

BERYLLS BY ALIXPARTNERS

WHEN THE SHOCK HITS THE STOCK: WHY THERE IS MORE TO A RESILIENT SUPPLY CHAIN THAN INVENTORY INCREASE



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INSIGHT

From 2021 to 2023, selected leading OEMs in Germany, the US and China have increased their inventories on average by 50%. While this may be a measure to address turbulent supply chains, it is time for OEMs to think more radically to safeguard their supply.

For a more resilient supply chain OEMs and suppliers should focus on enabling the procurement organization for taking a more holistic view on the supplier award as well as on smart product design and further vertical integration in the supplier network.

Ultimately, OEMs and suppliers need to make long-term thinking a virtue, integrate supply chain thinking and stay alert for the next crisis.

INTRODUCTION: WHEN THE SHOCK HITS THE STOCK

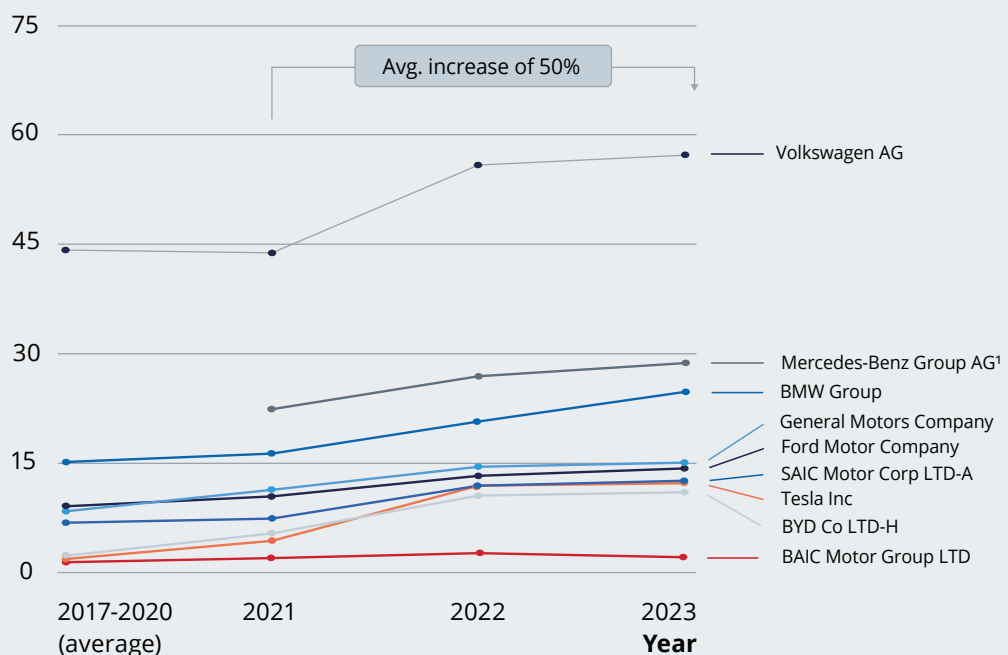
Since 2020, one crisis after another has been hitting OEMs and suppliers in their global supply chains, ranging from factory shutdowns caused by the COVID-19 pandemic to shipping delays and the war in Ukraine. Most recently, attacks on cargo ships in the Red Sea have added weeks to delivery times between Asia and Europe causing supply chain experts at all tiers sleepless nights.

On top of the geopolitical disruption, OEMs' supply chains are changing and becoming more complex, as a greater share of electric vehicle (EV) components and software-controlled electronics are added.

One of the most prominent "fall-back-measures" to address impacts from supply chain turbulences is inventory. In response to the pandemic and increasing instability, one would expect changes in this strategy. Indeed, post-COVID, the inventories of the largest German, Chinese, and US OEMs are increasing in the post-Covid period compared to the pre-Covid average. During the post-COVID period from 2021 to 2023, these OEMs saw a notable surge in inventories by an average of 50% (Figure 1).

FIGURE 1: INVENTORY DEVELOPMENT OF BIGGEST GER/US/CN OEM

INVENTORY [BN. EUR]



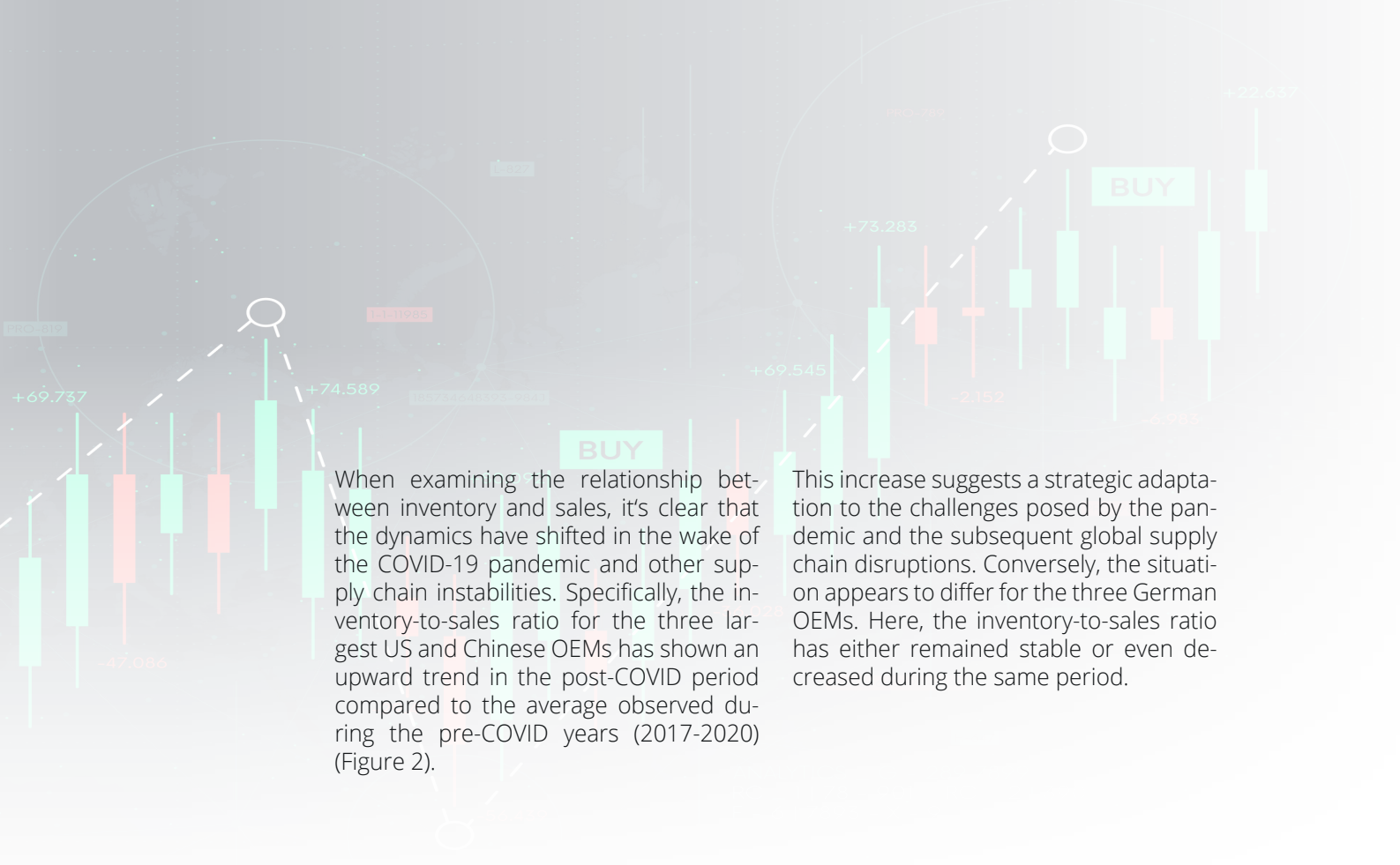
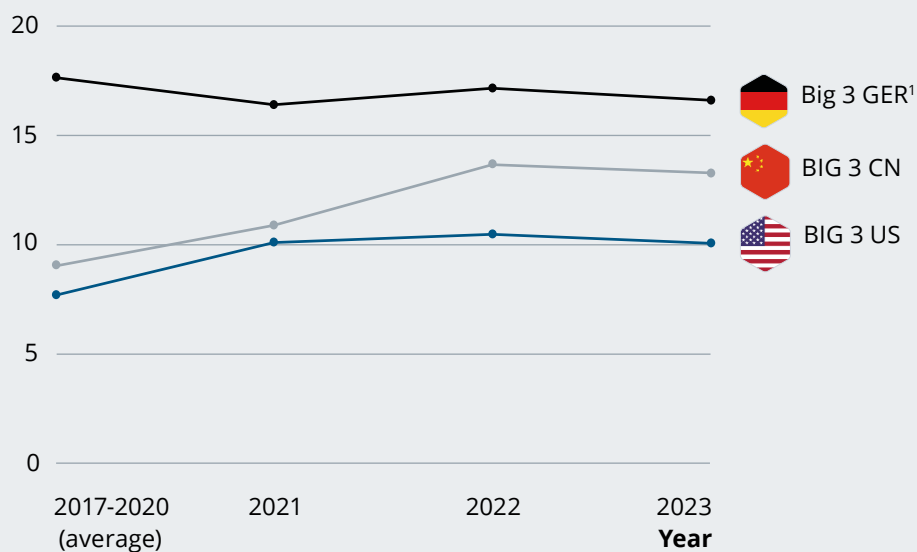


FIGURE 2: INVENTORY/SALES RATIO BIGGEST GER/US/CN OEM

AVG. INVENTORY/SALES [%]



BMW Group, Mercedes-Benz Group AG, Volkswagen AG
 BAIC Motor Group LTD-H, BYD Co LTD-H, SAIC Motor Corp LTD-A
 General Motors Company, Ford Motor Company, Tesla Inc

Source: Bloomberg 01.04.2024

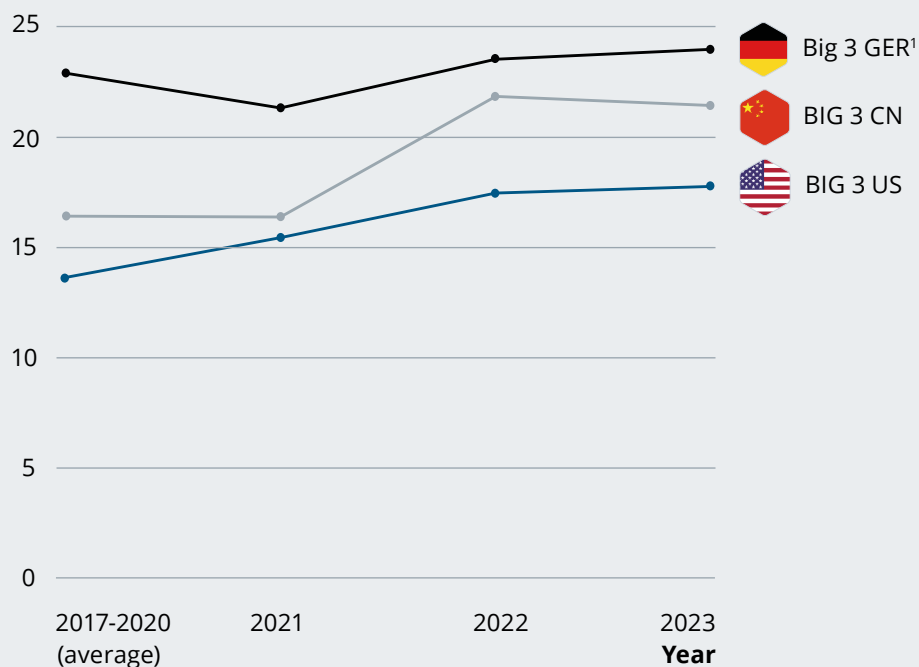
¹Values for Mercedes-Benz Group AG before 2021 excluded because of Daimler Trucks spin-off


During the post-Covid period of 2021-2023, the share of inventories as a portion of assets among major German, US, and Chinese OEMs surpassed the average of the pre-Covid period from 2017 to 2020. This trend suggests that these


companies may have accumulated larger inventory holdings during the Covid-19 pandemic to prepare for uncertainties and disruptions in supply chains.


FIGURE 3: INVENTORY/CURRENT ASSETS BIGGEST GER/US/CN OEM

AVG. INVENTORY/CURRENT ASSETS [%]



 BMW Group, Mercedes-Benz Group AG, Volkswagen AG

 BAIC Motor Group LTD-H, BYD Co LTD-H, SAIC Motor Corp LTD-A

 General Motors Company, Ford Motor Company, Tesla Inc

Source: Bloomberg 01.04.2024

¹Values for Mercedes-Benz Group AG before 2021 excluded because of Daimler Trucks spin-off

In summary, we observe changes in inventory levels among OEMs worldwide. Nonetheless, relying solely on inventory to address supply chain risks comes with considerable costs. Therefore, it's imperative to explore more efficient and

innovative approaches to mitigate risks associated with supply chains. In the following, three levers to improve will be presented.

LEVERS FOR IMPROVING SUPPLY CHAIN RESILIENCE

LEVER 1: ENABLING THE PROCUREMENT ORGANIZATION

Currently, when OEMs' procurement teams select suppliers, the final decision is often made based almost solely on price. However, that excludes many other costs that may emerge over the course of the supply contract, which a more comprehensive view would take

into consideration, for example: supply chain stability and resilience. When taking a more comprehensive view on an award, six main factors can be used to give procurement departments a broad, structured approach to assess suppliers offer:



PRICE AND NEGOTIATED TERMS

The monetary value standardized to a point in time, which was saved by cost reduction measures (i.e. negotiated terms with supplier)



PAST DELIVERY PERFORMANCE

Overall performance of suppliers (e.g., based on error rate, on-time delivery)



SUSTAINABILITY SCORE

Evaluation of sustainability efforts (CO2, materials, energy, compliance incidents)



SUPPLY CHAIN RESILIENCE

Assessment of the resilience of the supply chain (e.g., risk, delivery time, single source, transparency, etc.)



SUPPLIER-DRIVEN INNOVATION

Quantification of innovation capability through collaboration with suppliers



ADDITIONAL ENABLEMENT COSTS

Potential cost for a requirement enablement and reactive activities to underperformance of supplier and supply chain

With these broader factors in mind, OEMs and suppliers can assess the total cost of the contract, similar to a 'total cost of ownership' (TCO) approach and look to improve the target values to achieve the best possible overall cost. In the current approach taken by many OEMs, the main focus is for the directly accessible cost such as material costs, development cost or investment. However, over time additional cost may emerge, e.g. for enabling the supplier, delays in delivery, late maturity or line stoppages at worst. This means OEMs lack control over additional cost claims that suppliers make as well as that incur without active claiming once the sourcing decisions have been made and the contract is under way. Instead, with a broader awareness and consideration of cost as well as a corresponding methodology and toolset, optimization is assessed in parallel across all elements - materials, development, investment, carbon footprint, (lack of) innovativeness, supply stability and development excellence. All the variables contribute to the cost reference point throughout the life of the contract that should be considered for awarding ultimately leading to a more realistic depiction. However, we acknowledge the pressure felt by procurement departments - selecting a supplier that is quoting a higher price than others is often not a very popular decision with ma-

nagement teams. Most procurement departments and purchasing organizations are also not structured or incentivized to take decisions based on a broader perspective of cost - especially when short-term costs are higher, even if the cost over the life of the contract is lower because deliveries happen on time and meet the required quality. However, organizations can change and develop to allow better sourcing decisions, using the following five levers to go beyond the price tag:

Firstly, incentives and individual performance assessments must be based on the broader view of cost, as agreed by the company. Secondly, the procurement organization's decision-making structure and assessment tools must allow decisions to be made on that basis. Thirdly, a more cross-functional approach to procurement will bolster the broader cost perspective. Moreover, involving the teams responsible for both the developmental and series production stages of the car in contract awarding is crucial, given the evolving nature of supply chain considerations throughout the project lifecycle. Finally, establishing a procurement culture based on TCO will support all these changes.

HOW GEN AI CAN HELP

The procurement teams of OEMs and tier-1 suppliers face staff shortages and regulatory supply chain standards that require continuous monitoring and changes in documentation. For suppliers, new process standards from OEMs also mean an increase in paperwork. For these reasons, OEMs and suppliers are being pushed to make efficiency gains in the procurement function.

We believe GenAI tools can help in the following ways:

External stakeholder engagement: Gen AI facilitates procurement team interactions with suppliers and external partners, e.g., streamlining the creation and response to RFPs

In-house document creation: GenAI can be used to create key documents by translating invoices and shipping documents, guaranteeing that financial and logistical documents are correctly understood by all parties.

Insight generation: GenAI tools can be used to uncover insights within supply chain data, including a crawler to understand past patterns and predict future disruptions, or generate sales and operations planning (S&OP) as a second opinion.

Customised programming: GenAI can write code to accelerate the development of new software solutions and enhancements for the procurement function.

LEVER 2: SMART DESIGN FOR SUPPLY CHAIN EFFICIENCY

A fundamental way to make supply chains more resilient is by making them simpler, and that starts at the design phase. In the past, project teams have not had the parts supply chain front of mind, leading to a wide range of components in each vehicle type. That puts strain on production logistics and inventory management, leading to higher costs and delayed time-to-market.

Instead, when R&D teams focus on modular design and reducing complexity, fewer types of parts are needed from suppliers. This makes products more adaptable and reduces logistics costs.

A proven set of methods to achieve this exists: the first is to design products in a way that allows alternative components to be substituted without compromising

on quality. The second is to streamline the product structure so there are fewer variants or configurations. That avoids requiring suppliers to create multiple variations of a component and limits the risks going down through the supply chain to tier-2 and below.

Thirdly, use recognized standards to reduce product design complexity and establish a build-to-print network, in which suppliers are not involved in development but simply receive the instructions and build the part, so that several suppliers can build the same part in the same way, to increase flexibility or compete on price. Using separate specialists for product development and large-scale suppliers for series production also speeds up the transition to series production.

PROVEN SET OF METHODS

Account for Substitution of Parts in Product Design



Simplify functional components/ adjust set-part strategies systematically to promote flexibility in supplier exchange or use of alternative components without compromising the quality

Reduce Variance in Product Structure



Streamline product structure, i.e., minimize the number of product variants and configurations and avoid requiring suppliers to create 100 variations, while also considering supply chain risks in tier-2

Reduce Product Design Complexity



Focus on recognized standards and establish build-to-print network for flexibility and separation of development and series suppliers to faster transition from development to series phase

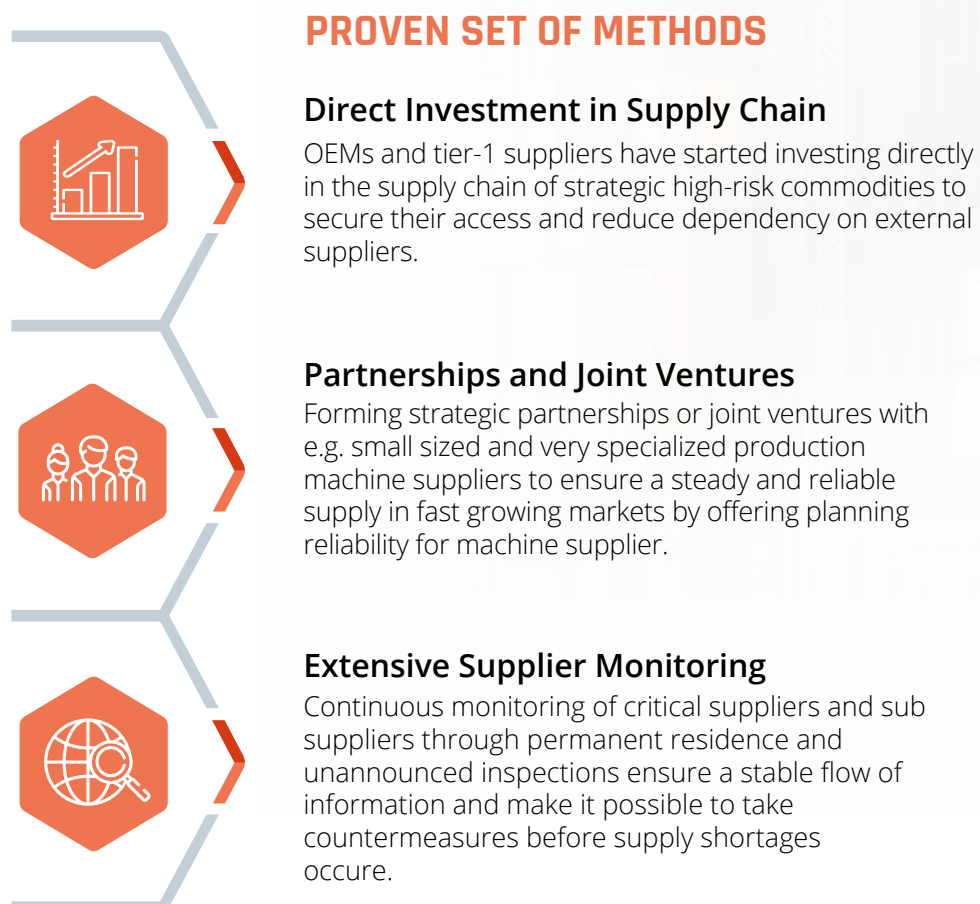
LEVER 3: VERTICAL INTEGRATION TO BUILD A RESILIENT SUPPLIER NETWORK

Increasing supply chain complexity, market consolidation, and portfolio shifts toward EVs and more software-defined vehicles all combine to demand a high degree of vertical integration between OEMs and suppliers, to build a resilient network. The supply chain crises of recent years have made clear the vulnerabilities of the global automotive supply chain built up over the preceding decades: over-reliance on limited geographic regions or specific suppliers for critical commodities has led to periods of severe pressure and OEMs being unable to meet consumer demand.

Successful vertical integration has three elements: the first is direct investment in the supply chain for essential commodities such as the metals and minerals used in EV batteries, to secure access and reduce the risk of depending on external suppliers.

The second approach is forming strategic partnerships or joint ventures, for example with small but highly specialized machine makers, to ensure a steady and reliable supply in fast-growing markets by offering a high degree of security about future orders to the smaller company.

The third is more active and extensive supplier monitoring than in the past. Continuous monitoring of critical suppliers and sub-suppliers, either by having a member of staff based with the supplier or regular unannounced inspections, may be needed for essential components and suppliers. Doing so will ensure a stable flow of accurate information and make it possible to put in place alternative contracts before supply shortages occur.



CONCLUSION: PRINCIPLES FOR SUPPLY CHAIN RESILIENCE

The supply chain crises of the past four years have made clear the importance of resilience, which had taken a backseat to efficiency for many OEMs and suppliers. However, resilience means far more than maintaining high levels of stock, which is not financially beneficial in the long term. Any low hanging fruit has already been gathered during the recent periods of disruption, so OEMs and suppliers that aim to substantially mitigate supply chain risk need to take the more radical types of measures described above, guided by the following principles:

» Make long-term-thinking a virtue

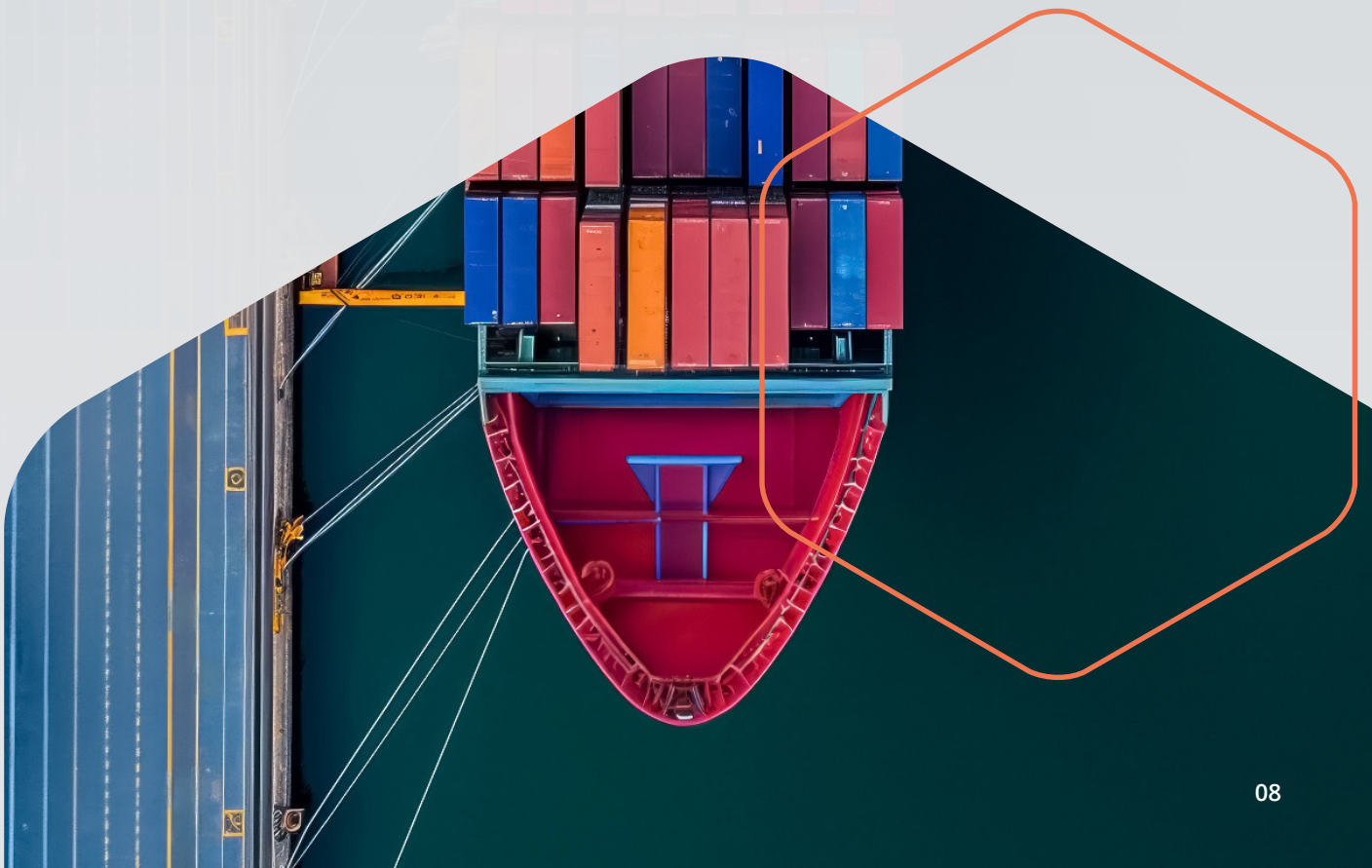
Actions that cost money or effort but pay off much later are typically unpopular. However, when it comes to supply chain risk mitigation, many of the most effective approaches work exactly this way. Making changes that contribute to a long-term goal of resilience need to be accepted and valued.

» Integrate Supply-Chain-thinking

In turbulent times, holistic collaboration is important. Everyone, across all domains within the OEM or supplier, needs to be involved in supply chain risk identification and mitigation. To effectively establish more radical measures, all departments need to contribute.

» Stay alert

Some radical actions may not pay off until later, but a different crisis may be just around the corner. This makes close monitoring of suppliers and projects essential, especially if the OEM or supplier has taken a calculated risk.



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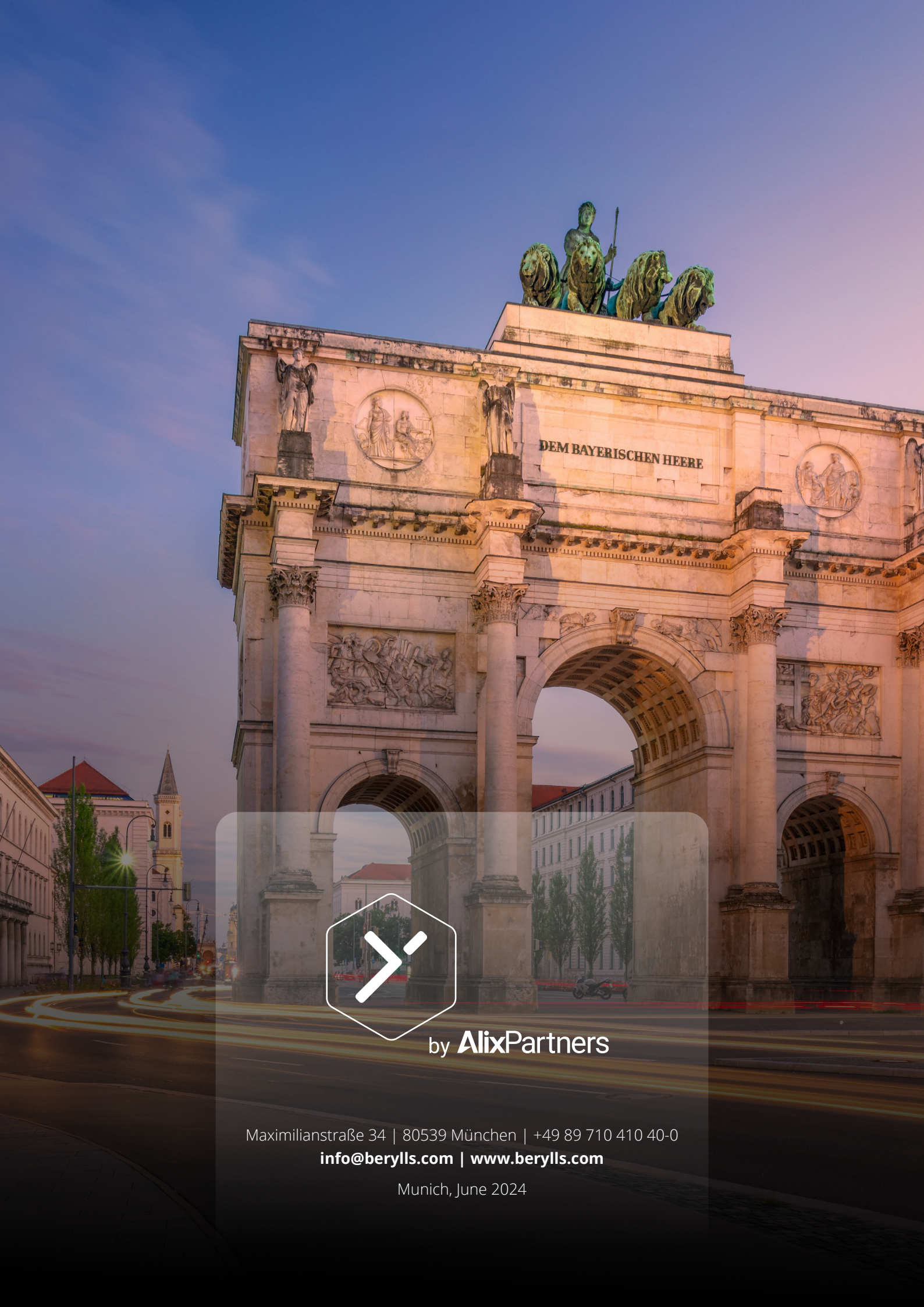
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Munich, June 2024