^{\infty}, l; l^*(j)) = \underbrace{\int_0^{\infty} \exp(-\rho t) \log(c_{j,t}) dt}_{\text{Consumption utility}} - \kappa |l^* - l| \quad (2)$$



- Financial product design:

$$\max_{l_i} \quad \max_{k_i} \quad p_0 * s(k_i, l_i; k_{-i}, l_{-i}) - \phi k_i \quad (3)$$

Nature: Information materialized

Game 1: Information market

Stage 1. Producers choose non-quality characteristics

Stage 2. Producers choose quality

Stage 3. Households choose producers

Game 2: Financial Market

Portfolios are managed

Markets (security and goods) clear

## Results

### Competition and Industry Structure

The symmetric equilibrium consists of the following components:

1. the total number of producers,  $N^* = \rho \sqrt{\frac{2\kappa}{\phi}}$ ;
2. the equilibrium information quality each producer chooses,  $k^* = \frac{1}{\rho \sqrt{2\kappa\phi}}$ ;
3. the information market share each producer captures,  $s^* = \frac{1}{N^*}$ ;
4. The expected disagreement is  $E[D] = \frac{1}{k^*} = \rho \sqrt{2\kappa\phi}$ .

### Social Welfare

When the socially optimal number of producers  $N^s$  is large, the social welfare function can be approximated by:

$$U_s(N) \approx -\frac{\kappa}{4N} - \frac{\phi N}{2\rho^2} - \frac{1}{\rho} \left[ \log(N) + \frac{1}{2} \right] + \frac{1}{2} e^{\frac{\rho}{\phi N}} E_1 \left( \frac{\rho}{\phi N} \right) \left( \frac{1}{\rho} + \frac{1}{\phi N} \right), \quad (4)$$

where  $E_1(x) = \int_x^{\infty} \frac{e^{-t}}{t} dt$  is the exponential integral function. Under this approximation, the socially optimal number of information producers  $N^s$  admits the following closed-form expression:

$$N^s \approx \tilde{N}^s := \rho \left( \sqrt{\frac{1}{4\phi^2} + \frac{\kappa}{2\phi}} - \frac{1}{2\phi} \right),$$

with the corresponding information quality given by  $\tilde{k}^s = \frac{1}{N^s}$ .

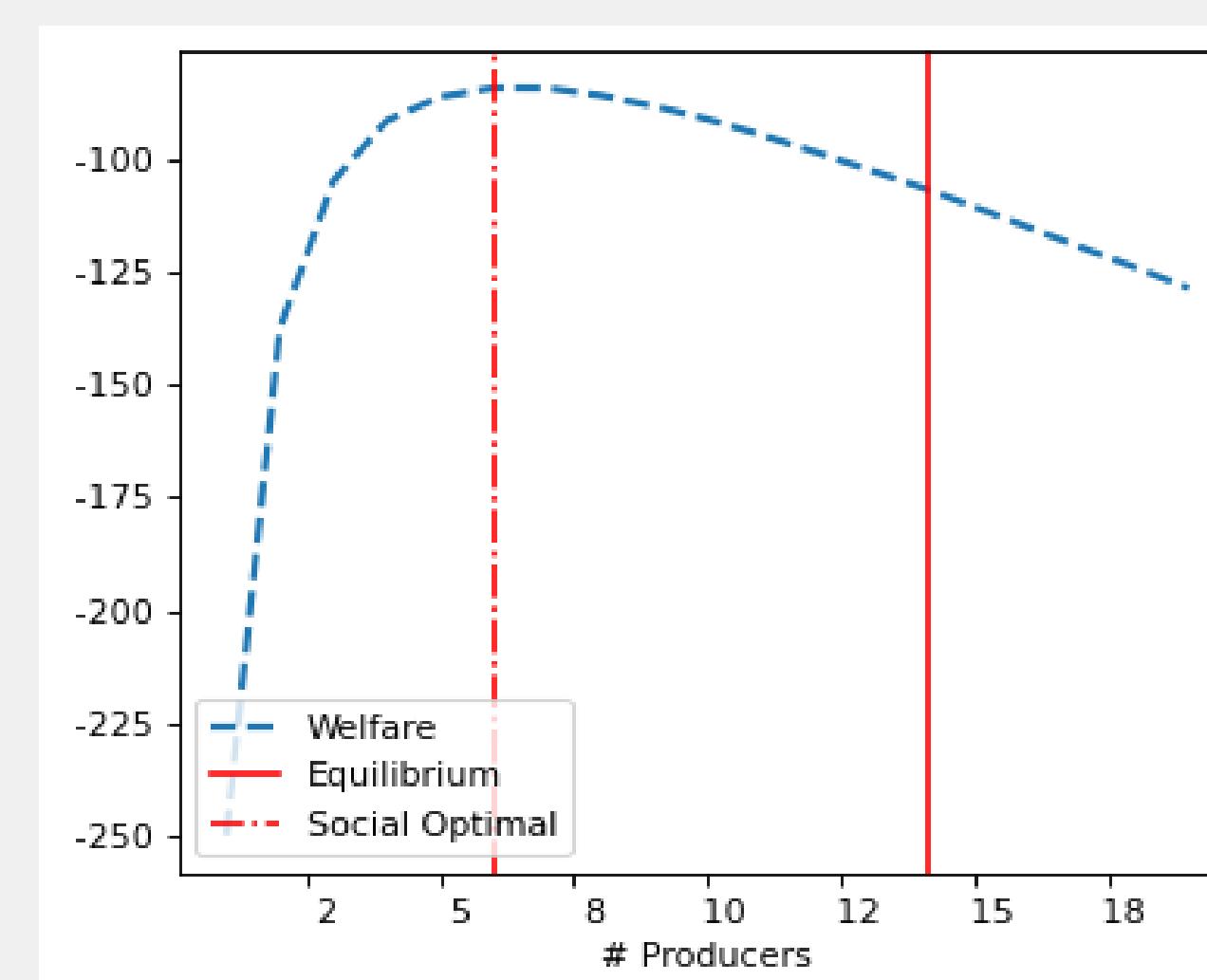


Figure 1. Social Welfare Analysis

## Discussion

1. **Key intuition:** Preference heterogeneity means the non-quality feature gives rise to market power while the quality feature cannot.
2. **Supply-side theory:** Market power reduces financial intermediaries' incentives to improve quality
3. **Technology:** Technology improvement mitigates consumption distortion
4. **Policy implication:** Regulators should be alert about the launch of financial products marketing features irrelevant to portfolio performance.

## References

Foerster, S., J. T. Linnainmaa, B. T. Melzer, and A. Previtero (2017). Retail financial advice: does one size fit all? *The Journal of Finance* 72(4), 1441–1482.

Hortaçsu, A. and C. Syverson (2004). Product differentiation, search costs, and competition in the mutual fund industry: A case study of s&p 500 index funds. *Quarterly Journal of Economics* 119(2), 403–456.