EYE ON THE MARKET | SPECIAL EDITION

The Lion in Winter

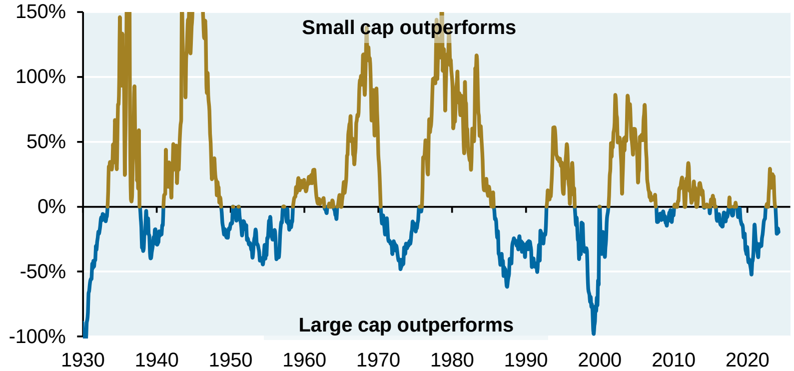
From 1930 to 2010, there were six extended periods of small cap outperformance as it dominated large cap over that entire period. But since 2010, small cap sits alongside value stocks and non-US stocks in the unholy trinity of underperforming portfolio strategies. While poor profit fundamentals argue against a prolonged period of outperformance vs large cap, small cap stocks are at their cheapest levels in the 21st century with potential market and political catalysts in their favor. First, a few words on the CrowdStrike outage.

By **Michael Cembalest** | Chairman of Market and Investment Strategy for J.P. Morgan Asset & Wealth Management

The Lion in Winter: small cap underperformance and potential catalysts; the CrowdStrike outage

You should forgive asset allocators for mistakenly assuming in 2010 that US small cap would outperform US large cap in their capital markets projections. From 1930-2010, the "small cap anomaly" yielded tremendous outperformance as shown in the first chart. There were six small cap outperformance eras during that period, the most recent of which occurred over 15 years ago.

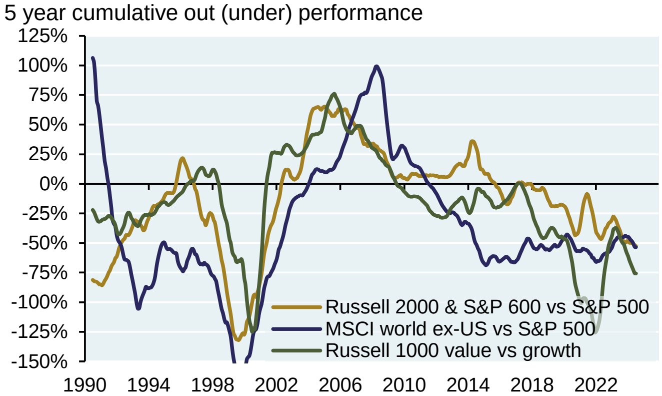
Small cap vs large cap index returns
3 year rolling out (under) performance of small cap vs large cap



Source: SBBI Ibbotson, JPMAM, July 2024

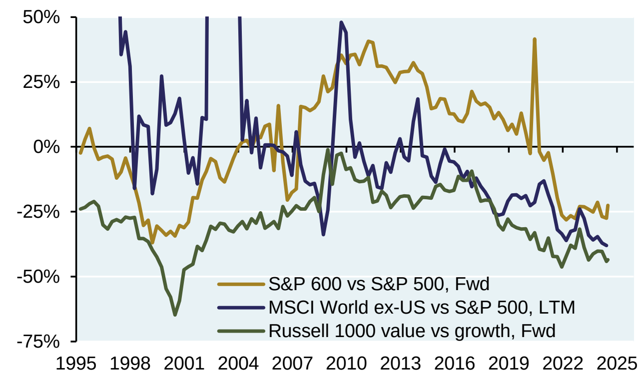
***The unholy trinity*.** Since 2010, small cap has been one of the big three underperforming portfolio strategies alongside large cap value vs growth and non-US stocks vs the US. All three out of favor strategies are at their cheapest levels in 20 years, but for good reason: weaker earnings growth than US large cap growth.

The Big Three: relative underperformance
5 year cumulative out (under) performance



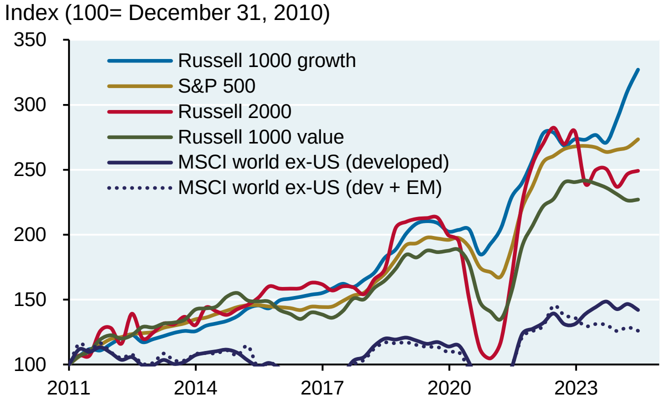
Source: Bloomberg, JPMAM, July 22, 2024

The Big Three: relative valuations
Relative P/E premium (discount)



Source: Bloomberg, JPMAM, July 22, 2024. Fwd = 12 mo forward, LTM = last 12 mo

Earnings growth
Index (100= December 31, 2010)



Source: Bloomberg, JPMAM, Q2 2024

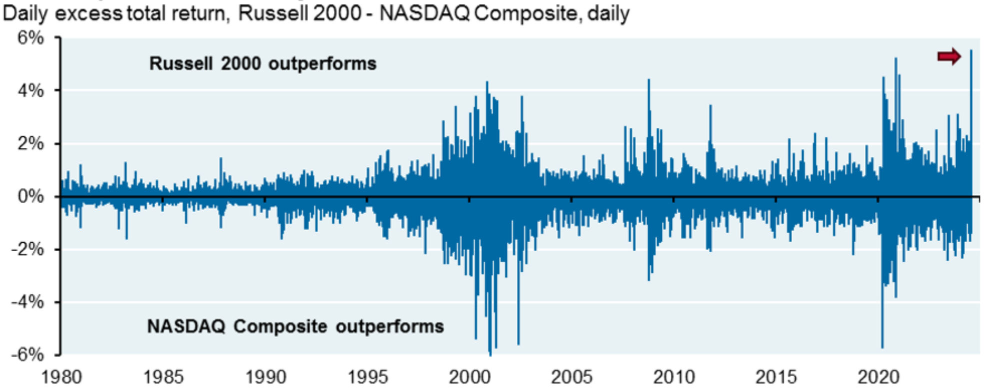
American exceptionalism: as shown on the left, non-US stocks (proxied by the MSCI World ex-US index) have been an earnings wasteland over the last decade whether we include emerging countries or not. Of the three underperforming strategies, I see better prospects for US small cap than the other two.

The Lion in Winter, 1968. A precursor to Game of Thrones intrigue: Henry II of England (Peter O'Toole) attempts to establish a line of succession with his three sons and his imprisoned wife Eleanor of Aquitane during a Christmas family gathering in the year 1183 AD.

Everything eventually has a price. After the soft June CPI report, the NASDAQ fell by 2% and the Russell 2000 Small Cap Index rose by 3.6%, the largest single day outperformance by small cap in over 40 years. It was just one day and may reflect unwinding of very entrenched positions at a time of a massive valuation gap. Poor small cap fundamentals (particularly portfolios that look like the Russell 2000) may prevent small cap from mounting its seventh sustained period of outperformance, but for diversified investors thinking about small cap stocks, today's valuations offer the cheapest entry point in the 21st century.

One more thing on small cap, related to politics. Trump has mentioned the possibility of higher tariffs on China and the rest of the world (which typically hurts large cap stocks the most), while Vance has said positive things about Lina Khan's FTC (despite her department losing almost all antitrust cases it brings). If a second Trump administration raises tariffs and ratchets up antitrust enforcement of large cap tech stocks, that could be a small cap relative value catalyst, albeit at a time of possibly declining overall US equity markets. Before we begin, a few words on the CrowdStrike outage given its breadth, and what it tells us about cybersecurity in 2024.

Small cap vs NASDAQ daily returns
Daily excess total return, Russell 2000 - NASDAQ Composite, daily



Source: Bloomberg, JPMAM, July 21, 2024

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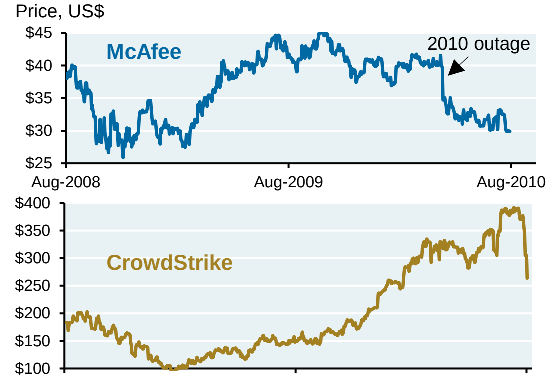
The CrowdStrike outage

It was an adventure wrapping this piece up last Friday given systems outages caused by CrowdStrike's botched software update. One cybersecurity firm observed that "CrowdStrike has done more to disrupt global business than all ransomware operators combined", while a former FBI counterintelligence agent cited CrowdStrike's "severe failure of quality control". Some more information from behind the scenes[1]:

- *It's all about "kernel" access.* The kernel refers to the core of an operating system and differs from "user space" in one very important regard. Once kernel access is granted to a software program, it can generally operate without restrictions, and if the program crashes it brings the computer down with it. Software operating in user space can crash without terminating the computer's ability to function
- *In Windows, cybersecurity software typically gets priority access to the kernel.* This dates back to the mid-2000's when Symantec and McAfee pressured Microsoft to allow them access to the kernel (rather than Microsoft being able to restrict cybersecurity tasks to its own cyber-program PatchGuard)
- *Microsoft requires software drivers operating in its kernel to receive a Windows Hardware Quality Labs certification after extensive testing, but CrowdStrike appears to have developed a workaround to bypass this with respect to certain updates of its driver.* CrowdStrike creates dynamic definition files that its software uses that do not require certification each time they're updated. Instead of just pointing to filenames, these definition files can also contain executable code. As a result, something like a null pointer reference in such files or inadequate parameter validation could crash the computer given its use by a kernel function
- *CrowdStrike's error sounds kind of shocking when explained in simple English:* CrowdStrike created a faulty driver definition file, failed to test it properly and then rolled it out to their entire client base in one fell swoop rather than rolling it out in batches. The result: 8 million (!!) crashed computers worldwide
- *Why weren't Apple or Linux computers affected?* Apple prevents third party developers from having access to kernel space, while the Linux driver updates appear to have been tested more thoroughly
- *I don't understand what the FTC's Lina Khan is talking about.* Khan's conclusion from the outage was that "concentration creates fragile systems". That's bizarre, since it was Microsoft's decision to open up the kernel to third party developers that is the root cause here. It's also bizarre since CrowdStrike only operates on 1% of all Windows PCs, which is not concentrated at all. I am inclined to believe that Khan would blame the Chicago Bears missed double-doink field goal in its 2018 wild card game on market concentration
- *There was evidence well before last week that something was amiss with CrowdStrike's Falcon Sensor software updates*. The enterprise software company Red Hat reported in June that CrowdStrike's updates were crashing Linux machines, creating "kernel panics" that are similar to Microsoft's "blue screen of death"
- *This kind of thing has happened before*. In 2010, CrowdStrike's CEO was the CTO at McAfee when it published an update that mistakenly labeled a legitimate Windows file as infected. This error paralyzed computers at hospitals, schools and gov't agencies. McAfee lost 40% of its market cap that day and sent ~4,000 employees on planes to help affected customers recover
- *Competitors go for the jugular after a mistake*. After the gov't released a report in 2023 chiding Microsoft for a "cascade of security failures," CrowdStrike's CEO used it as an opportunity to bash Microsoft in an appeal for new customers, citing "a crisis of confidence among security and IT teams within the Microsoft security customer base". What goes around…

McAfee and CrowdStrike stock price
Price, US$



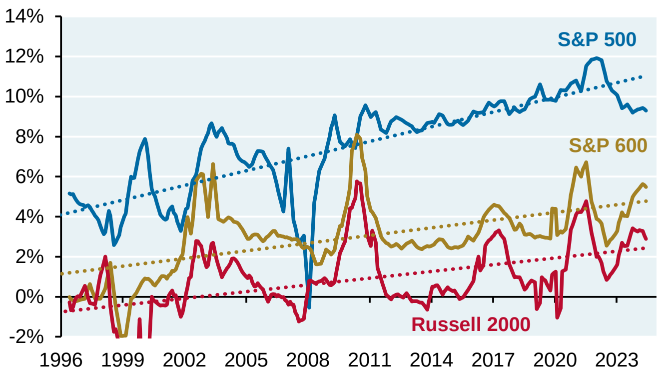
Source: Bloomberg, JPMAM, July 22, 2024

[1] Sources: Bloomberg, Stratechery, Register.com, Dave Plummer (ex-Microsoft, creator of Task Manager)

[1] US small cap: much lower profitability and more rate exposure than large cap

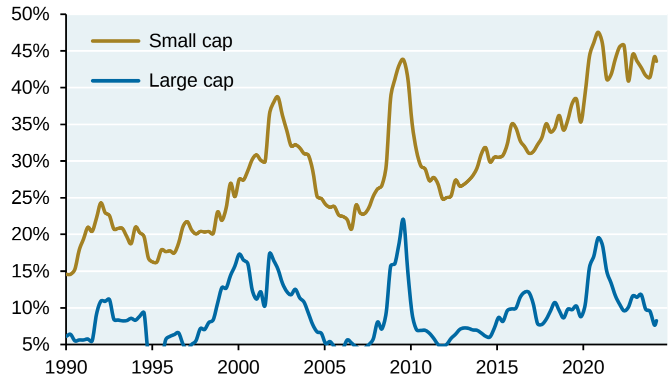
Relative to US large cap, US small cap stocks have (a) lower free cash flow margins, (b) a lot more companies with negative earnings, (c) lower return on invested capital[2], (d) more floating rate debt, (e) higher debt to cash flow ratios, (f) higher interest expense to cash flow and (g) ~70% of debt falling due in the next 5 years compared to 45% for large cap. These are depressing metrics if you're looking to find value in US small cap.

Free cash flow margin: large cap vs small cap
Free cash flow margin, 3 month smoothing



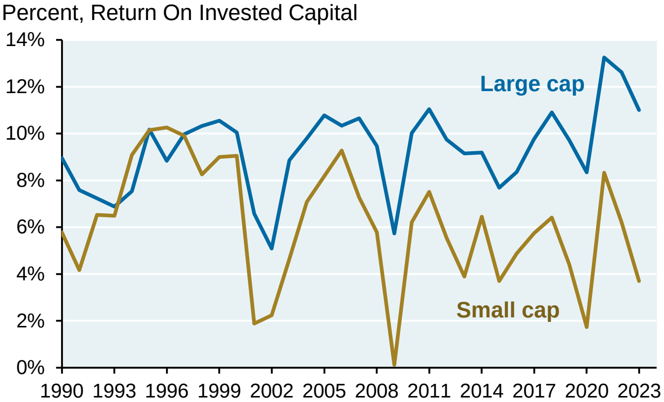
Source: Bloomberg, JPMAM, June 2024

Companies with negative earnings by size
% of companies with negative LTM earnings



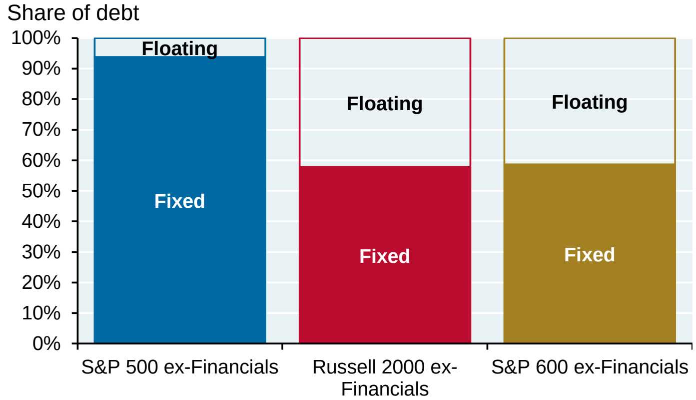
Source: Factset, JPMAM. May 15, 2024.

Aggregate ROIC for US large and small cap stocks
Percent, Return On Invested Capital



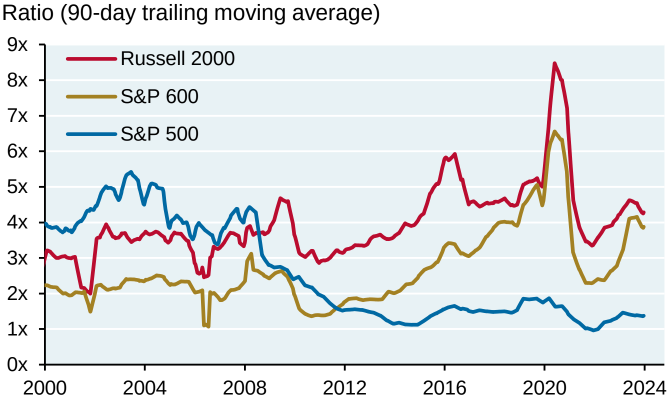
Source: *"Stock Market Concentration"*, Morgan Stanley, June 4, 2024

Fixed vs floating rate debt
Share of debt



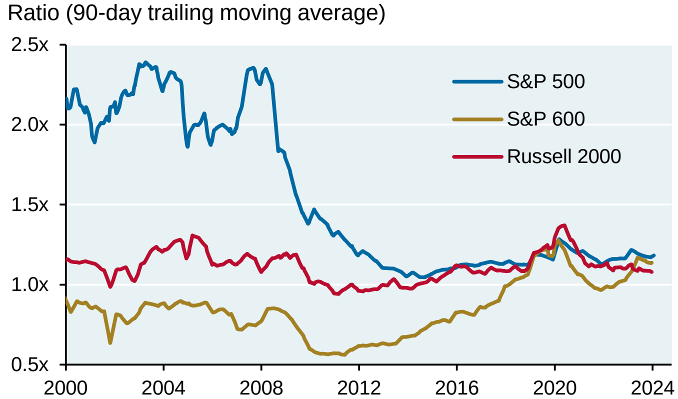
Source: Bloomberg, JPMAM July 8, 2024

Net debt to EBITDA for small and large cap companies
Ratio (90-day trailing moving average)



Source: Bloomberg, JPMAM, July 7, 2024

Total debt to equity for small and large cap companies
Ratio (90-day trailing moving average)

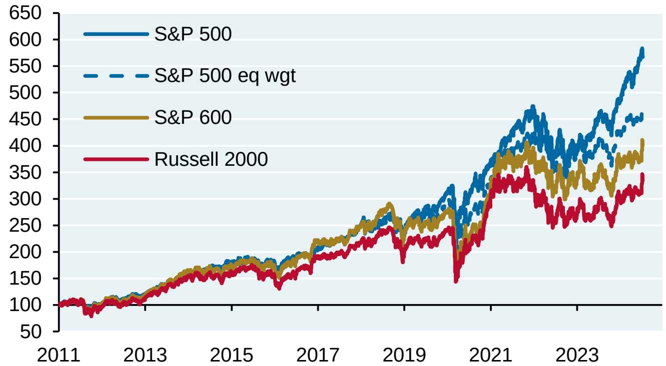


Source: Bloomberg, JPMAM, July 7, 2024

[2] ROIC = net operating profit after taxes divided by equity and interest-bearing debt (efficiency of debt and equity to generate profits); EBITDA = earnings before interest, taxes, depreciation and amortization

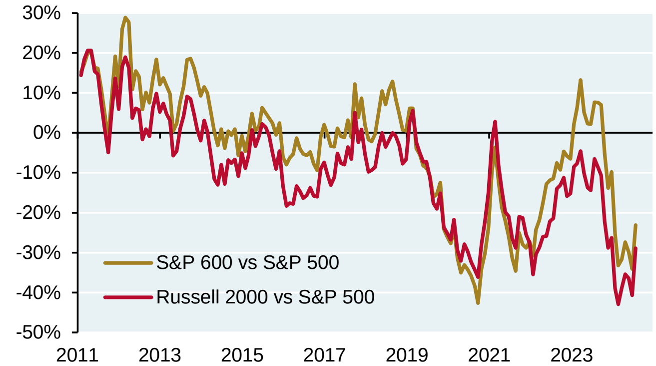
The next two charts illustrate small cap underperformance on a cumulative and rolling basis since Dec 2010. We use the Russell 2000 and the S&P 600 as US small cap proxies, which we explain next.

Large and small cap performance since 2011
Total return index (100 = January 1, 2011)



Source: Bloomberg, JPMAM, July 21, 2024

Rolling small cap performance vs large cap
Relative 3 year rolling return



Source: Bloomberg, JPMAM, July 19, 2024

[2] Small cap indexes: S&P 600 vs Russell 2000

Small cap stocks are a small part of US market capitalization. Even at their peak, small caps stocks represented only 4.5% of the S&P 1500; currently, they're just 2.5%. The S&P 600 and Russell 2000 are the most commonly used US small cap benchmarks.

The S&P 600 is rebalanced quarterly and is a higher quality index. To be added, a company's most recent earnings and its trailing four quarters of earnings must be positive at time of inclusion, and the stock must meet certain turnover criteria. The Russell 2000 includes small-cap stocks based solely on market cap (no earnings or turnover criteria) and is rebalanced annually.

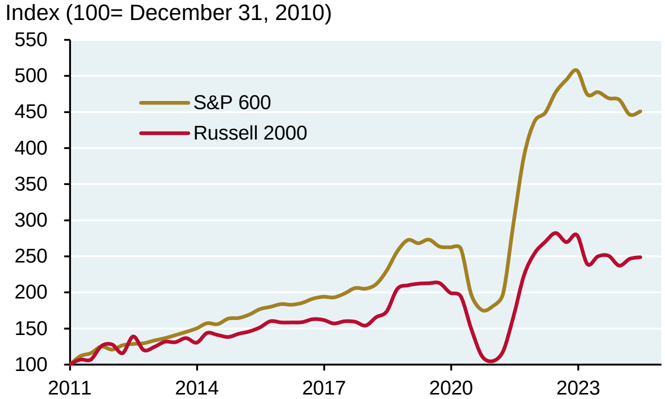
Key differences:

- Share of index with negative net income over the last 12 months: S&P 600 23%, Russell 2000 42%
- Median market cap: S&P 600 $1.8 bn, Russell 2000 $925 mm
- S&P 600 trades at cheaper valuations than the Russell 2000 (P/Book, EV/EBITDA, P/CF, P/E)
- S&P 600 stocks have generated faster earnings growth than the Russell 2000 (see below)

Similarities:

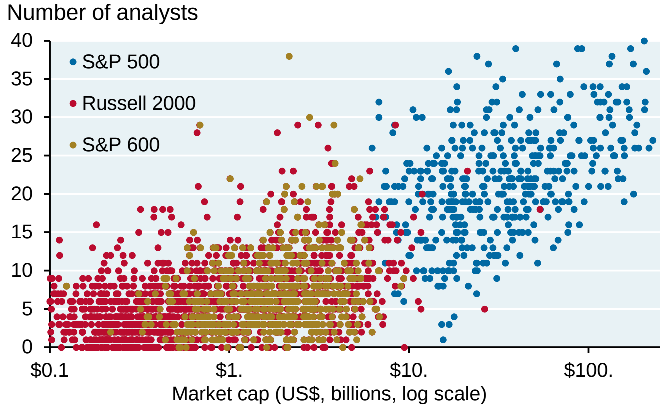
- Share of index constituents with > 100% annual turnover since 2002: S&P 600 70%, Russell 2000 67%
- Peak 50-day annualized index volatility during COVID recession: S&P 600 84%, Russell 2000 84%
- Similarly low levels of analyst coverage relative to large cap (see second chart below)

Earnings growth
Index (100= December 31, 2010)



Source: Bloomberg, JPMAM, Q2 2024

Analyst coverage vs market capitalization
Number of analysts

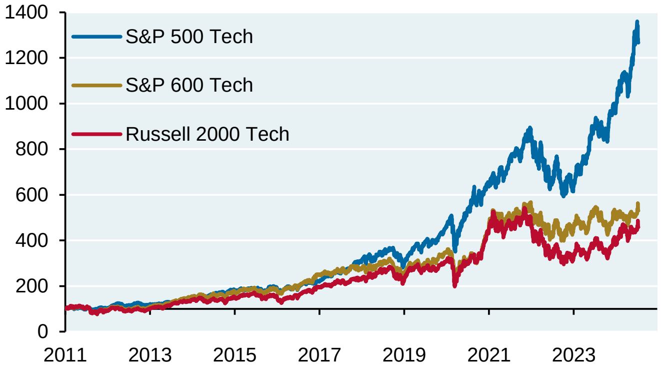


Source: Bloomberg, JPMAM, June 18, 2024

[3] Zeroing in on root causes: the performance gap between large cap and small cap US tech stocks

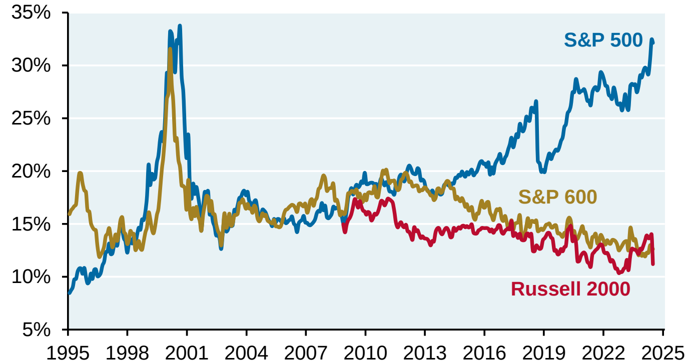
Small cap investors can blame much of their underperformance on small cap tech stocks which badly lagged large cap counterparts. Large cap tech stocks have tripled the performance of small cap tech since Dec 2010, with most of that outperformance taking place since 2019. Another way to visualize this: the declining index weight of small cap tech vs rising weights for large cap tech.

Large cap vs small cap tech sector performance
Total return index (100 = January 1, 2011)



Source: Bloomberg, JPMAM, July 21, 2024

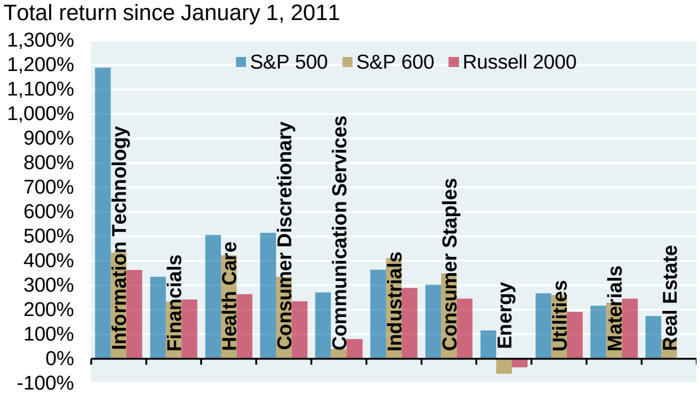
Large cap vs small cap tech sector weights
Index weight



Source: Bloomberg, JPMAM, July 22, 2024

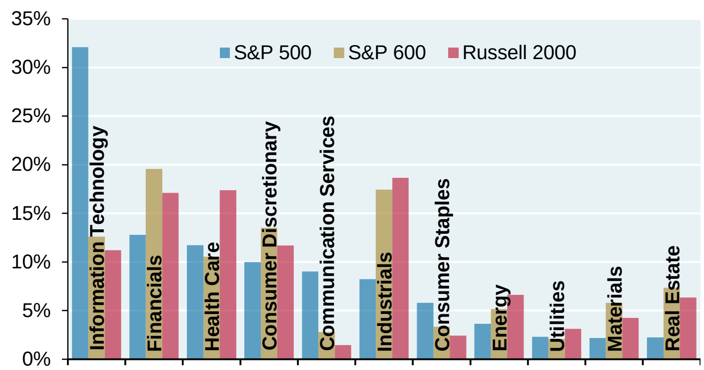
Small cap sector underperformance does not stop at tech. Since Dec 2010, large cap also outperformed small cap in financials, healthcare, consumer discretionary, communication services and energy. In fact, **no small cap sector meaningfully outperformed large cap since 2010**, particularly when looking at the Russell 2000 index. The next two charts show performance by sector since Dec 2010 and current sector weights.

Sector performance: large cap vs small cap
Total return since January 1, 2011



Source: Bloomberg, JPMAM, July 22, 2024

Sector weights: large cap vs small cap
Sector weight by index



Source: Bloomberg, JPMAM, July 22, 2024

Some observers believe that underperformance of US small cap vs large cap is due to companies staying private for longer periods of time, after which they go public as mid or large companies instead of small cap. We find some evidence for this line of reasoning as it relates to tech stocks. Median time-to-IPO for tech stocks rose from ~8 years before 2009 to ~12 years in 2021, after which IPO activity declined sharply in 2022/2023. Furthermore, the share of tech IPOs that fell into the small/micro universe were ~70% until 2017, after which they declined to ~30% [see charts on page 10]. However, while this took place in the tech sector, time-to-IPO and small cap share of IPOs were roughly unchanged when looking at all IPOs.

[4] How cheap is US small cap now? Very, using three different measures

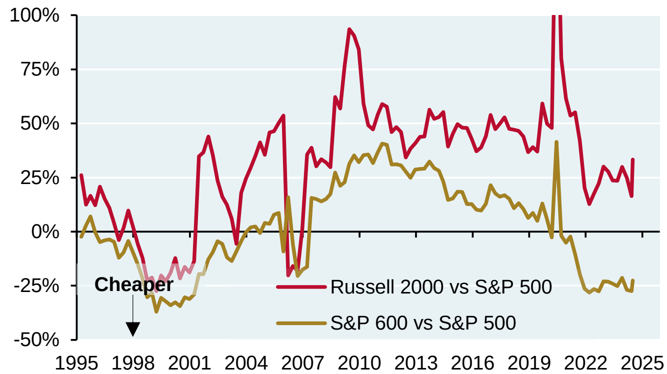
Answering this question involves competing sources of data and approaches since there's no one "right" answer. All three approaches discussed below indicate that small cap is at the very cheap end of its valuation range over the last 20 years. For investors that have avoided US small cap entirely, this might be an interesting entry point.

Method 1: P/E ratio comparisons using Bloomberg and Empirical Research data

The next chart shows forward P/E ratios for small cap vs large cap using Bloomberg data. We're puzzled since in some periods in the early 2000's, Bloomberg shows negative earnings for the Russell 2000 Index and yet still provides a P/E ratio greater than zero, which does not make sense. Bloomberg is unwilling/unable to explain this, so we have to accept this anomaly when using their data. Separately, Empirical Research computed the relative P/E ratios of the highest quality stocks in small and large cap markets since the 1970's, also finding a P/E discount for small cap that is close to the largest on record.

Relative valuation: small vs large cap forward P/E ratio

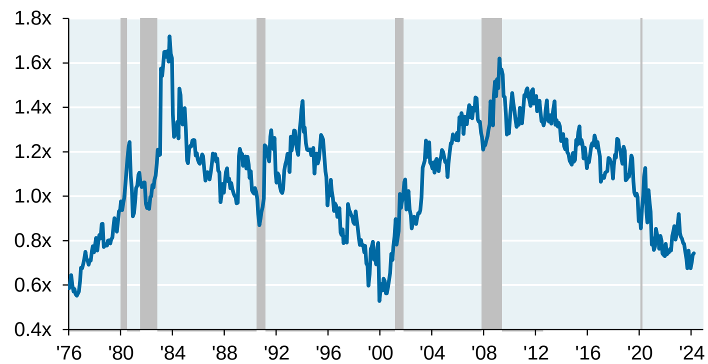
Relative forward P/E premium (discount)



Source: Bloomberg, JPMAM, July 22, 2024

Small cap vs large cap forward P/E for highest quality stocks

Highest quality = top quintile of free cash flow margins



Source: Empirical Research, June 2024

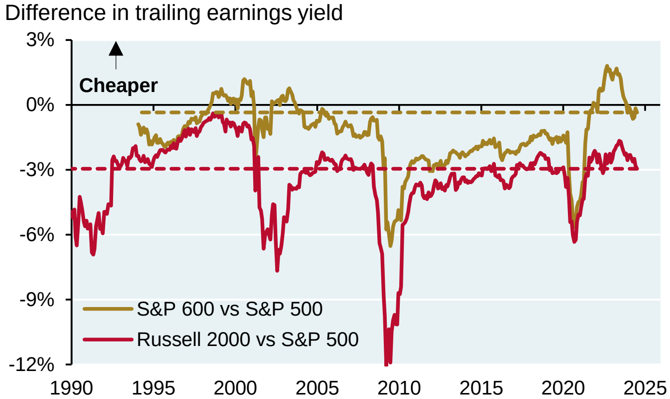
Method 2: earnings yield comparisons from JP Morgan's Structured Equity Group

Earnings yield is a simple concept: it's the inverse of a P/E ratio. The higher the earnings yield, the cheaper the stock or index. In a relative P/E chart, a discount indicates cheapness while in a relative earnings yield chart, a premium indicates cheapness. JP Morgan's Structured Equity Group get their data from Compustat (trailing earnings) and Factset (forward earnings estimates). They "winsorize" the data (sorry) to remove outliers. As a result, their earnings yield for a small cap index will not simply be the inverse of the Bloomberg P/E ratio.

As shown below, the group's earnings yield for small cap is close to its cheapest levels in 20 years as well, although you'll see that small cap was even cheaper on this basis at several junctures over the last 2-3 years.

Relative valuation: small vs large cap earnings yield

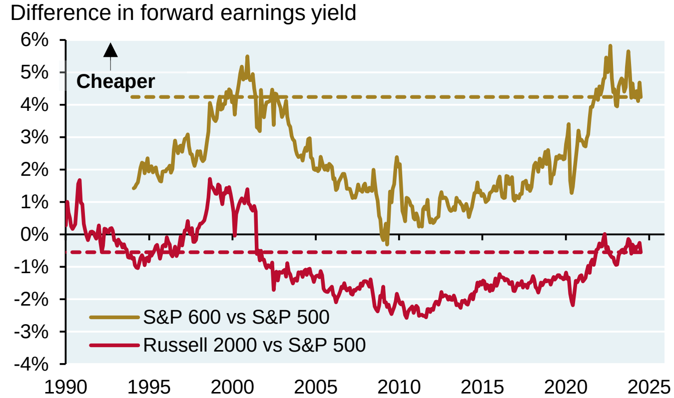
Difference in trailing earnings yield



Source: Compustat, JP Morgan Structured Equities Group, July 2024

Relative valuation: small vs large cap earnings yield

Difference in forward earnings yield



Source: Compustat, JP Morgan Structured Equities Group, July 2024

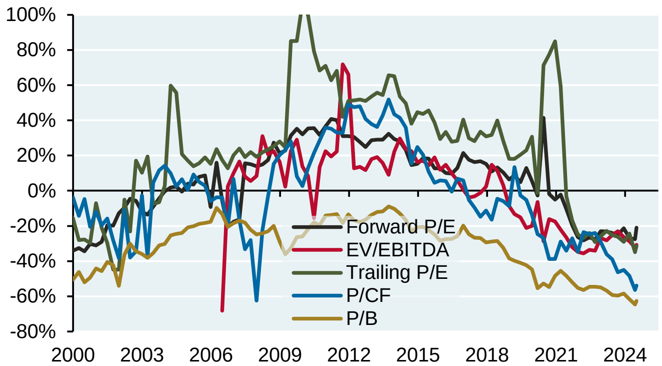
Method 3: multiple valuation indicators

Other relative valuation approaches involve the use of multiple signals and not just price to earnings. The chart below on the left is one example, showing different valuation metrics for the S&P 600 vs the S&P 500. The signal is the same: small cap is cheap vs large cap relative to its history.

[5] While US small cap lagged US large cap, it outperformed vs the rest of the world

While US small cap has been disappointing vs US large cap, **it still clobbered investing outside the US**. The chart on the right compares a blend of the S&P 600 and Russell 2000 to Japan, Europe and Emerging Markets since Dec 2010. Of the three underperforming asset class categories (small cap, value and non-US), non-US stocks have experienced the worst relative performance over this time period.

Small cap valuation measures
Premium (discount) of S&P 600 vs S&P 500



Source: Bloomberg, JPMAM, July 22, 2024

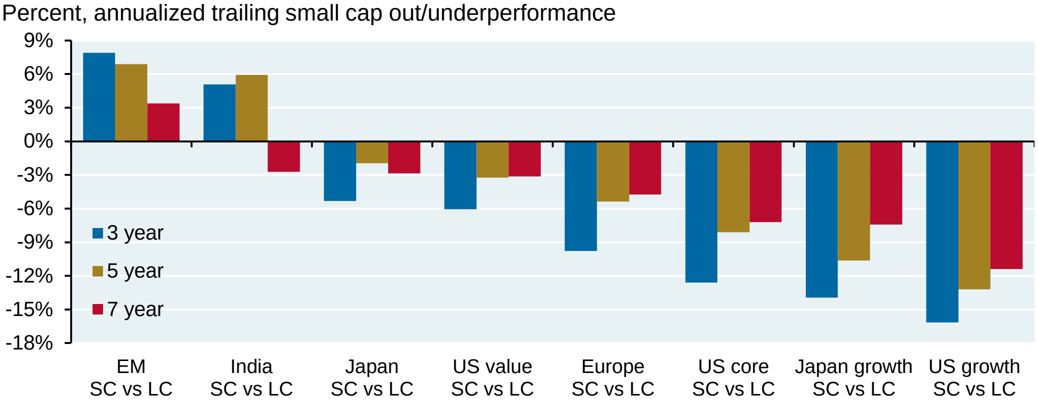
US small cap performance vs international indices
Index (100 = December 2010), US$

Source: Bloomberg, JPMAM, July 19, 2024

[6] Recent small cap underperformance vs large cap mostly a developed market phenomenon

Small cap underperformance vs large cap has been pervasive in the developed world over the last decade, but not in emerging markets. Comparing small cap to large cap performance by region requires choices regarding which indexes to use. See below for our index selections by region[3].

Small cap vs large cap returns by geography
Percent, annualized trailing small cap out/underperformance



Source: Bloomberg, JPMAM, June 30, 2024

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[3] **Small cap and large cap indexes used in the chart:**

US core:	Russell 2000 vs S&P 500
US growth:	Russell 2000 Growth vs Russell 1000 Growth
US value:	Russell 2000 Value vs Russell 1000 Value
Europe:	MSCI Europe Small Cap vs MSCI Europe
Japan core:	Russell/Nomura Small Cap vs MSCI Japan
Japan growth:	Russell/Nomura Small Cap Growth vs MSCI Japan
Emerging markets:	MSCI EM Small Cap vs MSCI Emerging Markets
India:	NSE Nifty Small Cap 250 vs MSCI India

[7] Can manager outperformance make up for small cap underperformance vs large cap?

Have small cap managers generated enough outperformance vs benchmarks to mitigate small cap under-performance vs large cap? The answers:

- For US small cap core and growth, median manager alpha was typically positive but only offset 30% or less of the associated small cap underperformance vs large cap. The presence of persistent median manager alpha in small cap may reflect a more inefficient market: ~80% of the small and mid-cap universe is either very thinly covered by research analysts or not covered at all. It may also reflect our use of the Russell 2000 benchmark while some managers construct higher quality portfolios that look more like the S&P 600
- For US small cap value, median manager alpha closed a lot more of the gap while top quartile managers closed practically all of it
- For Europe and Japan small cap core, median manager alpha was either negative or only slightly positive, offsetting no more than 15%-20% of the gap
- For India, small cap generally outperformed large cap, *and* median manager alpha was also positive; the only drawback is the limited number of small cap managers with sufficiently long performance history; note the outsized impact of our ETF adjustment on these results, explained below
- In Emerging Markets, median manager alpha was negative but there was a silver lining: EM small cap substantially outperformed EM large cap

Adjusted for ETF fees and tracking error

	3 year					5 year					7 year				
		Manager Alpha					Manager Alpha					Manager Alpha			
Market	SC-LC	# mgr	25th	50th	75th	SC-LC	# mgr	25th	50th	75th	SC-LC	# mgr	25th	50th	75th
US small cap blend	-12.6%	233	5.9%	**3.5%**	2.0%	-8.1%	218	2.9%	**1.3%**	0.2%	-7.4%	204	1.8%	**0.9%**	0.0%
US small cap growth	-16.2%	173	4.3%	**1.4%**	-2.9%	-13.2%	163	3.4%	**1.0%**	-0.2%	-11.4%	156	3.5%	**2.0%**	0.5%
US small cap value	-6.1%	154	5.5%	**3.6%**	1.9%	-1.9%	141	3.9%	**2.0%**	0.6%	-2.7%	134	2.3%	**1.4%**	0.3%
Europe small cap	-9.8%	137	0.3%	**-2.9%**	-5.7%	-3.2%	126	1.5%	**0.0%**	-2.1%	-2.9%	110	0.9%	**-0.2%**	-2.4%
Japan small cap	-5.3%	38	3.0%	**-4.4%**	-8.9%	-5.4%	34	2.3%	**0.0%**	-3.5%	-4.7%	28	2.9%	**0.8%**	-0.9%
Japan small cap growth	-13.9%	90	3.5%	**-0.6%**	-3.6%	-10.6%	84	5.0%	**2.2%**	0.7%	-7.2%	72	3.6%	**2.0%**	0.6%
India small cap	5.1%	20	6.1%	**5.0%**	2.2%	5.9%	18	7.8%	**5.1%**	4.0%	-3.1%	13	8.0%	**6.1%**	4.4%
Emerging Markets small cap	7.9%	37	0.6%	**-1.1%**	-4.0%	6.9%	38	-0.1%	**-1.7%**	-4.1%	3.4%	30	-0.2%	**-0.7%**	-1.9%

Source: Morningstar, JP Morgan Equity Research, JPMAM, June 2024

Working with small cap manager data

Data source: Morningstar, all active managers designated in one of several small cap categories. We excluded any managers with more than 35% in large cap stocks

Multiple share classes: most small cap managers have multiple share classes, some as many as 25. In our analysis, we chose the share class with the lowest fees (institutional share class). Using higher fee share classes would have impacted the results; in most categories, the difference between the highest and lowest fee share classes was 75-100 basis points

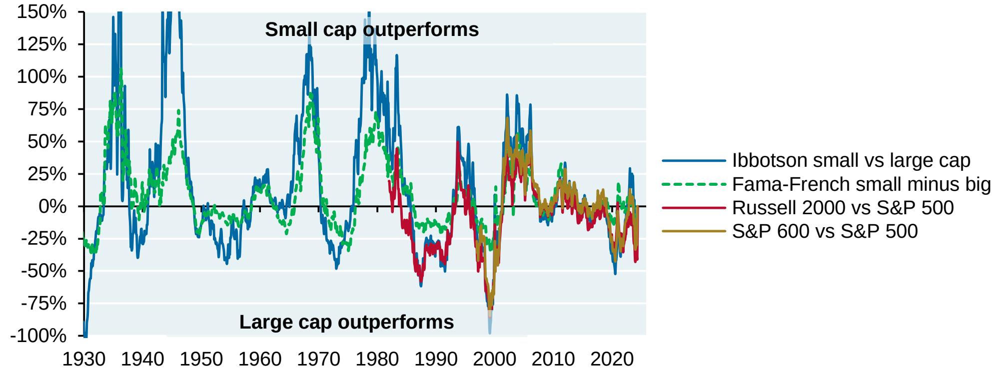
Manager alpha: Most managers have a stated benchmark. However, we use a single benchmark for each category as shown in footnote 2 irrespective of stated benchmarks. There are often multiple options to pick from; the higher the performance of a given benchmark, the lower the manager's imputed alpha would be. For example, the trailing 5 year annualized performance of the India NSE Nifty Small Cap Index was 20.7%, while the same figure for the S&P India BSE Small Cap Index was 22.7%. For developed markets, the difference between different index options has less of an impact.

ETF adjustments: Benchmarks are not investible, which in essence creates an artificially high hurdle for managers. In the manager alpha analyses that I have worked on, I generally make an adjustment to reflect the cost and tracking error of investible ETFs that correspond to each benchmark. That is a fairer way to compute the opportunity cost for an investor allocating to a manager instead of a passive investible benchmark. These adjustments are negligible in the case of US small cap, and larger in the case of India. An example: over the trailing 5-year period, the India Small Cap Index returned 132% while the comparable investible ETF returned 97%, resulting in an annualized adjustment of 3.8%.

[8] Wrapping up: small cap data sources and small cap performance around recessions

There are several sources for historical performance of US small cap vs large cap stocks. For the chart on the first page with data back to the 1930's, we use Ibbotson. As an alternative, we could have used Fama-French data shown in green. The results would usually have been similar with the exception of a period in the late 1940's. Russell 2000 Index data begins in the late 1970's, while S&P 600 data begins in the early 1990's.

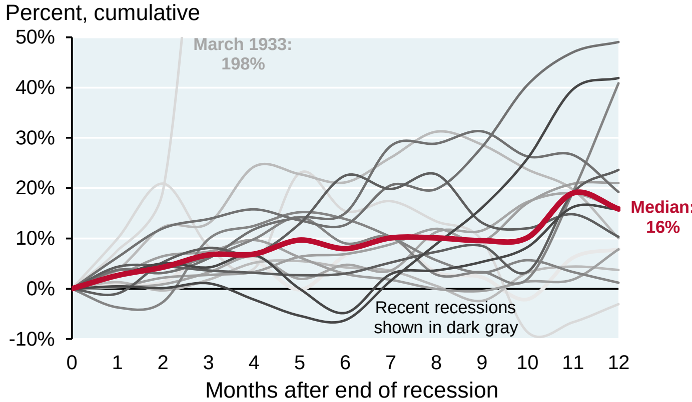
Small cap vs large cap index returns
3 year rolling out (under) performance of small cap vs large cap



Source: SBBI Ibbotson, Fama-French Data, Bloomberg, JPMAM, July 2024

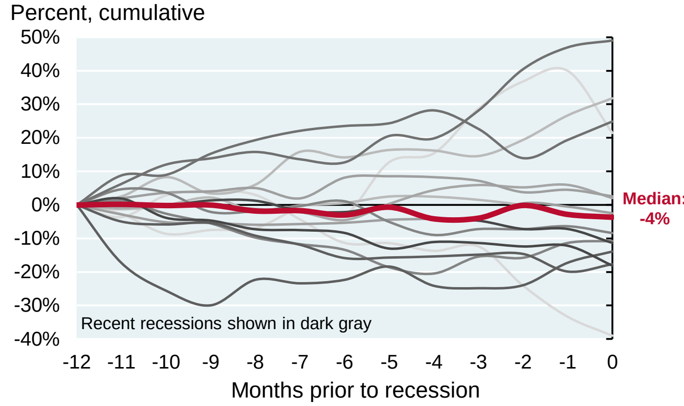
Small cap: good early cycle asset class, bad late cycle asset class. There's a clear historical signal showing that small cap tends to outperform large cap following recessions (first chart). Of the 16 recessions shown, small cap outperformed in all but one. This makes sense given the much higher cyclical share of the S&P 600 (55%) compared to the S&P 500 (28%). Prior to the onset of recessions, the relative performance data is decidedly mixed: there's a wide dispersion around the median, with no clear directional signal.

Small cap premium following end of recession
Percent, cumulative



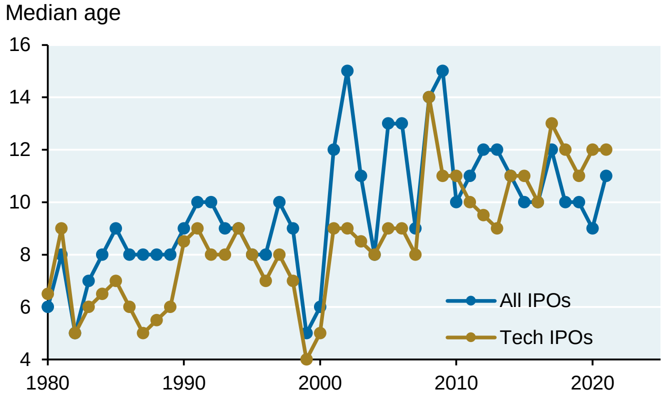
Source: SBBI Ibbotson, JPMAM, April 2024

Small cap premium prior to onset of recession
Percent, cumulative



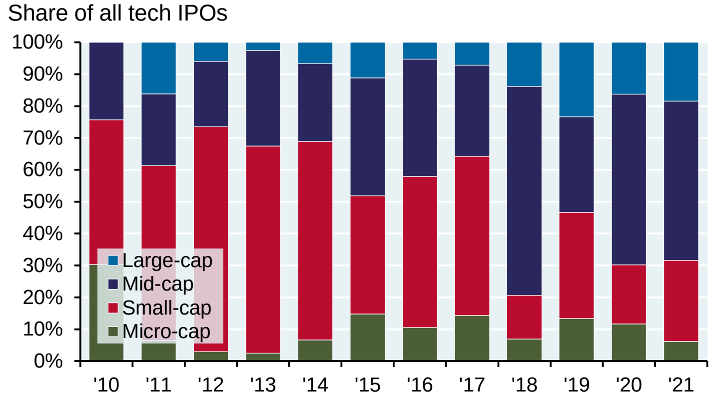
Source: SBBI Ibbotson, JPMAM, April 2024

Age of companies going public
Median age



Source: Jay Ritter, University of Florida, JPMAM, 2023

Tech IPOs by market cap at time of issuance
Share of all tech IPOs



Source: Bloomberg, FactSet, JPMAM, 2023

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