

Indexing and the Elasticity of Stock Demand

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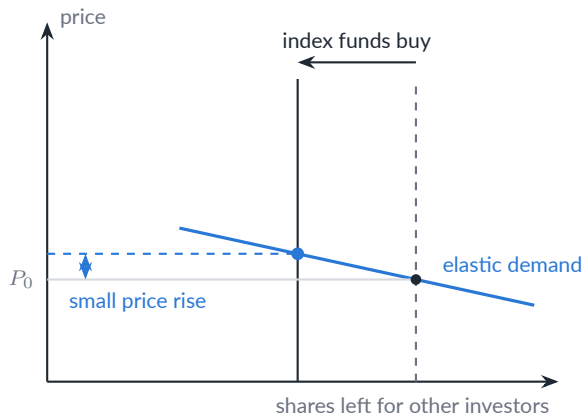
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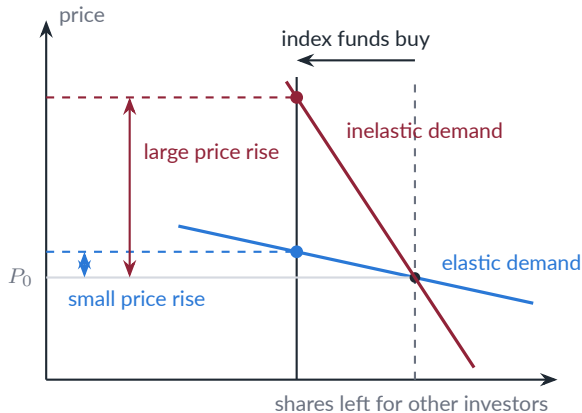
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Index capital ignores prices, so the same demand shock moves prices more



- Index capital follows benchmark weights at any price
- The other investors must absorb every demand shock

Index capital ignores prices, so the same demand shock moves prices more



- Index capital follows benchmark weights at any price
- The other investors must absorb every demand shock
- The less elastic their demand, the more the price has to move

Which stocks have become less elastic, and what does index buying do to their prices?

An aggregate passive share cannot say.

This paper

Which stocks have become less elastic as indexing grew, and what does index buying do to their prices?

MEASURE

We build IXI, realized indexing in each stock, from fund holdings.

Active funds hold only **a third** of the benchmark exposure attributed to them. The rest has no detectable price effect.

ELASTICITY

We estimate a demand elasticity for every stock, as in Kojen and Yogo (2019).

The most indexed stocks are about **25 percent** less elastic, within firms and in a model without IXI.

PRICES

We follow index fund demand into prices, and into what investors later receive.

One point of index fund ownership raises the price by **8.8 percent**. Only about **12 cents** of each dollar comes back to investors.

What we add to the closest work

	They study	We add
Pavlova and Sikorskaya (2023)	Demand implied by funds' benchmarks	How much of it funds actually hold
Haddad, Huebner, and Loualiche (2025)	How active investors respond as passive investing grows	Which stocks become less elastic, and who holds them
Chinco and Sammon (2024)	Passive ownership beyond declared index funds	Where that ownership sits, stock by stock
Koijen and Yogo (2019); Koijen, Richmond, and Yogo (2024); Gabaix and Koijen (2021)	How investor demand and flows, including index flows, move prices across stocks	Where realized indexing sits in each stock, the elasticity it leaves, and the price of index demand

IXI counts only the benchmark allocation a fund actually holds

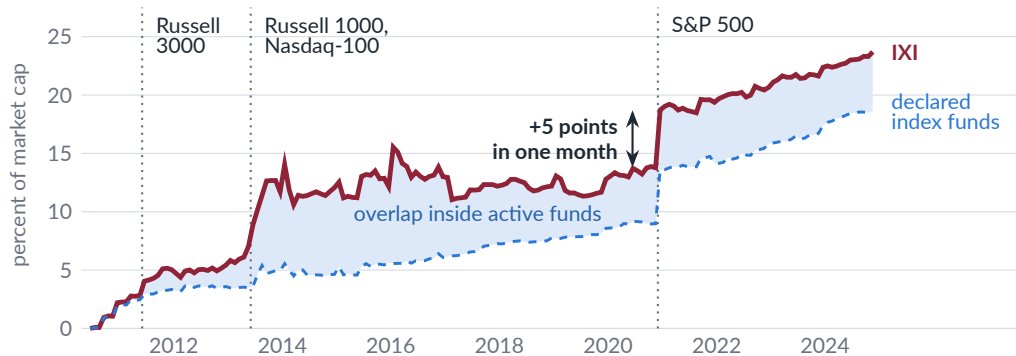
A \$100 fund. The stock is 10% of its benchmark.

		index funds only	full attribution	IXI counts
Index fund holds \$10		\$10	\$10	\$10
Active fund, underweight holds \$4		\$0	\$10	\$4
Active fund, overweight holds \$15 (\$5 is an active bet)		\$0	\$10	\$10
Active fund, stock not held holds nothing		\$0	\$10	\$0
<div> <div></div> benchmark allocation <div></div> position <div></div> overlap </div>		\$10	\$40	\$24

$$IXI_t(n) = \frac{\sum_j A_{j,t} \min\{w_{j,t}(n), w_{h(j),t}(n)\}}{ME_t(n)}$$

Summed over a fund's stocks, the overlap equals one minus Active Share (Cremers and Petajisto 2009).

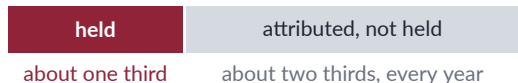
Tesla's IXI jumps each time it enters an index



The shaded gap is benchmark overlap inside active funds, which a count of declared index funds misses.

Active funds hold only about a third of their benchmark allocation

Active fund assets at benchmark weights (full attribution)

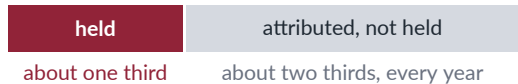


Share that is held, by fund Active Share (2023)



Active funds hold only about a third of their benchmark allocation

Active fund assets at benchmark weights (full attribution)

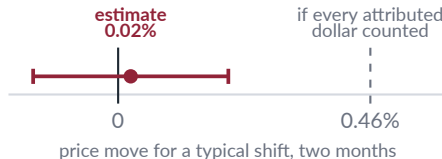


Share that is held, by fund Active Share (2023)



Which part acts like indexing?

Prices. The unheld part has no detectable price effect.



Trades. When a benchmark drops a stock, active funds trim the positions that match the benchmark; their active bets do not follow the cut.

A demand system turns holdings into an elasticity for every stock

Each investor i chooses portfolio weights from prices and characteristics (Kojen and Yogo 2019)

$$\frac{w_{i,t}(n)}{w_{i,t}(0)} = \exp\left\{ \beta_{0,i,t} me_t(n) + \beta_{1,i,t} IXI_t(n) + \beta'_{2,i,t} x_t(n) \right\} \cdot U_{i,t}(n)$$

- **Price response** $\beta_{0,i}$, with market equity instrumented as in Kojen and Yogo
- **Tilt toward indexed stocks** $\beta_{1,i}$, with IXI instrumented by equal-weighted index exposure
- **Standard model.** We also estimate the model without IXI

Stock elasticity is the holdings-weighted average of its holders' price responses

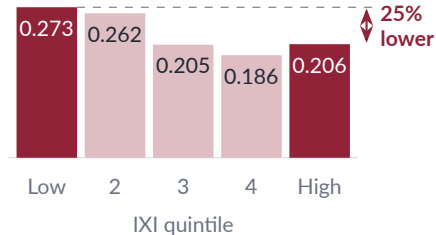
$$Elas_n = 1 - \frac{\sum_i \beta_{0,i} A_i w_i(n) (1 - w_i(n))}{\sum_i A_i w_i(n)}$$

Estimated year by year, 2001 to 2023, for about 1,200 institutions plus households.

► instrument

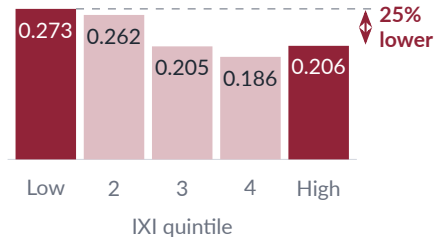
The most indexed stocks have about 25 percent less elastic demand

All stocks (holdings-weighted means)

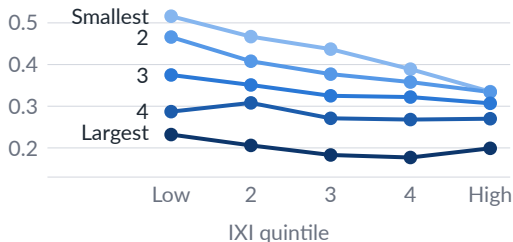


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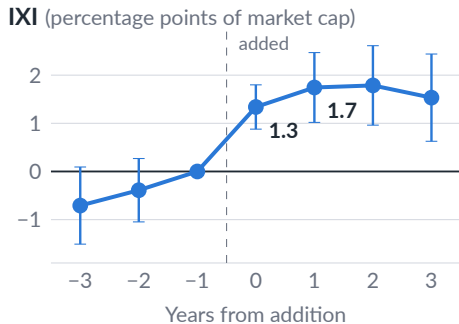
Within each size quintile



Lower in all 23 years, in every size group, within the same firm over time, and in a demand model estimated without IXI.

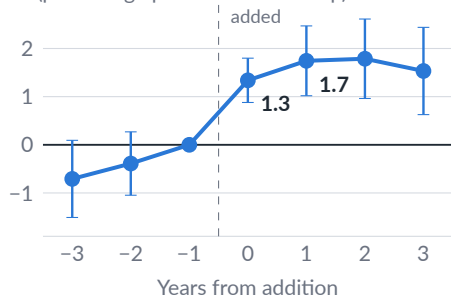
► regressions

After an S&P 500 addition, indexing rises and elasticity falls

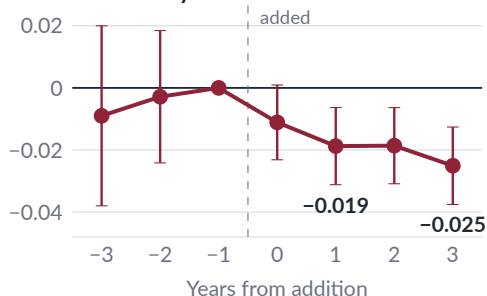


After an S&P 500 addition, indexing rises and elasticity falls

IXI (percentage points of market cap)

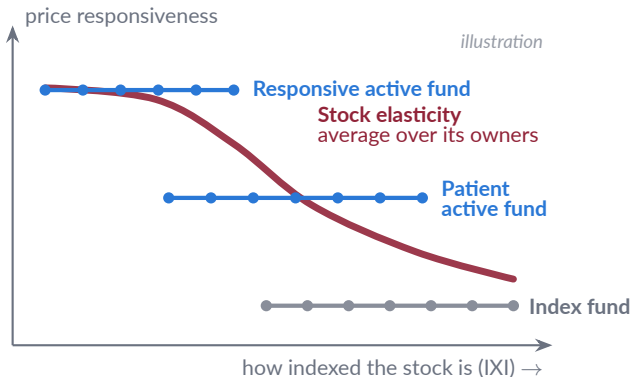


Demand elasticity



163 additions, 2002 to 2022, each compared with a matched stock of similar size and IXI. Bars are 95% intervals.

Different owners explain the gap; the same owner leans against it

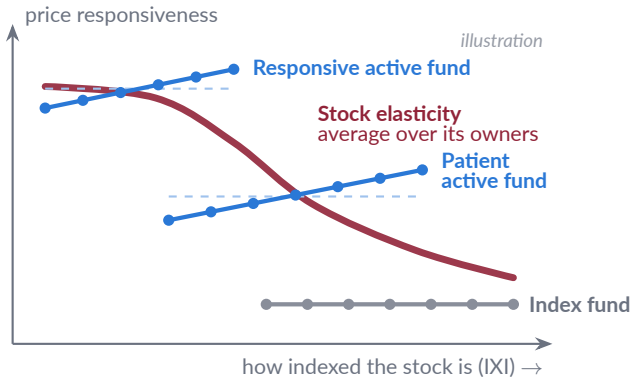


1 Different owners

Indexed stocks are held by index funds and by the less responsive active funds.

Index funds account for about half of the gap, the sorting of active owners for the rest.

Different owners explain the gap; the same owner leans against it



1 Different owners

Indexed stocks are held by index funds and by the less responsive active funds.

2 The same owner

An active fund family responds **more** to prices in its more indexed stocks. Index funds do not.

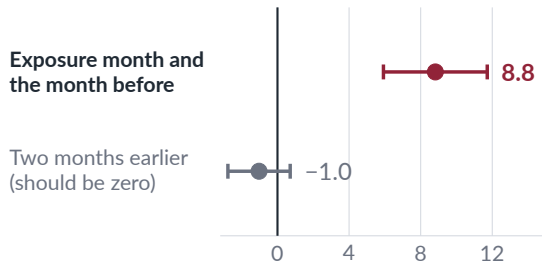
As Haddad, Huebner, and Loualiche predict.

The same-owner direction depends on instrumenting IXI.

▸ within-owner test ▸ aggregate

One point of index fund ownership raises the price by 8.8 percent

Log return (%) per point of index fund ownership, 95% intervals



- If index funds go from owning 10 to 11 percent of a stock, its price rises by about **9 percent**
- Instrument: the change in the stock's index exposure, computed at equal index weights
- Nothing happens two months earlier
- Measured in index fund ownership, not IXI: an active fund's overlap can change without any trade

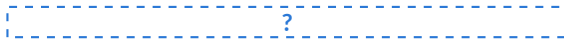
Only about 12 cents of each dollar of price rise comes back to investors

Index funds bought and the price went up. Did the company become worth more?



Extra price paid today  \$1.00

Extra value received



If the price rise were real value, this bar would match the one above.

Only about 12 cents of each dollar of price rise comes back to investors

Index funds bought and the price went up. Did the company become worth more?



Extra price paid today  \$1.00

Extra value received   88 cents never comes back \$0.12

We can rule out that even half of it comes back.

We cannot tell overpricing from a period in which investors accepted lower returns on the stock. Either way, it was not better cash flows.

► horizons

Takeaways

1. The more indexed the stock, the less elastic its demand.

The most indexed stocks are about 25 percent less elastic, in every year and within firms, and elasticity falls after S&P 500 additions.

2. Index demand raises prices far more than fundamental value.

One point of index fund ownership raises the price by 8.8 percent. Only about 12 cents of each dollar of that rise comes back to investors.

3. Measure the indexing that is actually held.

Active funds hold only a third of the benchmark exposure attributed to them, and the rest has no detectable price effect.

Questions about individual stocks need demand curves for individual stocks.

References

Chinco, A., and M. Sammon (2024). The passive ownership share is double what you think it is. *Journal of Financial Economics*.

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Koijen, R., R. Richmond, and M. Yogo (2024). Which investors matter for equity valuations and expected returns? *Review of Economic Studies*.

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Unheld benchmark exposure shows no detectable price effect

Monthly panel, 2002 to 2022, 647,545 stock-months. Outcome: log return over the exposure month and the month before.

	Estimate	s.e.	Typical shift (pp)
Attributed-only exposure, γ	0.0039	(0.0154)	0.02
Value implied if every attributed dollar counted	0.0777		0.46
Difference	-0.0739	(0.0229)	-0.44
p -value for equality	0.0014		
Price impact of realized index ownership (IV), same sample	8.81	(1.87)	

- Attributed-only exposure: the part of the exposure change from assets funds do not hold as overlap. Last column: two-month price move (pp) for a one s.d. shift.
- Proportionality is rejected at 1 percent; zero lies inside the interval. The test is silent on unheld benchmark weight in other settings.

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Inside active funds, the overlap follows the benchmark

Active funds holding the same benchmark across consecutive quarters, 2011 to 2023. Slope of the position change on the benchmark's prescribed weight change, within fund and event.

	Overlap positions	Deviation positions	Difference
Deletions	0.130 (0.024)	-0.075 (0.022)	0.205 (0.031)
Reweights	0.062 (0.016)	0.072 (0.021)	-0.010 (0.025)

- Positions are classified before the event by how much of the position matches the benchmark.
- Deletions separate the two. Reweights of continuing constituents do not, because a position above benchmark weight still contains a matched part.

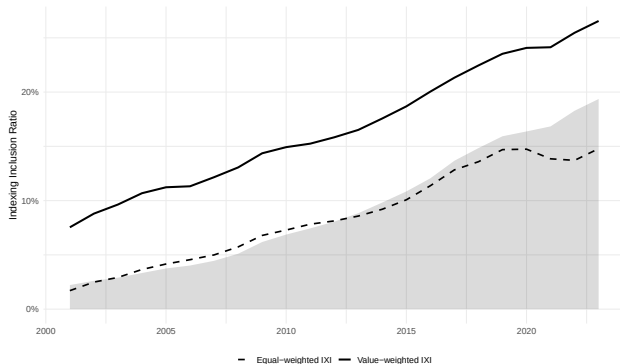
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IXI and Benchmarking Intensity measure different objects

	Benchmarking Intensity Pavlova and Sikorskaya (2023)	IXI this paper
Object	Exposure to benchmark incentives	Indexing realized in portfolios
Allocation rule	Fund assets at benchmark weights	Overlap of position and benchmark weight
A constituent the fund does not hold	Counts	Does not count
Benchmark	Declared	Assigned from holdings

- Pavlova and Sikorskaya show that benchmark incentives move ownership and prices, and their design allows partial implementation. IXI measures how much of the benchmark allocation is in portfolios. The two measures answer different questions.
- About two thirds of the active fund capital attributed at benchmark weights lies beyond realized overlap.

IXI has risen steadily, led by declared index funds



Annual mean IXI including the non-fund extension. Solid: value weighted. Dashed: equal weighted. Shaded: declared index funds. The average fund-only IXI is 8.2 percent of market cap, 6.3 points from index funds and 1.9 from active fund overlap.

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The IXI instrument uses equal-weighted index exposure

$$\widehat{ixi}_t(n) = \ln\left(\frac{\sum_h \tilde{A}_{h,t} w_{h,t}^{eq}(n)}{BE_t(n)}\right), \quad w_{h,t}^{eq}(n) = \frac{1}{N_{h,t}}$$

- Equal index weights replace cap weights, and book equity replaces market equity.
- Lagged one quarter. Parallels the market equity instrument of Kojen and Yogo (2019).
- The stock-level first stage is significant in 20 of 23 years. It is weak in 2010 to 2012 and its sign changes around 2010, so we report it year by year.
- A demand model estimated without IXI gives the same relation (−0.041 with size controls).

	2001	2004	2008	2010	2014	2018	2023
Partial R^2	0.04	0.02	0.03	0.00	0.01	0.05	0.05
First-stage coefficient	0.15	0.13	0.19	0.00	−0.12	−0.26	−0.21
t -statistic	10.8	7.3	9.8	0.1	−5.0	−11.5	−12.2

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Realized indexing and elasticity in regressions

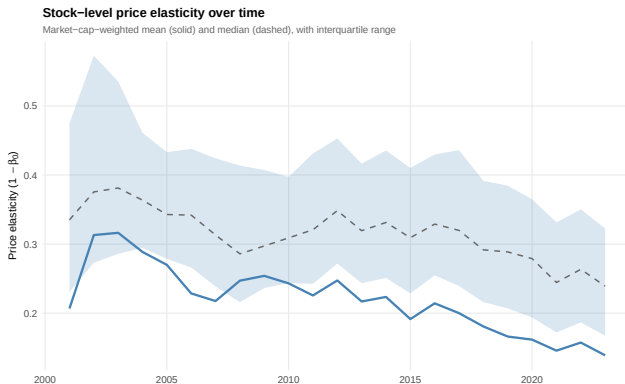
<i>Stock-year elasticity on log IXI</i>	Year effects	Size controls	Firm and year effects
Log IXI	-0.0528 (0.0028)	-0.0236 (0.0028)	-0.0266 (0.0032)
Observations	77,751	77,751	76,460

<i>By size quintile, with size controls</i>	Smallest	2	3	4	Largest
Elasticity from the IXI model	-0.0228 (0.0042)	-0.0200 (0.0040)	-0.0270 (0.0050)	-0.0253 (0.0044)	-0.0232 (0.0037)
Elasticity from the model without IXI	-0.0419 [-7.4]	-0.0426 [-9.2]	-0.0436 [-7.5]	-0.0337 [-7.3]	-0.0296 [-7.1]

Standard errors in parentheses and t-statistics in brackets, clustered by stock and year. Size controls are log market equity and log book equity (log market equity only in the last row). All stocks, model without IXI: -0.0413 [-10.7]. Sample 2001 to 2023.

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Stock-level demand elasticity has declined over the sample



Market-cap-weighted mean (solid) and median (dashed) of stock-level elasticity, interquartile range shaded, 2001 to 2023. Levels depend on the cap on the price coefficient, so the paper leans on relative gradients. [◀ back](#)

Active fund families respond more to prices in heavily indexed stocks

Holdings panel with investor by quarter effects. Interaction of instrumented log market-to-book with log IXI.

IXI treated as	Active families realized	Active families instrumented	All 13F instrumented	Passive families instrumented
Price $\times$ log IXI	0.293 (0.096)	-0.141 (0.055)	-0.036 (0.035)	-0.004 (0.043)
First-stage F , interaction	16.4	166	99	172
Investors	252	252	1,207	109

- With IXI instrumented, the same active fund family responds more strongly to prices in heavily indexed stocks. We find no clear response among passive families.
- This response would help absorb index demand, as in Haddad, Huebner, and Loualiche (2025). Using CRSP market cap gives the same direction (-0.10 , s.e. 0.07), but too little precision to establish the response conclusively.
- The composition results hold each investor's price coefficient fixed. They measure where passive capital sits and who holds the rest.

Reallocation toward passive investors accounts for the aggregate change

Decline in aggregate elasticity

2001 to 2003 average against 2021 to 2023 average

Reallocation toward passive investors	32%
Growth in IXI at the estimated slope	16%
Residual	52%

Each investor's price coefficient is held fixed within the year. The passive share of assets in the estimation universe rises from about 11 to about 33 percent.

Rise in the average price coefficient

Model estimated without IXI, AUM weighted

Total change	0.066
Composition (between groups)	0.065 (99%)
Within groups	0.001 (s.e. 0.028)

Mechanical benchmark: the pure passive share of U.S. equity rose from 2.6 to 18.2 percent, which alone implies a relative elasticity decline of about 16 percent.

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The valuation wedge by horizon, and the log correction

	Five years	Ten years	Fifteen years
Price response	7.24 (1.29)	7.60 (1.60)	9.27 (2.32)
Delivered claim	1.41 (0.89)	1.42 (0.53)	0.53 (0.52)
Valuation wedge	5.83 (1.39)	6.19 (1.41)	8.74 (2.25)
Wedge share before the log correction	80%	81%	94%
Wedge share, log corrected	83%	88%	99%
Bootstrap 95% lower bound	70%	74%	85%
First-stage F	52.2	37.5	25.4
Observations	593,060	441,268	286,949

- Ten-year bridge. The log correction lowers the claim response from 1.42 to 0.92, and $0.92 / 7.60$ leaves a wedge share of 0.88
- Each horizon uses the formation months with a complete window (through 2020, 2015, and 2010). The columns are different cohorts, not one cohort followed over time

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