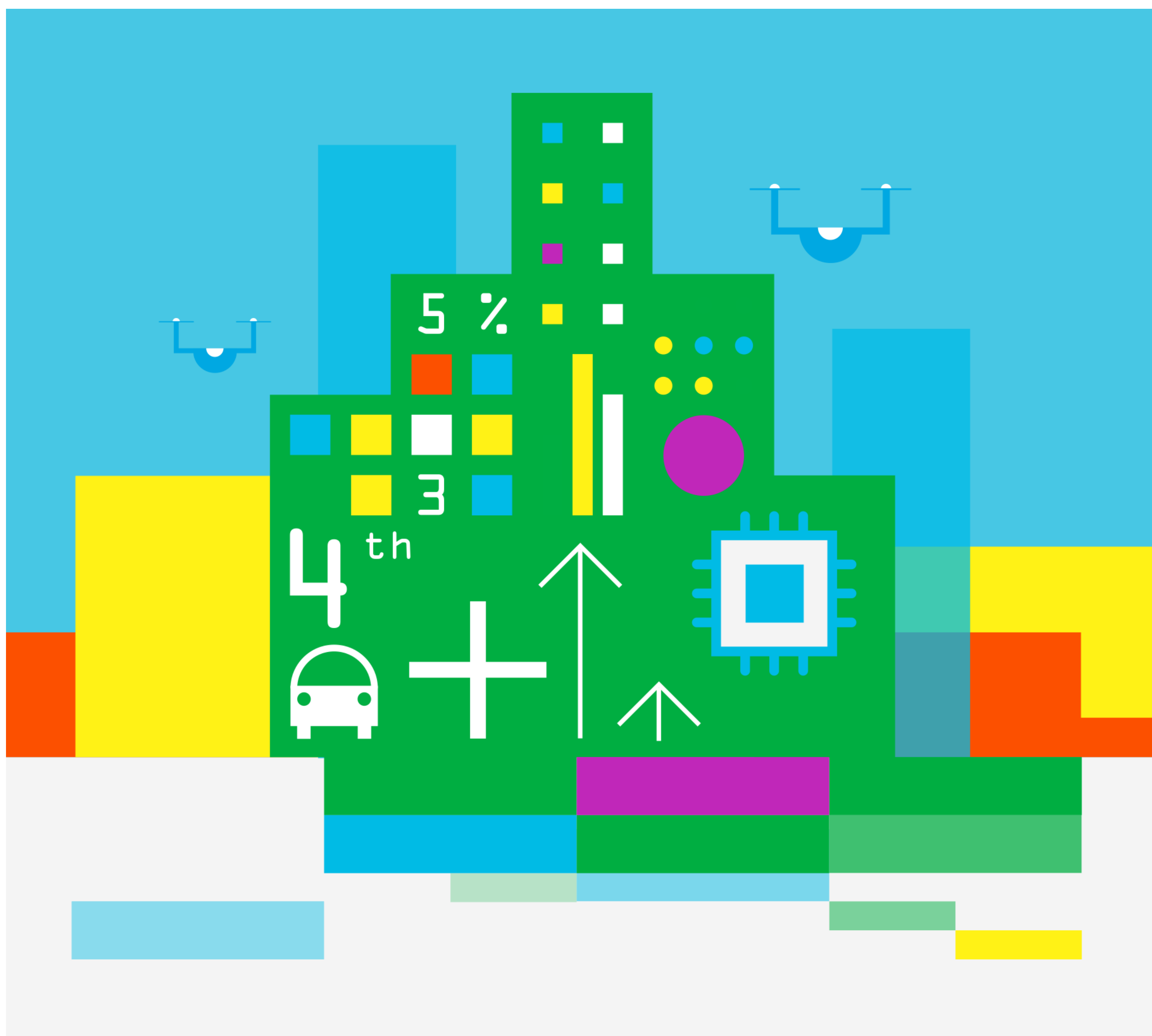
STATE STREET GLOBAL ADVISORS SPDR®

A Case for Investing in Innovation



Powerful technological advances fuel economic growth by enabling economies to create more value with fewer inputs. That's been true since the invention of the steam engine during the first Industrial Revolution to the Fourth Industrial Revolution still unfolding now.

Today the speed and impact of technological breakthroughs are exponential and unprecedented. Easy access to super computing power; rapid developments in artificial intelligence; robotics and automation; hyperconnectivity between the physical and digital world; and biological innovations are the driving forces behind technological breakthroughs that continue to transform society.

And yet, many portfolios lack exposures to innovation. Therefore, the question for investors becomes how best to identify and capture the economic benefits of innovation.

Innovation Premium Delivers Capital Appreciation

For some investors, innovation stocks may seem too risky. And it's true that companies developing and leading technological innovation face greater risks — from the cost of completion and uncertain future cash flows to the risk of obsolescence.[1] But something compensates investors for taking on these risks: the Innovation Premium.

Empirical research shows companies that drive technological innovation deliver higher shareholder returns. Companies ranked in the top 20% for innovation had double the shareholder returns of their industry peers, according to research by Arthur D. Little, the world's first management consulting firm, which examined the shareholder returns of 338 Fortune 500 companies between 1987 and 1996.[2]

And strong research & development (R&D) activity, an important driver of innovation, correlates to significant positive stock returns that asset pricing models like Fama-French 5-factor and 3-factor models cannot explain.[3]

While the Innovation Premium may be attractive, it's important to understand why innovative companies tend to outperform. Some researchers argue that innovative companies are able to provide higher quality products and services and create a wide economic moat, leading to greater pricing power and higher profitability.

Other researchers consider outperformance through a behavioral finance lens. Certainly, uncertainties along the path from patents to final products, the velocity of disruption, new products' impacts on competition and industry structure, and long-deferred profits are all challenging for investors to analyze. And the difficulty in processing this less tangible information can cause markets to underreact to news about the prospects of firms' innovations, resulting in the mispricing of innovation stocks.[4]

Capture Early Stage Growth of Innovation Companies

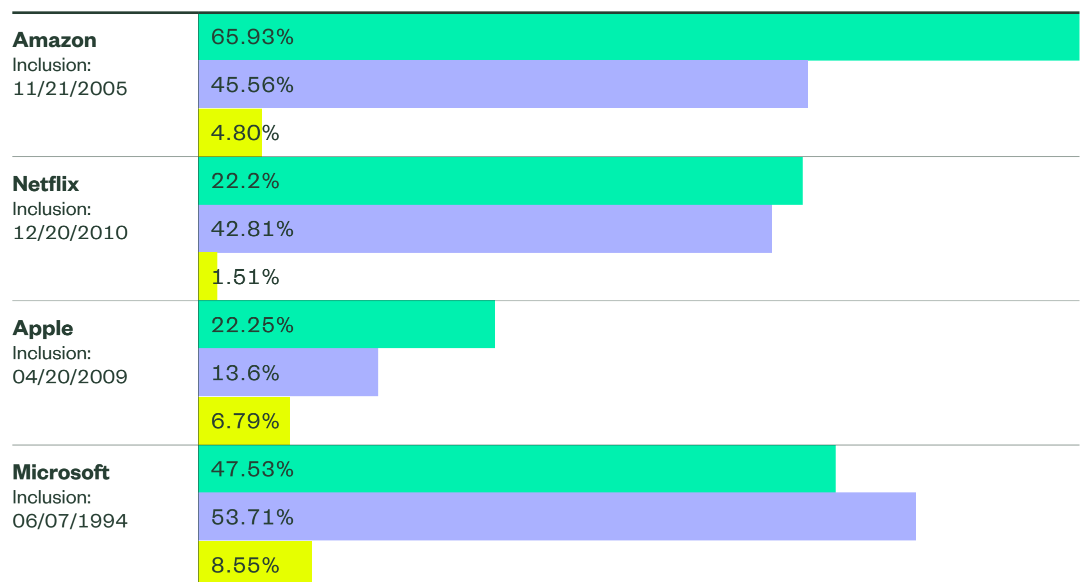
Taking advantage of mispriced innovative stocks requires identifying and investing in innovative companies in their early stages.

For example, some of the most-recognized innovative brands — Amazon, Netflix, Microsoft, and Apple Inc. — were included in the S&P 500 Index more than eight years after filing their initial public offering (IPO). By the time Apple Inc. was included, the iPhone had already been in market for two years and was the company's largest contributor to revenue growth. In fact, all of the aforementioned innovative companies experienced significant revenue growth and stock price appreciation and outperformed the broad market for many years before being included in the S&P 500 Index, as shown in figure 1.

Given the underrepresentation of innovators in the S&P 500 Index in their early days, most investors' portfolios likely missed out on significant capital appreciation during the initial stage of growth.

Figure 1

Innovation Leaders Delivered Strong Growth and Performance Before Joining the S&P 500 Index



Source: FactSet, S&P Dow Jones Indices, as of January 31, 2024. **Past performance is not a reliable indicator of future performance.** It is not possible to invest directly in an index.

Exponential Growth Creates Long-term Investment Opportunities

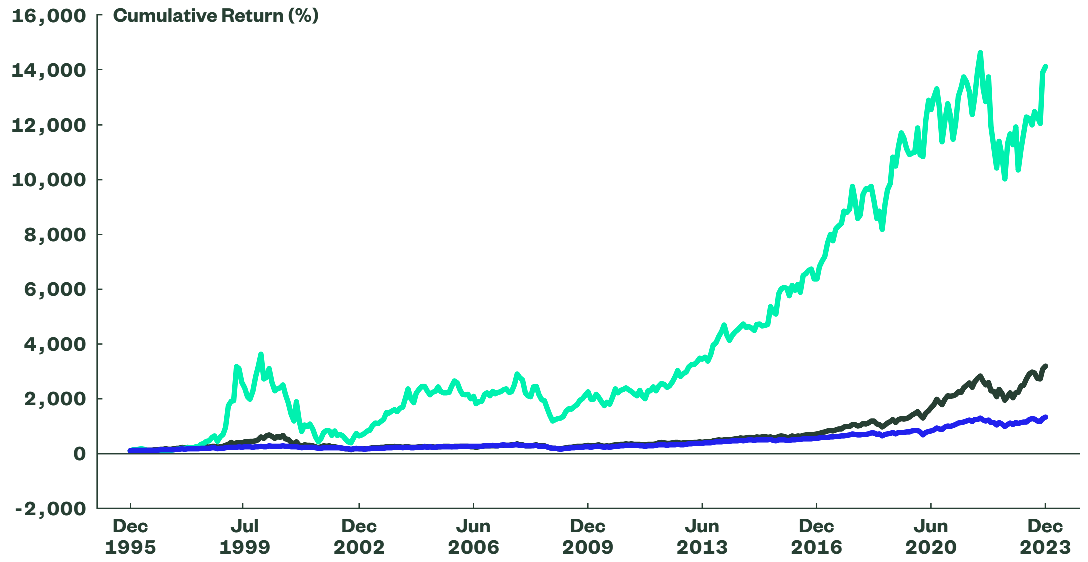
Since innovative companies derive a large percentage of their value from future inventions — and from future cash flows generated by the monetization of those inventions — uncertainty around new technology development, customer adoption, and market structure change can impact their valuations significantly. Changes to the risk-free rate and investors' risk sentiment also drive big valuation movements by impacting discount rates.

But because secular innovation trends can transcend monetary and market cycles, innovation stocks offer greater capital appreciation potential than the broad market over long-term investment horizons. In other words, innovation trends can supersede financial market boom and bust cycles and reward investors over the long term. A good example of this? The internet services and infrastructure industry.

In the eight years between 1995 and 2002, the Federal Reserve Bank conducted two rate-hiking cycles, increasing the policy rate from 3% to 6% between 1994 and 1995 and from 4.6% to 6.5% between 1999 and 2000. During the same period, internet services and infrastructure stocks saw seven of their largest yearly drawdowns ever. But none of those reversed the exponential increase in internet users and internet use cases that supported the industry's incredible growth, which ultimately drove its outperformance over the broad market and the broader Technology sector in the subsequent 20 years.

Figure 2

Secular Innovation Trends Can Outperform Over the Long Term



Source: FactSet, as of December 31, 2023. **Past performance is not a reliable indicator of future performance.** It is not possible to invest directly in an index.

Innovation Is Underrepresented in Today’s Portfolios

Due to various classification and index construction limitations and biases, innovation stocks are often underrepresented in investors’ portfolios today.

Most broad market exposures have a natural bias toward companies with larger market capitalizations and longer histories, because they track market-cap weighted benchmarks. This may skew portfolios toward incumbent firms that are more vulnerable to technology shocks. Incumbents, after all, have a competitive disadvantage when it comes to adopting new technology.[5]

NBER’s research on the 1970s US stock market shows the Information Technology Revolution favored younger and generally smaller firms and destroyed the value of incumbent firms — whose market value fell by more than 50% over a few years and never fully recovered.[6]

This suggests a large portion of investors’ core exposures may be subject to displacement risk created by major technological changes. Given the accelerating development of new technologies and their exponential impacts, the pace at which incumbents are replaced by new entrants may also increase and have even more significant implications for investors’ portfolios.

Innovative companies are also underrepresented in traditional growth style benchmarks, as shown in the chart below. One reason for this is that the most commonly used financial metrics for constructing growth/value indexes — including price-to-earnings, price-to-book, and historical sales growth — are often backward-looking or shortsighted and don’t reflect a company’s creativity or potential for future growth.

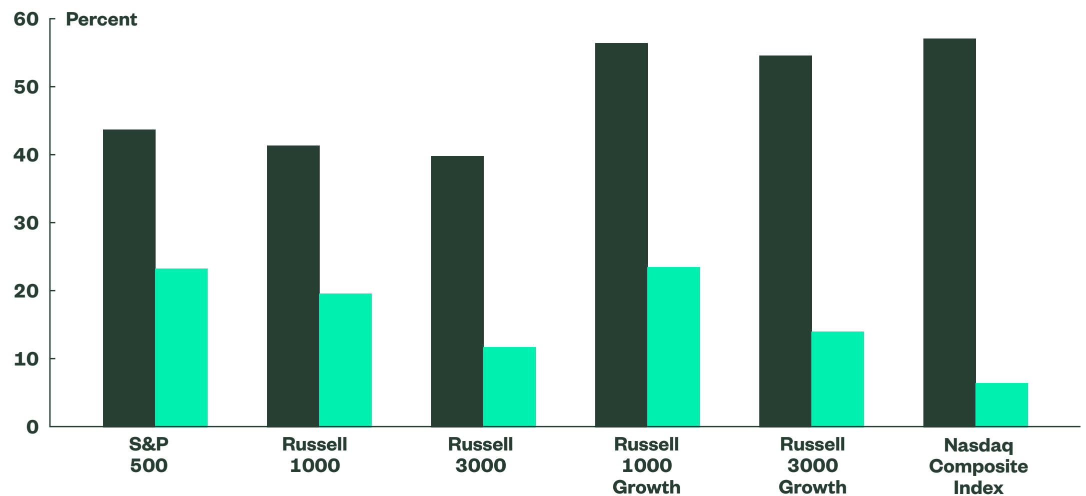
Specifically, innovative companies usually invest heavily in R&D, which may decrease their near-term/realized earnings. And since the start of Information Technology Revolution, while intellectual capital has become a critical resource to create competitive advantage, it isn’t sufficiently reflected in book value. Lastly, historical performance (sales growth) isn’t a reliable indicator of future performance.

In a fast-changing environment driven by disruptive technology and shifting corporate and consumer behaviors, what worked in the past may not deliver the same results in the future. All this makes the traditional style box simply insufficient for capturing innovation. Instead, we believe innovation exposures deserve a distinct allocation from traditional equity style exposures.

Some investors rely on revenue-defined sectors such as Technology and Communication Services to capture the benefit of technological advances. While these two sectors were the main beneficiaries of the Information Technology Revolution, technological advances today blur the boundaries between existing industries and new ones. The impacts cut across the economy, as new technologies transform digital, physical, corporate, and personal spheres. Consequently, traditional revenue-based sector classification schemes may fail to identify specific trends in technological transformation or a company's position within the new economy.

For example, companies driving the global clean energy transition with advanced energy generation, transmission, and storage technologies range from electrical component and equipment producers to chipmakers and electricity providers. They're categorized under the Industrials, Information Technology, and Utilities sectors. Investors focused only on the Information Technology sector won't capture the full benefits of this energy transition.

Figure 3
Innovative Companies Underrepresented



Source: FactSet, as of December 31, 2023. The universe of innovative companies is the constituents of the S&P Kensho New Economies Composite Index.

A New Way to Target and Invest in Innovation

Allocating to underrepresented innovation exposures in a portfolio's core adds diversification benefits that may enhance the total portfolio's growth potential over the long term. And since innovators carry high idiosyncratic risks, a diversified pool of innovative companies may help mitigate the total risk of the portfolio.

Because innovation exposures tend to have higher growth profiles and tilt toward small- and mid-cap companies, growth, small-cap, and mid-cap allocations are the prime places for adding innovation exposures. But, importantly, when analyzing investment options, traditional backward-looking financial data, created to reflect a manufacturing-oriented economy, won't help to identify the technological changes and innovators currently reshaping the economy.

The bottom line is, today's investors need forward-looking tools and adaptive approaches to understand technological innovation trends and to unearth the companies and emerging new industries driving the innovation.

The S&P Kensho New Economies Composite index is an example of such a novel systematic approach, designed to capture technological innovations across the new economy. It applies an adaptive classification framework based on five Axes of Innovation that capture the fundamental driving forces behind technological revolutions.[7]

Looking beyond traditional revenue, balance sheets, or traditional GICS classification, S&P Kensho's forward-looking approach leverages Artificial Intelligence in the form of a Natural Language Processing algorithm to scan regulatory filings for keywords associated with 25 areas of innovation form enterprise collaboration and 3D-printing to robotics and clean energy in its classification framework. The goal is simple, to identify the companies propelling technological transformation today.

Ready to capture the exponential growth of innovative firms reshaping our society? Check out the SPDR® S&P Kensho New Economy ETFs.

Endnotes

1 Richard P. Rumelt, "Theory, Strategy and Entrepreneurship," 1987.

2 Ronald S. Jonash and Tom Sommerlatte, "The Innovation Premium: Capturing the Value of Creativity," 1999.

3 Alessandro Grandi, Bronwyn H. Hall, Raffaele Oriani, "R&D and Financial Investors," UC Berkeley, 2009.

4 David Hirshleifer, Po-Hsuan Hsu, Dongmei Li, "Innovative Efficiency and Stock Returns," Journal of Financial Economics, Vol. 107, 2013.

5 Holmes and Schitz (1990), Ueda (1997) and Takii (1999), "The Information Technology Revolution and the Stock Market: Evidence."

6 Holmes and Schitz (1990), Ueda (1997) and Takii (1999), "The Information Technology Revolution and the Stock Market: Evidence."

7 Dane Rook, Adam Salvatori, John van Moyland, and Paul Rosa, "Innovation Patterns: Upgrading Sectoral Classification for the Fourth Industrial Revolution," March 2017.

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Our clients are the world's governments, institutions and financial advisors. To help them achieve their financial goals we live our guiding principles each and every day:

- Start with rigor
- Build from breadth
- Invest as stewards
- Invent the future

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* Pensions & Investments Research Center, as of December 31, 2022.
† This figure is presented as of December 31, 2023 and includes approximately $64.44 billion USD of assets with respect to SPDR products for which State Street Global Advisors Funds Distributors, LLC (SSGA FD) acts solely as the marketing agent. SSGA FD and State Street Global Advisors are affiliated.

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Glossary

Fama French Three Factor Model An asset pricing model named after economists Eugene Fama and Kenneth French that expands on the capital asset pricing model (CAPM) by adding size and value factors to CAPM's market risk, or beta, factor. The Fama-French model is based on data showing that value and small-cap stocks outperform markets regularly. In the fund industry, Fama and French's insights fueled the rise of style boxes and, more recently, the rise of 'smart beta' indices and ETFs.

National Bureau of Economic Research (NBER) A private, non-profit, non-partisan group that conducts economic research and disseminates findings among academics, public policy makers, and business professionals. Key focus areas include developing new statistical measurements, estimating quantitative models of economic behavior, and analyzing effects of public policies. NBER data surrounding the occurrence and duration of recessions are frequently cited across the financial services industry. NBER is based in Cambridge, Massachusetts.

S&P 500® Index A popular benchmark for U.S. large-cap equities that includes 500 companies from leading industries and captures approximately 80% coverage of available market capitalization.

State Street Global Advisors
One Iron Street, Boston MA 02210
T: +1 866 787 2257

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May Lose Value