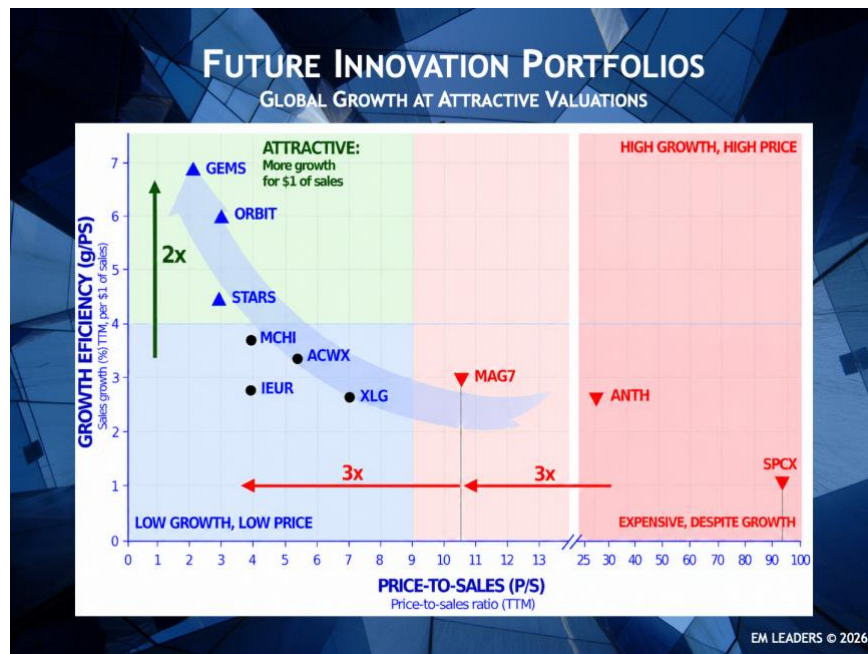




THIRD INNOVATION INVESTMENT CYCLE: WIDER - DEEPER - MORE SELECTIVE

U.S. innovation cycles have rewarded investors handsomely: first in venture capital, then across the Magnificent Seven. Where might the next wave emerge beyond today's platforms? Can Asian suppliers convert choke-point positions into durable pricing power? Can Chinese firms compress the AI catch-up cycle as they did in EVs? Can Europe turn its industrial capabilities into investable innovation? Can emerging markets use home markets to build defensible innovation niches?

For more than a decade, EM Leaders has worked with leading local managers across 20 markets, building an institutional platform and unique local research networks. We have extended that research architecture to 719 listed innovation companies globally, looking beyond familiar platforms to suppliers, bottlenecks and specialist enablers that make them scale. Our research suggests that the institutional opportunity is now broadening from headline platforms into upstream hardware and downstream infrastructure.

Our research universe contains these 719 companies across eight innovation buckets spanning upstream enablers and downstream specialist suppliers. About one quarter delivered triple-digit returns over the past year. Our observations reveal that: Innovation is abundant; investable innovation is narrower; attractively valued innovation is scarcer still. Only 194 companies currently meet our full investment criteria; 120 are in Asia and 100 have market capitalizations below \$10bn.

Regional capabilities are highly complementary. The U.S. retains exceptional depth in frontier platforms; Taiwan and Korea dominate critical enabling layers; Japan and Europe contribute specialized industrial capabilities; and selected emerging markets provide niches in power, automation, enterprise deployment and life sciences. Global innovation is wider than platform exposure, extends deeper into supply chains, and demands greater selectivity after recent re-ratings.

Portfolio construction combines quantitative discipline with macroeconomic, industry and local-market judgment. Our framework evaluates five dimensions: innovation, growth, quality, valuation and market confirmation, through proprietary calibration and portfolio construction. One element is our Growth Efficiency framework (G/PS), inspired by the intuition behind PEG but adapted to innovation companies. It asks a simple investment question: how much growth is an investor actually buying for the valuation paid? Combined with our quality and valuation disciplines, it helps distinguish compelling innovation from innovation already fully reflected in price. The resulting opportunity set looks markedly different from conventional benchmarks, raising a dilemma for institutional investors: how should innovation exposure be constructed when the opportunity set no longer resembles the old benchmarks?

This paper answers five questions, each in a separate section with a separate graphic.

Q1: What defines innovation companies and how can they be differentiated? Q2: Where do innovation firms possess choke points, moats and specialist niches? Q3: Which factors best distinguish attractive innovation investments? Q4: How complementary are different regions across the innovation value chain? Q5: How can these opportunities be translated into global institutional portfolios?

What is Innovation Investing? Innovation investing is not simply investing in inventions. Economic value is created when new technologies are commercialized, scaled and embedded in products, infrastructure and business processes. Investors can therefore capture innovation economics not only through the companies that create technology, but also through the suppliers and specialist enablers that make adoption possible.

We distinguish three innovation investment cycles during this century: private venture capital, U.S. public-market platforms, and an emerging global supplier cycle. The first cycle was largely private. A small group of institutional investors captured exceptional gains through early venture exposure to companies such as SpaceX and OpenAI. Those outcomes demonstrated the economics of accessing disruptive innovation before it became broadly available in public markets.

The second cycle moved innovation investing decisively into public markets. NVIDIA and the other Magnificent Seven companies became dominant institutional exposures as cloud computing, digital platforms and AI produced extraordinary earnings and shareholder returns. Innovation investing became increasingly synonymous with owning a concentrated group of U.S. mega-cap platforms.

A third innovation cycle is now emerging. Over the past year, several choke-point suppliers in Taiwan and Korea produced exceptional returns as AI demand exposed bottlenecks in memory, advanced manufacturing and other enabling technologies. Major platforms in the U.S., China and Europe all depend on increasingly complex global supply chains, ranging from compute, memory and semiconductor equipment to networking, datacenter systems, power, automation and specialist applications. Investors are moving from owning only the platform to including global infrastructure.

EM Leaders has analyzed this new global innovation ecosystem across 719 firms:
It is wider: global across geographies, sectors and segments; not simply technology.
It is deeper: beyond platforms into critical upstream and downstream suppliers.
And more selective: adding quality, valuation and confirmation to the process.

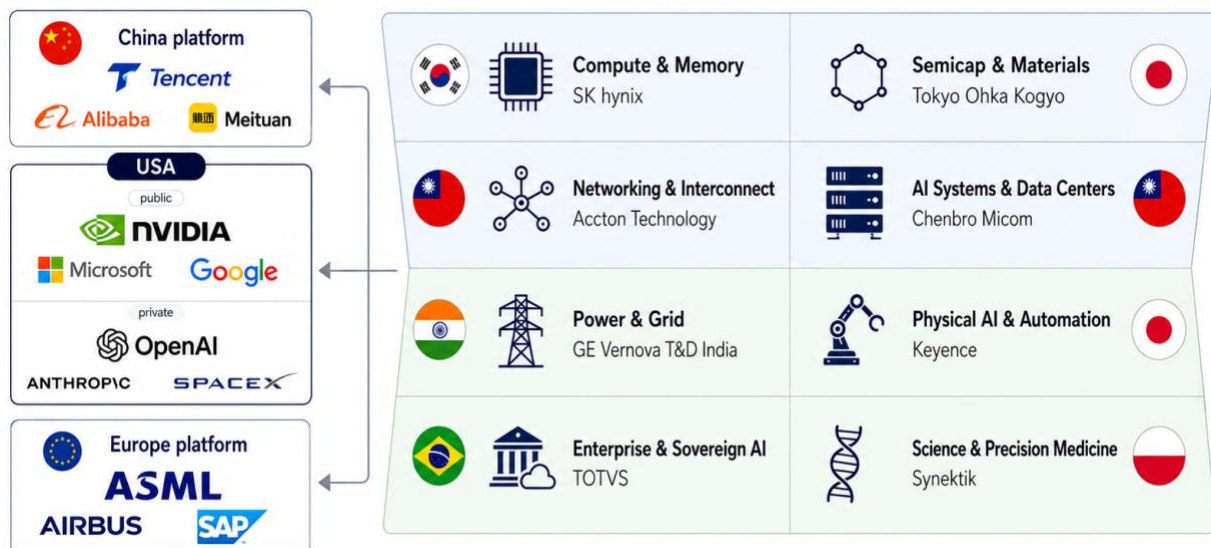
1. Local suppliers feeding global platforms

We have integrated our research across three major innovation ecosystems in the U.S., Europe and Asia. We identify the leading platforms in each and then look deeper into their supply chains and those of their key suppliers. Our objective is to identify companies that are innovative or provide technologies, components, infrastructure or applications essential to innovative customers. This research identifies 719 listed innovation companies across seven regions: the U.S., Europe, Japan, China/Hong Kong, Korea/Taiwan, India and other emerging/frontier markets. We then narrow our investable universe to 505 companies after applying institutional investability screens covering size, liquidity, leverage, governance, listing quality, and transparency.

We map these companies into eight functional innovation buckets that describe the roles they play in the global innovation ecosystem rather than conventional sectors. Graphic 1 shows that four sit upstream: B1 Compute & Memory (SK Hynix), B2 Semicap & Materials (Tokyo Ohka Kogyo), B3 Networking & Interconnect (Accton Technology), and B4 AI Systems & Data Centers (Chenbro Micom). Four are primarily downstream: B5 Power & Grid (GE Vernova T&D India), B6 Physical AI & Automation (Keyence), B7 Enterprise & Sovereign AI (TOTVS), and B8 Science & Precision Medicine (Synektik).

These companies range from mega-cap global leaders to specialized small- and mid-cap firms. What connects them is their role in enabling innovation across platforms. Tokyo Ohka Kogyo, for example, is a leading supplier of EUV photoresists used in advanced semiconductor manufacturing, placing it deep inside the lithography-to-foundry supply chain that ultimately enables leading-edge AI processors. Chenbro Micom, a smaller Taiwanese company, develops modular AI-server chassis within the NVIDIA MGX ecosystem while serving system integrators and server brands globally. The investment implication is that many specialist suppliers benefit not only from the success of a single platform, but from growth across a broader innovation ecosystem. **Cross-platform relevance can create a wider and more diversified demand base.** Supply constraints can also support greater pricing power and resilience.

Graphic 1: How to invest in innovation – local suppliers feeding global platforms



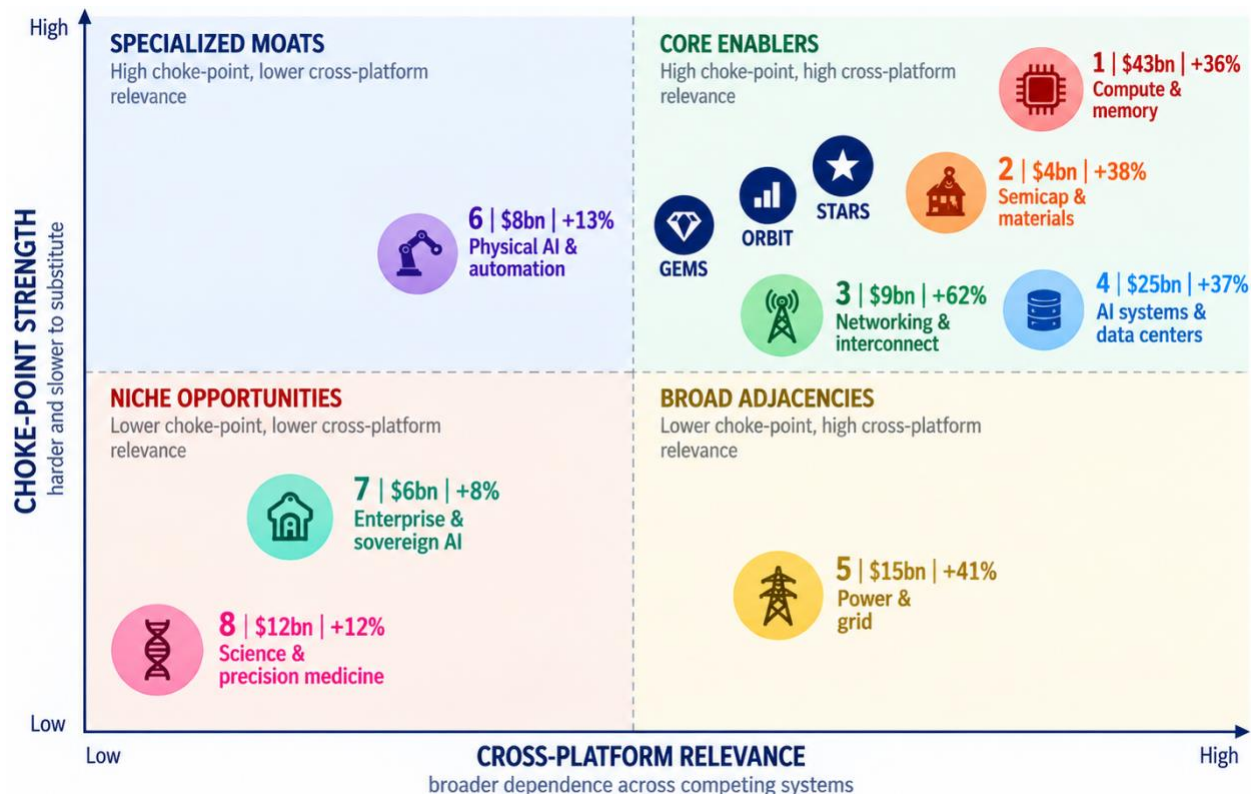
Note: AI is becoming more physical, requiring memory, packaging, networking, transformers, power.

2. Market power quadrants: choke vs. moat vs. niche vs. adjacencies

We compare methodologies to measure the market power of innovators and identify two main dimensions: cross-platform relevance as a long-term demand driver (x-axis) and choke-point strength as a measure of supply scarcity and substitutability (y-axis). Intuitively, companies in the upper-right “Core Enablers” quadrant should offer the strongest combination of broad demand, pricing power, resilience and economic rents. Strikingly, all four upstream buckets are located in this quadrant, which also delivered superior 36-month annualized returns (twice that of downstream buckets). B1 Compute & Memory has the largest median market capitalization and includes leaders such as NVIDIA and some of the strongest recent performers, including Micron and SK Hynix.

Downstream economics are more heterogeneous: B6 Physical AI & Automation combines choke-point strength with more specialized cross-platform relevance. B5 Power & Grid has broad relevance but generally less supplier-level scarcity, although localized power generation, transmission, transformers and permitting are becoming binding constraints on datacenter expansion. Specialist niches and differentiated applications shape B7 Enterprise & Sovereign AI and B8 Science & Precision Medicine. Downstream innovation therefore derives value from a more varied combination of localized constraints, specialist capabilities and differentiated applications, whereas upstream market power currently derives more directly from scarce enabling technologies required across multiple platforms.

Graphic 2: Eight stylized innovation buckets across market power quadrants



Note: numbers show bucket / median market cap / median 36m annualized total returns

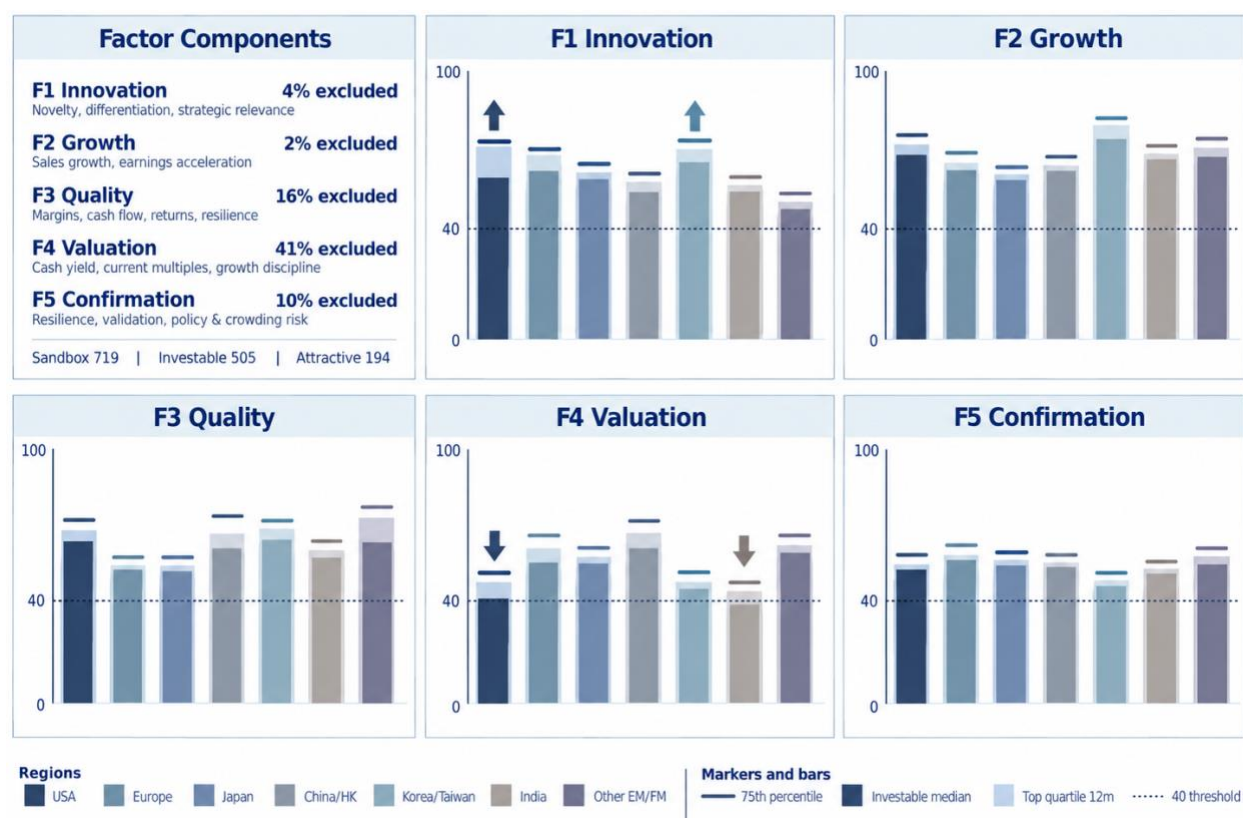
Choke points are dynamic rather than permanent. Strong pricing power attracts capital, competitors and policy intervention. Memory illustrates this tension. Korean and U.S. leaders currently benefit from scale, technology and constrained supply, but China has committed substantial resources to semiconductor self-sufficiency. YMTC has benefited from significant state support, has become a major NAND competitor and is expanding capacity and its technological reach, including into DRAM. Its ambition to challenge Samsung and SK Hynix illustrates how new investment can eventually erode scarcity economics even in powerful enabling layers.

DeepSeek illustrates a similar dynamic downstream in B7 Enterprise & Sovereign AI. U.S. frontier-model companies retain important capability advantages, while Chinese open-source models increasingly compete through cost, efficiency and ease of deployment. DeepSeek's rapid model development, low API pricing, open-weight strategy and use of model distillation demonstrate how quickly an apparently concentrated innovation layer can become more contestable. **Market power is highly dynamic:** today's choke point can become tomorrow's contested capacity market.

3. Valuation is the binding constraint on attractive innovation

Market power and strategic relevance are not sufficient for an attractive investment. An attractive company needs to be compelling across five dimensions: innovation, growth, quality, valuation and market confirmation. Graphic 3 reveals the factor profiles of our 505 investable companies across regions and illustrates an important asymmetry: innovation and growth are widely available, but valuation is much more restrictive, and often prohibitive.

Graphic 3: Selecting attractive innovation firms through our five-factor framework



Note: Single factor exclusions are non-additive. Our full factor model excludes 62% of investable firms.

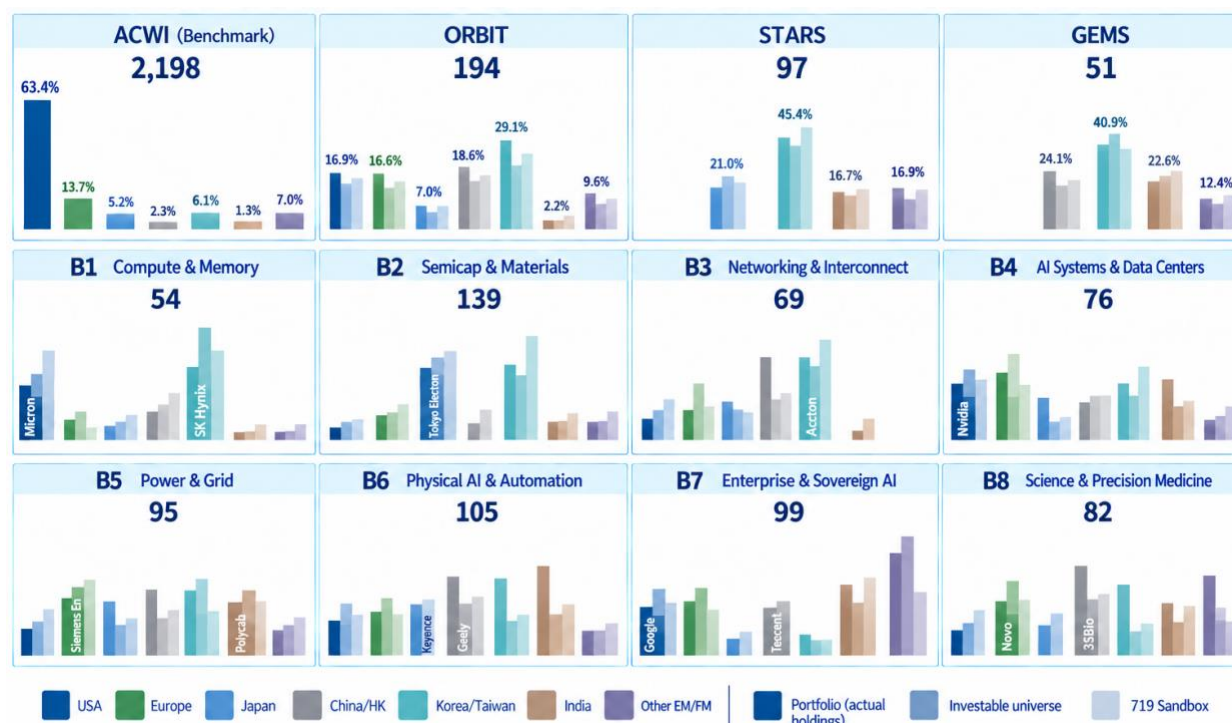
Innovation scores remain strongest in the U.S. and Korea/Taiwan, from leadership in frontier platforms and critical enabling technologies. Growth scores are comparatively strong across all regions. Quality is more discriminating: margins, cash generation, returns and resilience separate stronger companies from firms where rapid growth is more fragile. Market confirmation provides an additional test of whether fundamental strength is reinforced by resilience, investor behavior and policy conditions.

Valuation (F4) is clearly the dominant constraint. This factor alone disqualifies 41% of the 505-company investable universe, far more than innovation, growth or market confirmation. The pressure is particularly visible in the U.S. and India, where strong growth has coincided with richer valuations. After all of our investment criteria are applied, only 194 companies remain attractive, just 27% of the original 719-company research universe. The implication is simple: Innovation is abundant. Investable innovation is narrower. Attractively valued innovation is scarce.

4. Regional weights reflect comparative innovation landscape

Our framework narrows the global research universe to 194 attractive companies. From this opportunity set, we construct three global innovation portfolios with distinct mandates: **ORBIT** draws globally from the full 194-company attractive universe. **STARS** focuses on Japan, Korea/Taiwan, India and selected emerging markets, excluding the U.S., Europe and China/HK. **GEMS** focuses on \$400m-\$8bn emerging- and frontier-market companies, including qualifying Hong Kong listings.

Graphic 4: Comparative advantage across countries and innovation buckets



Note: ORBIT, STARS, and GEMS each contain 40 holdings, selected from mandate-specific eligible pools. Regional classification follows EM Leaders methodology; Poland is classified as emerging market.

ORBIT illustrates how bottom-up selection can produce a very different regional profile from a global benchmark. While the U.S. represents 63% of the ACWI universe, our models only allocate 17% in the ORBIT portfolio, reflecting the above-noted valuation constraints from excessive valuations. No country targets determine this outcome: regional weights emerge from security selection and diversification. Our models in fact allocate between 17% to 19% weights each to the U.S., Europe, and China/HK, a combined 29% to Korea/Taiwan and 12% to India and other emerging and frontier markets.

STARS concentrates more strongly in enabling Asia. Korea, Taiwan, and Japan each account for about 21% to 23% of the portfolio, followed by 17% in India and 17% in other emerging/frontier markets. These weights reflect the relative strength of eligible securities rather than predetermined country allocations.

GEMS moves further down the capitalization spectrum: Korea/Taiwan represent about 41%, China/Hong Kong 24%, India 23% and other emerging/frontier markets 12%. Compared with its emerging-markets benchmark, GEMS delivers roughly twice the Growth Efficiency (G/PS) at materially lower sales valuations, illustrating the power of our selection methodology.

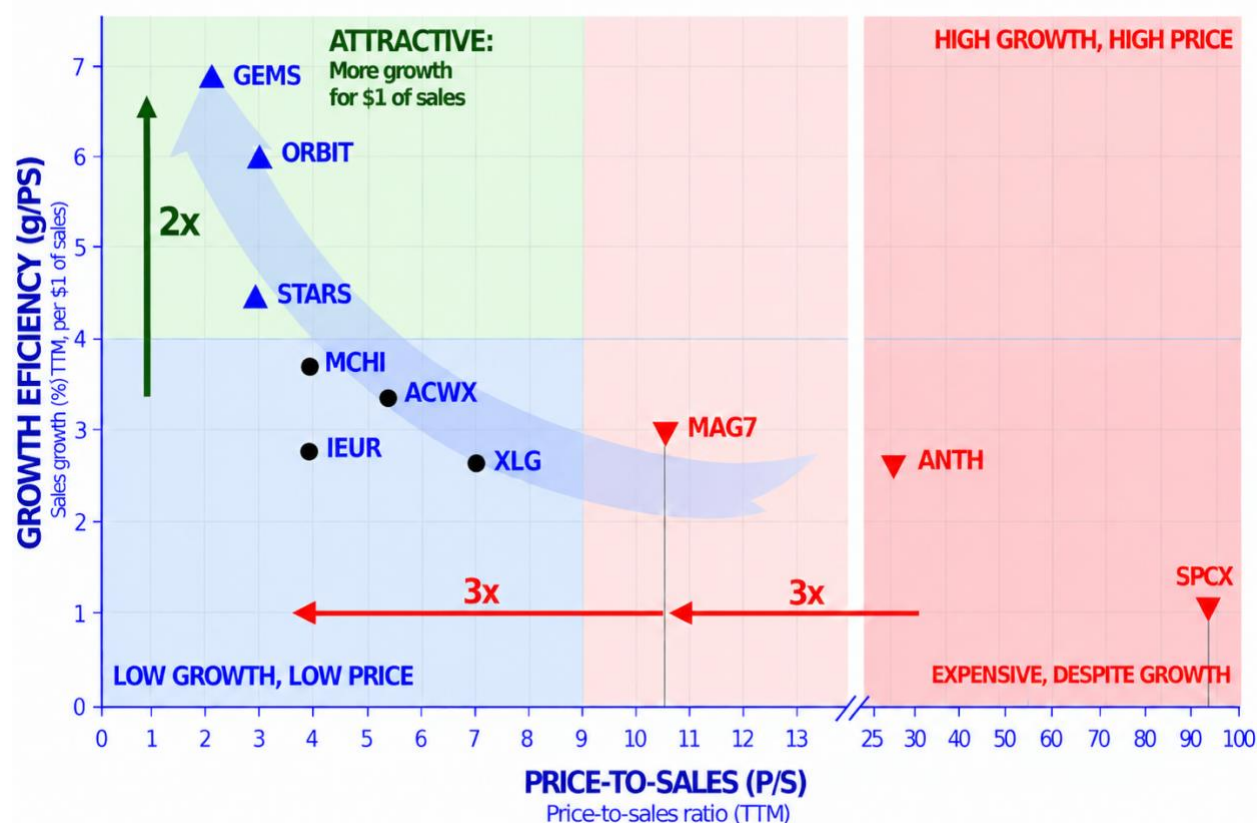
Graphic 4 also reveals how **regional comparative advantage** differs across innovation functions. The U.S. is prominent in B1 Compute & Memory, B4 AI Systems & Data Centers and B7 Enterprise & Sovereign AI; Korea/Taiwan dominates important layers of B1 and B3; Japan is particularly strong in B2 Semicap & Materials and B6 Physical AI & Automation; Europe contributes strongly in B5 Power & Grid and B8 Science & Precision Medicine; India has notable strength in B5; and China/Hong Kong is especially visible across B6, B7 and B8. The result reinforces a central finding: **regional innovation capabilities are complementary rather than interchangeable.**

5. Global innovation portfolios: paying less for growth

How should investors compare growth when earnings are an imperfect guide? The PEG ratio popularized the idea of relating valuations to earnings growth. But innovation companies often reinvest heavily, making near-term earnings less informative. Hence we use Growth Efficiency (G/PS) as a complementary diagnostic: how much revenue growth is an investor buying for the sales valuation paid? Our broader valuation framework separately tests profitability, cash generation and margins. Moving up and to the left in Graphic 5 represents more growth efficiency at a lower sales multiple.

The second innovation cycle provides a useful starting point. The Magnificent Seven currently trade at 10x sales with about 30% revenue growth, implying about a 3x Growth Efficiency. A broader U.S. benchmark such as XLG trades at a lower multiple with broadly similar growth efficiency. Moving internationally lowers the entry price substantially: ACWX trades at roughly half the MAG7 sales multiple with somewhat higher growth efficiency, while China/Hong Kong (MCHI) combines lower valuation with stronger efficiency. Europe (IEUR) is cheaper, but with lower growth efficiency.

Graphic 5: Growth efficiency across three innovation stages



Note: Historical returns shown are retrospective. Past performance is not indicative of future results. Illustrative valuation reference points use current public-market data or publicly reported estimates and may change materially. Data updated as of September 2026.

The first innovation cycle on the far-right illustrates the other extreme: exceptional innovation does not make every valuation attractive. At a P/S multiple of 95x, SpaceX would require approximately 285% revenue growth to produce G/PS of 3. And Anthropic would require about 90% growth at an illustrative 30x sales valuation. These are not return forecasts; they illustrate how demanding the growth assumptions become when sales multiples are extremely elevated. Much of the value creation in these businesses has already accrued before public-market investors receive access.

The third innovation cycle is broadening toward global suppliers that are enabling the major platforms. Recent performance in Taiwan and Korea illustrates both the opportunity and the risk: Samsung and SK Hynix delivered triple-digit 12-month returns, while TSMC nearly doubled. That performance has also produced substantial re-ratings, reinforcing the importance of the valuation discipline described above.

Our three portfolios ORBIT, STARS and GEMS occupy a distinctly different part of the valuation map. GEMS and ORBIT offer more than twice the Growth Efficiency of the concentrated MAG7 reference, while STARS also provides materially more growth per unit of sales valuation. All three require investors to pay substantially less for each unit of growth. Current ORBIT and STARS constituents also have median 36-month annualized historical returns of about 32%, broadly comparable with the strong returns associated with U.S. mega-cap growth over this period. These are retrospective characteristics of today's constituents, not realized portfolio returns.

6. Conclusion: innovation beyond the platforms

The next innovation cycle does not replace platforms; it expands the map around them into the global supply chains that enable them. This opportunity is wider across geographies, sectors and company sizes; deeper across upstream and downstream supply chains, and more selective once quality and valuation disciplines are applied.

Our central finding is that innovation is abundant, but attractively valued innovation is scarce. Our research begins with 719 listed innovation companies but identifies only 194 attractive candidates today; 120 are in Asia and 100 have market capitalizations below \$10bn. The opportunity is therefore much broader than traditional benchmarks suggest, but disciplined security selection sharply narrows what is attractive today.

Regional capabilities are complementary. The U.S. retains exceptional depth in frontier platforms; Taiwan and Korea dominate several critical enabling layers; Japan and Europe contribute specialized industrial capabilities; and selected emerging markets provide differentiated opportunities in power, automation, enterprise deployment and life sciences. The investment question is increasingly not only who owns the platform, but who controls the bottlenecks that allow platforms to scale.

Our portfolios are expressions of this research rather than substitutes for the platform or venture cycles. Current portfolio characteristics show materially higher Growth Efficiency than concentrated U.S. growth references, at substantially lower sales valuations. Our investment discipline requires innovation, growth, quality, valuation and market confirmation to reinforce one another.

This is where EM Leaders' research platform matters. More than a decade of collaboration with local managers across emerging markets has built unique research networks and local intelligence that help identify less-followed companies, specialist suppliers and changing capital flows. We combine that local perspective with fundamental research and quantitative portfolio discipline, supported by proprietary scoring, calibration and implementation processes.

For institutional investors, the implication is not to abandon the winners of previous innovation cycles, but to complement them with different sources of innovation exposure to mitigate concentration risks. How should the next innovation allocation broaden the existing platform exposure? Wider. Deeper. More selective.

<http://www.emleaders.com/pdf/EML-innovation.pdf>

Oliver Fratzscher is founder and portfolio manager of EM Leaders LLC, an investment firm focused on investing in global innovation strategies.