Market Status

~ June 2022 ~
Electronic Component Revenue Growth

World Revenue Growth

Americas Revenue Growth

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

Americas TAM / DTAM Revenue Growth Comparison

- Semiconductor TAM: 20% (2020), 25% (2021)
- Semiconductor DTAM: 10% (2020), 15% (2021)
- Passive TAM (C/R/I): -10% (2020), -5% (2021)
- Passive DTAM: -15% (2020), -10% (2021)

Americas Revenue for Top 50 Authorized Distributors

![Bar chart showing revenue for different categories in millions of dollars: Semiconductors, Interconnect, Passive, Electro-mechanical, Computer/Systems, Power & Battery, Other. The data is presented for 2019, 2020, and 2021.]
Semiconductor Revenue Growth Cycle

- Quarter-over-Quarter growth trending solidly down after highest level in over a decade
- Annual revenue cycle dips to follow quarterly but still trend for low double-digit / high single digit 2022 growth
- Rising ASPs boost revenue growth
- Still good demand and technology drivers
- Inflation and interest rates undermine consumer spending? Shifting trends?
- Question - How steep is the backside of the cycle?

Source – WSTS
Semiconductor Growth Trends

Quarter-over-Quarter Growth

Source: WSTS
Current Cycle Extremely Robust and Durable

Most cycles last about four years

Note: Low point in current cycle is -12.7% in Nov '19
Looking Forward

~ 2022 + ~
Observations:

- Forecast built up category-by-category with experienced analysts from all regions
- Typical semiconductor cycle pattern
- Memory IC drives Americas dramatic jump
- It appears the forecast has a more near-term focus
- Clear expectation for solid 2022 downturn
- Long-term forecasts gravitate to 5%
Worldwide Semiconductor Unit Shipments

Source: WSTS

Increase From:  
- Discretes 5.6%
- Analog ICs 23.9%
- Logic ICs 39.8%

Previous Peak: 30.7%

Recovery Start: 50.6%
But What About the Americas?

- Counter-cyclical trend starting in summer 2020
- High memory mix in Americas contributes to volatility
- Increasing ASPs will boost growth rates through 2022
- But inflation eventually clips the wings of growth

Source – WSTS
Americas Semiconductor Unit Shipments

- Discretes: 81.7% increase from previous peak, 152.4% recovery start
- Monolithic ICs: 43.7% increase from previous peak, 72.7% recovery start

Source: WSTS
North America Sentiment Survey Trends

North American Sales Performance Compared to Prior Quarter

Source: ECIA Electronic Component Sales Trends Survey
Economic Impact
Historic alignment between economy and electronics

Semiconductor Alignment Continues

Source: WSTS, IMF, OMDIA


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Historic alignment between economy and electronics

Semiconductor Alignment Continues

US Recession

Source: WSTS, IMF, OMDIA
Long-term Semiconductor Growth Trends

Source – WSTS

- Average annual growth
  - 2005-2015 = 5.5%
  - 2015-2022 = 8.0%
- $625 B in 2022?
- $1.0 T by 2029?
- $1.5 T by 2034?
- $2.0 T by 2038?
- HOW?
Twelve Month U.S. CPI Percent Change as of June 2022

Source – Bureau of Labor Statistics (BLS)
Inflation Hits Highest Rate in 41 Years

U.S. Annualized Inflation Rate (CPI)

Source – Bureau of Labor Statistics (BLS)
Semiconductor Revenues in Constant Dollar Value

Worldwide Semiconductor Revenue

Source – WSTS and Bureau of Labor Statistics (BLS)

The Impact on Semiconductor Revenue Growth

Worldwide Semiconductor Revenue Growth and Inflation

- Nominal Growth
- Real Growth
- Annual US Inflation
- Real US GDP

Inflation Target
Supply Chains & Lead Times
Stabilizing Lead Time Pressure

Average Lead Time


Electronic Components Industry Association
Hopeful Outlook for Moderating Pressure

Product Lead Time - May to June Comparison

- May - EM / Connectors
- Jun - EM / Connectors
- May - Passives
- Jun - Passives
- May - Semiconductors
- Jun - Semiconductors
- May - Overall Average
- Jun - Overall Average

- Decreasing
- Stable
- Increasing
# Lehigh University Supply Chain Risk Index – Q2 2022

<table>
<thead>
<tr>
<th>Risk Type</th>
<th>1st Quarter 2022 Risk Index</th>
<th>2nd Quarter 2022 Risk Index</th>
<th>Trend</th>
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<td>Transportation Disruption Risk</td>
<td>85.47</td>
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<td>Economic Risk</td>
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<td>Cybersecurity and Data Risk</td>
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<td>Supplier Risk</td>
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<td>Environmental Risk</td>
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<td>Quality Risk</td>
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<tr>
<td>Technological or Competitive Risk</td>
<td>59.05</td>
<td>55.00</td>
<td>↓ -4.05</td>
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<tr>
<td><strong>Average Risk Index</strong></td>
<td><strong>72.79</strong></td>
<td><strong>69.95</strong></td>
<td>↓ -2.84</td>
</tr>
</tbody>
</table>

Source: Lehigh Univ, CSCMP

- **TRANSPORTATION DISRUPTION RISK 89.50**
  - Remain the same 19%
  - Increase 80%
  - Decrease 1%

- **ECONOMIC RISK 87.00**
  - Remain the same 18%
  - Increase 78%
  - Decrease 4%

- **CYBERSECURITY AND DATA RISK 79.00**
  - Remain the same 42%
  - Increase 58%
  - Decrease 0%
Lehigh University Supply Chain Risk Index – Q2 2022

Overall Risk Index Trends

Source: Lehigh Univ, CSCMP
And the Hits Just Keep on Coming!

• California Air Resources Board (CARB) issued regulations which require trucking companies to upgrade their trucks with 2010 or newer engines by Jan. 1, 2023
  • Will take roughly 80,000 commercial trucks, or roughly 17% of the trucking fleet, off the road
  • Adds pressure to the supply chain crisis and causes many small trucking businesses to close or significantly reduce their workforce

• BofA chief investment strategist Michael Hartnett warns surging consumer prices + increasingly hawkish central bank = economic downturn in the U.S.
  • "Inflation shock worsening"
  • “rates shock just beginning”
  • “recession shock coming”

“If you think there was a supply chain problem over the last year, wait until you take this many trucks out of the marketplace that are not replaceable”

Joe Rajkovacz, director of governmental affairs and communications at the Western States Trucking Association

Recent Developments

- Bi-Partisan support of CHIPS Act - $52B / $75B / $250B ??
  - Senate Passage

- Hydrogen pipelines and clean energy solutions from Canada

- Samsung $200B investment in Texas for Fabs over next 2 decades?

*What happened:* “We cannot allow countries like China to use their market position in key raw materials, technologies or products to disrupt our economy or exercise unwanted geopolitical leverage,’ Yellen said in a speech in Seoul,” Axios reported.

*A path forward:* Yellen said that the U.S. and its allies “should focus on ‘friend-shoring,’ or diversifying their supply chains to rely more on trusted trading partners, strengthening economic resilience and lowering risks,” according to Reuters’s summary of her pre-released remarks.
Supply Chain Disruptors

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

The Vision Thing
Journey Into the Future
Exploring the Tech that is Waiting for Us

“Dream no small dreams for they stir not the hearts of men.”
– Johann Wolfgang von Goethe

“To look to the future, we must first look back upon the past. That is where the seeds of the future were planted. I never think of the future. It comes soon enough.”
– Albert Einstein

“Any sufficiently advanced technology is indistinguishable from magic”
– Arthur C. Clarke

“Shouldn't we be content to be cosmic sloths enjoying the universe from the comfort of earth? The answer is: No.”
– Stephen Hawking
The Future is Here

Meet Me in the Metaverse
The continuum of technology and experience, reshaping business
Executive Summary
The Metaverse Continuum is a spectrum of digitally enhanced worlds, realities, and business models poised to revolutionize life and enterprise in the next decade.

From metaverse and Web3, to digital twins and conversational AI, efforts to reimagine the future of technology are giving rise to new worlds and realities businesses will soon need to operate across – stretching from digital to physical and encompassing consumer experiences and enterprise business models alike.

The Metaverse Continuum’s impact will be felt across every dimension of the enterprise.

Thinking about “just” the metaverse misses the bigger picture. It’s not about one virtual environment or another, but the deep-rooted impact they will have on our reality. Over the next decade, nearly every environment that businesses currently operate across will transform as the Metaverse Continuum matures. Leaders will need to reimagine every dimension of their enterprise, from operating models to their core value proposition – and some are already starting today.

Source: Accenture
Completing the Picture

Accenture’s Technology Vision report comprises a three-year set of technology trends, currently including trends from 2020 and 2021.

It’s important to recognize that each year’s trends are part of a bigger picture. Tracking how they evolve over time offers a glimpse into how they may continue to grow in the future.
Our Four Technology Trends for 2022

WebMe
Putting the Me in Metaverse
The internet is being reimagined as metaverse and Web3 efforts transform the underpinning and operation of the virtual world.

Programmable World
Our Planet, Personalized
Control, customization, and automation are being enmeshed into the world around us, making the physical as programmable as the digital.

The Unreal
Making Synthetic, Authentic
As AI-generated data and synthetic content convincingly mimic what is “real,” authenticity is the new north star.

Computing the Impossible
New Machines, New Possibilities
A new generation of computers are solving some of the world’s most intractable problems, leading to one of the biggest technological disruptions of our time.

Source: Accenture
The next generation in computing has started to emerge, making industry-altering capability increasingly feasible. Several computing areas are leading the way:

**High Performance Computers (HPC)**
are massive parallel processing supercomputers that can help businesses take advantage of the huge swaths of data inherent to the digital world in ways that would be too expensive or inefficient using traditional computing.

**Quantum computers**
use properties of quantum physics to enable massively parallel and probabilistic problem solving – meaning they could solve a class of problems that are considered impossible for classical computers.

**Biology-inspired computers**
either mimic (bio-mimicry) or harness (bio-compute) the power of biological processes to store data, solve problems, or model complex systems in fundamentally different ways, with the potential to improve power efficiency, speed, accuracy or other computing constraints.
Thank you!

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