



# Rebalancing Global Supply Chains: Essential Axes of US- Japan Coordination for Supply Chain Independence

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- CEO of Boston Strategies International
- Author of *Guide to Supply Chain Management*; *Trump, Trade and the End of Globalization*; *Supplychainification*, and other books
- Senior Fellow at Boston University's Institute for Global Sustainability.
- Professor of Operations Management at NYU (Adjunct)
- MBA (Wharton/Lauder)

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### **High-Value Supply Chains For Critical Materials and Components**

- Total Value Chain: Strategy, Competitive Analysis, Investment Advisory
- Logistics: Digital Supply Chains
- Procurement: International Sourcing, Logistics, Negotiation
- Production: Management & Technology Programs

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### **Value Proposition**

- Supply Chain Security
- Supply Chain Resiliency
- Financial: 15% cost reduction, 25% ROI

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### **History and Track Record**

- Founded in 1998
  - 1,000 impactful client engagements
  - 400+ publications
  - Offices in USA, India, Italy, UAE, and UK
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Advising  
Corporations,  
Governments,  
and NGOs



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CABOT

VATTENFALL



أرامكو السعودية  
Saudi Aramco



JAXPORT  
JACKSONVILLE PORT AUTHORITY



“

The team at Boston Strategies did an outstanding job on our supply chain strategy project. Their research and recommendations were thorough and data-driven.

.....

*City of New York*

“

I highly recommend BSI for expertise in strategy development involving global markets. It can work across a diverse array of industries and deliver insight based on incredible research capabilities and current knowledge of market conditions.

.....

*General Dynamics*

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The formidable team at Boston Strategies has developed and compiled a valuable toolkit of successful strategies for the implementation of world-class Supply Chain Management.

.....

*Saudi Aramco*



# Agenda

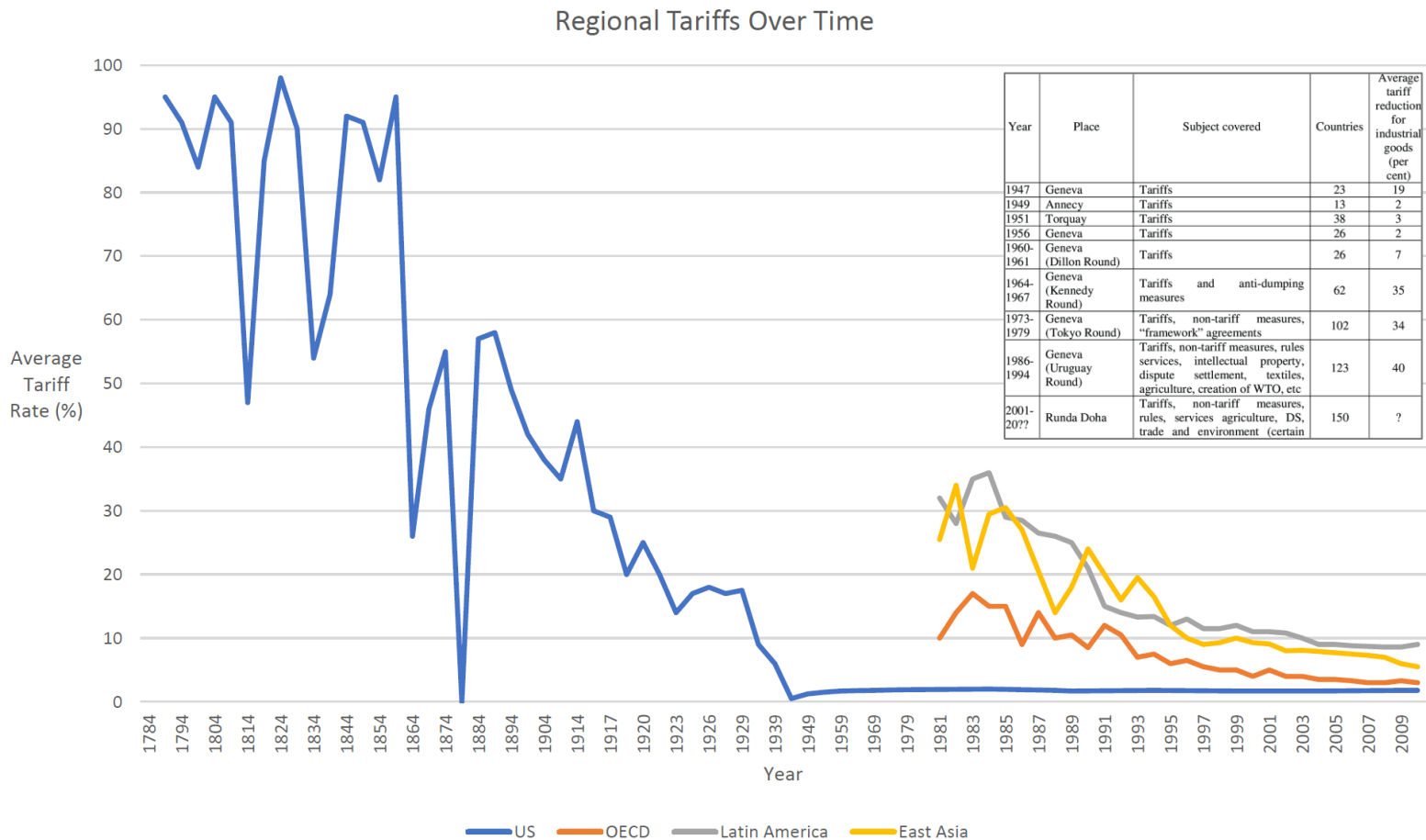
- Historical Evolution of Global Supply Chains
- Pandemic Disruption
- Dependence on China
- Rebalancing Economies and the Manufacturing Sector
- Rebalancing Corporate Supply Chains
- What the US and Japan Can Learn from Each Other's Approaches to Supply Chain Independence and Resilience
- Essential Areas Of Us-Japan Collaboration For Enhanced Supply Chain Independence And Resilience





# Historical Evolution of Global Supply Chains

# Tariff Reductions Incentivized Global Trade

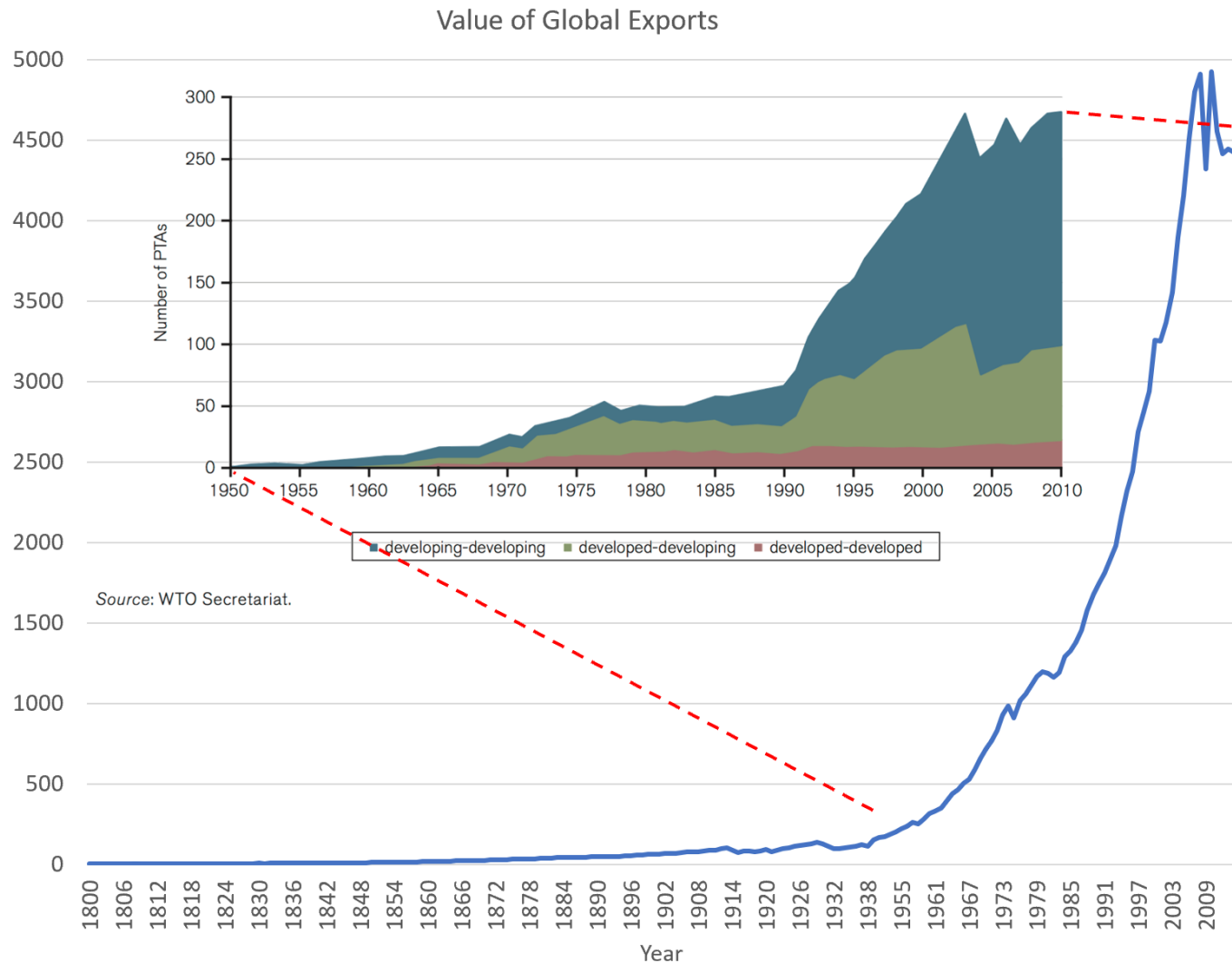


## Sources:

- Megumi Naoi. Building Legislative Coalitions for Free Trade in Asia. Cambridge University Press. <https://www.cambridge.org/core/books/building-legislative-coalitions-for-free-trade-in-asia/building-open-economy-coalitions/1208168DE2E3E3CDF4F599AED6E739AE>
- [https://ipfs.io/ipfs/QmXoyvizjW3WknFiJnKLwHCnL72vedxjQkDDP1mXWo6uco/wiki/Tariffs\\_in\\_United\\_States\\_history.html](https://ipfs.io/ipfs/QmXoyvizjW3WknFiJnKLwHCnL72vedxjQkDDP1mXWo6uco/wiki/Tariffs_in_United_States_history.html)
- Boston Strategies International Analysis

# An Explosion of Exports Drove Hyper-Globalization

Time series of world exports at constant prices, relative to 1913 (i.e., values correspond to world export volumes indexed at 1913=100)



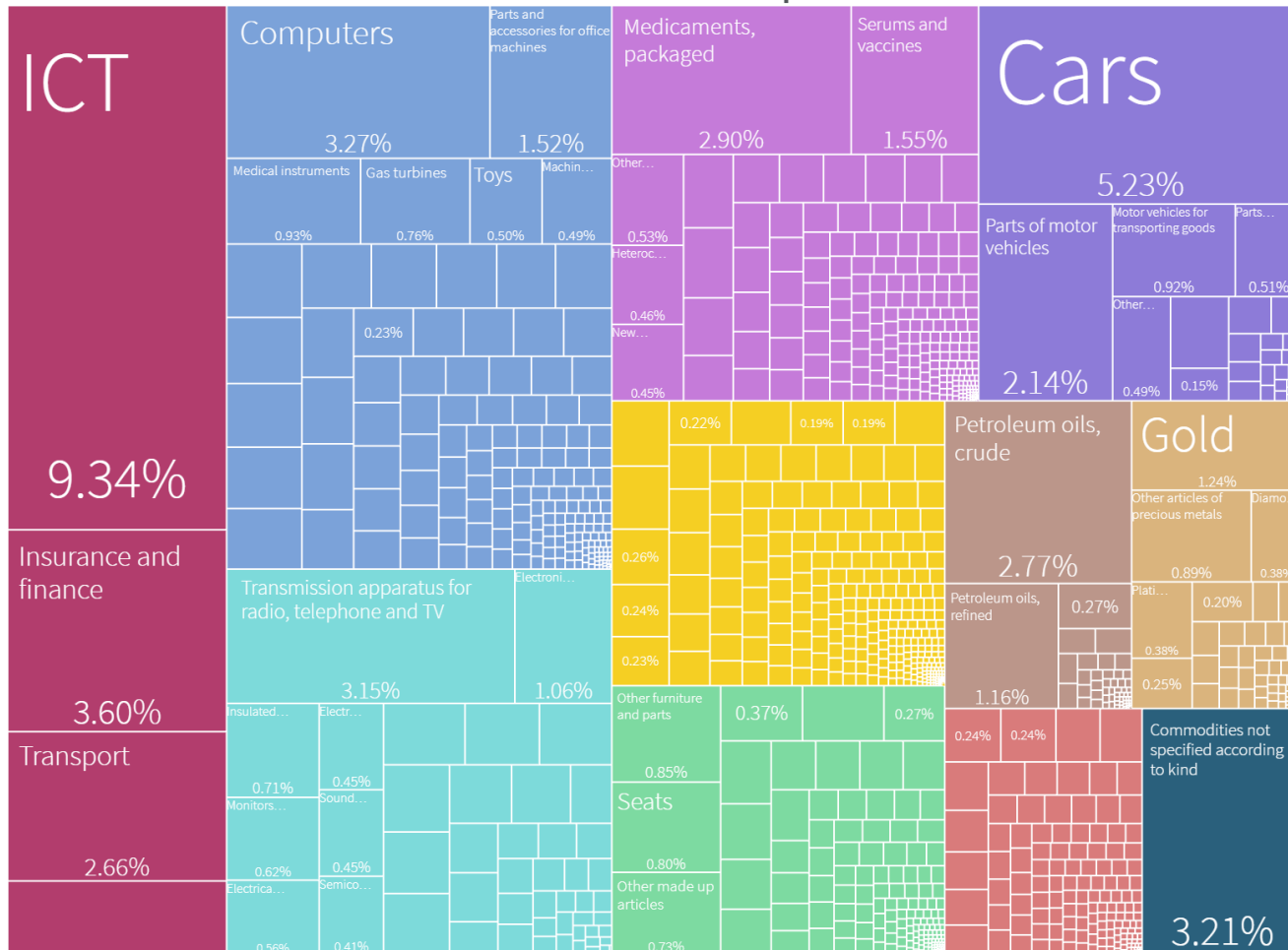
Source: Federico and Tena-Junguito (2016), [ourworldindata.org/international-trade](http://ourworldindata.org/international-trade)





# US Trade is Weighted Toward ICT and Manufactured Goods

What did United States of America impor... Shown: \$2.72T | Total: \$2.72T 

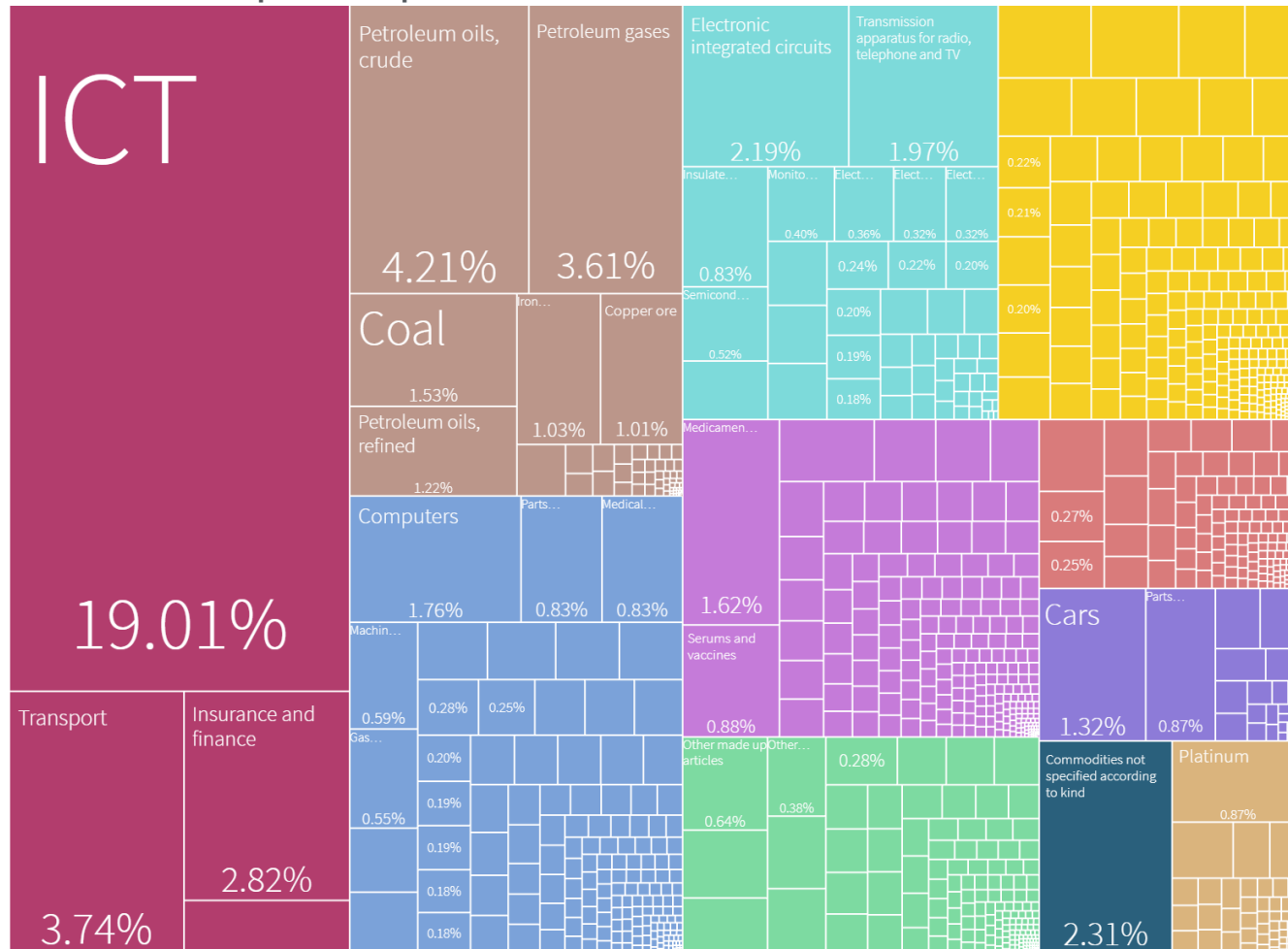


Source: Atlas of Economic Complexity

## Japan's Trade is Weighted Toward Components and Energy

## What did Japan import in 2020?

Shown: \$748B | Total: \$748B 



Source: Atlas of Economic Complexity



# Pandemic Disruption

# The Bullwhip Effect (MIT, ~1965) Is a Phenomenon That Plagues Supply Chains

## Characteristic Shape of Bullwhip Effect

### • Causes

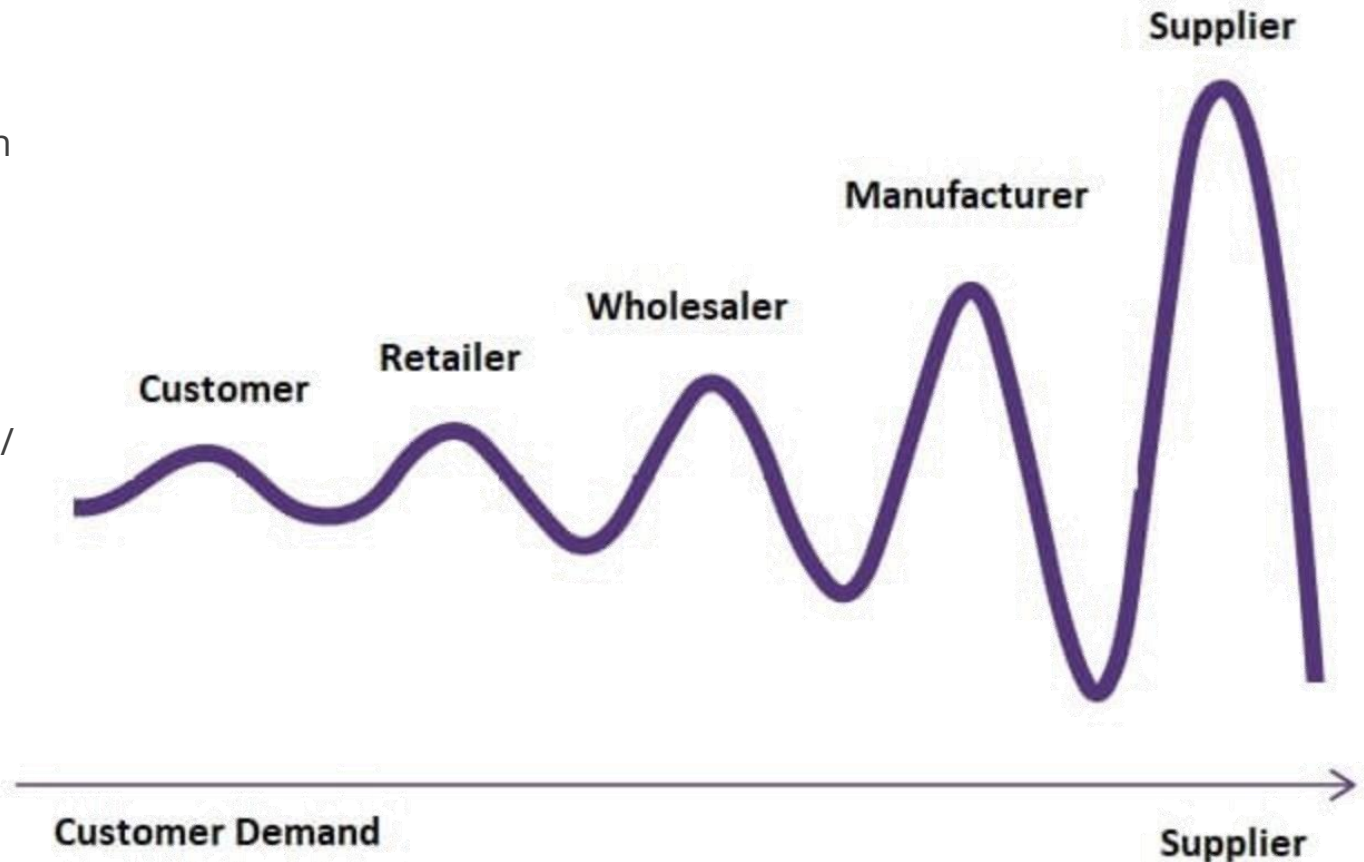
- Perturbances/  
Over-correction
- Promotions/  
Price  
Discounting
- Batching/  
Irregular  
Production
- Order Changes/  
Changes in  
Order Patterns

### • Characteristics

- Oscillation
- Amplitude  
Magnification

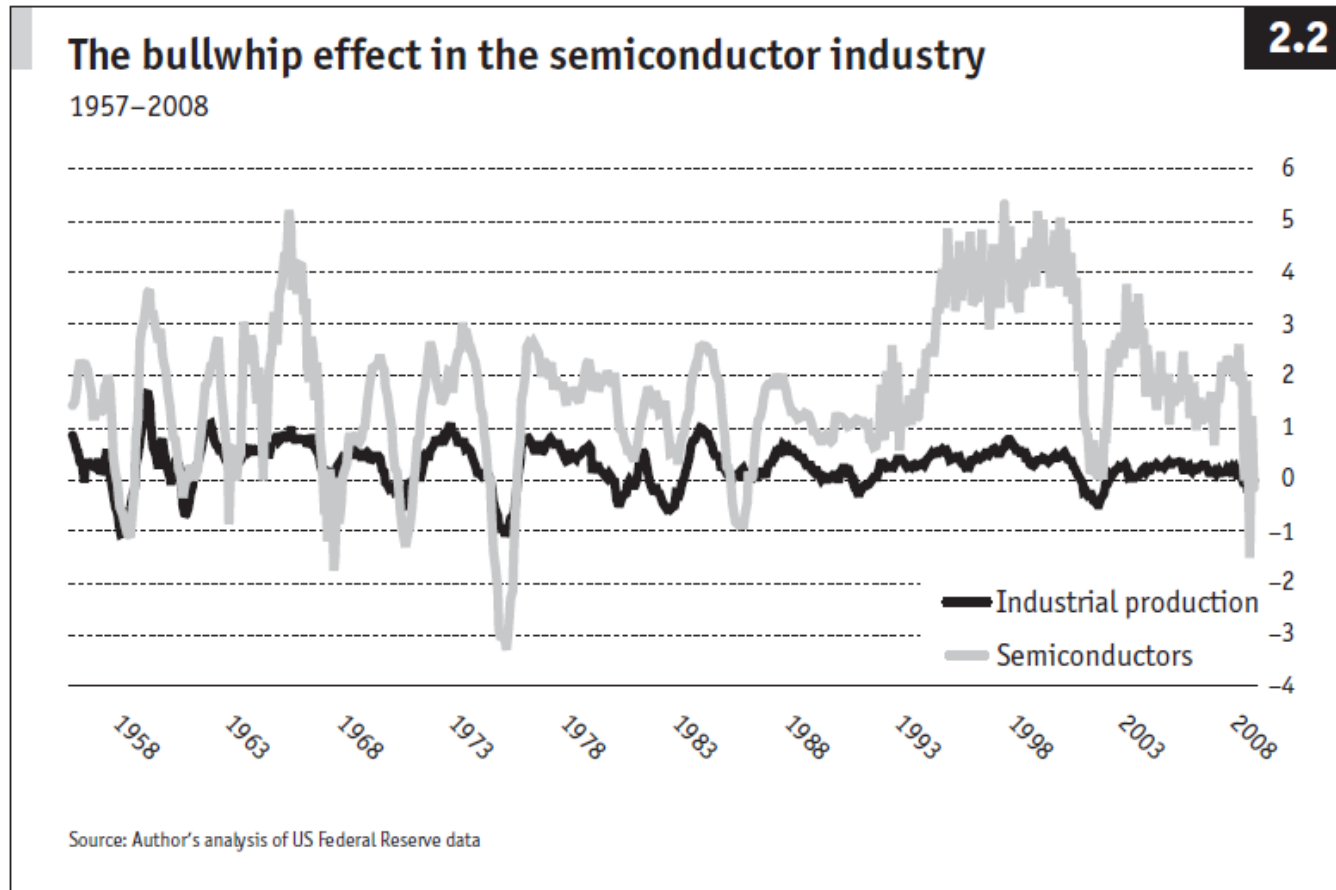
### • Exacerbators

- Long supply  
chains
- Long feedback  
loops



Sources: Norris, Clay. *Bullwhip Effects in an Unknown Market*. Medium.com,  
Jacoby, David Steven. *Guide to Supply Chain Management* (Economist, 2009).

# The Bullwhip Effect Has Been Evident in Critical Industries to Both the US and Japan Since the 1950s



Source: Jacoby, David Steven. Guide to Supply Chain Management (Economist, 2009).

# The Pandemic Created the Ultimate Conditions for Bullwhip in Global Supply Chains

- Perturbances / Over-corrections: Lockdowns, Factory shutdowns
- Promotions / Price Discounting : Work From Home
- Batching / Irregular Production: Stochastic lockdowns, curfews and travel bans
- Order Changes/ Changes in Order Patterns: Erroneous announcements about when it would end
- Exacerbating Factors
  - Global disruption / affecting all tiers of every supply chain
  - Long feedback loop



Source: USA Today

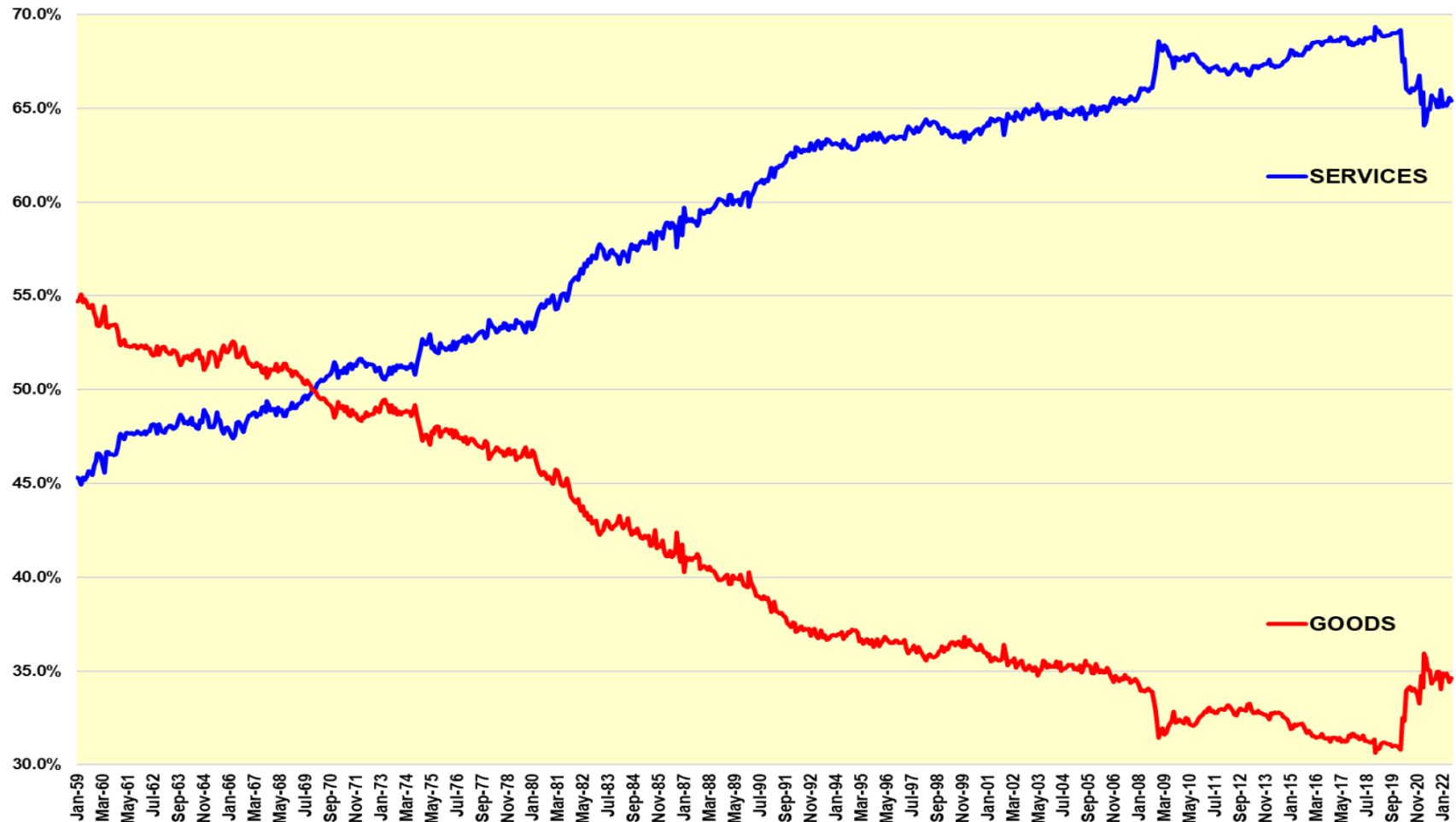




# A Surge in Demand for Goods vs. Services Disrupted Supply Chains

## Seismic Shift in Shares of U.S. Consumption Wreak Havoc With Supply Chains

(Shares of U.S. Personal Consumption Expenditures for Goods vs. Services, Source: U.S. BEA)





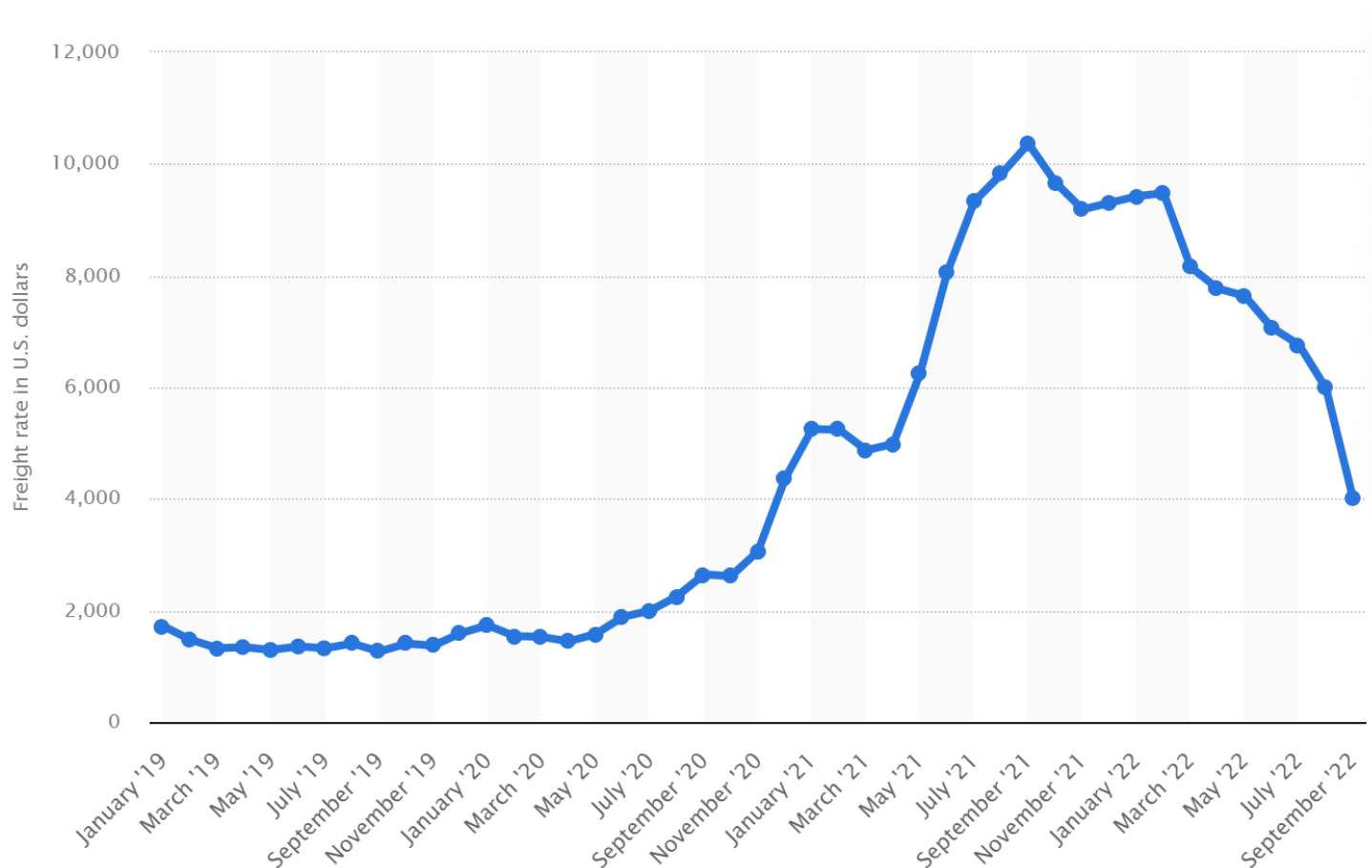
# The Perturbance to Global Trade Was Similar in Magnitude to the Global Financial Crisis





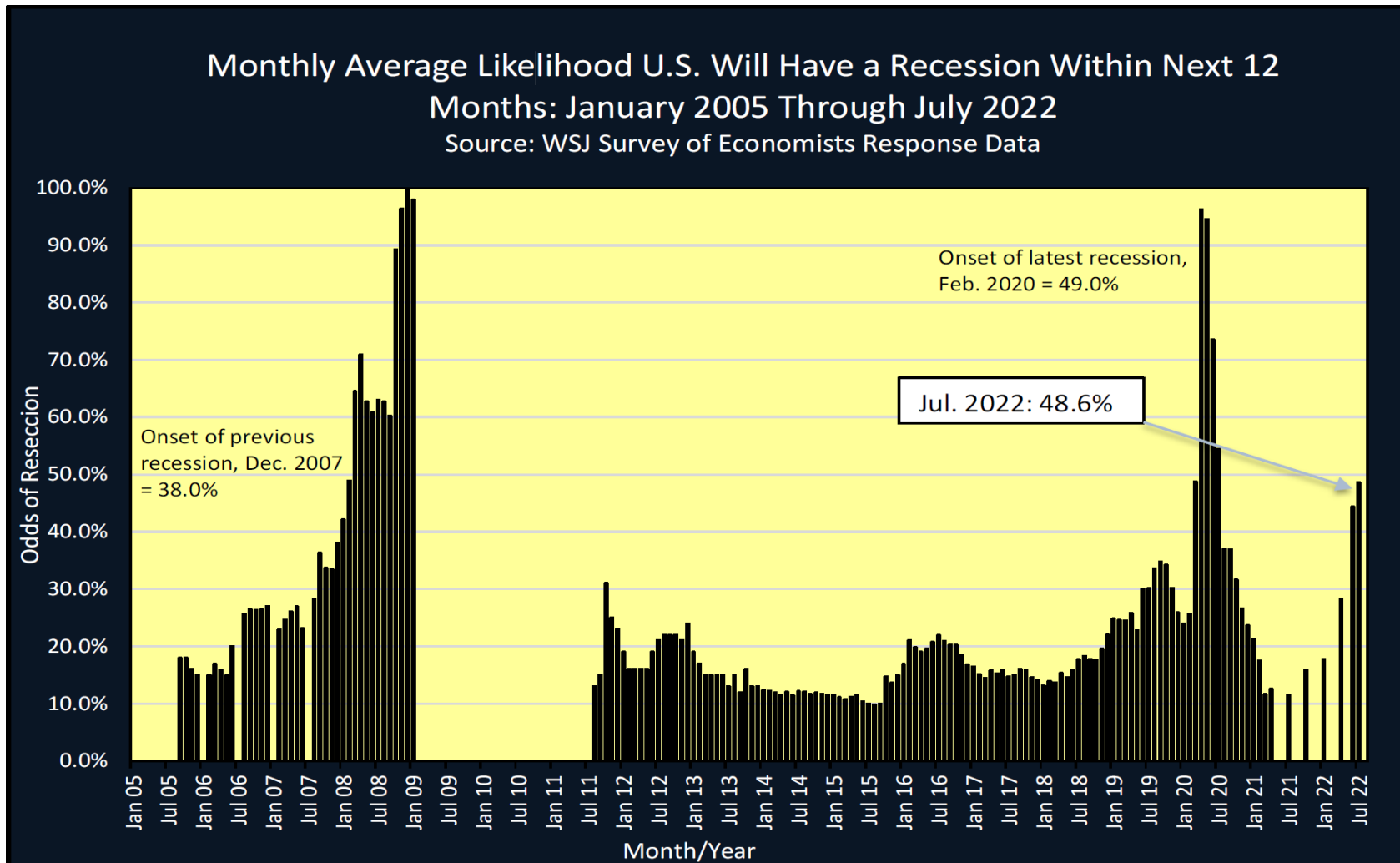
# Global Shipping Rates Went Crazy as Carriers Pulled Capacity Out, Then Couldn't Supply Enough

**Global Container Freight Rate Index**





# A Recession Will Likely Create an After-Tremor in Global Supply Chains

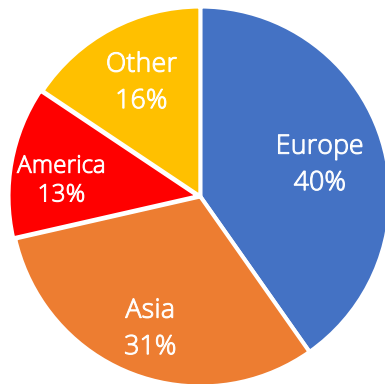




# Dependence on China

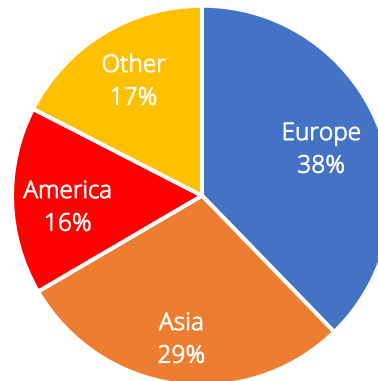
# The US and EU Have Become Dependent on China's Exported Goods

Share of World Exports, 2016



Exports of Goods (fob) and Services, 2016		
Region / Country	Billions of US Dollars	% of Total
Europe & Central Asia	8,580	40%
--Germany	1,573	7%
East Asia & Pacific	6,649	31%
--China	2,431	11%
North America	2,757	13%
--USA	2,264	11%
Other	3,331	16%
World	21,318	100%

Share of World Imports, 2016



Imports of Goods (fob) and Services		
Region / Country	Total	% of Total
Europe & Central Asia	7,832	38%
--Germany	1,319	6%
East Asia & Pacific	5,985	29%
--China	2,046	10%
North America	3,315	16%
USA	2,786	13%
Other	3,621	17%
World	20,754	100%

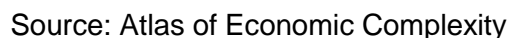
Top Trading Partners, 2016

Region/ Country	Partner	% of Imports	% of Exports
USA	China	21%	8%
	Canada	13%	18%
	Mexico	13%	16%
	Japan	5%	<5%
	Germany	5%	<5%
	South Korea	3%	2%
EU	USA	15%	21%
	China	20%	10%
	Switzerland	7%	8%
	Russia	7%	4%
	Turkey	4%	5%
	Japan	4%	3%
China	South Korea	6%	4%
	USA	5%	22%
	Japan	5%	7%
	Germany	4%	4%
	Hong Kong	3%	13%

Source: Jacoby, David Steven. *Trump, Trade, and the End of Globalization*. Praeger, 2018.

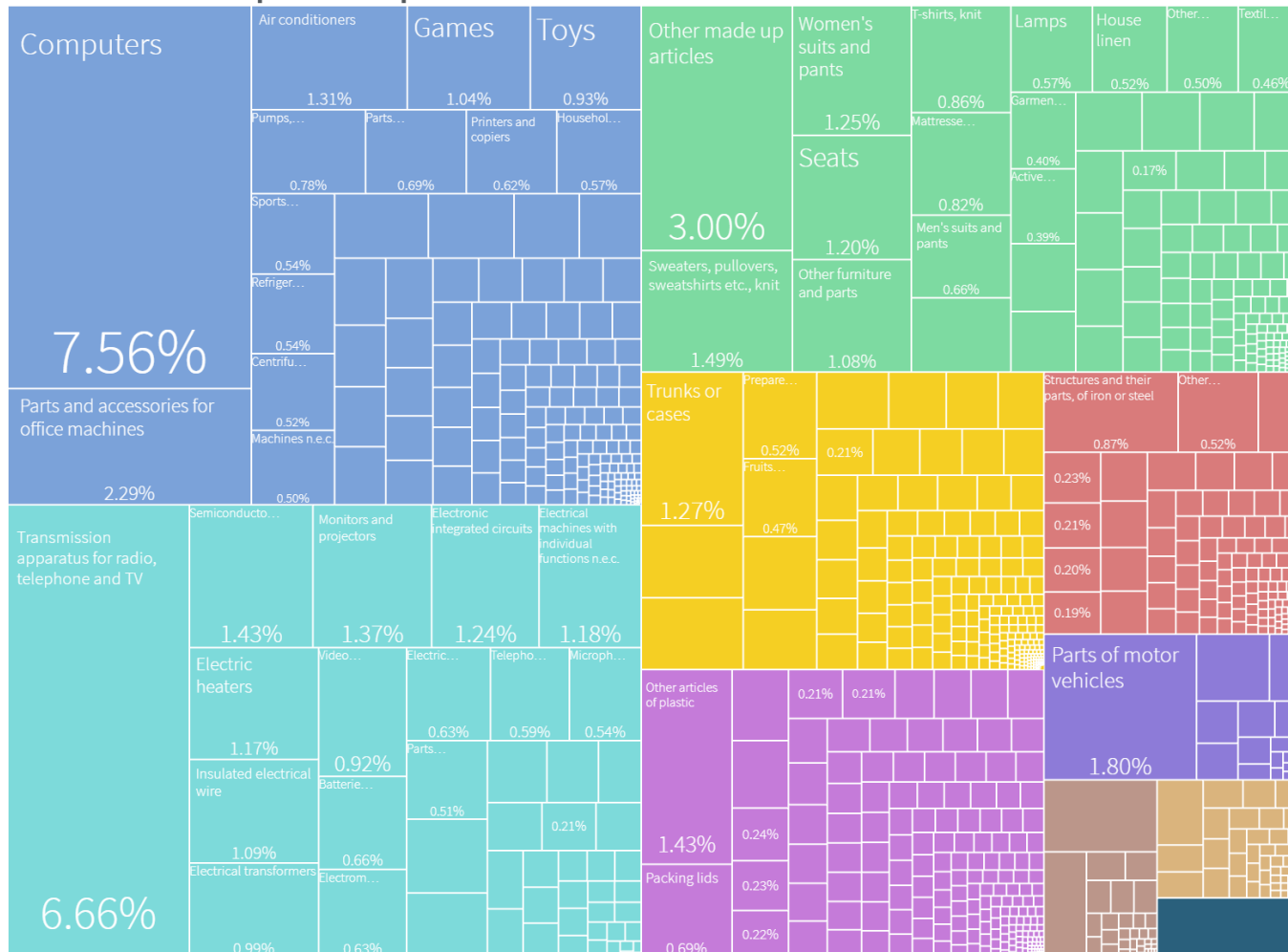


## What did United States of America import... Shown: \$457B | Total: \$457B



# Japan's Imports From China Are Broadly Similar to the US's

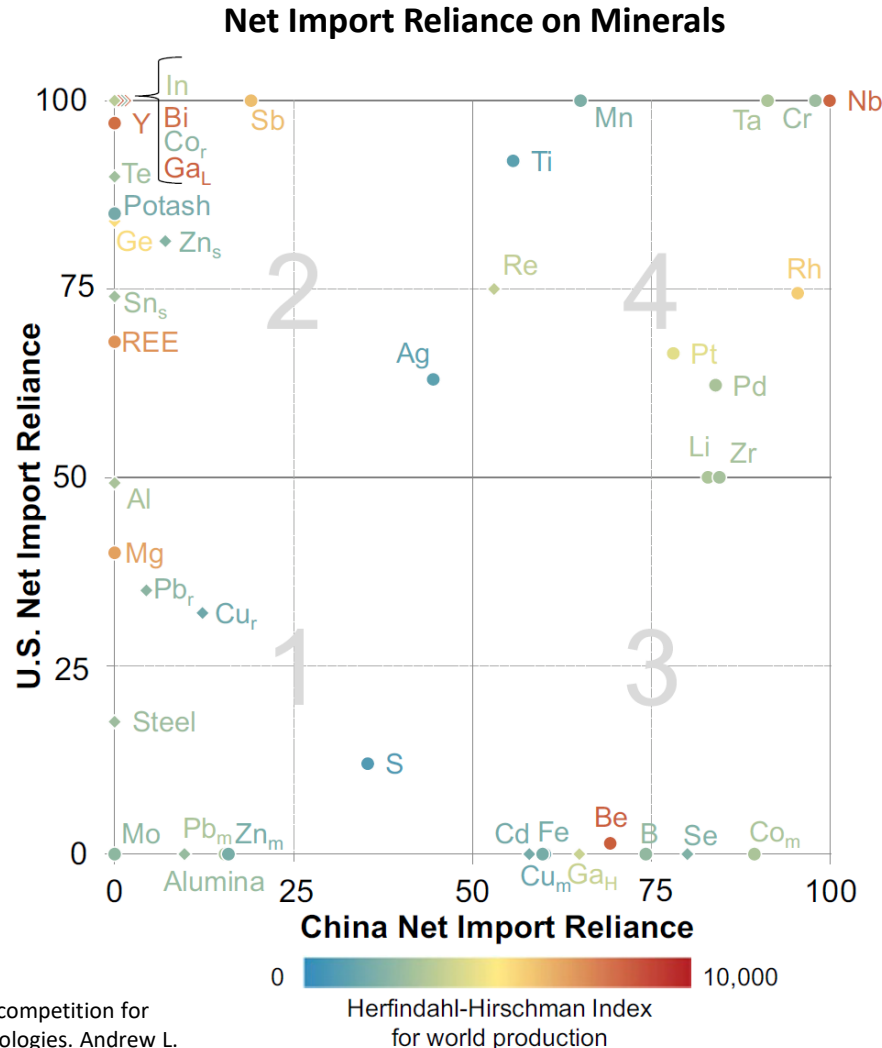
What did Japan import from China in 2020? Shown: \$144B | Total: \$144B ⓘ



Source: Atlas of Economic Complexity



# Import Dependency, Especially on China, Has Become a Political Hot Button



Source: China, the United States, and competition for resources that enable emerging technologies. Andrew L. Gulleya,1, Nedat T. Nassara, and Sean Xuna



# Rebalancing Economies and the Manufacturing Sector

# The Feds (Globally) Are Raising Interest Rates to Cool Demand, Especially in Housing, Which Could Dampen the Bullwhip Effect

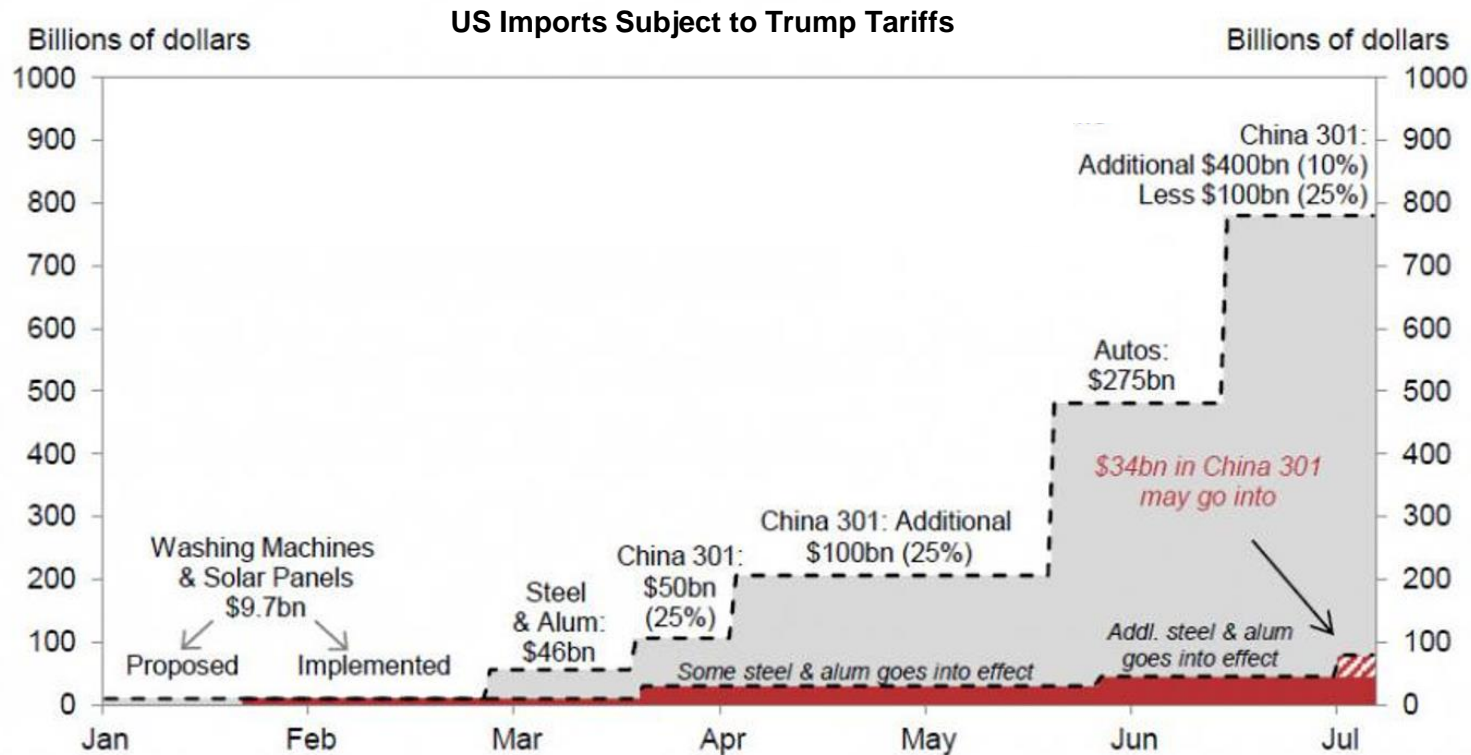
**U.S. 10 Year Treasury Note Rate Trend**



Source: Wall Street Journal. October 7, 2022.



# Near-shoring (or At Least Relocating Production Away From China And Into Home Country) Has Become A Major Focus Of US Trade Policy



Source: USITC, Goldman Sachs Global Investment Research





# The US Has More Recently Layered On Stimulus Packages for Re-Shoring

- “Inflation Reduction Act” includes \$369 billion for Energy Security and Climate Change (2022)
- CHIPS: Creating Helpful Incentives to Produce Semiconductors for America Act:
  - \$54 billion in grants for semiconductor manufacturing and research
  - Tens of billions to support regional technology hubs
  - Tax credit covering 25% of investments in semiconductor manufacturing through 2026
- Carbon Ore, Rare Earth and Critical Minerals (CORE-CM) Initiative for U.S. Basins (2021)
- Infrastructure Investment and Jobs Act (2021), a \$547–715 billion infrastructure package
- Domestic Manufacturing Protection Act of 2021 (inactive)



## In Japan, Ministry of Economy, Trade and Industry (METI) Has Been Similarly Stimulating Re-Shoring

- Subsidies to strengthen supply chain resilience by incentivizing Japanese companies to building new plants and introducing new facilities for critical products and materials in Japan.
- Strategically essential products, parts, and materials produced overseas
  - Aircraft parts
  - Automotive molds
  - Chemical fertilizer
  - Displays
  - Electric vehicle battery parts or materials
  - Medical equipment
  - Pharmaceutical ingredients
  - Rare metals
  - Semiconductor parts, materials, and products.
- Health products
  - Antiseptic alcohol
  - Covid-19 test reagent kits
  - Medical gowns and gloves
  - Nonwoven masks, surgical masks
  - Vaccines
- Small and medium-sized business stimulus package



# Debottlenecking Corporate Supply Chains



# Actors Across the Supply Chain Have Been Liberating Capacity Where Possible

- Ports and airports
  - Union rules and non-union ports
  - Use of smaller ports – terminals
- Transport carriers
  - Vertical integration
  - Upgrade/downgrade modes
  - Enhanced slot-sharing
  - More intermodal routes (trunk and feeder)
- 3PLs and 4PLs
  - Supply chain solutions
  - Postponement
- Shippers
  - Lean
  - Zero Waste



# Shippers Have Been Reducing Behaviors That Trigger Bullwhip Dynamics

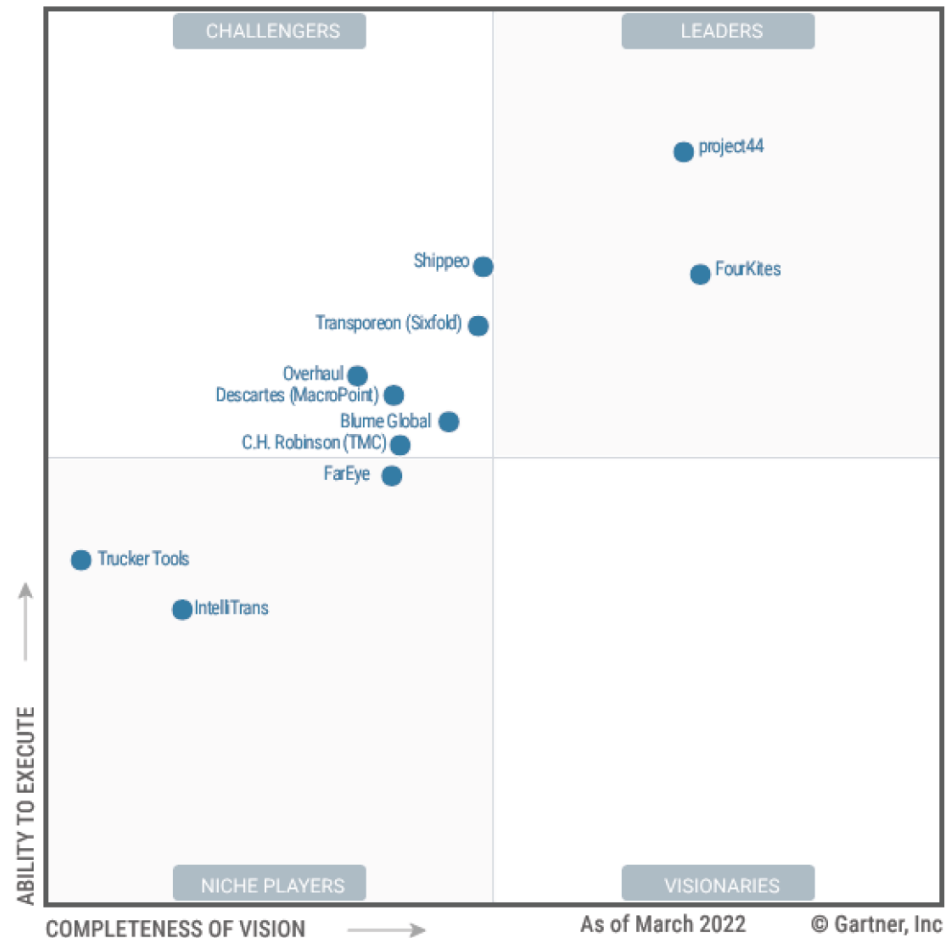
- More discipline around over-correction and tweaking
  - CPFR
  - S&OP
  - Supply chain control towers
- Fewer promotions
  - Constant price (long-term agreements)
- Less batching
  - One-piece flow



# Investors Have Been Plugging Money into Technology Solutions for Increased Supply Chain Visibility

- Of cargo (venture funded startups including Minerva, Altana)
- Of potential future disruptions (venture funded startups including Tive, Project44, SC control towers)

**“Magic Quadrant” for Real-Time Transportation Visibility Platforms**







# What the US and Japan Can Learn from Each Other's Approaches to Supply Chain Independence and Resilience



# The US and Japan Are Pursuing Many Common Approaches to Rebalancing Supply Chains and Achieving Supply Chain Independence

**Approaches Toward Supply Chain Rebalancing Post-Pandemic**

Lever	US	Japan
Level demand	✓	
Near-shoring production (tariffs, PPP, diversification)	✓	✓
Vertical integration	✓	✓
Lean	✓	✓
Postponement	✓	✓
JIT	✓	✓
SC Visibility	✓	✓
SC risk prediction (AI)	✓	✓
CPFR, S&OP, Digital Twins	✓	✓
LTAs		✓



# Essential Areas Of Us-Japan Collaboration For Enhanced Supply Chain Independence And Resilience



# The US and Japan Could Benefit By Coordinating Economic & Industrial Policies, Technology & Innovation in Supply Chain Visibility, and Investing in Predictive Artificial Intelligence Solutions

## **Essential Axes of US-Japan Coordination for Supply Chain Independence**

### Industrial policies

1. Reducing import dependence for critical materials
2. Developing trade bi/multi/neo-multilateralism frameworks aside from WTO
3. Reinforcing cybersecurity

### Supply chain visibility technologies

4. Building manufacturing digital twins
5. Designing supply chain control towers
6. Monitoring supply chain visibility for strategic materials and products

### Artificial Intelligence for supply chain risk mitigation

7. Developing machine learning algorithms for supply chain management
8. Applying predictive analytics to minimize supply chain risks

Note: Ongoing efforts should include traditional macroeconomic and foreign policies to minimize likelihood of global recession and economic bullwhip, e.g., interest rates, housing, etc.



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