



Lehigh Business Supply Chain
Management Risk Index

Quarterly Report

3rd Quarter / 2020



LEHIGH
UNIVERSITY

College of
Business



Council of Supply Chain
Management Professionals

Educating and Connecting the World's Supply Chain Professionals.™

LEHIGH BUSINESS SUPPLY CHAIN MANAGEMENT RISK INDEX

Welcome to the **Lehigh Business Supply Chain Risk Management Index Report** developed by the Center for Supply Chain Research at Lehigh University and the Council of Supply Chain Management Professionals.

We developed this index to better understand the different kinds of supply chain risks businesses face. Supply chain professionals' rate the likelihood that the risk in the 3rd Quarter of 2020 compared to the risk in the 2nd quarter will likely increase, remain the same or decrease for 10 different categories.

The Lehigh Business Supply Chain Risk Management Index (LRMI) value is a number between 0 – 100, where greater than 50 suggests increased risk, equal to 50 suggests the same risk and less than 50 suggests decreased risk. The average LRMI is 69.49 suggesting a high level of risk in the 3rd Quarter.

The table below reflects the 10 categories of risk from highest risk to lowest risk when evaluated independently as perceived by supply chain professionals.

If you would like to have additional information about the survey or to participate in the survey please contact Dr. Zach G. Zacharia at zacharia@lehigh.edu.



Overview

Risk Type	Risk Index
Customer Risk	81.81
Economic Risk	79.89
Transportation Risk	77.27
Supplier Risk	75.00
Government Intervention Risk	70.11
Cyber Security Risk	69.89
Operational Risk	66.48
Environmental Risk	64.20
Quality Risk	55.68
Technological Risk	54.55
Average Risk Index	69.49

The Risk Index is a number between 0 – 100.

The further the number is from 50 the greater the level of risk.

Four biggest risks in 3rd Quarter 2020

(When compared head-to-head.)

1. Economic Risk
2. Supplier Risk
3. Customer Risk
4. Transportation Disruption Risk

Did You Know?

The Lehigh Business Supply Chain Management Risk Index for the 3rd Quarter in 2020 is

69.49



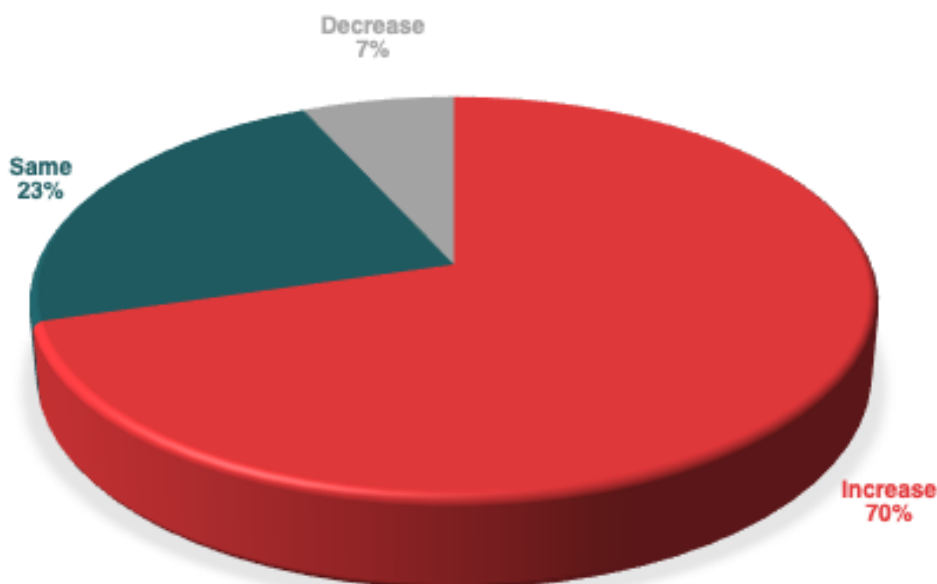
01 Customer Risk

Some examples are: fast changing customer demand, easy to lose customer loyalty, changing customer base demographics, hard to predict customer behavior and hard to service customer.

Selected Comments:

- Change in consumer buying patterns to home delivery is straining existing final mile home delivery networks.
- Customers are not sure what they are doing and what they want.
- Depending on the workforce correction, we are expecting to see a decrease in demand.
- Luxury items don't sell well when you can't find work.
- We are also seeing a trend from the shippers to exploit the market and release bids to purely drive down their transportation costs.
- We expect our bad debt expenses to increase due to weakened balance sheets and some bankruptcies.
- We have seen a massive loss in revenue due to changing customer behavior and concern's with work patterns being forever altered by COVID. Due to high demand and tight supply in my industry, we expect to struggle with meeting our customer's demands.

CUSTOMER RISK - 81.81



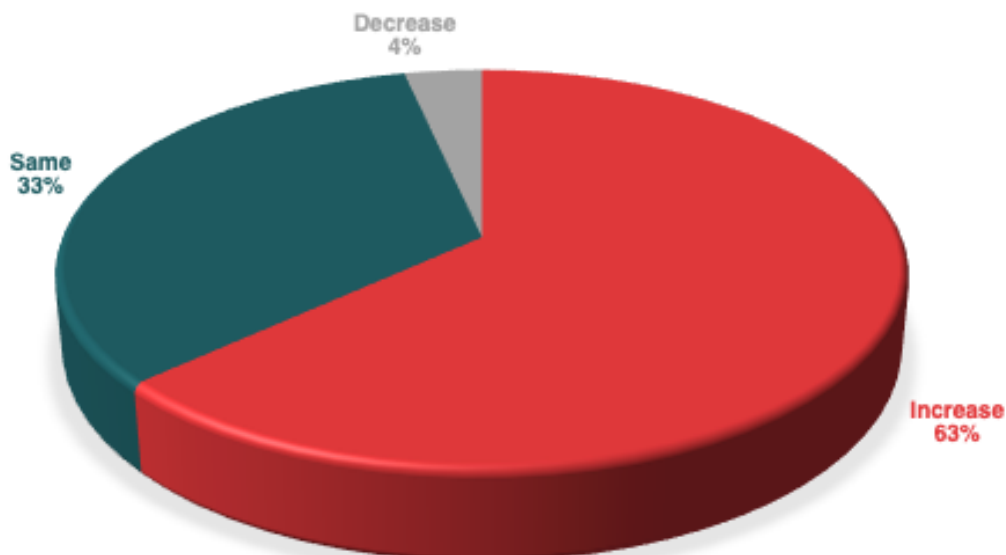
02 Economic Risk

Some examples are: increasing energy costs, commodity price volatility, labor shortages, sudden demand shocks, global energy shortages and border delays.

Selected Comments:

- I believe the worst of COVID has passed and the economy will now begin to climb out of the damage inflicted this spring.
- The big economic risks no-one is even talking about is cashflow, credit, and debt. Many companies almost zeroed out cash flow for months. They short term borrowed against future receivables which now may not start for many months.
- I see a wave of bankruptcies after companies run out of free government money and protections.
- We are seeing a trend of on-shoring to Mexico and Central American countries, moving manufacturing the US friendly countries in APAC and also moving manufacturing to US friendly South American countries.
- The risk of labor shortages is less than the benefit of increased demand as the economy rebuilds.

ECONOMIC RISK - 79.89



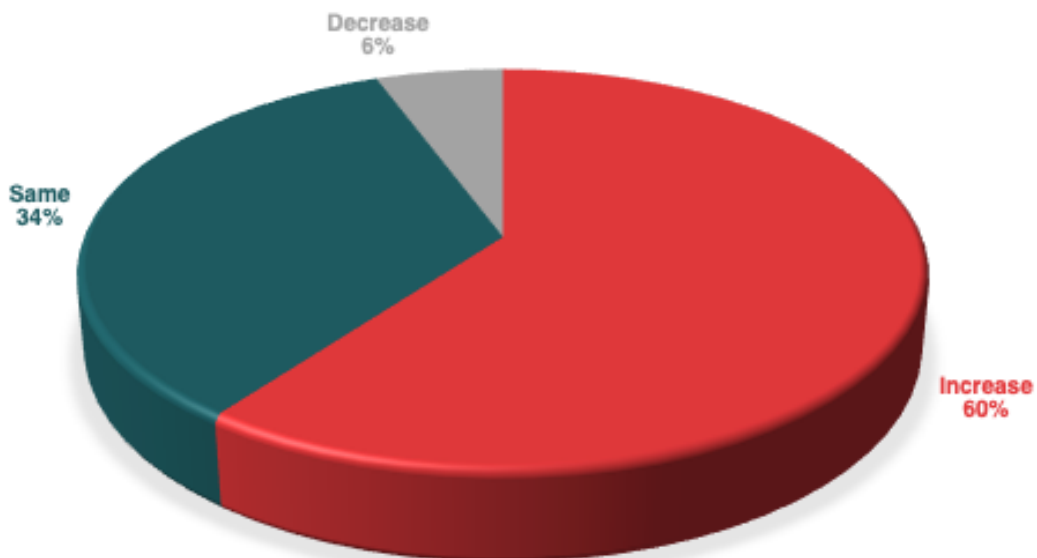
03 Transportation Disruption Risk

Some examples are: fuel prices, driver shortage and infrastructure demand volatility.

Selected Comments:

- As non-essential businesses stay closed, we expect demand for transportation to fall.
- Smaller carriers are struggling to stay in business. Some have not returned to post-COVID.
- Companies are going out of business including several large trucking companies who have been borrowing to make payroll.
- The lack of air traffic has had a significant impact on the cost increase of international air shipments.
- Spot market rates are still depressed but the rates are starting to improve as capacity tightens.
- Once the economy fully opens up, we do expect capacity to be extremely tight as the carriers will still have drivers on furlough. We are losing 6-7 drivers on average per week, and we could be down 100-150 when this is all said and done. To replace these drivers will take months.

TRANSPORTATION RISK - 77.27



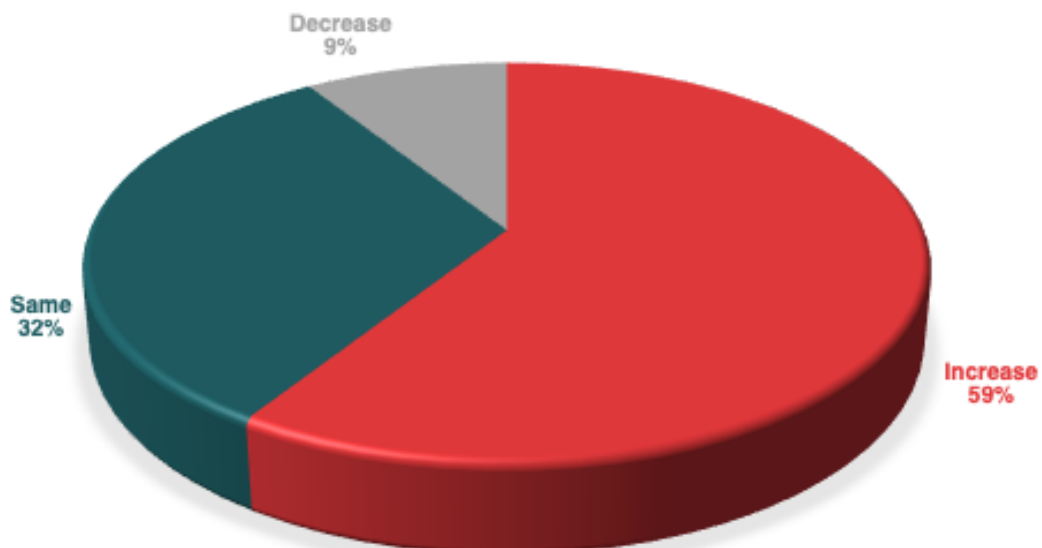
04 Supplier Risk

Some examples are: single/sole source supplier, suppliers from one geographic location, supplier quality issues, price volatility and counterfeit products.

Selected Comments:

- Food companies have seen demand spike, but most have changed their supply chains to buy from China to meet shareholder value without creating contingency plans.
- Risk related to price volatility and counterfeit risk seem to be diminishing.
- The risk for suppliers has been all over the board.
- There may be increased risk due to social unrest and political issues with suppliers in China.
- Ensuring supply back up through alternative sources has decreased supplier risk.
- With so many companies leaving China, the risk with Chinese suppliers has really increased and some suppliers won't ship the final production until they are paid in full. Because of COVID, our company has postponed some truck and trailer orders even from vendors who have been our partners for many years.

SUPPLIER RISK - 75.0



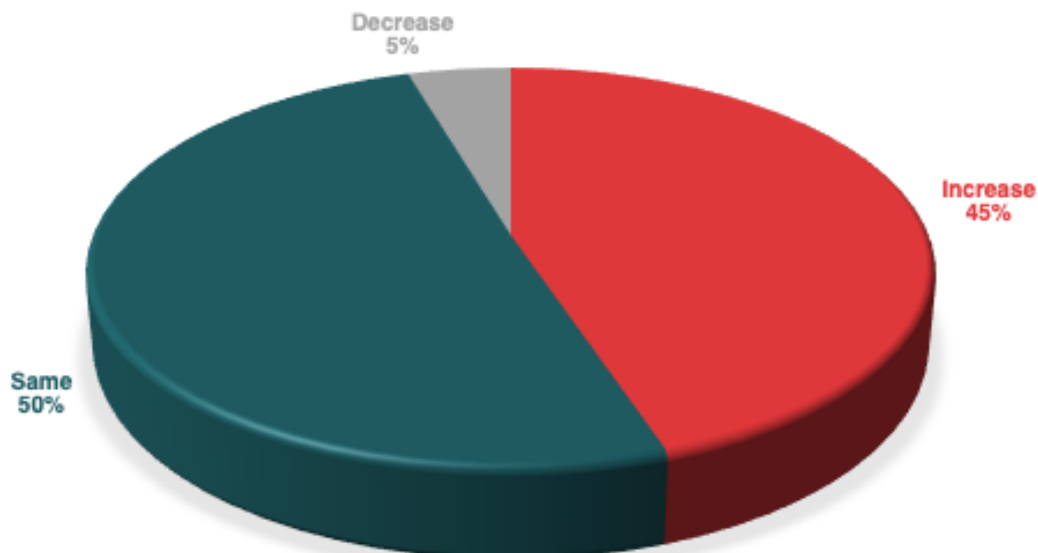
05 Government Intervention Risk

Some examples are: new regulations, tariffs/trade wars and governmental restrictions on source material, methodologies or technologies.

Selected Comments:

- Government intervention is constantly increasing.
- The government keeps screwing it up. It is all politics and how they make money out of the deals and even the stock market.
- Increased issues with China, where much of our supply comes from, may cause shortages or price increases.
- We are prepared to exit the market if we see excessive government regulation or tax increases.
- A lot of the variability and chaos in government intervention will hopefully be quieted after the November election.
- Hopeful that foreign trade policy will get the US to allow increased production and trade in our Hemisphere.
- Expectation of settling of China trade war, as Election Year campaign rhetoric increases. On-going impacts from trade war between China and US remain and despite Phase One announcement existing conditions remain.

GOVERNMENT INTERVENTION RISK - 70.11



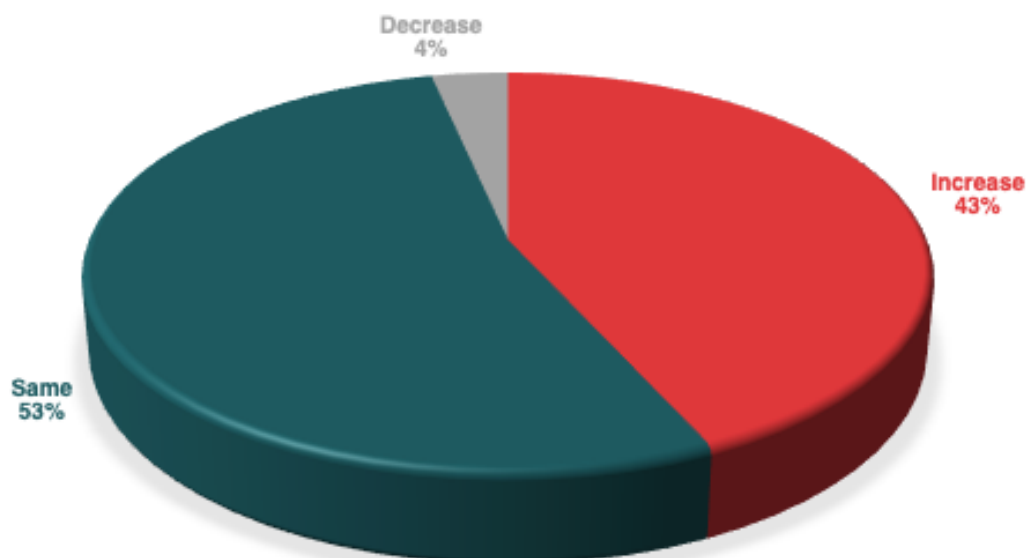
06 Cybersecurity and Data Risk

Some examples are: cyber-attacks, data corruption, data theft, system viruses, hardware and software issues and security platform controls.

Selected Comments:

- With our people working from home, there is somewhat greater risk of breaches but this is partially offset by greater focus on cybersecurity.
- E-commerce will pick up and the need for robust cybersecurity and data risk will become more important than ever.
- Many people working remotely or otherwise in different environments increase the "attack surface" for cyber-attacks.
- Cybersecurity is a concern for any company when data is routed through public Internet connections with international nodes and differing government regulations.
- Not a matter of if you will be attacked but when. Companies need to invest heavily into the cybersecurity.
- A lot of scope for phishing and scams so we are constantly increasing our security parameters.
- Cybersecurity and Data Risks rose for us during the past 3 months of COVID.

CYBER SECURITY RISK - 69.89



07 Operational Risk

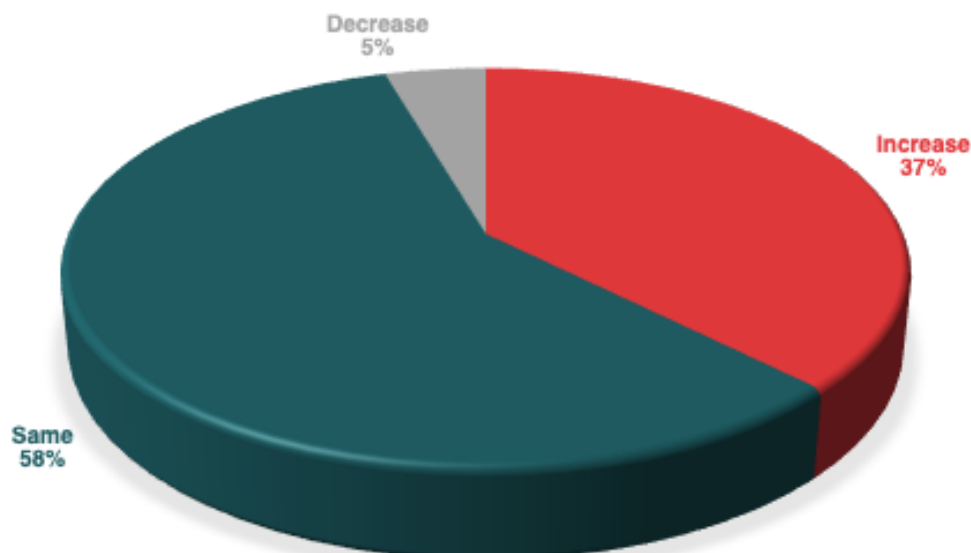


Some examples are: site disasters, product counterfeiting, damage or disruption to physical assets and machine breakdown.

Selected Comments:

- Supply disruptions due to shutdowns and any problems resulting from that remain the same as they have been based on prior experience.
- We worry more about supply and people with current issues around the world.
- The threat of another wave of COVID will decimate hospitals and the overall healthcare industry.
- Increase political instability throughout the world, confusion over national bank institution's policies on monetary issues, and euro currency valuation, increase operational risk
- Unemployment increases the default on loan payments.
- Anytime you shut down equipment and try and restart it, unexpected things happen.
- In aviation, our physical assets being grounded has a big risk with maintenance, but we've been incredibly proactive. We are assuming that the operational issues caused by COVID will diminish however the risks will remain the same.

OPERATIONAL RISK - 66.48



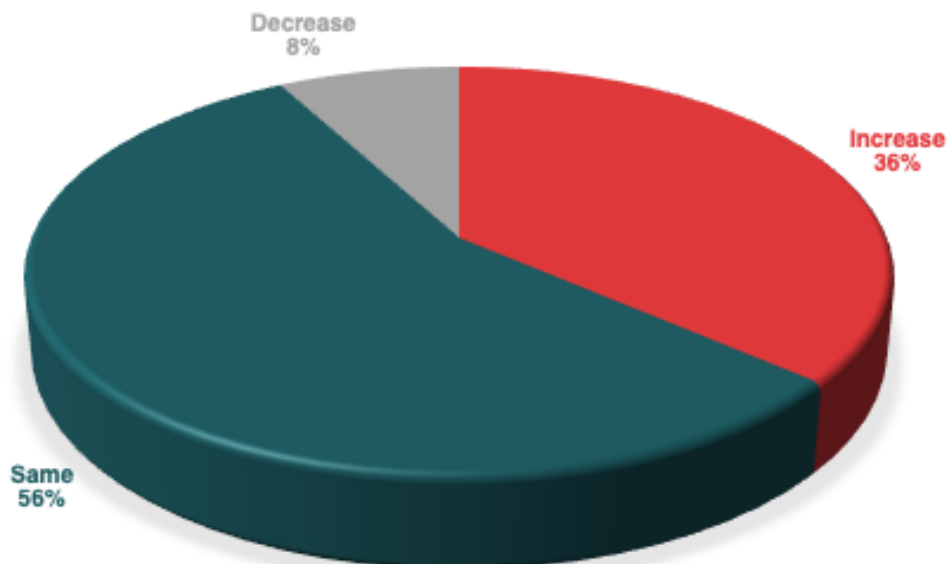
08 Environmental Risk

Some examples are: natural disasters, extreme weather, industrial accidents and pandemics.

Selected Comments:

- The government removed many of the environmental regulations. A company can dump toxins in a river with no repercussions. There are more environmental issues happening now then people are aware of because they do not have to be reported.
- Southern Mexico had a 7.4 earthquake a couple of days ago...did that trigger others? California is a ticking bomb with fault lines, 2020 seems to be the year for it.
- Risk related to the climate crisis are totally underestimated and will have the highest implications for our industry.
- Overall reduction due to lesser energy consumption as workforce is adopting to remote. We are planning for COVID to run similarly to the Spanish Flu. 1st wave was the eye opener, but the 2nd wave was very deadly.

ENVIRONMENTAL RISK - 64.20



09 Quality Risk

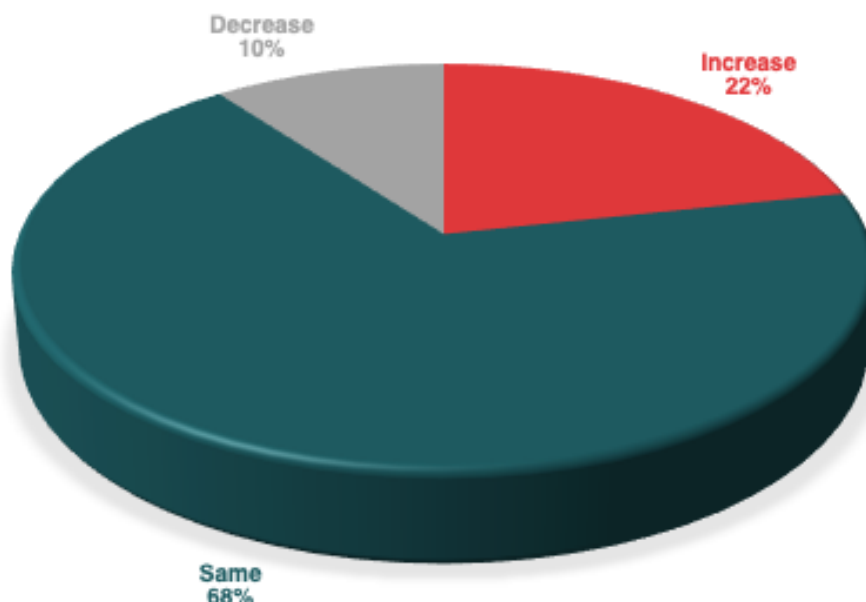


Some examples are: lack of sufficient quality testing, changing quality standards, informal quality control documentation, customer safety issues and product recalls.

Selected Comments:

- If a significant number of individuals at our client companies should become ill with COVID, the demand for our services will decrease during that time period.
- Currently we have some quality issues and expect them to potentially increase (FDA related).
- Our quality standards are getting stricter.
- Shifting procedures at suppliers and internal operations due to COVID increase risk due to changes from typical processes that formal or informal Quality Assurance procedures may not address.
- Counterfeit is on the rise.
- Our company and industry we work in (Healthcare) maintains very high standards for Quality.
- Customer safety is the biggest concern for our industry Demand remains high, concern exists with lesser quality product from manufacturers to meet schedules due to COVID related shortages of materials and manpower.

QUALITY RISK - 55.68



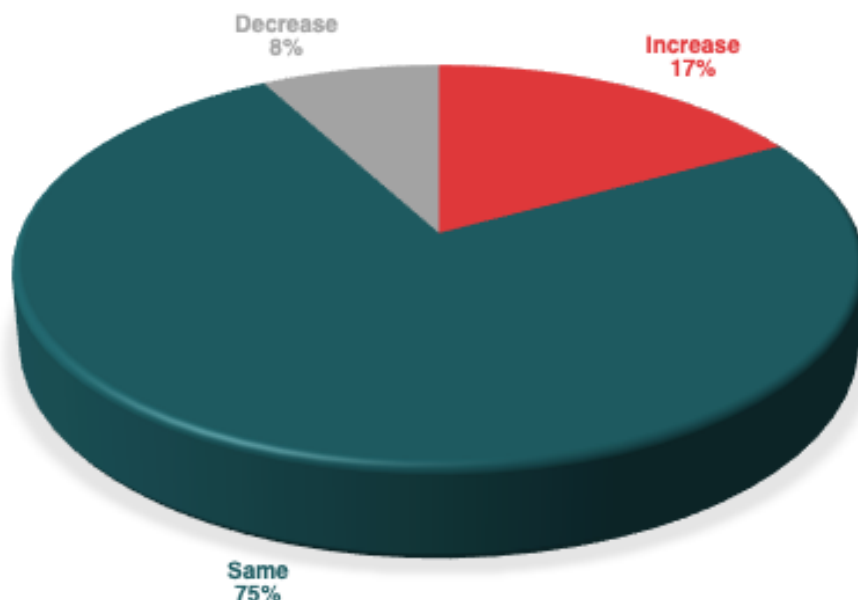
10 Technological or Competitive Risk

Some examples risk are: disruptive or replacement technologies, introduction of new competitor firms and ineffective or non-existent regulation for competitors.

Selected Comments:

- There is more technological risk in this climate than there has ever been. The need for digital transformations in modern day business tactics will draw a lot of competition from both incumbents and new players.
- With social distancing, customers will tend to remain loyal to known suppliers as there will be fewer opportunities for new suppliers to present their "sales pitches".
- As we come out of this going into next spring the people that figure it out will be in the best place to get new business.
- Forced to find new ways of operating in COVID world.
- We expect a continued growth of disruptive technologies so we may see some traditional competitors go bankrupt, giving survivors a larger market share.
- COVID move to Tele-Health presents opportunity and risk.

TECHNOLOGICAL RISK - 54.55



Appendix A

Risk Index Summary

The Risk Index is a number between 0 – 100

Risk Index ≤ 49 suggests less risk

Risk Index = 50 indicates no change in risk

Risk Index ≥ 51 suggests greater risk

The further the number is from 50 greater the level of risk

$$\text{LBRI} = (P1 * 1) + (P2 * 0.5) + (P3 * 0)$$

P1 = percentage of answers reporting an improvement

P2 = percentage of answers reporting no change

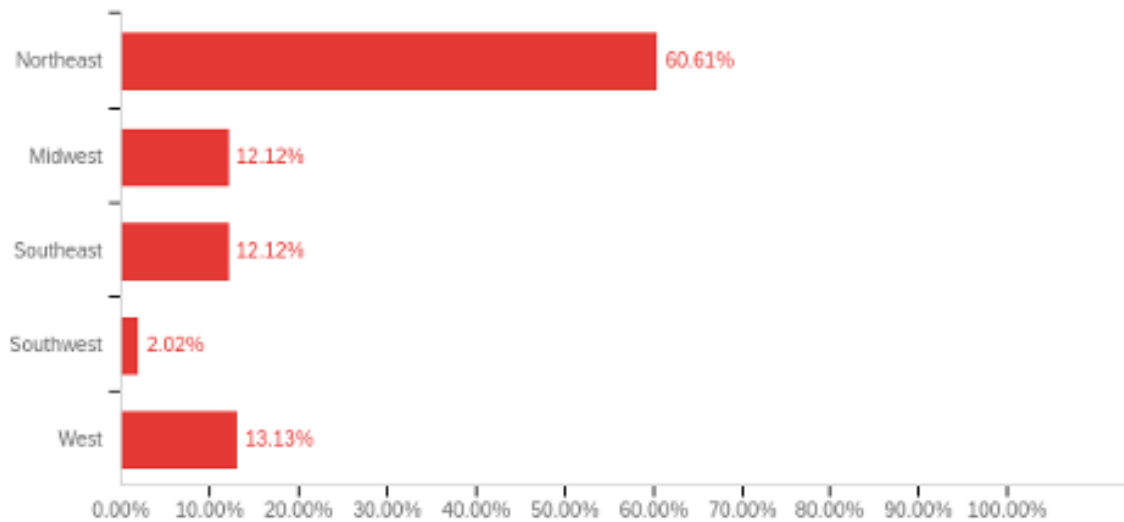
P3 = percentage of answers reporting a deterioration



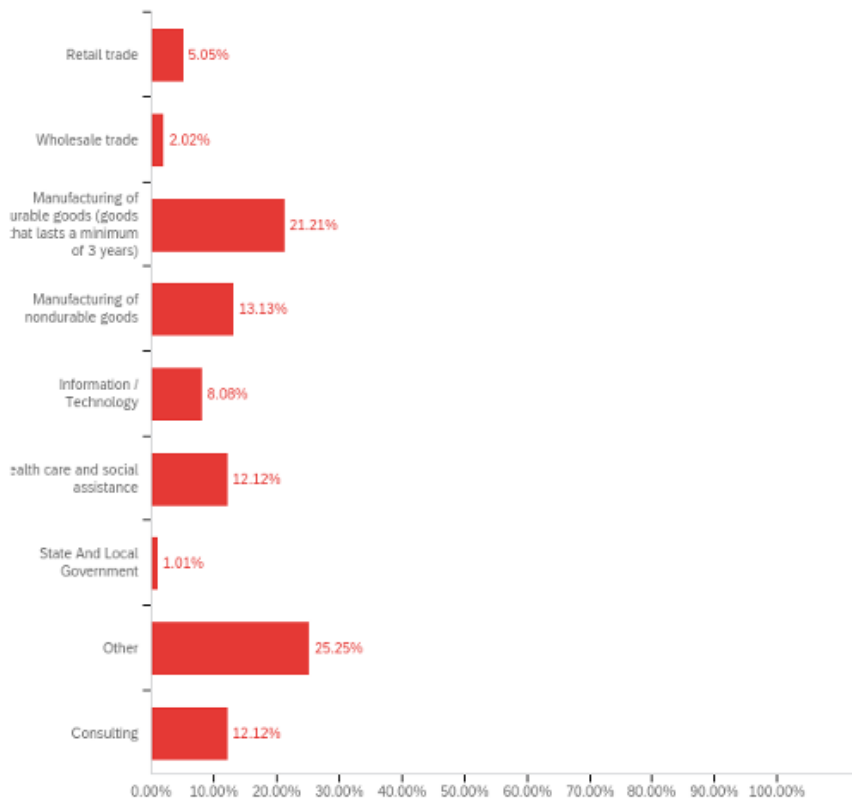
Appendix B

Survey Demographics

US Region



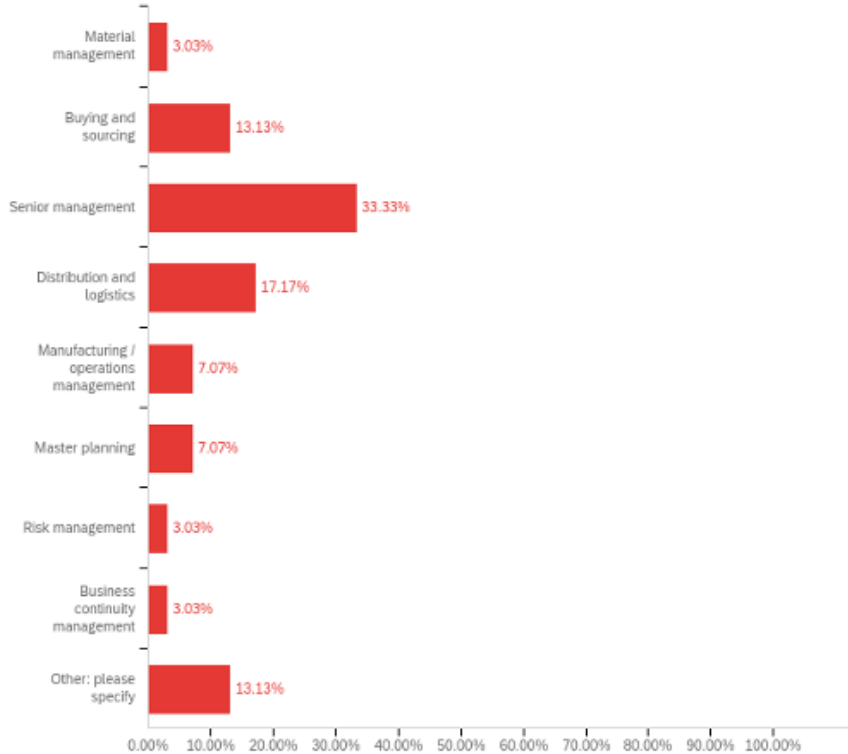
Industry



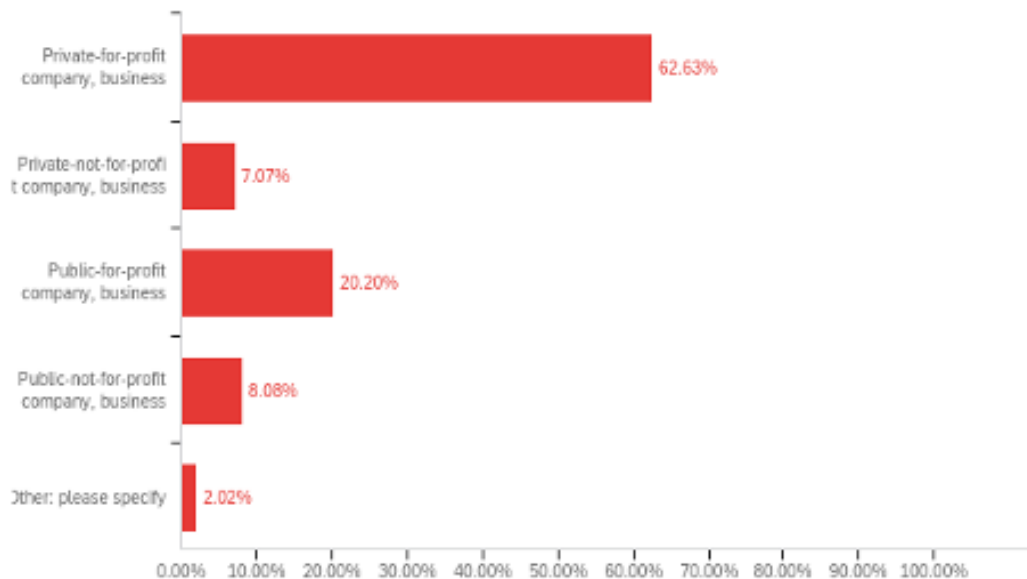
Appendix B

Demographics (continued)

Primary Role



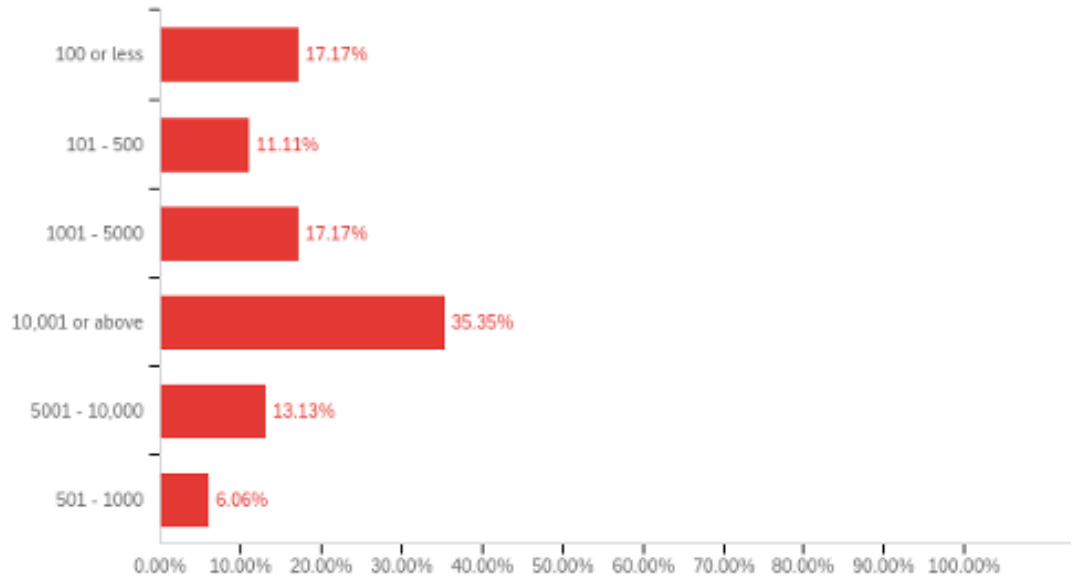
Place of Employment



Appendix B

Demographics (continued)

Company Employee Amount



Work Experience

