

The age of strategic supply chains



INVESTMENT INSIGHT | INTERNATIONAL EQUITY TEAM | September 2025

In today's environment, where geopolitical tensions threaten the cohesion of the global economy, building more resilient supply chains has become a strategic imperative. Companies must navigate a landscape defined by fluctuating demand, rising policy intervention, and increasingly unpredictable disruptions. Yet for many manufacturers, full disengagement from offshore suppliers remains impractical. For global businesses, resilience is no longer just about contingency—it's about rebalancing without unravelling.

The age of seamless global supply chains may be coming to an end. Today, some of the world's most critical industries—from technology and energy to defence and industrials—are dependent on a semiconductor ecosystem that is increasingly fragmented and geopolitically fraught. Bottlenecks are no longer occasional glitches but structural realities.

An obvious example would be U.S. trade restrictions, which have specifically targeted China's ability to manufacture advanced artificial intelligence (AI) chips. In response, China's Ministry of Commerce imposed export controls on seven rare earth elements (REEs)—including dysprosium, terbium, and gadolinium—vital to the production of magnets used in high-performance computing, electric vehicles, and power grids.¹ These materials now require special export licenses, heightening supply uncertainty across multiple sectors. Supply chain friction isn't theoretical—it's already manifesting in real-world choke points.

Imagine a data centre in Texas—designed to power the next wave of AI computing—sitting idle because it's waiting on high-voltage transformers stuck at a port in Shenzhen. The U.S. grid can't expand fast enough, not for lack of ambition, but because the specialised magnets needed for advanced transmission gear rely on rare earth elements almost entirely sourced from China. What good is innovation if the infrastructure can't catch up?

¹ Center for Strategic & International Studies, 'The Consequences of China's New Rare Earth's Export Restrictions', <https://www.csis.org/analysis/consequences-chinas-new-rare-earths-export-restrictions> ² The Budget Lab at Yale, as of June 17, 2025

AUTHORS



SORA UTZINGER
Vice President



ALESSANDRO VATURI
Vice President

“Supply chain resilience is not merely about avoiding downside, but enabling long-term optionality, sustained innovation, and superior capital efficiency.”

Resilience by design: evolving procurement & environmental risk models

Cost-efficiency may provide a significant competitive advantage in the absence of disruptions. For decades, a Japanese automaker's "just-in-time" (JIT) operations management model was celebrated as an efficiency-focused strategy, ensuring materials were delivered precisely when required to minimise inventory costs, until the 2011 Tohoku earthquake and tsunami revealed the inherent vulnerabilities of highly optimised supply chains.^{2,3}

The COVID-19 pandemic in turn prompted many businesses to adopt a "just-in-case" inventory model to mitigate losses from unexpected interruptions. By 2023, as pandemic-related challenges subsided, some organisations transitioned back to JIT practices despite persistent supply chain risks, influenced by the increased costs associated with maintaining substantial inventories in an environment of high interest rates and inflation.⁴

These cyclical responses point to a deeper truth: resilience now lies in strategic flexibility, not dogmatic adherence to any one model. But building resilience today requires more than buffer inventory or supplier diversification—it demands accounting for the physical impacts of climate change and natural resource scarcity. Heatwaves, droughts, floods and extreme weather events are disrupting logistics networks, industrial output, and raw material availability with increasing frequency.

One underappreciated risk is water scarcity. From semiconductor fabs in Arizona to pharmaceutical manufacturing in India, access to consistent water supply is emerging as a critical constraint. Climate-related risks are no longer hypothetical—they are quantifiable disruptions. As such, resilience requires integrating climate risk mapping, scenario analysis, and adaptation strategy into procurement and capital planning.

Industrial policy as a market shaper

The reconfiguration of supply chains is no longer solely a corporate exercise—countries are becoming strategic actors in market formation. A striking example is the U.S. Department of Defence's equity stake in the only fully integrated rare earth producer in the U.S.⁵ To support domestic resilience, the government has provided minimum price guarantees for long-term orders—effectively underwriting investment in a sector plagued

by cost volatility and geopolitical risk.⁶ In this new landscape, industrial policy isn't peripheral—it's a central force shaping supply dynamics. For investors, this marks a shift: state-led incentives, subsidies, and procurement models are now critical variables in evaluating long-term supply chain resilience, particularly in areas such as critical minerals, semiconductors, and defence manufacturing.

Investing in resilience: quality companies leading the way

For long-term investors, the reconfiguration of global supply chains doesn't just present a risk to be managed but also an opportunity to identify companies that convert resilience into competitive advantage. In our view, supply chain resilience is increasingly a marker of operational excellence, pricing power, and strategic foresight—hallmarks of the quality companies we favour. With that in mind, supply chain resilience has been a thematic engagement topic for the team this year, as we seek to assess how companies we own are tackling the potentially financially material risk of supply chain disruption.

Legrand is a strong example of a company addressing supply chain resilience. The company has proactively mapped climate exposure and geographic risk across its value chain. During tariff-related volatility, its U.S. operations assessed not only their own exposure to China and Mexico, but also that of key suppliers, enabling clear communication with stakeholders. Legrand also avoids single sourcing, including in vulnerable areas like Taiwan, where it is actively widening its supplier base.

Similarly, Safran is working to desensitise its reliance on Russian titanium and Chinese REE, adapting to shifting regulations via contractual clauses and flexible sourcing. In ASML's case, supply chain resilience emerged as a necessity from the outset, requiring the organisation to actively invite companies to collaborate, balancing deep partnerships with growing oversight of risks, particularly around rare earths. The company is expanding upstream visibility, dual-sourcing selectively, and investing in climate resilience, all while navigating export controls and tariff-related pressures that underscore its pivotal role in the semiconductor value chain.

In a world where disruption is becoming the norm, understanding corporate supply chains remains essential—not only in the face of unresolved trade tensions, but also in anticipation of deeper, systemic shifts in the global

² Supply Chain Dive, <https://www.supplychaindive.com/news/toyota-semiconductor-shortage-earthquake-inventory-ihg-gartner-forecast-2022/600193/>

³ Hirofumi Matsuo, 'Implications of the Tohoku earthquake for Toyota's coordination mechanism: Supply chain disruption of automotive semiconductors', *International Journal of Production Economics* Volume 161, March 2015, Pages 217-227

⁴ Global Data, 'Supply Chain Disruption – Thematic Intelligence, 14 May 2022

⁵ MP Materials, <https://investors.mpmaterials.com/investor-news/news-details/2025/MP-Materials-Announces-Transformational-Public-Private-Partnership-with-the-Department-of-Defense-to-Accelerate-U-S--Rare-Earth-Magnet-Independence/default.aspx>

⁶ SFA Oxford, <https://www.sfa-oxford.com/market-news-and-insights/sfa-pentagon-and-mp-materials-forge-u-s-ree-independence/>

order. Ultimately, these examples show that resilience is not merely about avoiding downside. It is increasingly about enabling long-term optionality, sustained innovation, and superior capital efficiency. In a fragmented world,

we believe companies that invest early and intelligently in supply chain durability will be structurally better positioned—and that resilience may well become the new alpha.

Risk Considerations

There is no assurance that a portfolio will achieve its investment objective. Portfolios are subject to market risk, which is the possibility that the market value of securities owned by the portfolio will decline. Market values can change daily due to economic and other events (e.g. natural disasters, health crises, terrorism, conflicts and social unrest) that affect markets, countries, companies or governments. It is difficult to predict the timing, duration, and potential adverse effects (e.g. portfolio liquidity) of events. Accordingly, you can lose money investing in this strategy. Please be aware that this strategy may be subject to certain additional risks. Changes in the worldwide economy, consumer spending, competition, demographics and consumer preferences, government regulation and economic conditions may adversely affect global franchise companies and may negatively impact the strategy to a greater extent than if the strategy's assets were invested in a wider variety of companies. In general, **equity securities'** values also fluctuate in response to activities specific to a company. Investments in **foreign markets** entail special risks such as currency, political, economic, and market risks. **Stocks of small- and mid-capitalisation companies** carry special risks, such as limited product lines, markets and financial resources, and greater market volatility than securities of larger, more established companies. The risks of investing in **emerging market countries** are greater than risks associated with investments in foreign developed markets. **Derivative instruments** may disproportionately increase losses and have a significant impact on performance. They also may be subject to counterparty, liquidity, valuation, correlation and market risks. **Illiquid securities** may be more difficult to sell and value than publicly traded securities (liquidity risk). Non-diversified portfolios often invest in a more limited number of issuers. As such, changes in the financial condition or market value of a single issuer may cause greater volatility. **ESG strategies** that incorporate impact investing and/or Environmental, Social and Governance (ESG) factors could result in relative investment performance deviating from other strategies or broad market benchmarks, depending on whether such sectors or investments are in or out of favor in the market. As a result, there is no assurance ESG strategies could result in more favorable investment performance.

IMPORTANT INFORMATION

There is no guarantee that any investment strategy will work under all market conditions, and each investor should evaluate their ability to invest for the long-term, especially during periods of downturn in the market.

A separately managed account may not be appropriate for all investors. Separate accounts managed according to the particular Strategy may include securities that may not necessarily track the performance of a particular index. A minimum asset level is required.

For important information about the investment managers, please refer to Form ADV Part 2.

The views and opinions and/or analysis expressed are those of the author or the investment team as of the date of preparation of this material and are subject to change at any time without notice due to market or economic conditions and may not necessarily come to pass. Furthermore, the views will not be updated or otherwise revised to reflect information that subsequently becomes available or circumstances existing, or changes occurring, after the date of publication. The views expressed do not reflect the opinions of all investment personnel at Morgan Stanley Investment Management (MSIM) and its subsidiaries and affiliates (collectively "the Firm"), and may not be reflected in all the strategies and products that the Firm offers.

Forecasts and/or estimates provided herein are subject to change and may not actually come to pass. Information regarding expected market returns and market outlooks is based on the research, analysis and opinions of the authors or the investment team. These conclusions are speculative in nature, may not come to pass and are not intended to predict the future performance of any specific strategy or product the Firm offers. Future results may differ significantly depending on factors such as changes in securities or financial markets or general economic conditions.

This material has been prepared on the basis of publicly available information, internally developed data and other third-party sources believed to be reliable. However, no assurances are provided regarding the reliability of such information and the Firm has not sought to independently verify information taken from public and third-party sources.

This material is a general communication, which is not impartial and all information provided has been prepared solely for informational

and educational purposes and does not constitute an offer or a recommendation to buy or sell any particular security or to adopt any specific investment strategy. The information herein has not been based on a consideration of any individual investor circumstances and is not investment advice, nor should it be construed in any way as tax, accounting, legal or regulatory advice. To that end, investors should seek independent legal and financial advice, including advice as to tax consequences, before making any investment decision.

Charts and graphs provided herein are for illustrative purposes only.

Past performance is no guarantee of future results.

The indexes are unmanaged and do not include any expenses, fees or sales charges. It is not possible to invest directly in an index. Any index referred to herein is the intellectual property (including registered trademarks) of the applicable licensor. Any product based on an index is in no way sponsored, endorsed, sold or promoted by the applicable licensor and it shall not have any liability with respect thereto.

This material is not a product of Morgan Stanley's Research Department and should not be regarded as a research material or a recommendation.

The Firm has not authorised financial intermediaries to use and to distribute this material, unless such use and distribution is made in accordance with applicable law and regulation. Additionally, financial intermediaries are required to satisfy themselves that the information in this material is appropriate for any person to whom they provide this material in view of that person's circumstances and purpose. The Firm shall not be liable for, and accepts no liability for, the use or misuse of this material by any such financial intermediary.

This material may be translated into other languages. Where such a translation is made this English version remains definitive. If there are any discrepancies between the English version and any version of this material in another language, the English version shall prevail.

The whole or any part of this material may not be directly or indirectly reproduced, copied, modified, used to create a derivative work, performed, displayed, published, posted, licensed, framed, distributed or transmitted or any of its contents disclosed to third parties without the Firm's express written consent. This material may not be linked to unless such hyperlink is for personal and non-commercial use. All information contained herein is proprietary and is protected under copyright and other applicable law.

Morgan Stanley Investment Management is the asset management division of Morgan Stanley.

DISTRIBUTION

This material is only intended for and will only be distributed to persons resident in jurisdictions where such distribution or availability would not be contrary to local laws or regulations.

MSIM, the asset management division of Morgan Stanley (NYSE: MS), and its affiliates have arrangements in place to market each other's products and services. Each MSIM affiliate is regulated as appropriate in the jurisdiction it operates. MSIM's affiliates are: Eaton Vance Management (International) Limited, Eaton Vance Advisers International Ltd, Calvert Research and Management, Eaton Vance Management, Parametric Portfolio Associates LLC, and Atlanta Capital Management LLC.

This material has been issued by any one or more of the following entities:

EMEA

This material is for Professional Clients/Accredited Investors only.

In the EU, MSIM and Eaton Vance materials are issued by MSIM Fund Management (Ireland) Limited ("FMIL"). FMIL is regulated by the Central Bank of Ireland and is incorporated in Ireland as a private company limited by shares with company registration number 616661 and has its registered address at 24-26 City Quay, Dublin 2, D02 NY19, Ireland.

Outside the EU, MSIM materials are issued by Morgan Stanley Investment Management Limited (MSIM Ltd) is authorised and regulated by the Financial Conduct Authority. Registered in England. Registered No. 1981121. Registered Office: 25 Cabot Square, Canary Wharf, London E14 4QA.

In Switzerland, MSIM materials are issued by Morgan Stanley & Co. International plc, London (Zurich Branch) Authorised and regulated by the Eidgenössische Finanzmarktaufsicht ("FINMA"). Registered Office: Beethovenstrasse 33, 8002 Zurich, Switzerland.

Outside the US and EU, Eaton Vance materials are issued by Eaton Vance Management (International) Limited ("EVM") 125 Old Broad Street, London, EC2N 1AR, UK, which is authorised and regulated in the United Kingdom by the Financial Conduct Authority.

Italy: MSIM FMIL (Milan Branch), (Sede Secondaria di Milano) Palazzo Serbelloni Corso Venezia, 16 20121 Milano, Italy. **The Netherlands:** MSIM FMIL (Amsterdam Branch), Rembrandt Tower, 11th Floor Amstelplein 1 1096HA, Netherlands. **France:** MSIM FMIL (Paris Branch), 61 rue de Monceau 75008 Paris, France. **Spain:** MSIM FMIL (Madrid Branch), Calle Serrano 55, 28006, Madrid, Spain. **Germany:** MSIM FMIL Frankfurt Branch, Große Gallusstraße 18, 60312 Frankfurt am Main, Germany (Gattung: Zweigniederlassung (FDI) gem. § 53b KWG). **Denmark:** MSIM FMIL (Copenhagen Branch), Gorrissen Federspiel, Axel Towers, Axeltorv2, 1609 Copenhagen V, Denmark.

MIDDLE EAST

Dubai: MSIM Ltd (Representative Office, Unit Precinct 3-7th Floor-Unit 701 and 702, Level 7, Gate Precinct Building 3, Dubai International Financial Centre, Dubai, 506501, United Arab Emirates. Telephone: +97 (0)14 709 7158).

This document is distributed in the Dubai International Financial Centre by Morgan Stanley Investment Management Limited (Representative Office), an entity regulated by the Dubai Financial Services Authority ("DFSA"). It is intended for use by professional clients and market counterparties only. This document is not intended for distribution to retail clients, and retail clients should not act upon the information contained in this document.

This document relates to a financial product which is not subject to any form of regulation or approval by the DFSA. The DFSA has no responsibility for reviewing or verifying any documents in connection with this financial product. Accordingly, the DFSA has not approved this document or any other associated documents nor taken any steps to verify the information set out in this document, and has no responsibility for it. The financial product to which this document relates may be illiquid and/or subject to restrictions on its resale or transfer. Prospective purchasers should conduct their own due diligence on the financial product. If you do not understand the contents of this document, you should consult an authorised financial adviser.

U.S.

NOT FDIC INSURED. OFFER NO BANK GUARANTEE. MAY LOSE VALUE. NOT INSURED BY ANY FEDERAL GOVERNMENT AGENCY. NOT A DEPOSIT.

LATIN AMERICA (BRAZIL, CHILE COLOMBIA, MEXICO, PERU, AND URUGUAY)

This material is for use with an institutional investor or a qualified investor only. All information contained herein is confidential and is for the exclusive use and review of the intended addressee, and may not be passed on to any third party. This material is provided for informational purposes only and does not constitute a public offering, solicitation or recommendation to buy or sell for any product, service, security and/or strategy. A decision to invest should only be made after reading the strategy documentation and conducting in-depth and independent due diligence.

ASIA PACIFIC

Hong Kong: This material is disseminated by Morgan Stanley Asia Limited for use in Hong Kong and shall only be made available to "professional investors" as defined under the Securities and Futures Ordinance of Hong Kong (Cap 571). The contents of this material have not been reviewed nor approved by any regulatory authority including the Securities and Futures Commission in Hong Kong. Accordingly, save where an exemption is available under the relevant law, this material shall not be issued, circulated, distributed, directed at, or made available to, the public in Hong Kong. **Singapore:** This material is disseminated by Morgan Stanley Investment Management Company and should not be considered to be the subject of an invitation for subscription or purchase, whether directly or indirectly, to the public or any member of the public in Singapore other than (i) to an institutional investor under section 304 of the Securities and Futures Act, Chapter 289 of Singapore ("SFA"); (ii) to a "relevant person" (which includes an accredited investor) pursuant to section 305 of the SFA, and such distribution is in accordance with the conditions specified in section 305 of the SFA; or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA. This publication has not been reviewed by the Monetary Authority of Singapore.

Australia: This material is provided by Morgan Stanley Investment Management (Australia) Pty Ltd ABN 22122040037, AFSL No. 314182 and its affiliates and does not constitute an offer of interests. Morgan Stanley Investment Management (Australia) Pty Limited arranges for MSIM affiliates to provide financial services to Australian wholesale clients. Interests will only be offered in circumstances under which no disclosure is required under the Corporations Act 2001 (Cth) (the "Corporations Act"). Any offer of interests will not purport to be an offer of interests in circumstances under which disclosure is required under the Corporations Act and will only be made to persons who qualify as a "wholesale client" (as defined in the Corporations Act). This material will not be lodged with the Australian Securities and Investments Commission.

JAPAN

For professional investors, this material is circulated or distributed for informational purposes only. For those who are not professional investors, this material is provided in relation to Morgan Stanley Investment Management (Japan) Co., Ltd. ("MSIMJ")'s business with respect to discretionary investment management agreements ("IMA") and investment advisory agreements ("IAA"). This is not for the purpose of a recommendation or solicitation of transactions or offers any particular financial instruments. Under an IMA, with respect to management of assets of a client, the client prescribes basic management policies in advance and commissions MSIMJ to make all investment decisions based on an analysis of the value, etc. of the securities, and MSIMJ accepts such commission. The client shall delegate to MSIMJ the authorities necessary for making investment. MSIMJ exercises the delegated authorities based on investment decisions of MSIMJ, and the client shall not make individual instructions. All investment profits and losses belong to the clients; principal is not guaranteed. Please consider the investment objectives and nature of risks before investing. As an investment advisory fee for an IAA or an IMA, the amount of assets subject to the contract multiplied by a certain rate (the upper limit is 2.20% per annum (including tax)) shall be incurred in proportion to the contract period. For some strategies, a contingency fee may be incurred in addition to the fee mentioned above. Indirect charges also may be incurred, such as brokerage commissions for incorporated securities. Since these charges and expenses are different depending on a contract and other factors, MSIMJ cannot present the rates, upper limits, etc. in advance. All clients should read the Documents Provided Prior to the Conclusion of a Contract carefully before executing an agreement. This material is disseminated in Japan by MSIMJ, Registered No. 410 (Director of Kanto Local Finance Bureau (Financial Instruments Firms)), Membership: the Japan Securities Dealers Association, The Investment Trusts Association, Japan, the Japan Investment Advisers Association and the Type II Financial Instruments Firms Association.