

INVESTING IN INNOVATIVE COMPANIES

Investors readily recognise some innovative companies. Roche is widely associated with scientific research, precision medicine and diagnostics. Schneider Electric is closely linked to electrification, automation and energy management. Assa Abloy has transformed a traditional security business into a digital access ecosystem. Baker Hughes, historically viewed as an oilfield-services company, increasingly applies advanced engineering to energy-transition technologies and industrial systems.

These companies have little in common from a sector perspective. Yet each has created value through an ability to innovate more effectively than competitors. That is the commercial intuition behind innovation investing.

The investment challenge is that innovation is difficult to measure. Traditional indicators such as R&D spending or patent counts capture part of the picture, but they often miss harder to measure innovation embedded in software adoption, operating processes, organisational capability or business-model change. As a result, markets may underestimate or even miss the future profitability, durability and cash-flow potential of innovative firms.

This report examines how investors can identify innovative companies more systematically. We distinguish innovation-driven growth from conventional Growth styles, explain why traditional metrics are incomplete, and present a multi-dimensional Innovation signal that combines R&D, patents, digital transformation and innovation culture. We then test whether this signal forecasts future profitability, whether it is different from simply another expensive Growth exposure, and how it behaves across different market regimes.

The central argument is simple: innovation is not merely a marketing label. With the right tools, it can be a measurable firm characteristic. When measured correctly and implemented carefully with appropriate risk controls, it can provide a differentiated source of long-term equity alpha.

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What Does an Innovative Company Look Like?

Innovation takes many forms. Some firms innovate through formal research and intellectual property. Others innovate through digital transformation, operational excellence, business-model change or organisational capability.

EXHIBIT 1

Company	Innovation Focus
Roche	Precision medicine and diagnostics
Schneider Electric	Electrification and industrial automation
Assa Abloy	Digital access and security ecosystems
Baker Hughes	Energy-transition engineering and industrial technology

Source: NTAM Company Examples.

These examples highlight a broader challenge for investors¹. Innovation often creates future value long before it becomes fully visible in earnings, valuation metrics or even conventional growth measures. The question is therefore not whether innovation matters, but how to identify it systematically and at scale.

That distinction matters for investors. A narrow view of innovation tends to identify the companies where innovation is already visible. A broader framework is needed to identify companies where innovation is economically meaningful but not yet fully recognised in expectations, valuation or market classification.

Why Innovation is Often Mispriced

Traditional innovation metrics such as R&D expenditure and patents capture important dimensions of innovation, but only part of the overall picture.

Many important forms of innovation are not fully captured by R&D or patents. Companies can innovate by digitising operations, improving industrial processes, embedding software into products, changing distribution models, building data advantages or developing cultures that support experimentation and continuous improvement.

This creates both a measurement problem and an investment challenge. Accounting standards generally expense many intangible investments rather than capitalising them. As a result, investments in software, data, brand, organisational knowledge and R&D can depress current earnings even when they increase future earnings power. At the same time, traditional Growth measures often focus on realised or expected sales and earnings growth, which may already be recognised by the market. Further, companies have some discretion in whether innovation-related expenditures are recorded as R&D or embedded within SG&A.

¹The companies shown are illustrative examples rather than an exhaustive list. Other companies that exhibit innovation through different dimensions of our framework include Qualcomm (wireless connectivity and semiconductor innovation), Iberdrola (energy transition and grid modernisation), and Hitachi (industrial digitalisation), among others.

Several features of innovation make it difficult to price correctly. Its benefits are uncertain, often realised over long horizons, frequently embedded in intangible assets, and only partially visible in financial statements. As a result, investors may systematically underreact to innovation-related information. Moreover, innovation often takes years to translate into earnings, making its long-term economic value difficult to assess.

For investors, the implication is straightforward: if markets systematically underestimate innovation, they may also underestimate future profitability, competitive advantage and long-term shareholder value.

Growth is Expensive And Regime-Sensitive and Inadequate to Capture Innovation

Growth can be defined in a variety of ways, typically involving combinations of earnings and sales growth, both historical and forward-looking. Growth stocks are widely viewed as expensive, and several explanations support this view. Studies (1, 2) document the long-run outperformance of Value relative to Growth, reinforcing the view that Growth stocks tend to trade at high prices relative to underlying fundamentals.

Growth stocks are also sensitive to macroeconomic conditions. This sensitivity reflects the long-duration nature of many Growth stocks. A larger share of their valuation is often derived from cash flows expected far into the future, making valuations particularly sensitive to discount-rate changes and market regimes. Growth has therefore historically underperformed materially during Value-dominated regimes.

The key question is whether innovation is merely another version of Growth, or whether it captures a more differentiated source of future value creation.

Exhibit 2 illustrates that innovative companies are not necessarily identified by traditional Growth metrics. Several of our examples score only around the median, or even in the bottom quintile, on the Barra Growth measure.

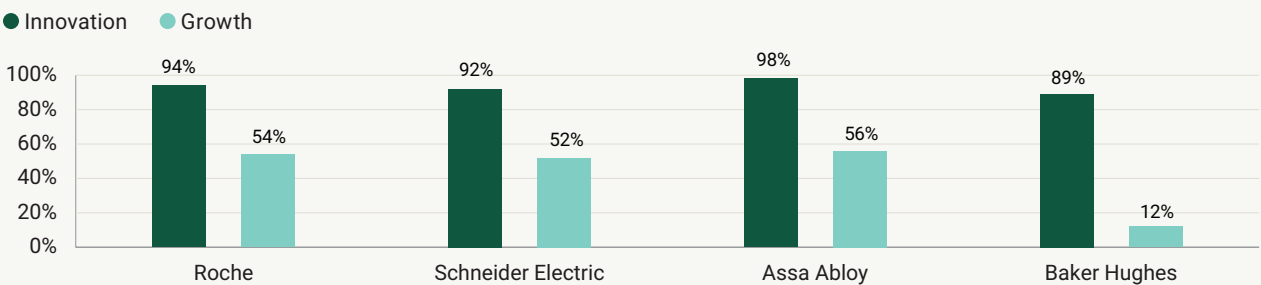
MARKET CONTEXT

As of 31 Dec 2025, the MSCI World Growth Index trades on 35x earnings and 8.5x book equity, versus 24x earnings and 4x book equity for the standard MSCI World Index.

As of 31 Dec 2025, the correlation between US 10-year yield changes and excess returns of the MSCI World Growth Index vs MSCI World Index is -14% over the last 30 years, -19% over the last 20 years, and -34% over the last 10 years. All correlations are statistically significant at the 1% level.

EXHIBIT 2 Percentiled Innovation and Growth Scores

Innovation scores and Barra GEMLT Growth scores for selected companies



Innovation scores and Barra GEMLT Growth scores for selected companies as of 31 July 2021. Scores are expressed as percentiles within the MSCI World Index universe.

Building An Innovation Signal

The theoretical link between innovation and future stock performance is well established in academic research and investment practice. The investment challenge is not identifying innovation conceptually; it is measuring innovation systematically and at scale.

Different data sources capture different dimensions of innovation. R&D reflects investment in future capabilities (3, 4). Patents capture technological output (5). Digital transformation indicators identify technology adoption (6). Organisational culture reflects a firm's ability to convert innovation into long-term competitive advantage (7).

We therefore construct an Innovation signal from four complementary, forward-looking components:

- R&D
- Patents
- Digital innovation
- Innovation culture

These components are designed to identify under-appreciated information related to future profitability and the durability of cash flows. They are also intended to be weakly related to traditional equity style factors such as Value, Growth, Momentum and Low Volatility.

R&D – DRIVEN INNOVATION

R&D spending is the traditional starting point for measuring innovation. It captures a company's investment in intangible, knowledge-based assets that may support future products, processes and competitive advantages.

However, reported R&D expenditure is not a complete measure of innovation. Some companies innovate through software adoption, process improvements, customer experience, supply-chain design or business-model evolution. These activities may be only partially reflected in reported R&D numbers.

Under prevailing accounting standards, R&D expenditures are generally expensed rather than capitalised. This creates several distortions:

- Invested capital may be understated.
- Current earnings may be depressed.
- Future earnings may rise once the benefits of R&D investment materialise.
- Reported profitability may become more sensitive to accounting treatment and investment timing.
- Firms may face incentives to underinvest in long-term innovation.

Because R&D assets are intangible, uncertain, and non-tradable, markets often struggle to value them accurately. This component therefore captures firms that are building durable intangible capital that may be mispriced by the market.

PATENT-BASED INNOVATION

Patents complement R&D by measuring innovation output rather than innovation input. The value of patents is particularly evident when technological leadership

INVESTMENT THESIS

The objective is not to find companies that look like conventional Growth stocks.

The objective is to identify firms where innovation is economically meaningful, systematically measurable and insufficiently reflected in market prices. Put differently, Innovation seeks to capture the component of future growth that markets have not yet fully recognised.

translates into durable competitive advantages. Extensive patent portfolios can reflect accumulated research, technological relevance and barriers to entry.

Patent data and citation networks provide a direct measure of a firm's technological output and the economic relevance of its innovations. Patent quality, originality, breadth and citation reach can help distinguish genuinely valuable innovation from routine patent activity.

Patenting activity is most visible in Information Technology and Health Care, but economically meaningful patent-based innovation can also appear in traditionally under-appreciated sectors such as Industrials and Materials. Markets may underreact to patent-related information because the economic implications of new technologies are difficult to assess and may take years to materialise.

To isolate genuine internal innovation, we focus exclusively on patents developed in-house. This helps capture a firm's own innovation capability rather than innovation acquired through M&A. The resulting component measures both the scale and quality of a company's technological output.

DIGITAL INNOVATION

Some firms derive their advantage not from breakthrough inventions but from the application of digital technologies throughout their operations. Digital adoption can reshape business processes, improve efficiency, enhance customer engagement, create data advantages and enable scalable growth.

Traditional financial statements often do not capture this dimension well. Investment in software, data infrastructure, automation, cloud migration and analytics capability may be spread across expense categories and may not appear as a distinct innovation asset.

To capture digital innovation, we analyse corporate disclosures using natural-language processing. We construct a point-in-time, periodically updated dictionary of digital innovation themes that reflects the technologies relevant in each period. Using this evolving dictionary, we analyse company filings across the investable universe to derive a digital innovation component.

This approach allows the signal to adapt as the language of innovation changes. What counted as digital leadership twenty years ago is different from what counts today. A point-in-time textual approach helps avoid applying today's terminology mechanically to the past.

CORPORATE INNOVATION CULTURE

Innovation depends not only on financial investment or technical output, but also on organisational capability. Firms that encourage experimentation, grant autonomy, support continuous improvement and adapt quickly to changing conditions may be better positioned to sustain innovation over time.

Corporate innovation culture is a critical intangible asset that is largely invisible in traditional financial statements. We therefore include innovation culture as the fourth dimension of the framework. This component uses natural-language processing applied to employee reviews from a global employer-review platform.

For each company, we assess the extent to which employee feedback reflects an innovative rather than stagnant organisational environment.

To mitigate selection and sentiment biases inherent in employee-review data, scores are adjusted for firm size, industry effects and review volume. The resulting score provides a systematic, forward-looking measure of an otherwise difficult-to-observe organisational asset.

SEPARATING INNOVATION FROM GROWTH

A common criticism of innovation investing is that it can become a disguised bet on technology stocks, U.S. equities or highly valued growth companies. Unless these exposures are carefully controlled, investors may mistake sector or market effects for genuine innovation.

We therefore explicitly control for these exposures to ensure that measured returns reflect innovation rather than sector, regional or style-factor effects.

We address these risks by explicitly neutralising the combined signal for:

- Sector concentration, including Technology and Health Care dominance.
- Regional effects, including the outsized role of the United States in certain innovation domains.
- Market sensitivity, as innovative firms may exhibit higher volatility.
- Market capitalization, distinguishing mega-cap platforms from smaller innovators.

After these adjustments, the resulting Innovation signal has materially reduced exposure to broad macroeconomic risk factors relative to traditional Growth strategies. The next question is whether the signal contains economically meaningful information: does it identify companies that subsequently become more profitable and generate attractive investment outcomes?

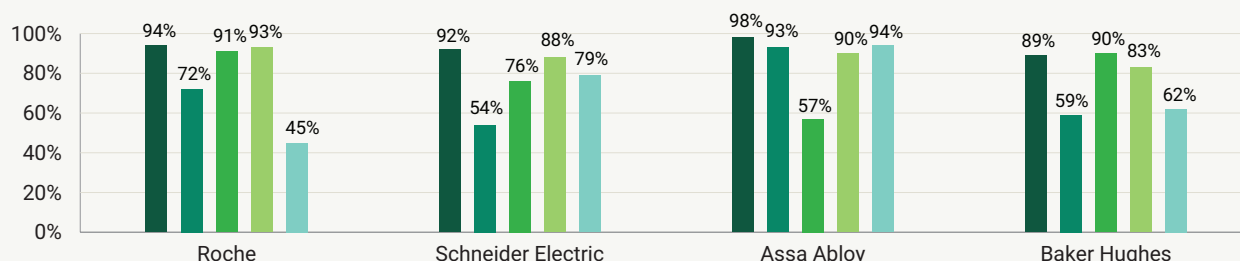
Exhibit 3 highlights that innovative companies can arrive at high overall Innovation scores through different combinations of R&D, patents, digital innovation and innovation culture.

EXHIBIT 3

Percentiled Innovation and Components Scores

Composite Innovation scores

● Innovation ● R&D ● Patents ● Digital Innovation ● Innovation Culture



Composite Innovation scores and the four underlying innovation dimensions for selected companies as of 31 July 2021. Scores are expressed as percentiles within the MSCI World Index universe.

Performance of the Innovation Signal

INNOVATION PREDICTS FUTURE PROFITABILITY

We find that firms identified by the Innovation signal subsequently experience stronger profitability growth. Exhibit 4 presents a multivariate panel regression of future profitability growth on both Innovation and a traditional Growth measure. The results show that Innovation - not Growth - is the primary driver of future profitability growth.

EXHIBIT 4

Regression Analysis	Beta	T-stat
Innovation	0.0048	17.3
Growth	-0.0058	-16.3

Profitability growth is defined as the percentage change of annualised return on invested capital over three fiscal years. These growth numbers are shifted by 36 months so that they represent future growth rates and are subsequently ranked within the universe. Control variables are regions, sectors and time fixed effects. Period: Jan 1996 – Dec 2025, universe: MSCI World IM Index. Past performance does not predict future performance.

This result goes to the heart of the investment thesis. If innovative companies subsequently become more profitable, innovation is not merely a descriptive characteristic. It contains economically meaningful information about future value creation.

IS INNOVATION EXPENSIVE?

While Growth typically reflects expansion in sales and earnings, Innovation captures advances in technology, processes, products, and business models. These drivers are often poorly measured by traditional accounting frameworks, which tend to understate investments in intangible capital such as R&D, software, data, and brand equity.

As a result, innovative firms may be undervalued relative to their true long-term cash-flow potential. This raises an important question: are innovative companies nevertheless “expensive”?

Encouragingly, the answer is no. Exhibit 5 shows the average Value exposure of portfolios constructed on Growth and Innovation. Growth exhibits a negative Value exposure, whereas Innovation is approximately Value-neutral on average, especially relative to conventional Growth portfolios.

EXHIBIT 5

Value Exposure	Z-score
Innovation	-0.04
Growth	-0.72

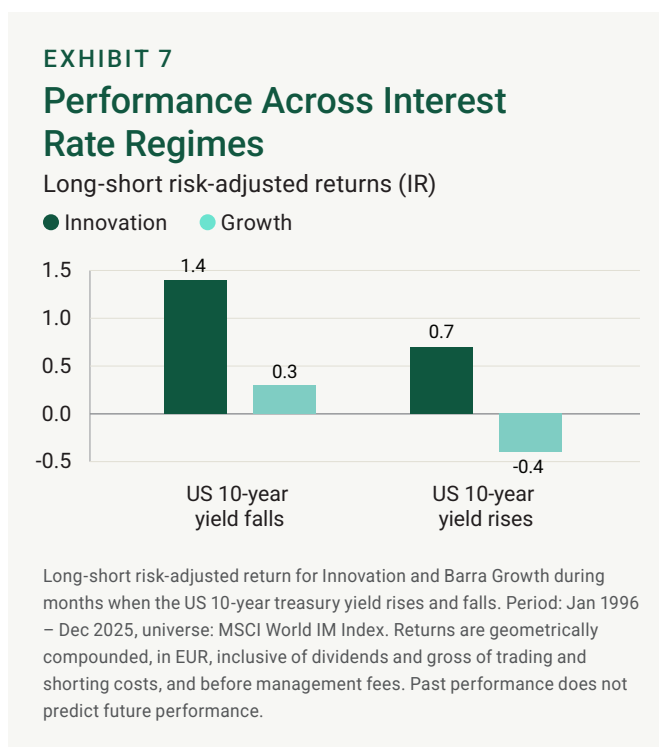
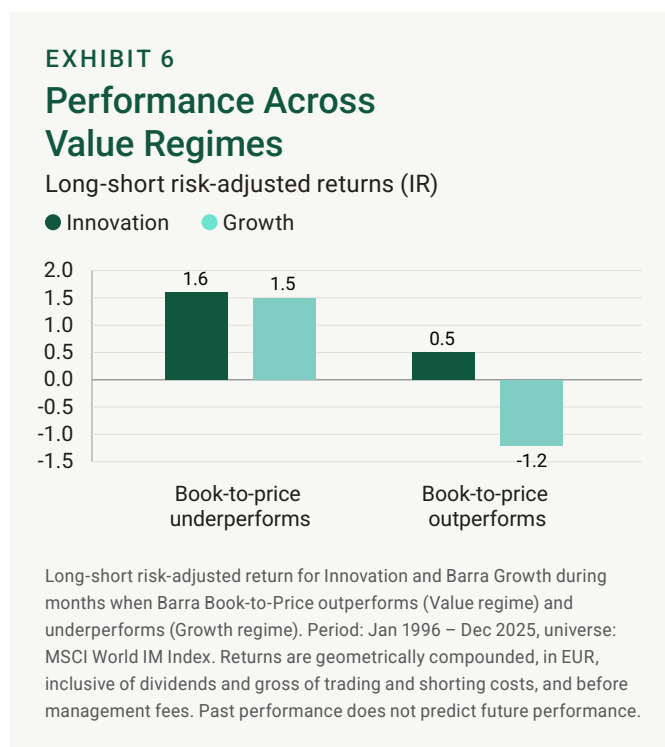
Value is defined as an equal weighted z-scored combination of Barra Book to Price, Barra Earnings Yield and Barra Dividend Yield. Growth is a long-short portfolio of Barra Growth and Innovation is a long-short portfolio of an equally weighted composite of the four Innovation drivers described above. Exposure is calculated as the sum-product of the long-short portfolio weights and the combined value score. This makes the exposures directly comparable. Period: Jan 1996 – Dec 2025, universe: MSCI World IM Index. Past performance does not predict future performance.

REGIME BEHAVIOUR

Some degree of regime dependence is to be expected. Innovative companies are likely to perform well during easing cycles and risk-on environments, and may face headwinds when interest rates rise sharply or liquidity tightens. The key question is whether Innovation merely outperforms less in such environments, or whether it actually underperforms.

To test this, we divide the historical sample into months in which Value outperforms and months in which Value underperforms. Within each subsample, we evaluate the information ratio (IR²) of both Growth and Innovation strategies.

As shown in Exhibit 6, Innovation is considerably more resilient than Growth during Value regimes. It demonstrates far less performance degradation when market leadership shifts away from Growth stocks.



We repeat the analysis using an alternative regime definition, distinguishing between months in which the U.S. 10-year Treasury yield rises and months in which it falls. The results are presented in Exhibit 7. Once again, Innovation is more resilient than traditional Growth.

The pattern is consistent with the broader thesis. Traditional Growth strategies often have an asymmetric return profile: they perform well when Growth leads and interest rates fall, but struggle in Value-led and rising-yield environments. Innovation appears less dependent on any single macroeconomic regime.

² Information Ratio (IR) is a measure of risk-adjusted performance and defined here as the geometric mean long-short return divided by the standard deviation of long-short returns.

HISTORICAL PERFORMANCE OF THE INNOVATION SIGNAL

In a historical backtest using point-in-time data and realistic implementation assumptions³, the Innovation signal delivers strong risk-adjusted long-short performance. From January 1995 to December 2025, the information ratio (IR) is 1.0, and it remains 1.0 over the past ten years.

After controlling for all sources of risk captured by the Barra GEMLT factor risk model, the Innovation signal continues to generate economically meaningful residual returns. The resulting long-short IR is 0.8 over the full sample period and rises to 1.0 over the last decade.

This persistent residual performance highlights the distinctive nature of Innovation. It is not fully captured by traditional equity style factors embedded in standard risk models.

INVESTMENT IMPLICATIONS

The results suggest that Innovation is meaningfully different from conventional Growth.

- First, the signal identifies companies with stronger subsequent profitability growth. This supports the view that Innovation contains forward-looking information about future economic performance.
- Second, Innovation is not simply an expensive Growth exposure. Its Value exposure is close to neutral, whereas conventional Growth has a materially negative Value exposure.
- Third, Innovation is more resilient across regimes that have historically challenged Growth strategies, including Value-led markets and rising-yield environments.
- Fourth, the signal retains economically meaningful residual performance after controlling for standard risk-model factors. This suggests that Innovation captures information not fully represented by conventional style factors.

For investors, the implication is that Innovation can be treated as a systematic investment opportunity rather than a thematic label. The opportunity is not to buy the most obvious growth companies. It is to identify firms whose future value creation is not yet fully recognised by the market.

Conclusion

Innovation is a measurable and investable characteristic, not just a marketing label. It captures advances in technology, processes, products, business models and organisational capability that can strengthen future competitive advantages and support long-term profitability.

Traditional Growth strategies often capture companies already recognised for expanding sales and earnings. They can be expensive and macro-sensitive. A broader Innovation framework seeks to isolate the component of future growth that is tied to genuine value creation rather than simple extrapolation.

³ Backtest assumptions: results are based on constituents of the MSCI World Investable Market Index using point-in-time data, square root market-capitalisation weights, geometrically compounded returns in EUR, gross of trading and shorting costs, and before management fees.

By combining R&D, patents, digital transformation and innovation culture, and by controlling for sector, regional, size and market-risk exposures, investors can access a more diversified and differentiated source of innovation-related alpha.

The empirical evidence suggests that innovation is not merely associated with future growth; it helps identify firms that subsequently become more profitable while avoiding many of the valuation and regime risks typically associated with Growth investing.

For investors, this distinction matters. Innovation should be viewed not as a thematic allocation, but as a systematic source of future value creation. For long-term investors, the opportunity lies in identifying innovative firms before their future profitability becomes fully recognised by the market and reflected in prices.

REFERENCES

1. Fama, E. F., & French, K. R. (1998). Value versus growth: The international evidence. *Journal of Finance*, 53(6), 1975–1999.
2. Chan, L. K. C., & Lakonishok, J. (2004). Value and growth investing: Review and update. *Financial Analysts Journal*, 60(1), 71–86.
3. Chan, L. K. C., Lakonishok, J., & Sougiannis, T. (2001). The stock market valuation of research and development expenditures. *Journal of Finance*, 56(6), 2431–2456.
4. Eberhart, A. C., Maxwell, W. F., & Siddique, A. R. (2004). An examination of long-term abnormal stock returns and operating performance following R&D increases. *Journal of Finance*, 59(2), 623–650.
5. Hirshleifer, D., Hsu, P.-H., & Li, D. (2018). Innovative originality, profitability, and stock returns. *Review of Financial Studies*, 31(7), 2553–2605.
6. Drechsler, K., Müller, S., & Wagner, H.-T. (2025). The “digital” premium: Why does digitalization drive stock returns? *Journal of Economic Dynamics and Control*, 181, Article 105217.
7. Li, K., Mai, F., Shen, R., & Yan, X. (2021). Measuring corporate culture using machine learning. *Review of Financial Studies*, 34(7), 3265–3315.

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