## Manufacturing Supply Chain Stress

 April 2020
## Executive Summary

- COVID-19 Fallout- With operations in some areas suspended for more than a month, manufacturers are facing an unprecedented challenge. Major manufacturers, such as Automotive OEMs, have cut all US production capacity-plans on when to restart production have been delayed several times through public announcements.
- Near Term Criticality- Companies should review their supply base for critical components from plants that have or might shutdown, have low safety stock levels, and are under financial stress.
- Supply Risk- Companies should review their supply base for critical suppliers that will lose large amounts of revenue and have low cash levels. Suppliers' approaches to COVID-19 risk mitigation should also be reviewed. In addition to financial risk, companies with low cash levels may have additional difficulties rapidly reopening.
- Production Restart- Geographic clusters of restart dates will require suppliers to prioritize production timed to each OEM and production lines.
- Supplier Financial Risk- Companies will undergo varying degrees of stress if operations remain suspended over the next few weeks and months. Public and Private suppliers' financials should be reviewed to determine exposure to the industry, cash reserves, and available means of mitigation.


## 1. Background \& Supplier Impact

2. Cost \& Capital Supplier Risk Approach
3. Reference Cases

## Supply Risk Assessment

Companies should review their supply base for critical components from plants that have or might shutdown, have low safety stock levels, and are under financial stress.

- Resources should be focused on major suppliers as well as suppliers that provide supplycritical components
- Financial stress will increase as shutdowns become prolonged
- Working with manufacturing and engineering highlights critical components
- Working with supply chain highlights limited sources for critical components
- Efforts should be narrowed to the most critical suppliers



## Automotive Capacity Cuts and Planned Restarts

Automotive OEMs have cut all US production capacity—plans on when to restart production have been delayed several times through public announcements.


- GM and Ford have not publicly committed to restart dates
- Several OEMs located in the Southeast will likely delay planned restart dates as infection rates have been increasing in those areas
- OEMs are looking to balance securing production capacity with suppliers with the need to wait until plants can be safely opened
- Automotive shutdowns reflect similar actions being taken in other manufacturing-related industries


## Automotive Capacity Cuts and Planned Restarts

Planned restart dates tend to be more aggressive in the Southeast.

## US Automotive OEM Restart



- Geographic clusters of restart dates will require suppliers to prioritize production timed to each OEM and production line
- Freight capacity between suppliers and OEMs will need to be managed to secure capacity timed to each restart

Plan to Open in April
Plan to Open in May
No Stated Restart Date

## Production Cut Analysis

Companies started the year with large cash cushions and could easily cover interest payments. However, this will change if significant shutdowns continue.

|  | LT Debt / Equity | LT Debt / EBITDA | LT Debt Due in One Year | EBITDA / <br> Interest <br> Expense | EBITDA <br> Margin | Current Ratio | $\begin{aligned} & \text { (Cash + } \\ & \text { Credit) / } \\ & \text { Revenue } \end{aligned}$ | If 33\% drop in Annual Revenue |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  | EBITDA Margin | EBITDA / <br> Interest <br> Expense | Risk |
| AK Steel | 412\% | 4.7 | 2\% | 2.9 | 7\% | 191\% | 8\% | 4\% | 1.2 | High |
| AkzoNobel | 31\% | 1.7 | 8\% | 15.8 | 13\% | 158\% | 33\% | -2\% | (1.4) | High |
| Amphenol | 85\%' | 0.6 | 10\% | 15.8 | 23\% | 199\% ${ }^{\prime}$ | 14\% | 19\% | 8.7 | Low |
| Arkema | 45\% | 1.6 | 22\% | 12.6 | 17\% | 198\% | 26\% | 15\% | 7.8 | Low |
| Axalta | 269\% | 4.5 | 1\% | 5.2 | 19\% | 240\% | 32\% | 11\% | 2.0 | Moderate |
| BASF | 35\% | 1.9 | 18\% | 16.6 | 13\% | 187\% | 14\% | 6\% | 5.0 | Low |
| Corning | 59\% | 2.8 | 0\% | 12.7 | 24\% | 212\% | 21\% | 19\% | 6.7 | Low |
| Dow | 113\% | 6.1 | 3\% | 2.8 | 6\% | 157\% | 23\% | 2\% | 0.6 | High |
| Fastenal | 13\% | 0.3 | 1\% | 85.5 | 22\% | 451\% | 16\% | 10\% | 25.8 | Low |
| Grainger | 93\% | 1.3 | 11\% | 19.0 | 13\% | 212\% | 10\% | 1\% | 0.6 | High |
| Intel | 33\% | 0.8 | 13\% | 67.2 | 46\% | 140\% | 20\% | 39\% | 38.8 | Low |
| Micron | 14\% ${ }^{\prime}$ | 0.4 | 4\% | 67.4 | 65\% | 274\% | 50\% | 83\% | 57.7 | Low |
| Nucor | 40\% | 1.6 | 1\% | 21.7 | 12\% | 334\% | 13\% | 12\% | 14.5 | Low |
| NVIDIA | 16\% | 0.6 | 4\% | 62.1 | 30\% | 767\% | 105\% | 14\% | 19.1 | Low |
| PPG | 84\% | 2.0 | 10\% | 17.5 | 15\% | 141\% | 23\% | 2\% | 1.2 | High |
| Saint-Gobain | 52\% | 2.2 | 15\% | 17.4 | 11\% | 135\% | 21\% | 4\% | 4.3 | Moderate |
| SKF | 35\% | 1.0 | 5\% | 17.2 | 15\% | 207\% | 7\% | 10\% | 8.0 | Low |
| Steel Dynamics | 67\% | 2.0 | 3\% | 10.3 | 12\% | 422\% | 25\% | 11\% | 6.3 | Low |
| TE Connectivity | 32\% ${ }^{\prime}$ | 1.3 | 14\% | 54.2 | 21\% | 164\% ${ }^{\text {² }}$ | 18\% | 15\% | 25.8 | Low |
| Timken | 84\% | 2.4 | 4\% | 9.4 | 18\% | 254\% | 19\% | 12\% | 4.2 | Low |
| US Steel | 89\% | 9.4 | 0\% | 2.7 | 3\% | 145\% | 21\% | 1\% | 0.7 | High |

Additionally, many companies have large long-term debt loads which could cause additional financial stress if waves of virus last 18-24 months.

Note: AK Steel's 2019 financials were used. The company's acquisition by Cleveland-
Cliffs was completed in March 2020.

## Production Cut Analysis

Companies will undergo varying degrees of stress if annual revenue declines $25 \%$.


- Compared to the group, AK Steel, Fastenal, and Grainger have less of a cash cushion on hand
- Low cash cushions might make it more difficult for companies to rapidly reopen and ramp up operations
- Companies that need to raise additional capital may risk violating credit covenants

Projected EBITDA Impact

## Risk Exposure

Companies will undergo varying degrees of stress depending upon how much their revenue declines.


## Interest Coverage

Before the crisis, benchmarked companies could cover interest expenses ${ }^{1}$, however several may not be able to meet obligations if sales decline by more than $30 \%$.

|  | Annual Revenue Decline |  |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
|  | $0 \%$ | $-5 \%$ | $-10 \%$ | $-20 \%$ | $-30 \%$ | $-40 \%$ | $-50 \%$ | $-60 \%$ |
| AK Steel | 2.9 | 2.6 | 2.3 | 1.8 | 1.3 | 0.8 | 0.3 | $(0.2)$ |
| AkzoNobel | 15.8 | 13.2 | 10.6 | 5.4 | 0.1 | $(5.1)$ | $(10.3)$ | $(15.5)$ |
| Amphenol | 15.8 | 14.8 | 13.7 | 11.5 | 9.4 | 7.2 | 5.0 | 2.9 |
| Arkema | 12.6 | 11.8 | 11.1 | 9.7 | 8.2 | 6.8 | 5.3 | 3.9 |
| Axalta | 5.2 | 4.7 | 4.2 | 3.2 | 2.3 | 1.3 | 0.4 | $(0.6)$ |
| BASF | 16.6 | 14.8 | 13.1 | 9.6 | 6.1 | 2.6 | $(0.9)$ | $(4.4)$ |
| Corning | 12.7 | 11.8 | 10.9 | 9.1 | 7.2 | 5.4 | 3.6 | 1.8 |
| Dow | 2.8 | 2.5 | 2.1 | 1.5 | 0.8 | 0.1 | $(0.6)$ | $(1.2)$ |
| Fastenal | 85.5 | 76.4 | 67.4 | 49.3 | 31.2 | 13.1 | $(5.0)$ | $(23.1)$ |
| Grainger | 19.0 | 16.2 | 13.4 | 7.8 | 2.3 | $(3.3)$ | $(8.9)$ | $(14.4)$ |
| Intel | 67.2 | 62.9 | 58.6 | 50.0 | 41.3 | 32.7 | 24.1 | 15.5 |
| Micron | 67.4 | 65.9 | 64.5 | 61.5 | 58.6 | 55.6 | 52.7 | 49.7 |
| Nucor | 21.7 | 20.6 | 19.5 | 17.3 | 15.1 | 12.9 | 10.7 | 8.5 |
| NVIDIA | 62.1 | 55.6 | 49.0 | 36.0 | 23.0 | 10.0 | $(3.0)$ | $(16.0)$ |
| PPG | 17.5 | 15.0 | 12.5 | 7.6 | 2.7 | $(2.2)$ | $(7.1)$ | $(12.1)$ |
| Saint-Gobain | 17.4 | 15.4 | 13.4 | 9.5 | 5.5 | 1.5 | $(2.5)$ | $(6.4)$ |
| SKF | 17.2 | 15.8 | 14.4 | 11.6 | 8.8 | 6.0 | 3.2 | 0.4 |
| Steel Dynamics | 10.3 | 9.7 | 9.1 | 7.9 | 6.7 | 5.5 | 4.3 | 3.1 |
| TE Connectivity | 54.2 | 49.9 | 45.6 | 37.0 | 28.4 | 19.8 | 11.3 | 2.7 |
| Timken | 9.4 | 8.6 | 7.8 | 6.2 | 4.6 | 3.1 | 1.5 | $(0.1)$ |
| US Steel | 2.7 | 2.4 | 2.1 | 1.5 | 0.9 | 0.3 | $(0.3)$ | $(0.9)$ |

Note: EBITDA / Interest Expense. Values of greater than 3 are typically considered safe.
Values below 1 indicate a company cannot meet its current interest obligations.

1. Background \& Supplier Impact
2. Cost \& Capital Supplier Risk Approach
3. Reference Cases

## Risk Identification

## Risk Assessment

- Review financial statements and analyze key metrics determine level of supplier risk
- Rank suppliers in terms of potential short term and long term stress
- Identify actions to address with the supply base, depending on level of risk


## Cash Burn Walk Chart

Why: Based on the revenue and fixed cost assumptions, the model estimated the quarterly cash burn rate for each supplier
What to discuss with the supplier: The assumptions estimate reduced revenue based on exposure to GM, Chrysler, and automotive in general. Discuss revenue projections, specific programs and new business awards. If they show a near-term default (cash below 0 ) determine what steps they are taking to secures additional cash i.e. debt, selling assets, etc.

How to Calculate: The model uses the supplier's most recentrevenue, EBIT and fixed asset numbers to estimate forward quarterly revenue and costs resulting in quarterly revenue and

Supplier Detail Report - ArvinMeritor

## Summary

-ArvinMertorwill not be able to manage
reduced volumes with their current access to
Alrasdy highly leveraged, ArvinMertor will
need to look to bankruptcy protection


Supplier Detail Report - ArvinMeritor


## Supplier Engagement

## Supplier Interviews

- Determine proper topics to address for both public and private suppliers to gauge financial risk
- Quantify supplier initiatives to reduce cash burn rates to maintain solvency
- Identify ownership structures and financing for private companies
- Calculate credit revolver covenants and understand supplier cash consequences for default
- Apply standard templates to collect financials from private suppliers



## Private Supplier Assessment

## Gut Check Data Received

- Suppliers may view this data request as unimportant and simply provide information to make the problem go away
- Thus, the materials provided will likely have unintentional missing information, incorrect information, or contradictory information


## Examples



## Supplier Engagement

|  | Liquidity | Viability | Volume |
| :---: | :---: | :---: | :---: |
| What to Ask | - Credit covenants <br> - Sources of short term cash <br> - Ownership of equity and their access to capital | - Manufacturing footprint (e.g. components from sties deemed 'nonessential') <br> - Stability of contracts <br> - Sole sourced components | - Capacity reduction <br> - Cash management <br> - Safety stock levels |
| Key Data | - Interest Coverage <br> - CAPEX limits | - Quantify initiatives and timing for cost reduction activities such as SG\&A reduction, plant consolidation and business segment disposition | - Cash Conversion Cycle <br> - Working capital initiatives |

## Supplier Prioritization

Risk assessment can be prioritized for large as well as small but critical suppliers.

## Prioritized Approach

- Resources should be focused on major suppliers as well as suppliers that provide supply-critical components
- Working with manufacturing and engineering highlights critical components
- Working with supply chain highlights limited sources for critical components
- Efforts should be narrowed to the most critical suppliers


## Supplier Focus by Spend



## Supply Continuity

A daily call is critical as conditions are changing rapidly.

COVID-19 Readiness and Impact Scorecard

| Supplier Name | Date of last interview |  |  |  | State |  |  | City |  | Zip Code |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | March (Sample Data) |  |  |  |  |  |  |  |  |  |  |  |
|  | 16 | 17 | 18 | 19 | 20 | 23 | 24 | 25 | 26 | 27 | 30 | 31 |
| Absentee Rate | 3\% | 3\% | 2\% | 5\% | 5\% | 9\% | 8\% | 3\% | 12\% | 15\% | 13\% |  |
| On-Site Procedures |  |  |  |  |  |  |  |  |  |  |  |  |
| PPE - Facemask |  | No | No | No | No | No | No | No | No | No | No |  |
| PPE - Gloves | No | No | No | No | No | No | No | No | No | No | No |  |
| Social Distancing | No | No | No | No | No | No | No | No | No | No | No |  |
| Temperature Check | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes |  |
| Paid Sick Leave | No | No | No | No | No | No | No | No | No | No | No |  |
| State / Local Restrictions |  |  |  |  |  |  |  |  |  |  |  |  |
| Deemed Essential | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |
| No Restrictions | Yes | Yes |  |  |  |  |  |  |  |  |  |  |
| Non-Essential Businesses |  | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |  |  |  |
| Stay At Home Order |  |  |  |  |  |  |  |  | Yes | Yes | Yes |  |
| Local Rate of Infection | 0.03\% | 0.03\% | 0.04\% | 0.06\% | 0.07\% | 0.08\% | 0.10\% | 0.12\% | 0.13\% | 0.16\% | 0.20\% |  |
| Tier 2 Supplier Assessment | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |  |

## A standardized and consistent approach to critical suppliers will identify trends and sounds alarms when conditions deteriorate.

## Risk Management Playbook

Developing counter measures for the riskiest suppliers

## Focus Area

- Cost and Capital will work to develop risk mitigation playbooks for the identified high-risk, high-impact suppliers
- For each identified supplier, a specific contingency roadmap will be created with event triggers and defined countermeasures

Criticality Matrix


## Private Supplier Process

## Cost \& Capital's private supplier evaluation

| Send financial template to suppl | Review data | Interview CFO | Quantify risk |
| :---: | :---: | :---: | :---: |
| - Use the Cost \& Capital template for P\&L, Balance Sheet and Cash Flow | - Evaluate submission and calculate key ratios | - Interview CFO or controller to add detail behind the submitted template | - Generate risk profile for supplier |
|  | - Assess liquidity position |  |  |
|  | - Gauge risk due to customer mix |  |  |

## Sample Supplier Detail Report ABB

```
ABB
Nidec
Regal Beloit
Yaskawa
WEG
Emerson
Ametek
```

| LT Debt / Equity | LT Debt / EBITDA | LT Debt Due in One Year | EBITDA / <br> Interest <br> Coverage | EBITDA Margin | Current Ratio | NTM Cash Required/ (Cash + Credit) | (Cash + Credit) / <br> Revenue | Z-Score | Risk |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 67.0\% | 12.0x | 25\% | 3.5x | 2.7\% | 131\% | 51\% | 21\% | 1.53 | Moderate |
| 69.7\% | 12.5x | 12\% | 5.7x | 3.6\% | 145\% | 54\% | 15\% | 1.60 | Moderate |
| 48.4\% | 11.8x | 0\% | 1.8x | 3.0\% | 287\% | 0\% | 23\% | 1.85 | Moderate |
| 79.9\% | 42.2x | 25\% | 6.0x | 1.0\% | 189\% | 7\% | 10\% | 2.07 | Moderate |
| 26.2\% | 3.2x | 41\% | 9.1x | 5.3\% | 217\% | 19\% | 25\% | 1.71 | Remote |
| 71.3\% | 7.7x | 33\% | 3.8x | 4.2\% | 114\% | 41\% | 28\% | 3.01 | Remote |
| 54.1\% | 7.7x | 18\% | 4.1x | 7.0\% | 142\% | 0\% | 27\% | 1.90 | Remote |

## Sample Supplier Detail Report ABB




## Cash Metrics

LT Debt / Equity Ratio
0.67

Current Portion of LT Debt / Total Capital
Current Assets / Current Liabilities
LT Debt / Trailing EBITDA
Percent of Debt Due in One Year
Projected Change in Cash / Revenue NTM
Cash Requirement NTM / Cash on Hand
Cash Requirement NTM / Available Credit
Cash Requirement NTM/Available Credit
161.5\%

Cash Requirement NTM / (Cash + Credit)
Cash and Cash Equivalents / Revenue NTM
Credit Revolver Available / Revenue NTM

## Volume Metrics

Projected FY 2020 Volume vs. FY 2019

| COGS / Sales |  |
| :--- | ---: |
| SG\&A / Sales | $19.3 \%$ |
| CAPEX / Sales | $3.3 \%$ |
| Operating Profit Margin | $7.2 \%$ |
| Days Sales Outstanding (DSO) | 80.1 |
| Days Payables Outstanding (DPO) | 81.6 |
| DSO / DPO | 1.0 |
| Days of Inventory | 80.23 |
| Cash Conversion Cycle | 78.7 |
| Working Capital Turnover | 1.11 |
| Fixed Asset Turnover | 1.44 |

## Sample Supplier Detail Report ABB

## Working Capital Performance

|  | Days Sales Outstanding (DSO) |  |  |
| :--- | :--- | :--- | :--- |
| 88 |  |  |  |
| 86 |  |  |  |
| 84 |  |  |  |
| 82 |  |  |  |
| 80 |  |  |  |
| 78 |  |  |  |
| 76 |  |  |  |




# Sample Supplier Detail Report ABB 

|  |  |
| :---: | :---: |
| Z Score | 1.53 |
| Working Capital / Total Assets | 0.13 |
| Retained Earnings / Total Assets | 0.43 |
| EBIT / Total Assets | 0.05 |
| Market Value fo Equity / Total Liabilities | 0.00 |
| Revenue / Total Assets | 0.61 |
| NTM Projected C\&CE Score | 3.78 |
| Cash Flow/ Revenue | 3.0\% |
| Cash Flow / Capital Employed | 13.5\% |
| Cash Flow / Debt | 7.4\% |
| Cash Flow / Current Liabilities | 3.3\% |
| Cash Flow / Equity | 4.9\% |
| Cash / Capital Employed | 82.8\% |
| Cash / Debt | 45.4\% |
| Cash / Current Liabilities | 20.3\% |
| Cash / Equity | 30.4\% |

1. Background \& Supplier Impact
2. Cost \& Capital Supplier Risk Approach
3. Reference Cases

## Cost \& Capital Partners Introduction

## Previous project work

- Cost \& Capital Partners focuses on the two most critical levers for shareholder value today - Cost Efficiency and Capital Efficiency
- Cash should be treated as the valuable resource it is
- Spend management preserves cash
- Capital efficiency frees cash trapped in traditional operations
- We deliver results - not just recommendations, each and every time
- We stand behind our recommendations and prefer to be involved in implementation
- We conduct negotiations on behalf of our clients
- We are passionate about our work and the results
- We work with our clients to implement the changes required to improve the business



## Reference Case

## Risk Management

## Packaging - Chemicals




## Engagement Overview

- Cost \& Capital was asked to review risk factors for packaging suppliers for a maker of lawn and garden care products
- The team analyzed and audited packaging suppliers to determine the level of risk in the supply chain due to financial strain, capacity and cost reduction initiatives
- Suppliers were segmented into low, medium, high and critical risk suppliers
- Detailed agendas were created to engage the suppliers and develop risk mitigation plans


## Reference Case

## Risk Management

Supplier Risk Management - Industrial Equipment


## Engagement Overview

- A global industrial company needed to assess several dozen private suppliers for financial risk
- Templates were distributed to the suppliers and interviews were conducted to determine key operating and cash metrics
- Second round interviews were held to uncover any inconsistencies in data that was submitted
- Suppliers' financial risk was ranked and reported to management and risk mitigation plans were developed


## Reference Case

## Risk Management

Supplier Risk Management - Industrial Equipment



## Engagement Overview

- Maintaining plant continuity during a credit crunch, a major automotive OEM tasked the team with identifying troubled suppliers beyond D\&B ratings for private suppliers
- Suppliers were audited and key cash burn rate details were summarized to identify the more critical suppliers to monitor
- Each supplier was assessed for access to credit, cash as well as upcoming debt maturities
- The resulting analysis helped the client to consolidate the supply base and manage reduced volumes


## Reference Case

## Cost Reduction

## Skills Development - Industrial Equipment



## Engagement Overview

- A global industrial equipment supplier needed to gauge the level of supply chain competence within a new structured organization
- Leveraging the experience and materials from supporting sourcing projects across multiple industries, the team developed a set of assessment questions for each competency area:

BenchmarkingCost Analysis
Finance Market Knowledge
Negotiations Risk Management
Value Chain Analysis

## Cost $\&$ Capital

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