Discussion of Hanson and Kontz (2025)

"The Real Cost of Benchmarking"

Discussant: Sangmin Simon Oh (Columbia Business School)

SFS Cavalcade North America 2025

Background: A World with Benchmarking

Two groups of investors

- Individuals maximize mean-variance utility of absolute portfolio return
- Delegated managers (agents) care about the active return and treat the benchmark as the "risk-free" asset inside the objective
- CARA utility with risk aversion a_j (for agents) and b_j (for individuals)

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Optimal Portfolios

- Agents:

$$x_i = x_{0i} + \frac{1}{a_i}\Sigma^{-1}(\mu - \lambda_i \mathbf{1})$$

  where λ_i is the expected return on the global minimum-variance portfolio.

- Individuals:

$$x_j = \frac{1}{b_i}\Sigma^{-1}(\mu - R_f \mathbf{1})$$

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Two-Factor CAPM with Benchmark

Imposing market clearing and solving for equilibrium expected return yields:

$$\mu_k = R_F^* + \theta_1^* \beta_{km} - \theta_2^* \beta_{k0}$$

Recap

Question: Did asset price changes due to benchmarks lead to weak corporate investment?

[1] Benchmarking

[2] CAPM $\hat{\beta}$

[3] Perceived Cost of Capital

[4] Capital Accumulation (Corporate Investment)

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Question: Did asset price changes due to benchmarks lead to weak corporate investment?

[1] Benchmarking

↓ Difference-in-Difference (DD) around Russell index reconstitution dates

$$\text{CAPM } \widehat{\beta}_{i,t} = \delta \, \text{Treated}_i \times \text{Post}_{t>\text{May}} + \theta_i + \theta_{t,s} + \zeta X_{i,t} + \varepsilon_{i,t}$$

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using BMI as instrument for CAPM $\hat{\beta}$

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A very thought-provoking paper connecting two important trends!

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Plan for Discussion

1. Understanding the asset pricing effects of benchmarking
2. What do behavioral managers do?
3. Reconciling findings on benchmarking and investment

Point 1. Understanding the asset pricing effects of benchmarking

Conceptual Distinctions

Valuations of firms that are added to a benchmark can change due to two forces:

[1] Inelastic demand of benchmarked funds for constituent stocks (Demand $\uparrow \Rightarrow$ P $\uparrow$)

[2] Measured CAPM $\hat{\beta}$ goes up (Demand $\downarrow \Rightarrow$ P $\downarrow$)

[3] Assume that the riskiness of cash flows are unaffected

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Price effects of benchmark inclusion include the combined effects of [1] and [2].

- For example, barring changes to cash flow expectations, most existing studies document that P ↑ when included in the benchmark, which suggests that (objective) E[R] should fall.

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> *Our findings suggest benchmarking primarily impacts the cost of capital through persistent changes in CAPM $\hat{\beta}$s rather than short-term price fluctuations (p.4)*

> *The price effect of benchmark inclusion incentivizes investment, whereas the increase in CAPM $\hat{\beta}$ discourages investment. (p.16)*

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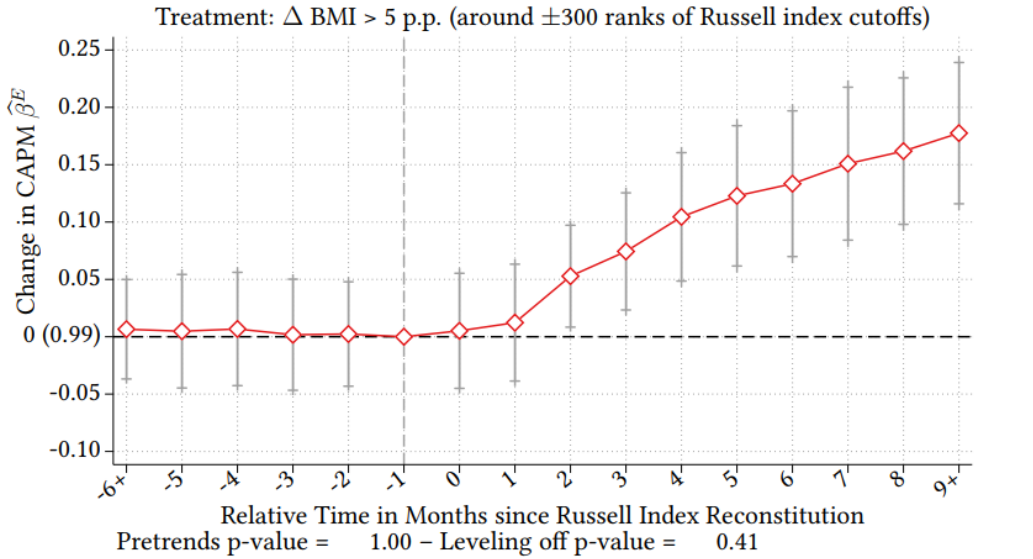
Suggestion 2a. Clarify language regarding the two opposing forces

- Relevant juxtaposition seems to be between benchmarked demand vs. CAPM $\hat{\beta}$, rather than “price effects” vs. CAPM $\hat{\beta}$.

Difference-in-Difference Design

Change in CAPM $\hat{\beta}$ seems quite strikingly large, which leads to subjective cost of capital ↑

$$\text{CAPM } \widehat{\beta}_{i,t} = \delta \text{ Treated}_i \times \text{Post}_{t>\text{May}} + \theta_i + \theta_{t,s} + \zeta X_{i,t} + \varepsilon_{i,t}$$



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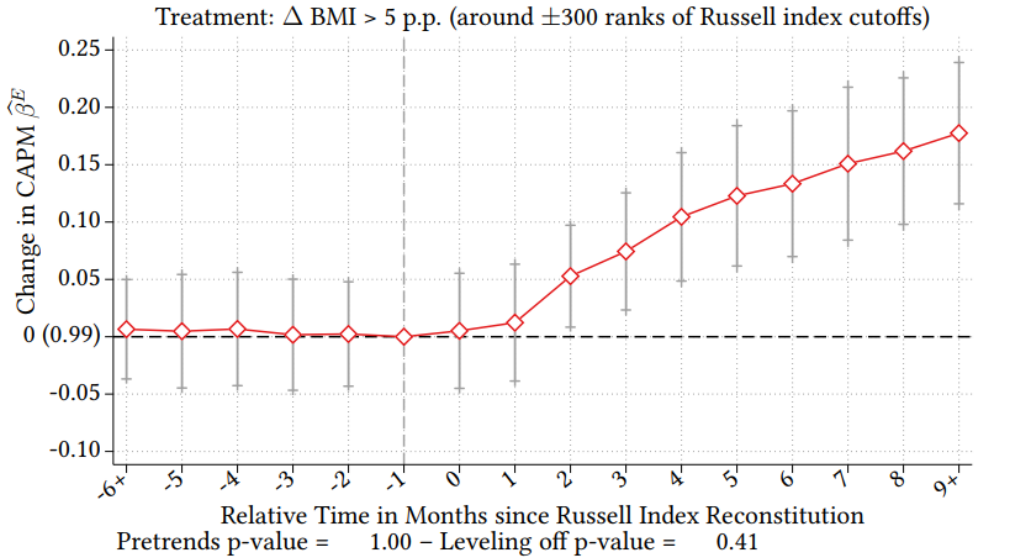

Suggestion 2b. Augmenting the difference-in-difference specification

1. Replace $Treated_i$ with a continuous treatment variable
   - Current definition: whether a firm's BMI changed by more than ± 5 p.p.
2. Add additional stock-level controls
   - Standard control variables in the benchmarking literature (e.g. market cap)

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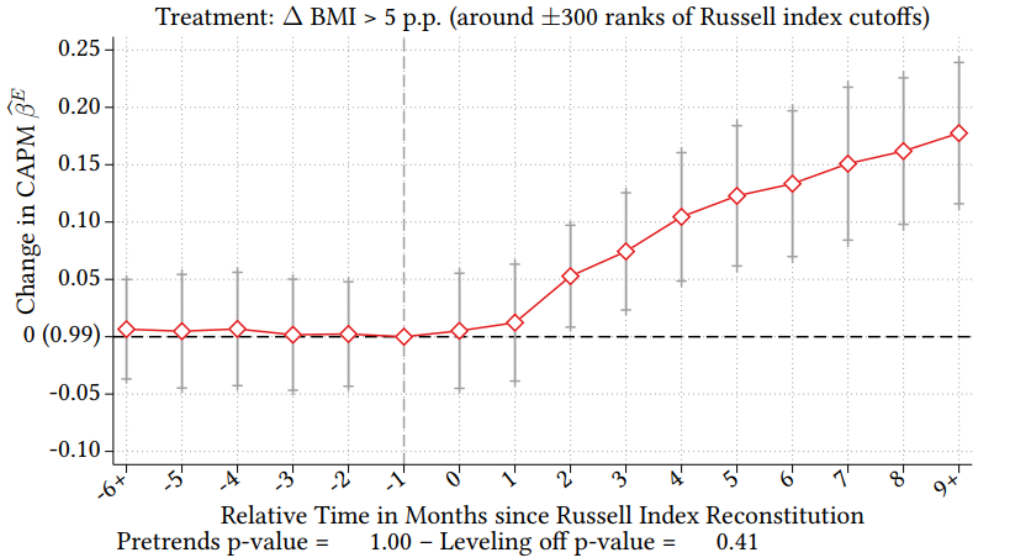

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Suggestion 2c. Bring the section "What causes the increase in CAPM $\hat{\beta}$" to the main body

Nota Bene: Benchmarking and Cost of Capital

Maybe: **objective** cost of capital ↓ but the **subjective** cost of capital ↑?

Side Note: Sharma (2024), “The Product Market Effects of Index Inclusion”

The Product Market Effects of Index Inclusion*†

Varun Sharma‡

March 2022

Abstract

I investigate how a firm's inclusion in an index affects its product market outcomes. I compile a micro-level dataset that matches firms' investors with firms' products and customers. Using a plausibly exogenous change in firms index membership, which increases the proportion of firms' equity held by benchmark-constrained funds that track the index, I show that firms (i) reduce product prices, especially for products with lower market share, (ii) generate higher sales, but at the cost of lower profitability, and (iii) introduce new products and diversify. Furthermore, with a higher proportion of such investors, large firms get a competitive advantage and sell similar products 7% cheaper, resulting in a 30% gain in market share. To shed light on the mechanism, I provide evidence that inelastic demand from benchmark-constrained investors allows firms to raise more equity and invest in expanding their customer base and product portfolio. A general equilibrium model with product-level habits and heterogeneous firms further corroborates these findings. These results show that benchmarking can increase product affordability but potentially at the cost of higher market concentration.

Point 2. What do behavioral managers do?

How behavioral are the firm managers?

Existing literature paints a relatively **sophisticated** view of firm managers:

- Managers are known to time equity issuance and share repurchases based on perceived mispricing and investor demand conditions. Loughran and Ritter (1995), Graham and Harvey (2001), Baker and Wurgler (2002)

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Suggestion 1a. How literal is the use of CAPM $\hat{\beta}$?

- While surveys (e.g. Graham and Harvey, 2001) suggest a widespread use of CAPM-like heuristics, it would be useful to know how literal this is.
- Many CFOs also report using multiple models or making discretionary adjustments.

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Suggestion 1b. Cross-firm Variation in CAPM Usage

- Exploit heterogeneity across firms in how literally they apply the CAPM when setting discount rates for their investment decisions

Point 3. Reconciling findings on Benchmarking and Investments

Benchmarking and Investment

Perhaps the most surprising result is the result on investments.

$$\Delta \text{CAPM}\ \beta_{i,t} = \delta_i + \delta_{j,t} + \theta \Delta \text{BMI}_{i,t} + \zeta X_{i,t} + \epsilon_{i,t}$$

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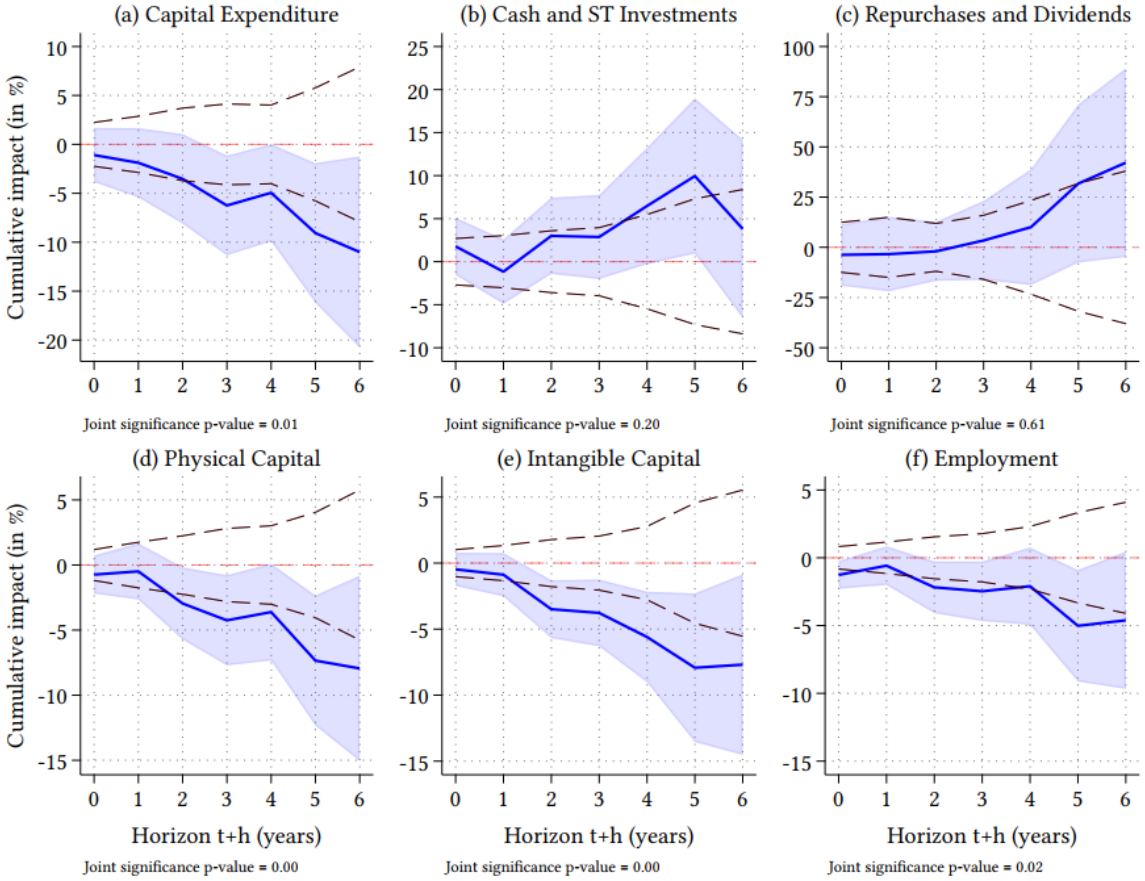
Figure 6: LP-IV: Impulse Response of Outcome Variables to CAPM $\widehat{\beta}$ shock



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Abstract

This paper provides causal evidence that asset price distortions caused by benchmarking affect corporate investment decisions. We document that the rise in benchmark-linked investing over the past two decades fundamentally changed the cross-section of CAPM $\widehat{\beta}$s. Exploiting exogenous variation from Russell index reconstitutions, we show inclusion in benchmark indices leads to higher CAPM $\widehat{\beta}$s, with larger effects observed among stocks facing greater benchmarking intensity. Firm managers interpret the resulting higher CAPM $\widehat{\beta}$ as an increase in their firm's cost of capital, leading them to reduce investment. Six years after inclusion, firms experience 7.1% and 8.4% declines in physical and intangible capital, respectively. Supporting evidence shows that benchmark-inclusion similarly increases the perceived cost of equity among stock analysts and regulators. We find consistent results at the industry level. Industries which experienced greater increases in CAPM $\widehat{\beta}$s due to benchmarking accumulated less capital over the past two decades. Moreover, benchmarking creates excess dispersion in the cost of capital within industries, causing inefficient capital allocation across firms. The rise in CAPM $\widehat{\beta}$s largely offset the decline in the risk-free rate over the past decades and can explain 57% of the "missing investment" puzzle.

Benchmarking and Investment

Yet other papers find the **opposite** or **no** result on investment.

- Example 1: Pavlova and Sikorskaya (2023), "Benchmarking Intensity"

Table 33: Tests on additional stock characteristics

	Leverage	ROA	Repurchase	Div.yield
ΔBMI	-0.090	0.102*	-0.001	-0.013
	(-1.39)	(1.97)	(-0.06)	(-1.28)
Observations	11,426	11,426	10,159	11,417
	Capex/Assets	M/B	R&D/Sales	Asset growth
ΔBMI	0.009	-1.400*	0.135	0.530
	(0.55)	(-2.03)	(1.11)	(1.64)
Observations	11,427	11,427	11,407	11,422
	Sales growth	1(Acquisition)	Altman Z-score	SUE
ΔBMI	0.299	0.104	-1.887	-0.010
	(0.52)	(0.76)	(-0.77)	(-1.10)
Observations	11,387	11,434	11,427	10,797
	Turnover	ILLIQ	Bid-ask spread	Short interest ratio
ΔBMI	0.718	-0.026	-0.016	0.110***
	(1.22)	(-1.14)	(-0.41)	(5.78)
Observations	11,434	11,375	11,329	10,642

This table reports how the change in stock characteristics is related to the change in BMI. Dependent variable is the 3-year change in the respective variable compared to the value prior to the reconstitution. The main independent variable is the change in BMI, ΔBMI. We limit the sample to 300 stocks around the cutoffs. All regressions include $logMV$ (the logarithm of proprietary total market value), $Float$ (proprietary float factor), $BandingControls$ (being in the band, being in the Russell 2000 and their interaction in May), $\bar{X}$ (β^{CAPM} and bid-ask spread), and year fixed effects. t-statistics based on standard errors double-clustered by stock and year are in parentheses. Significance levels are marked as: *p<0.10; **p<0.05; ***p<0.01.

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- Example 2: Bena et al. (2017), "Are foreign investors locusts? The long-term effects of foreign institutional ownership"

Table 6
Instrumental variables estimates with bandwidth.

This table shows results of instrumental variables (IV) firm-level panel regressions of long-term investment, employment, and innovation output on institutional ownership using a sample of Worldscope nonfinancial and nonutility firms in the 2001–2010 period. The sample is restricted to firms in the 10% bandwidth of the number of stocks around the MSCI ACWI cutoff point in each country. The cutoff point is the (free float-adjusted) market capitalization ranking of the first stock after which the index coverage is at least 85% of the free float-adjusted market capitalization in each country. The dependent variables are the sum of capital expenditures and R&D expenditures as a fraction of assets (CAPEX+R&D), the logarithm of the number of employees (LABOR), and the logarithm of one plus the number of patents applied for with the USPTO (PATENTS). Foreign institutional ownership is instrumented with MSCI (a dummy variable that equals one if a firm is a member of the MSCI ACWI in a given year, and zero otherwise). Regressions include the same control variables as those in Tables 3–5 (coefficients not shown). Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one year. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	First stage	IV		
Dependent variable	*IO_FOR*	*CAPEX+R&D*	*LABOR*	*PATENTS*
	(1)	(2)	(3)	(4)
IO_FOR		0.099***	7.485***	8.953***
		(0.032)	(0.572)	(0.940)
IO_DOM	0.001	0.001	0.322***	0.124***
	(0.003)	(0.006)	(0.051)	(0.040)
MSCI	0.035***			
	(0.002)			
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
R^2	0.41			
Number of observations	37,277	37,277	34,873	37,557

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- Example 3: Massa, Peyer, and Tong (2006) "Limits of Arbitrage and Corporate Financial Policies"

Abstract: We focus on an exogenous event that changes the cost of equity of the firm—the addition of its stock to the S&P 500 index—and we use it to test capital structure theories in a controlled experiment, where the effect of the index addition on the stock price is exogenous from a manager's point of view. We investigate how firms modify their corporate financial and investment policies as a reaction to the addition to the index. Consistent with both traditional theories and Stein's (1996) market timing theory, we find bigger increases in equity issues and investment - partly through more acquisitions – in response to bigger drops in the cost of equity. However, in the 24 months after the index addition, firms that issue equity and increase investment display negative abnormal returns and they perform worse than firms that issue but do not increase investment. This finding is consistent only with the market timing theory of Stein (1996) and supports a "limits of arbitrage" story in which stocks display a downward sloping demand curve and firms themselves act as "arbitrageurs" taking advantage of the window of opportunity provided by the stock price change around the S&P500 index addition.

Potential Road to Reconciliation

Before quantifying the magnitude of the “missing investment puzzle” that this channel can account for, it seems first order to reconcile the findings of the authors to that of literature.

- These papers are using similar variation coming from index reconstitution!

Note: See Kashyap et al. (2021) for additional citations on ΔBMI ⇒ Investments

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Suggestion 3b. Use a cleaner variation in ΔBMI

- The main regression seems to use all or most of the variation in ΔBMI rather than just the exogenous variation induced by the Russell index reconstitution

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- **Very much looking forward to the next version!**