Nasdaq International Patent Leaders™ Index: Tracking Top Innovators Outside the US

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The Nasdaq International Patent Leaders Index (NQIPL™) was launched on June 24, 2024 to offer investors a differentiated approach to track the largest innovation-driven companies based outside the US. While the Nasdaq-100 Index® has long been regarded as one of the leading benchmarks for innovation – with the US as the undisputed leader among countries – a significant amount of innovation as measured by research & development (R&D) spending and patent filings does occur internationally. Using alternative data in the form of patent valuation estimates, NQIPL is designed to offer investors an equity benchmark that in many ways looks and feels like an international version of the Nasdaq-100®.

Reasons to Consider NQIPL:

- An objective, rules-based international growth strategy that seeks to track the top 100-ranked companies by patent valuation from an index universe of large & midcap non-US companies, capturing exposure to more than 80% of aggregate patent value generated outside the US
- Grounded in empirical research that demonstrates long-term fundamental and price outperformance potential of companies that prioritize R&D spending and patent development
- Differentiated and potentially superior risk-adjusted approach for investors to track international growth companies, with substantially similar sector exposures to the S&P 500 Index

Methodology Overview

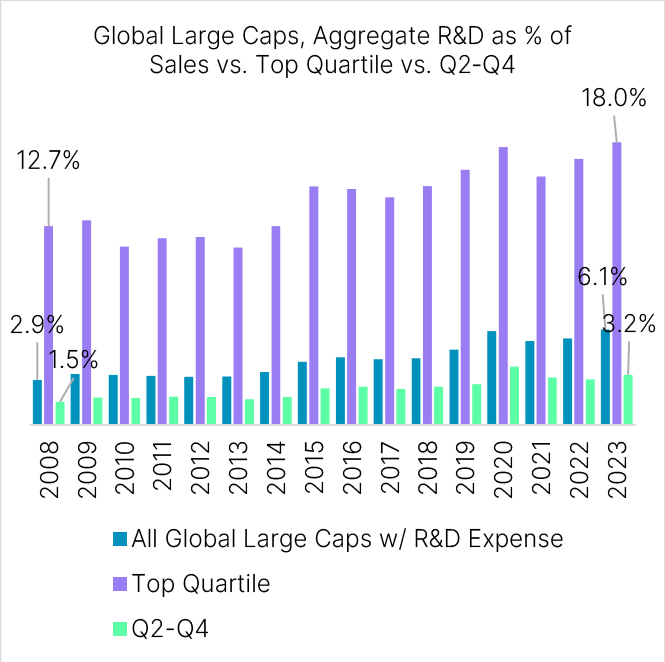
The Nasdaq International Patent Leaders Index consists of the top 100-ranked companies by patent valuation in the Nasdaq Global Ex United States Large Mid Cap™ Index (NQGXUSLM™), which tracks approximately 1,600 securities across 48 countries. Patent data is sourced from IPR Strategies, an established leader in the field of patent valuation and consulting. Patent values are updated and reviewed as of the end of April and October, with the NQIPL Index reconstituted and rebalanced on a semiannual basis in June and December.

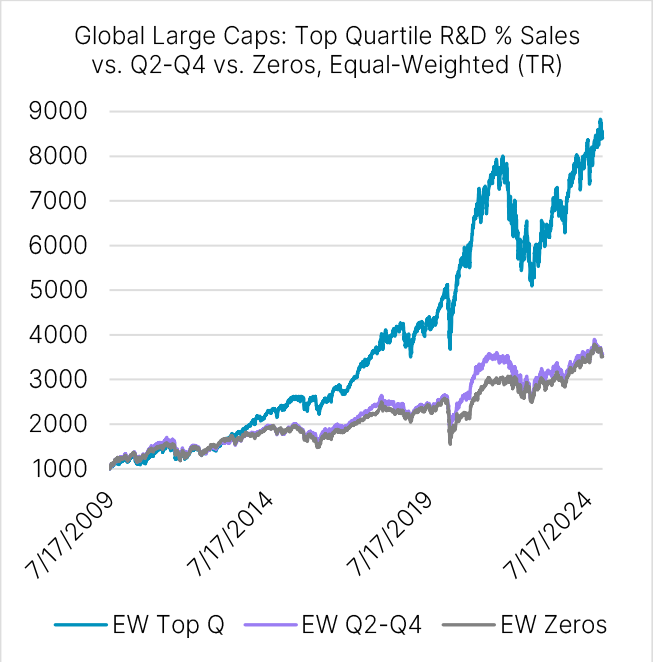
The index utilizes full market capitalization in its constituent weighting scheme, subject to an individual security cap of 10%. In addition, the aggregate weight of securities with weights greater than 4.75% each cannot exceed 50%. Iterative weight adjustments are performed until the constraints are met to reduce potential concentration. For more detailed information on the process, please refer to the full index methodology.

Innovation as an Alternative Fundamental Factor with Empirical Support

R&D spending has grown substantially in the 21st century as the global economy has become increasingly driven by technological innovation. Since 2008, total R&D spending across all companies in the Nasdaq Global Large Cap™ Index tripled from $342 billion to more than $1 trillion by 2023. The top quartile of R&D spenders (R&D as a

% of Sales) demonstrated the fastest growth, from ~13% of aggregate revenues in 2008 to ~18% in 2024, reinvesting six times more of every dollar of revenue earned back into R&D vs. the bottom three quartiles of R&D spenders (~3% of aggregate revenues). As a result, top quartile R&D companies experienced revenue growth at approximately four times the speed of the others (+115% in aggregate vs. +27%). An equal-weighted portfolio of top R&D spenders, rebalanced annually, outperformed bottom-spenders by approximately three times over a simulated period from July 2009 – December 2024 (+713% total return vs. +271%). Notably, companies ranked in the bottom three quartiles of R&D as a % of Sales showed nearly identical performance to those that spent zero on R&D (+263%), implying that a **high level of R&D intensity matters moreso than simply spending some nominal amount every year**.

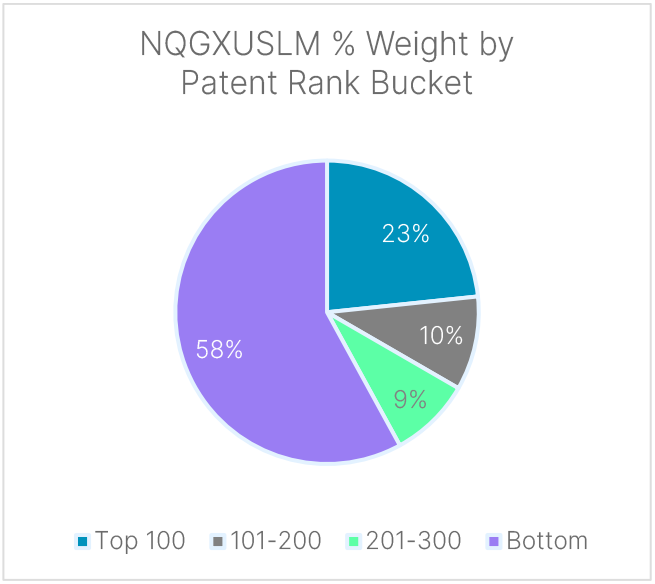


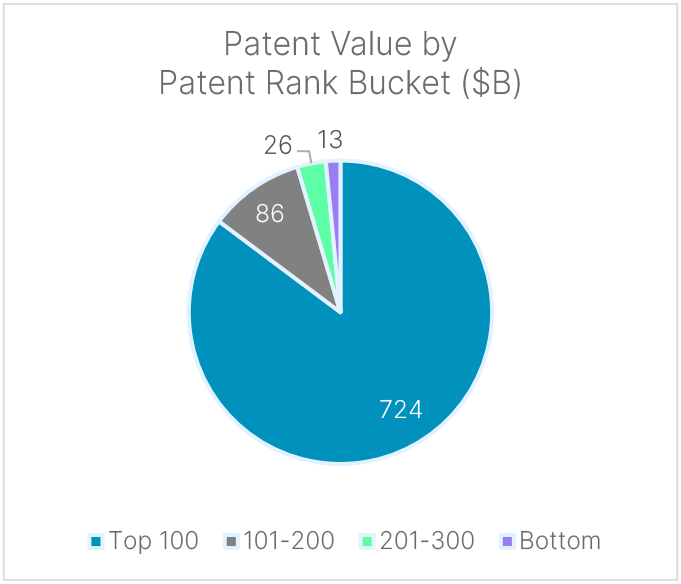


Source: Nasdaq, Factset as of 12/31/2024. Index data as of each year-end from 12/31/2008 to 12/31/2023. Companies ranked on prior full-year R&D expense as % of Sales on 6-month lag (June 30). Baskets rebalanced annually 3rd Friday of July.

R&D metrics can be useful for investors in identifying many of the most innovative companies, but there are potential drawbacks to utilizing it as a standlone selection criteria. Firstly, R&D expense is reported on financial statements and easily accessible for many investors to analyze, meaning there may not exist much of an "edge" – or the potential to generate alpha – in building portfolios solely based on R&D. Secondly, R&D is reported as a *one-time expense on income statements*, and can be subject to financial modelling blindspots as it does not appear anywhere on the balance sheet (unlike physical assets generated by CapEx). Patent valuation is a solution to the blindspot because it reflects (an estimate of) the actual monetary value of historical R&D that led to the granting of patents, which are "intangible" assets not reported anywhere on the balance sheet. As many others have pointed out in recent years, intangible assets now represent upwards of 80-90% of the market value of companies in benchmarks such as the S&P 500, vs. less than 20% only half a century ago. The nature of patent valuation as an alternative, less publicly-available dataset with the potential for differentiated alpha generation; its ability to reflect ***capitalized*** *R&D expenditures that actually resulted in revenue-generating "assets" in the form of patents*; and the fact that patent development itself likely represents the most innovative of all areas of R&D spending and intangible asset creation – together suggest a powerful combination of factors that justify its potential application in portfolio construction.

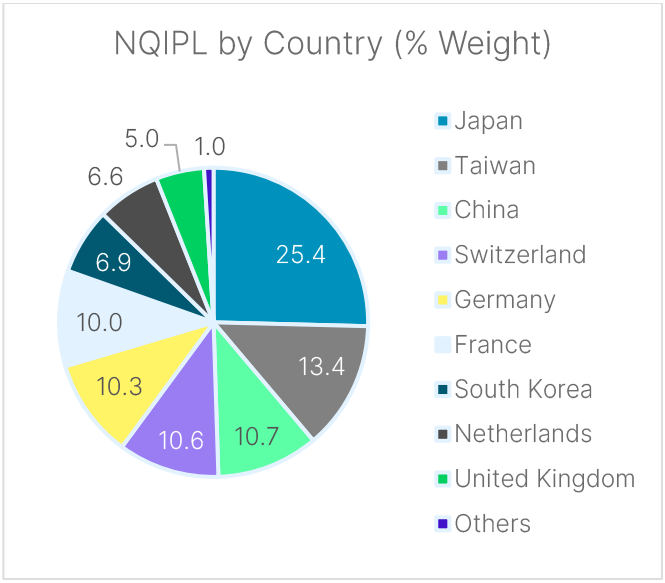
When analyzing the distribution of patent value across all ~1,600 global ex-US large and mid cap companies, it quickly becomes clear that – as with many other examples of power laws at work in the modern economy – there is tremendous concentration at the very top. Despite representing only 23% of aggregate market cap in the space (i.e. NQGXUSLM index weight), the top 100 global ex-US companies by patent valuation represent 85% of aggregate patent value: $724 billion out of approximately $850 billion, as of April 30, 2025. There is a precipitous dropoff moving further down in the rankings, with the next 100 largest companies by patent value spending an order of magnitude less: only $86 billion.

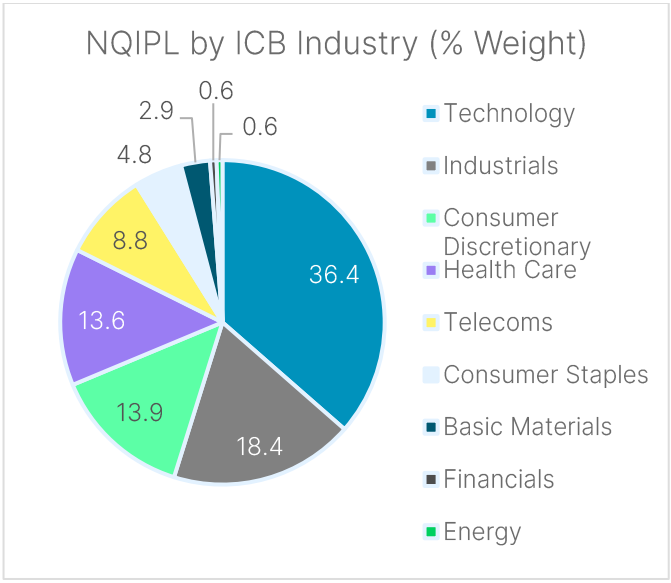




Source: Nasdaq, IPR Strategies. Index data as of 6/30/2025. Patent valuation data as of 4/30/2025.

Index Composition





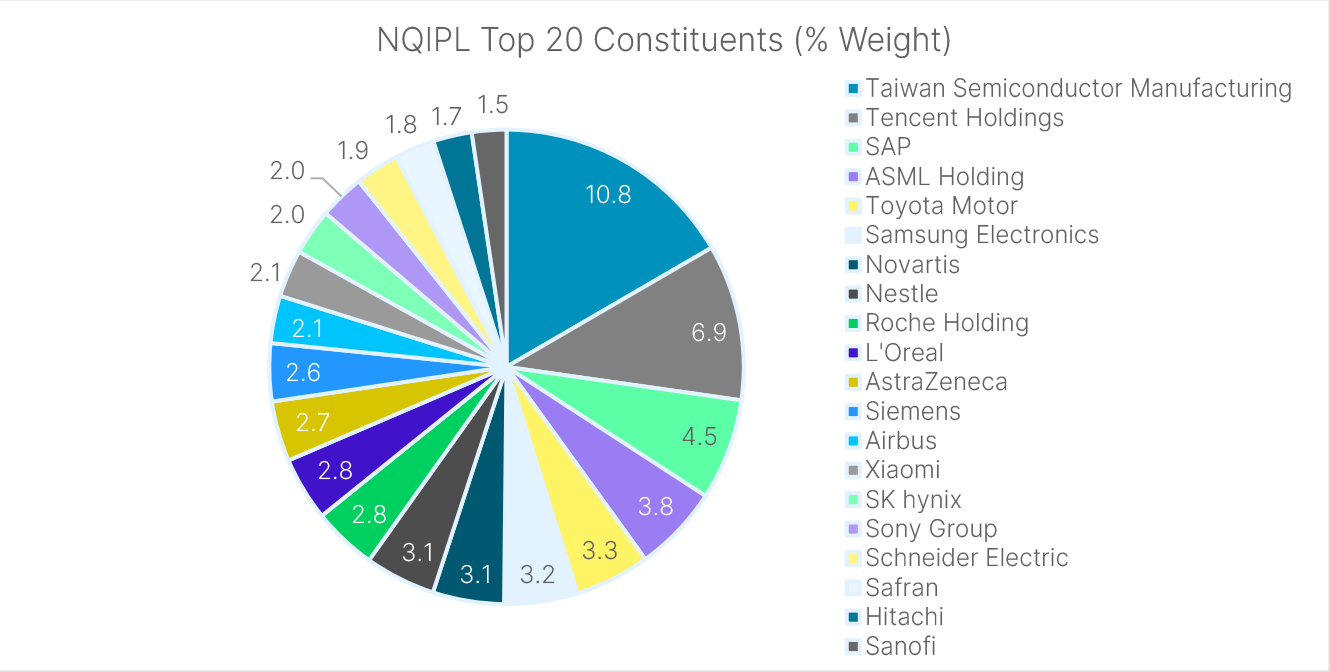
Source: Nasdaq, Factset. Index data as of 6/30/2025. Country exposure based on Factset Headquarters Country.

In terms of geographic exposure, NQIPL concentrates most of its allocations across nine countries, with Japan

by far the biggest at nearly one-quarter of index weight. Japan has long been recognized as a leader in patent development, and the dataset reflects that with six of the top 10 ranked companies including names such as Sony, Toyota, Panasonic and Mitsubishi. Overall, Japanese companies represent ~47% of patent value across all names in the starting universe of global ex-US large and mid caps. Taiwan, China, Switzerland and Germany round out the top five.

In terms of sector allocations (per ICB Industry), Technology companies comprise the largest index exposure at ~36% of index weight, followed by Industrials at ~18%, Consumer Discretionary and Healthcare at ~14% each, and Telecoms at ~9%. While not quite as concentrated as the Nasdaq-100 with respect to Technology (typically 55-60% of index weight) , NQIPL does mimic the sector exposure with minimal allocations to most of the "old economy" sectors such as Basic Materials, Energy, Consumer Staples and Utilities. The biggest differential is Industrials, which is a generally more substantial component of equity market capitalization in many developed markets such as Japan and Germany.

The index's top 20 constituents represent ~65% of total exposure. The list includes many names that are well-known for leading innovation in their respective industries and geographies, including two of the world's most important semiconductor companies (Taiwan Semi, global leader in chip manufacturing and ASML, global leader in lithography equipment); four of the biggest pharmaceutical companies (Novartis, Roche, AstraZeneca, Sanofi); Europe's premier software company (SAP), European industrial champions (Siemens, Airbus), China's leading tech champion (Tencent) and Samsung Electronics – owner of the world's most valuable portfolio of patents worth ~$73 billion. Together these 20 companies represented $5.4 trillion in market value as of June 30, 2025.



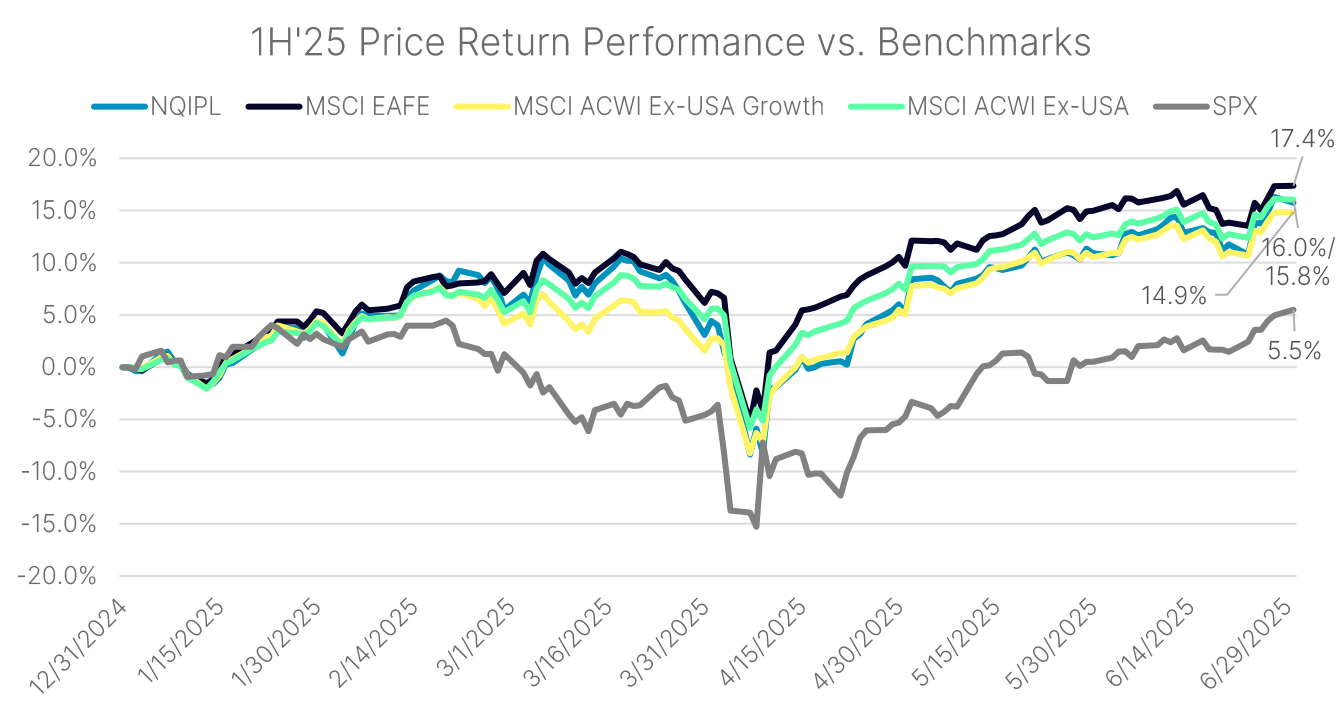
Source: Nasdaq. Index data as of 6/30/2025.

Index Live Performance Analysis

Since launch on June 24, 2024, NQIPL has generated a price return of 11.3% and a total return of 13.9%. The first year of the index's live performance was bookended by two sharp corrections: the first in late July/early

August 2024, followed by another in late March/early April 2025. Most of the performance contribution has come from Technology and Industrials companies, with standout performance from Hong Kong-listed Chinese smartphone/electric vehicle maker Xiaomi (+228%) and Tencent (+32%), with Germany's SAP (+58%) and Taiwan Semiconductor Manufacturing (+23%) also strong; the biggest drags have been South Korea's Samsung (-21%) and Netherlands-based ASML (-22%).

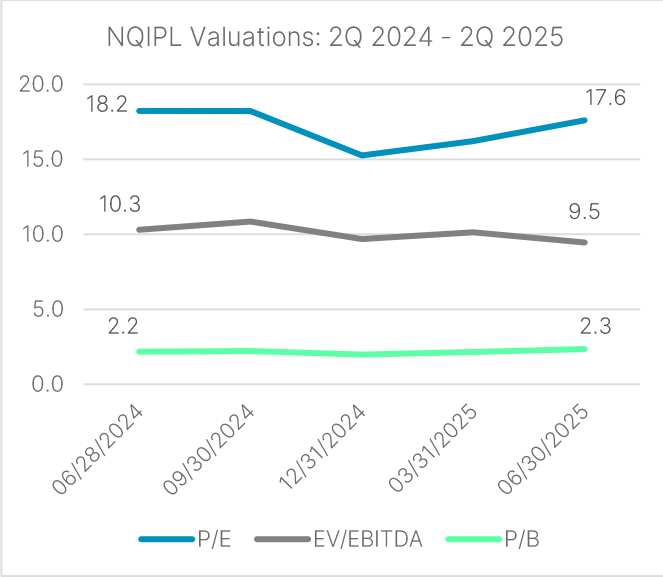
In the first half of 2025, NQIPL generated a price return of 15.8%, in-line with MSCI ACWI Ex-USA (+16.0%), marginally outperforming MSCI ACWI Ex-USA Growth (+14.9%) and marginally underperforming MSCI EAFE (+17.4%). The period was marked by the biggest outperformance of international vs. US equities since 1999, with the S&P 500 Index (SPX) up only 5.5% after nearly falling into a bear market with a ~19% drawdown from February 19 – April 8, 2025.

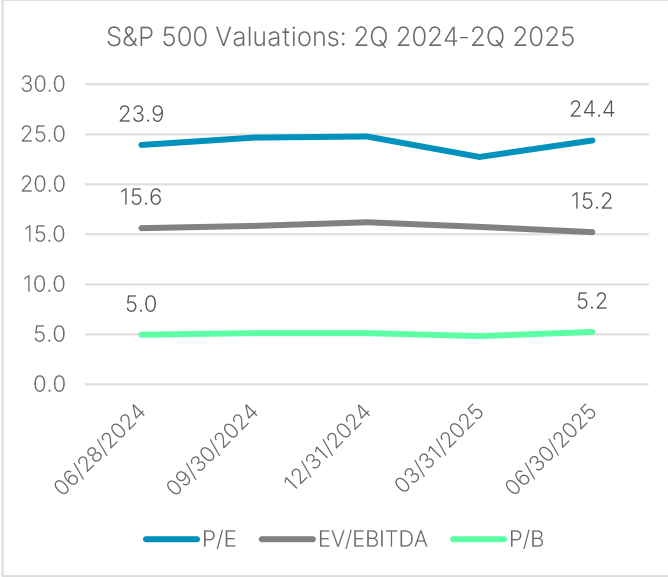


Source: Nasdaq, Bloomberg as of 6/30/2025.

Index Fundamental Analysis

As of June 30, 2025, NQIPL was valued at an index-weighted price-to-earnings ratio of only 17.6, 28% lower than the S&P 500; at an enterprise value-to-EBITDA ratio of 9.5, 38% lower; and a price-to-book ratio of 2.3, 55% lower. While it is a more broad-based index in terms of sector exposure, the S&P 500 currently allocates a very similar amount to Technology companies (~38% vs. NQIPL's ~36%); Consumer Discretionary is also very similar (~14.5% vs. ~14%), while Industrials (~12% vs. ~18%) and Healthcare (~9% vs. ~14%) are lower. The fact that an equity benchmark of many of the most innovative companies outside the US sports valuation discounts of approximately one-third to one-half vs. the S&P 500 (depending on the ratio used) speaks to the extended nature of US equity outperformance in the current regime, especially among large caps. It also suggests the possibility of extended outperformance of international vs. US equities in the coming years in order to further close the valuation gap. As investors position for this mean reversion trade, they may especially want to overweight the segments of the ex-US equity market that offer the greatest potential for fundamental growth.

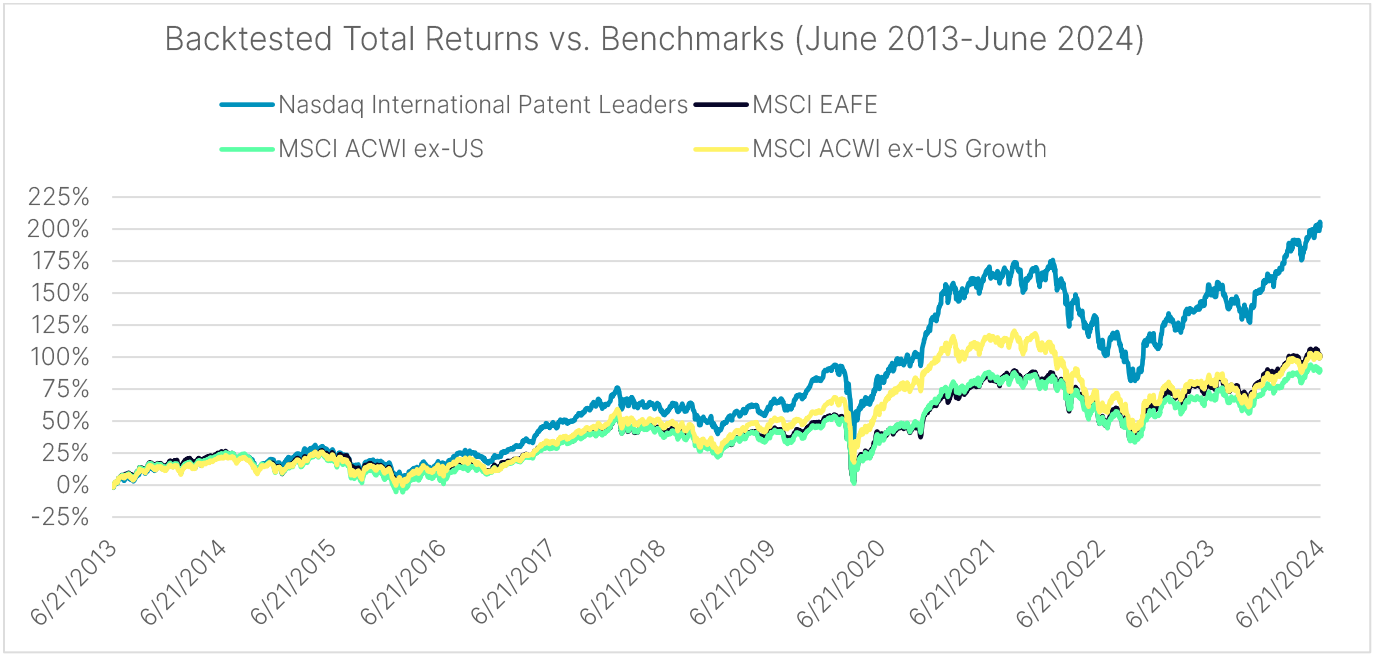




Source: Nasdaq, Bloomberg as of 6/30/2025.

Backtested Performance & Exposure Analysis

The simulated performance of the index, with a backtested period from June 21, 2013 - June 21, 2024, suggests meaningful outperformance potential with a total return of 202% – doubling the performance of leading international equity benchmarks such as the MSCI EAFE Index and MSCI ACWI Ex-USA Growth Index (100% total returns for each) and more than doubling the performance of the MSCI ACWI Ex-USA Index (89% total return). In particular, it is interesting to observe the failure of MSCI ACWI ex-USA Growth (utilizing a very traditional approach to growth benchmark construction) to meaningfully outperform the broader MSCI ACWI ex-USA during an extended period wherein growth investors have generally outperformed others – suggesting an alternative approach to international growth benchmark construction is indeed warranted.

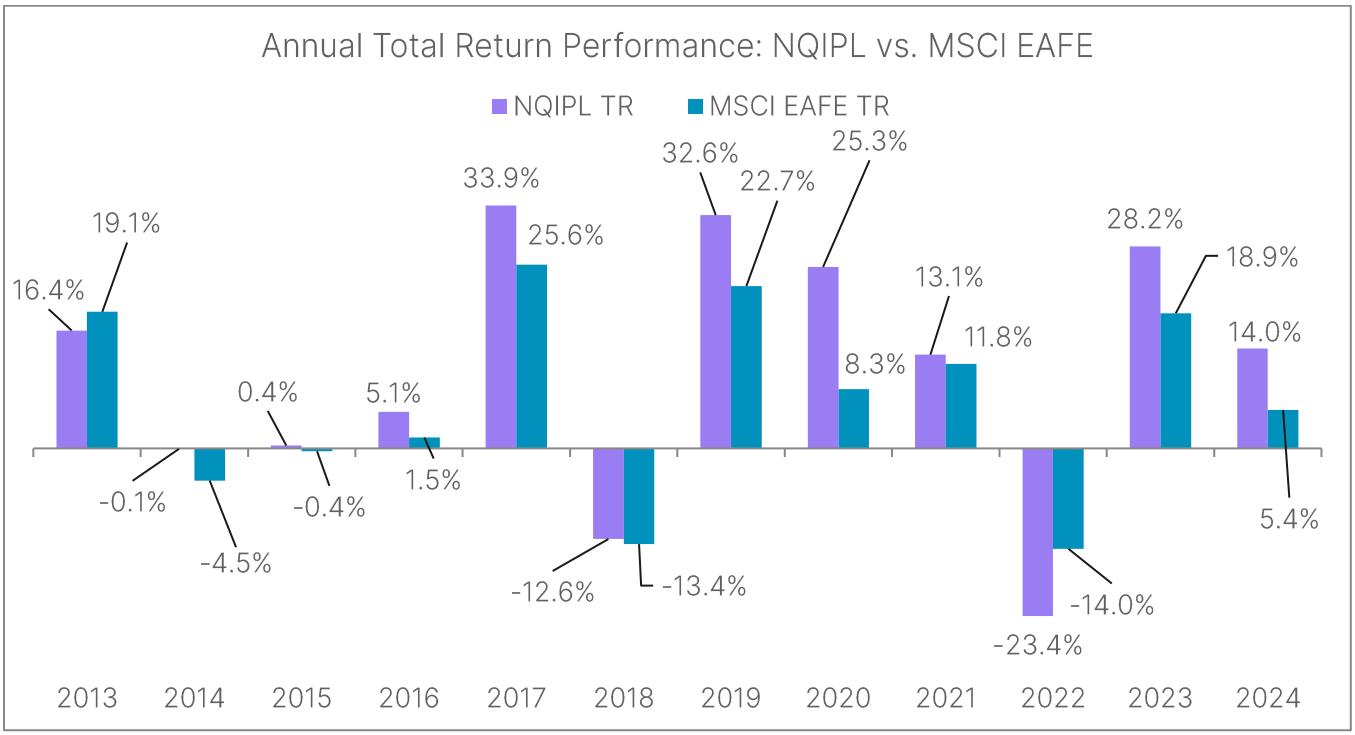


Source: Nasdaq, Bloomberg as of 12/31/2024.

On a year-by-year basis, NQIPL outperformed MSCI EAFE 10 of the 12 calendar years in the backtest period, similar to the win rate of the Nasdaq-100 vs. the S&P 500 over this timeframe. With slightly lower volatility (~20 bps annualized improvement vs. MSCI EAFE), NQIPL seems capable of producing a superior risk-adjusted return, with a backtested Sharpe ratio of 0.67 vs. 0.38 for MSCI EAFE (based on annualized returns of 10.6% vs. 6.5% and annualized volatility of 14.2% vs. 14.4%, respectively). Its correlation w/ MSCI EAFE measured 0.90 during this time period, with an annualized tracking error of 21.7%.

Turnover during this period remained quite low, similar to the Nasdaq-100. On average, ~4 securities were added/deleted at each semiannual reconstitution. Average composite turnover was 8.0%.

Among countries, Japan and Switerland exposure trended generally lower, offset by increasing exposure to Taiwan, South Korea, Netherlands, and China. Across sectors, Tech exposure nearly quadrupled with Healthcare exposure cut in half. Most other sector exposures stayed fairly stable or shrank marginally. (See Appendix A for more detailed data on the evolution of country and sector exposures over the length of the backtest.)



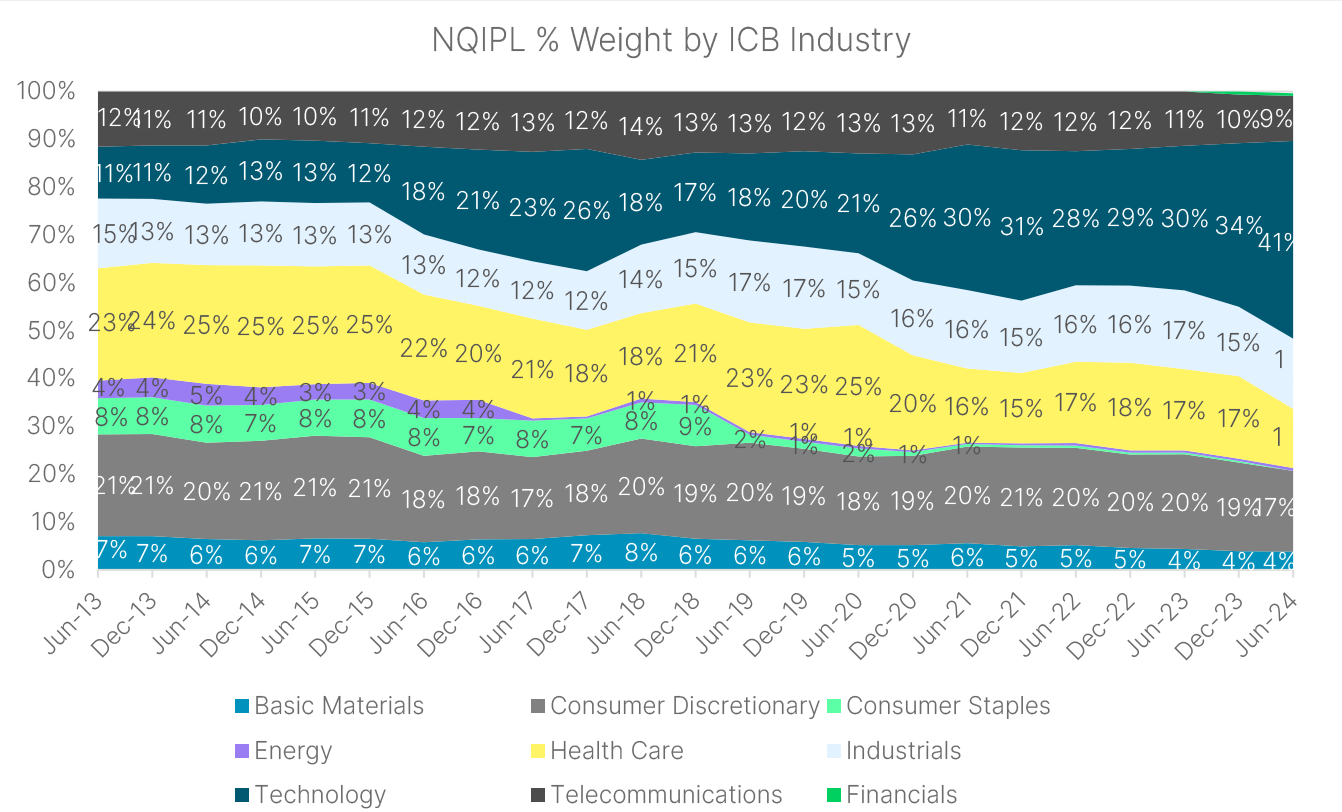
Source: Nasdaq, Bloomberg as of 12/31/2024.

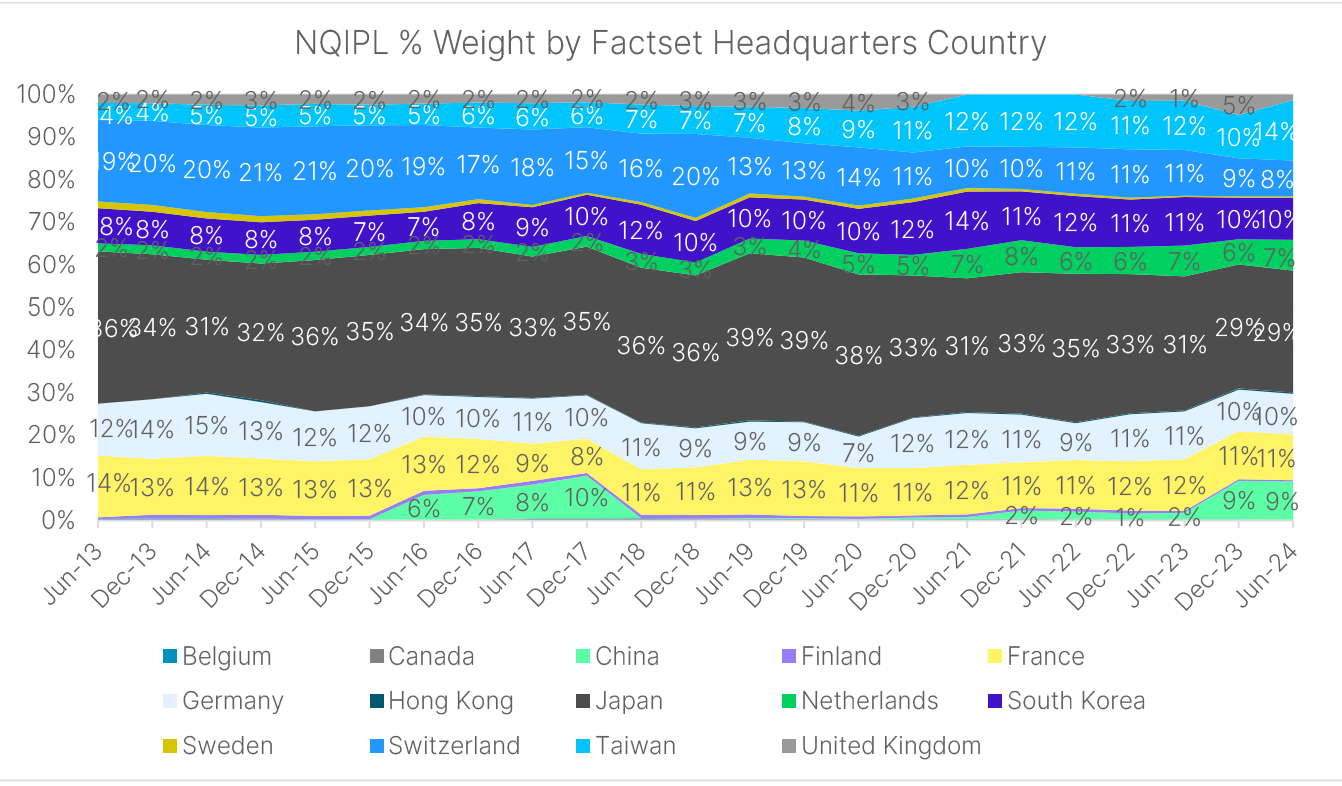
Conclusion

Investors have long considered the Nasdaq-100 as a useful benchmark for tracking many of the modern economy's leading innovators, offering a diversified and differentiated alternative to formulaic large cap growth equity indexes. After a historic run of outperformance that was broken in 1H 2025, US equities may be in the process of ceding their leadership to international stocks. For investors looking to tailor their international equity exposure to reflect many of the underlying sector, thematic, and fundamental dynamics of the Nasdaq-100, the Nasdaq International Patent Leaders Index represents a compelling new benchmark offering.

Sources: Nasdaq Global Indexes, IPR Strategies, FactSet, Bloomberg.

Appendix A: Backtested Index Exposures by Sector & Country





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