Coronavirus COVID-19:

Global Health & Crisis Response
March 25 NABE webinar
COVID-19 is, first and foremost, a global humanitarian challenge. Thousands of health professionals are heroically battling the virus, putting their own lives at risk. Governments and industry are working together to understand and address the challenge, support victims and their families and communities, and search for treatments and a vaccine.

Companies around the world need to act promptly. This document is meant to help senior leaders understand the COVID-19 situation and how it may unfold, and take steps to protect their employees, customers, supply chains and financial results.
The Virus and our Economy
Economic Impact of COVID-19 spread, public health response, and policies

COVID-19 Pandemic Evolution
Effectiveness of the public health response in controlling the spread and human impact of COVID-19

Majority of the global spread profile “China/Korea like”
Strong public health response succeeds in controlling spread in each country within 2-3 months

Effective response, but (regional) virus resurgence
Public health response initially succeeds but measures are not sufficient to prevent viral resurgence so social distancing continues (regionally) for several months

Broad failure of public health measures
Public health response fails to control the spread of the virus for an extended period of time (e.g., until vaccines are available)

Prolonged economic contraction
Self-reinforcing recession dynamics kick-in; widespread bankruptcies and credit defaults; potential banking crisis

Muted economic recovery
Policy responses partially offsets economic damage; banking crisis is avoided; recovery levels muted

Economic rebound to fundamentals
Strong policy response prevents structural damage; recovery to pre-crisis fundamentals and momentum

Profile of Economic Recovery
Speed and strength of recovery depends on whether policy moves can mitigate self-reinforcing recessionary dynamics (e.g., corporate defaults, credit crunch)
The hardest hit sectors may not see restart until 2021
Preliminary views on some of the hardest hit sectors – subject to change as the COVID-19 outbreak evolves

<table>
<thead>
<tr>
<th>Estimated global restart</th>
<th>Avg. change in stock price</th>
<th>Industry specific examples</th>
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<tbody>
<tr>
<td>Aerospace/defense</td>
<td>-47%</td>
<td>Aircraft delivery shocks mitigated by size of order backlog; which is currently large (~4 years for wide-body, ~9 years for narrow)</td>
</tr>
<tr>
<td>Air &amp; Travel</td>
<td>-51%</td>
<td>Aftermarket maintenance will be deeply impacted immediately due to lower aircraft flight hours and operators’ cash constraints</td>
</tr>
<tr>
<td>Insurance carriers</td>
<td>-38%</td>
<td>N. Hemisphere summer travel peak season deeply impacted since pandemic fears coincide with peak booking period</td>
</tr>
<tr>
<td>Oil and gas</td>
<td>-48%</td>
<td>Production at F-35 plants in Japan &amp; Italy disrupted with unclear impact on delivery schedules; expectations for additional disruption as US cases grow</td>
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<tr>
<td>Automotive</td>
<td>-35%</td>
<td>Oil price decline driven by both short-term demand impact and supply overhang from OPEC+ decision to increase production</td>
</tr>
<tr>
<td>Apparel/fashion/luxury</td>
<td>-36%</td>
<td>Existing vulnerabilities (e.g., trade tensions, declining sales) amplified by acute decline in Chinese demand, continued supply chain and production disruption (in China, rest of Asia, EU) to amplify impact despite ongoing Chinese economic restart</td>
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<td>Overall decline in private consumption and exports of services.</td>
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Air & Travel:
- Deep, immediate demand shock 5-6x greater than Sept 11; ~70-80% near-term demand erosion due to int’l travel bans & quarantines now prevalent in 130+ nations
- N. Hemisphere summer travel peak season deeply impacted since pandemic fears coincide with peak booking period
- Recover pace faster for domestic travel (~2-3 quarters); slower for long-haul and int’l travel (6+ quarters)

Insurance carriers:
- US insurers have been strongly affected, especially reinsurers and life & health
- Reduced interest rates and investment performance impacting returns – esp. for longer-tail lines
- Disruptions expected in new business and underwriting processes due to dependence on paper applications and medical underwriting

Oil and gas:
- Oil price decline driven by both short-term demand impact and supply overhang from OPEC+ decision to increase production
- Oversupply expected to remain in the market even after demand recovery, and post 2020, unless OPEC+ decides to cut production

Automotive:
- Existing vulnerabilities (e.g., trade tensions, declining sales) amplified by acute decline in Chinese demand, continued supply chain and production disruption (in China, rest of Asia, EU) to amplify impact despite ongoing Chinese economic restart
- Headwinds to persist into Q3 given tight inventories (<6 weeks), supply chain complexity (therefore, minimal ability to shift)

Source: IHS Market, McKinsey Global Institute, Subject matter experts, press reports, Corporate Performance Analytics, S&CF Insights, S&P Capital IQ

Current as of March 24, 2020
What business leaders should look for in coming weeks

There are three questions business leaders are asking, and a small number of indicators that can give clues:

1. **Depth of disruptions**
   - How deep are the demand reductions?
   - *Indicators to monitor*:
     - Speed of social distancing after community transmission confirmed
     - Number of cases – absolute (post test ramp-up in 1-2 weeks)
     - Geographic distribution of cases relative to economic contribution
     - Extent of travel reduction (% flight cancellations, travel bans)
     - Extent of spend reduction (e.g., credit card usage)
     - Extent of behavior shift (e.g., restaurant reservations, gym activity)

2. **Length of disruption**
   - How long could the disruption last?
   - *Indicators to monitor*:
     - Evidence of virus seasonality
     - Test count per million people
     - % cases with likely hospitalization, relative to hospital bed capacity
     - Speed of regulatory approval of off-the-shelf drugs for mild cases
     - % of cases treated at home
     - Case fatality ratio vs. other countries
     - % unemployment
     - Bailout bill passage & underlying time assumptions
     - % increase in bankruptcy filings

3. **Shape of recovery**
   - What shape could recovery take?
   - *Indicators to monitor*:
     - Examples of testing as pre-requisite for some activities (e.g., flying)
     - Potential for virus mutation
     - Evidence of increased economic activity in China, S. Korea vs. new case count
Supply side impact

China (ex-Hubei) manufacturing is restarting after multiple weeks of lower capacity

What is happening now

**Peak traffic congestion, % of same day YoY**
Feb 13 – Mar 16, 2020

- Avg. of Nanjing, Shenzhen, Hangzhou
- Wuhan

- Back to normal during working hours with a slow ramp-up as incremental cases in China has dropped to near zero
- There is still a significant drop during non-peak hours and weekends

**Return to work index %**

- Average of China
- Wuhan

- ~60% labor capacity to date
- ~80% of companies have restarted (and ~100% of large enterprises)

- ↑ 10% daily power generation in March since Feb

1. Wuhan with slower pace of recovery (migrant workers not yet authorized to return)

Source: Baidu, Tomtom Traffic Index, Reuters, press search

What to expect

**Peak Traffic congestion, % of same day YoY**

- Milan (Feb 24 - Mar 16, 2020)
- LA (Mar 2 - 16, 2020)

EU has already been significantly impacted with US beginning to experience early effects of COVID-19

For now, there have been minimal production shutdowns, but labor capacity reductions to the same order of what was felt in China are expected

Effects will be felt after labor returns – parts and labor shortages leading to further SC disruptions

Supply of many goods likely to continue to be an issue as companies work through their safety stock of direct materials

Higher demand goods will see customer pressure for prioritization
Ocean transportation

Recent decline in volumes but showing recovery from Chinese Lunar New Year

What is happening now

↓ 15%  YoY decrease in Q1 volume expected

↓ 25%  YoY reduction in cargo sailings

↓ 9%  latent container capacity (2M TEU have been idled in Feb)

Baltic Dry Index – Bulk shipping 2019 vs. 2020

50% increase in BDI 2020 since Lunar NY, nearly recovering to 2019 levels

What happened in ‘08 financial crisis (for the US)
12% decrease in container capacity (1.5 million TEUs of capacity idled)
25-30 months to full recovery for container shipping

What to expect

Increased demand and previously planned reduced capacity likely to result in price increases

Ocean transportation likely to maintain operations

Additional volume declines in the short term

Demand to increase as production ramps back up, likely spike in demand to re-fill stock

1. Only includes January volumes

Source: JOC, WSJ, Alphaliner, Bloomberg, Baltic Index data sets
### Air cargo

Significant drop in volumes, but increase in pricing and yields

**What is happening now**
- ↓ 60% capacity decrease in cargo to/from China in last 2 months
- ↓ 14% YoY global belly capacity decrease in March due to 50%+ cancellation rates in passenger flights (responsible for ~50% of global air cargo capacity)
- ↑ 2x price to ship air cargo to China since CLNY

**TAC Rate Index incr. since CLNY**

<table>
<thead>
<tr>
<th>Region</th>
<th>2018-19</th>
<th>2019 CLNY</th>
<th>2020 CLNY</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>US-China</td>
<td>3.4</td>
<td>3.7</td>
<td>3.6</td>
<td>3.5</td>
</tr>
<tr>
<td>EU-China</td>
<td>1.7</td>
<td>2.9</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>China-US</td>
<td>2.1</td>
<td>2.9</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>China-EU</td>
<td>1.0</td>
<td>3.5</td>
<td>3.4</td>
<td>3.4</td>
</tr>
</tbody>
</table>

**What to expect**

Rates likely to increase, with notable sharp increases as available capacity remains limited and demand from China slowly starts to recover

Declines in available capacity will continue, as to travel bans increasingly restrict available belly capacity on commercial flights

Periodic spikes in freighter capacity, may occur in the near term, as carriers rush to backfill the lost belly capacity

Increasing shift in capacity from passenger aircraft to cargo-only operations

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1. Chinese Lunar New Year 02/05/2019
2. End of extended Chinese Lunar New Year holiday 02/07/2020
3. US-China current as of 03/02/2020, others current as of 03/09/2020

Source: Seabury Consulting, TAC index, Air Cargo News, US DOT, IATA, Airport websites, Airsavvi
Ground transportation

What is happening now

↓ **20%**  drop in port volumes in the US

~**80%**  truck staff available in China, increasing significantly in past weeks, easing past bottlenecks in intermodal deliveries

Demand for express last-mile delivery has spiked in China due to quarantine and social distancing

What happened in ‘08 financial crisis (for the US)
Rail: 24% decrease in volumes over 11 months; 48+ months to full recovery
Trucking: 11% decrease in volumes over 5 months; 25-30 months to full recovery

What to expect

Sustained volumes in the short term to maintain inventory
Declines at US ports likely foreshadow declines in ground (rail and truck) transportation
Shutdowns in receiving ports in Europe and North America as restrictions go into effect
Permanent shift of mode unlikely as long as fundamental economics will restore. Rather, rail and rail-air option might evolve to be alternative mode to capture more ad hoc demand in future

Source: AAR, US DOT, Cass Index, US DOT, JOC, MSJ, Forbes, FT
Demand side impact

China consumer confidence has seen partial rebound

<table>
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<th>Consumer sentiment</th>
<th>... with some evidence of increases</th>
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<tbody>
<tr>
<td><strong>↓ 21%</strong> Decrease in retail sales in Jan &amp; Feb (YoY)</td>
<td>Computer sales and home office supplies seeing large spike with increase of WFH</td>
</tr>
<tr>
<td><strong>↓ 90%</strong> Decrease in passenger car sales in Feb</td>
<td>20% increase in production forecast for iPads in China</td>
</tr>
<tr>
<td><strong>↓ 60B</strong> Decrease in consumer spending on F&amp;B in Jan &amp; Feb (1% of Chinese 2019 retail sales)</td>
<td>Online orders increased exponentially – JD.com reported 215% growth in late Jan-Feb compared to previous year in fresh foods sales</td>
</tr>
<tr>
<td><strong>↓ 40%</strong> Decrease in smart phone sales in Jan</td>
<td>Stores mostly re-opening (with limited foot traffic)</td>
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<td></td>
<td>• Hermes to open all but two stores in mainland China</td>
</tr>
<tr>
<td></td>
<td>• Large jeweller reported 85% of stores were operational</td>
</tr>
</tbody>
</table>

What to expect

Inventory whiplash effect

7-8 weeks for Automotive

2-4 weeks for High tech

Increased demand from measure to curb the coronavirus can be anticipated (e.g., work for home policies increase demand for laptops and broadband)

Demand slump may persist as we start to see greater impact of the coronavirus in the world

Organizations can expect to see and demand spikes and inventory hoarding behaviors as actions of uncoordinated actors exacerbate the supply chain

As demand rebounds organization must take measure to mitigate the impact by leveraging Chinese sentiments (e.g., Amazon hiring 100K workers to meet demand)

Source: McKinsey team analysis, CNBC, NYT, WSJ, Bloomberg, Nike Asia, Reuters
There are multiple end-to-end immediate supply chain actions to consider in response to COVID-19:

1. **Create transparency on multi-tier SC**
   - Determine critical components, and determine origin of supply
   - Assess interruption risk and identify likely Tier 2+ risk
   - Look to alternative sources if suppliers in severely affected regions

2. **Analyze available inventory**
   - Estimate inventory along the value chain, including spare parts/re-manufactured stock
   - Use after sales stock as bridge to keep production running

3. **Optimize production and distribution capacity**
   - Assess impact on operations and available resource capacity (mainly workforce)
   - Ensure employee safety and clearly communicate with employees
   - Conduct scenario planning and assess impact on operations based on available capacity
   - Optimize limited production determining production with highest margin and highest opportunity cost/penalty

4. **Leverage available logistics capacity**
   - Estimate available logistics capacity
   - Accelerate customs clearance
   - Change mode of transport and pre-book air/rail capacity given current exposure
   - Collaborate with all parties to jointly leverage freight capacity

5. **Estimate realistic final customer demand**
   - Work with S&OP to get demand signal to determine required supply
   - Leverage direct communication channels with direct customer
   - Use market insights/external databases to estimate for customer’s customers

6. **Manage cash and net working capital**
   - Run supply chain “stress tests” vs. major supplier balance sheets to understand when supply issues will start to stress financial or liquidity issues
Supply chain actions to consider in the coming months

- Evaluate alternative sourcing for all materials impacted – availability of suppliers, additional cost due to logistics, tariffs, estimated component price increases.
- Enhance the demand verification process to correct inflated demand to mitigate the whiplash effect.
- Provide continuous support to small and mid-sized tier 2-3 suppliers in financial trouble.
- Assess regional risks for current and backup suppliers.
- Codify the processes and tools created during the crisis management as formal documentation.
- Digitize process and tools to integrate demand, supply, and capacity planning.
- Convert war room into a reliable supply chain risk management process.
- Ensure stakeholders address vulnerabilities across all parts of the supply chain.
- Trigger the new supply network design for resilience.

- Work with public agencies to explore opportunities for support.
- Engage investors and other stakeholders to improve transparency and get help.

- Continuously improve material supply stability.
- Kick off designing resilient supply chain for the future.
- Build collaborative relationships with external partners.
Thank you

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