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Risk, resilience, and rebalancing in global value chains

National Academy of Sciences

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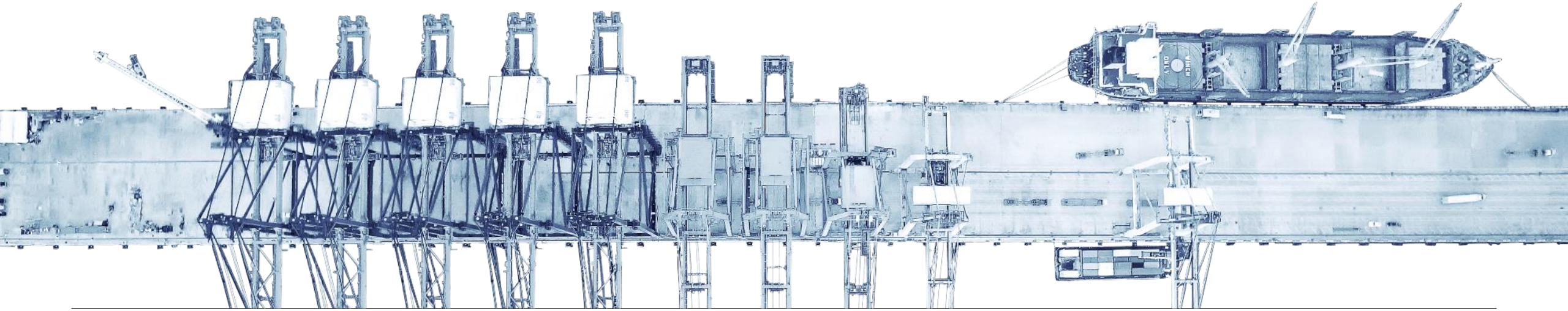
Key messages

1 Real value is at stake in supply chains risk; **45% of one year's EBITDA is lost during a decade** to disruptions

2 Covid-19 has accelerated trends already in motion – **over 90% of executives plan to invest in supply chain resilience**

3 Opportunities abound: **$2.9 and $4.6 trillion in annual trade may shift** to new locations

4 Governments, CEOs, and investors need to act – **the winners will use this transition to become more resilient and more productive**



Source: McKinsey Global Institute analysis

Supply chains are highly complex, multi-tiered and interconnected networks, and shocks in any node can propagate in unexpected ways

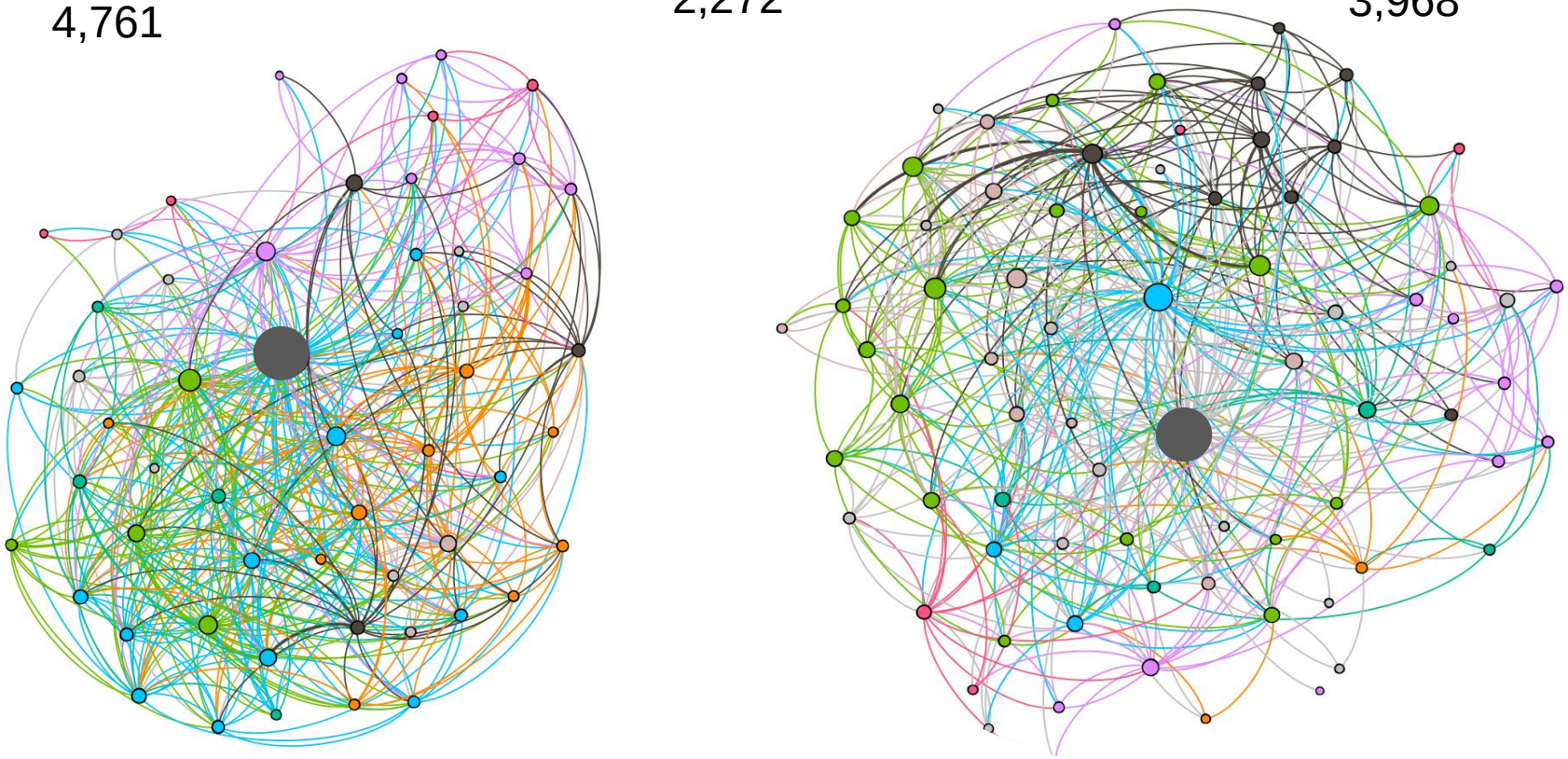
Dell's ecosystem is more clustered (risking bottlenecks) while Lenovo's is deeper (risking lack of visibility)

Number of publicly known Tier 1-2 suppliers

Dell only
4,761

Shared
2,272

Lenovo only
3,968



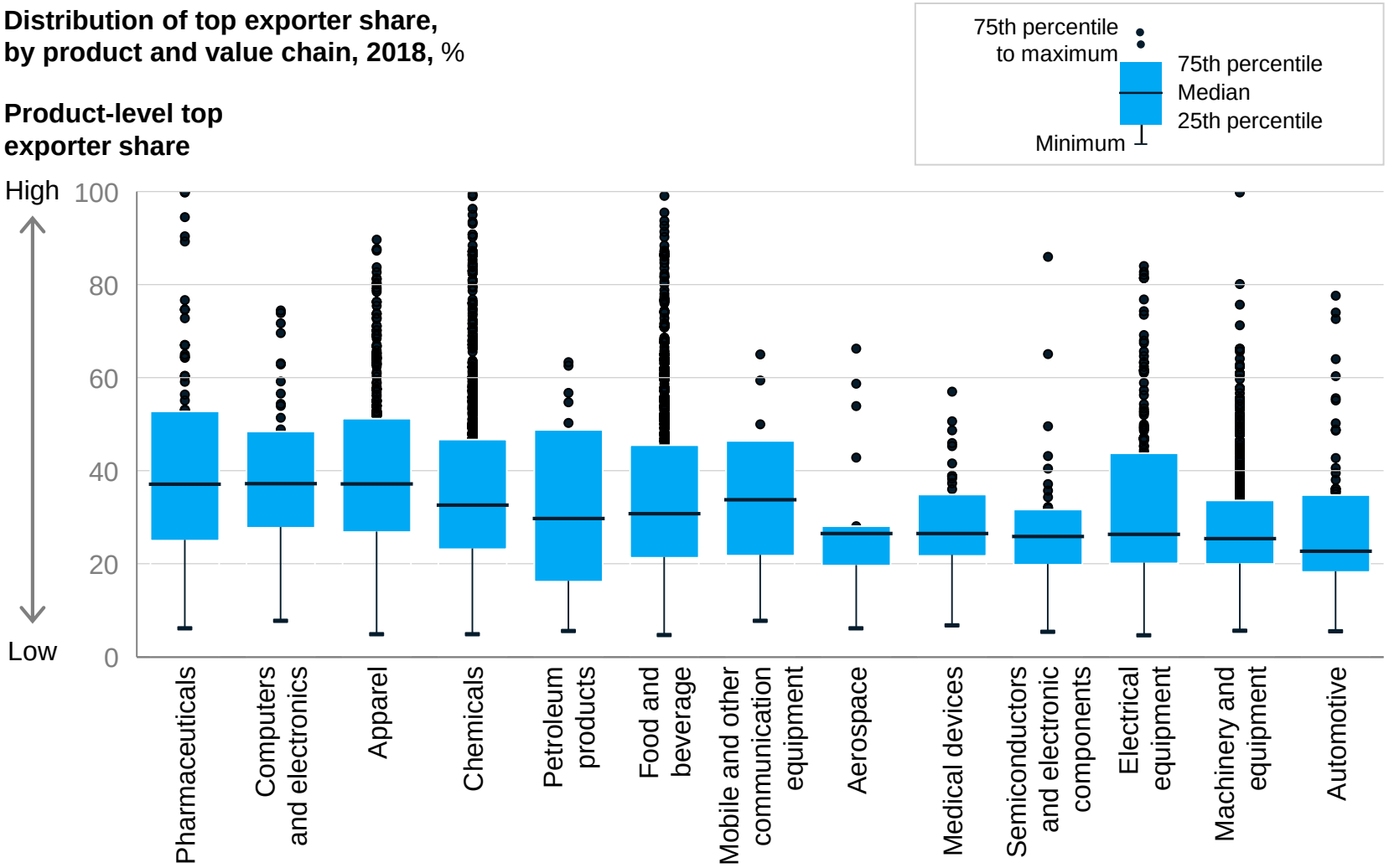
- Software providers
- Electronics manufacturing service providers
- Suppliers of advanced optics + glass components
- Electronic component manufacturers
- Semiconductor manufactures
- Chemical manufacturers
- Digital equipment manufacturers
- Data storage and other hardware manufacturers
- Mobile and communication devices and components

Source: Bloomberg, McKinsey Global Institute analysis

Most value chains have some products that are significantly concentrated in one country and can be a source of vulnerability

Nearly 200 products are exported almost exclusively by one country, creating potential bottlenecks

Distribution of top exporter share, by product and value chain, 2018, %



China exports
94%
of an antibiotic used to treat conjunctivitis, meningitis, typhoid fever, and other serious infections

China exports
74%
of personal laptop computers

Japan exports
76%
of cyclohexanol, a chemical used for paints, plastics, and varnishes

Germany exports
53%
of machine tools for heavy material machine operations

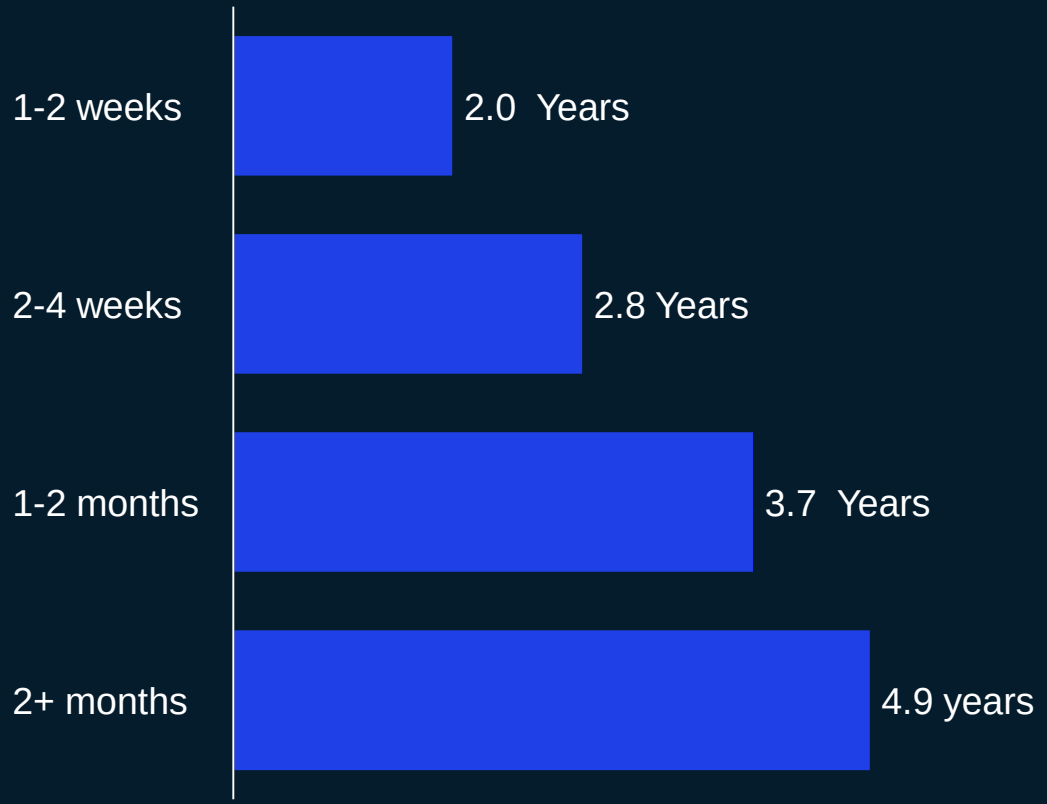
Source: UN Comtrade; McKinsey Global Institute analysis

External shocks are often impossible to predict, but happen with regularity

On average, companies experience a disruption of 1-2 months every 3.7 years

Expected frequency of a disruption by duration

Based on expert interviews, n=35



Shocks are diverse

Force majeure

- Geophysical
- Acute climate event
- Pandemic

Geopolitical

- Financial crisis
- Trade war
- Military conflict

Malicious actors

- Counterfeit
- Cyber attacks

Idiosyncratic risks

- Supplier bankruptcy
- Industrial accident

Source: McKinsey Global Institute analysis

Value chains have different exposure to shocks based on their geographic footprint, factors of production, and other factors

Results for select value chains

Disruption risk Low High Better Worse X = Rank in exposure among 23 value chains

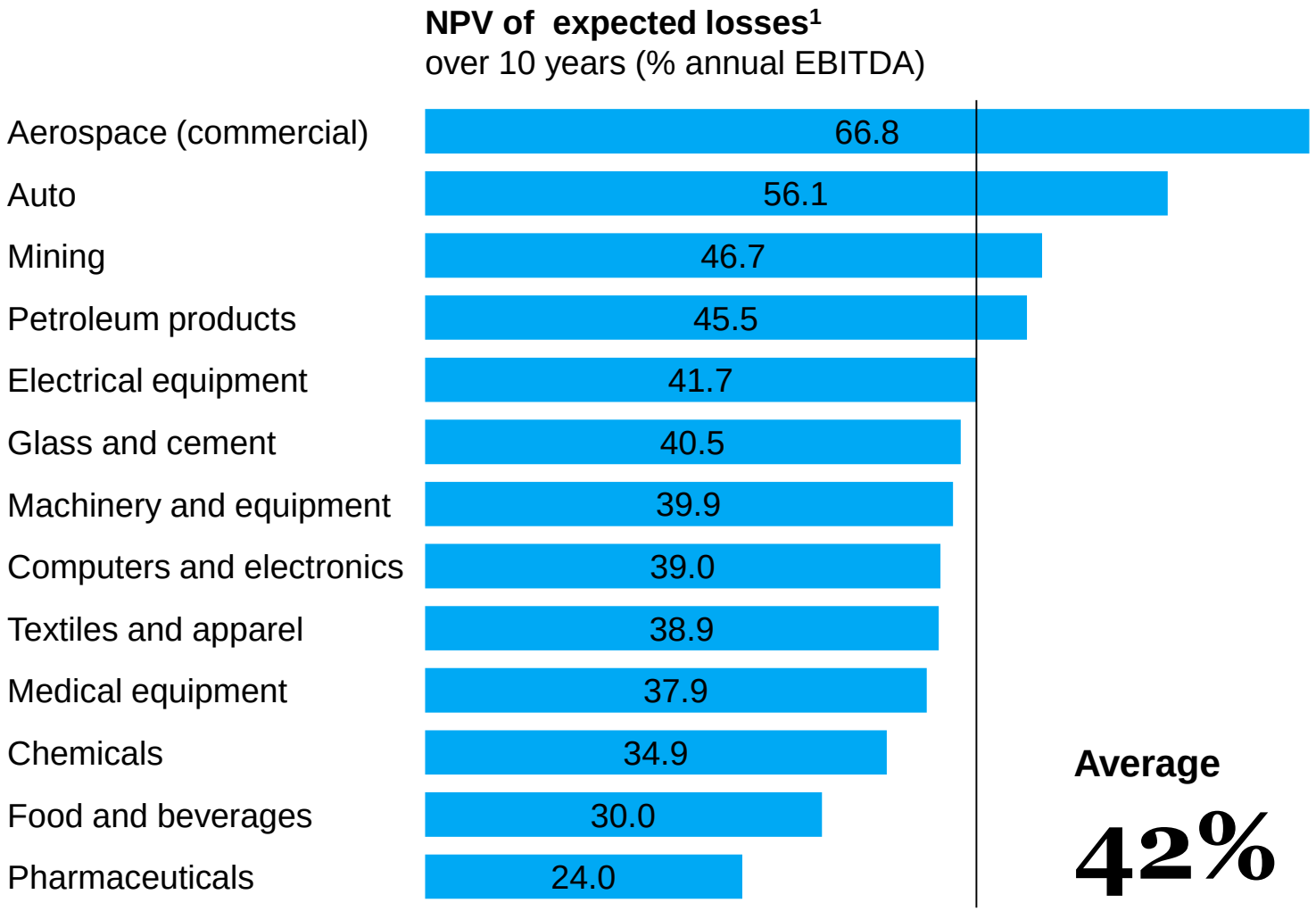
	Overall exposure to shocks*	Pandemic	Large-scale cyber-attack	Geophysical**	Climate heat shock	Climate flood shock	Trade dispute
Communication equipment	1	13	3	2	16	7	2
Computer and electronics	6	15	5	4	14	14	9
Aerospace	8	2	1	18	20	21	5
Semiconductors	9	19	6	1	18	23	1
Machinery and equipment	18	9	10	20	17	20	7
Medical device	23	22	8	22	22	22	3

* Full analysis considered 23 value chains; ** e.g., earthquake, tsunami

Source: McKinsey Global Institute analysis

Expected losses from supply chain disruptions equal 42% of one year's EBITDA on average

Net present value of expected losses over a 10 year period



Source: McKinsey Global Institute analysis

Companies can invest significantly in resilience measures – and come out ahead financially

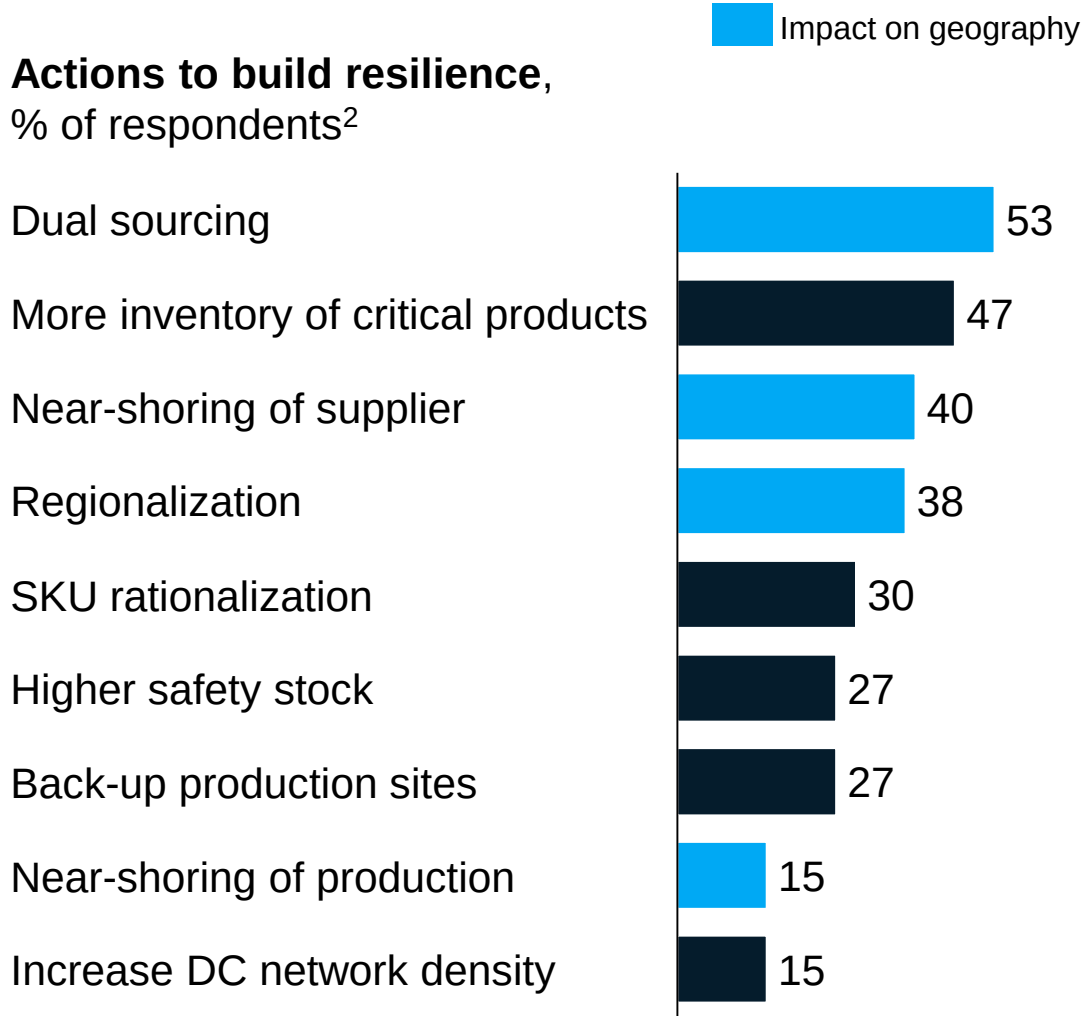
Building resilience is a high priority among supply chain executives – and many actions could shift the geography of trade

Executive survey results,
May 2020

93% Supply chain leaders planning to increase resilience[1]

44% Would increase resilience at the expense of short term efficiency[2]

Actions to build resilience,
% of respondents[2]



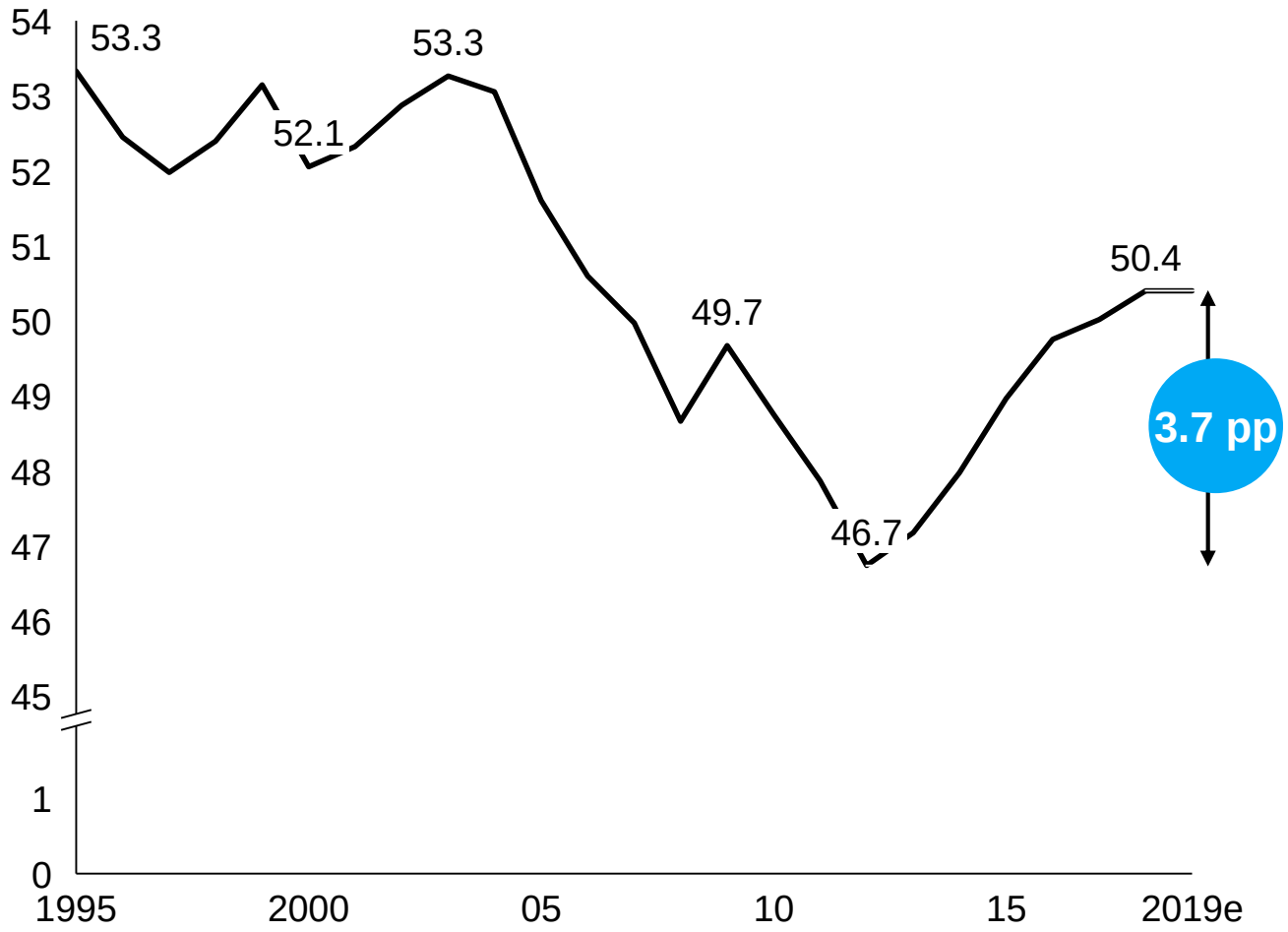
1. Survey of leading executives, n=60

2 Survey of leading executives, n=605

Source: McKinsey Global Institute survey of executives

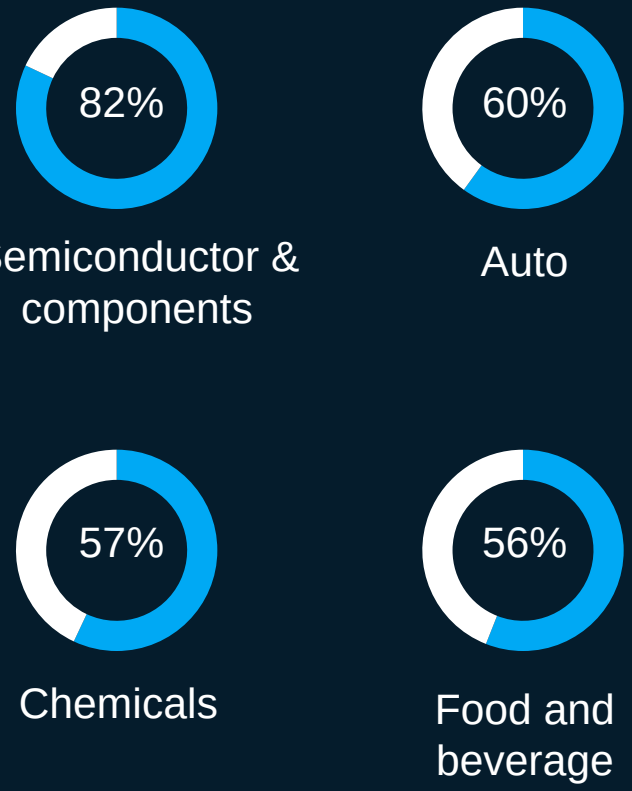
Regionalization of supply chains was underway before Covid-19 to increase speed to market and reduce logistics cost and time

Share of intraregional goods trade in total trade (exports + imports), (1995-2019)
Percent

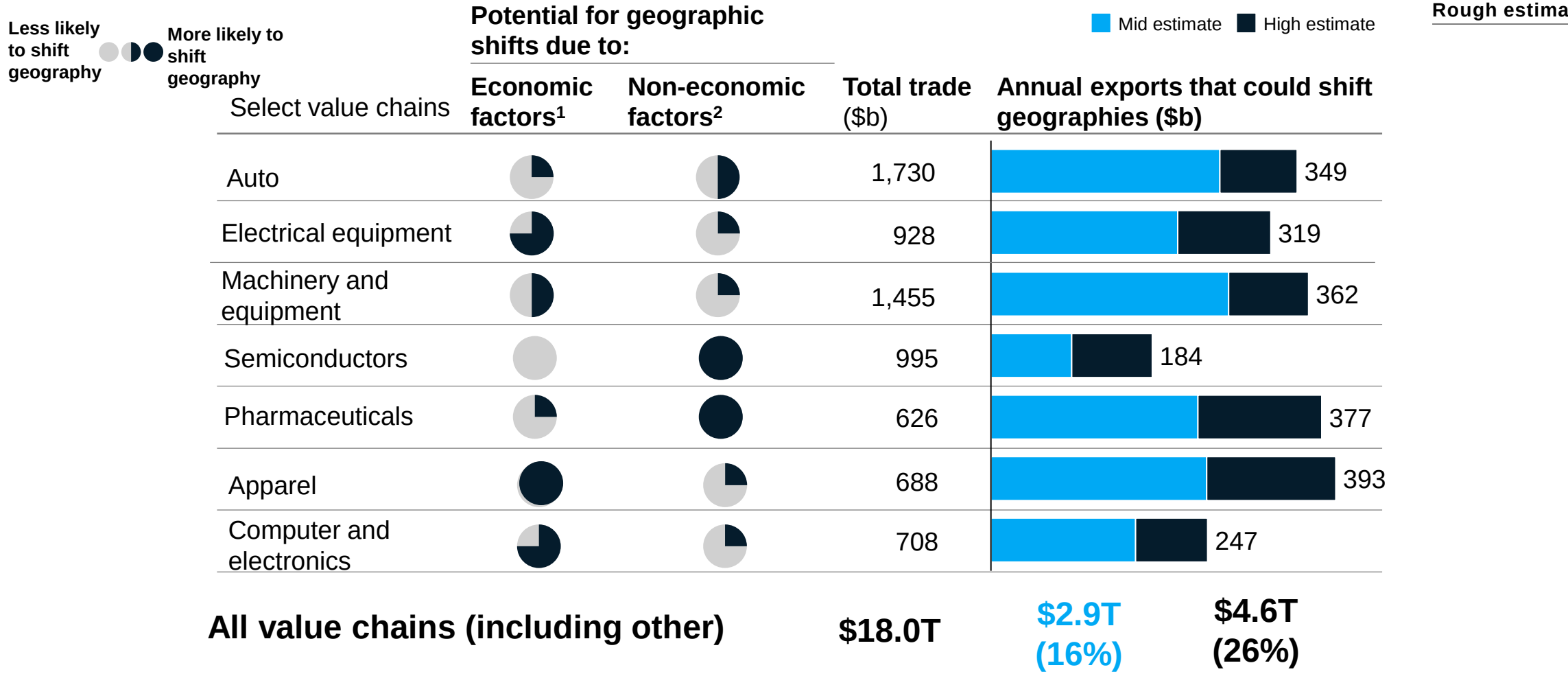


Source: UN Comtrade, McKinsey Global Institute analysis

Intra-regional goods trade by value chain, 2018



In a scenario in which global value chains regionalize, ~15% to 25% of global goods exports should shift to different geographies

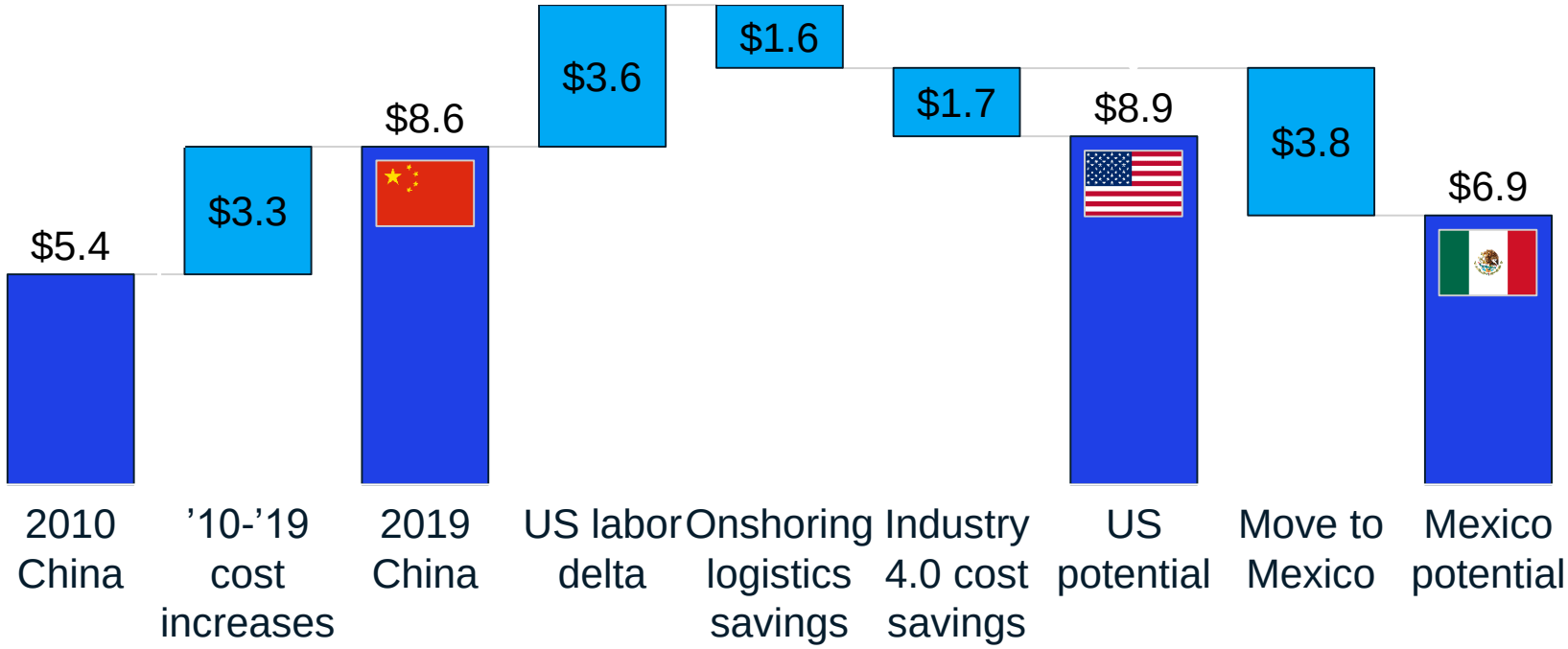


1. Economic factors include variable cost difference, capital intensity, product complexity, and trade weighted distance
2. Non-economic factors refer to likelihood of increased market intervention to advance objectives such as national security, national competitiveness, and essentiality

Source: McKinsey Global Institute analysis

Changing factor costs could favor reshoring or nearshoring production of some components

Cost comparison of example mechanical component[1], $USD



- China labor costs roughly doubled in last decade
- Mexico is competitive in labor costs and has lower logistics costs
- Industry 4.0 technologies can offset ~50% of the labor cost differential between US and China

1. AC motor used for example

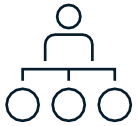
Source: McKinsey Global Institute analysis

Resilient and efficient supply chains have four key features…

E2E visibility on risks across the value chain from tier N supplier to customers

Regular stress-testing and reassessment

Portfolio of actions to reduce vulnerability and exposure to shocks



CEO agenda has both resilience & efficiency to ensure reimagined supply chain of future

…which requires new ways of working

Resiliency metrics balanced against growth and cost metrics, built into performance management system

New tools and capabilities to ensure both resilience and efficiency

Investor and customer communications program to develop understanding of built-in resilience for investors to value

Governance and processes to manage resilience over the long term

Concluding thoughts

- Industry exposure to shocks varies – and even within an industry company exposures will vary
- Localized supply chains are not necessarily more resilient than globalized ones
- But there is a huge opportunity to rethink supply chains and improve *both* efficiency and resilience

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Download the full report at:

https://www.mckinsey.com/business-functions/operations/our-insights/risk-resilience-and-rebalancing-in-global-value-chains