

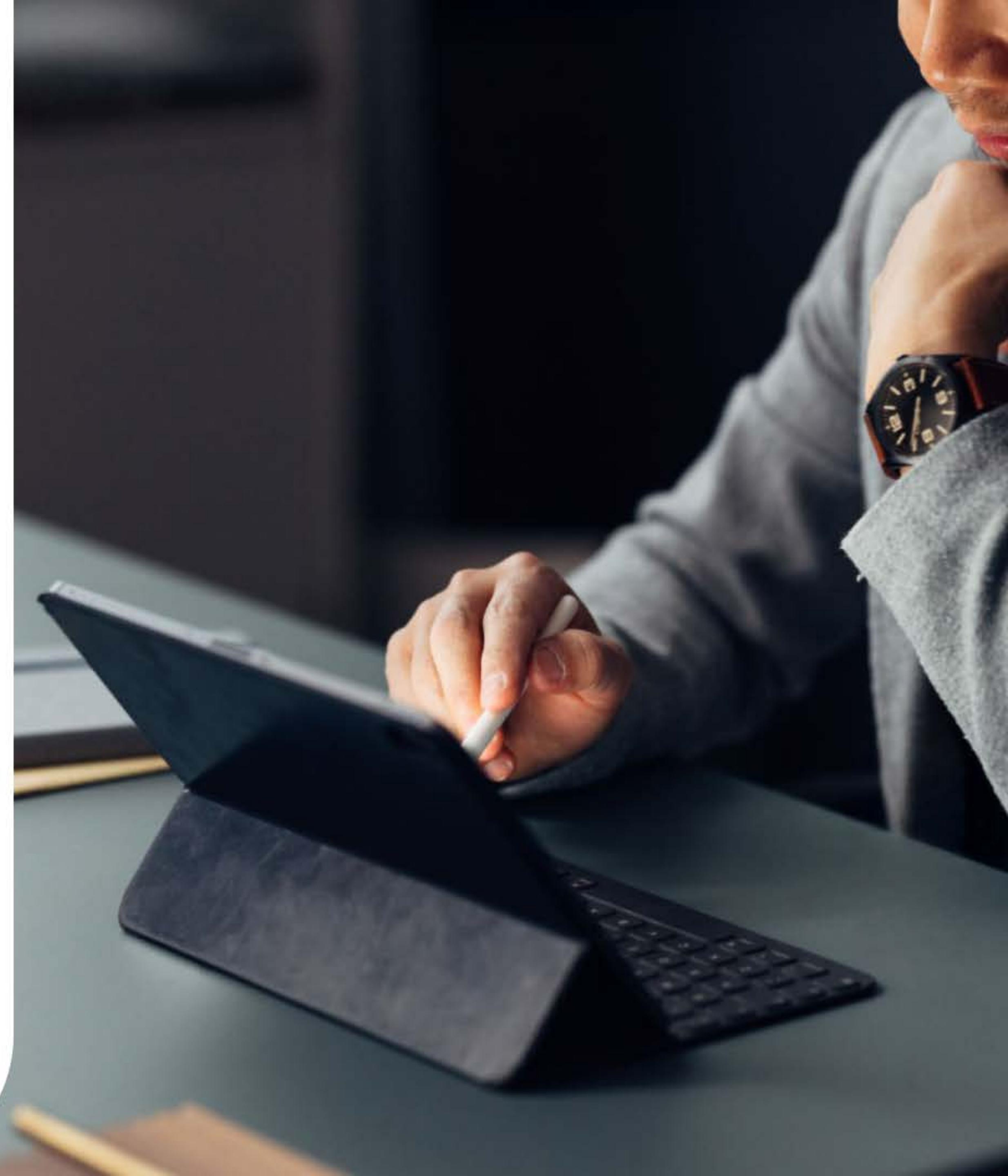
Course for Change: How tech companies build resilient supply chains in an unconventional world



ALL THE WAY

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01. Executive summary

Is your supply chain resilient enough for today's uncertain, volatile and complex world? Geopolitical conflicts, the impact of climate change and the increased frequency of natural disasters are exacerbating risks. Evolving trade relationships further complicate the situation, adding to the possibility of shortages or increased costs of goods and components.

Companies need to have answers to this, and the technology sector is particularly exposed because of its global supply chains and complex products.

Smartphones, for instance, can contain several thousand parts, often manufactured by dozens of different suppliers located around the world.

And the think tank Oxford Economics warns that the home electronics industry is one of the most vulnerable to a global trade war, because of the complexity of its supply chains.¹

Some technology firms do have answers. They have built robust supply chains that are designed to withstand the headwinds of this unconventional world, and they give us a template that other technology companies can follow to strengthen their own supply chains.

This small group of companies, which we call the resilience frontrunners, emerged from our global survey of 950 senior supply chain, logistics and operations professionals, including 190 working in the technology sector. How are the technology frontrunners making their supply chains more resilient?



What we found out

Technology businesses lost 3.61% of revenue on average to supply chain disruptions, while frontrunners kept losses under 1%.



97% of frontrunners view supply chain and procurement as strategic growth enablers.



61% are investing in advanced analytics and AI to boost resilience and manage risk.



Frontrunners emphasize collaboration both internally and across supply chain networks.



33% cite logistics and transportation optimisation as a top resilience success in the past two years.



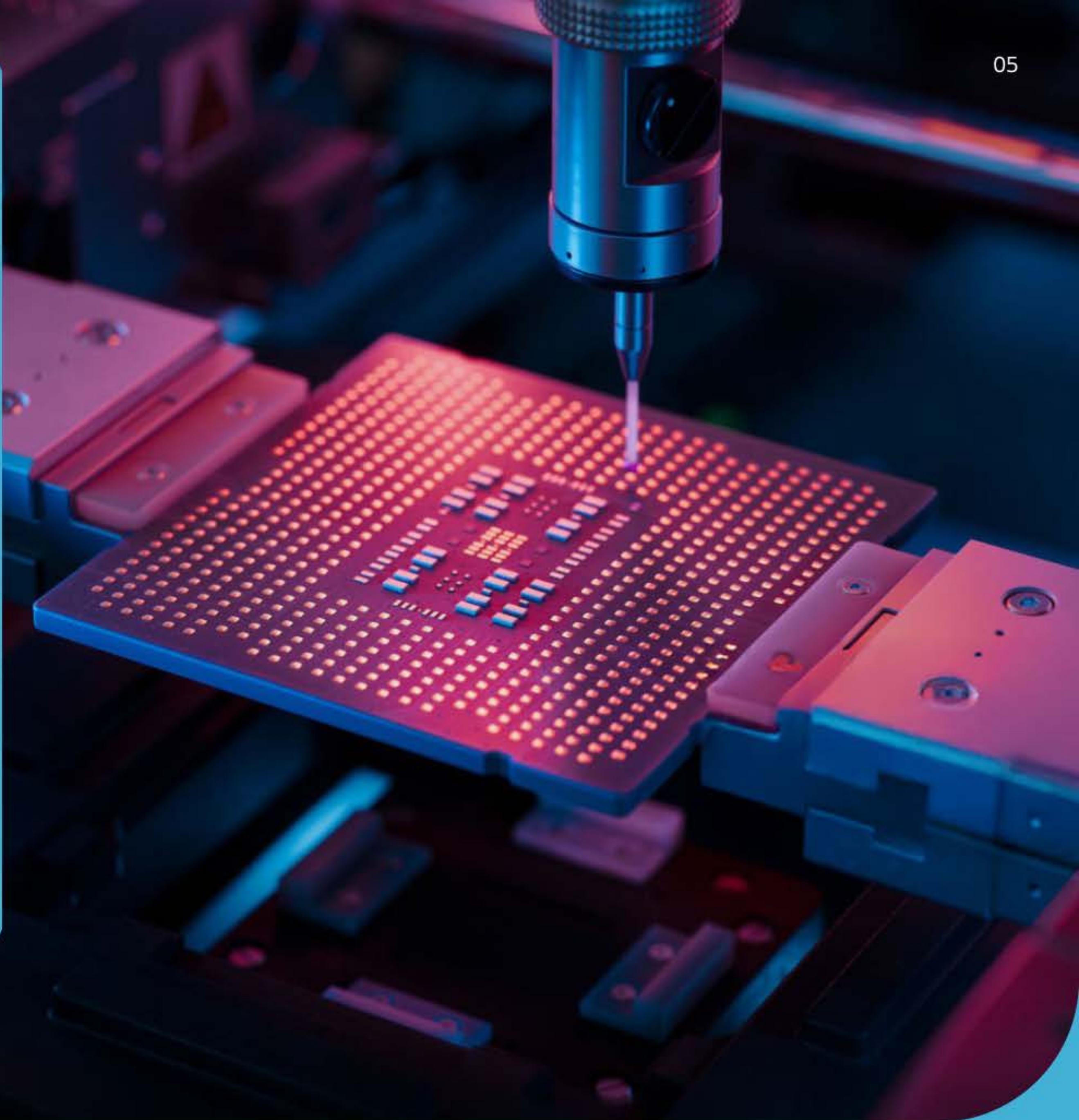
02. Introduction

Many technology businesses are vulnerable to supply chain risk. They depend on large numbers of components, which are often sourced from multiple markets. Manufacturing is carried out worldwide, and a single item might be built across multiple assembly lines. And many businesses commit to demanding timeframes built around high-profile product launch dates.

The uncertainties of recent years have repeatedly exposed the fragility of the sector's supply chain. Ukraine, for instance, produced more than half the world's supply of neon, which is needed for the lasers that produce the chips that power mobile phones and laptops. The conflict there exacerbated a chip shortage caused by the Covid-19 crisis.²

Extreme weather is another threat, and events are becoming more frequent as the climate changes. In 2022, for example, Hurricane Ian caused widespread flooding across Florida and other southern US states that closed sites relied on by high-tech manufacturers.³

The crises keep coming. Nintendo, for instance, was forced to delay pre-orders of its Switch 2 gaming console for US customers⁴ to assess the impact of changes to global tariffs.



Some businesses are doing better than others

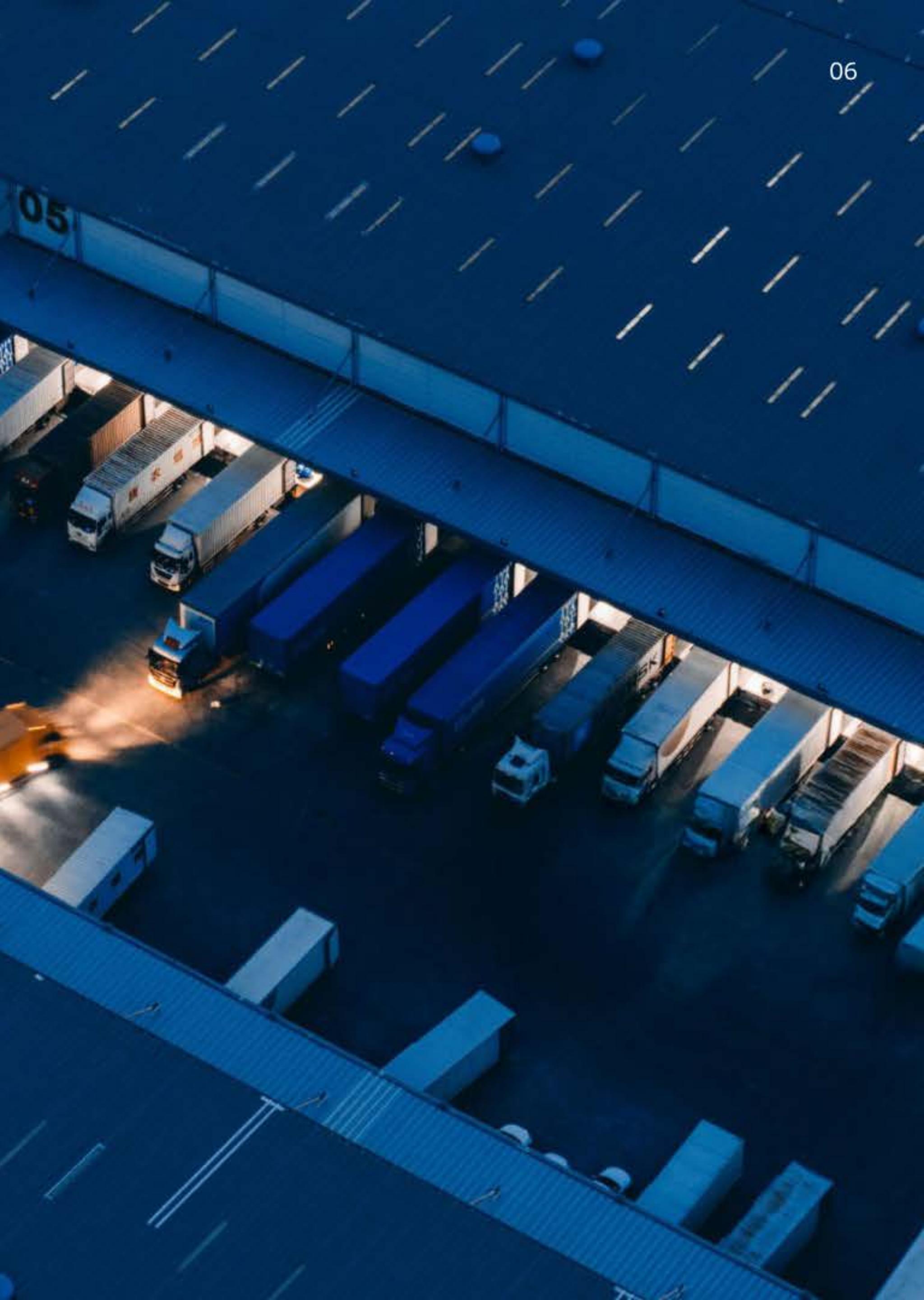
Across the technology sector in our research, the average business lost an equivalent of 3.61% of revenues in its last fiscal year because of disruptions to the supply chain. However, a small number of organisations performed far better and reduced losses to a minimum. These businesses are the “resilience frontrunners”.

These frontrunners aren't just managing risk more effectively. One in four have experienced revenue growth linked to their supply chain resilience improvements, and one in eight improved their profit margins (see Chart 2). On the flip side, the least resilient tech companies in our survey – the “resilience followers” – were more likely to suffer from shrinking profit margins caused by supply chain disruption.

The followers also struggle with growing supply chain costs and poor return on investments in supply chain resilience measures.

“Leading organisations recognise that supply chain resilience gives them a competitive advantage. We look at our supply chain as a contributor to our revenues. If our supply chain doesn't deliver from an operational standpoint, it's a brake on our commercial effectiveness – and on our growth.”

Matteo Pecci
Chief operating officer
De'Longhi

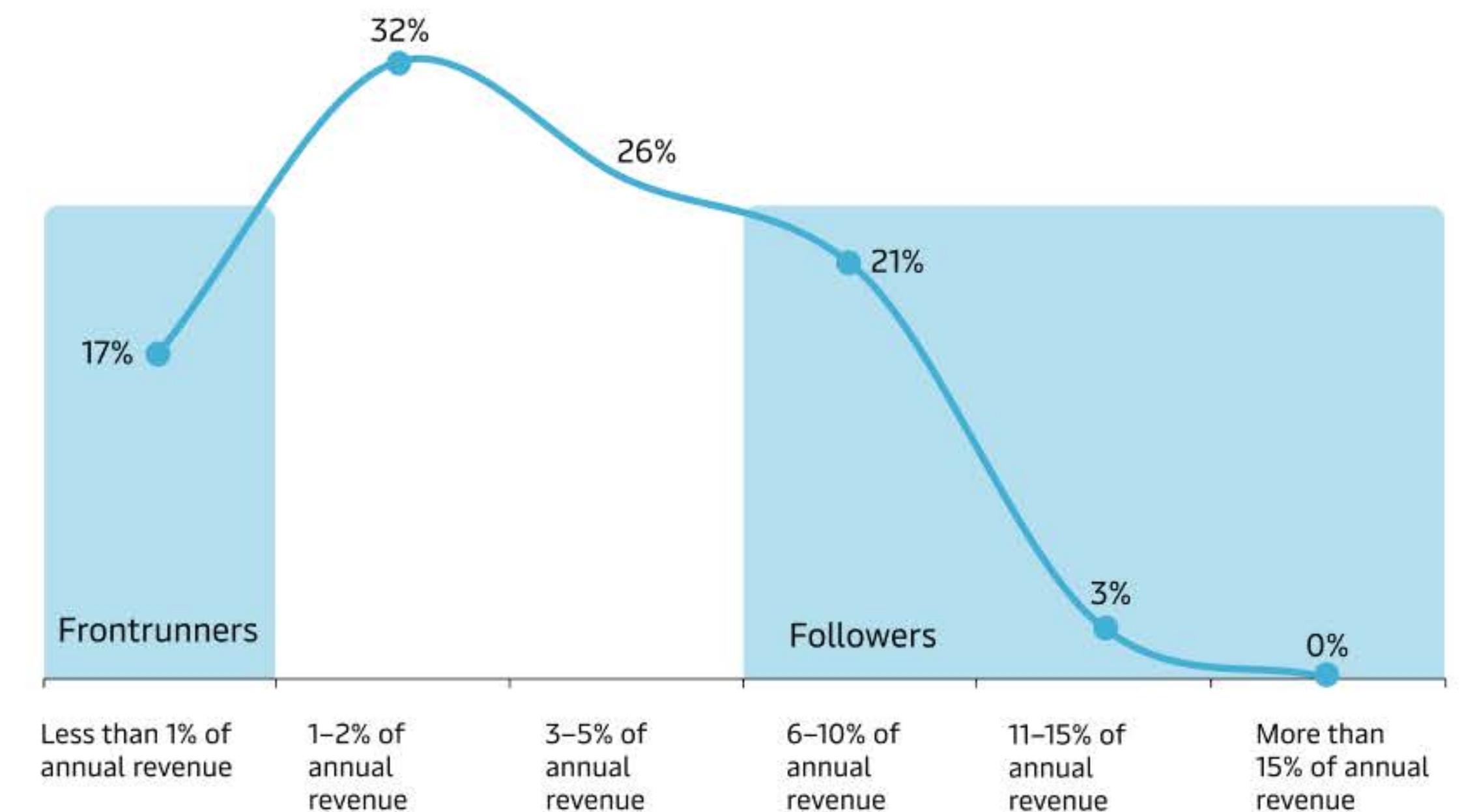


A closer look at the resilience frontrunners

We looked at variations in average annual revenue losses in tech companies caused by supply chain disruptions. The ones with losses of less than 1% of revenues in the most recent fiscal year are the resilience frontrunners, and the ones with losses of more than 5% are the resilience followers. Using this methodology, 17% of tech organisations emerge as frontrunners and 24% are followers (see Chart 1).



Chart 1: The frontrunners are 17% of technology firms



Overconfidence is creating complacency

But do the least resilient businesses know they're behind? Our research suggests that too many tech businesses are complacent about the robustness of their supply chains: 61% of supply chain leaders at technology businesses believe their organisation is more resilient than its industry peers.

Statistically, they can't all be right.

Complacent businesses risk their ability to recover from supply chain disruption. They will also miss out on significant upside potential. Our research reveals that the most resilient organisations do a better job of keeping their customers happy: they're smarter at anticipating problems, quicker to respond and more reliable on delivery.

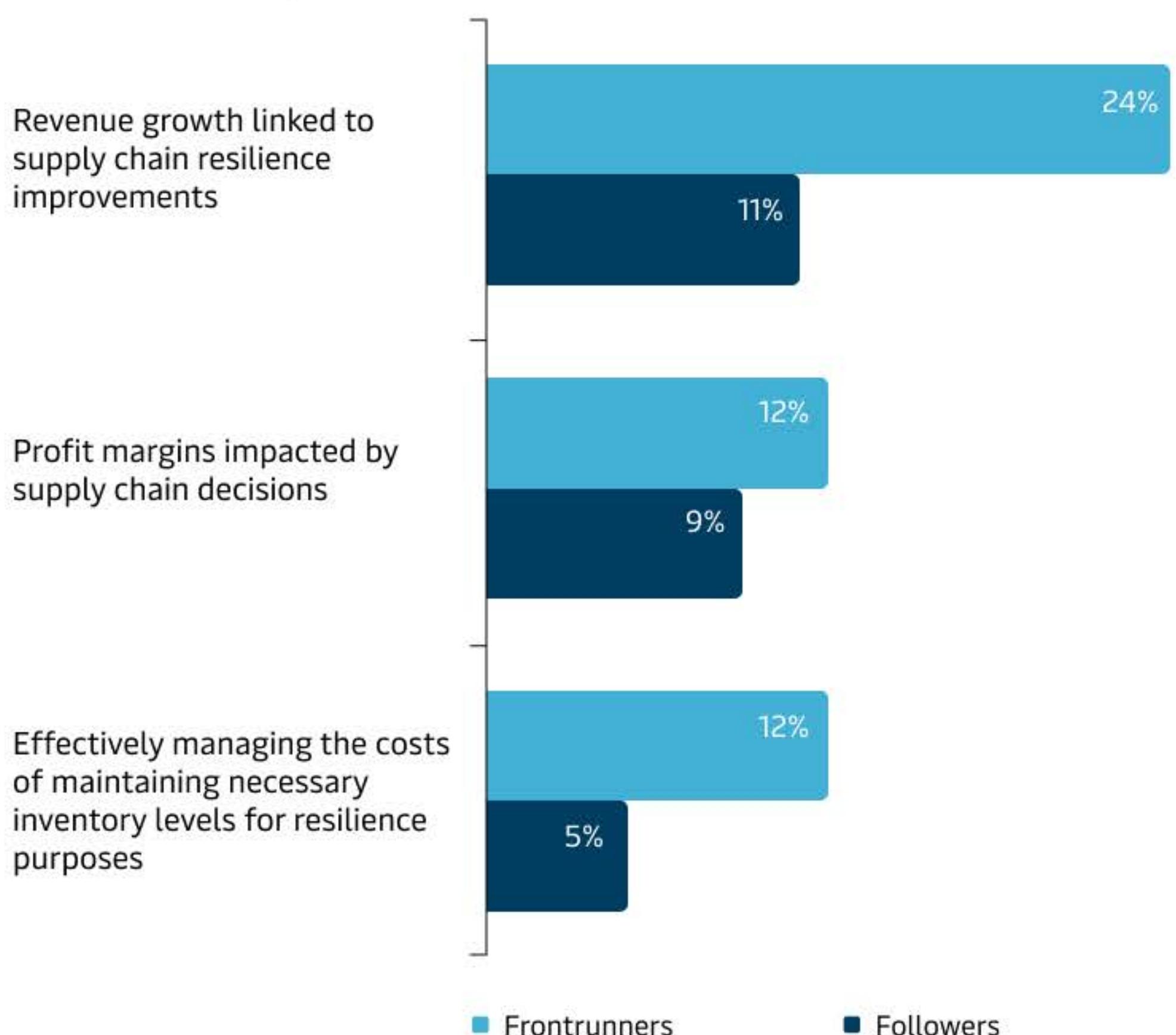
This translates into better financial performance (see Chart 2).

The good news is that the frontrunners give the rest of the tech sector ways to improve across three crucial pillars of supply chain resilience.

This report examines:

- How the frontrunners count on **leadership, people and skills** to maximise resilience
- How they make the most of **technology and data**
- How they **share responsibility** to drive supply chain resilience

Chart 2: The resilience frontrunners perform better than other companies



03. How the frontrunners count on leadership, people and skills to maximise resilience

The resilience frontrunners have a clear view of the role of the supply chain function and the chief supply chain officer (CSCO). If supply chain resilience is a critical driver of overall business performance, they argue, the function must play a more strategic role in the organisation.



97% of the frontrunners agree that the supply chain function needs to become a central pillar of the organisation's strategic thinking.

Frank McKay, Chief Supply Chain and Procurement Officer at global electronics and manufacturing services company Jabil, agrees that resilience is a strategic lever companies can't afford to ignore: "It's become a clear mandate from our customers: the best way to add value to our relationship is delivering absolute supply chain resilience."

Asked to rate their current CSCo role in terms of its contribution to the organisation's growth strategy, the resilience frontrunners average a score of 8.12 out of 10; among the resilience followers, the score is only 6.80 (see Chart 3).

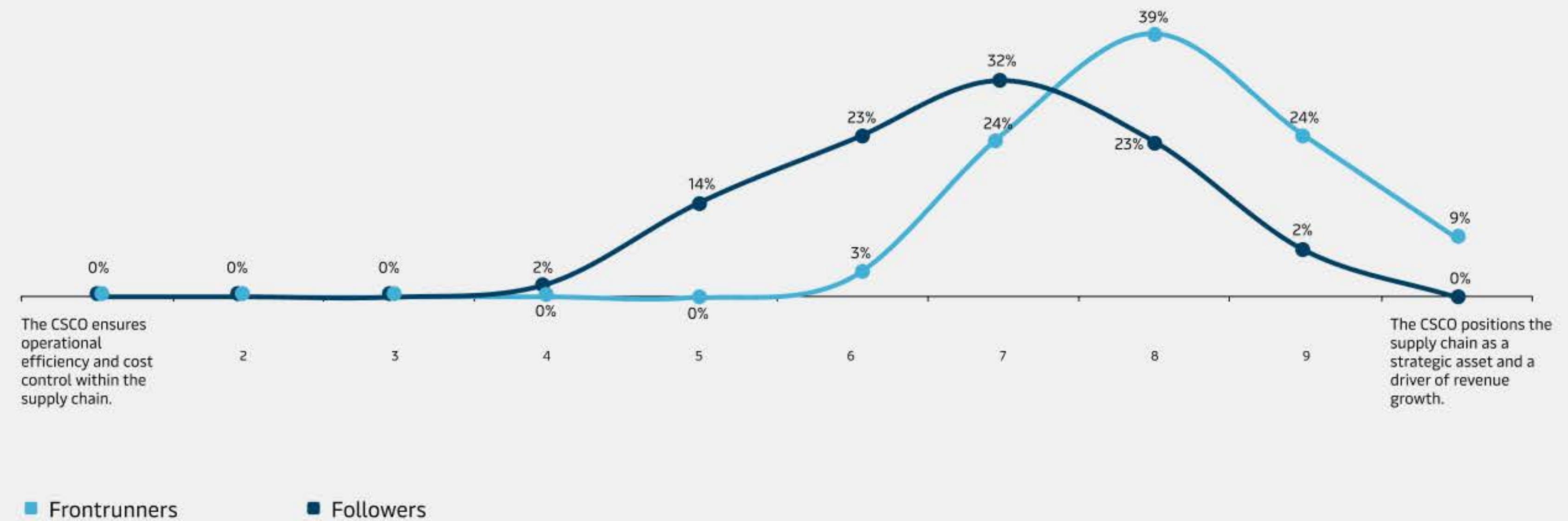
CSCOs with such a strategic remit see supply chain resilience as an organisation-wide imperative that requires them to work with colleagues across functions.

Jabil is an example of a business that's taking this approach.

"I report directly to our CEO, and attend our board meetings on a quarterly basis. I also work very closely with our operational leaders on scenario planning and risk. For Jabil, resilience has become part of our core DNA."

Frank McKay
Jabil

Chart 3: For the frontrunners, the role of the CSCo is more strategic



Time for the supply chain to skill up

This newly strategic supply chain function demands a different – and evolving – set of skills. The resilience frontrunners in the technology sector understand this. Nearly a quarter say that talent strategy to build a resilient and adaptable supply chain workforce is the most important strategic priority for CSCOs, compared with less than one in 10 of the resilience followers.

Unlike other businesses, which are more likely to focus on traditional supply chain competencies such as logistics expertise, the frontrunners aim to build a broad range of competencies. For example, they are more likely than the followers to focus on: collaboration and relationship management skills to deal with supply chain partners; proficiency in advanced supply chain technologies such as artificial intelligence (AI) and digital twins; and geopolitical risk management skills.

Acquiring these new competencies doesn't have to mean hiring – which in any case can be difficult because of talent shortages in many markets. The frontrunners are much more likely than the followers to look for internal solutions, such as upskilling:

- 24% of the frontrunners say cross-functional training is their top way to equip employees with technical and supply-chain-specific expertise, compared with just 7% of the followers.
- 15% of the frontrunners focus on targeted training programmes, compared with just 9% of the followers.

The frontrunners are also more likely to outsource specialised tasks to logistics service providers (LSPs), technology vendors or other external partners to overcome internal skills shortages.

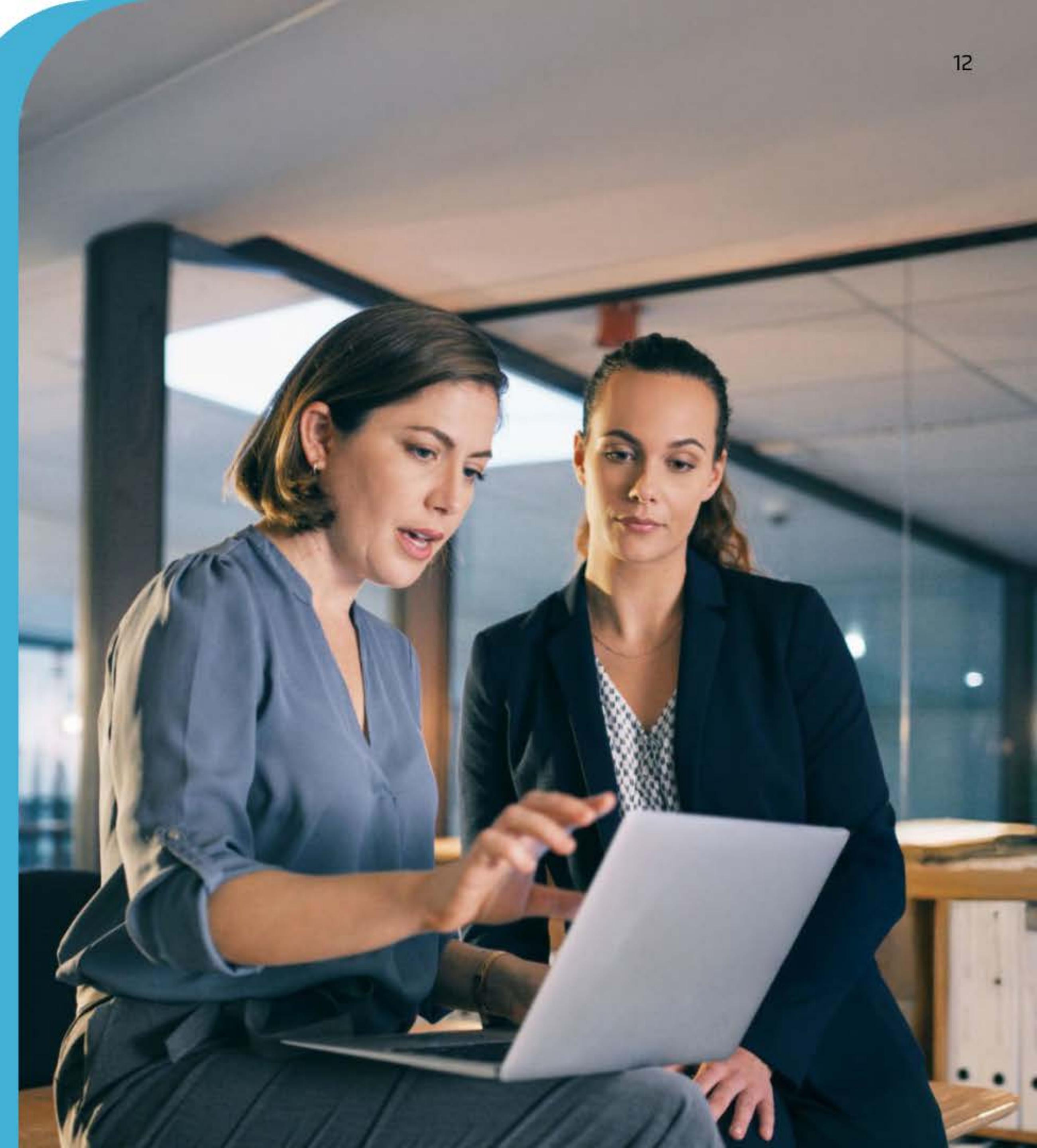
Stuart Whiting, Senior Vice President, Global Supply Chain - Logistics and Planning at Schneider Electric, says it's important to think differently about the cost of new competencies. "Is it a cost or is it an investment?" he asks. "The most important thing for our customers is availability and reliability. The way we deliver on that contributes to growth – you can see that in our revenue quality and how we attract and retain our customers."



Key takeaways:

How to use leadership, people and skills like a resilience frontrunner

-  Position your supply chain function – led by the CSCO – as a strategic enabler of growth rather than as a cost centre.
-  Work closely with other functions and teams to build a resilience culture across the organisation.
-  Optimise the skills mix in your supply chain team, blending technical and technological competencies with softer skills such as communication, relationship building and risk management and awareness.
-  Fill talent gaps by upskilling and forming partnerships with third parties that can supplement in-house expertise and experience.



04. Making the most of technology and data

To increase resilience, the modern supply chain function is turning to emerging technologies – and the skills it needs to use them effectively. Our research shows that the resilience frontrunners are determined to do this.

Many organisations are planning to increase their investment in advanced tech, as well as in the data collection, management and analysis that provide the foundations for the new tools.



45% of the resilience frontrunners say that advanced supply chain technology skills are among the competencies they want to add to their teams over the next one to two years.

Already, almost a quarter of technology businesses (including more than a third of the frontrunners) describe predictive analytics tools for supply chain planning as "mission critical".

Nearly a fifth say this about the digital twin technology that provides real-time visibility, crisis-scenario simulations and decision-making support.

Many technology companies are also already using AI in their supply chain functions – and are preparing to go further. They're particularly enthusiastic about stepping up the use of AI for risk detection, dynamic routing and transportation management, and for managing multi-tier supplier relationships. In each case, they say there's significant scope for AI tools to take responsibilities from humans.

Emerging technologies are more popular among the frontrunners

The resilience frontrunners in our research are particularly likely to be increasing their use of emerging technologies. For example, 61% are investing in advanced analytics tools to help them to forecast shifts in market demand and to adapt to supply chain disruption; only 43% of the followers are matching these investments.

“We use AI to run statistical forecasting that gives a pretty accurate assessment of what business will look like in our regions.”

Stuart Whiting

Senior Vice President
Global Supply Chain - Logistics and Planning
Schneider Electric

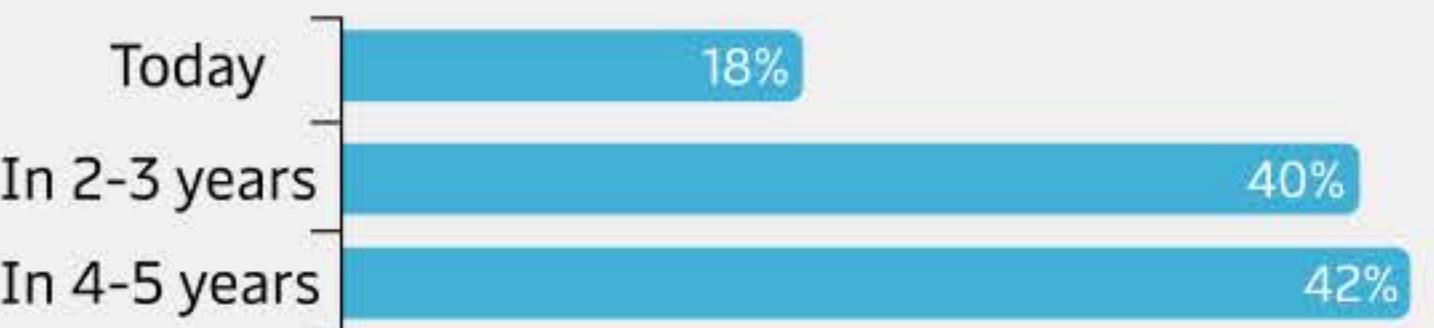


Schneider Electric is among the companies that are already benefiting from AI. "We use AI to run statistical forecasting that gives a pretty accurate assessment of what business will look like in our regions," says Stuart Whiting. "Then you can run the supply chain to satisfy that demand and free up your people to focus on parts of the business that need more human interaction."

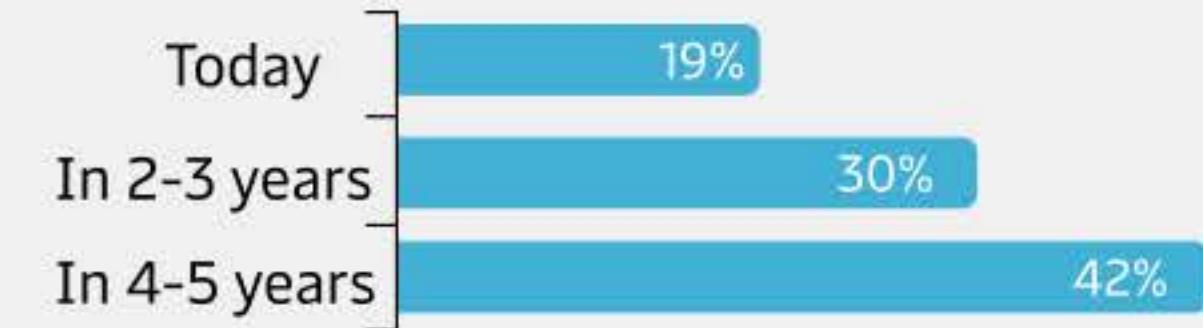
There's more investment to come: technology companies intend to shift towards data-driven resilience in the years ahead. For example, the proportion of organisations that see predictive analytics as mission critical is set to reach 47% within four to five years; 44% expect digital twin technology to become mission critical within the same period (see Chart 4).

Chart 4: There's growing dependence on technology to increase supply chain resilience

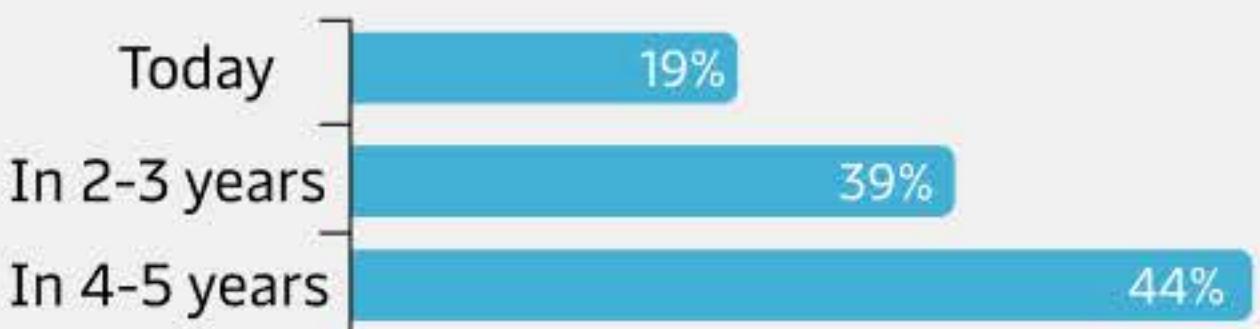
Real-time risk visibility and actionable insights
for proactive disruption management



Multi-tier supplier mapping to enhance transparency and ensure regulatory compliance



Digital twin technology for real-time visibility, crisis scenario simulations, and decision-making support



Predictive analytics for supply chain planning to improve resilience



■ Mission-critical – Essential for achieving supply chain resilience; cannot operate effectively without it

Data needs to be optimised – and then handled with skill

The workforce will need to be equipped to work with these tools: 29% of technology companies are worried that they lack the skills to extract actionable insights from supply chain data.

“We’re working on tools and systems that summarise data to make it more usable as an input for decision making. Lack of data is not an issue – we need to find ways to process the data in more meaningful ways.”

Matteo Pecci
Chief Operating Officer
De’Longhi

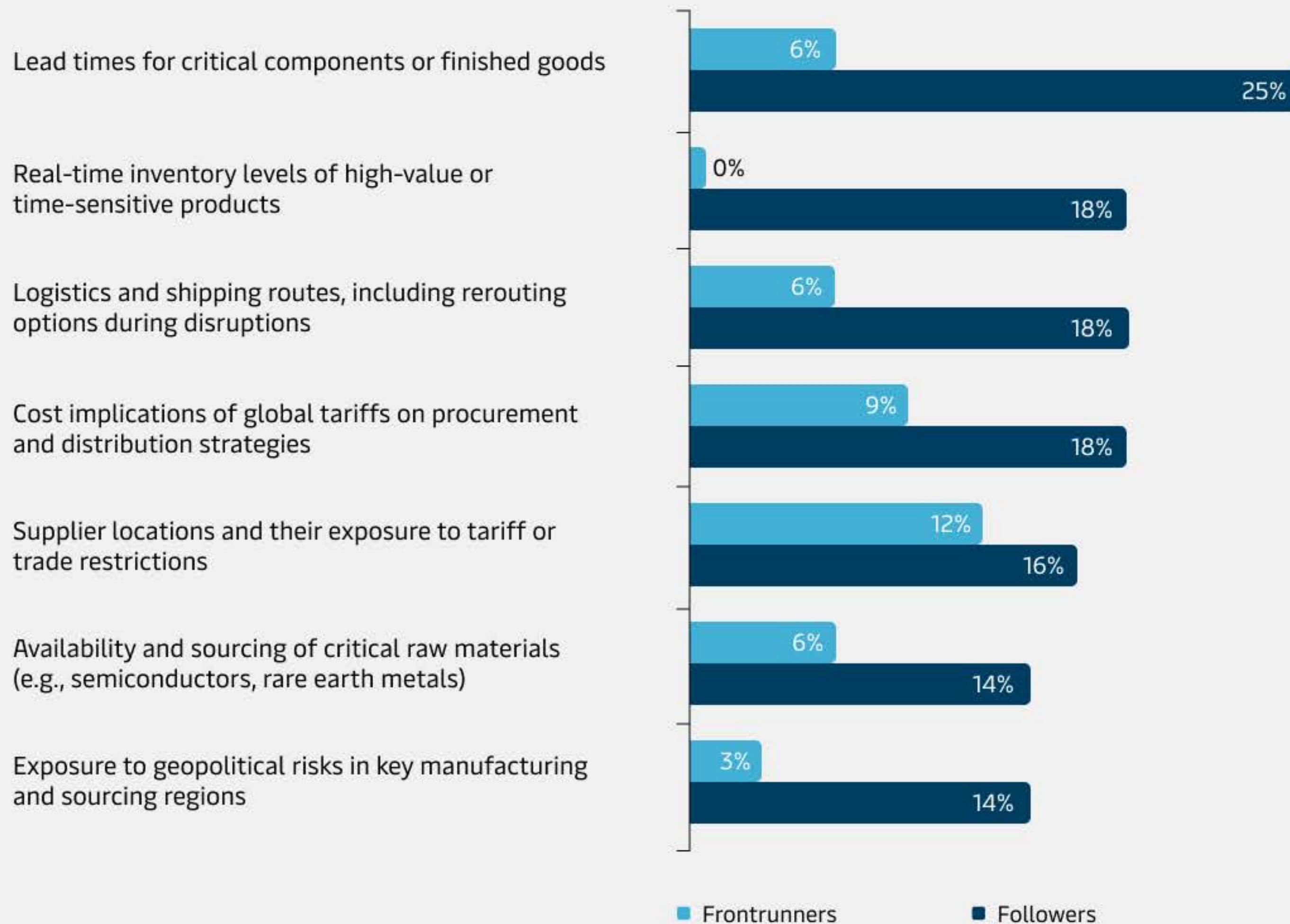
Jabil is exemplary in the way the company is investing in data optimisation. It uses a tool to track its 38,000 suppliers that models in real time the impacts of changing market dynamics and potential or actual disruptions.

When an earthquake hit Myanmar and Thailand in early 2025, says McKay, “we could easily identify all our suppliers in the region that might be affected and immediately begin communicating with them. Within seconds, we were able to start working on contingency plans and to identify where we might need to use alternative suppliers.”

But many companies aren’t there yet. The followers struggle with visibility of lead times for critical components and finished goods, real-time inventory levels, and logistics and shipping routes – including rerouting options. They’re also finding it harder to get a clear understanding of the cost implications of tariffs (see Chart 5). The frontrunners have fewer issues with visibility.



Chart 5: The resilience followers have less visibility of their supply chain data



Key takeaways:

How to optimise technology and data for supply chain resilience

Future proof your supply chain resilience by investing in AI, digital twins and other emerging technologies, and collaborate with partners that offer access to these tools.

Assess your foundational data. Close gaps in that data to build a 'single source of truth' for the business, using both internal and external data sources. Invest in tools that allow you to exploit this data.

Build your supply chain function's skills and expertise. Make sure that the whole team is comfortable working with emerging technologies, and work with third parties to add to your talent.

05. Share responsibility to drive supply chain resilience

The supply chain function doesn't exist in a bubble. The most resilient businesses in the technology sector value closer partnerships with a broad ecosystem of partners – within their own organisations and beyond.

"We work backwards from our customers," says De'Longhi's Matteo Pecci. "We have cross-functional processes, tools, reports and KPIs that are all designed around serving our customer in the optimal way, rather than organised around individual business functions."



The resilience frontrunners are consistently more likely to acknowledge the value of collaboration and to be acting on it:

97%

say that cross-functional expertise, collaboration and partnerships are increasingly crucial for preparing for supply chain disruption and for mitigating risk, compared with only 80% of the followers.

88%

collaborate across their ecosystems to map and understand their entire supply networks – more than twice as many as the followers (43%).

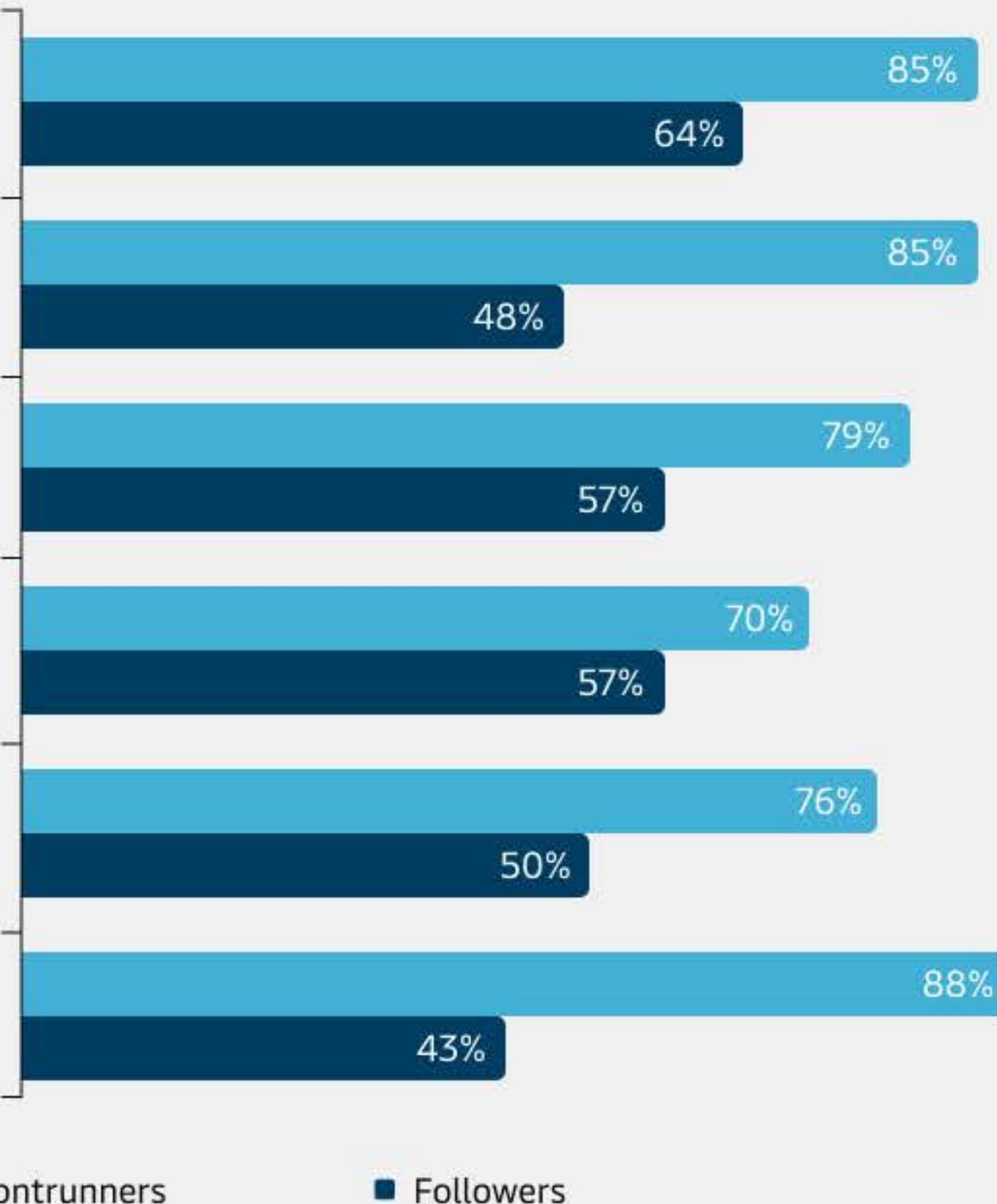
85%

are working with their partners to coordinate forecasting, capacity planning and order management. Just 64% of the followers have made this leap (see Chart 6).



Chart 6: The frontrunners are more likely to collaborate with their supply chain network to improve resilience

Coordinating forecasting, capacity planning, and order management to improve adaptability to changes



Maintaining open and frequent communication channels for quick problem-solving during disruptions

Investing in long-term partnerships and trust-building to strengthen collaboration during crises

Exchanging real-time data and insights about supply chain events, risks, and performance metrics

Sharing knowledge and best practices for risk management and resilience strategies

Collaborating to map and understand the entire supply network, including sub-tier suppliers, for better risk identification and mitigation

“There are multiple ways in which we collaborate with our partners. From co-innovation on products to embedding sustainability and becoming more cost effective, we work alongside our strategic suppliers and logistics partners.”

Stuart Whiting

Senior Vice President
Global Supply Chain -
Logistics and Planning,
Schneider Electric

Whiting says that Schneider Electric has deliberately and drastically reduced the number of logistics providers it works with, from 1,450 in 2012 to 16 key partners today. “We co-host together in our control towers to ensure we have end-to-end solutions and execution in delivery.”

The frontrunners are pursuing more sophisticated collaborations

Some organisations plan to go further: 42% of the frontrunners say that cross-functional decision-making processes and workflows are an area for improvement as they seek to balance supply chain agility with long-term stability.

42% of the frontrunners identify cross-functional decision making and workflows as an area for improvement, compared with just 23% of the followers

Looking outside their organisations, the frontrunners are also focusing on enhanced data sharing with supply chain partners. Sourcing more data from across their supply chain ecosystems will help these organisations to achieve better results from emerging technologies.

"Our VCommand platform enables us to connect third parties to create a single source of the truth," says Jabil's Frank McKay. "It's not just Jabil and its supply chain function building something from scratch – our partners have been instrumental in our efforts."

Building these relationships isn't straightforward, but the most resilient technology companies see an opportunity to create effective, mutually beneficial partnerships. For example, 55% of the frontrunners are renegotiating supplier contracts to share the impacts of global tariffs, compared with only 34% of the followers.

Key takeaways:

How to collaborate for supply chain resilience

 Map your supply chain network: identify all the partners in your network, including sub-suppliers, to identify and address risks before they cause problems.

 Build coalitions of the willing: Tap into your supply chain network by collaborating with internal and external partners, and set up data-sharing arrangements.

 Keep talking: follow the lead of the 85% of the frontrunners that have open communication channels for rapid problem-solving.

06. Logistics service providers are at the heart of supply chain resilience

With their global service centres and networks of physical and digital infrastructure, LSPs are vital to the flow of goods and materials around the world.

They are also vital to resilience. A third of technology businesses say that securing efficiency gains from optimised logistics and transportation services has been one of their three biggest successes over the past two years as they sought to balance cost effectiveness with resilience.



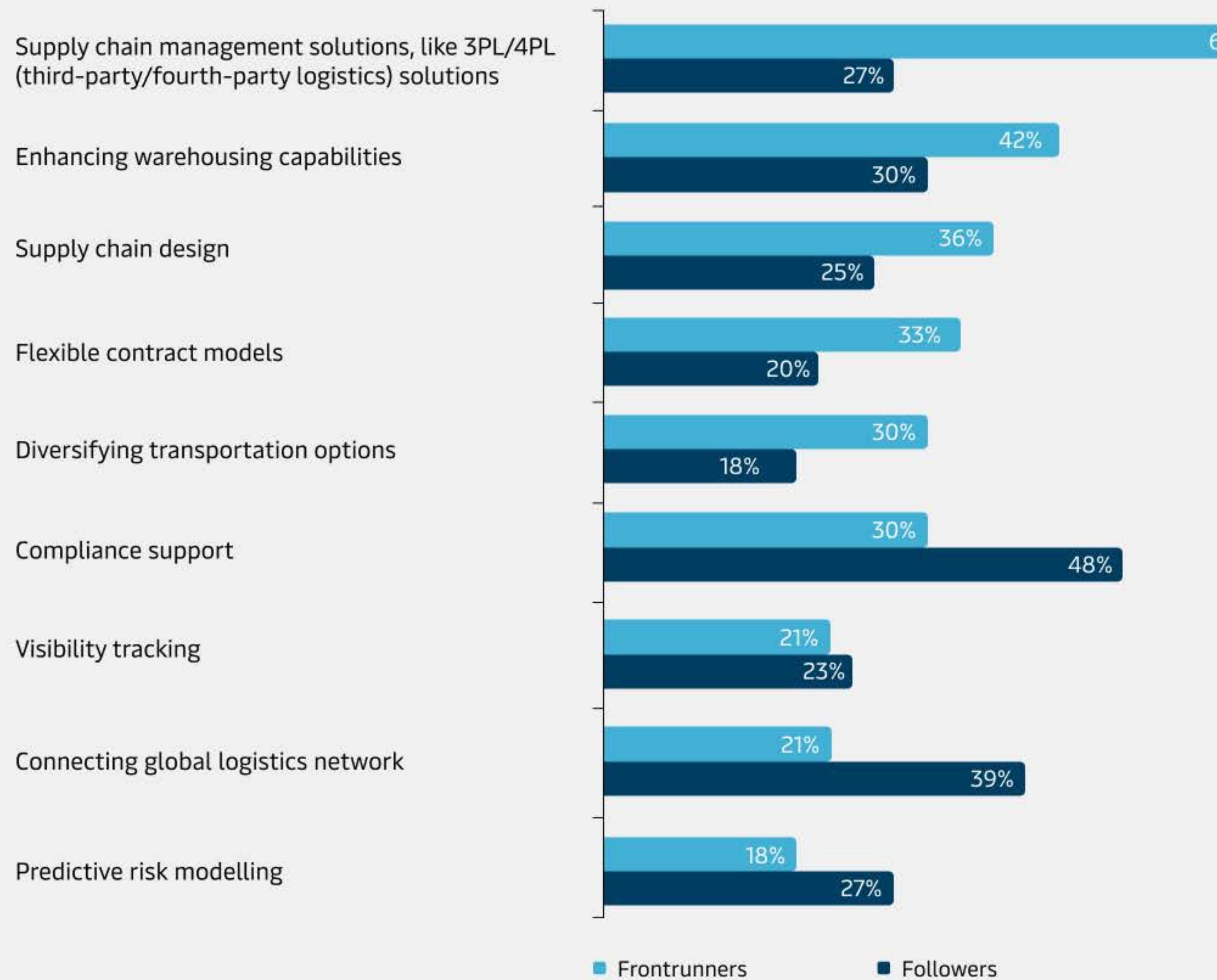
33% of technology businesses include efficiency gains from optimised logistics among their top three resilience successes from the past two years, but 20% had problems

20% of technology organisations say that this is an area where they have experienced significant setbacks. So logistics is a high-impact resilience lever: it can create measurable gains for organisations that get it right, and negative consequences for the ones that don't.

The frontrunners in our research are particularly likely to see the value of many of the services offered by LSPs, and they're thinking more broadly about their relationships with logistics partners. For example, 61% say that supply chain management solutions such as third party and fourth-party logistics (3PL and 4PL) services as valuable for boosting resilience, compared with only 27% of the followers (see Chart 7).



Chart 7: The frontrunners are using a wider range of LSP offerings that drive resilience

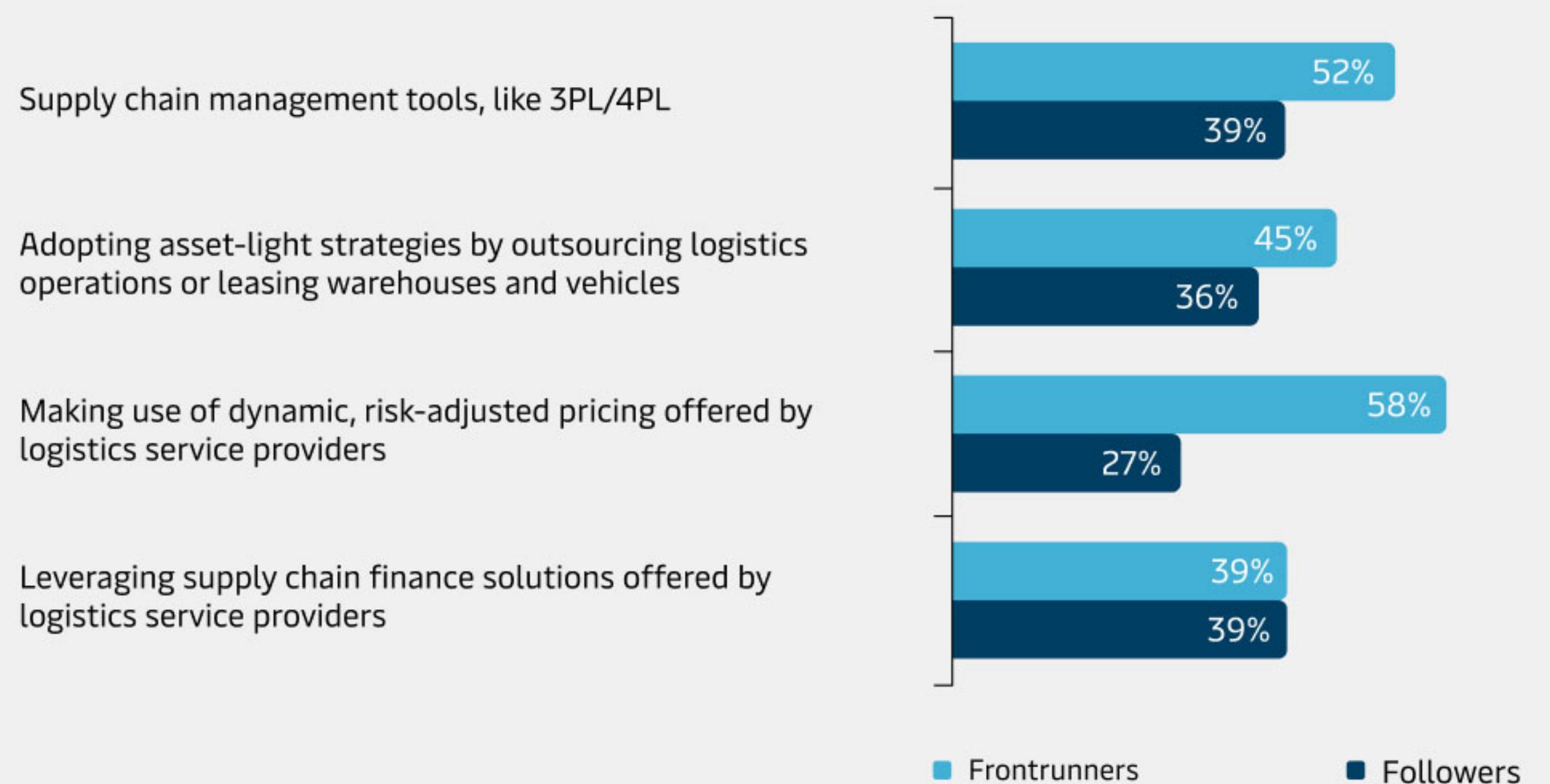


The frontrunners also see value for LSPs in areas such as supply chain design and flexible contract models, as well as in more obvious places such as enhanced warehousing capabilities and diversification of transport options.

There's also considerable scope for tech companies to work with LSPs to increase financial resilience in the supply chain, and the frontrunners recognise this. More than half (58%) are using the dynamic, risk-adjusted pricing now offered by some LSPs, and almost as many have adopted 3PL and 4PL supply chain management tools. The frontrunners are also more likely to be outsourcing logistics operations or leasing warehousing and vehicles as part of an asset-light strategy (see Chart 8).

A clear picture emerges from our tech sector research: the frontrunners are using LSPs to build flexibility and adaptability – and therefore additional resilience – into their supply chain management.

Chart 8: The frontrunners value LSP offerings that improve financial supply chain resilience



“When you work with LSPs that have their own assets and equipment, you can make positive changes more quickly and transparently. You get cost efficiency, but you can also co-invest – particularly in digitisation and data.”

Stuart Whiting
Senior Vice President
Global Supply Chain -
Logistics and Planning,
Schneider Electric

07. Course for Change: Mastering supply chain resilience in an unconventional world

The technology sector recognises the critical importance of improving supply chain resilience. Every company in our research said they're investing in increasing resilience in one way or another.

But even if the sector's average disruption-related losses are slightly smaller than in others, many technology companies have a lot of work to do. The pressure is mounting.

The good news is that some tech firms are improving their resilience and minimising the impact of disruption. These frontrunners are enjoying the commercial upside of resilient supply chains, and their efforts are translating into genuine competitive advantage. This best-in-class approach gives other, less resilient companies a template they can – and must – follow. If they don't, they could fall even further behind.



The frontrunners' approach is strategic. They:

-  Position the **CSCO and supply chain function as drivers of growth**, not just operational enablers.
-  Equip their teams with a **forward-looking mix of skills**, focusing on adaptability, digital capability and cross-functional expertise.
-  Invest in **advanced technologies** while building the skills and data foundations they need to maximise their effectiveness.
-  Work closely with **partners across the value chain**, and emphasise that resilience is a responsibility that's shared with suppliers, sub-suppliers and LSPs.
-  Embed resilience thinking beyond the supply chain team by creating **awareness and accountability across every function** in the organisation.
-  Invest in scenario planning and simulation **tools to prepare for disruption**, rather than waiting to react to it.
-  **Map their supply networks** in depth, including sub-suppliers, so they can identify and address vulnerabilities before they get worse.
-  Approach **partnerships with logistics providers** strategically, targeting financial and operational resilience as well as cost efficiency.

Less resilient organisations in the technology sector aren't doing nothing – many are investing in similar areas. But they tend to be at an earlier stage and are more likely to lack internal alignment and to be less open to the external collaborations that can help them get the most value from their investments.

The frontrunners show us that resilience is a competency that requires commitment from across the business and beyond. And in an unconventional world, it's a competency that has the power to propel your tech business ahead of the rest.



Appendix: About our research

This report is part of a broader series of reports covering five sectors: lifestyle, retail, fast-moving consumer goods, technology and auto.

The survey took place in February and March 2025 and covered 19 countries, with 26% of respondents based in North America, 26% in Europe, 26% in Asia Pacific, 11% in India, the Middle East and Africa, and 11% in Latin America.

The technology survey

This report draws on the analysis of responses from 190 technology sector experts from four industries: consumer electronics (39%), manufacturing of home appliances (27%), power management and automation (25%), and wearable tech (9%).

Respondents are C-level executives (22%) and senior supply chain, procurement and operations professionals.

- 62% represent companies with revenues between US\$1bn and US\$10bn
- 22% have revenues of between US\$500m and US\$1bn
- 16% have revenues above US\$10bn

We would like to thank everyone who took part in the research.





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