Peter Benda

Finding Safe Harbor in the Supply Chain: Covid Impact on Market Performance and Market Risk up and down the Supply Chain

Being downstream may offer a safer haven for agile companies to weather supply chain disruptions. Vertically integrated industries may have the highest exposure to supply chain risks.

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Executive summary

North American supply chains experienced significant disruptions in 2020–21. We have determined that where a company sits in the supply chain — being upstream, downstream, or on the sidelines — does have a surprising impact on stock performance and risk.

Two preliminary major findings suggested by our analysis:

- We expected downstream companies to be hardest hit by the supply chain disruptions; while volatility during the recovery was highest, the impact on stock price was least adverse, and fastest to recover (as measured by changes in sector market caps).
- Conversely, the aggregate market cap of companies in the vertically integrated sector had the greatest losses and lowest recovery, but the lowest volatility.

We assert that downstream companies have greater flexibility to adjust to market conditions, and that those that are agile and flex operationally, can dramatically drive up their stock performance. This is consistent with a finding in our prior research that stock returns disproportionately favor rapid, significant adjustments to the workforce.

Background

From a supply chain standpoint, Q1 2020 through Q1 2021 was an exceptionally erratic period, with labor shortages, logistical constipations, regulatory squeezes, and diverse meteorological occurrences, such as hurricanes and ice storms, and plant maintenance shuts that didn't go well.

It wasn't so much a single perfect storm on the macroeconomic level as it was a simultaneity (to co-opt a technical term) of unfortunate events. Sometimes the root causes were actually supply chain interdependencies, but sometimes there were failures in planning, operational response, and preparedness to unusual but normal events. For example, while some companies were hamstrung by The Great Pallet shortage, others had the opportunity and ability to implement reverse logistics to recover and reuse pallets from their clients.

We are interested in understanding how macroeconomic disruptors, like Covid, affect different parts of the supply chain. How much does it matter in the performance and risk of a company where that company is located in the supply chain?

We developed three hypotheses that motivated the design and approach to our analysis:

Where a company sits in the supply chain — being upstream, downstream, or on the sidelines — does have a surprising impact on stock performance and risk

- **Hypothesis 1: Position in the supply chain matters.** Further, we believed that business risk amplifies farther down the supply chain due to the multiplication of disruptions as supply chains weave together, effectively experiencing network effects farther down the chain. We anticipated that the adverse impact on both performance (i.e., falling stock price and associated market cap) and on risk (increased volatility of market cap) would be highest downstream.
- **Hypothesis 2: Vertically Integrated industries will be the most protected.** We expected that industries that control the flow of their product from point of extraction/ harvest to point of sale to the consumer market would be least susceptible to external supply chain breakdowns and therefore would experience less risk, even cannibalizing business from less integrated companies.
- **Hypothesis 3: Stock performance of Enabler industries (defined below) is tied to the aggregate performance of the primary supply chain.** Those companies that support the manufacturing supply chain, but are not directly in the business of making or moving products to consumers, will experience an impact on stock price and risk that tracks the aggregate performance of those companies directly within the supply chain.

Approach

A broad measure of economic success in a portion of the supply chain is the stock performance of those companies. We have undertaken an analysis to track stock performance by aggregating the market caps and the volatility of those market caps for groups of companies positioned in different sectors of the supply chain.

We defined five supply chain "sectors" within or relative to the supply chain:

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- **Upstream in the supply chain:** These are extraction industries, such as mining and oil and gas, and industries that harvest sustainable resources, such as agriculture and fishing. We might call them R2B, or Resource to Business.
- **Midstream in the supply chain:** These are businesses that make stuff or provide intermediate services and are typically B2B. These include manufacturers of products and service providers that directly support the making/moving of products through the supply chains. This group includes any industrial players that support factors of production or logistics, and can include contracted labor, engineering services, and manufacturers of parts and raw materials. We included logistics providers, such as airlines, railways, trucking, and shipping. We also included housing construction and infrastructure companies.
- **Downstream in the supply chain:** These are companies that act at the point of sale to sell consumers products and services. These are primarily B2C companies and include Walmart, Amazon, grocery stores, and other retailers.
- **Vertically integrated companies:** These are select energy companies (e.g., Exxon), whom we assigned to their own category as they do make and move material but are vertically integrated and cannot be primarily assigned to a single tier (up/mid/downstream) of the supply chain. One might call them R2C, or Resource to Consumer.
- **Enabling companies.** These are businesses that do not make or move anything but support other companies up and down the supply chain. We included financial services companies, REITs, healthcare plans, and utilities. Our research shows that this category is a distinctive sector with unique performance characteristics. While we believe that this sector is important to call out separately, we recognize that it is difficult to disentangle these companies from the other sectors (in particular, the midstream sector).

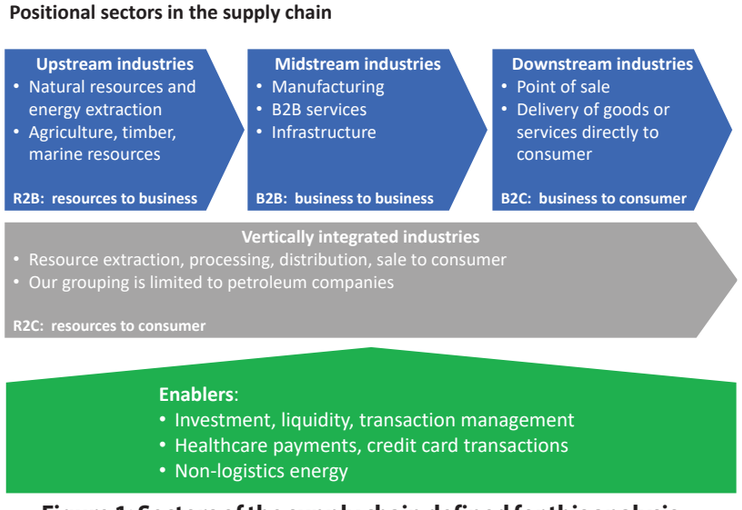


Figure 1: Sectors of the supply chain defined for this analysis.

We narrowed our analysis to a universe of 860 companies by setting a threshold (minimum) market cap of US$10B, listed either on the New York Stock Exchange or NASDAQ. Some of these companies are also listed on foreign exchanges. We used industry classifications defined by Yahoo Finance (finance.yahoo.com) to map industries, and therefore, companies, to the five supply chain sectors above. The market capitalization of these 860 companies was, at the time, US$54.5T, or about 50% of the global market cap, and generated about US$21T in revenues, or about 23% of world GDP.

We tracked stock prices and vol-

atility of these stocks on a monthly basis from January 2020 to June 2021. We aggregated the market capitalization and the in-month volatility of the market cap across the companies associated with the one supply chain sector (of the five shown in Figure 1) to which they had been assigned. The charts show how these figures trended over time in each supply chain sector.

While the primary supply chain sectors (up-, mid-, downstream industries) took a large hit in market capitalization in the April–March 2020 period, all of them recovered smoothly and to surprisingly consistent levels relative to their pre-pandemic performance. However, the vertically integrated sector had the greatest decline and failed to recover. The enabling sector — including financial services and utilities — experienced a middle-of-the-group impact but struggled to recover as the primary supply chain.

The weak market cap of the narrow group of vertically integrated petroleum companies suffered the most from the Covid crisis, at least to some part due to a nearly complete stoppage in travel and consumption of fuel. However, Chart 2 shows that volatility in market capitalization was subdued; in fact, lower than pre-Covid volatilities.

Also noteworthy, and very surprising to us, is that companies in the Enabler sector (red line in Chart 2) experienced the greatest volatility in the April–March period when the United States experienced the initial economic shock of the Covid.

Chart 1: Evolution of aggregate market capitalization by supply chain sector.

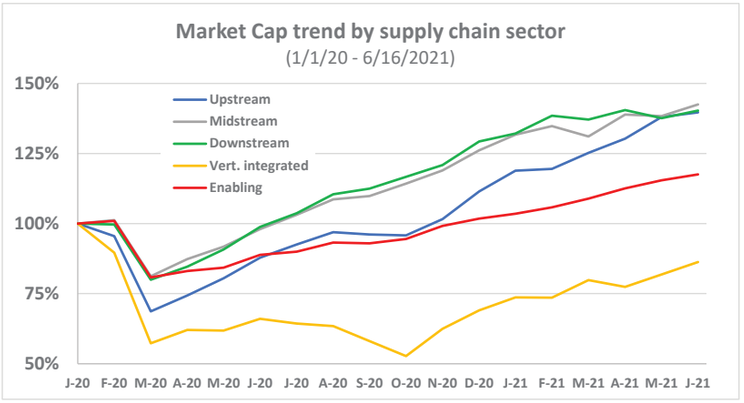
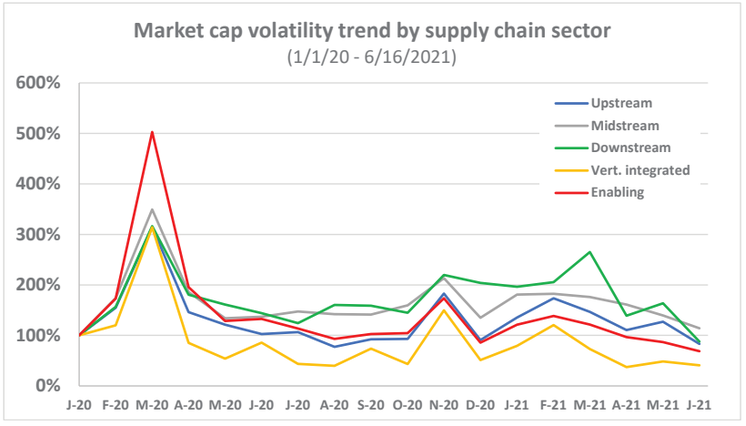


Chart 2: Volatility in market capitalization by supply chain sector.



These include companies that finance investment and provide liquidity to the market. This data shows that their performance is sensitive to the variabilities in performance of the companies they serve, thus they are at higher risk than the industries they support when there is instability in those industries.

There was a significant bump in downstream industry market capitalization in the late first quarter of this year

The elections in November 2020 may have triggered additional volatility in industries throughout the supply chain, as seen in the bump for all sectors in November 2020 in Chart 2. Likewise, there was a significant bump in downstream industry market capitalization in the late first quarter of this year. We attribute this to a variety of supply chain disruptions, ranging from the storm in Texas to logistical backups at Long Beach and the Suez Canal, just to name a few, which had direct impact on consumer goods flow.

Conclusions

Our main purpose was to determine whether large-scale macroeconomic disruptors, like the Covid epidemic, would have a differentiated impact on the performance and risk of a company based on where that company is positioned in the supply chain.

Our first hypothesis was that the farther downstream a company is located, the more the risk amplifies, as disruptions superimpose and have an oversized impact due to what may be a network effect. We believe that our high-level analysis does bear out that the impact is differentiated depending on where in the supply chain a company operates, but the localization of that impact did not meet all expectations.

While risk, measured as volatility of market caps of the companies, was highest farther downstream, stock performance (measured as aggregate market cap for the sector) was, surprisingly, also stronger downstream than in any other sector for most of the period following the initial shock.

The performance of the downstream sector — relatively lower impact in the February–March 2020 window, and faster recovery afterwards — suggest several possibilities: Do downstream industries somehow bear less of the impact of supply chain breakdowns than their upstream partners? Are they are better equipped to respond effectively to such risks?

In an earlier article[1] ("Do Investors Value Agility?", 11/22/2021), we concluded that companies that exercise vigorous responses to changing market conditions are rewarded very highly. In that article, we looked at behaviors regarding managing the workforce (specifically, using job postings as a proxy for growing or shrinking the organization) and found that companies that appear to restructure quickly — as revealed by either surges in new hiring, or stop-in-your-tracks curtailment of new hiring — had terrific stock gains within two months.

Our conclusion was that agility rewards investors. At this point, we can only speculate as to whether there is a connection between agility and the superior performance of these companies that are at the last mile of the supply chain. Perhaps companies in the downstream sector are structurally more agile, perhaps they have leadership that thinks and acts in more agile ways, or perhaps agility is in the DNA of companies that are close to the consumer.

Our second hypothesis held that the vertically integrated industries would experience the least risk, since they should depend less on outside supply chains to move their product from source to consumer. This hypothesis (the risk part) was borne out. However, the second part of the hypothesis, that vertically integrated sector would outperform all other sectors, was vividly contradicted. Explanations for the latter may have to do with the fact that vertically integrated companies have less resilience. If their one and only internal supply chain is disrupted, then the entire enterprise is affected. Also, the industries in this sector, primarily oil and gas, suffered uniquely from the drop in oil consumption and their non-integrated counterparts in the up-/mid-/downstream sectors may have experienced the very same performance problems.

Table 1: Summary of findings vs. original hypotheses.

Hypothesis:	**Market performance (trends in aggregate market cap for the sector)**	**Market risk (volatility of aggregate market cap for the sector)**
A company downstream in the supply chain is more susceptible to disruptions due to higher interdependencies and multiplying effects. This will decrease performance (stock price) and increase risk (stock volatility).	**Not supported:** The fall in market cap of Downstream companies was less dramatic, and the rebound stronger, than in other sectors.	**Supported:** Volatility in market caps for downstream companies was highest of all sectors during recovery (post-March 2020 shock).
Vertically Integrated industries will experience less risk and have more consistent market value than companies in one part of the supply chain since they rely less on outside supply chains.	**Not supported:** The market cap of the vertically integrated sector had the greatest losses and lowest recovery.	**Supported:** Volatility of market cap of vertically integrated sector was lowest of the sectors.
The performance of Enabler companies tracks the aggregate performance of companies inside in the supply chain,	**Supported**: The aggregate enabler market cap trend was roughly at the median of all the sectors.	**Supported**: The aggregate enabler market cap volatility was roughly at the median of all the sectors.

Our last hypothesis was that the Enabler companies would experience an impact on stock price and risk that would essentially match the aggregate performance of all other companies, as their fate depends on those companies in aggregate. As energy use, financial activity, or human activity fluctuates across the economy, the enablers would rise and fall accordingly. We believe that the analysis directionally does support this hypothesis.

We have provided analysis that directionally supports some, but not all, of our hypotheses (Table 1). In particular, we were surprised that downstream companies performed better than expected and that vertically integrated companies did not perform as well as expected.

Global supply chains are not single, isolated strands of economic activity. They are more like webs that become increasingly intertwined as the value-add of materials is increased, and as those materials reach consumers. The adverse interactions are not only always downstream from each other, but there is also a possibility that downstream disruptions effect upstream backups. These complexities are exacerbated by shifts in capital and consumer demand in response to perceived problems in the supply chain.

We are interested in improved decision making, both by the leaders of corporations and by those who provide the capital to them.

For corporate leaders, there are many ways to mitigate risks. Here is a partial list:

- **Ensure awareness:** Assess risks and resiliency in the supply base; for key suppliers, look farther upstream to the suppliers' suppliers. Ask suppliers to provide insight into the risk analysis they have performed of their own supply chain. It's a red flag if they have not

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undertaken such an analysis.

- **Diversify sourcing risk:** Consider options to diversifying and/or strengthening your supply base and continually evaluate make-vs.-buy options (i.e., the right balance between more and less vertical integration).
- **Ensure robust information flow:** Push suppliers as well as customers to get visibility in both directions — demand signals on the sales side and capacity constraints on the supply side.
- **Be agile:** Develop contingency plans and ensure that leaders are comfortable implementing them if appropriate. This should include being willing and able to make fast adjustments in the workforce, in production capabilities, and in product design.

For investors, optimizing an asset portfolio from the standpoint of supply chain positioning is more complex. It requires having insight into the supply chain dependencies that a company has. It is feasible to glean insight into the procurement and operating dependencies from independent research. But knowing that a building products company will be unable to fulfill orders for roof tile if it has a shortage of pallets, or that an auto maker cannot complete the manufacturing of its vehicle because a specific chip is unavailable, may be as unobvious to the company's own internal supply chain professionals as it would be to the analyst on Wall Street.

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Therefore, the investor has to look for indirect indicators of a company's resiliency in the supply chain. We suggest that some of these indicators are: past performance, product and market complexity, supply chain resilience, and corporate agility.

- **Past performance:** The company whose sales choked in 2020 because of delays of a specific component may struggle to secure commitments for similar items in the future due to structural limitations: there may be limited supply capacity for the particular products they require. While there are many examples of companies that struggled because of a delay or shortage of only a single or primary component or raw material, it may be even more insightful to identify those that suffered on multiple fronts, because this may indicate that they were caught flat-footed with shortages across diverse commodities.
- **Product and market complexity:** What is the complexity of the product itself, and how diverse and robust is the supply chain? A furniture manufacturer depends on a very narrow range of raw materials, such as lumber, plastic materials, fasteners. Housing construction depends on the same kinds of materials plus many, many more (copper wiring, plumbing parts, HVAC systems, to name a few). The asset manager should be able to assess supply complexity for a particular industry by identifying the top commodities and materials that companies in that industry depend on, and at least generate a score of "high", "medium", and "low" complexity.
- **Supply chain resilience:** Has a company undertaken actions to ensure resilience, for example, by announcing new strategic supplier relationships, changes in operating practices, and/or new hiring of supply chain risk managers? Does the company have strong control over its supply chain, either through vertical integration, or by ensuring proprietary and exclusive relationships? There are companies that are recognized for being highly effective in their supply chain management, such as Apple, while others do not have any reputation for this. Companies that are not articulating to their investors the effectiveness of their supply chain risk management are probably not doing it well to begin with.
- **Corporate agility:** Has corporate leadership demonstrated the ability to respond quickly to market conditions? This would show up in the timeliness and magnitude of adjustments in workforce size and capabilities, adjustments to the investment portfolio (R&D, physical assets, product design), and market behaviors. Has leadership demonstrated the ability to retool its business on the fly? Two examples come to mind: several food service companies changed over quickly from indoor seating to pick-up and delivery models during Covid. They overhauled their business models within weeks. Another example is how airlines responded to the drop in travel in early 2020. Some airlines canceled job postings dramatically, and earlier, than other airlines. We believe that this indicates that those airlines demonstrated the ability and were willing to act more quickly than their competitors on the information they had.

About the Author

Peter Benda is a senior management consultant and entrepreneur with experience developing strategies for companies operating throughout the supply chain. He is especially concerned about global readiness for the increasing threat of climate change and related challenges to sustainability. Peter is president of DecisionPoint, Inc. DecisionPoint works with global clients to improve operating efficiencies and organizational effectiveness.

ENDNOTE

1. "Do Investors Value Agility?" (*Wilmott*, Volume 2021, Issue 116, pages 14–19. Wiley Online Library; 11/22/2021. https://doi.org/10.1002/wilm.10965).