Where Are We Going?

- Cycle Analysis 2021
- Looking Forward 2022
- What About the Electronics & Components Supply Chain?
- The Impact of Inflationary Pressures
Cycle Analysis

~ 2021 ~
Electronic Component Revenue Growth

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

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
Semiconductor Growth Trends

Quarter-over-Quarter Growth

Source: WSTS

Current Cycle Extremely Robust and Durable
Most cycles last about four years

Source – WSTS

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 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
- At Fall Forecast, WSTS data still did not really reflect recent price increases
ECIA North America Sales Sentiment Survey Trends

North American Sales Performance Compared to Prior Month

Source: ECIA Electronic Component Sales Trends Survey

100 = Stable

ECIA North America Sales Sentiment Survey Trends

North American Sales Performance Compared to Prior Quarter

Q1 ’22 - EM / Connectors
Q2 ’22 - EM / Connectors
Q1 ’22 - Passives
Q2 ’22 - Passives
Q1 ’22 - Semiconductors
Q2 ’22 - Semiconductors
Q1 ’22 - Overall Average
Q2 ’22 - Overall Average

Source: ECIA Electronic Component Sales Trends Survey

ECIA North America Sales Sentiment Survey Trends

OVERALL MARKET
Market Status and Outlook

Source: ECIA Electronic Component Sales Trends Survey

What About the Electronics Components Supply Chain?

~ Worldwide / Americas~
Supply Chain Disruptors

CLIMATE
POLITICS
SHIPPING
PANDEMIC
TRADE WARS
RAW MATERIALS
LABOR SCARCITY
GROWING DEMAND
North America Lead Times – Record Shattering

Average Lead Time In Weeks
Semiconductor Devices

Source: ECIA
Lead Time Status – Hopes Dashed?

Product Lead Time - January to February Comparison

Source: ECIA
Worldwide Semiconductor Unit Shipments

Source: WSTS

Increase From:  
- Discretes 9.9%  
- Analog ICs 22.4%  
- Logic ICs 37.0%

Previous Peak

Recovery Start

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Previous Peak</th>
<th>Recovery Start</th>
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</thead>
<tbody>
<tr>
<td>Discretes</td>
<td>9.9%</td>
<td>35.9%</td>
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<tr>
<td>Analog ICs</td>
<td>22.4%</td>
<td>48.7%</td>
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<tr>
<td>Logic ICs</td>
<td>37.0%</td>
<td>60.4%</td>
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Worldwide Annualized Semiconductor Revenue

Source: WSTS

Growth Swings

• Jun ‘16 to Nov ’18
  - 29 Months
  - +$146B; +45%

• Nov ’18 to Nov ’19
  - 12 Months
  - -$60B; -13%

• Nov ’19 to Jul ’21
  - 20 Months
  - +$88B; +21%

• ^Volatility = ^Risk
• ^Risk = ^Required ROI
### Lehigh University Supply Chain Risk Index – Q1 2022

<table>
<thead>
<tr>
<th>Risk Type</th>
<th>4th Quarter 2021</th>
<th>1st Quarter 2022</th>
<th>Trend</th>
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<tbody>
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<td>Technological or Competitive Risk</td>
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<tr>
<td>Average Risk Index</td>
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Source: Lehigh Univ, CSCMP

**Connect. Influence. Optimize.**
Lehigh University Supply Chain Risk Index – Q1 2022

Overall Risk Index Trends

Source: Lehigh Univ, CSCMP
NAM Economic Assessment - Mixed

- Personal consumption expenditures jumped 2.1% in January / On a year-over-year basis, personal spending rose 11.8%.
- Personal saving rate decreased to 6.4% in January, the lowest rate since December 2013.
- Consumer confidence fell in the latest data, largely on inflation concerns.
  - The University of Michigan - lowest reading since October 2011
  - Conference Board - more mixed

  - Optimism about production moving forward despite ongoing supply chain bottlenecks, workforce shortages and pricing pressures.
- U.S. economy rebounded very strongly in 2021
  - Real GDP soaring 5.7% following the 3.4% decline seen in 2020.
  - Forecast for 2022 is for 3.8% growth.

“Events in Russia and the Ukraine pose a notable downside risk to global growth”

The Impact of Inflationary Pressures
“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 40 Years

Source – Bureau of Labor Statistics (BLS)
Twelve Month U.S. CPI Percent Change as of January 2022

CPI: 12-month percent change

Source – Bureau of Labor Statistics (BLS)
Raw Material Pricing Trends – IHS Markit Index

- Data through mid-December 2021
- Price pressure easing in last 3 months
- Prices still very elevated
- Energy & Shipping extremely high
- Potential for increases with overall inflation pressure
Semiconductor Revenues in Constant Dollar Value

Worldwide Semiconductor Revenue

Source – WSTS and Bureau of Labor Statistics (BLS)

77%
The Impact on Semiconductor Revenues

Source – WSTS and Bureau of Labor Statistics (BLS)
Thank you!

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