Market Concentration, Capital Misallocation, and Asset Pricing

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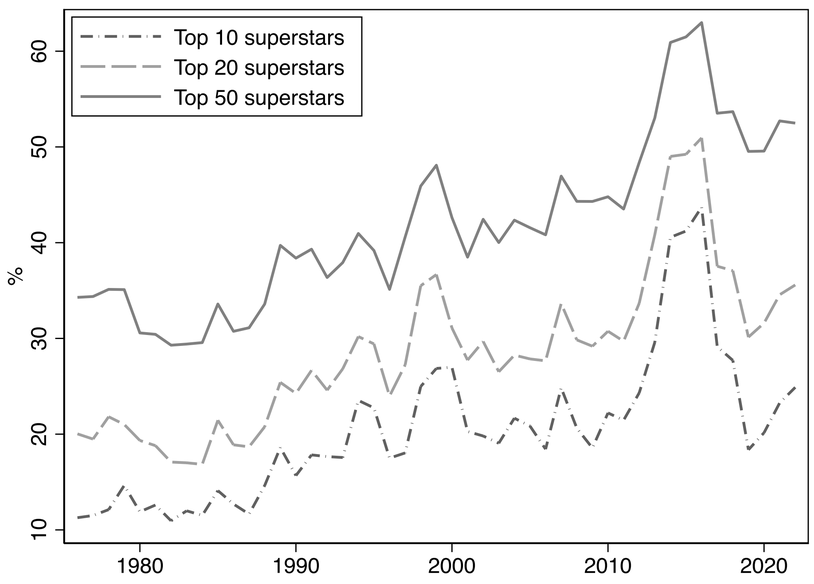
Research question

Figure 1: The rise of superstar firms



Caption. Contribution of superstar firms to total market capitalization

- Stock markets concentrated in superstars are associated with higher capital misallocation (Bae, Bailey, and Kang, 2021).
- Capital misallocation determines economic growth (Hsieh and Klenow, 2009; Dou et al., 2023).

Q: Do superstar firms matter for asset pricing?

My paper: Yes, via the channel of capital misallocation.

Capital Misallocation

- Capital misallocation σ^2_{mpk} = cross-sectional dispersion of marginal product of capital (MPK).
  - Implies the economy forgoes the opportunity to increase the aggregate output by reallocating capital from low MPK to high MPK firms.
  - Data: Quarterly Compustat US listed firms.
- Shocks to misallocation: $\Delta\sigma^2_{mpk,t} = \sigma^2_{mpk,t} - \sigma^2_{mpk,t-4}$.

Decomposing capital misallocation

$$\underbrace{\sigma^2_{mpk}}_{\text{Misall}_{\text{total}}} = \underbrace{\frac{N_0-1}{N-1}\sigma^2_{mpk,\text{rest}}}_{\text{Misallocation among the rest (Misall}_{\text{rest}})} + \underbrace{\frac{N_*-1}{N-1}\sigma^2_{mpk,\text{top}}}_{\text{Misallocation among superstars (Misall}_{\text{top}})} + \underbrace{\frac{N_0 N_*}{N(N-1)}\left(\mu_{mpk,\text{rest}} - \mu_{mpk,\text{top}}\right)^2}_{\textbf{MPK spread}}$$

- MPK spread = Capital misallocation **between** superstars and the rest.
- Superstars = top 5% firms within the industry by markup and market cap.

Main findings

- Shocks to capital misallocation *between* superstars and the rest (ΔMPK spread) are **negatively priced** in the cross-section of stock returns.
- Capital misallocation between superstars and the rest **negatively predict** economic growth and aggregate stock returns.

Consistent with the **ICAPM**,

- Capital misallocation between superstars and the rest is a key **state variable**.
- Its shocks capture an important macroeconomic **risk factor**.
  - Negative news to investors whose marginal utility depends on long-run consumption risk.

Result 1: Negative price of risk

$$R^e_{it} = \lambda_{0,t} + \lambda_{MKT,t}\hat{\beta}_{i,MKT} + \lambda_{f,t}\hat{\beta}_{i,f} + \varepsilon_{i,t},$$

where $f \in \{\Delta\text{Misall}_{\text{total}}, \Delta\text{Misall}_{\text{rest}}, \Delta\text{Misall}_{\text{top}}, \Delta\text{MPK spread}\}$.

Table 1: Pricing 25 size×book-to-market and 10 momentum portfolios

	(1)	(2)	(3)	(4)	(5)	(6)
λ_0 (%)	12.090***	10.792***	10.894***	11.410***	14.109***	13.966***
	(3.67)	(3.25)	(3.28)	(3.47)	(4.26)	(4.43)
MKT	-0.257	-0.057	-0.056	-0.319	-1.191	-1.093
	(-0.25)	(-0.05)	(-0.05)	(-0.31)	(-1.17)	(-1.10)
$\Delta\text{Misall}_{\text{total}}$		-0.435				
		(-0.99)				
$\Delta\text{Misall}_{\text{rest}}$			-0.410			-0.032
			(-0.87)			(-0.10)
$\Delta\text{Misall}_{\text{top}}$				-0.353		0.204
				(-1.40)		(0.91)
ΔMPK spread					-1.077***	-1.037***
					(-3.54)	(-3.72)
R^2	0.012	0.064	0.050	0.131	0.668	0.688

Fama-Macbeth t-statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Only ΔMPK spread are significantly and **negatively** priced.
- Robust results to alternative definitions of superstars, pricing Giglio and Xiu (2021)'s 202 portfolios, value-weighted capital misallocation, etc.

Result 2: Factor-mimicking portfolios

$$R^e_{it} = \alpha_i + \beta_{it}\Delta\text{MPK spread}_t + \varepsilon_{it}, \quad t = t-20 \to t.$$

Table 2: Portfolios sorted on stock exposure to ΔMPK spread

	Low β	Q2	Q3	Q4	High β	High–Low
Ret–rf	11.633***	5.243***	3.707***	2.062***	6.816***	-4.818***
	(6.52)	(5.95)	(5.87)	(4.88)	(5.45)	(-2.64)
α_{CAPM}	0.594	0.843	1.258*	-1.617**	-3.213**	-3.807**
	(0.41)	(1.16)	(1.79)	(-2.08)	(-2.57)	(-2.12)
$\alpha_{FF3+UMD}$	1.329	1.253	1.647**	-1.673**	-2.056	-3.384*
	(0.83)	(1.51)	(2.27)	(-2.09)	(-1.59)	(-1.68)
α_{FF5}	2.419	0.569	0.103	-2.455***	-1.694	-4.113**
	(1.64)	(0.71)	(0.15)	(-3.14)	(-1.38)	(-2.06)

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Stocks (–) exposed to ΔMPK spread outperform stocks (+) exposed to ΔMPK spread by **4.8%** per year.
  - Stocks (–) exposed to shocks earn higher expected returns → risky.
  - Stocks (+) exposed to shocks earn lower expected returns → hedge.

Result 3: Predicting negative economic growth

$$\Delta Y_{t:t+q} = \alpha + \beta\text{MPK spread}_t + \epsilon_{t:t+q},$$

where $Y \in \{CG, IP, E, R^e_{mkt}\}$.

Table 3: Long-run predictive regressions

	q=1	q=4	q=8	q=12
Per capita real consumption growth	-0.271***	-0.750***	-0.757***	-0.336
	(-3.39)	(-3.24)	(-2.59)	(-0.87)
R^2	0.039	0.089	0.051	0.007
Industrial production growth	-0.283	-1.176**	-2.427***	-1.667*
	(-1.57)	(-2.19)	(-3.38)	(-1.70)
R^2	0.014	0.040	0.080	0.027
Employment growth	-0.152**	-0.497**	-0.888***	-0.586**
	(-2.28)	(-2.49)	(-4.05)	(-2.25)
R^2	0.013	0.056	0.096	0.032
Market excess returns	-1.084**	-1.654***	-2.613**	-2.815*
	(-2.43)	(-2.66)	(-2.53)	(-1.87)
R^2_{IS}	0.018	0.018	0.028	0.024
R^2_{OOS}	0.002	0.003	0.005	0.011

t-ratio of Hodrick (1992) with k-1 lags in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- MPK spread **negatively** predicts economic growth, proxied by consumption growth, industrial production growth, and employment growth, and stock market returns. → MPK spread is a **state variable**.
- Aggregate misallocation and other components **do not** yield significant predictive power.