

Electronics Components: 2021 Review and 2022 Outlook

Learning from the Past; Looking to the Future

Dale Ford – Chief Analyst
December 2, 2021



Electronic Components Industry Association

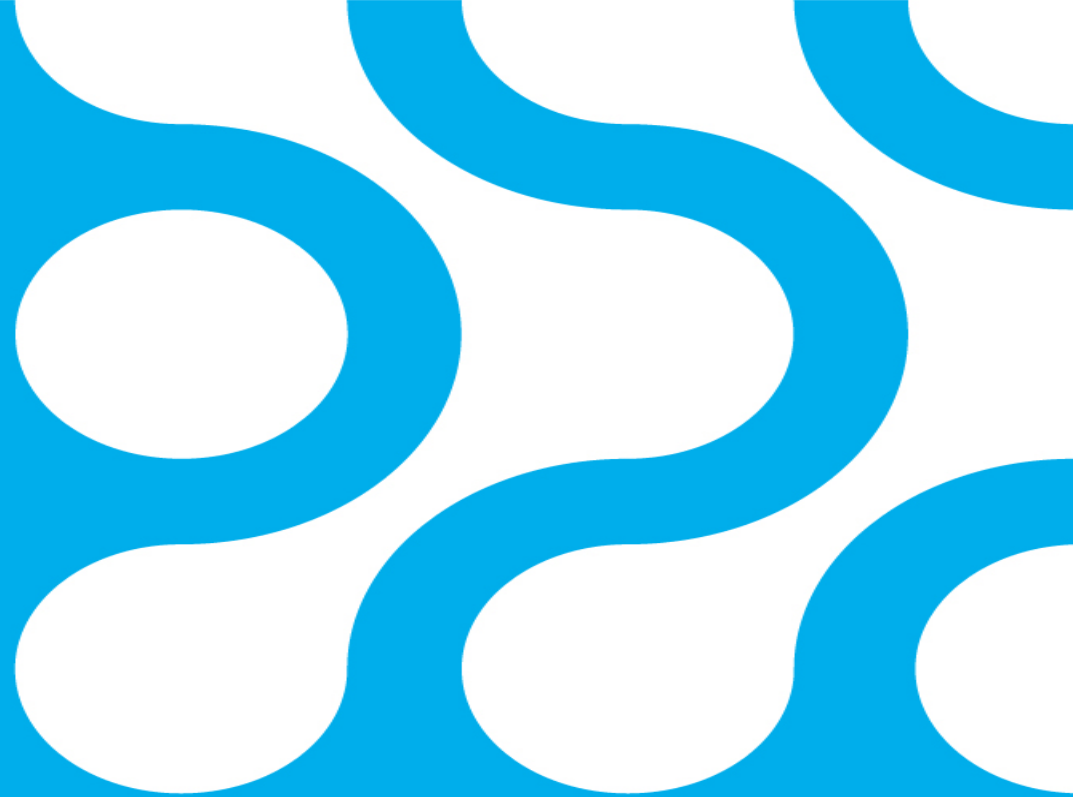


Review and Outlook

- Cycle Analysis
- Looking Forward ~ 2021
- What About the Electronics & Components Supply Chain?
- The Impact of Inflationary Pressures
- Electronics & Components Market Drivers

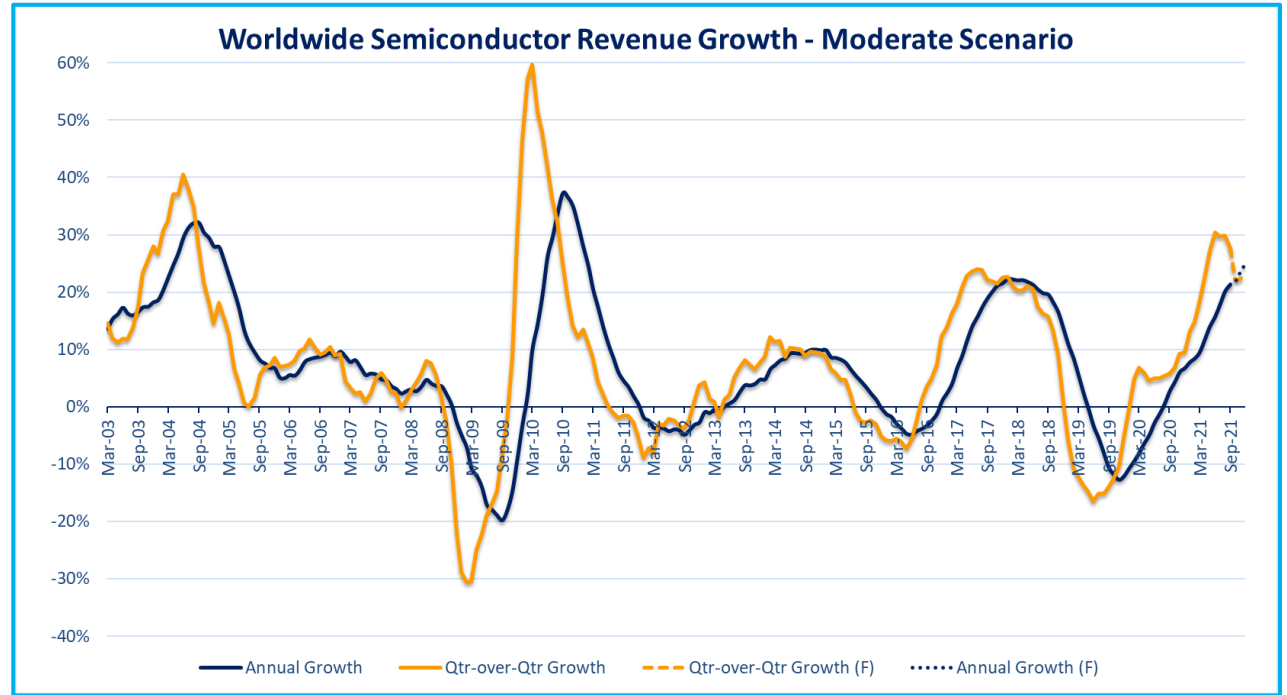
Cycle Analysis

~ 2021 ~



Semiconductor Revenue Growth Cycle

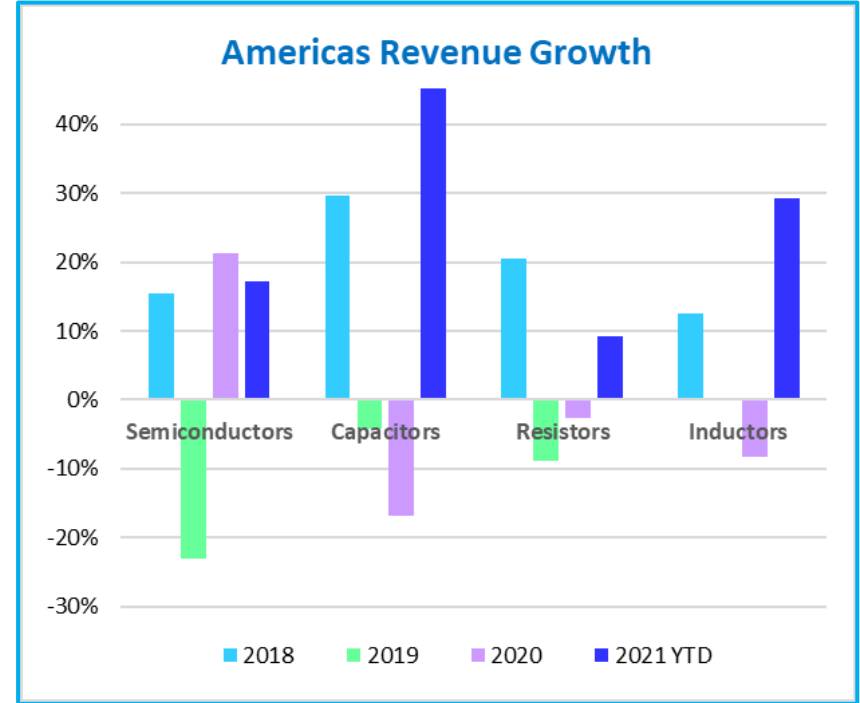
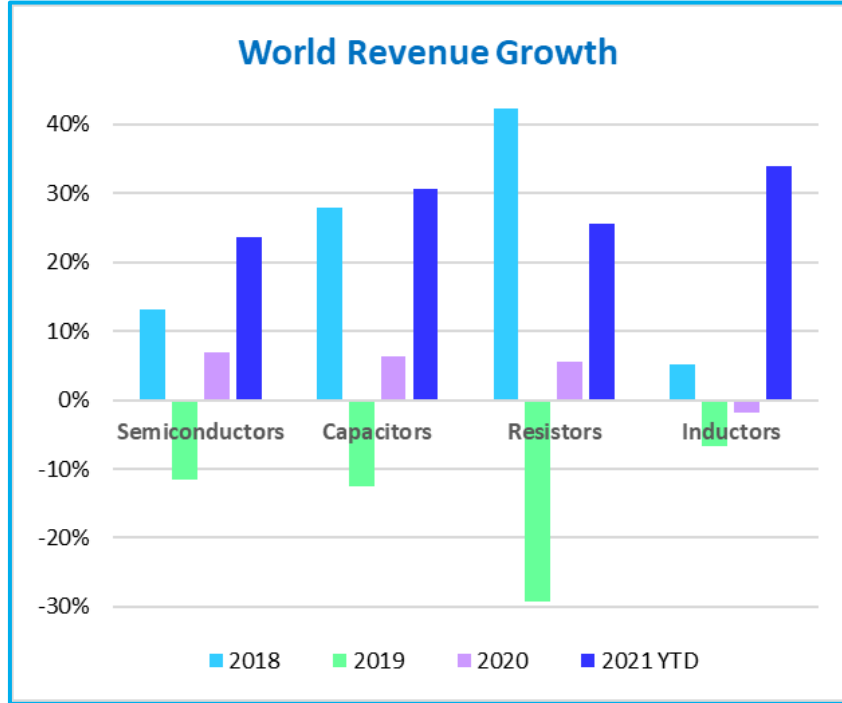
- Quarter-over-Quarter growth surges to highest level in over a decade
- Pause or peak in Q-over-Q growth?
- Annual revenue cycle appears to have legs through 2022
- Annual revenue growth breaks positive in August 2020
- Strong demand and technology drivers
- Boost from shift in consumer spending? Durable?



Source – WSTS

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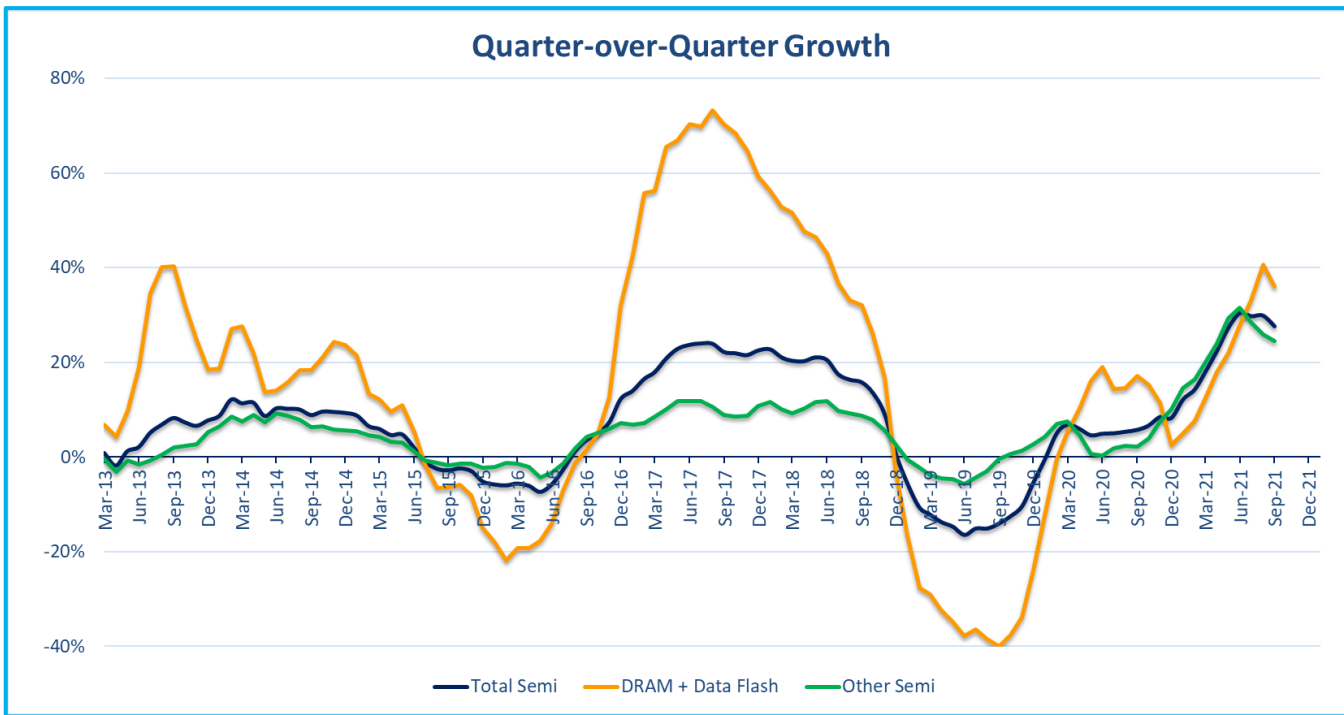
Electronic Component Revenue Growth



Source: World Semiconductor Trade Statistics (WSTS),
World Passive Trade Statistics (WPTS)

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Semiconductor Growth Trends

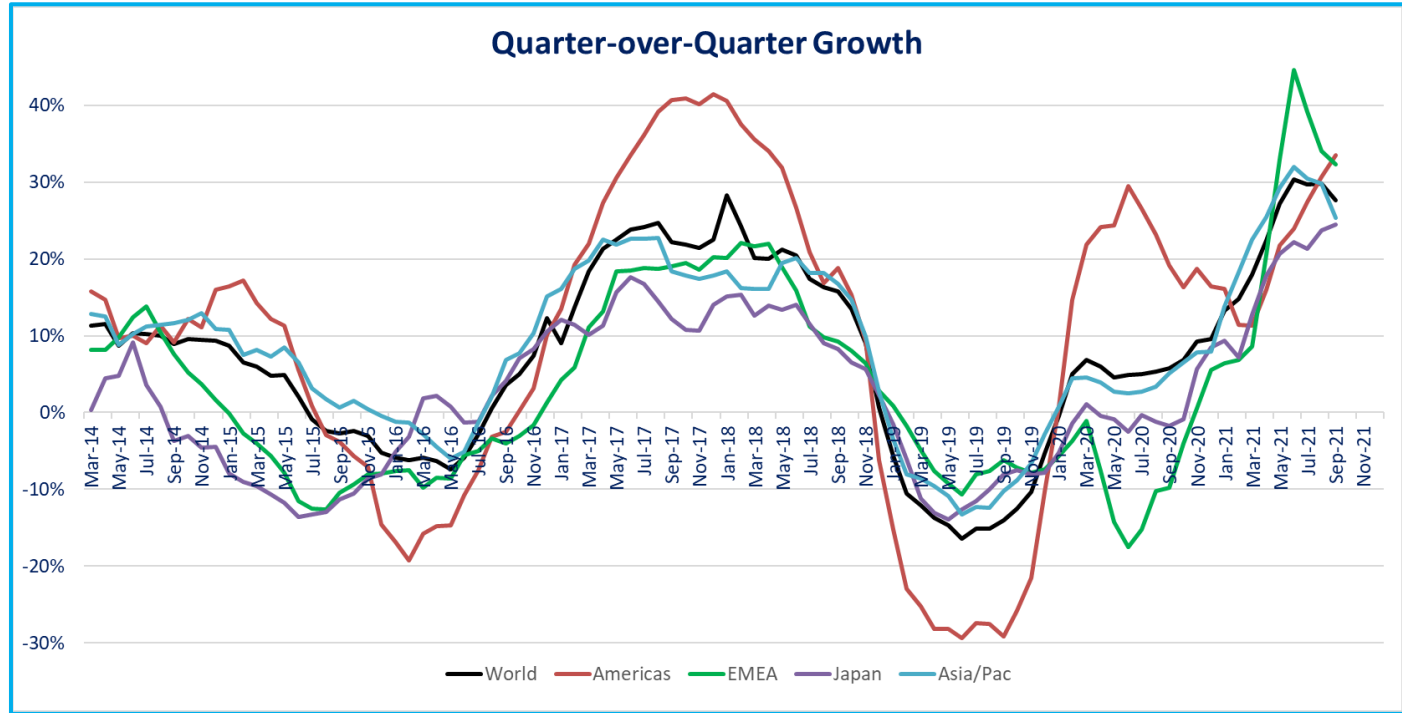


Source: WSTS

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Americas Semiconductor Market Sustains Growth

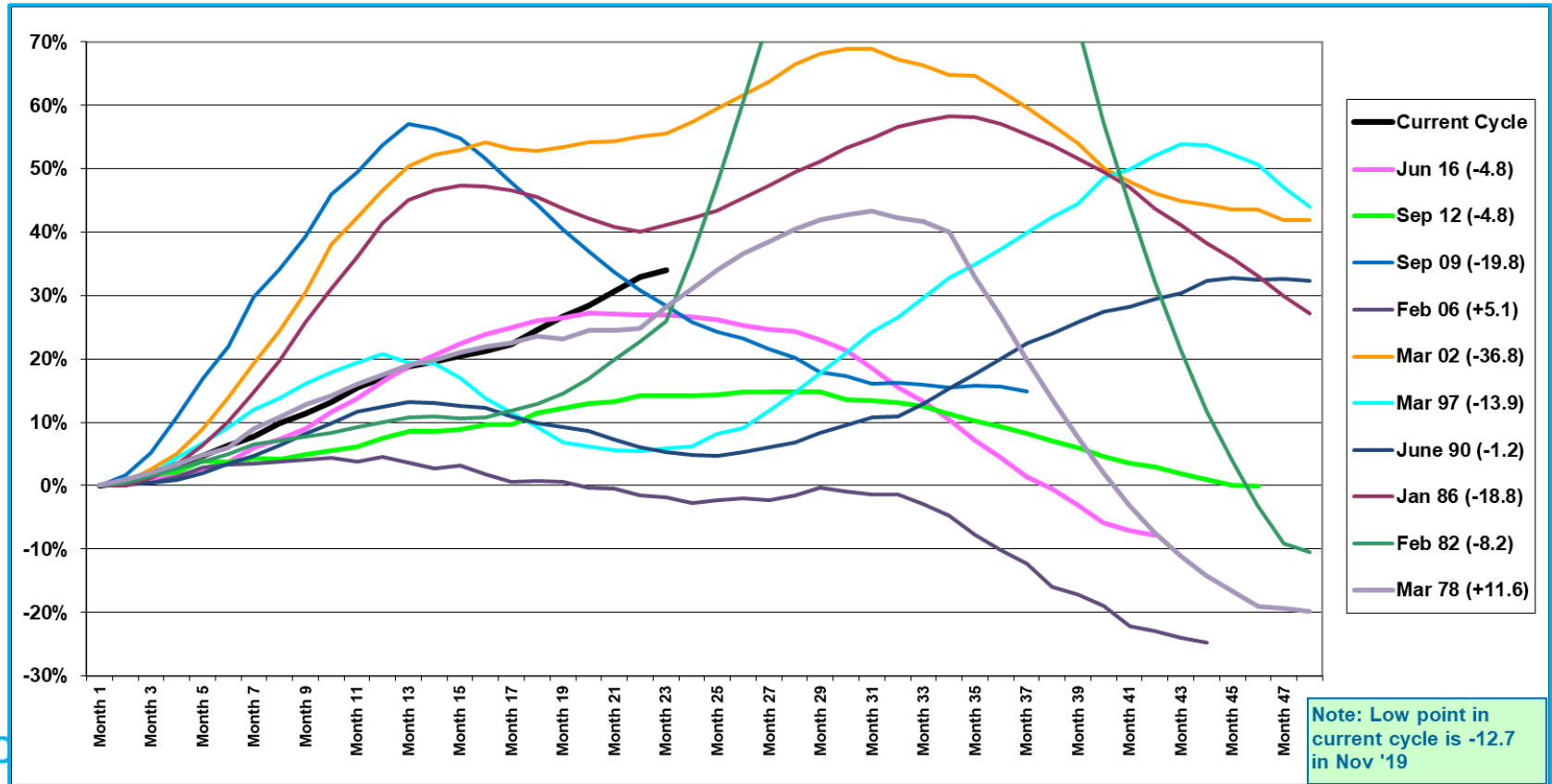
- Memory follows its own path and drives more volatile Americas growth pattern
- EMEA achieves a remarkable turnaround in growth – now leads world with America in growth
- Japan sustains strong improved growth after stagnation



Source – WSTS

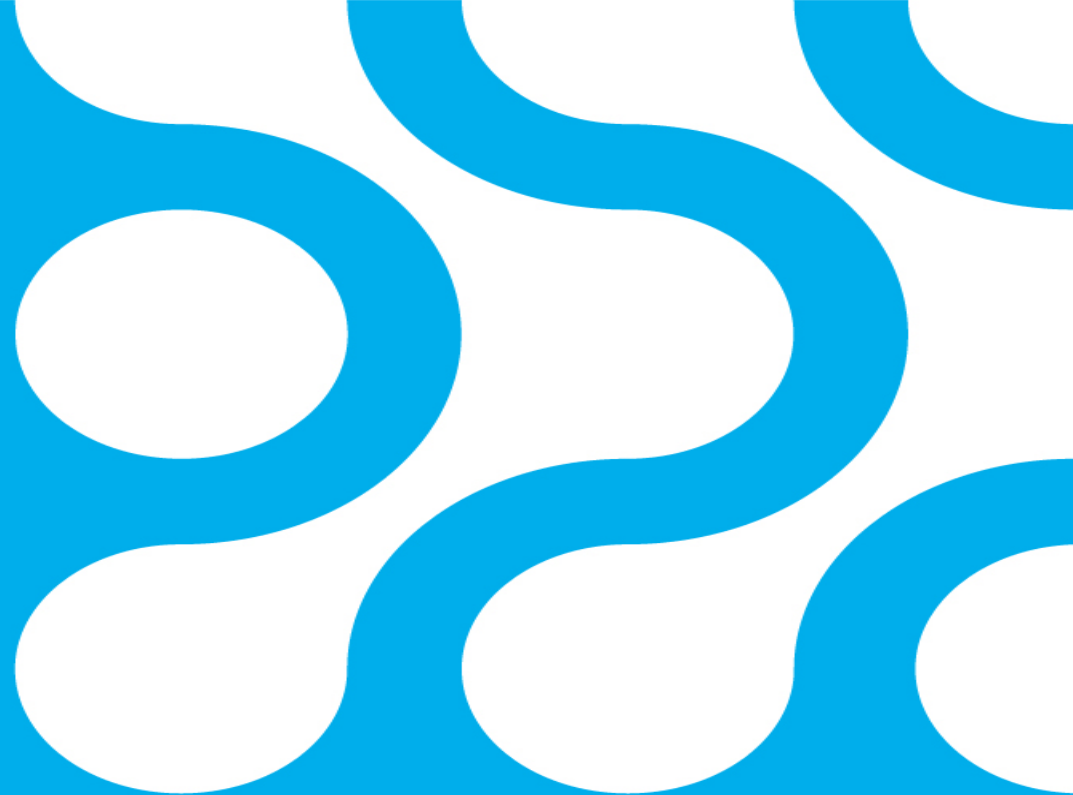
Strongest Recent Cycle

Most cycles last about four years

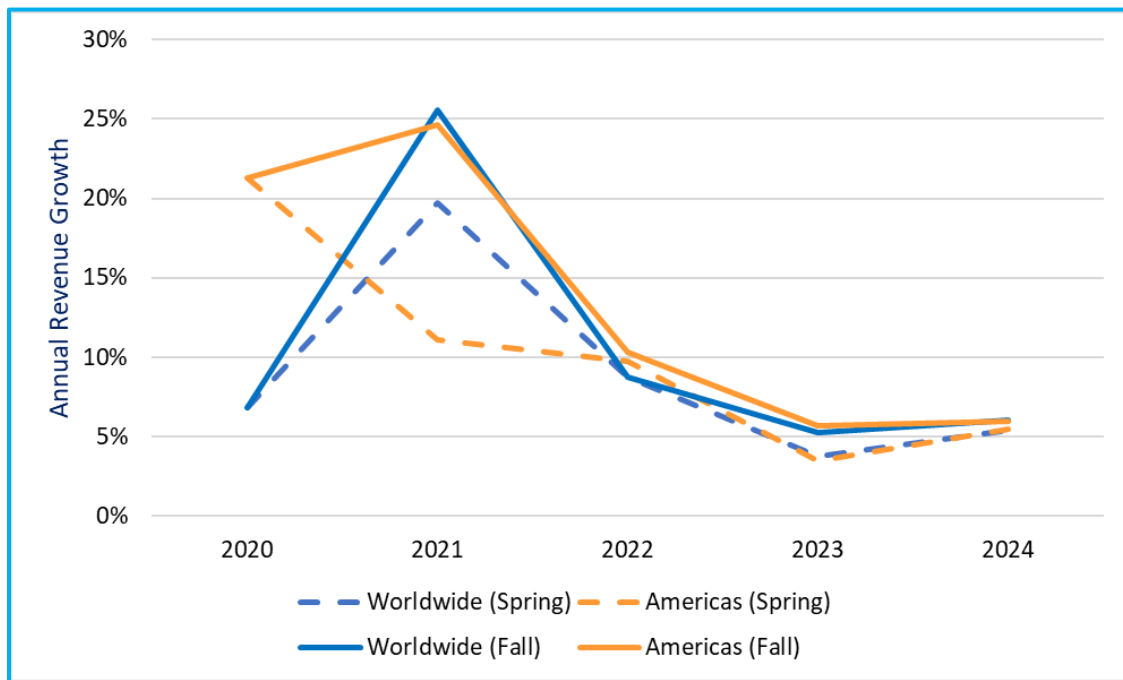


Looking Forward

~ 2022 + ~



WSTS Spring & Fall 2021 Semiconductor Forecast

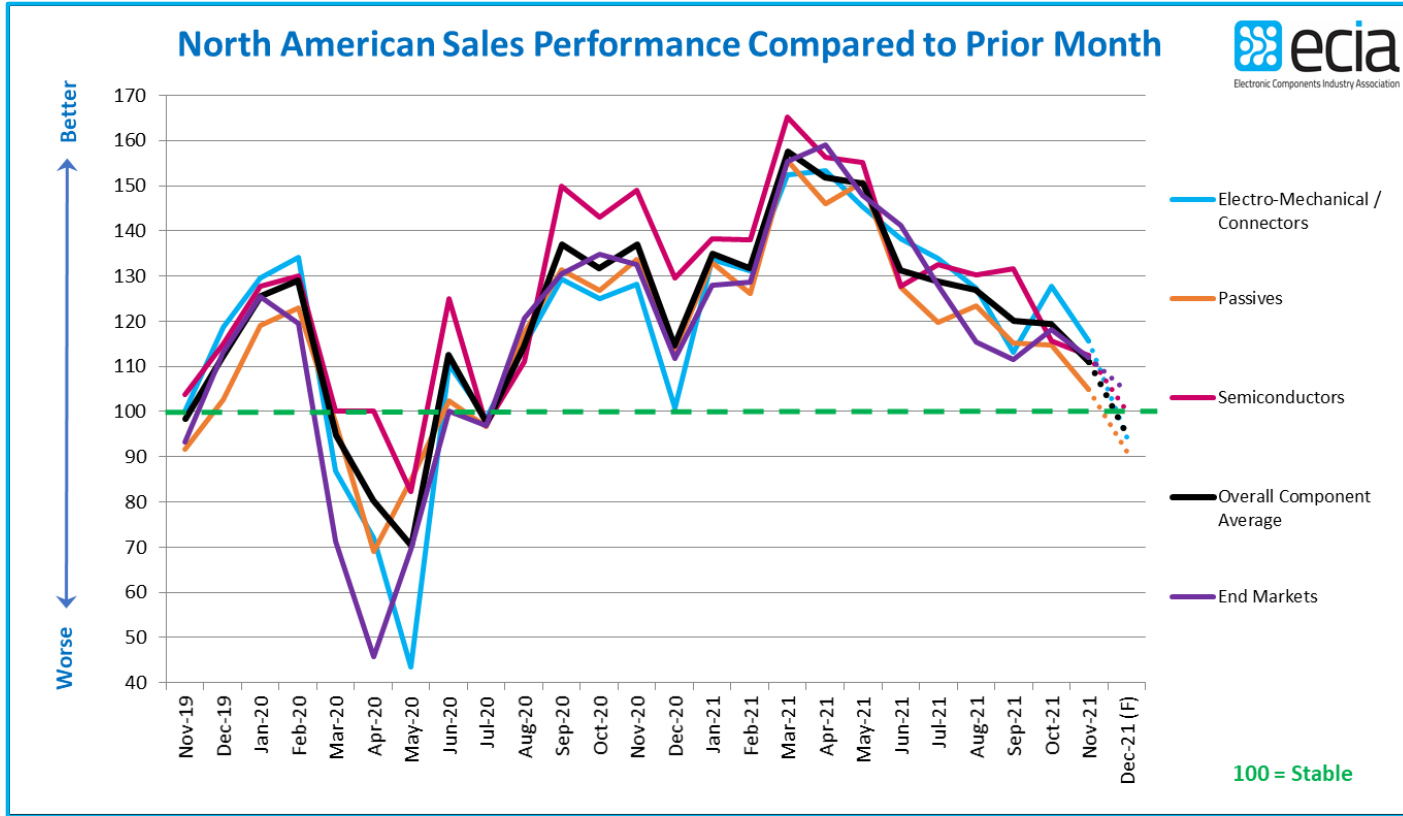


Source: WSTS

Observations:

- Forecast built up category-by-category with experienced analysts from all regions
- Typical semiconductor cycle pattern
- Memory IC drives Americas dramatic jump from Spring Fcst
- Early indicators of stronger current cycle manifest in 2021 results
- Expect will also result in stronger and more durable than common expectations in long-term
- Also, WSTS data still does not really reflect recent price increases

North America Sentiment Survey Trends

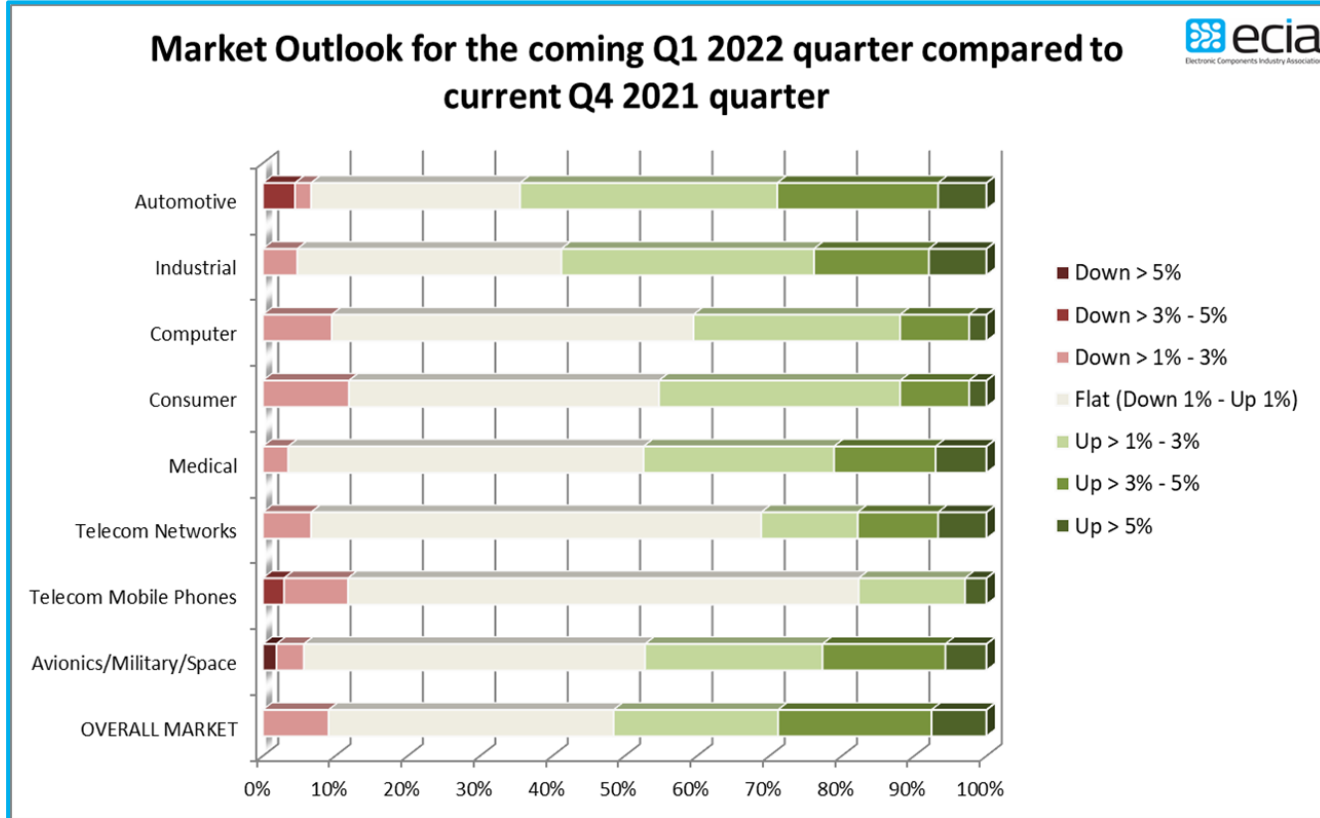


- Overall Average drops below 100 in December outlook – First time in 18 months
- Seasonality likely playing a role in Oct to Dec index
- BUT – Economic and supply chain factors exacerbate downward acceleration
- Important to remember context – Month compared to prior Month

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Source: ECIA Electronic Component Sales Trends Survey

North America Sentiment Survey Trends

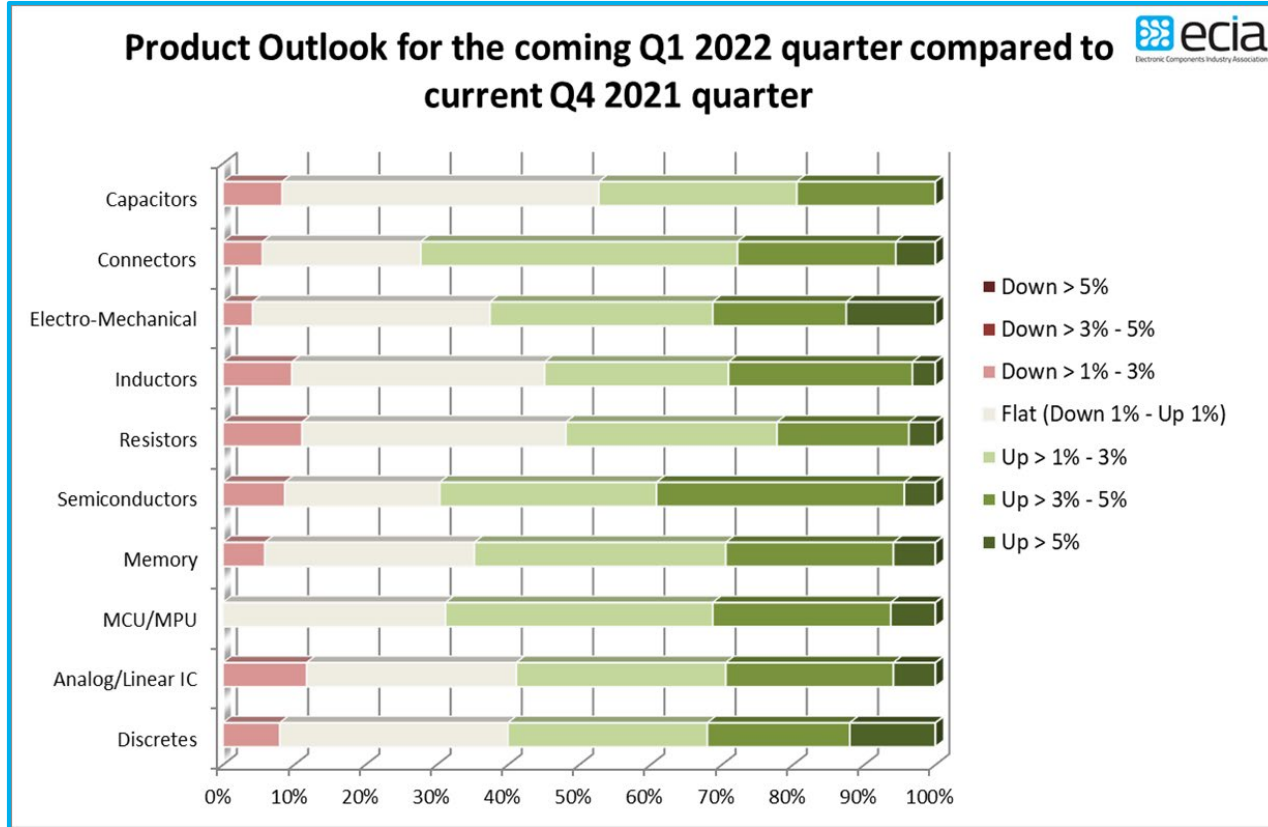


Source: ECIA Electronic Component Sales Trends Survey

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- Over half still expecting overall market growth in Q1 2021 - 52%
- Less than 12% expect a market decline in any segment
- Wide range of growth expectations by market – 18% to 64%
- Industrial & Automotive continue to lead in optimism
- Shift in balance of growth expectations in Q1 2021 to “1% to 3%”

North America Sentiment Survey Trends

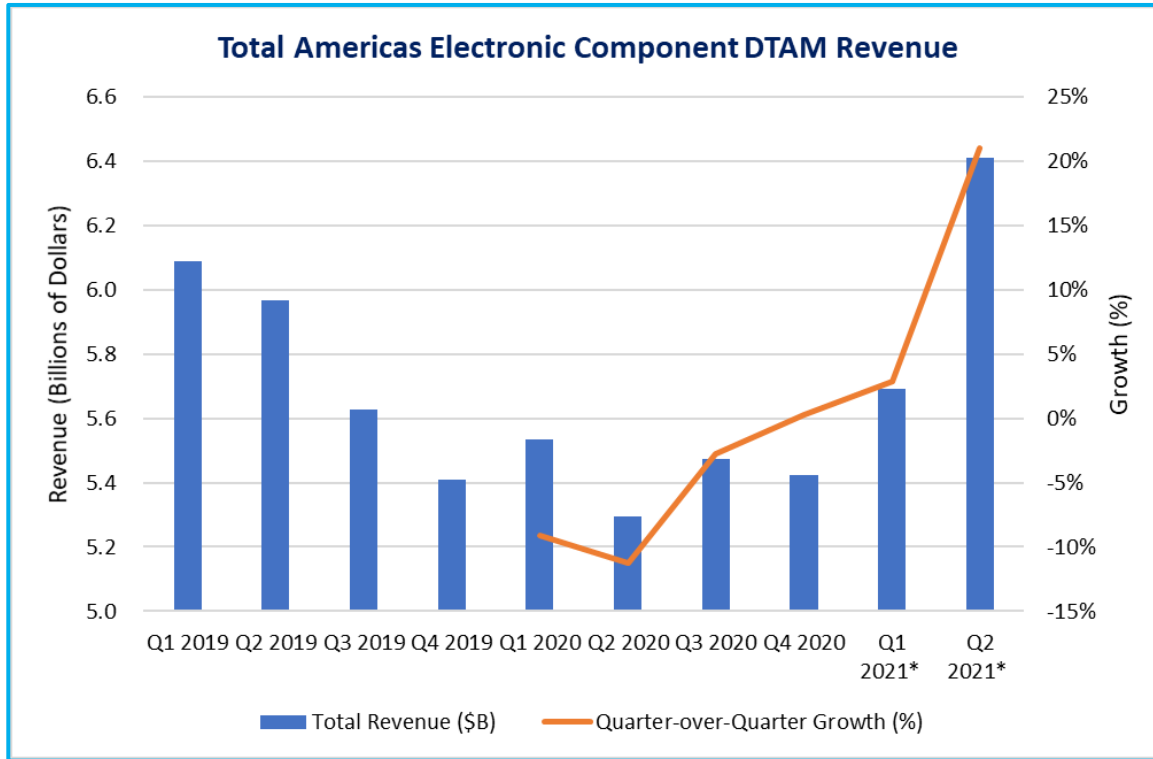


Source: ECIA Electronic Component Sales Trends Survey

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- Positive growth expectations range still skews on the high end between 47% and 72% of survey respondents
- Less than 6% report growth expectations “Above 5%” in all but 2 categories – Capacitors & Discretes
- Strongest growth outlook in Electro-Mechanical and Semiconductors
- Percent of respondents expecting overall market growth = 62%

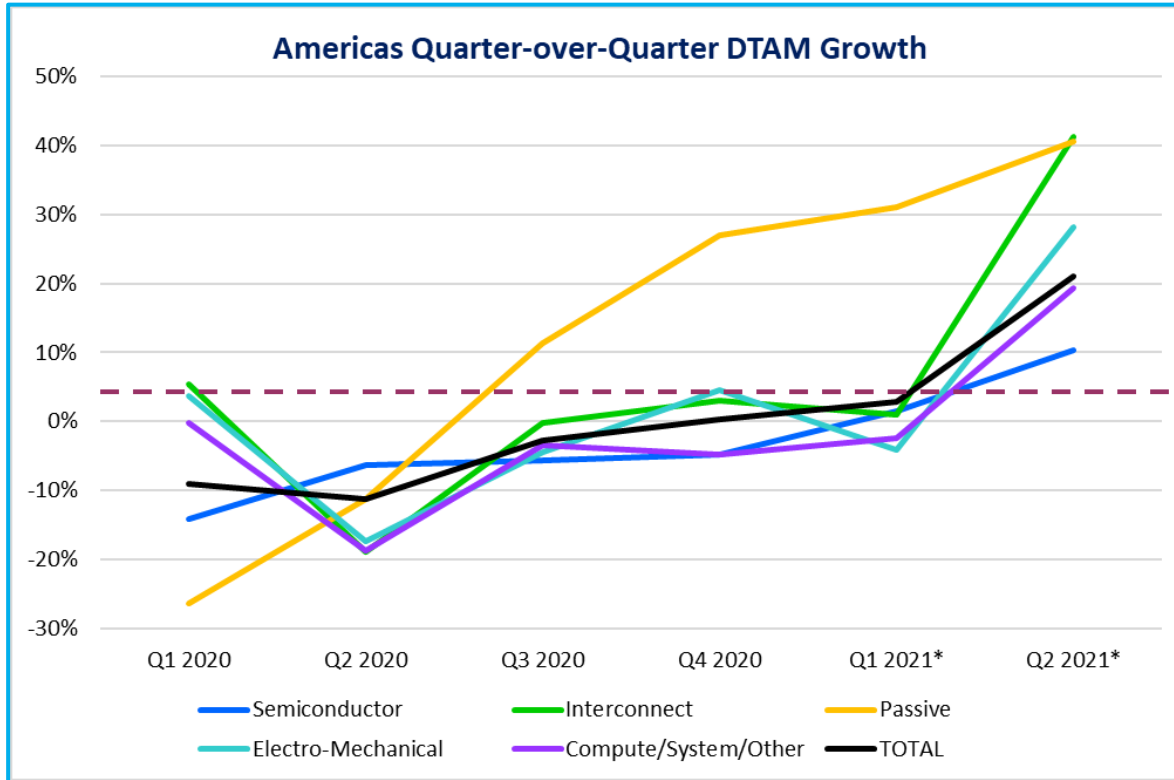
Quarterly DTAM Estimates



Source: ECIA

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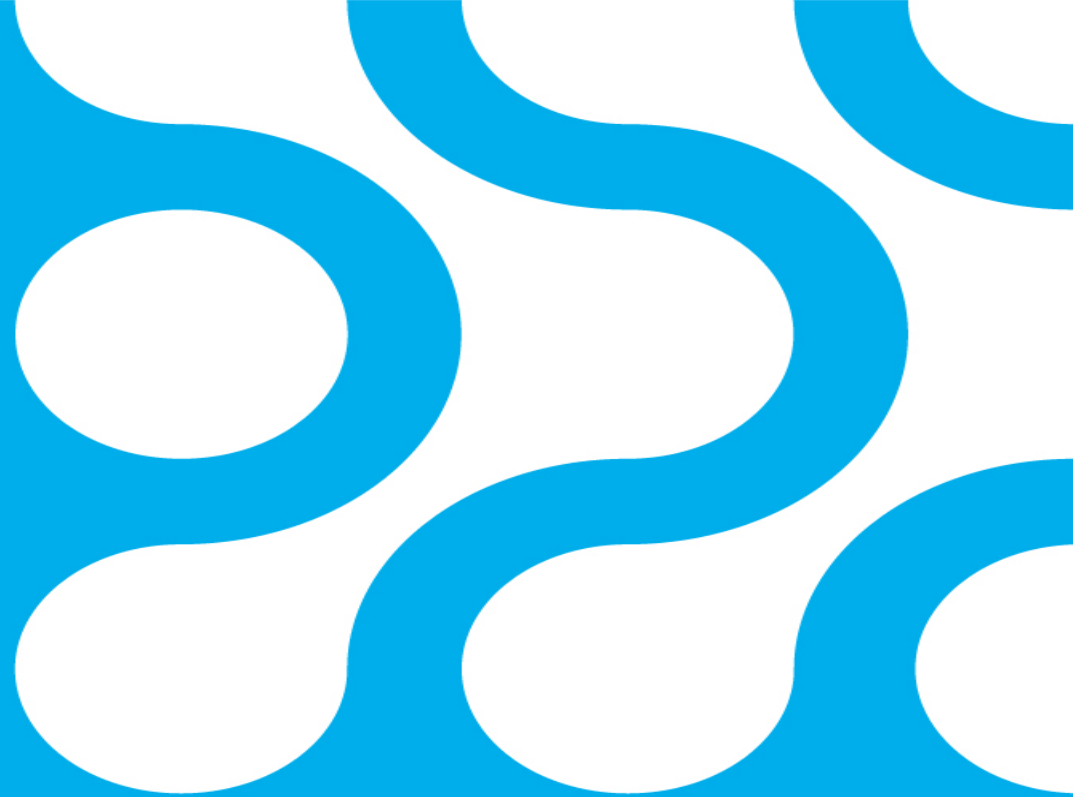
Americas Quarterly DTAM and TAM Growth Comparison



Source: ECIA / WSTS

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What About the Electronics & Components Supply Chain?

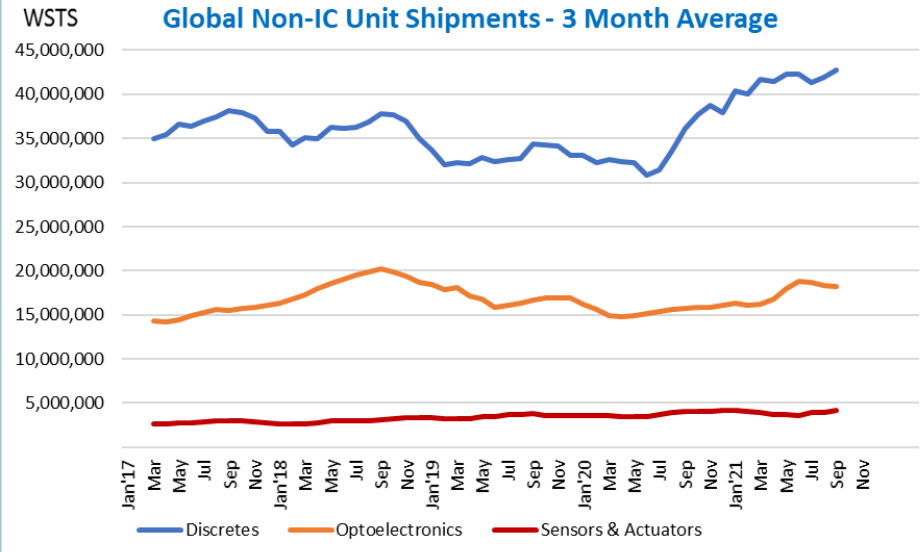
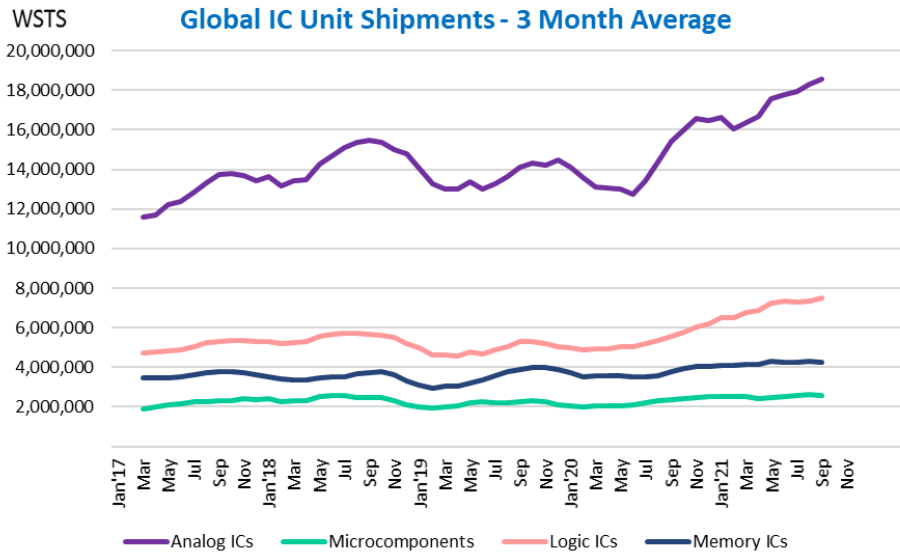


Supply Chain Disruptors

CLIMATE
POLITICS
SHIPPING
PANDEMIC
TRADE WARS
RAW MATERIALS
LABOR SCARCITY
GROWING DEMAND

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Worldwide Semiconductor Unit Shipments



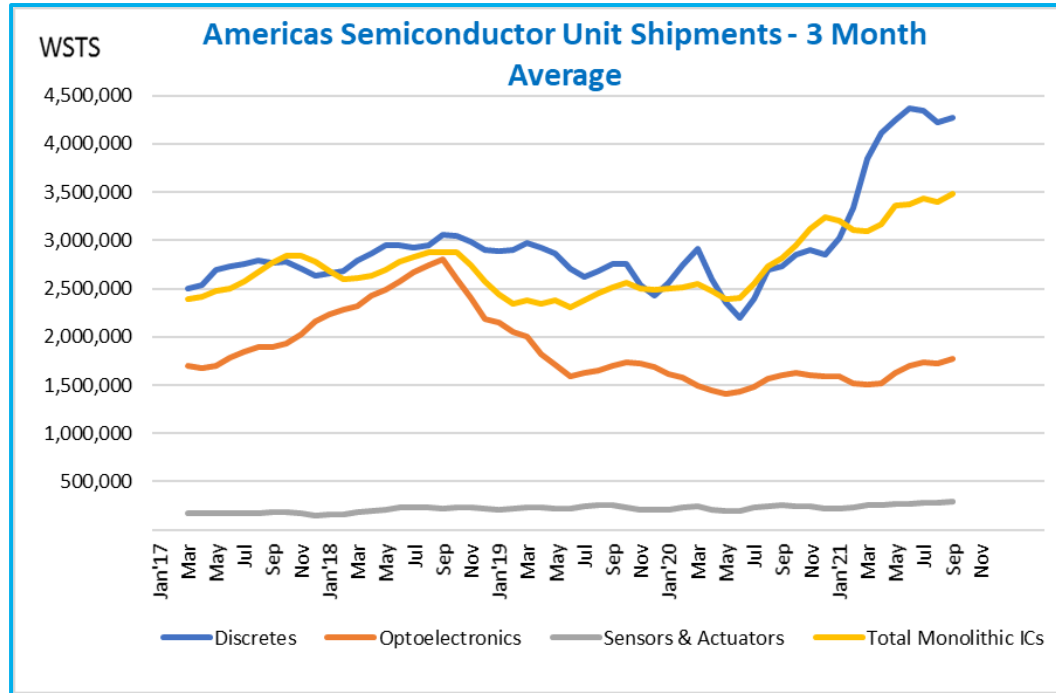
Source: WSTS

	Increase From:	Previous Peak	Recovery Start
• Discretes		12.0%	38.5%
• Analog ICs		19.9%	45.7%
• Logic ICs		31.7%	54.1%

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Americas Semiconductor Unit Shipments



Source: WSTS

Increase From:

- Discretes
- Monolithic ICs

Previous Peak

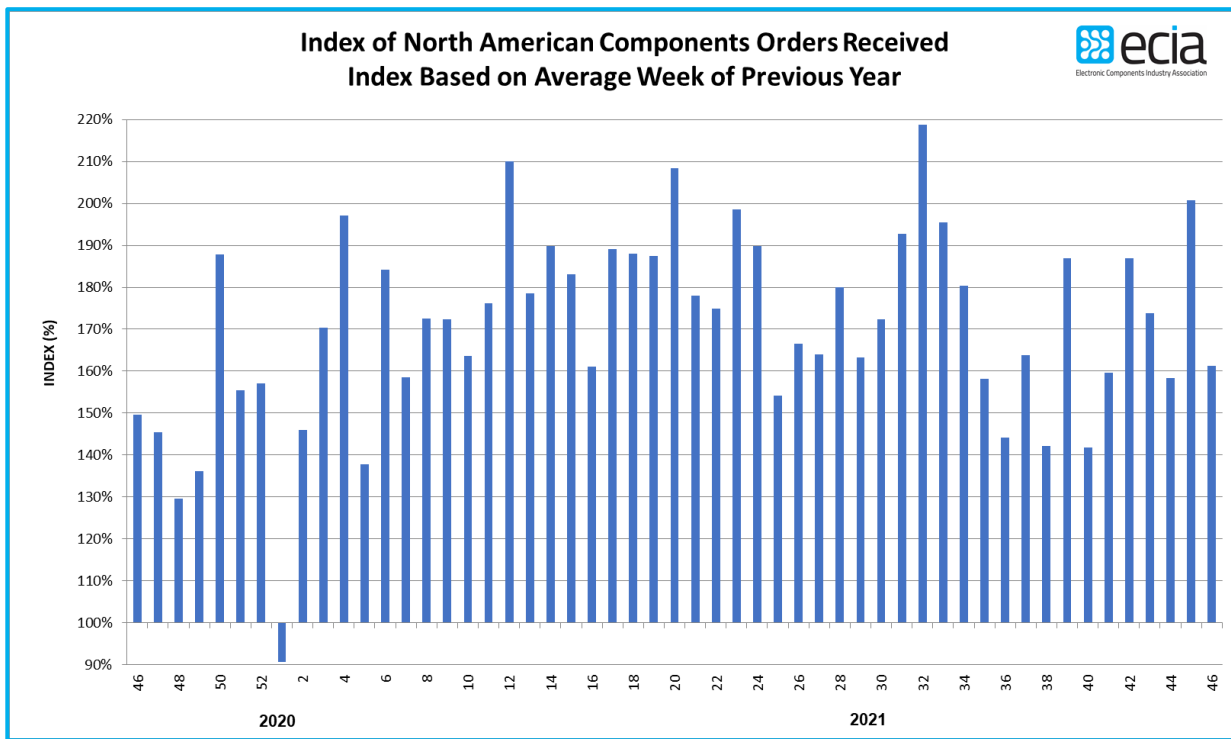
39.7%
21.1%

Recovery Start

94.1%
45.5%

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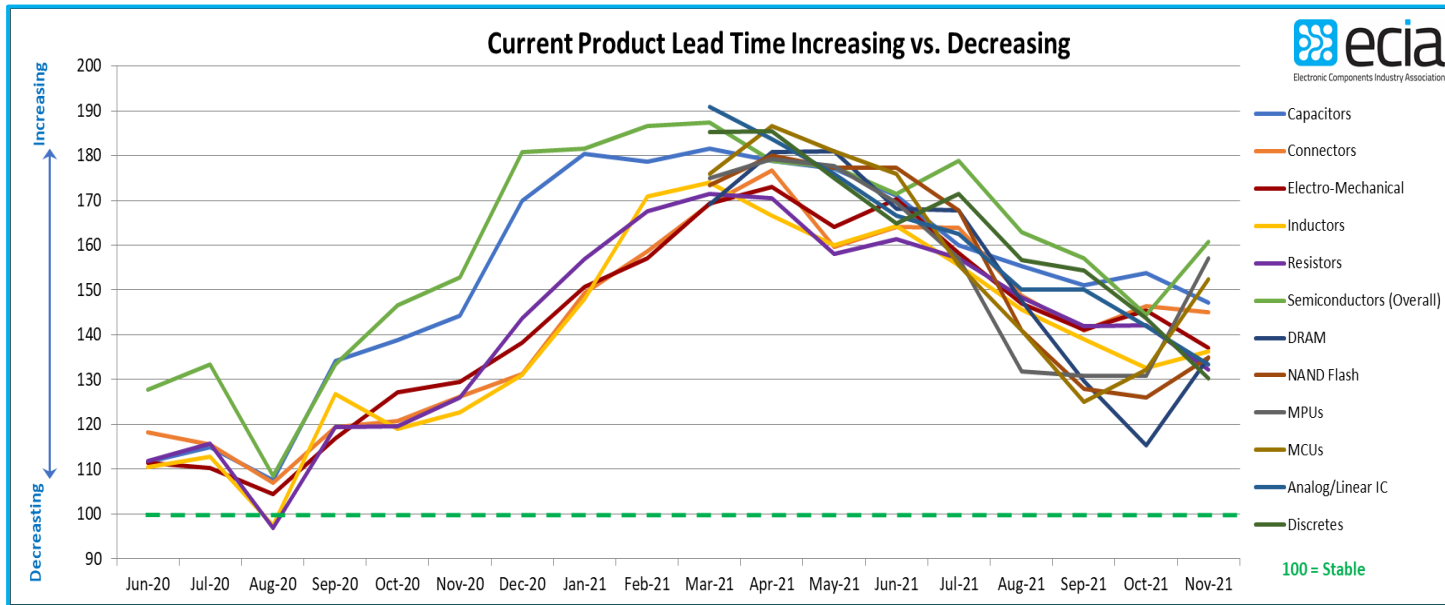
IP&E – Interconnect, Passive, Electro-Mechanical Orders



Source: ECIA

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Lead Time Status – ECIA Member Monthly Survey



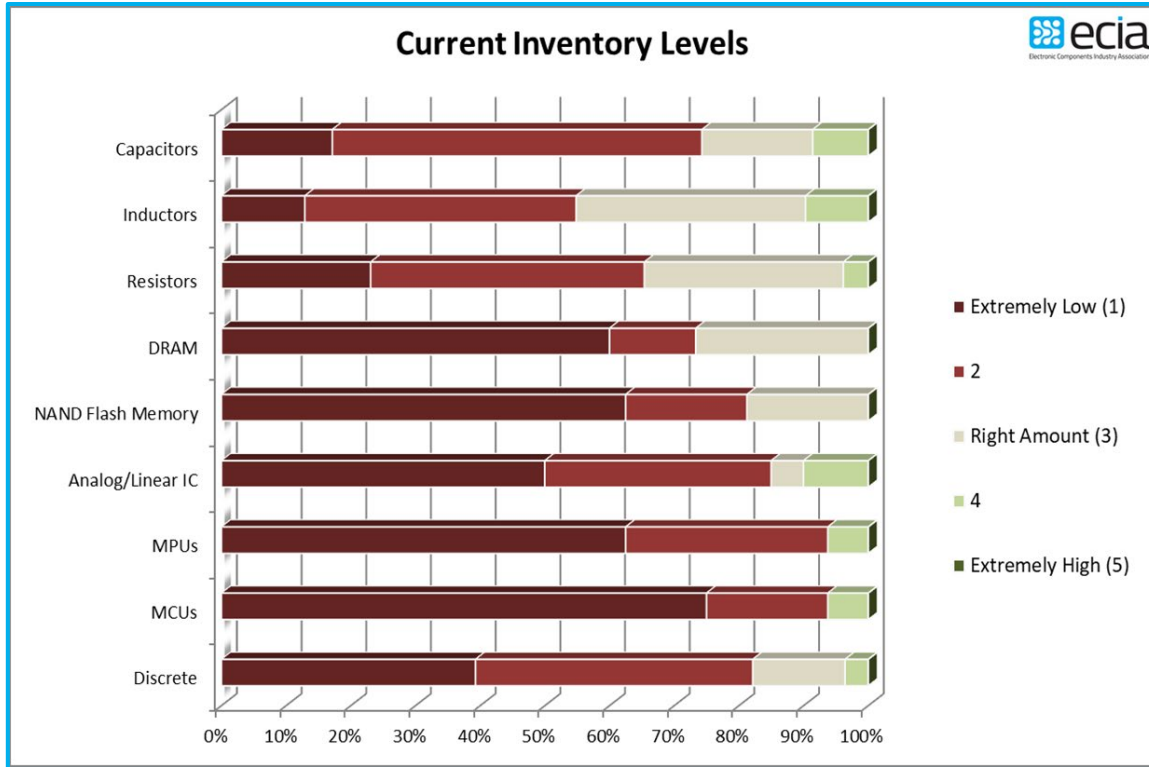
Overall Trend to Less Pressure

- Except November
- On average 45% see increasing / Smattering of categories with ~4% reported decreases
- Manufacturer perspective much more positive than Distributor & Mfr Reps view

Index Calculation Formula = (%Decreasing * 0) + (%Stable * 100) + (%Increasing * 200)

Source: ECIA

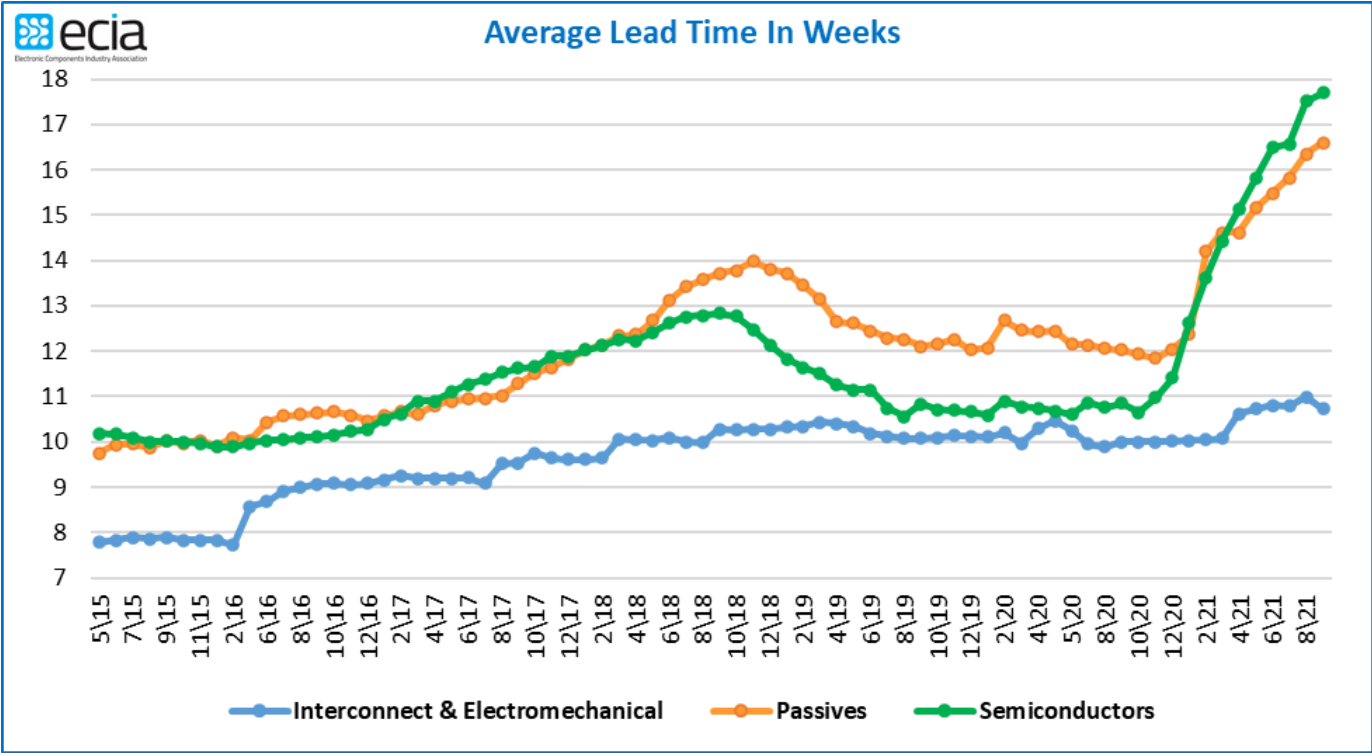
Critical Inventory Levels Still in Every Category



Source: ECIA

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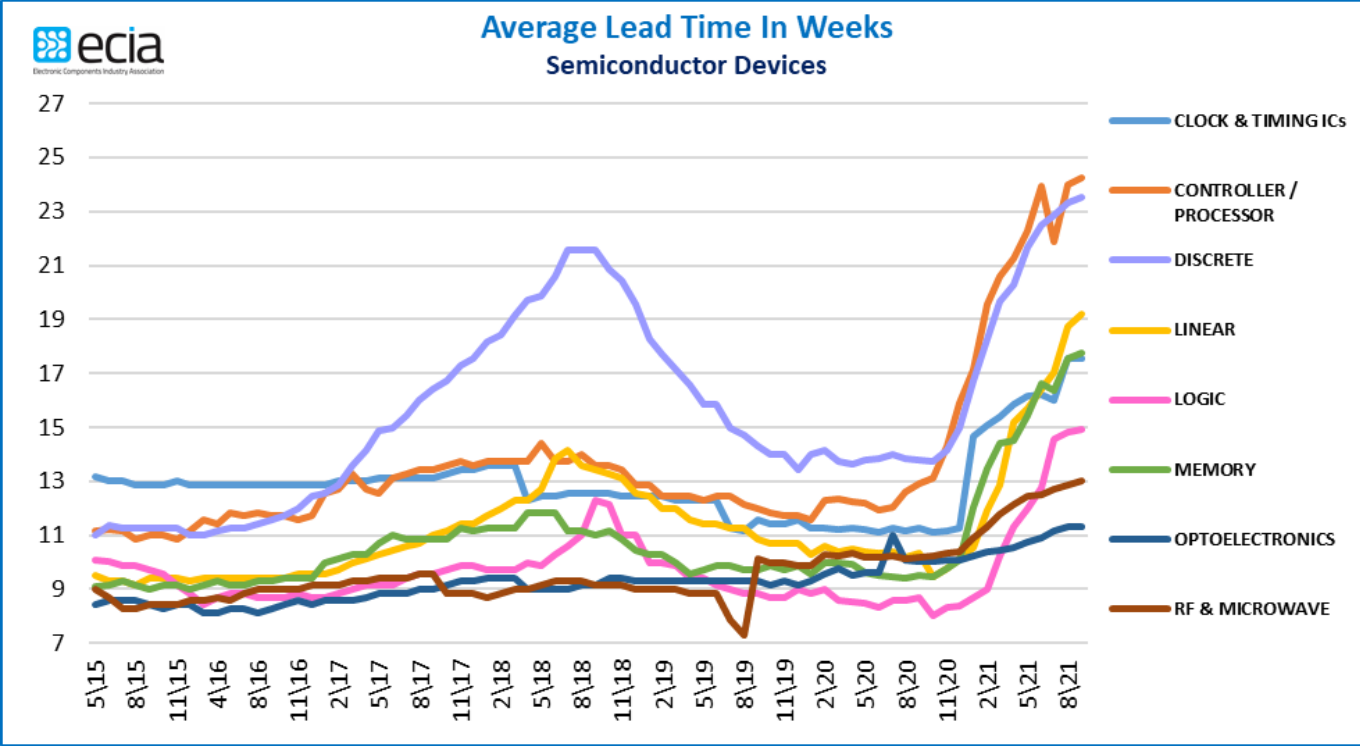
North America Lead Times – Record Shattering



Source: ECIA

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North America Lead Times – Record Shattering

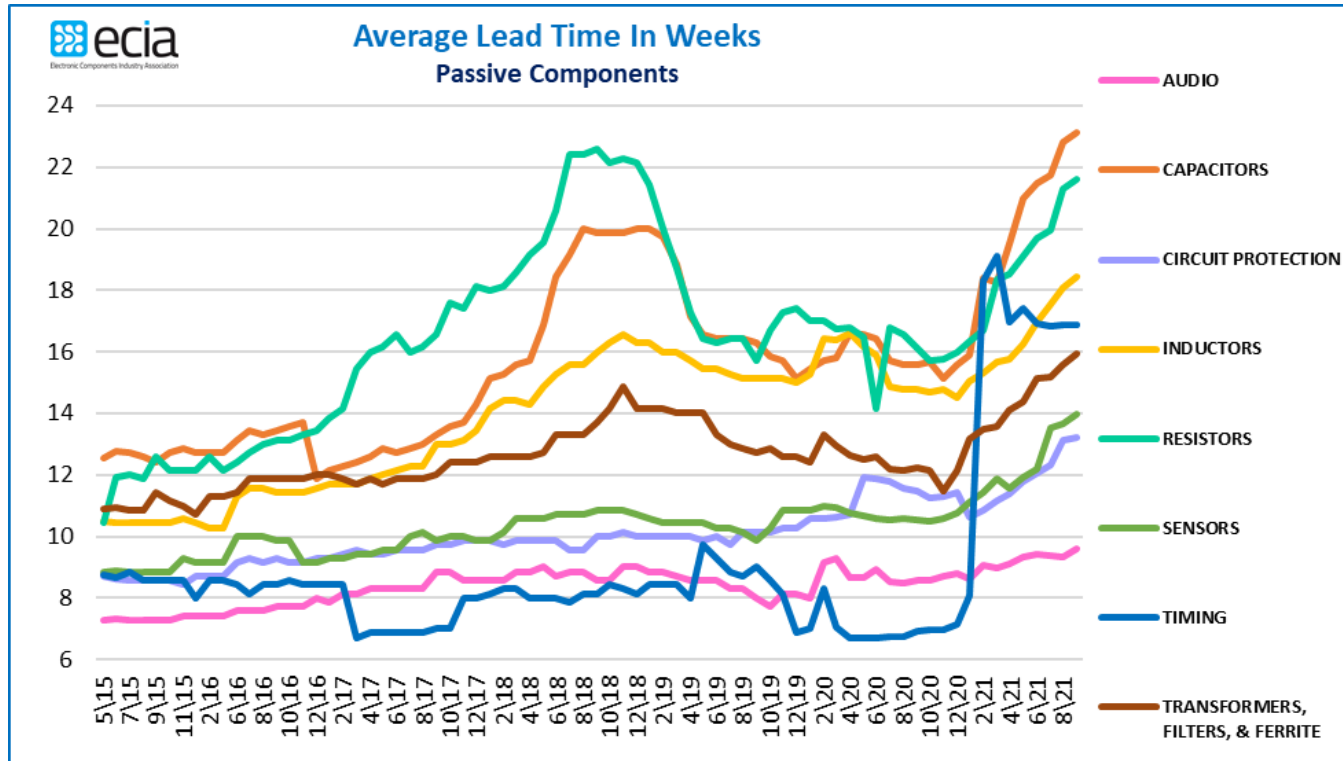


Source: ECIA

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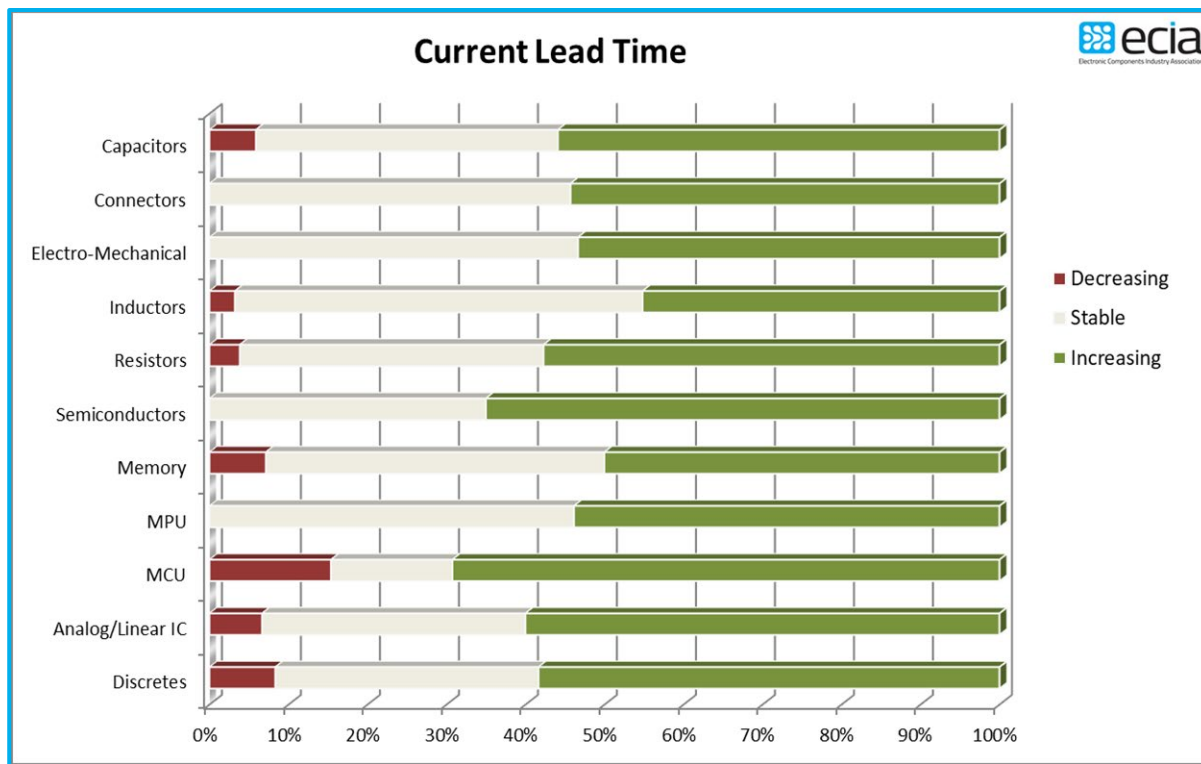
North America Lead Times – Record Shattering



Source: ECIA

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Lead Time Status – A Hint of Slight Improvement



Source: ECIA

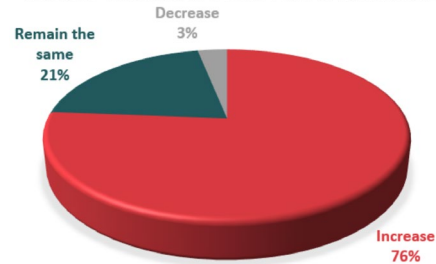
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Lehigh University Supply Chain Risk Index – Q3 2021

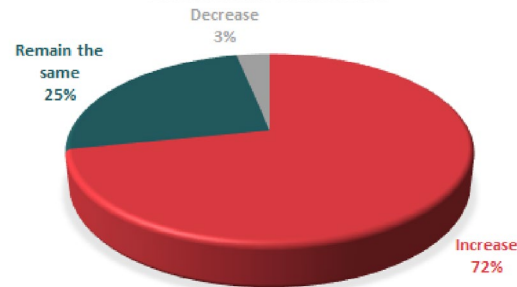
Risk Type	3rd Quarter Risk Index	2nd Quarter Risk Index	Trend	
Transportation Disruption Ri	86.02	79.11	↑	+6.91
Economic Risk	81.99	79.45	↑	+2.54
Supplier Risk	80.12	74.66	↑	+5.46
Cybersecurity and Data Risk	77.64	78.42	↓	-0.78
Government Intervention Ris	70.50	70.55	↓	
Technological or Competitive	61.49	60.27	↑	
Customer Risk	60.87	67.47	↓	
Operational Risk	59.32	53.77	↑	
Quality Risk	58.07	52.74	↑	
Environmental Risk	57.45	54.79	↑	
Average Risk Index	69.35	67.12	↑	

Source: Lehigh Univ, CSCMP

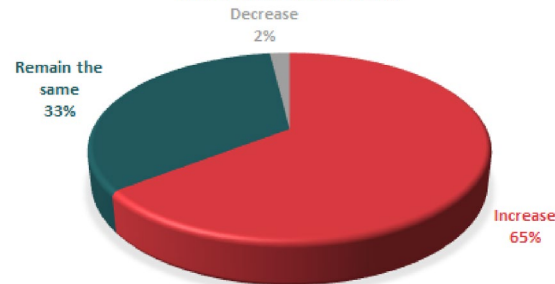
TRANSPORTATION DISRUPTION RISK 86.02



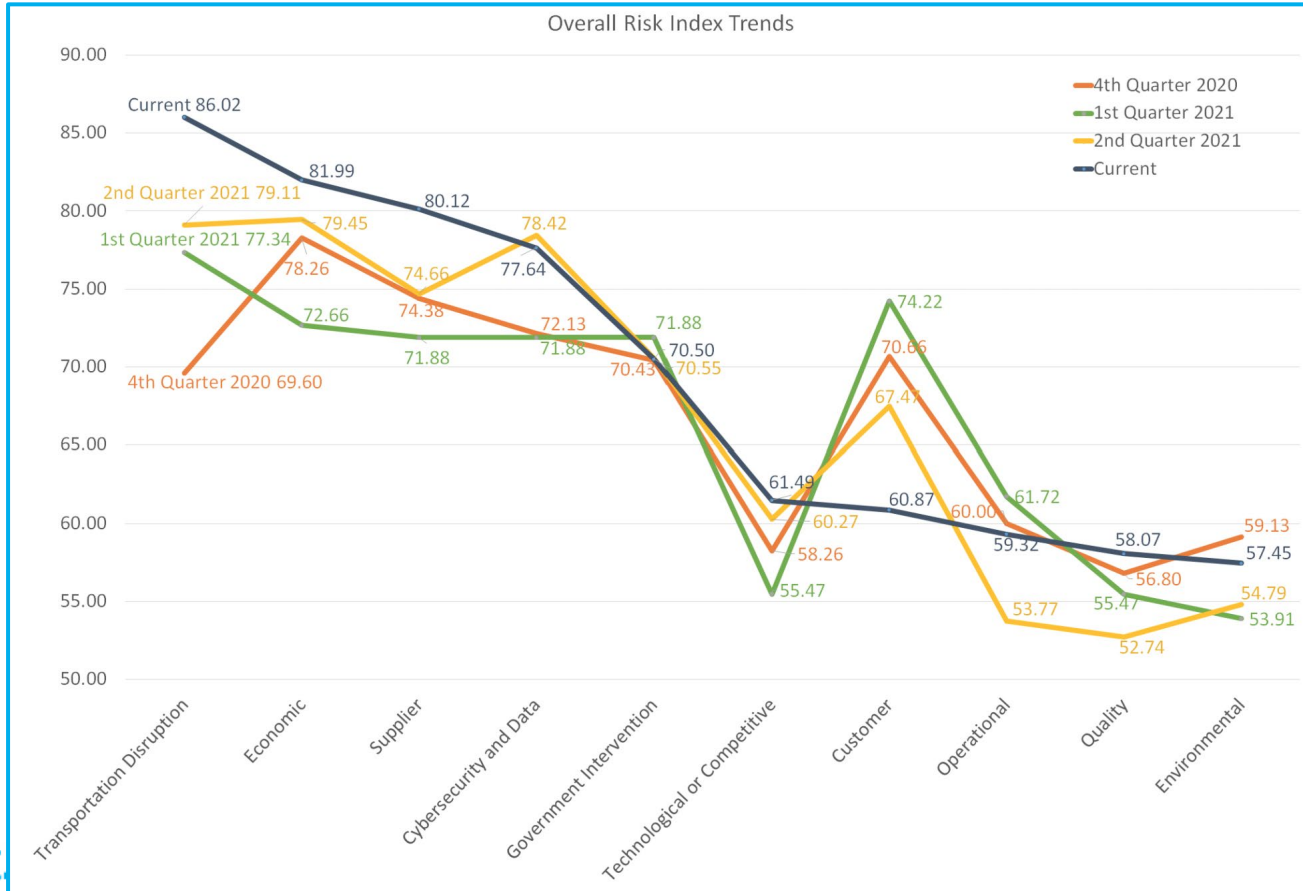
ECONOMIC RISK 81.99



SUPPLIER RISK 80.12



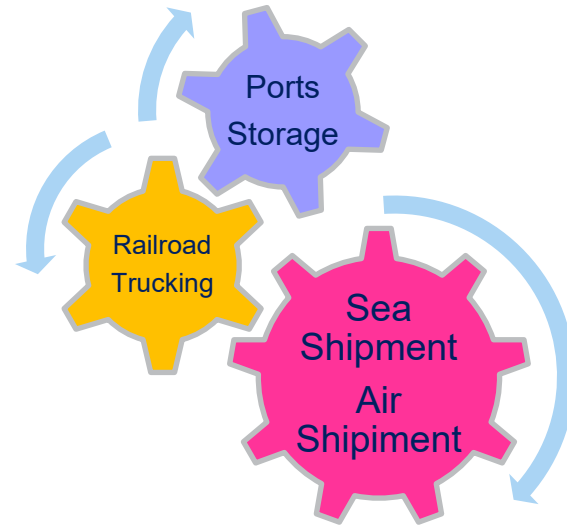
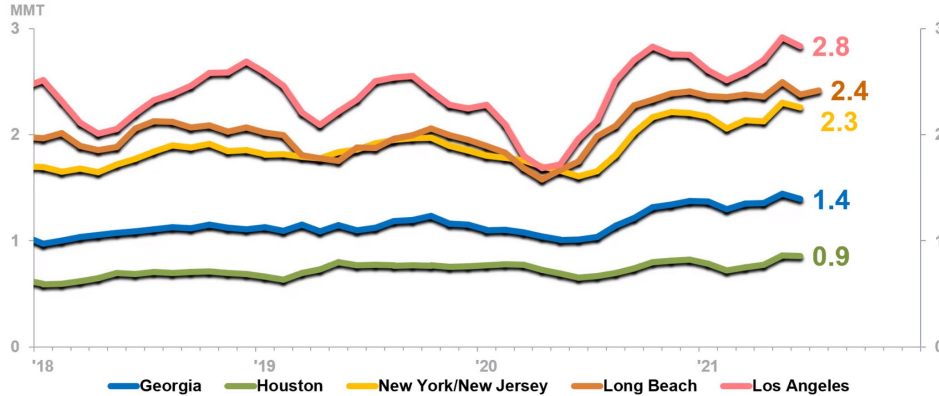
Lehigh University Supply Chain Risk Index – Q3 2021



Pressure At Every Stage

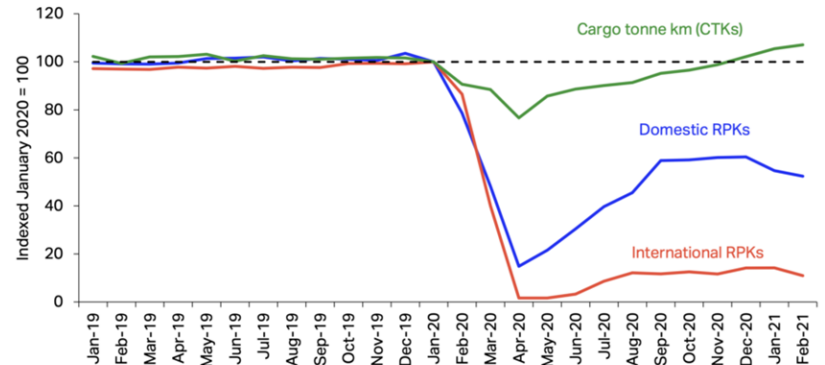
Overwhelming Demand

Total Intermodal Container Traffic | Top Five US Ports



International air travel 89% down, domestic falling, though cargo strong

Cargo tonne km (CTK) and passenger km (RPK), Jan 2020 = 100



Source: IATA Economics using data from IATA Monthly Statistics. Data is adjusted for seasonality.

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First In Forecasts Worldwide

Sources: Port of Authority Statistics NY & NJ, GA, Los Angeles, CA, Long Beach, CA, Houston, TX

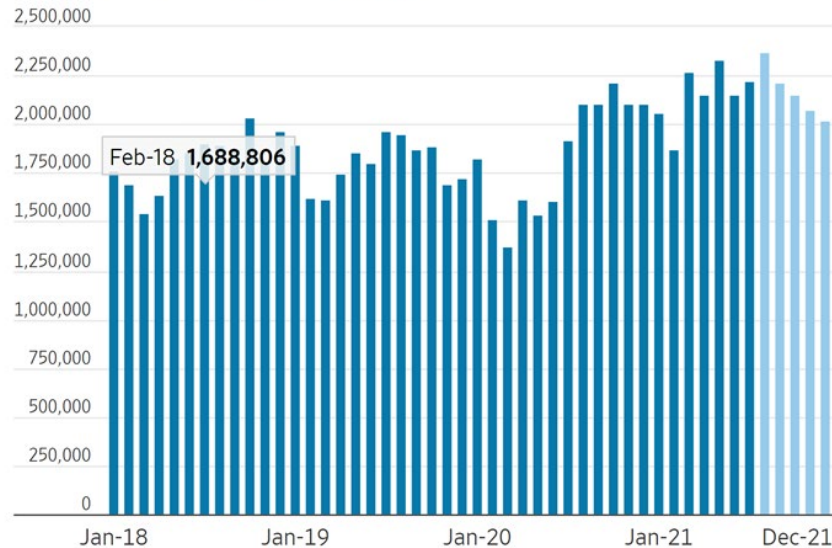
Millions of TEU

Demand for shipping cargo capacity remains elevated

Boxed Up

Monthly container volumes imported into major U.S. ports

Imported TEUs (20-foot equivalent units)



Note: August 2021 is projected and September-December 2021 are forecasts

Source: Global Port Tracker, prepared by Hackett Associates for the National Retail Federation

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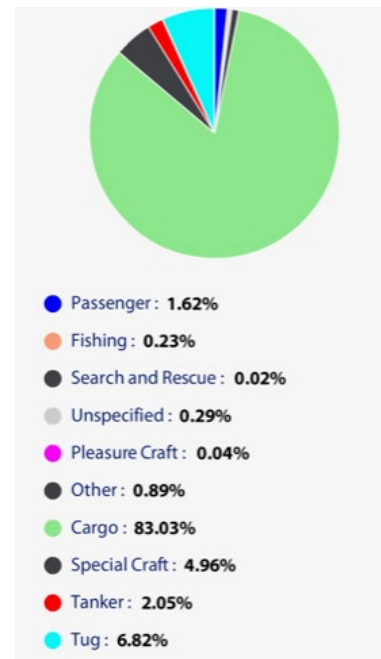
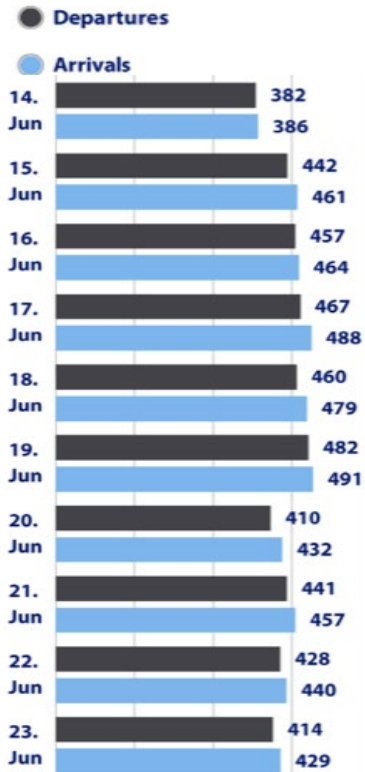
Supply Chain Challenges Abound

One example – Shenzhen Port a Major Bottleneck

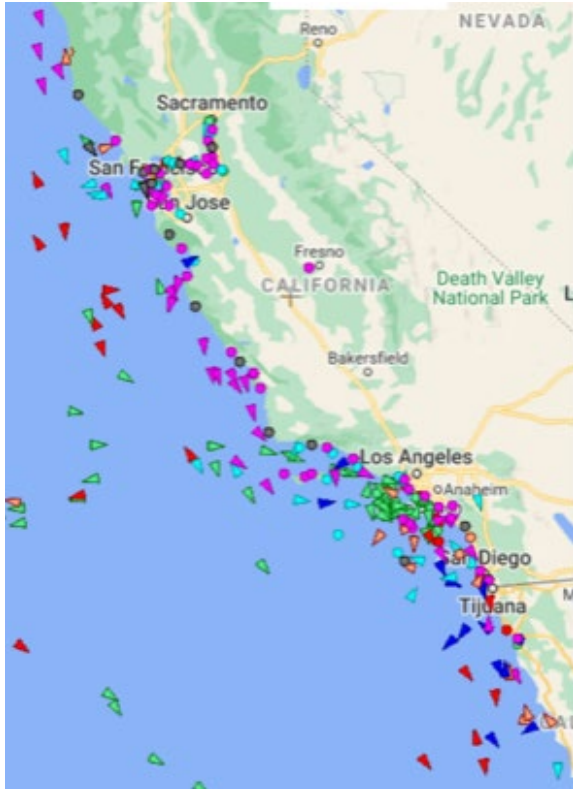


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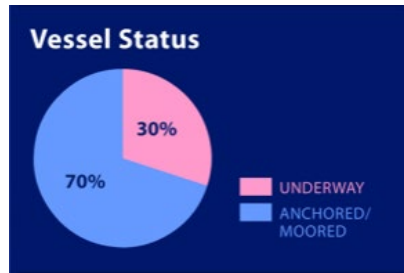
Select Port Calls Type:



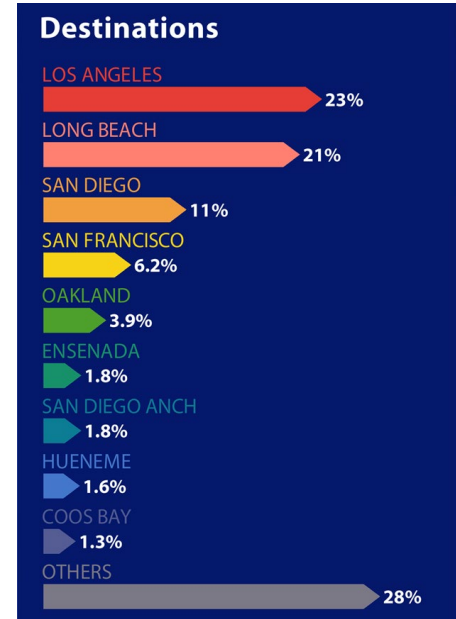
California Ports Overwhelmed – Florida Alternative



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TOTAL VESSELS: 1,886

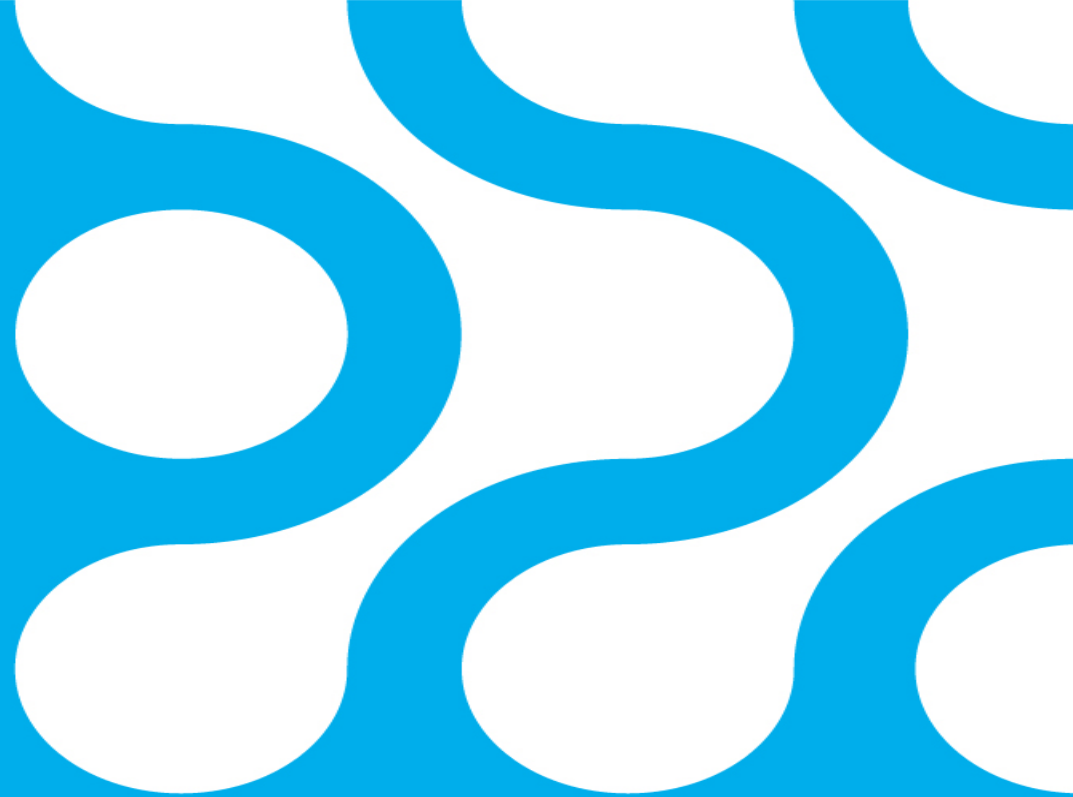


Efforts to Solve the Crisis

- Biden administration announcement with LA/Long Beach Ports & Retailers
 - Billion-dollar government investment in port technology a long-term solution?
- Need to solve trucking flow – more than a driver shortage
 - Bring in the military?
- Solutions need to begin with domestic movement of cargo – truckers/rail
 - Preferably industry and not government driven
- Small businesses hardest hit once again
- Shift back to domestic production? Short term? Long term?
- Nightmare scenario

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The Impact of Inflationary Pressures



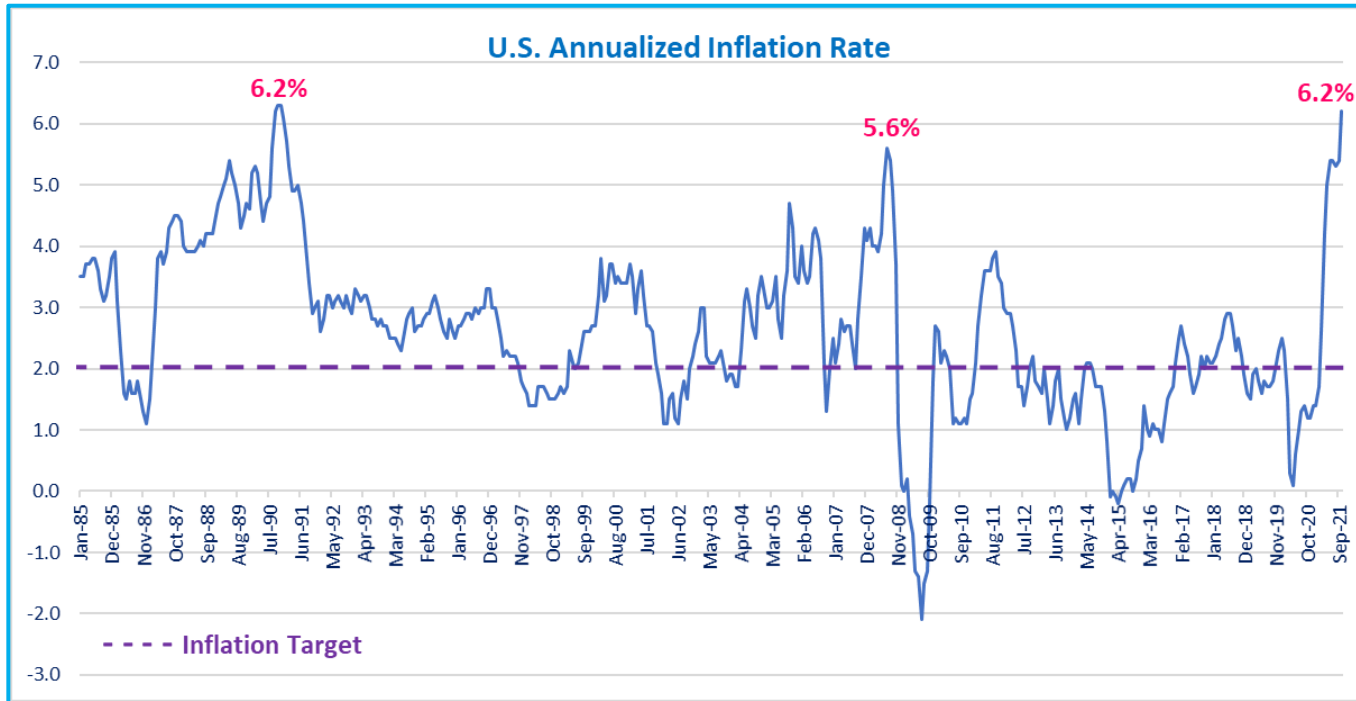
Fed “Beige Book” Report

“With pervasive resource shortages, input price pressures continued to be widespread,” the Fed said. “Even at greatly increased prices, many businesses reported having trouble sourcing key inputs. Some Districts reported that businesses are finding it easier to pass along more cost increases through higher prices. Several Districts indicated that businesses anticipate significant hikes in their selling prices in the months ahead.”

The Fed also noted that demand for labor remains strong but “all Districts noted extensive labor shortages that were constraining employment and, in many cases, impeding business activity.”

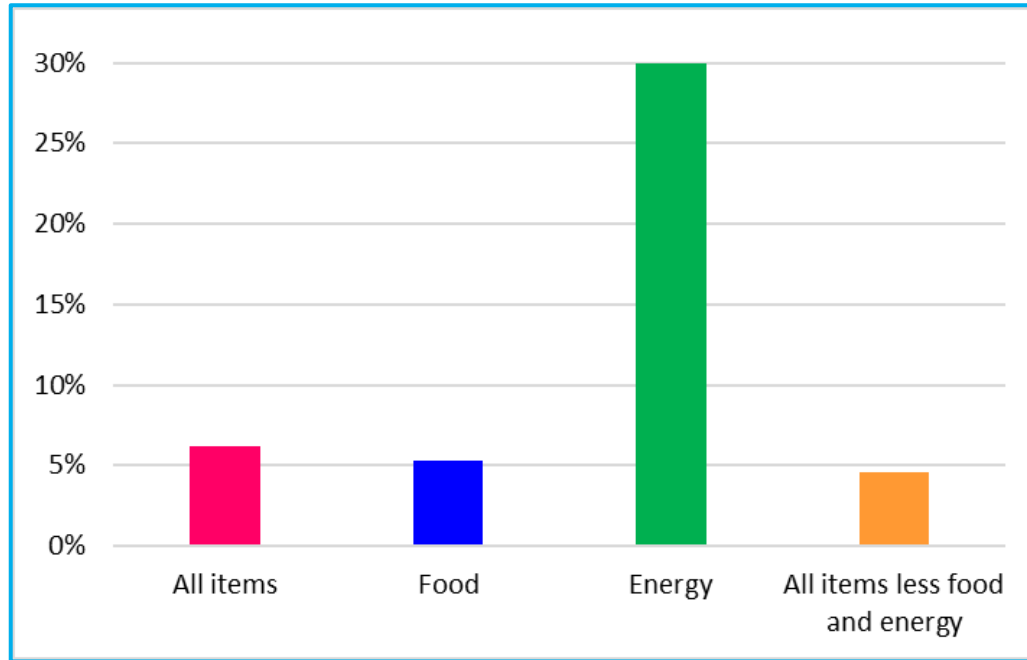
In a hint that the economy could be threatened with stagflation—a period of accelerating price hikes and low growth—the Fed also noted that the economy had “downshifted” in late July and August.

Inflation Hits Highest Rate in 30 Years



Source – Bureau of Labor Statistics (BLS)

Twelve Month U.S. CPI Percent Change as of October 2021

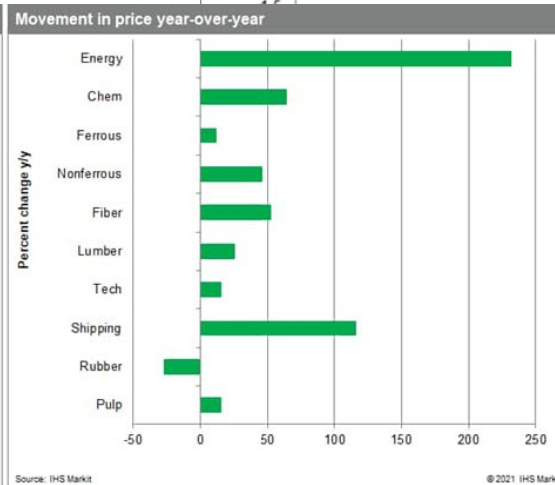
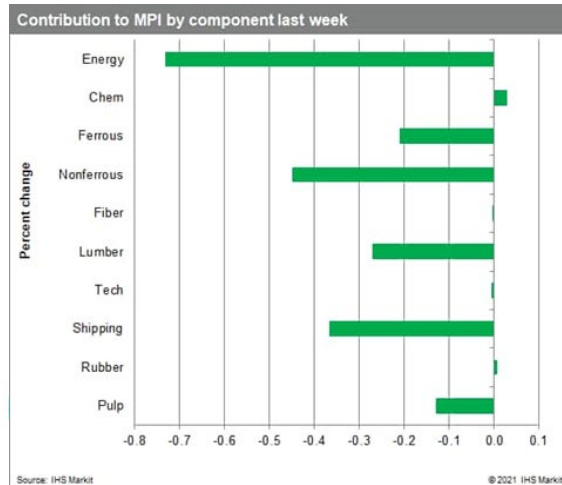
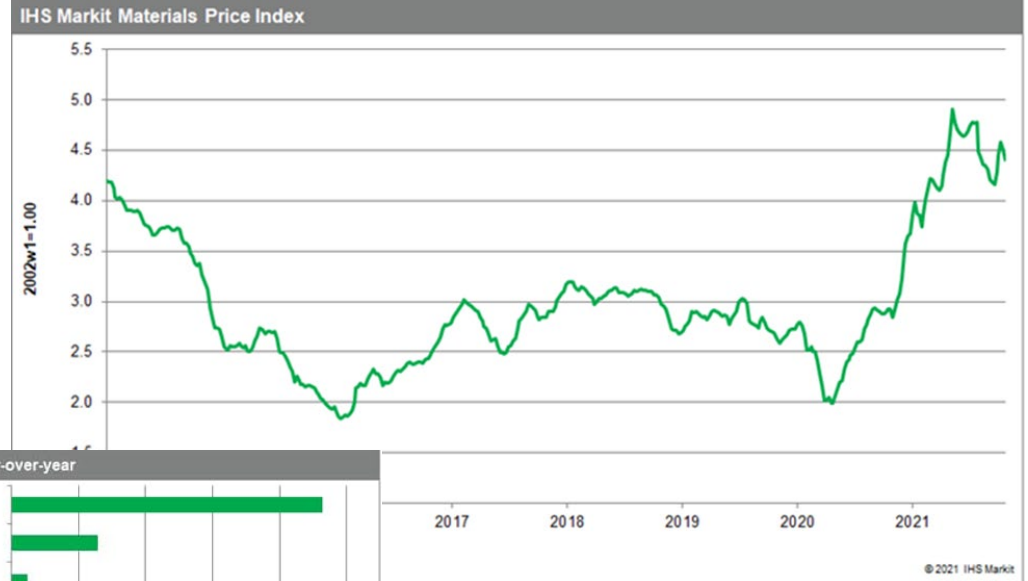


Source – Bureau of Labor Statistics (BLS)

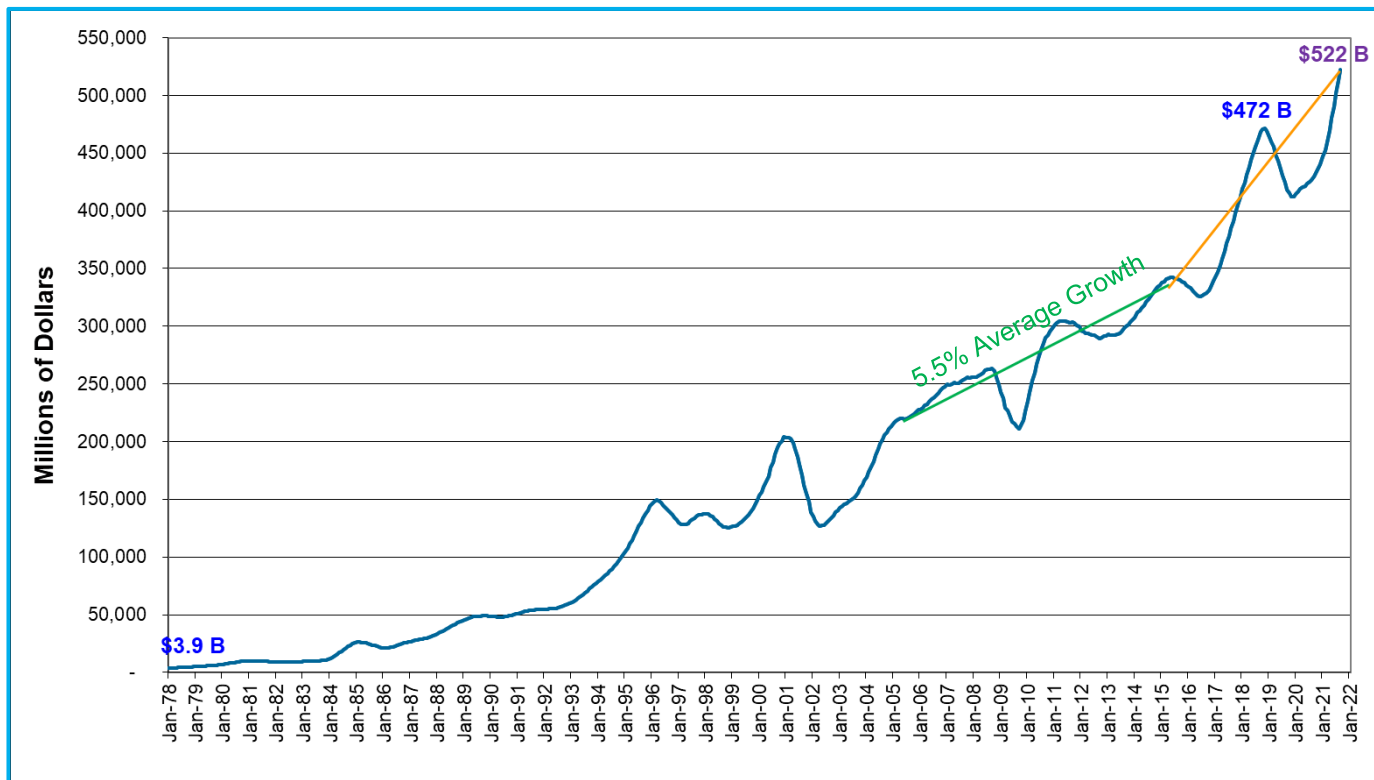
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Raw Material Pricing Trends – IHS Markit Index

- Index saw 2 weeks of decline following 3 weeks of strong increase
- Prices dropped for only one out of ten subcomponents
- Prices still at highest levels in index
- Potential for increases with overall inflation pressure



Worldwide Annualized Semiconductor Revenue



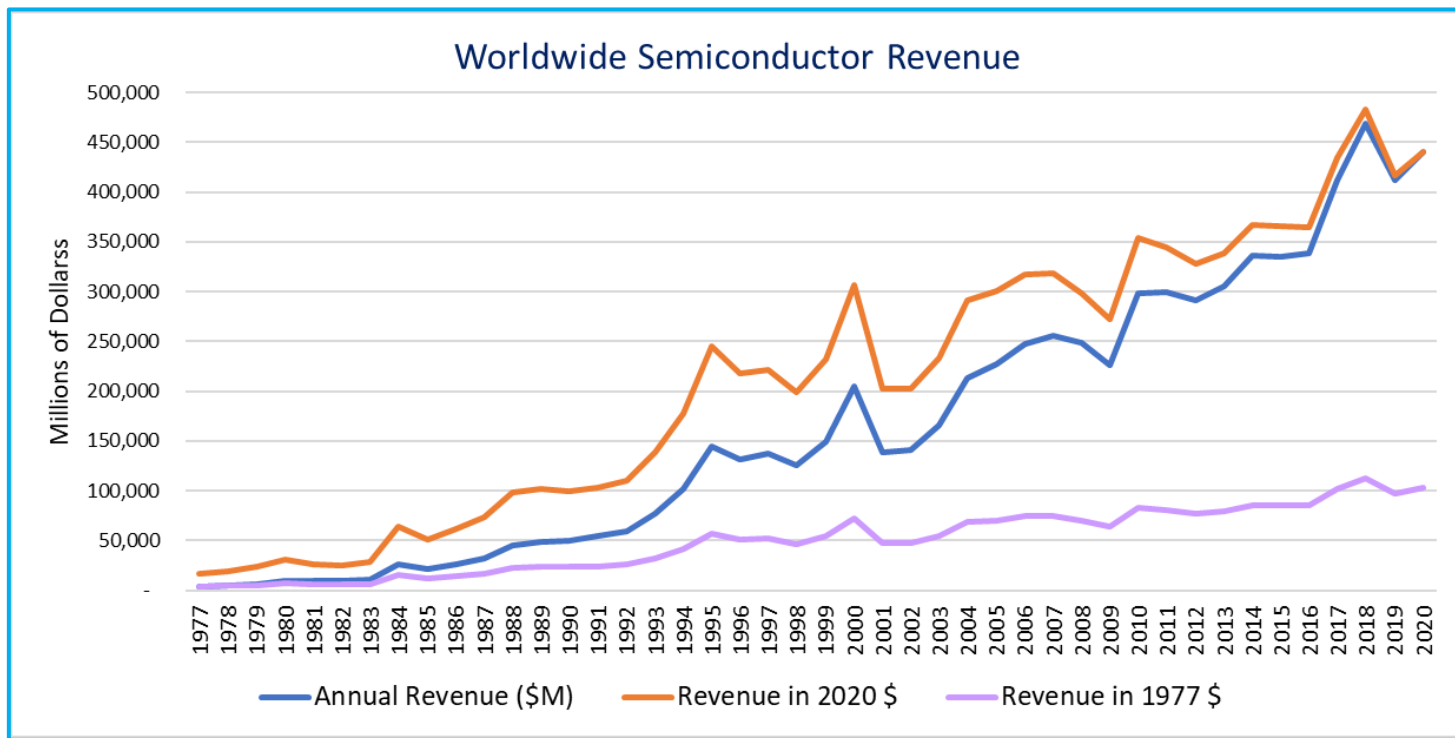
Source: WSTS

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Growth Swings

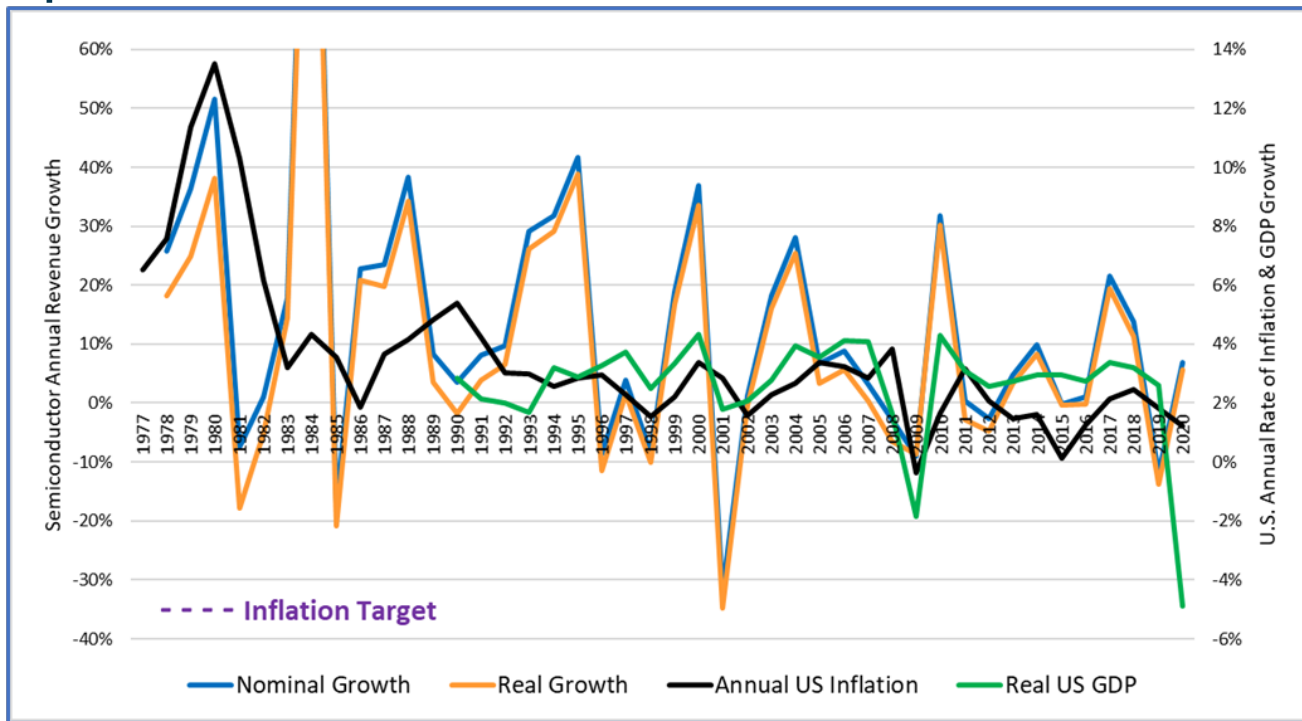
- Jun '16 to Nov '18
 - 29 Months
 - +\$146B; +45%
- Nov '18 to Nov '19
 - 12 Months
 - -\$60B; -13%
- Nov '19 to Apr '21
 - 17 Months
 - +\$57B; +14%
- ^Volatility = ^Risk
- ^Risk = ^Required ROI

Semiconductor Revenues in Constant Dollar Value



Source – WSTS and Bureau of Labor Statistics (BLS)

The Impact on Semiconductor Revenues

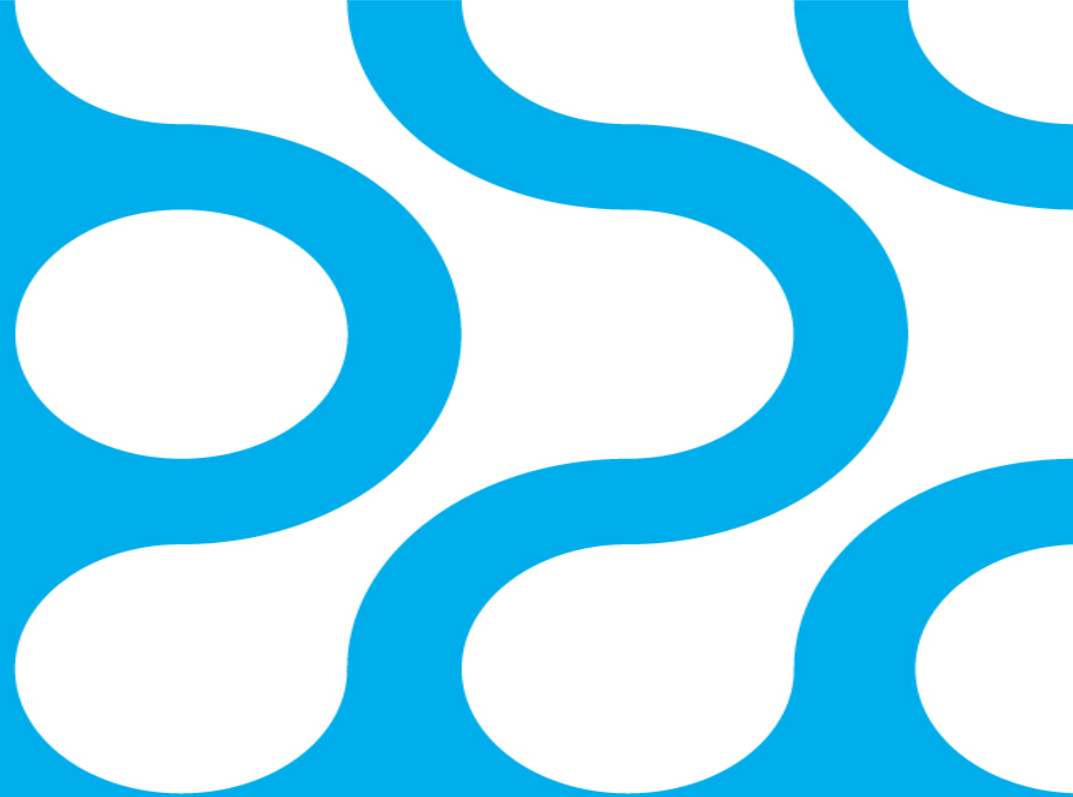


Source – WSTS and Bureau of Labor Statistics (BLS)

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Electronics & Components

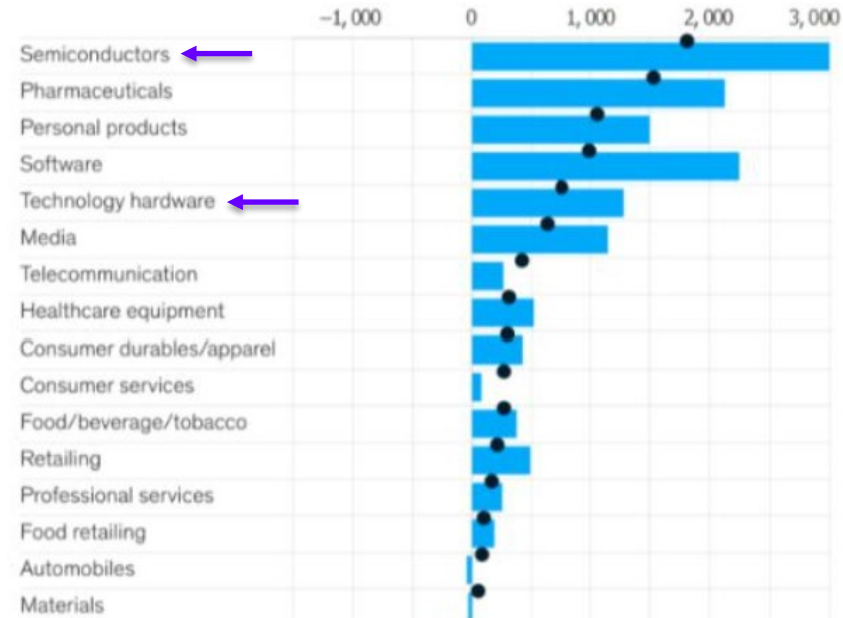
Market Drivers



Best Industries Getting Better, Worst Getting Worse

Average economic profit by industry, \$ billion (n = 2,562)¹

● 2018 ■ Long term, 2020-market-valuation implied



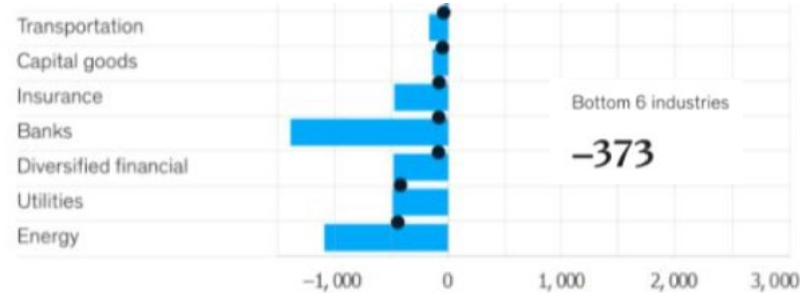
Total change

Top 6 industries

+275

Middle industries

11



¹Largest nonfinancial companies by revenue in 2018 with data for 2003-18 available. Source: Corporate Performance Analytics by McKinsey

McKinsey & Company

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 **ecia**
Electronic Components Industry Association

Data Creation, Communication, Storage & Analysis

Data Creation, Communication, Storage & Analysis

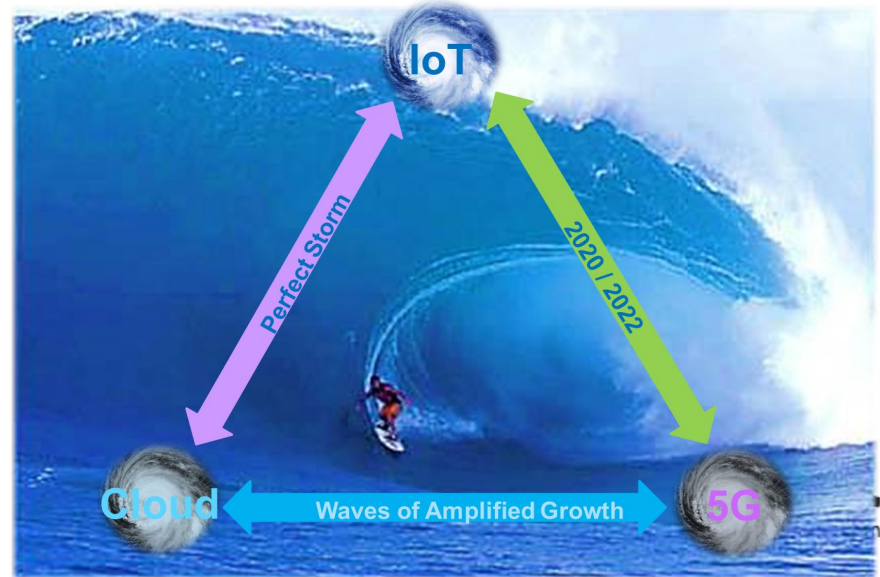
COVID19 has accelerated the fourth industrial revolution, expanding the digitization of human interaction, e-commerce, on-line education and remote work.

"+25 million terabytes of data are being created every day and 90% of all data in history has been generated in the last two years, 80% of that is unstructured, and <2% is being analyzed."

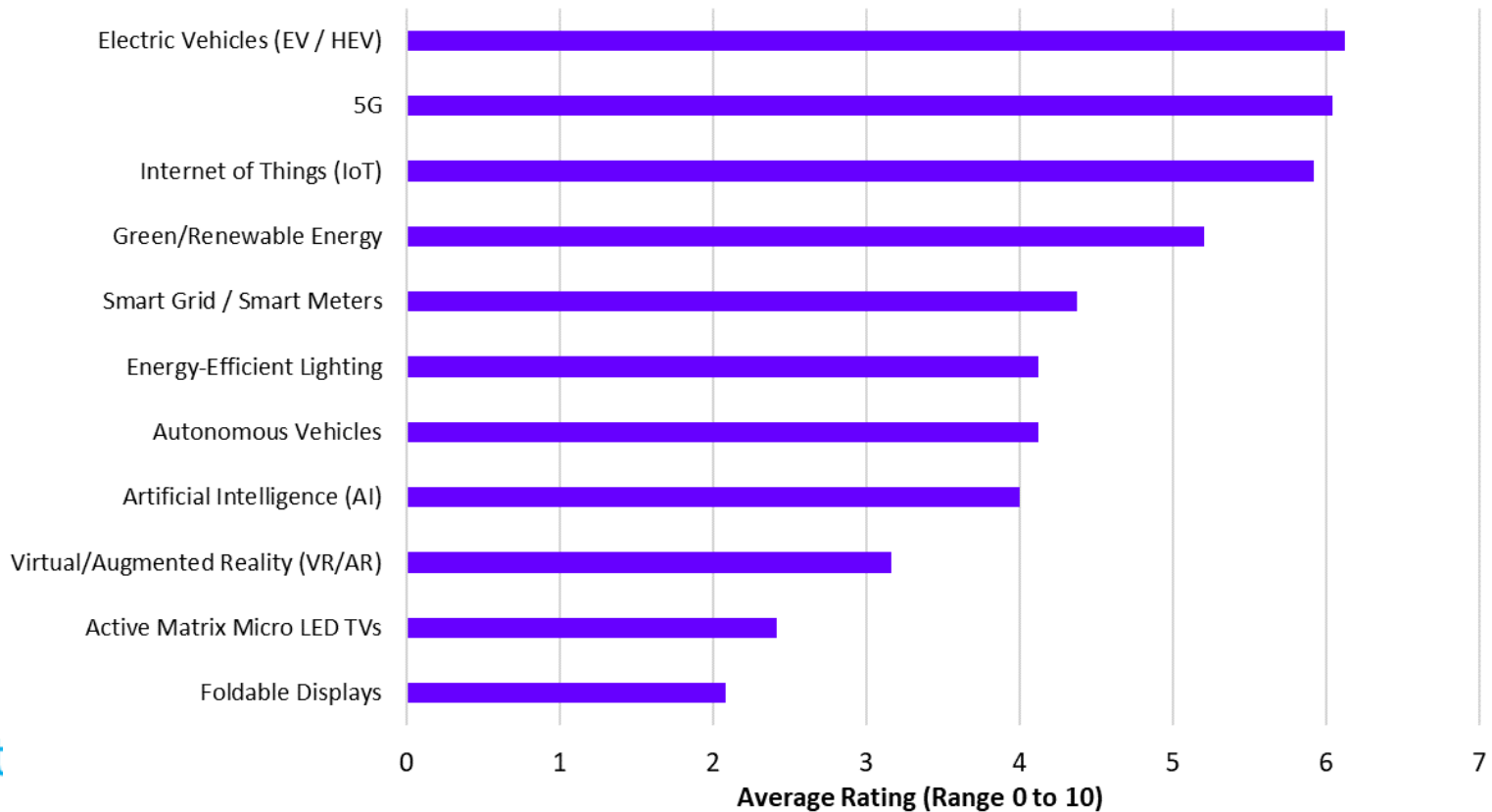
Lip-Bu Tan, CEO Cadence

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The Technology Triumvirate



Americas Technology Sales Growth Driver Average Ratings 2021



Thank you!

Dale Ford – Chief Analyst
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ecia

Electronic Components Industry Association

