

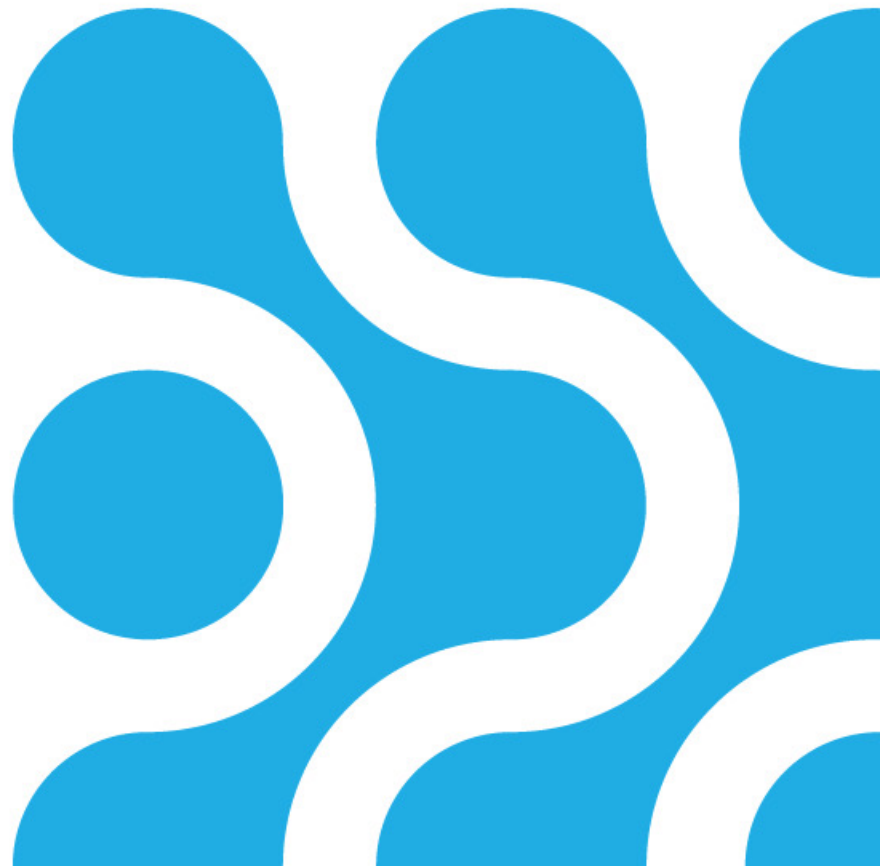
2022/23 Semiconductor Market Analysis & Outlook

SIA Roundtable

Dale Ford – Chief Analyst
February 23, 2023



Electronic Components Industry Association

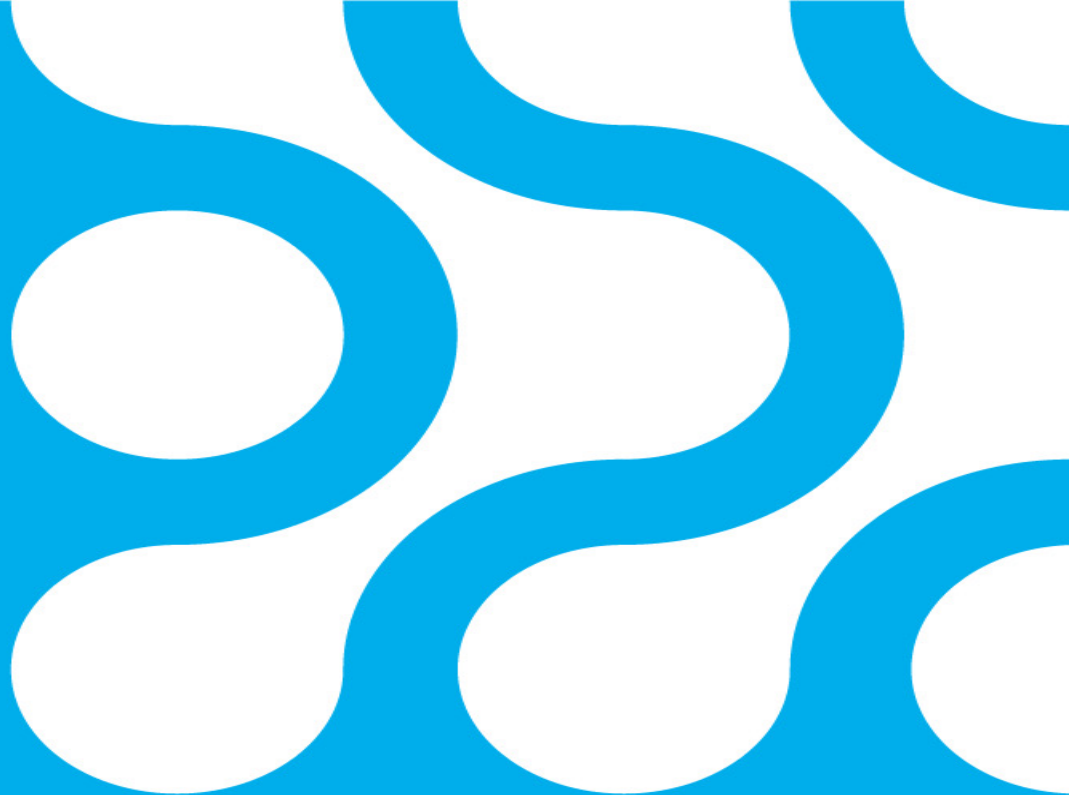


Where Are We Going?

- Cycle Analysis 2021
- Looking Forward 2022
- What About the Electronics & Components Supply Chain?
- Economic Impact

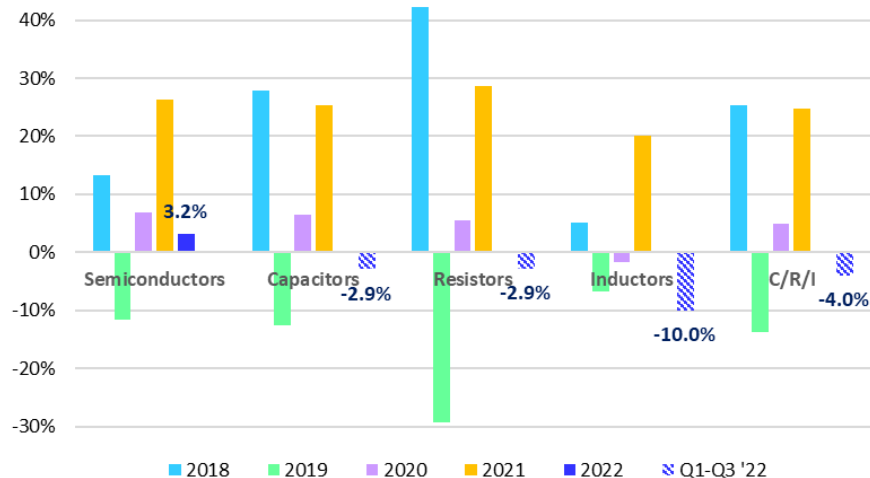
Cycle Analysis

~ 2022 ~

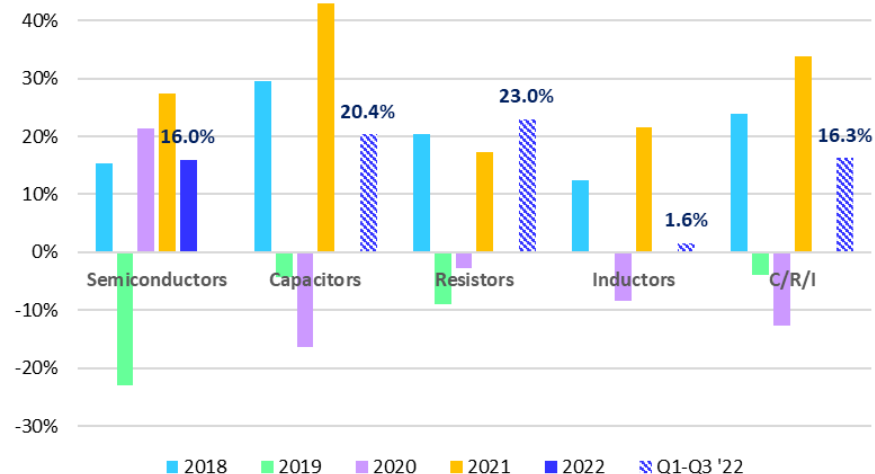


Electronic Component Revenue Growth

World Revenue Growth



Americas Revenue Growth



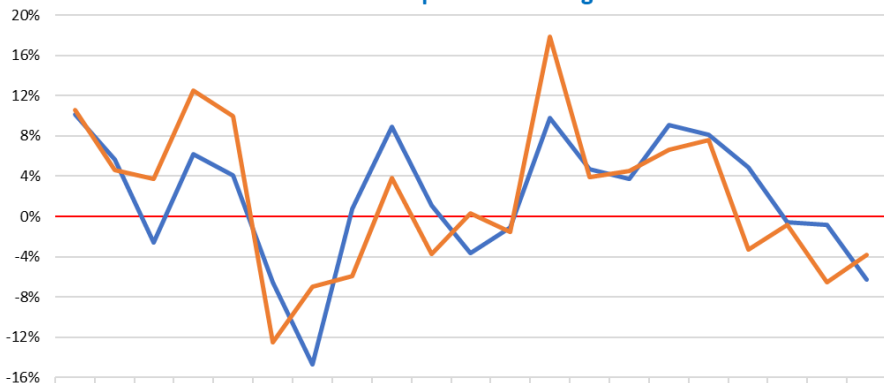
Source: World Semiconductor Trade Statistics (WSTS),
World Passive Trade Statistics (WPTS)

Connect. Influence. Optimize.

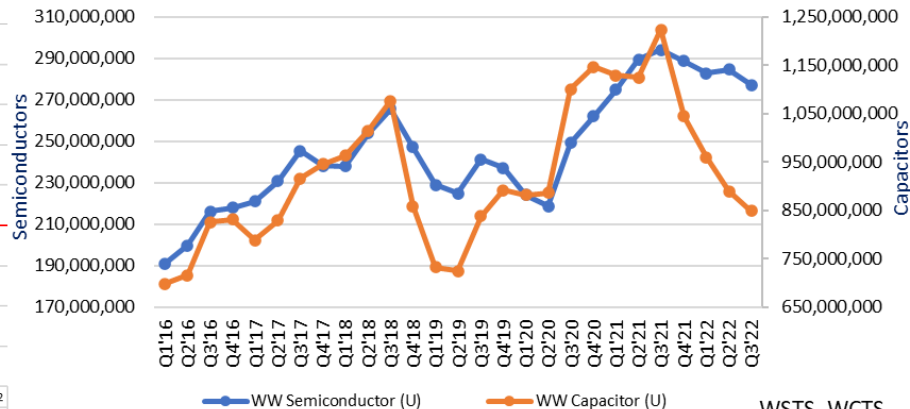
Semiconductors and Passive Parallels

World Quarterly Sales Performance Qtr Over Qtr
Semiconductor & Capacitor % Change

WSTS \ WCTS

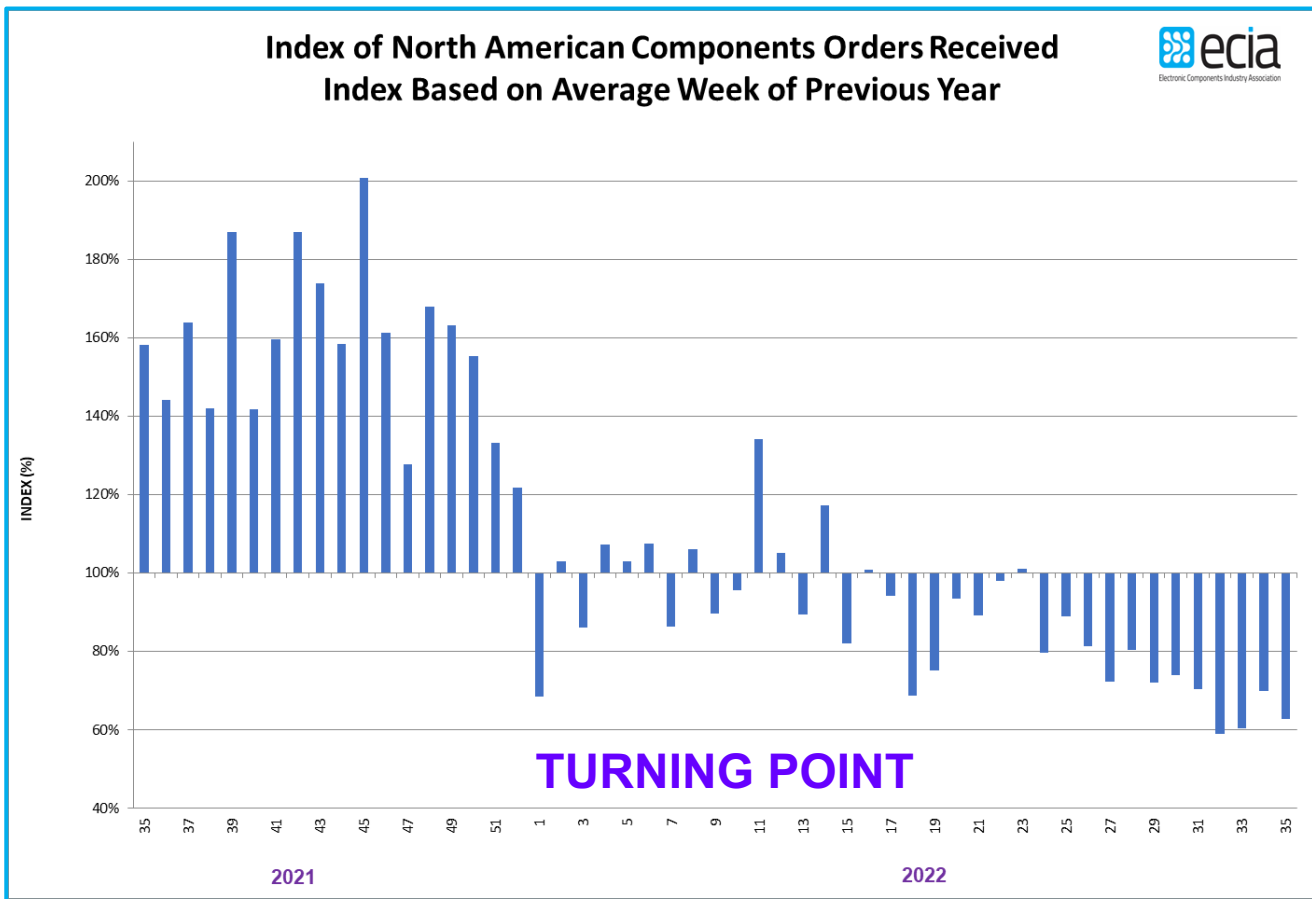


Worldwide Units Sold Semiconductors vs Capacitors



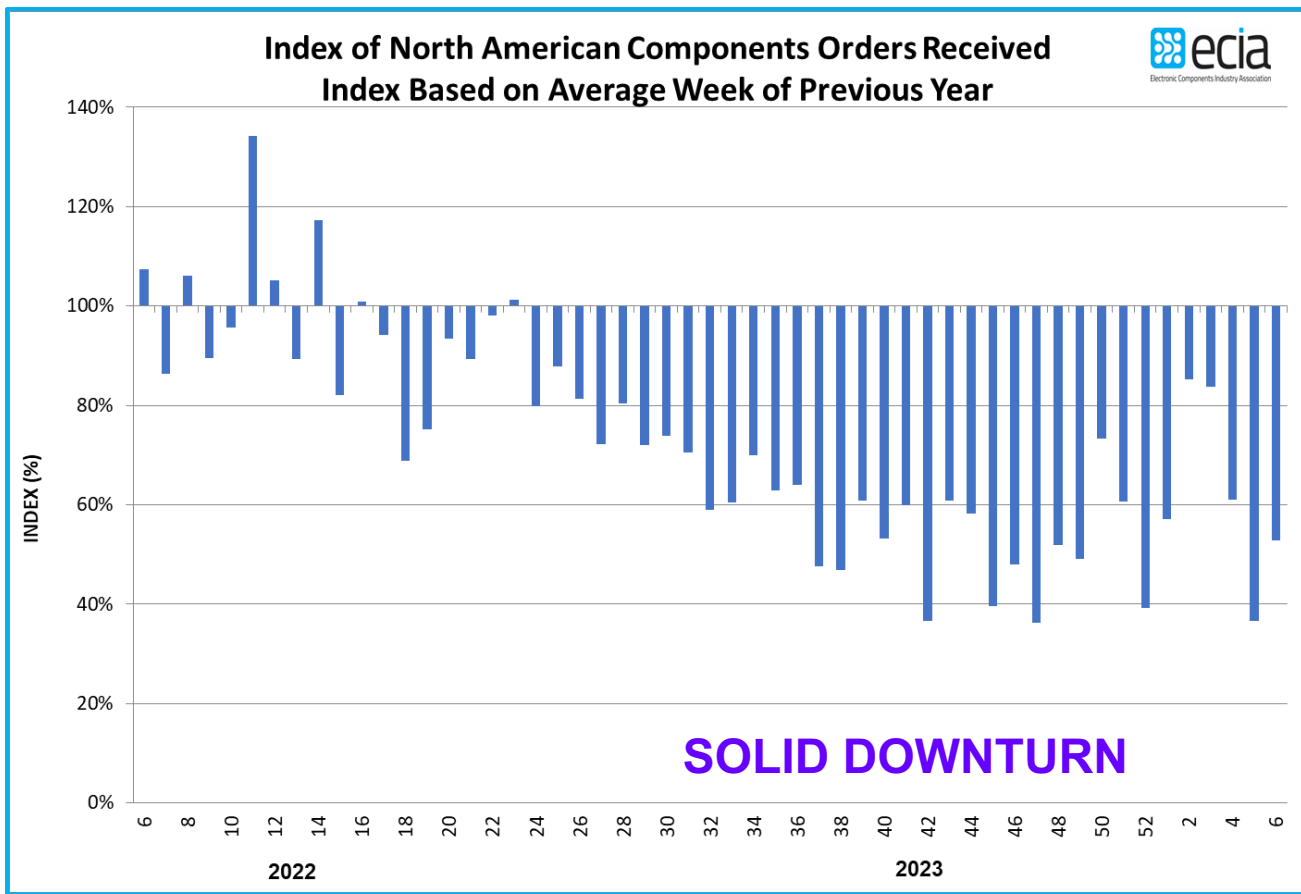
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IP&E – Interconnect, Passive, Electro-Mechanical Orders



Source: ECIA

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



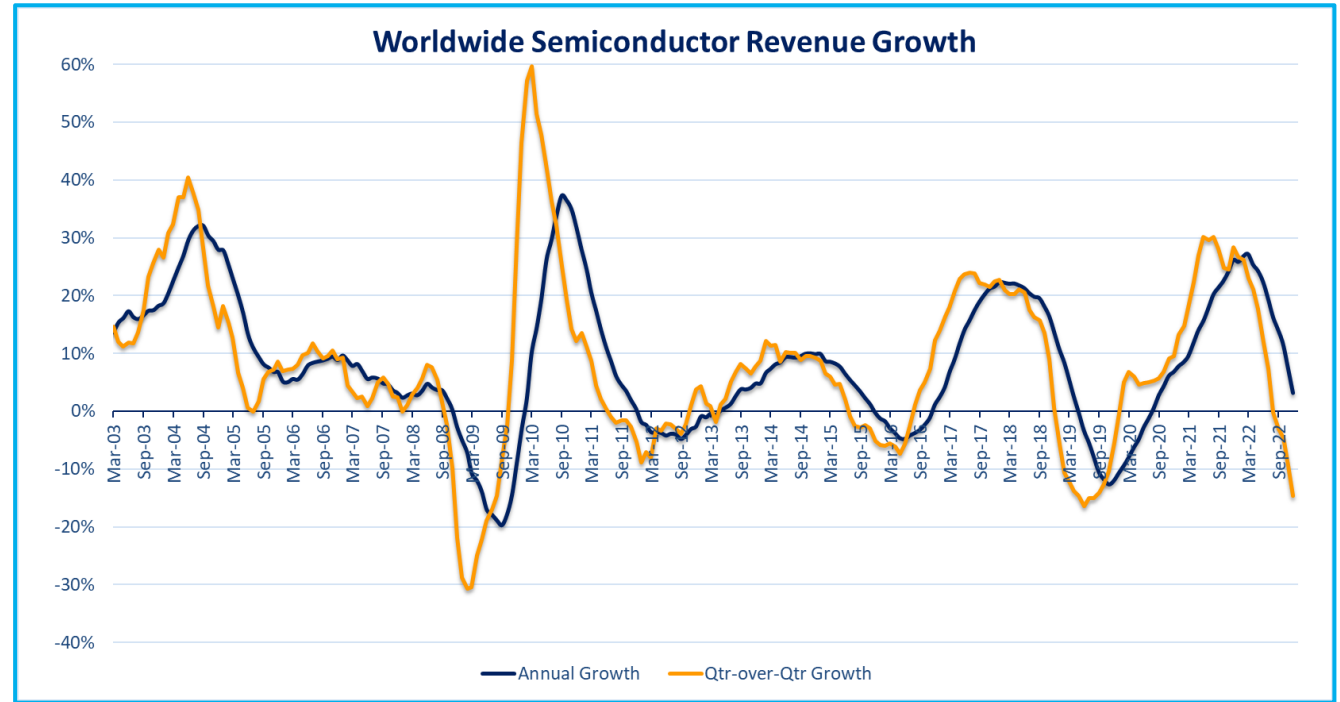
Connect.

ecia
Electronic Components Industry Association

Source: ECIA

Semiconductor Revenue Growth Cycle

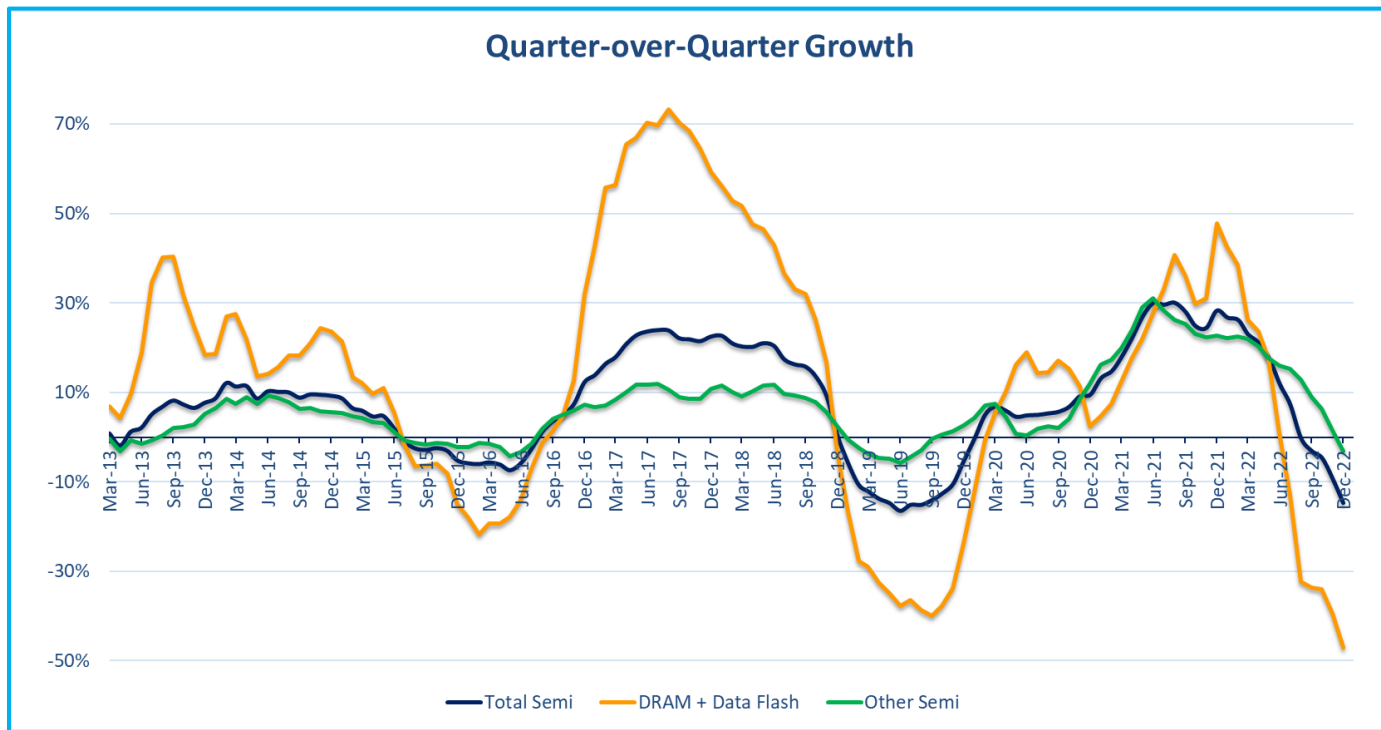
- Quarter-over-Quarter growth dives to -14.7% at end of 2022
- Annual revenue cycle drives lower than expected and ends year slightly positive at +3.2%
- Annual growth driving to negative range in 2023 – How Deep?
- Demand drivers shifting from consumer markets
- Asia pushing global market down – Americas following
- Question – What does a “Soft Landing” look like?



Source – WSTS

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Semiconductor Growth Trends

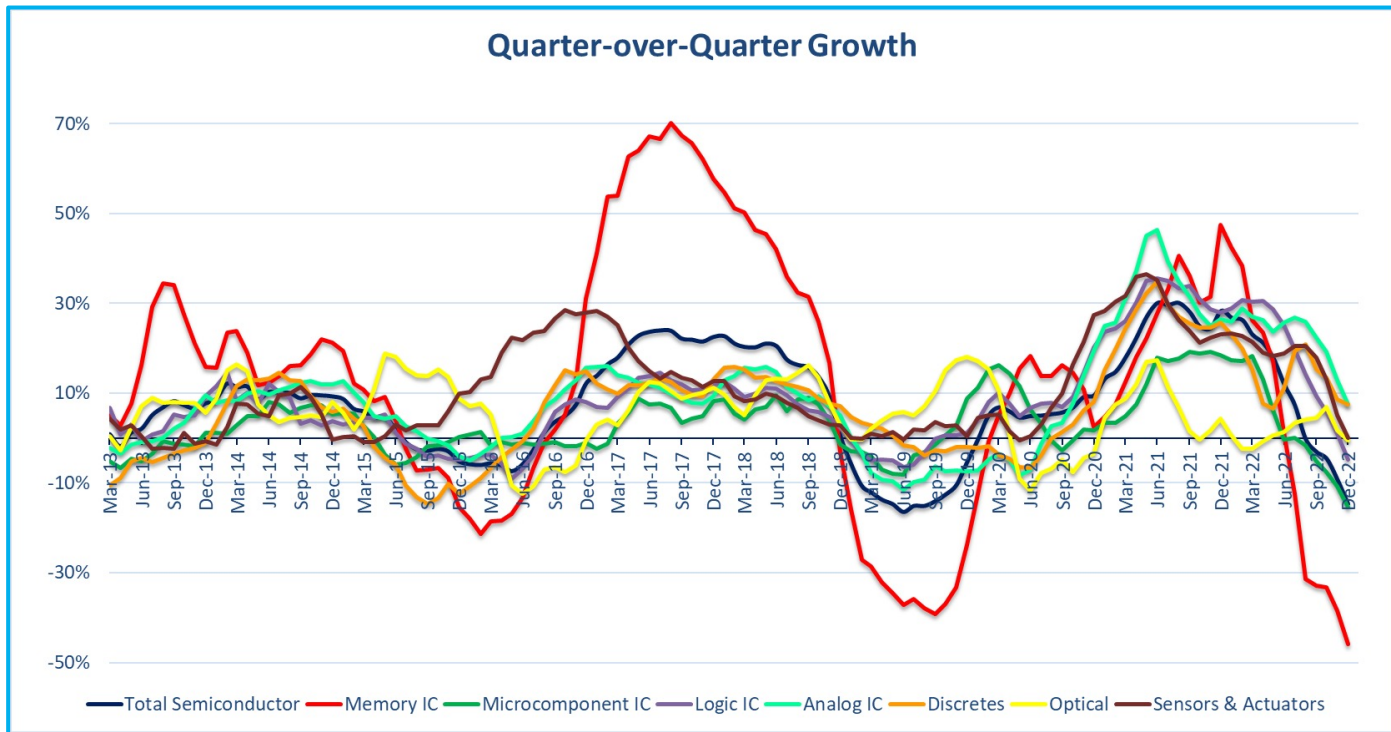


Source: WSTS

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Unified Downward Slide – No Market is Immune

- Memory ICs Amplifying / Distorting the Cycle
- All other components started downturn in mid-2021
- Analog ICs and Discretes still positive!
- Americas growth still positive for all components except Memory and Sensors/Actuators
- Pricing dynamic now undermining growth after temporary boost

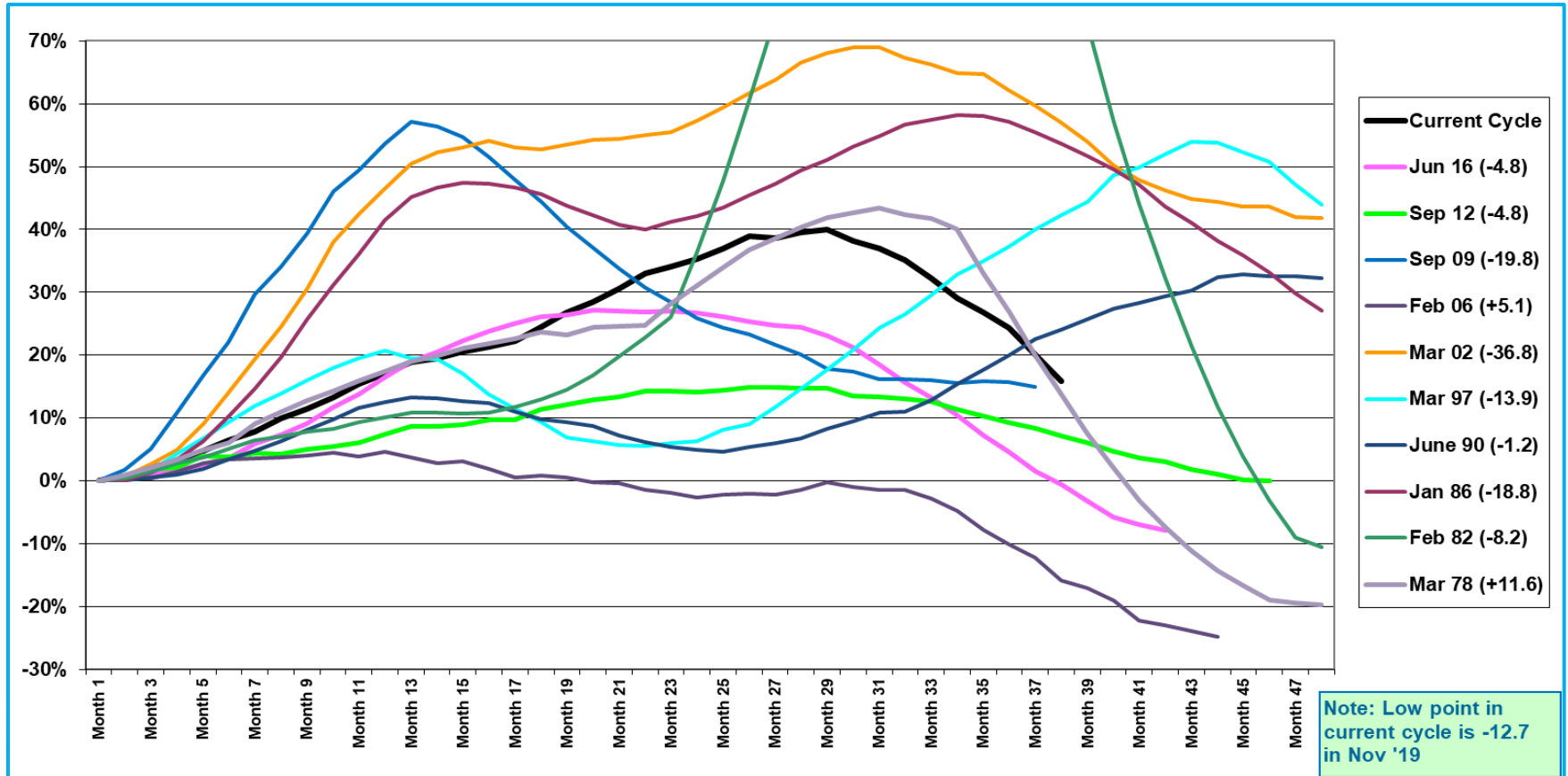


Source – WSTS

Connect. Influence. Optimize.

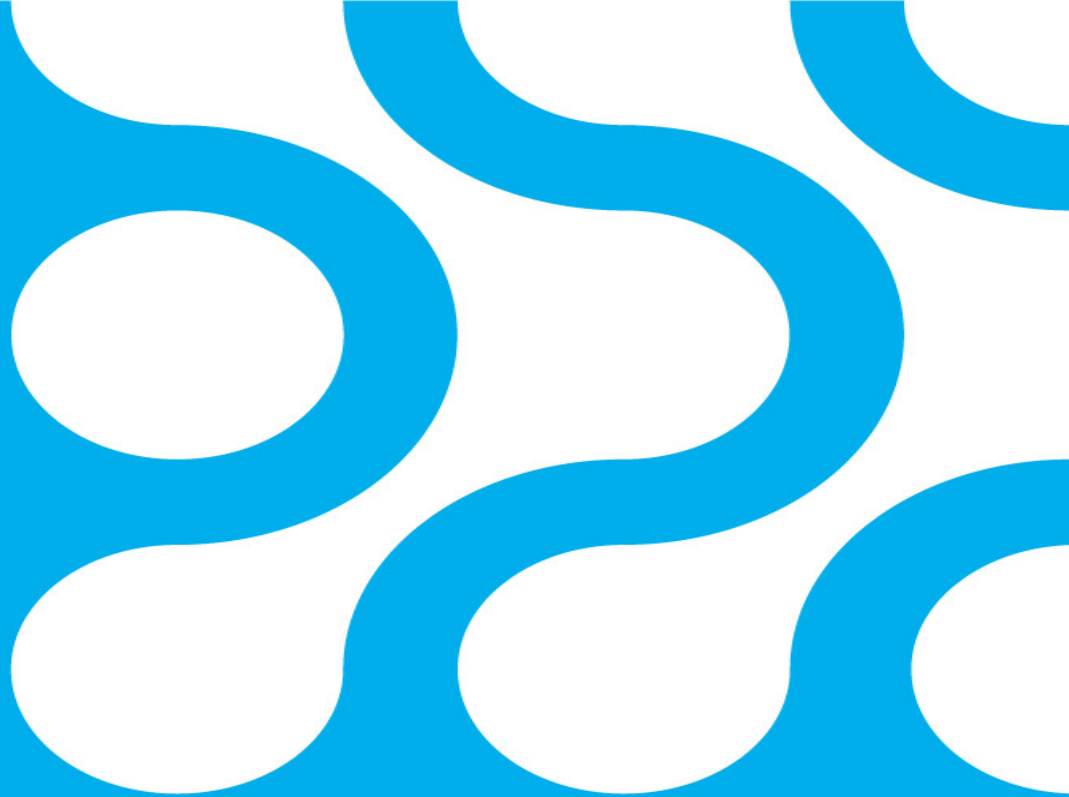
Current Cycle Moving Down Backside – How Steep?

Upside of current cycle = 29 months; Most cycles last about 48 months

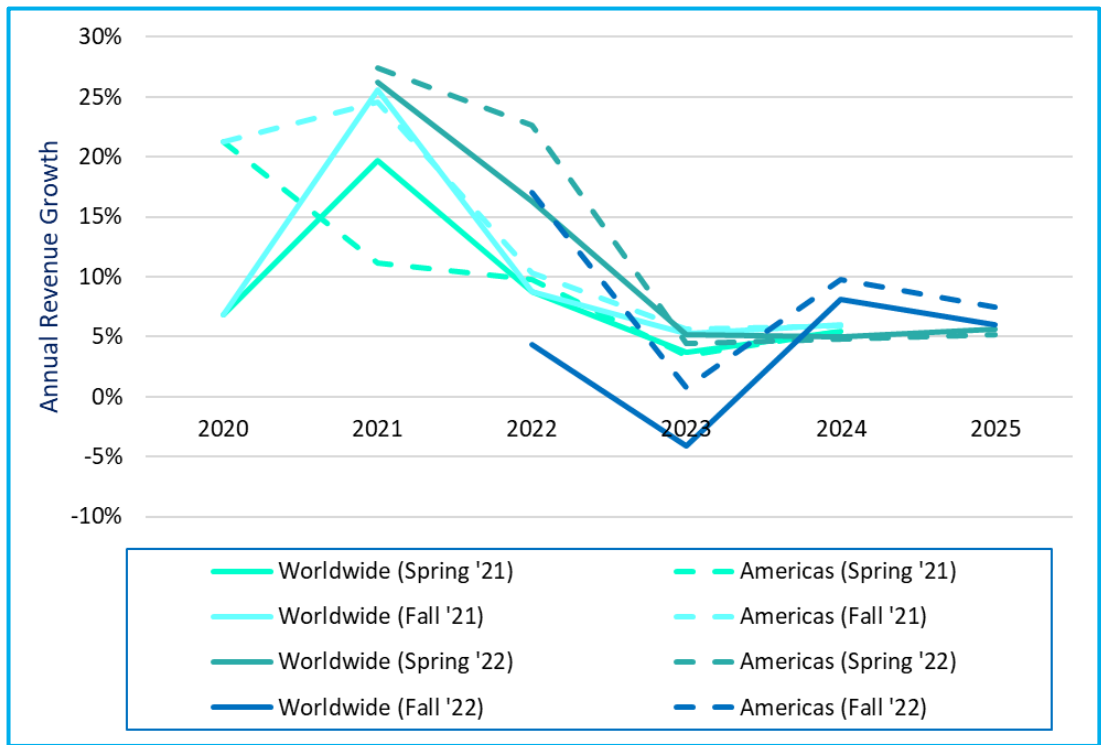


Looking Forward

~ 2023 + ~



WSTS Semiconductor Forecasts



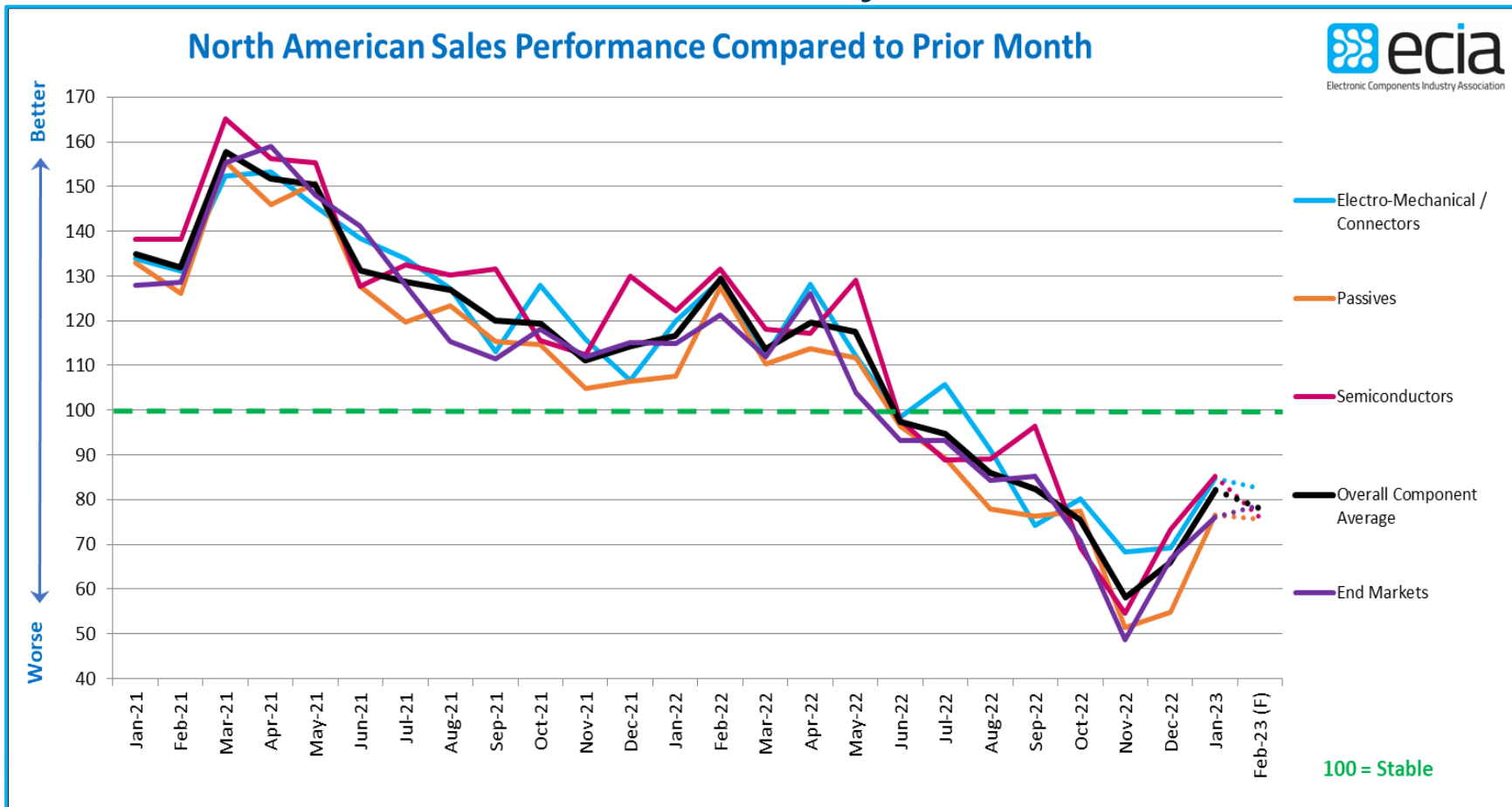
Source: WSTS

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Observations:

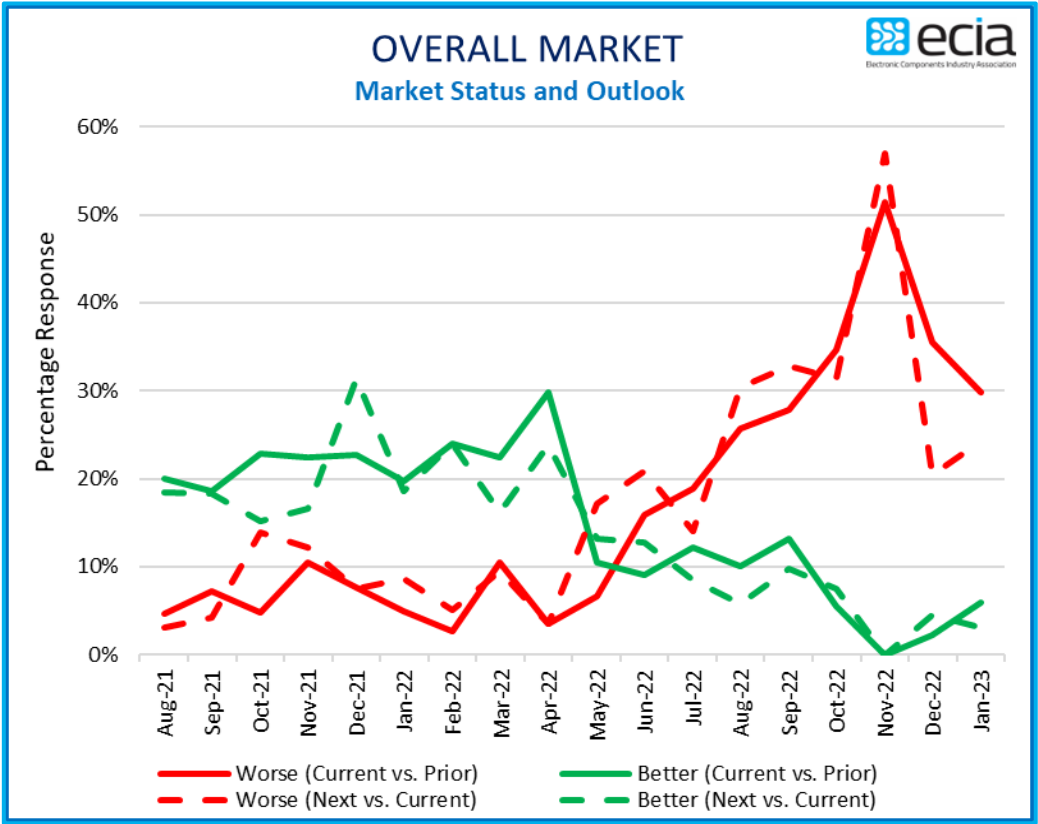
- 2022 Worldwide and Americas growth drops well below Spring '22 forecast.
- Fall WSTS forecast recognizes strong trend pushing market negative in 2023. Can it rebound to 5+% in 2024?
- Greater hope for Americas markets to avoid decline by end of 2023 and rebound to 10% in 2024
- Once again, Memory ICs play the role of the spoiler in growth
- Cyclical pattern supports hope for future growth

North America Sentiment Survey Trends

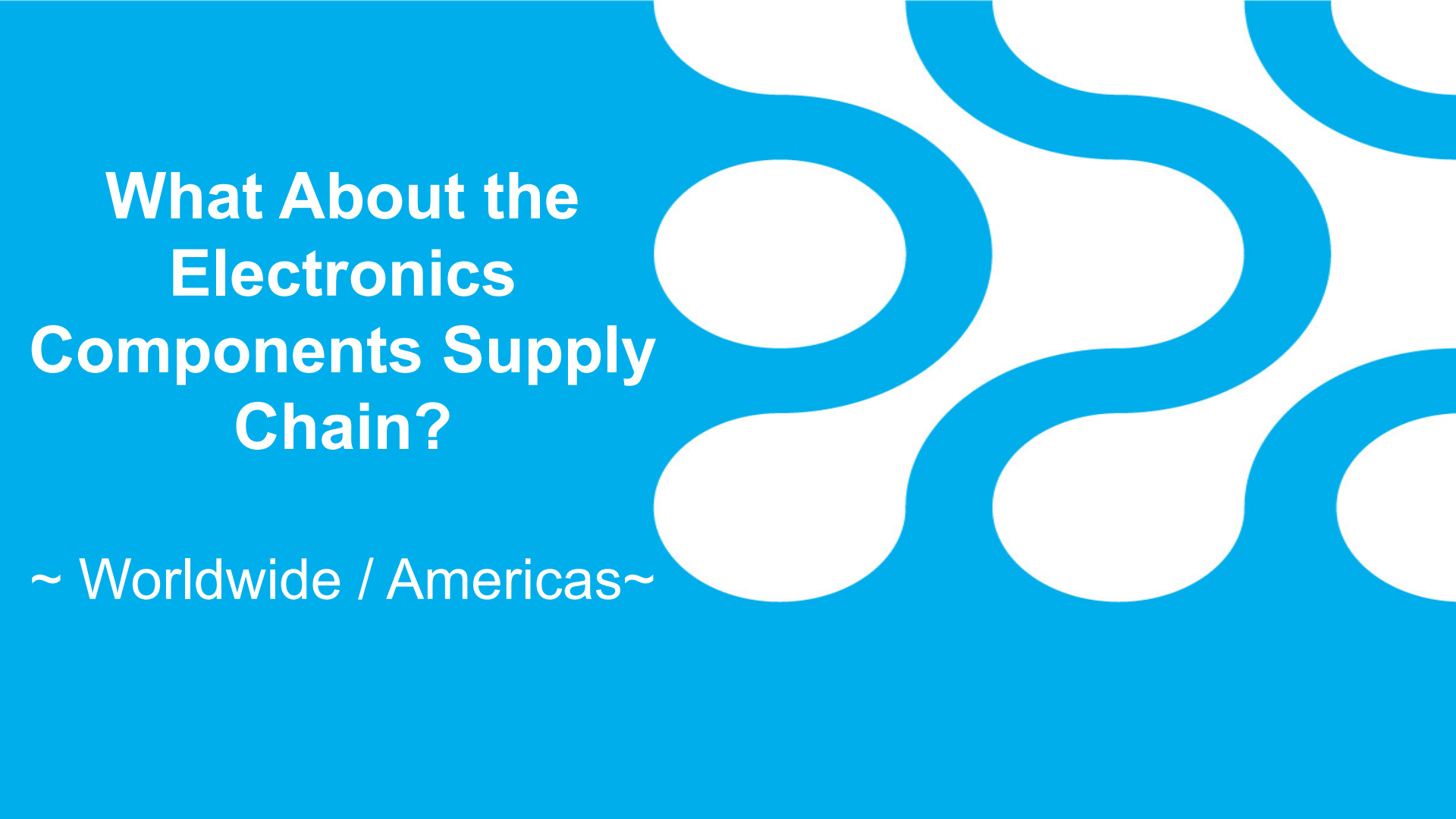


Source: ECIA Electronic Component Sales Trends Survey

North America Sales Sentiment Survey Trends



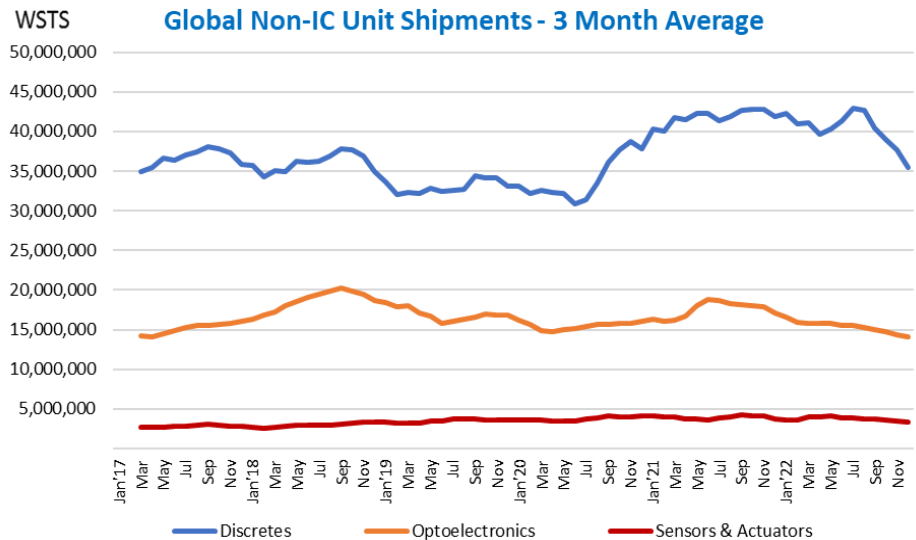
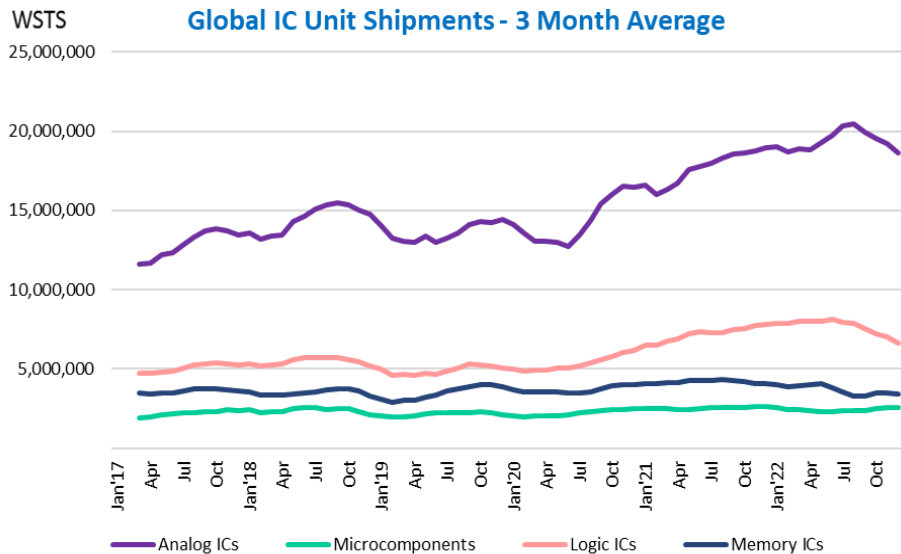
Connect. Influence. Optimize.

The background of the slide features a repeating pattern of thick, blue, wavy lines that form a series of interconnected, rounded, S-shaped or '3' shaped motifs. These motifs are set against a solid white background, creating a high-contrast, modern, and abstract visual texture.

What About the Electronics Components Supply Chain?

~ Worldwide / Americas~

Worldwide Semiconductor Unit Shipments



Source: WSTS

Increase From:

- Discretes
- Analog ICs
- Logic ICs

Previous Peak

-7.1%

20.3%

16.5%

Recovery Start

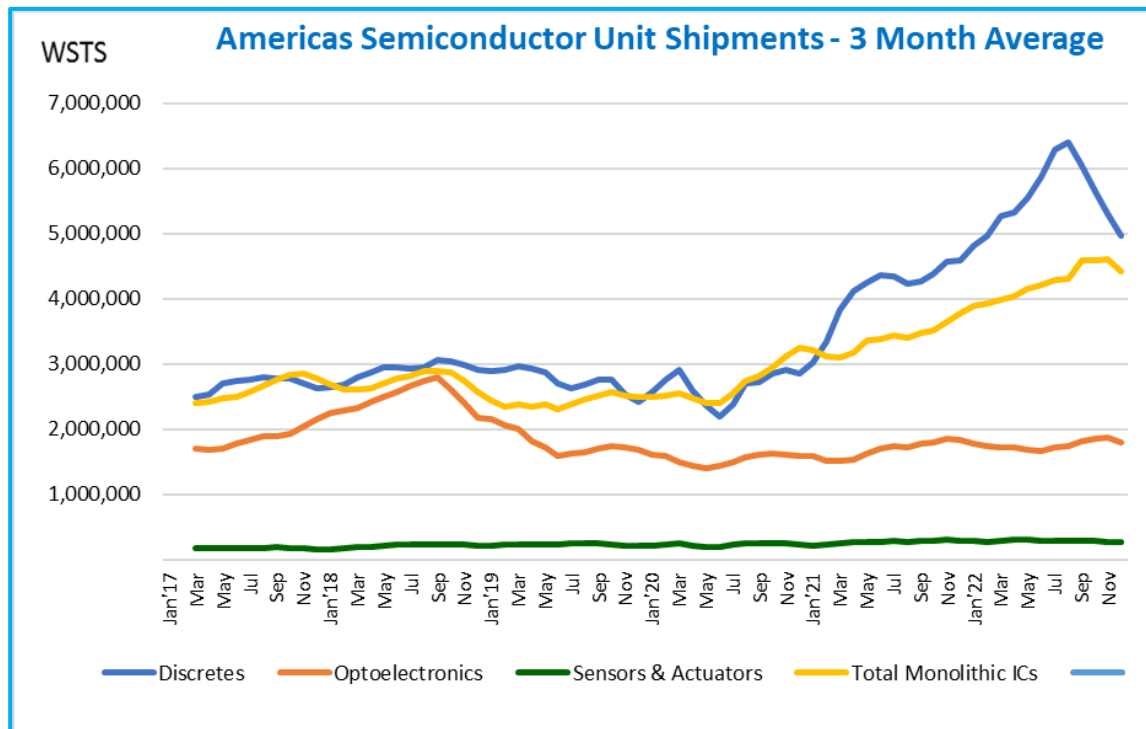
14.9%

46.2%

36.4%

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Americas Semiconductor Unit Shipments



Source: WSTS

Increase From:

- Discretes
- Monolithic ICs

Previous Peak

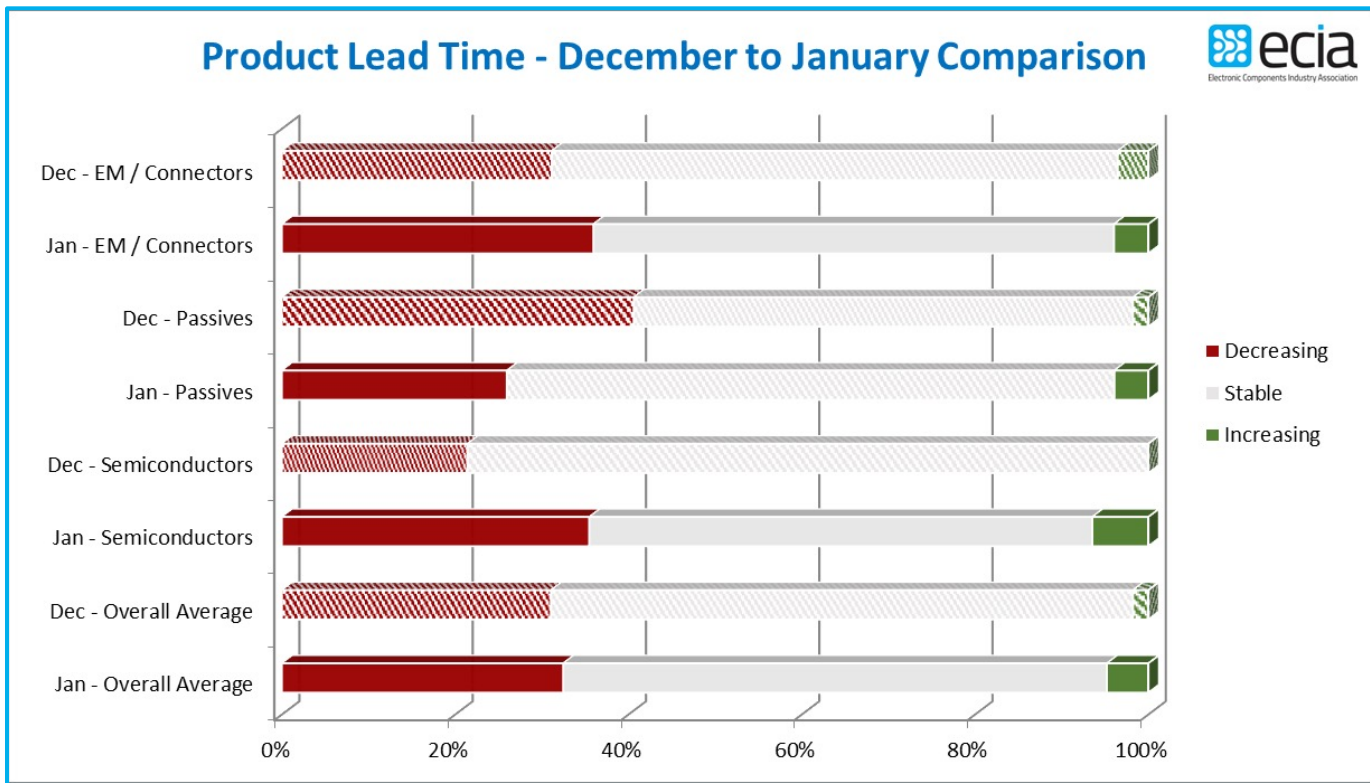
62.7%
53.4%

Recovery Start

126.1%
84.4%

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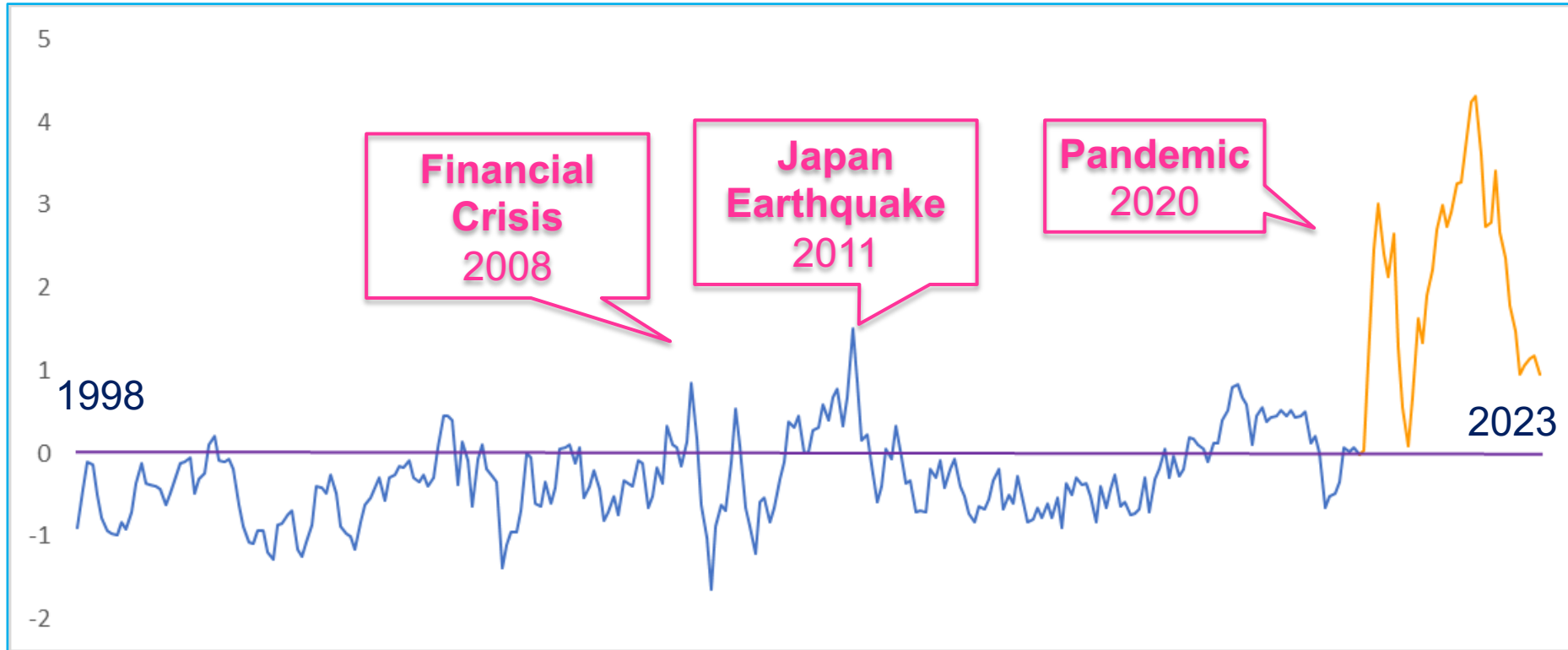
Hopeful Outlook for Moderating Pressure



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Supply Chain Pressure

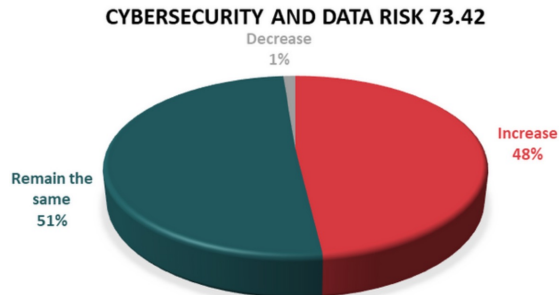
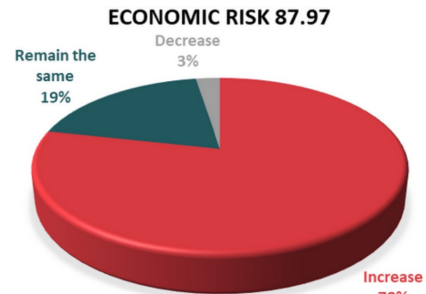
Global Supply Chain Pressure Index, showing monthly deviations from the long-term trend



Lehigh University Supply Chain Risk Index – Q1 2023

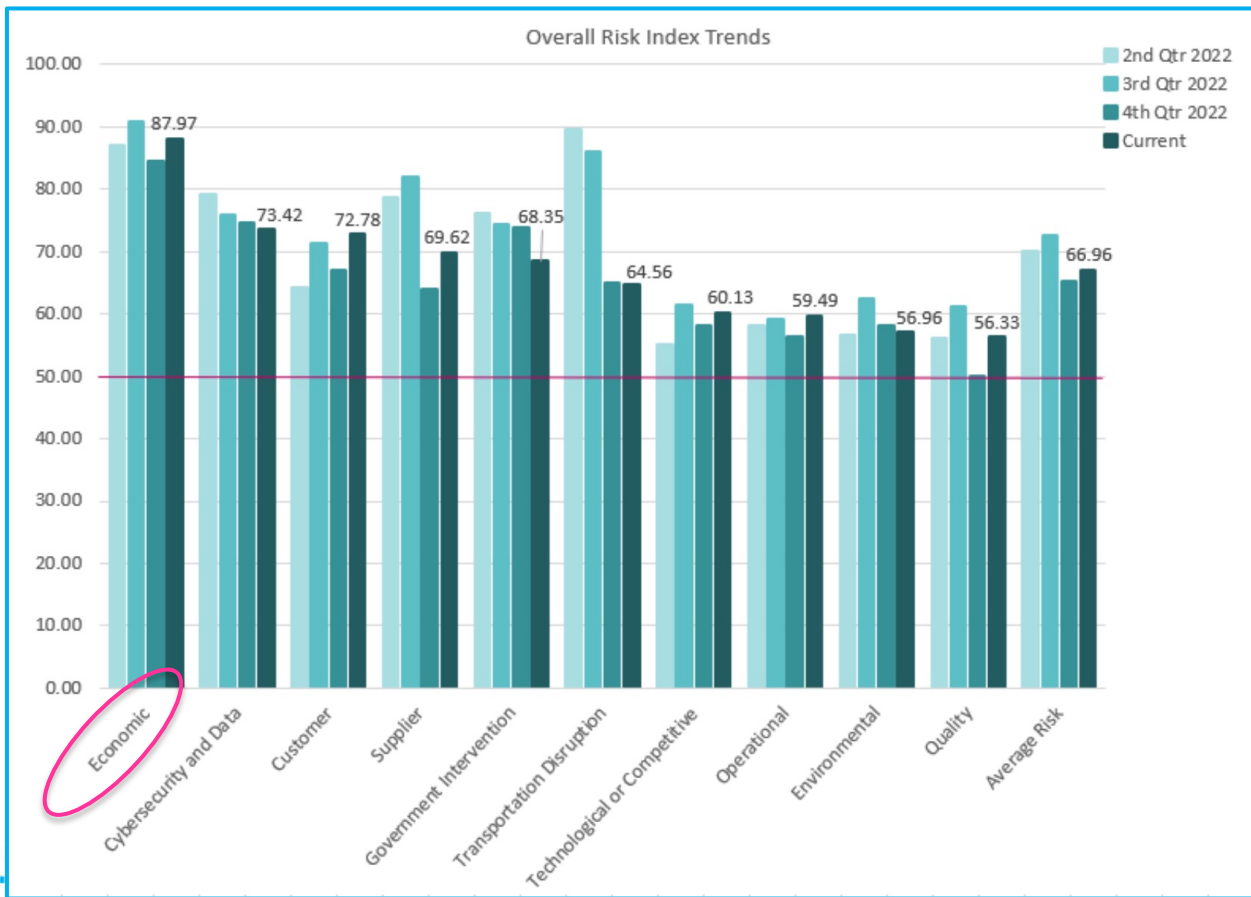
Risk Type	4th Quarter 2022	1st Quarter 2023	Trend	
	Risk Index	Risk Index		
Economic Risk	84.38	87.97	↑	+3.59
Cybersecurity and Data Risk	74.38	73.42	↓	-0.96
Customer Risk	66.88	72.78	↑	+5.90
Supplier Risk	63.75	69.62	↑	+5.87
Government Intervention Risk	73.75	68.35	↓	
Transportation Disruption Risk	64.81	64.56	↓	
Technological or Competitive Risk	58.13	60.13	↑	
Operational Risk	56.17	59.49	↑	
Environmental Risk	58.13	56.96	↓	
Quality Risk	50.00	56.33	↑	
Average Risk Index	65.04	66.96	↑	

Source: Lehigh Univ, CSCMP



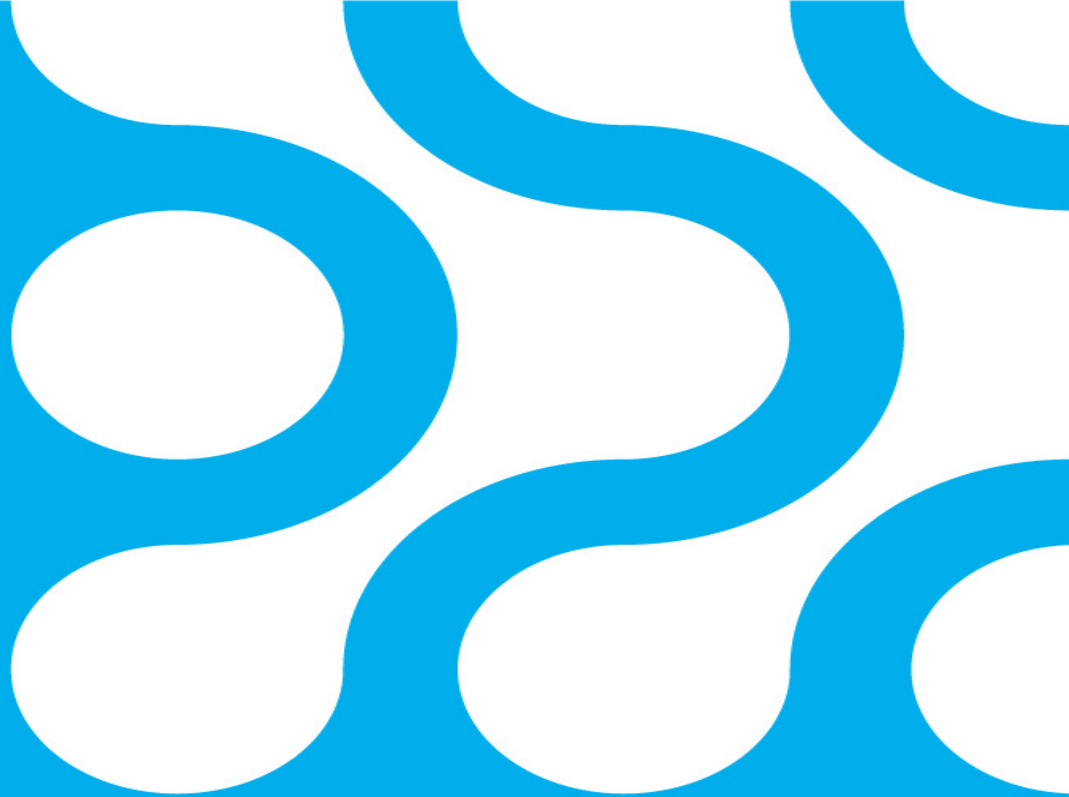
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Lehigh University Supply Chain Risk Index – Q1 2023



Connect.

Economic Impact

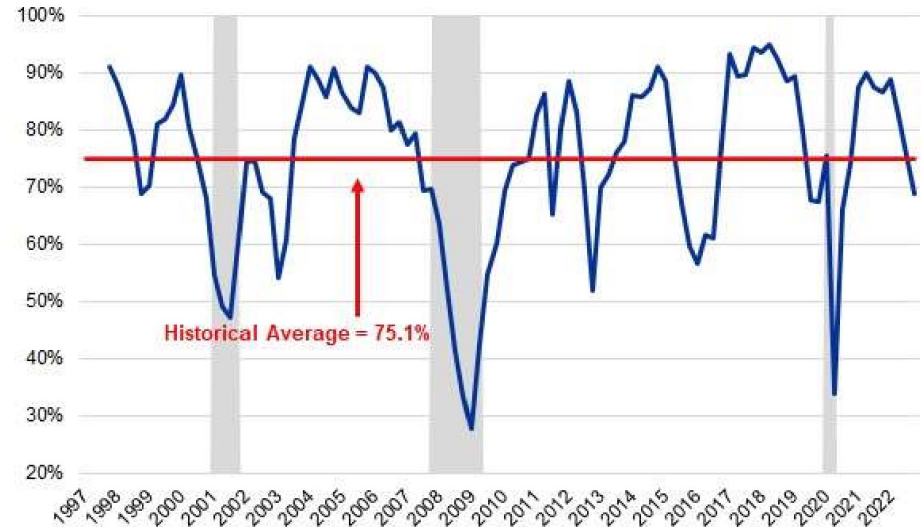


NAM Economic Headlines

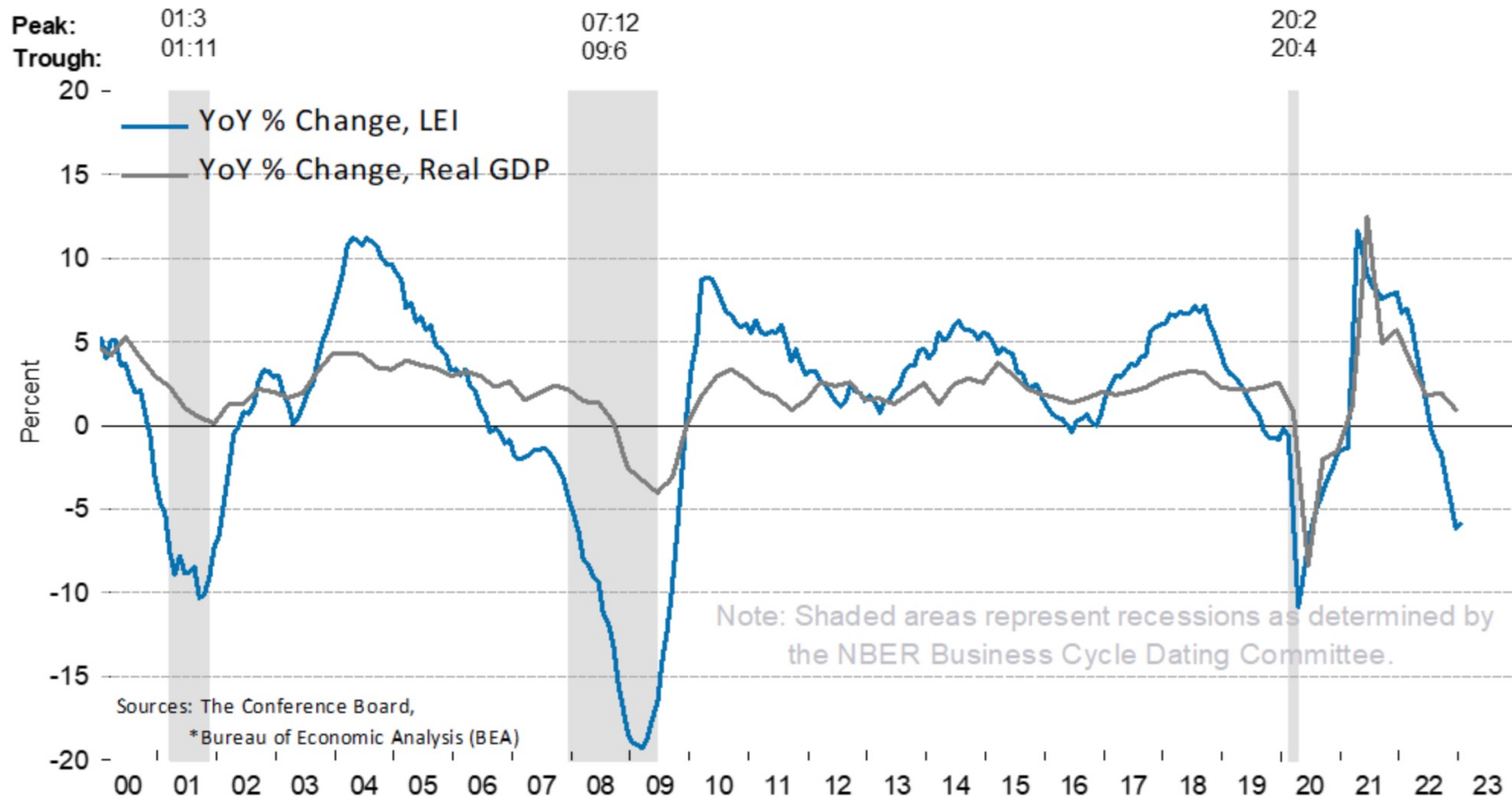
- 68.9% of respondents felt somewhat or very positive in their company outlook, down from 75.6% in Q3
 - Weakest reading since the Q3 2020
- 62.4% of manufacturing leaders believed that the U.S. economy would slip officially into a recession in 2023
 - Despite worries about a downturn, manufacturers plan to continue to invest in their companies
- Manufacturing employment in 2022 rose by the sector hired 396,000
 - Most of any year since 1994
 - Currently, 12,999,000 employees total, the most since November 2008

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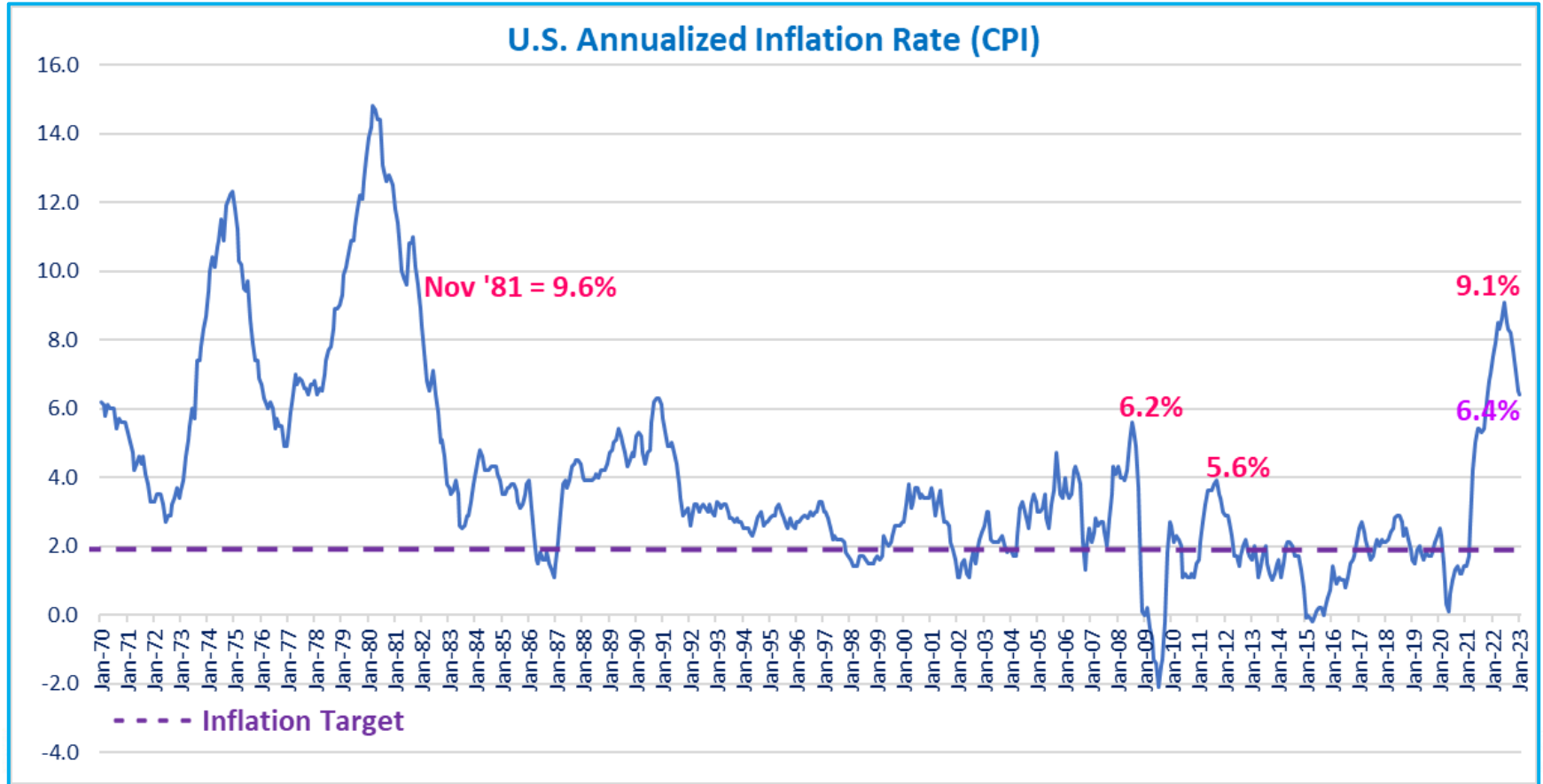
NAM Manufacturers' Outlook Survey by Quarter, 1997–2022, Percentage With a Somewhat or Very Positive Outlook for Their Company
(Recessions Are Highlighted with Gray Shading)



The Conference Board Leading Economic Indicator (LEI)



Inflation Falls from 40 Year High



Source – Bureau of Labor Statistics (BLS)

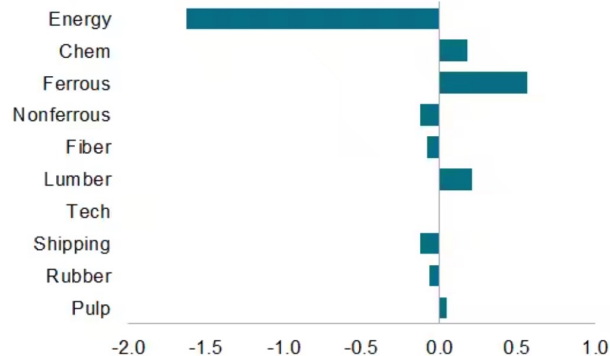
Raw Material Pricing Trends – IHS Markit Index

- Data through February 2023
- The MPI sits 15% lower year on year (y/y)
- However, remain far higher (45%) than the pre-pandemic levels of the fourth quarter 2019
- Falling energy prices were the major driver of decline in the MPI

Materials Price Index by S&P Global Market Intelligence (week 1 2002 = 1.00)

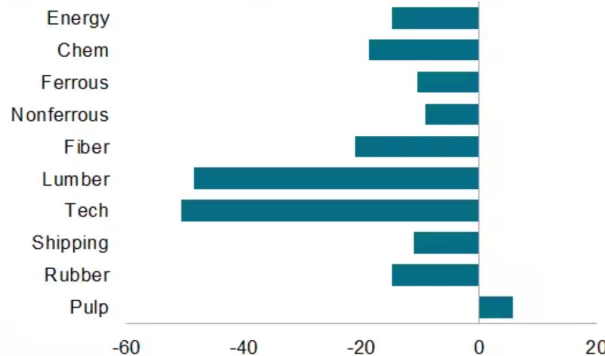


Contribution to MPI by component last week, % chg



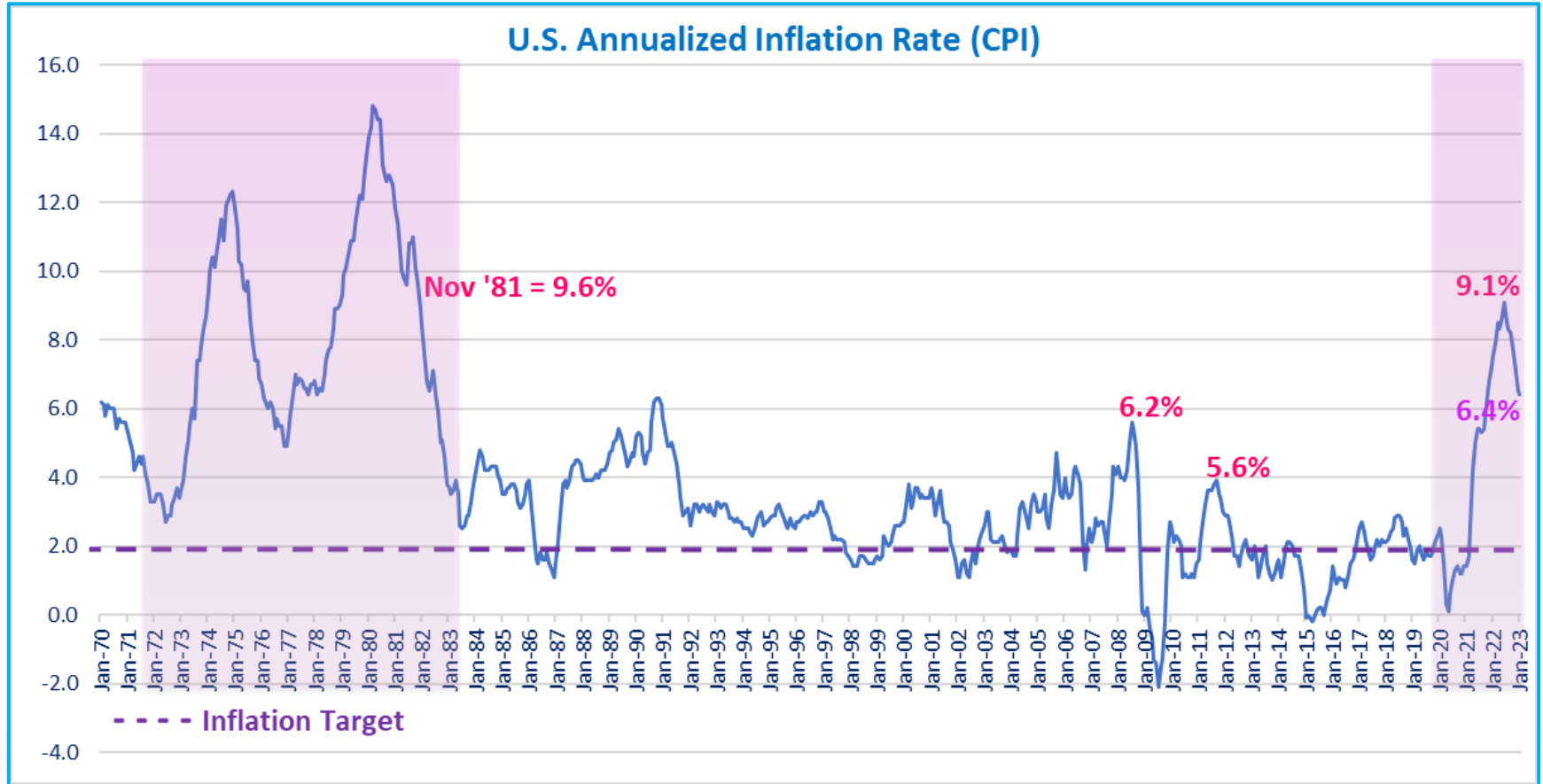
Data compiled Feb. 07, 2023.
Source: S&P Global Market Intelligence.
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Movement in price last week, year-over-year % chg



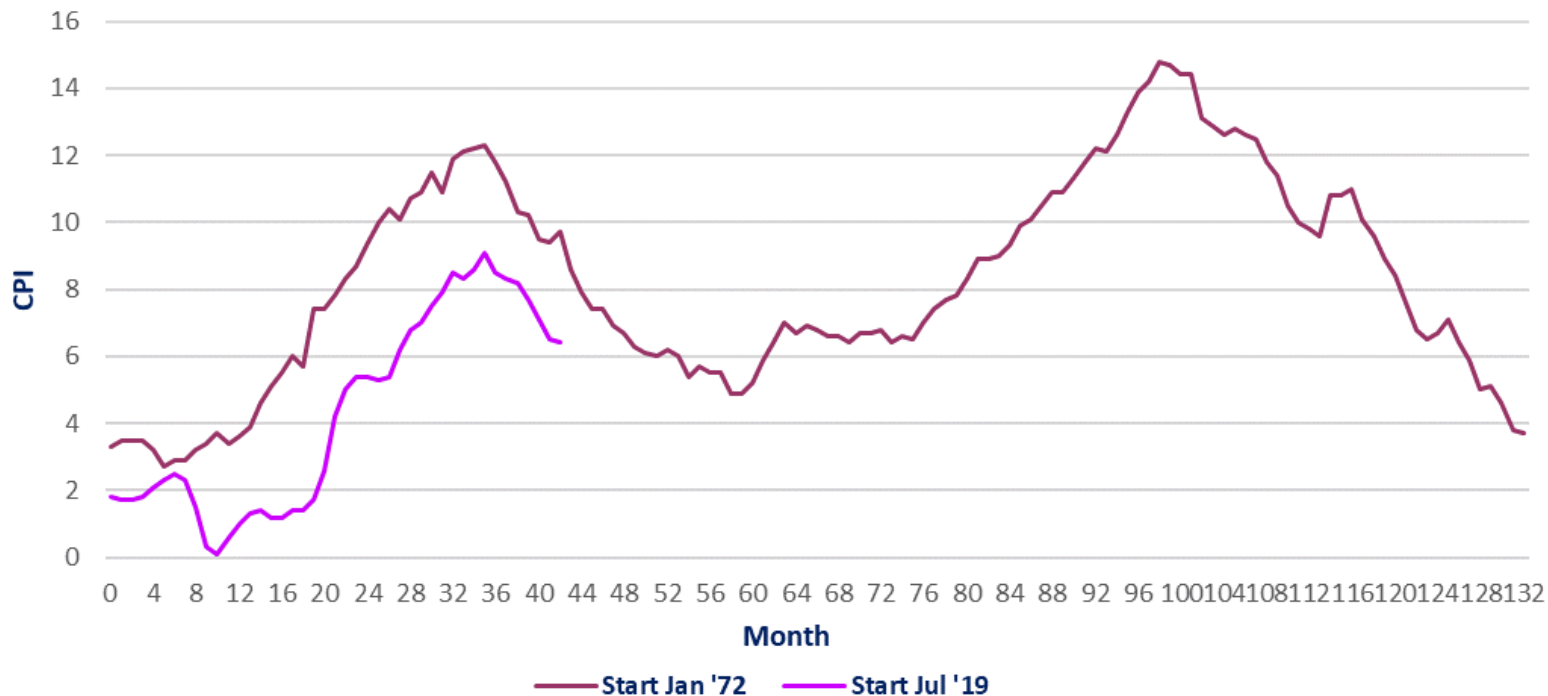
Data compiled Feb. 07, 2023.
Source: S&P Global Market Intelligence.
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Inflation Falls from 40 Year High



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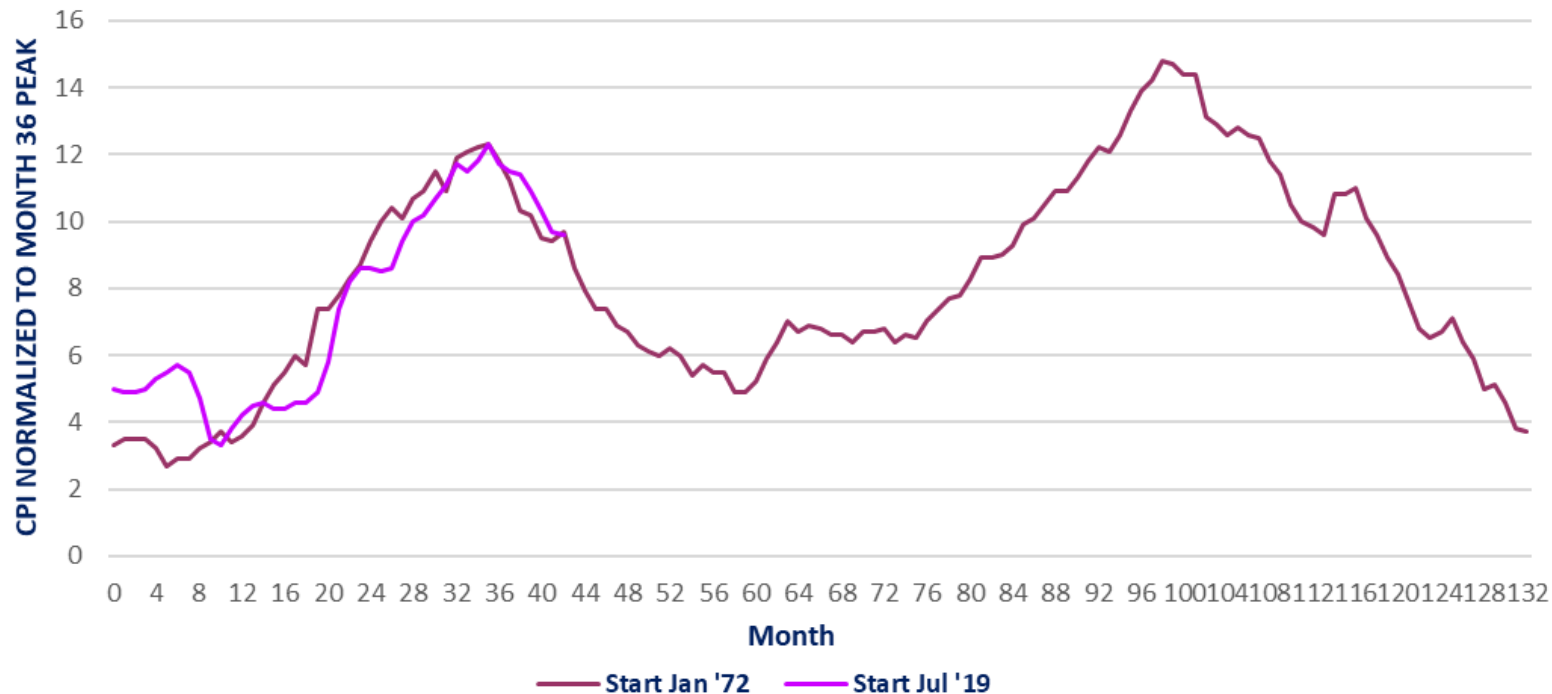
The Danger of History Repeating



Source – Bureau of Labor Statistics (BLS)

Connect. Influence. Optimize.

The Danger of History Repeating



Source – Bureau of Labor Statistics (BLS)

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In discussions of the “death of Moore’s Law” the quote from Mark Twain might be appropriate. When one major American newspaper actually printed his obituary and, when Twain was told about this by a reporter, he quipped: “The reports of my death are greatly exaggerated.”

Technology – The Irresistible Force

TSMC recently announced that it is introducing 3nm chips in the second half of 2022 and will bring 2nm technology to the world stage in 2025.

Looking ahead to 2024, Intel expects to finalize the design for its first chips with transistors smaller than 1 nanometer. They'll be measured by angstroms, instead. The "Intel 20A" node will be powered by "RibbonFET" transistors, the company's first new architecture since the arrival FinFET in 2011.

Until the periodic table is exhausted, we will be relentless in our pursuit of Moore’s Law and our path to innovate with the magic of silicon.” – Intel CEO, Pat Gelsinger

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Thank you!

Dale Ford – Chief Analyst
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Electronic Components Industry Association

