Executive Summary

Supplier Barometer Index (SBI)
SBI Score = 35; down from Q4 level of 39
Pessimism has soared across all revenue groups due to continued trade tensions and poor sales performance, sending the SBI 15 points below the neutral threshold of 50 to the lowest level since 2009. Pessimism was felt across firms of all sizes but was especially dismal for companies with revenue greater than $1 billion.

Trade policy is identified as the greatest industry threat, followed closely by poor vehicle sales.
Trade policy remains the greatest industry threat, but improved slightly from Q4 2018.
Poor sales of programs supplied was identified as the second largest threat to the industry.

Production Breakeven Level Falls To 14.7m Units:
Suppliers hold a buffer between production and an estimated breakeven point, yet the gap continues to tighten.

The median ‘all-in’ capacity utilization rate fell to 80% with the range of responses widening a bit compared to last year.
Over the past 6 years, there has been an estimated 5% rise in the median utilization rate.

Suppliers running over 90% utilization are taking the following actions to balance production requirements:
• New Capital Investment
• Production Scheduling Changes
• Expanding Operations
• Outsourcing
• Automation
Executive Summary

The primary internal production issue is a shortage of skilled labor

Engineering talent and availability improved compared to a year ago, but follows the shortage of skilled labor closely.

Production overtime premiums and inventory carrying costs worsened compared to last year, while internal manufacturing constraints improved.

Material cost premiums continue to be the primary sub-tier issue impacting suppliers’ abilities to meet production requirements.

Shortages of components and raw materials affected more of the supply base in comparison to last year, while liquidity shortages of sub-tier suppliers picked up.

R&D Spending is unchanged from last year; remaining at 4% of total sales

From the R&D budget, approximately one-fifth goes to research while four-fifths is allocated to development. Advanced material technologies remain the top priority for investments. Despite economic and political uncertainty, suppliers feel committed to R&D investment in the near-term.

Suppliers are confident in their customers production releases are aligned to their sales and inventory requirements overall.

Uncertainty is most apparent in programs to support car production as well as programs that support HEV/PHEV and BEV production.

Suppliers are generally deflating their releases down through their supply chain more frequently compared to last year.

Inventories increased in 2018

Nearly half of all suppliers reported increased inventories compared to last year on sales/forecast misses and value based inventory gains.
SUPPLIER OUTLOOK
OESA Supplier Barometer: Q1 2019 Results

Describe the general twelve month outlook for your business. Over the past three months, has your opinion become...?

Current Supplier Outlook (Share of Respondents)

- Significantly more optimistic
- Somewhat more optimistic
- Unchanged
- Somewhat more pessimistic
- Significantly more pessimistic

Supplier Barometer Index: (SBI and 6m Average)

- Q4 2018
- Q1 2019

Continued concerns over tariffs and trade policy pulled down the Q1 2019 OESA Supplier Barometer Index (SBI) by four points to 35, the lowest level since 2009.
OESA Supplier Barometer: Q1 2019 Results By Revenue

Describe the general twelve month outlook for your business. Over the past three months, has your opinion become...

Regardless of revenue size, responses continue to reflect a high level of pessimism over Q4 2018. Sharply lower optimism is evident within the largest suppliers compared to prior quarter.
OESA Supplier Barometer: Industry Threats

What are the greatest threats to the industry over the next 12 months?

- Changes in government trade policy: Feb. 3.6, Nov. 3.1
- Poor sales of vehicles in programs supplied: Feb. 4.3, Nov. 4.2
- Implementation of new government regulations: Feb. 4.5, Nov. 4.6
- Weakness in the U.S. Economy: Feb. 5.3, Nov. 5.2
- Likelihood of higher interest rates: Feb. 5.4, Nov. 4.6
- Inability to address internal labor constraints: Feb. 5.5, Nov. 5.2
- Terrorism or some type of international event: Feb. 6.6, Nov. 6.8
- Inability to fulfill customer volumes: Feb. 7.1, Nov. 6.5

Trade policy remains the greatest industry threat, at 3.6 in the first quarter, but improved slightly from Q4 2018. Poor sales of programs supplied was identified as the second largest threat at 4.3.
PRODUCTION AND PLANNING
Production Planning: Breakeven and Year-End Estimates

Considering North America light duty vehicle production, estimate the required 2019 industry volume needed to achieve breakeven in your North American operations?

Historical Breakeven (Millions of Units)
- 2018 = 15.0
- 2017 = 14.5
- 2016 = 14.3
- 2015 = 13.5
- 2014 = 12.7
- 2013 = 12.0
- 2012 = 11.0
- 2011 = 10.5
- 2010 = 10.0
- 2009 = 9.5

2019 Median breakeven level = 14.7 million units of production.

Suppliers hold a buffer between production and an estimated breakeven point, yet the gap continues to tighten.

Source: IHS Markit (History, Sales and Production); IHS Markit (Sales Forecast)
Production Planning: Capacity Utilization

Please estimate your ‘all-in’ capacity utilization levels (in percent)

‘All-in’ capacity is the total of your current capacity utilization (current workforce levels and operating plant and equipment assuming 270 working days and 3 shifts)

plus warm-idled capacity (idled capacity but being able to ramp up production within 3 months with minor capital needed)

plus cold-idled capacity (idled but being able to ramp up production after 3 months with moderate levels of capital required).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Quartile Value</td>
<td>Median Value</td>
<td>Upper Quartile Value</td>
<td>Lower Quartile Value</td>
</tr>
<tr>
<td>70%</td>
<td>80%</td>
<td>87%</td>
<td>75%</td>
</tr>
</tbody>
</table>

The median ‘all-in’ capacity utilization rate fell to 80% with the range of responses widening marginally compared to last year.

<table>
<thead>
<tr>
<th>January 2015</th>
<th>May 2014</th>
<th>May 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Quartile Value</td>
<td>Median Value</td>
<td>Upper Quartile Value</td>
</tr>
<tr>
<td>66%</td>
<td>80%</td>
<td>86%</td>
</tr>
</tbody>
</table>

Supplier efforts if over 90% capacity utilization:
21% of responding suppliers

➢ New Capital Investment (5)
➢ Production Scheduling Changes (4)
➢ Expanding Operations (3)
➢ Outsourcing (2)
➢ Automation
Production Planning: Internal Issues

Over the next 12 months, identify which of the following internal issues you will face as you meet required levels of production?

Other Issues (6% Yes)

- We see many of our customers leaving the business. The people buying them tend to be clueless. A lot of talented people are looking to leave.
- EBIT
- New requirements for cybersecurity and functional safety
- Expansions into other countries is still a big push so we are "prepared" to support the next wave of programs, but very few programs to support current activities are increasing risk levels.
- Negotiations with customers for tariff relief
Production Planning: Internal Issues

What steps are you taking at your firm to address the issues identified?

**Engineering Talent/Availability**
- Training and development (6)
- Outsourcing (4)
- Targeting recent graduates (3)
- Increasing salaries and benefits (3)
- Using consultants (2)
- Internships, co-ops, and apprenticeships (2)
- Marketing (2)

**Skilled Labor Shortages**
- Internal employee development (8)
- Increasing salaries and benefits (4)
- Internships, co-ops, and apprenticeships (4)
- Targeting recent graduates/Young Talent (3)
- Trade school/community college collaboration (2)

**Production Overtime Premiums**
- Efficiency improvements (3)
- Expansion (2)
- Additional hiring
- Temporary employees
- Driven by labor shortage

**Hourly Labor Shortages**
- Increased pay and benefits (6)
- Improve culture (2)
- Training programs (2)
- Automation (2)
- Direct hiring (2)
### Production Planning: Internal Issues

What steps are you taking at your firm to address the issues identified?

<table>
<thead>
<tr>
<th>Inventory Carrying Costs</th>
<th>Internal Manufacturing Capacity Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Tight inventory controls (4)</td>
<td>• Adding capacity (2)</td>
</tr>
<tr>
<td>• Slower orders driving inventories higher (2)</td>
<td>• Adding equipment (2)</td>
</tr>
<tr>
<td>• Managing tariff impact (2)</td>
<td>• Utilization improvements</td>
</tr>
<tr>
<td></td>
<td>• Program delays</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Re-allocation of Resources - Quality/Production</th>
<th>Outbound-Expedited Freight</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improving plant independence</td>
<td>• Efficiency improvements (4)</td>
</tr>
<tr>
<td>• Minor issue</td>
<td>• Driven by labor shortages (2)</td>
</tr>
<tr>
<td>• Reflected in pricing</td>
<td>• Utilize a 3PL provider</td>
</tr>
<tr>
<td>• Redesign work process</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Set-up and Change-Over Costs</th>
<th>Liquidity Shortages Within Your Own Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SMED (2)</td>
<td>• Driven by customers (3)</td>
</tr>
<tr>
<td>• Driving inefficiencies</td>
<td>• Delaying payments</td>
</tr>
<tr>
<td>• Kaizen events, customer/product line streamlining</td>
<td>• Capital expense reductions and cash flow management</td>
</tr>
<tr>
<td>• Training</td>
<td>• Working through defined process</td>
</tr>
</tbody>
</table>
Production Planning: Sub-Tier

Over the next 12 months, identify which of the following issues your sub-tier suppliers will face as you meet required levels of production?

- Material Cost Premiums
- Production Scheduling Difficulties
- Transportation/Logistics Constraints
- Component Shortages
- Raw Material Shortages
- Inbound-Expedited Freight
- Liquidity Shortages

Other Issues (4% Yes)
- Require much help in developing reasonable cyber security processes and understanding. This is a bigger challenge in the future when new requirements and regulations surface and the supply chain is unprepared. Commodity raw material pricing on many commodities is on the edge to increase.
- Supplier bankruptcy has been an issue for us in Europe.
Production Planning: Sub-Tier

What steps are you taking at your firm to address the issues identified?

<table>
<thead>
<tr>
<th>Production Scheduling Difficulties</th>
<th>Material Cost Premiums</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased communication (2)</td>
<td>• Resourcing (6)</td>
</tr>
<tr>
<td>• Monitoring and verify sub-supplier production</td>
<td>• Tariff impacts (4)</td>
</tr>
<tr>
<td>• Monitoring suppliers on-site</td>
<td>• Renegotiate with customers (4)</td>
</tr>
<tr>
<td>• Always an issue with OE forecast/demand</td>
<td>• Renegotiate with suppliers (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transportation/Logistics Constraints</th>
<th>Inbound-Expedited Freight</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Driver shortages (3)</td>
<td>• Resourcing</td>
</tr>
<tr>
<td>• Slowing demand relief for logistics</td>
<td>• Linked to component shortages</td>
</tr>
<tr>
<td>• Customers requesting DDP terms</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component and Raw Material Shortages</th>
<th>Liquidity Shortages Within Your Supply Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Electrical components (3)</td>
<td>• Negotiate between Tier 2 and OEM</td>
</tr>
<tr>
<td>• Resourcing (3)</td>
<td></td>
</tr>
<tr>
<td>• Chemicals (2)</td>
<td></td>
</tr>
<tr>
<td>• Chargebacks to supplier</td>
<td></td>
</tr>
</tbody>
</table>
Production Planning: Confidence in Customer Releases

Are your customers’ 2019 production releases aligned to their 2019 sales and inventory requirements?

- Overall: 3.0
- Car: 3.1
- Truck: 3.0
- Utility: 2.9

Are your customers’ 2019 production releases aligned to their 2019 sales and inventory requirements by powertrain platform?

- ICE: 3.1
- HEV/PHEV: 3.3
- BEV: 3.3
- Diesel: 3.0

Legend:
1=Far too low  2=Too low  3=About right  4=Too high  5=Far too high  Avg. (Rt. Axis)
Production Planning: Releases to Supply Chain

Generally, across customers and programs, are you currently tending to inflate or deflate your releases down through your supply chain?

Comments:

Deflate
- To optimize inventory levels, and based on recent history, tending to reduce releases somewhat
- Especially for Passenger cars (non-light truck or SUV/CUV platforms)
- We see reductions in the forecasts when comparing 3-month, 2-month and 1-month data. Anticipating this trend to continue.

Pass Through
- A couple are deflated and a few are inflated. On average we are pass through.
- It depends on the customer

Inflate
- Short window release fluctuations are driving to inflate

Suppliers are generally deflating their releases down through their supply chain more frequently compared to last year, with 38% indicating deflation in 2019 up 14 ppts. from 2018.
Compared to average 2017 levels, how did your average 2018 finished goods inventory levels change?

- **Decreased**
  - Decreased 10% or more: 2%
  - Decreased 7-9%: 1%
  - Decreased 4-6%: 5%
  - Decreased 1-3%: 13%

- **Increased**
  - Increased 10% or more: 2%
  - Increased 7-9%: 5%
  - Increased 4-6%: 22%
  - Increased 1-3%: 19%

- **No Change**: 31%

**Comments:**

- **Decreased**
  - Improved inventory/release management (5)
  - Cash control

- **Increased**
  - Sales/forecast miss (8)
  - Productivity improvements (2)
  - Value based inventory increase (2)
  - Changing Production wheel to reduce late deliveries
  - Complexity of parts delivered
  - Transition from steel to aluminum
  - Cut in call-offs in the last 6 weeks of the year left us with increased inventory
  - Several program had product banking for new programs
  - Inventory associated with delay of new powertrains
  - Electronic components shortage pushed the company to increase its inventory to face coming months and eradicate premium freight and premium expense from brokers

After a successful year of inventory management in 2017, the percentage of suppliers with increased inventories rose 16 ppts. to 48%
### Production Planning: Research & Development Spending

For 2018, estimate your R&D spending as a percent of total sales.

<table>
<thead>
<tr>
<th>Year</th>
<th>Lower Quartile</th>
<th>Median Value</th>
<th>Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>2%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>2018</td>
<td>3%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>2017</td>
<td>2%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>2015</td>
<td>2%</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>2014</td>
<td>2%</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>2012</td>
<td>2%</td>
<td>3%</td>
<td>5%</td>
</tr>
</tbody>
</table>

R&D Spending is essentially unchanged from last year, around 4% of total sales. Approximately 80% of the R&D budget is allocated towards the development of specific programs, while 20% is allocated to researching future technologies.

For 2018 R&D budget, estimate the percent allocated to research and percent allocated to development.

<table>
<thead>
<tr>
<th>Year</th>
<th>Lower Quartile</th>
<th>Median Value</th>
<th>Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>10%</td>
<td>20%</td>
<td>30%</td>
</tr>
<tr>
<td>2018</td>
<td>20%</td>
<td>32%</td>
<td>44%</td>
</tr>
<tr>
<td>2017</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td>2015</td>
<td>20%</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>2014</td>
<td>16%</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>2012</td>
<td>20%</td>
<td>30%</td>
<td>50%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Lower Quartile</th>
<th>Median Value</th>
<th>Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>70%</td>
<td>80%</td>
<td>90%</td>
</tr>
<tr>
<td>2018</td>
<td>50%</td>
<td>67%</td>
<td>80%</td>
</tr>
<tr>
<td>2017</td>
<td>58%</td>
<td>75%</td>
<td>85%</td>
</tr>
<tr>
<td>2015</td>
<td>35%</td>
<td>67%</td>
<td>80%</td>
</tr>
<tr>
<td>2014</td>
<td>50%</td>
<td>70%</td>
<td>84%</td>
</tr>
<tr>
<td>2012</td>
<td>50%</td>
<td>70%</td>
<td>80%</td>
</tr>
</tbody>
</table>

R&D Spending is essentially unchanged from last year, around 4% of total sales. Approximately 80% of the R&D budget is allocated towards the development of specific programs, while 20% is allocated to researching future technologies.

For 2018 R&D budget, estimate the percent allocated to research and percent allocated to development.
Research & Development Technology Investments

If you had additional dollars for R&D investment, rating in terms of importance, how would you allocate it across the following technology areas?

The order of top supplier R&D priorities remains consistent with last year.

<table>
<thead>
<tr>
<th>Technology Area</th>
<th>2019 Average</th>
<th>2018 Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Materials Technologies (composites, lightweight materials, etc.)</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>&quot;Industry 4.0&quot; (Connected Manufacturing Technologies.)</td>
<td>2.8</td>
<td>NA</td>
</tr>
<tr>
<td>Powertrain Technologies (ICE Hybrid, Electric, Alternate Fuels, Fuel Cell, Transmissions)</td>
<td>3.0</td>
<td>2.7</td>
</tr>
<tr>
<td>Driver Assist Technologies (park assist, crash avoidance, lane departure, etc.)</td>
<td>3.4</td>
<td>3.8</td>
</tr>
<tr>
<td>Autonomous Driving Technologies (V2X)</td>
<td>3.4</td>
<td>3.8</td>
</tr>
<tr>
<td>Other</td>
<td>3.3</td>
<td>NA</td>
</tr>
</tbody>
</table>

1=Highest Priority  2  3  4  5=Lowest Priority
Research & Development Technology Investments

How committed is your organization to its R&D spending over a 2-3 year time horizon in the face of economic uncertainty?

<table>
<thead>
<tr>
<th>Research Investment</th>
<th>Development Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Very Committed</td>
<td>Avg. (Rt. Axis)</td>
</tr>
<tr>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>3</td>
<td>2.3</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5 Not at all Committed</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Comments:
- Can't waste commitment
- Added new CTO and team and roadmaps and deliverables recently
- Large amount of launches are consuming more resources than planned as additional customer requirements are pushed downstream
- Not all business units are getting an equal % spent. More mature ones are getting a lower % and newer technologies are getting a high % spend
- It is key as our customers continue to off load engineering challenges on us
- We expect to stay course on advance development plans though cash/resource issues could impact
OESA Automotive Supplier Barometer is a survey of the top executives of OESA regular member companies. The OESA Automotive Supplier Barometer takes the pulse of the suppliers’ twelve month business sentiment. In addition, it provides a snapshot of the industry commercial issues, business environment and business strategies that influence the supplier industry.

www.oesa.org

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Survey Methodology

- Data collected February 14- March 1 via invitation to online survey.
- Executives of OESA supplier companies.
- 107 survey responses were received.

The information and opinions contained in this report are for general information purposes. Comments are edited only for spelling and may contain grammatical errors due to their verbatim nature. Responses to this survey are confidential. Therefore, only aggregated results will be reported and individual responses will not be released or shared.

Antitrust Statement: Respondents/participants should not contact competitors to discuss responses, or to discuss the issues dealt with in the survey. It is an absolute imperative to consult legal counsel about any contacts with competitors. All pricing and other terms of sale decisions and negotiating strategies should be handled on an individual company basis.