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Small business survival and COVID-19 - An exploratory analysis of carriers

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\textbf{A R T I C L E I N F O}

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  \item COVID-19
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  \item Cost structure
\end{itemize}

\textbf{A B S T R A C T}

Small businesses are more susceptible to cash flow problems created by the COVID-19 pandemic putting them in jeopardy of survival. This research utilized a case study methodology that focused on small businesses in the trucking industry to assess the impact of this pandemic on the supply chain. Power imbalances can occur in the supply chain when certain parties act opportunistically. These imbalances are analyzed through theories of Resource Dependence, Resource Orchestration, and Entrepreneurial Orientation and embellished through the changes in power in the supply chain using actual data and describe the management actions taken by these small businesses to survive under these depressed business conditions. Next, actions are highlighted that small businesses are taking to deal with this crisis and potential business failure through qualitative data gleaned from interviews. Finally, using actual sales data, we compare the volatility of small business sales to a national transportation index. Our data shows more volatility in our two carriers’ revenue in these times, versus the broader index. We first provide an overview of the current pandemic situation and then proceed to discuss the theoretical portion before moving to analyze the conditions existing at the two carriers. We then summarize our analysis and provide recommendations.

\textbf{1. Introduction/Overview}

The COVID-19 pandemic has created survival problems for most businesses regardless of size. However, small businesses due to their financial limitations, customer base and dependence on a few key employees, face a much more critical situation. Small businesses often have limited access to public financial markets and are often more susceptible to cash flow crises created by revenue changes. Short term cash outflows exceed cash inflows creating survival problems.

Being able to navigate these short-term sudden business drops by managing short-term costs is often the difference between survival and bankruptcy. The federal government, realizing this situation, rushed to develop new programs to help contain the damage and assist small business by creating the CARES Act which was signed into law on March 27, 2020. Additionally, loan assistance was also available through the Small Business Administration’s Paycheck Protection Program (PPP).

In this research we look at the impact of COVID-19 utilizing case studies with two small businesses in the trucking industry. The overall analysis of supply chains in crisis indicate they experience different degrees of power imbalances as certain parties act opportunistically. We analyze these behaviors through Resource Dependence, Resource Orchestration and Entrepreneurial Orientation (EO) theories. We show the changes in power in the supply chain using actual data and describe the management actions taken by these small businesses to survive under these depressed business conditions. Next, actions are highlighted that small businesses are taking to deal with this crisis and potential business failure through qualitative data gleaned from interviews. Finally, using actual sales data, we compare the volatility of small business sales to a national transportation index. Our data shows more volatility in our two carriers’ revenue in these times, versus the broader index. We first provide an overview of the current pandemic situation and then proceed to discuss the theoretical portion before moving to analyze the conditions existing at the two carriers. We then summarize our analysis and provide recommendations.

\textbf{2. Literature review-current situation}

The following section discusses the impact of COVID-19 on business and the trucking industry. We analyzed government’s response to assist businesses and assessed the economic impact on the trucking industry.

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through a national survey.

2.1. Impact of COVID-19 on businesses

“Unlike natural disasters, technical disasters, malicious acts, or terrorist events, the impact of a pandemic is much more difficult to determine because of the unanticipated difference in scale and duration. The nature of the global economy virtually ensures that the effects of a pandemic event will be widespread and threaten not just a limited geographical region or area, but potentially every continent. In addition, while traditional disasters and disruptions normally have limited time durations, pandemics generally occur in multiple waves, each lasting two to three months.” (Guide to Pandemic Planning, 2020).

The size and nature of this pandemic created chaos in many industries. The airline and lodging industry saw demand come to a halt as business travelers were quarantined at home. Meetings and conferences were held remotely, and some companies indicated this would not change. Facebook chief Mark Zuckerberg announced in May 2020 that within a decade as many as half of the company’s more than 48,000 employees would work from home (Conger, 2020).

According to the Institute for Business and Home Safety, up to 25% of businesses don’t reopen following a major disaster. FEMA has this number at nearly 40%. No one likes to think about disasters or losing key employees. However, when these events do happen, prepared businesses are better off (Rowe, 2020).

The effect of the COVID-19 pandemic has been extensive. In a recent study by Veem (a global payments network firm), eighty-one (81) percent of small U.S. companies surveyed expect the new coronavirus pandemic to affect their business over the next 12-16 months, and nearly 90% are bracing for an economic slowdown. While the prevailing outlook seems bleak, businesses that were deemed essential or those that either benefit from the situation or repurpose their business so that they’re not as badly impacted. (Shala, 2020). However, a major problem is SMEs that lack the ability and resources to cope with uncertainties are more vulnerable to risks like the COVID-19 pandemic, causing severe capital shortage (Zhu et al., 2020). Consequently, financial service providers may significantly change their attitude toward financing SMEs and make corresponding strategic adjustments that move their loan portfolios away from SMEs in response to the pandemic (Goodell, 2020).

2.2. Government’s role in assisting business

The COVID-19 pandemic has caused businesses to stagnate and disrupted supply chains, forcing numerous enterprises, especially small and medium-sized enterprises (SMEs), and individuals facing great pressure in terms of capital shortage (Guo et al., 2020). Multiple stakeholders, such as public administrations and regulators, have taken different measures to support SMEs financially. Public administrations and regulators, for example, have issued a series of supporting policies (Song et al., 2020). Realizing the severity of the crisis, the government passed the CARES Act to establish several new temporary programs to address the COVID-19 outbreak. They include the following: Paycheck Protection Program; EIDL Loan Advance; SBA Express Bridge Loans; and SBA Debt Relief (SBA, 2020).

Additionally, the Small Business Development Centers have been active in developing and providing resources for small businesses to deal with the pandemic crisis including resiliency guides and guides to pandemic planning. Unfortunately, in their research, Granja, et al. did not find evidence that funds flowed to areas more adversely affected by the economic effects of the pandemic, as measured by declines in hours worked or business shutdowns. If anything, funds flowed to areas less hard hit. “According to an analysis by a group of University of Chicago and M.I.T. economists, the country’s largest banks are often heavy lenders to small businesses, but during the first of the program’s two rounds, community banks and regional institutions did most of the lending.” (Granja et al., 2020). That contributed to a disproportionately large share of loans going to areas that were not as hard-hit by the virus.

The SBA’s stimulus program was created to help businesses pay their workers through the Paycheck Protection Program. Applicants did not have to prove a sharp drop in sales or other specific harm. But many of the most devastated businesses had already laid off workers and were uncertain when their sales would return. Because the program’s rules require companies to maintain their head count at pre-pandemic levels, those businesses have a much harder time taking advantage of the program than companies that still have their full work force intact (Russell & Cowley).

Existing efforts, however, have had less of an impact than expected. Some studies have shown that the cash flow pressure of SMEs has not been significantly relieved even after the implementations of self-help measures and external support (Bartik et al., 2020) while Zhu et al. (2020) found that of the SME’s they surveyed, over 70% of cash flow pressure had not been relieved significantly despite support measures. (Song et al., 2020).

2.3. Impact of COVID-19 on the trucking industry

In this paper we focused on two small U.S. based trucking firms. However, these firms are impacted by what takes place internationally. According to the International Road Transport Union (IRU) in Geneva, which represents operators in 80 countries, new freight contracts have declined by 60%–90% since COVID-19 struck while empty runs have climbed by up to 40%. For truckers shipping products such as car parts, clothes, flowers and construction materials, operations have ground to a complete halt, the IRU said (Plume, 2020).

In the U.S., the Trucking Industry is being impacted significantly. In normal times, the U.S. trucking industry is the backbone of the nation’s economy, leveraging its 3.5 million truck drivers to deliver more than 71 percent of all freight tonnage valued at $10.4 trillion, generating $796.7 billion in gross revenue (ATRIA, 2020).

IBISWorld updated its reports on both the Long-distance Freight Trucking Industry and the Local Freight Trucking Industry as to how these industries are likely to be impacted as a result of the global COVID-19 pandemic. Revenue for the Long-Distance Freight Trucking industry has been adjusted to decline 14.8% in 2020, due to reduced demand for industry services (Cook, 2020b). Revenue for the Local Freight Trucking industry has been adjusted to a decline of 13.5% in 2020 due to reduced demand for industry services. As overcapacity influences the industry, industry operators are anticipated to encounter revenue and profit declines (Cook, 2020a).

If the pain is prolonged, smaller U.S. carriers who are unable to spread their costs across a large fleet could shut their doors. According to industry groups, these actions will put many skilled drivers out of work and accelerate a longer-term shortage of truckers (Plume, 2020). The American Trucking Association (ATA) estimates that 97% of trucking companies in the United States operate fewer than 20 trucks, and 91% have six or fewer. Those workers rely more often on one-off jobs than long-term contracts. At the Mexico-U.S. border, some truckers are carrying just one full load south for every seven full northbound trips, well below the usual three-to-one ratio, according to data from freight forwarder Nuvocargo (Plume, 2020).

The ATA’s Sean McNally says the trucking industry didn’t push for specific government relief in the Federal CARES Act (Coronavirus Aid, Relief, and Economic Security), “but there are many, many trucking companies applying for the Small Business Administration’s (SBA) PPP program or are preparing to access the Exchange Stabilization Fund or other tax credits. However, it may not be enough as we, eventually, prepare to start turning the key on re-starting the economy. We are already engaging with many champions in Congress to make sure as
these programs are expanded, truckers have access to liquidity and a bridge to the better times we know are coming.” (Garsten, 2020).

2.4. An indicator of trucking activity - The Cass Index

The Cass Freight Index® is a measure of the North American freight market. The monthly data and the Cass Transportation Index Report provide valuable insight into freight trends as they relate to other economic and supply chain indicators and the overall economy. Data within the Index includes all domestic freight modes and is derived from approximately 36 million invoices and $28 billion in spend processed by Cass annually on behalf of its client base of hundreds of large shippers. These companies represent a broad sampling of industries including consumer packaged goods, food, automotive, chemical, medical, pharmaceutical, OEM, retail and heavy equipment. Annual freight volume per organization ranges from $40 million to over $2 billion. The diversity of shippers and aggregate volume provide a statistically valid representation of North American shipping activity (Cass, 2020). Later, we compare our two firms’ monthly revenue over a thirty-month period to the Cass Index of freight expenditures.

3. Literature review-a theoretical perspective

We have previously reviewed the effect of the pandemic on the marketplace with a focus on small business and the trucking industry. We now turn to what applicable management theories can explain behavior of the parties in the supply chain. While our focus in this research is small business, these theories could apply to businesses of any size. We have split our analysis into external and internal compartments to better understand how theory can explain the activities that have occurred. We know that when market conditions change, actors in the supply chain gain or lose relative power over the scarce resources for which they are competing. We also can observe their actions in times of crisis as being benevolent or opportunistic. Internally, the management must be focused on surviving in a totally different marketplace. They must re-examine their entire business model and make changes that will give them the best chance to capture resources in a significantly different environment. We focus on power, resources (market driven and internal), behavior (opportunistic or benevolent), and entrepreneurial orientation.

3.1. Theories related to COVID-19 events in the supply chain

The role of power in the supply chain has been examined by researchers through different theoretical lenses. One stream of research has focused on the power imbalances and the different types of power. Maloni and Benton (2000) highlighted power imbalances that existed in the automotive industry. Five major automotive firms controlled 90% of the market, yet they each had thousands of suppliers. This power imbalance allowed them to transfer responsibility for cost reductions, product development and inventory management to their suppliers. Non-compliant suppliers faced the loss of business and replacement by a competing supplier (Maloni & Benton, 2000). In researching the different types of power, they found that referent and reward power were beneficial, but that coercive and legal power had harmful effects on relationships.

The identification of these types of power can be traced to French and Raven (1959). They defined referent power as the attractiveness of one party to another. Reward power relates to the perceived or actual power one party perceives the other possesses to influence the allocation of incentives. The ability to punish another party is termed coercive power and finally legal or legitimate is the extent to which one party believes the other has the lawful authority. French and Raven’s typology of power extended Weber’s (1947) definition that power is “the probability that a person can carry out his or her own will despite resistance.”

Resource dependency theory (RDT) provides another lens to assess how power forms and how it is managed in interorganizational relations (Pfeffer, 1987). In RDT, firms are viewed as interdependent entities seeking to manage the uncertainty that is affecting them (Pfeffer, 1987). These interdependencies create various forms of dependency. A firm(s) that owns or controls valuable, scarce resources holds power over firms seeking those resources, creating an unbalanced dependency that is not mutual (Pfeffer & Salancik, 1978). Krajewski et al. (2005) found that this power or dependency in supply chains stems from multiple sources. Examples of these include: the number of major customers; total market share; the number of potential customers, and the amount of revenue generated from a single customer.

From the above discussion we can see that power in the supply chain can emanate from many sources and inter-organizationally power is a strong indicator of which firm(s) possess or control the scarce resource(s) in that specific chain. While the conditions for power vary, when these power imbalances occur one or more firms possessing that power may act opportunistically towards other firms in the supply chain. This opportunistic behavior is how actors in a supply chain use their power. The actions of these actors can be explained by transaction cost economics (TCE). TCE postulates that opportunism occurs when one party takes advantage of the other with guile (Williamson, 1975).

3.2. Theories related to internal management actions during COVID-19

The previously mentioned theories shed light on the impact COVID-19 has had on the external marketplace and the various actors in the supply chain. A second part of this analysis involves examining how effective small businesses are in meeting the challenges faced by a crisis. This can be examined through two additional theories. First is entrepreneurial orientation (EO) and the second is resource orchestration theory (ROT). In EO we specifically focus on risk taking.

Raush et al. (2009) in a review of the literature suggest that entrepreneurial orientation (EO) has been most consistently defined as being comprised of three dimensions. They include product innovation, proactiveness, and risk taking. Product innovation reflects a firm’s propensity to engage in and support creativity and experimentation. Such actions help firms improve existing products or develop new ones. Meanwhile proactiveness is the forward-looking capacity that enables firms to capitalize on emerging opportunities. Taken together these actions help shape future markets and can influence the competitive landscape of these markets. Risk taking is characterized by behavior in which both the cost of failure and the potential returns are high (Lumpkin & Dess, 1996). We argue that risk taking in small business must be managed in concert with the external environment. Certainly, small businesses take on risks, but they must constantly monitor their external market environment and take proactive internal actions to properly manage the magnitude of these risks. However, the pandemic has created a sizable and more unanticipated risk for small business than normal. Since extreme risk created by the pandemic threatens the very survival of businesses, we examine the literature on business failure as part of the risk dimension in EO.

3.3. Business survival and risk under crisis conditions

As stated above, EO postulates that being an entrepreneur involves risk taking, but it doesn’t specifically address how entrepreneurs address risk under crisis conditions. Thus, it is necessary to determine if business owner-managers handle all types of risks and crisis in the same manner. Gilmore et al. (2004), studied owner-managers/entrepreneurs’ perceptions of risk, and further, to understand how they manage and cope with situations that they deem to be risky. They found that owner-managers of small firms operating in a wide spectrum of industry settings, it was shown that the key situations owner-managers deemed to be risky were those pertaining to cash flow, company size, entering new markets or new areas of business, and entrusting staff with responsibilities.

Furthermore, it was shown that the two key tools used to manage...
these risky situations included managerial competencies and networking. This study showed that, while entrepreneurs recognize that they will encounter risky situations, they endeavor to manage these situations so that the risk is minimized. Having gone through and survived the difficult and uncertain start-up years, these owner-managers are reluctant to involve themselves in activities that may jeopardize the relative security that they worked so hard to attain (Gilmore et al., 2004). Doern et al.’s (2019) review of the literature on risky situations indicates that whether and how entrepreneurs respond to a crisis may depend on several factors including experience, stage of business development, the type or stage of the crisis impacting on the business, and resources, both in terms of how resources are utilized as well as the suitability of resources for the stage of the crisis (Doern et al., 2019).

However, a pandemic is not a situation of choice and depending on the level of exposure, a business could be operating at significantly reduced capacity for an extended period. Therefore, broader business strategies, rather than the usual business continuity strategies, will be required to make the operational changes necessary to effectively manage under these conditions. The usual business continuity strategies are unlikely to be sufficient (Guide to Pandemic Planning, 2020).

If normal business strategies to manage crisis risk are insufficient, there will be a higher number of business failures which magnify the risk dimension of EO. Two major factors contributing to business failure are cited in the literature. The first factor is related more to environmental events which are sudden, unpredictable and difficult to mitigate. The COVID-19 pandemic would fall into this category. The second factor is more internal or within the firm. This factor relates to the abilities of management, such as developing risk or crisis management plans. Amankwah-Amoah (2016) developed an integrated model of business failure. He described external factors and theorized they combine with firm level factors. The combination of these factors resulted in business decline and eventual failure. Other research describing the events leading to business failure were described as deterministic or voluntaristic. Deterministic is attributed to external factors, while voluntaristic view attributes of business failure to firm-specific factors such as lack of leadership, poor decision-making and misallocation of resources (Amankwah-Amoah, J., & Debrah, Y. A., 2010 & 2014; Zhang, H. et al., 2019).

More recent research on failure specifically addressed the current pandemic. This research hypothesized that events such as COVID-19 are exogenous or external to the firm (Amankwah-Amoah et al., 2021). However, the researchers stated that more work is needed to address the extent that COVID-19 contributed to business failure. In summary, the business failure literature provides support to our view that the risk dimension of EO is related to external environmental issues. Meanwhile the internal dimension of failure is more closely aligned Resource Orchestration Theory (ROT) which is addressed next.

As previously stated, EO provides a perspective on the key characteristics (e.g. risk taking, forward looking philosophy, etc.) of entrepreneurs, it does not explain their management actions. How the firm responds internally to mobilize its resources in response to these external events can be understood through Research Orchestration Theory (ROT). ROT is an extension of the resource-based view (RBV) of the firm. RBV postulates that competitive advantage is achieved by having resources that are valuable, rare, non-substitutable (Barney, 1991). ROT argues that having these resources alone is not a sufficient condition to produce competitive advantage. However, these resources must effectively be managed to achieve competitive advantage (Sirmon et al., 2007; Sirmon & Hitt, 2009). The specific ways managers influence firm performance is by structuring the firm’s resource portfolio, bundling resources to build capabilities, and leveraging capabilities to exploit the marketplace (Sirmon et al., 2007). Now that we have established internal and external theories that can be used to explain the behavior of small businesses during the pandemic, we describe our methodology, then detail the events at two small freight carriers.

4. Research methodology

In this research we performed a detailed analysis of two small trucking firms hereinafter called “Trucking Firm 1” (TF1) and “Trucking Firm 2” (TF2). This research relied on both qualitative analysis and quantitative comparison through case study and a national transportation data base. According to Patton (2005), qualitative research is particularly useful when the goal of research is to gain in-depth insights of a real world phenomenon. It can be conducted via various approaches from in-depth open ended interviews to observations to written documents. The approach to the qualitative research was phenomenology. Phenomenology focuses on lived experiences, thus “seeks to make explicit the implicit structure and meaning of human experiences” (Sanders, 1982). By using qualitative interviews with a phenomenological focus, we specifically and inductively generated rich narrative descriptions from in-depth interviews. This method provides a detailed analysis of the conditions faced by these small trucking firms that would be difficult to uncover relying on quantitative methods alone.

A convenience sample was used based on the researchers’ knowledge of small transportation firms and cross-checked through a Small Business Development Center. We felt the case study was an appropriate means to study the responses and actions to a complex and continually changing pandemic. According to Yin (2012) the case study method is an appropriate method to investigate a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident. Further, case studies allow researchers to collect data from participants through interviews and direct observation. We collected both qualitative and quantitative data through multiple interviews at various time periods. In order to collect accurate responses, we guaranteed the companies anonymity and confidentiality. For our case data collection, we followed the research protocol listed below.

This research utilized a semi-structured interview format to investigate the phenomenon of interest (McCracken, 1988). A multi-stage approach was used whereby the researchers first reviewed existing literature on small business, supply chain, and government actions to ameliorate the pandemic. This was followed by in-depth interviews conducted with one owner and one chief operating officer (COO) of two family-owned small transportation firms. The research method enabled collection of detailed responses to identify critical issues affecting these businesses during the pandemic. We then reviewed our notes and returned for additional rounds of interviews to provide clarification and interview depth until we reached saturation point. Given our small sample size we continually cross checked our results with national studies to increase external validity and generalizability. Since our participants are from one sector this helps increase internal validity while providing a detailed analysis of two small carriers during the pandemic.

5. Analyses of the trucking firms

TF1 is truly a family owned, as the co-owners are a father-son tandem. The father started the business and the son joined the business after graduating from college. In their business model the owners focus managing all aspects of the transportation transaction for their independent drivers. This includes all the back-office documentation and billing and support for the drivers. TL1 does all the back-office functions and pre-pandemic provided loans to drivers to repair their equipment and cash supplements for incidental expenses of meals, tolls etc. TL1’s philosophy was summed up by the co-owner as “our staff support allows the drivers to focus on driving and not worry about all the back office documentation processes.”

Most of TL1’s drivers’ business is obtained through third party logistics carriers (3 PLs) and or freight brokers. TL1 scans the market for business opportunities that their independent drivers are offered opportunities to bid. The drivers also develop their network of customers.
that are managed by TL1. TL1’s owners receive the difference between the rate they quote their customers and the rate paid to the freight carriers.

According to the TF1, 2018 was a good year for the trucking industry. This led to an increase in the number of drivers buying trucks which resulted in more trucking and driver capacity. However, the load volumes at TF1 did not increase enough to absorb this extra capacity. As a result, the oversupply of drivers resulted in a decrease in rates. This excess capacity continued into 2019 and many single operator truckers went out of business and their trucks were repossessed. This resulted in fewer drivers and lead to the hope that 2020 would be a good year since rates were expected to improve. TF1 expected to have higher revenue in December 2019 and January 2020 than the comparable months a year earlier. However, this did not happen as COVID-19 began affecting shipments from China. When China shut down in January, business volumes declined and when China started re-opening, the U.S. started shutting down.

TL2 is an asset-based carrier that provides customers with a direct seamless transportation source. Customers are one call from having their freight needs met. TL2’s customers are in a variety of retail and manufacturing businesses. On the retail side TL2 transports beverages, groceries, and pet supplies. On the manufacturing side they transport HVAC equipment and flooring products. The business was established in the mid-1980’s and is family owned. TL2 employs its own company drivers as well as utilizing independent owner operators.

Business opportunities are developed by marketing directly to customers. TL2’s philosophy is to put the customer first by emphasizing the human element versus machine interaction when customers call about shipping requests and order follow-up. From a total revenue perspective, approximately 70 percent of the revenue is on the asset side and 30 percent from freight broker activities. Of the brokerage portion only about 3 percent originates through 3PLs. Brokerage operations allow TL2 to provide its customers coast to coast service. Shipments from the brokerage side are carried by independent drivers or other asset-based trucking firms. TL2 considers the brokerage business to be much more transactional in nature than its established customers.

5.1. TL1’s COVID-19 challenges

TL1 experienced a COVID-19 driven power shift as a result of the drop off in carrier volumes. This made the market for scarce resources (customer shipments) critical and those who secured customer contracts (in our case, brokers) became powerful players in the supply chain. As can be seen in Fig. 1 below, TL1 in a normal pre-pandemic market on average received 6% of the total shipment revenue. For example, if the shipment revenue from a customer was $1000, TL1 would net $60. The other 94% of revenue was split between the driver (60%), broker (25%) and agent (9%). However, as stated earlier, transportation revenue dropped dramatically during the pandemic. This resulted in fewer customers shipping goods and thus the power in the supply chain shifted to the brokers. Brokers that were able to win customer orders from this smaller customer base through their systems and network were now the power players in the supply chain. Once they posted the customer requirement on their Dashboard, the same number of pre-COVID drivers were now competing for much smaller shipping volumes. As a result, drivers lowered the price they were willing to accept for moving freight. A national study of almost 4000 confirmed this weakness in rates (ATRI, 2020).

“For fleets with fewer than five power units, 39 percent of respondents reported that their freight levels were ‘much lower’. In contrast, 30 percent of respondents with fleets of over 1,000 power units reported that their freight levels were “about the same.” This disparity indicates that, in terms of freight volumes, smaller fleets are more negatively impacted than larger fleets. From a revenue standpoint, owner-operators and small fleets also rely more heavily on the spot market, which declined 38 percent from March to April 2020, according to DAT’s spot market load postings.

![Fig. 1. Pre and post pandemic supply chain payout.](image-url)
In this weak market, the broker negotiated a fixed price from their customer for moving the freight and they acted opportunistically by capturing a larger share of the total supply chain revenue. The driver (30%), small business owner (3%) and agent (5%) all received much lower revenue when compared to pre-pandemic levels. Meanwhile, the broker (62%) prospered by their opportunistic actions and extracted 2.5 times more revenue from the supply chain. In essence, the power shifted from the driver to the broker who now controlled the scarce resource that prior to the pandemic was controlled by the drivers who were in short supply and were the scarce resource. The broker’s portion left TL1’s position in the supply chain weakened and they struggled to survive at these much lower revenue and profit levels. They experienced pressure to meet revenue and profit levels that would allow them to break even. The following comment illustrated TL1’s frustration.

“Major demand decline across the industry allowed Brokers to retain greater share of the revenue even though the customer firms (for example the large retailers) were paying the same or more than pre-COVID rates to “help out”. But that was “for nothing” because the broker kept a bigger share than pre-COVID simply because they could.”

Internally, they responded to this lower level of volume and revenues prior to the Care’s Act by laying off three of their seven staff members. According to TL1’s owner, “the Care’s Act saved us from additional layoffs as it allowed us the funds to continue paying our four remaining employees.” TL1 took other proactive measures to reduce their operating costs and increase their chances of survival. These actions reflect the proactiveness and risk-taking dimensions of EO.

“First we eliminated driver loans which provided drivers a source of funds to fix their trucks. Secondly, we tightened the recruitment strategies. Before COVID we basically took any driver. Now a new driver cannot hold more than five jobs in five years. The goal of this policy is to ensure that the drivers possess the characteristics and values that indicate they will continue to carry freight for us vs jumping ship for a marginal increase in pay.” “During the pandemic we have experienced high driver turnover.” Several drivers left our firm to work for companies that guaranteed rates.

From a theoretical perspective, TL1 managed risk and avoided failure to an exogenous event (COVID-19) by using management’s initiatives in taking advantage of government assistance. This assistance provided a safety net to extreme layoffs created by the lower total revenue from reduced rates and volumes. Second, to further manage risk and avoid broker’s price gouging, TL1 performed market research to identify potential customers and avoid brokers. TL1 has made efforts to diversify its portfolio. TL1 stated “we increased dedicated lanes and reduced broker driven markets where drivers had to pick their customers (on broker dashboards).” From an applied perspective, the need for portfolio diversification and brokerage avoidance are potentially two of the biggest lessons learned as well as considerations in future crises planning strategies developed by TL1.

5.2. TL 2’s COVID-19 challenges

TL2 indicated their market experienced a 31% average rate drop from 2019 to March 2020. This significant drop was proceeded by 31% average rate drop from 2019 to March 2020. Thus, on average freight rates were 40% lower at TL2 in 2020 from average rates charged in 2018. Operating with this significant revenue drop required difficult decisions and as a result staff was reduced by 18%. Company drivers were being paid at a fixed cost per ton mile. These fixed costs combined with less freight volume and lower rates forced TL2 to reduce internal driver headcount by 40%. Finally, owner operators, who are true variable cost since they are paid by the job at the revenue rate negotiated by TL2, were downsized only by 8%.

TL2 being asset based operates a more direct business model than TL1. On the brokerage side of their business they were able to capture higher gross profits per load during the pandemic. Again, the independent drivers captured less of the supply chain revenue. However, with the recent business pickup drivers were pushing to recapture revenue.

“The brokerage side of the business is very transactional. When dealing with the carriers we broker, we do not have contracted rates. Each load is independent, the pricing is market driven, and the load rates are negotiated for each load. In regular times we will average 12% gross profit per load and during the peak of Covid19 we were seeing 21% gross profit per load. Now freight is picking back up and carriers are pushing back and currently we are running in the 15% range.”

As a carrier, the pandemic related shutdowns were a source of concern and their expectation was that 2020 would continue to be filled with challenges. When asked what the most significant challenge was TL2 commented:

“The biggest challenge to our business was the government (state & local) mandated shut down of manufacturing and retail locations reducing consumer demand and overall freight opportunities.”

TL2 indicated they were implementing forward looking strategies to handle these challenges and capture revenue when it came back on-line. They were managing risk and making extensive efforts to reach out to customers as well as be innovative by exploring new markets.

“We are devoting significant time and effort to leveraging existing relationships to be the first-choice carrier when a customers’ freight opportunities increase.”

“We are actively seeking to develop new customers in higher demand pandemic related areas. For example, we have been continually targeting the grocery space to make up for the loss of manufacturing related freight.”

“Additionally, we are increasing sales focus on growing existing customers that are shipping and working with customers set to open soon to ensure we are one of the early carriers back in the door.”

External government assistance was also part of the plan to insure continuous operations through the pandemic and retain valuable employees. The politically sensitive issue of when the economy will reopen is part of another difficult decision the government could make that would help TL2.

“We have received a paycheck protection (PPP) loan from the SBA. This loan helped us retain key employees. We plan to meet all employee retention criteria and will apply the additional funds to eligible expenses. As a result, expect that SBA will forgive our loan.”

“There is nothing specific the government could do to help improve our business, but opening up the economy as much as possible to increase consumer spending.”

Disaster planning is another area for which the trucking industry was under-prepared. The ATRI/ODDIA study indicated only 24 percent of respondents had disaster response plans in place before the COVID-19 pandemic. TL2 did have a business continuity plan in place that allowed them to shift to a work from home environment. They also learned from previous natural disasters such as hurricanes and floods to have backup systems, generators, and IT equipment to mitigate risks and ensure business continuity.

“We were able to shift our operations off-site quicker than some of our competitors and even customers. For example, we had one Fortune 500 customer who we had no contact with for more than one week. We only had their phone numbers at work. Initially, their
home systems even lacked email access. As a risk mitigation strategy, we have requested emergency cell phone numbers from all our customers. In our business you have to be able to communicate continually with customers.”

Driver turnover is a way of life in the trucking business and TL2 indicated that average driver turnover in a year is in the 75-80 percent range.

“We have significant driver turnover, but it is a bimodal distribution. One group of our drivers is low turnover, they will stay five years and up. The high turnover group will work two or three months on average and then move on. We are constantly adding and losing drivers in this group.”

From a theoretical view TL2’s actions demonstrated the proactive-ness dimension and risk mitigation dimensions of EO. Management orchestrated their resources by restructuring their resource portfolio via layoffs and managing to hold key employees through SBA’s PPP loan program. They also leveraged their capabilities to other markets through increased sales efforts and attempting to become the customer of choice with existing customers as they resume normal business activities. During this period, management’s actions of securing external funding and reducing the employee base, allowed the firm to remain a viable operating concern.

6. Cass Index vs. TL1 and TL2

Years prior to the pandemic, researchers and practitioners described the business environment as rapidly changing and characterized by volatility, uncertainty, complexity and ambiguity (VUCA). In their opinion, these characteristics would define the new normal in business (Bennett & Lemoine, 2014). To measure this volatility under these uncertain conditions that are fraught with ambiguity, we compared the monthly sales revenue from TL1 & TL2 to the Cass Freight Index for a thirty-month period from January 2018 to June 2020. As previously mentioned, The Cass Freight Index® is a measure of the North American freight market. The monthly data provides insight into freight trends as they relate to other economic and supply chain indicators and the overall economy.

As is illustrated in Fig. 2, the volatility of the TL1 was much greater than the Index. TL2 being the larger of the two businesses and with a more direct supply chain and greater customer diversity, particularly in groceries and bottled water, experienced less volatility. We would expect that the Cass Index volatility would be lower than that of our two firms given that it is mainly populated by larger firms. The comparisons provide a compelling look at small business over a thirty-month period including the last six that were affected by the pandemic. They also show that both TL1 and TL2 while dropping at a faster rate, follow the same overall trend lines as their larger competitors in the Cass Index.

There was economic growth for the first 24 months of the 30-month period until the slowdown in transportation in early 2020 due to the Chinese pandemic. For example, GDP grew 3.1% and 2.3% respectively in both 2018 and 2019 (Macrotrends, 2020). This is compared to the Bureau of Economic Analysis data showing a 5.0% GDP drop in the first quarter of 2020 (BEA, 2020). Overall, during this entire period TL1’s volatility compared to the Index averaged 38% greater and TL2’s 14%. One explanation of this is size. TL2’s revenues for the full two-year period were approximately 10 times those of TL1. TL2’s revenue was further buffered by a more diversified customer base. One of TL2’s biggest customers is groceries which experienced increased demand during the pandemic and offset weakness in the manufacturing sector.

Cass Freight Index shows expenditures experienced steady volume growth in 2018 with the Index hitting its peak of 115 in September of 2018, due to buildup for the holiday season. TL1 experienced robust revenues that exceeded the Index in April and July of 2018. However, the remainder of the year, except for October, was below January 2018 levels. TL 2 revenue was less volatile than TL1 and its revenue slightly exceeded the Index through June, whereas from July through December it ran below the Index. Average volatility from the Index for both firms during 2018 was relatively stable at 12% for TL1 and 9% for TL2.

In 2019 the negative gap between TL1 and the Index widened, averaging 57% for TL1 and 15% for TL2. The gap continued in 2020.
while both experienced a small uptick in March then greater declines as the shutdown took effect in early April. Year to date revenue for both carriers is lower on a year to year basis. As explained earlier, both carriers took significant actions related to reducing staff and drivers to allow their businesses to operate at these lower volumes.

7. Conclusions, implications, and recommendations

This research has provided an in-depth analysis of what is happening in the trucking sector of small business experiencing the crisis created by a pandemic. Fig. 3 provides a summary of what we discovered in this research from both a theoretical and business perspective. We used a case study methodology and triangulated our findings with a national survey of 5000 respondents. Per Yin (2012), in depth case studies are useful to uncover phenomena in investigating a contemporary phenomenon. The COVID-19 pandemic is a phenomenon that we were directly able to observe through our interaction with these small carriers. It has created a double whammy within supply chains. In the medical, grocery, and e-commerce sectors supply chains are stressed to meet demand. For example, the demand and pricing for personal protective equipment (PPE), ventilators, hospital beds, ND common consumer items has stressed manufacturers capacity and created temporary shortages. Meanwhile, the business shutdown over the general economy has left many supply chains with a surplus of capacity, lower rates and a struggle for survival. One of these sectors is transportation, the Cass Index reported freight expenditures increased 6.4% in June from May 2020. This concurs with TL2 in our study who indicated rates were firming in June. However, year-over-year and two-year expenditures were down 18%. While June showed improvement, recent COVID-19 related spikes in the southeast and western states pose problems for continued momentum of a return to normal business operations. This will continue to contain potential freight gains from increased economic activity and continue to limit increased rates as volume gains will be muted.

From a theoretical perspective we observed that these lower volumes and rates changed the power in the supply chain from the driver to the broker at both TL1 and TL2. The broker was able to use its ability to obtain freight contracts from customers. The contracts were scarce due to decreased demand. This created a condition of dependence as drivers bid lower rates to move these fewer contracts. As a result, brokers took advantage of this, acted opportunistically, and captured more value (in TL1’s case 2.5x) post pandemic than pre pandemic. These actions highlight the interaction of resource dependency and transaction cost economics in explaining the behavior of the actors in TL1’s supply chain. By obtaining access to scarce resources (customer orders) the brokers put themselves into a power position and acted opportunistically to capture more of the supply chain revenue. TL2 experienced less of this variation as their supply chain was shorter and more direct since only 3% of their business revenue was through 3PL providers. While TL2 brokered out 30% of their business volume, they also captured more value, but refrained from major margin increases. TL2’s actions represented a more relational view in TCE as they didn’t use increased dependence for excessive short-term gains. They perceived current conditions as fleeting and would only harm longer term business opportunities.

This opportunistic broker behavior led to a collective attempt by the truckers to regain their fair share of load revenue. First, May Day demonstrations were “organized to protest unscrupulous freight brokers, who truckers felt were taking advantage of the chaos to charge unfair prices” (CDL Life, 2020). Second, a group of drivers conducted a protest strike in Washington D.C. This demonstration drew widespread media attention and also resulted in a meeting between the truckers and President Trump (CDL Life, 2020). Third, a social media movement “Stop the Tires 2020” started and gained momentum but was later canceled due to concerns that it might divide trucker unity. It was

Fig. 3. COVID 19 and Supply Chain Events and Response.
important enough for TL1 to mention that “they tried to force brokers to pay them a minimum amount per mile, something similar to a minimum wage”. These efforts were mostly unsuccessful and TL1 discontinued these negotiations with their brokers. While not directly mentioned by TL1, it is possible that these efforts were discontinued because of fear of repercussions and subsequent loss of broker-driven business which could lead to potential bankruptcy.

Internal management activities at both TL1 and TL2 initially focused on cutting costs by releasing drivers and staff. Both also took advantage of the SBA’s PPP loan program to retain their critical staff members by paying their salaries. Comparisons to the Cass Index clearly indicated that TL2’s larger size, more direct supply chain and moving goods for the grocery sector lessened their sales revenue drop. Meanwhile TL1’s longer supply-chain and dependence on third party brokers created greater volatility and much greater volume swings. Small trucking firms are advised to use this experience and develop risk mitigation plans. They also should actively market to existing customers to seek to be the carrier of choice and seek new markets to improve their market position when business returns to pre-pandemic levels. Both these businesses clearly utilized their entrepreneurial orientation (EO) by being forward-looking and managing risk. They also restructured their resource portfolios by lowering their cost structures through layoffs. Further, they took advantage of market opportunities by obtaining PPP loans and pursuing new market opportunities. This behavior is explained by a combination of EO and Resource Orchestration Theory in avoiding business failure in a pandemic. While the pandemic created severe disruptions for these two businesses, they avoided ultimate bankruptcy. Thus, capturing the knowledge gained during these times is critical. The following discussion reviews lessons learned by these firms.

7.1. Lessons learned from the COVID-19 pandemic

The following are the major lessons learned from this crisis for small business. They were developed in our post analysis discussion with these small business leaders, other external contacts (SBA), and with the benefit of hindsight.

First, small businesses need to be cognizant of our global economy. For example, prior to the pandemic President Trump enacted tariffs against China to help American business. Yet, depending on the business, some suffered. For example, one small consumer products firm in the soap and beauty business saw raw material prices spike and domestic supply dry up. Earlier identification of the supply chain source of this material in China would have mitigated the need to increase prices to prevent long disruptions and dependence on third party brokers. As a result, trucking firms should develop a crisis management plan. Finally, small trucking firms should develop a risk management program that provide transaction transparency since it leads to a reduction of unfair compensation (Lockridge, 2020). Refusal to sign contracts that allow brokers to bypass federal regulations would potentially balance the effects of brokers’ power in low demand scenarios witnessed during the pandemic.

Bringing together the business intelligence gathered from various networking techniques can be used to develop a risk management program that will provide early warning signals that trigger mitigation plans. For example, TL1 noted that the company has already made efforts in portfolio diversification and reduction of broker dependent business in order to safeguard themselves from broker dependence. TL1’s goal is to grow their direct customer business and reduce reliance on brokered business.

Second, there is the need to monitor both political changes and exogenous events (pandemics, weather, etc.) that could impact their business environment. For example, how will the Biden infrastructure plan in the U.S. impact the type of products carriers’ haul? Are key customers using the Suez Canal as a transportation route? TL1 specifically noted the political effects on the industry during crisis by stating that the trucking industry and the company’s “future will depend on how the government will respond next”.

Third, trucking firms should network either on social media or through an association that is populated with similar businesses. For example, the National Association for Small Truckers describes itself as a “voice for small truckers” and provides an invaluable source of knowledge. Social media such as LinkedIn and Facebook also have interest groups that discuss trucking issues of small businesses. More specifically, business owners could track these online communities to discover opportunities, threats and dynamics within the industry by conducting a simple netnography. Netnography, is performed through studying online communities. The researcher’s goal is to uncover behaviors in these communities that are potentially threatening or unethical to consumers and businesses (Rynarzewska, 2019). Another industry specific publication (Truckinginfo.com) cited an OOIDA study (One Voice For Truckers Everywhere) that advised trucking firms to work with brokers

CRediT authorship contribution statement

Larry C. Giunipero: Writing – original draft, preparation, theory, data collection, survey question preparation. Diane Denslow: Writing, literature review, editing and reviewing. Ania Izabela Rynarzewska: data collection, Methodology, reviewing, data analysis, data triangulation.

References

Alley, S. (December 2020). CDRLink.com. https://cdrlife.com/2020/2020-a-look-back-a transformative-year-in-trucking. (Accessed 18 April 2020).

Amankwa-Amoah, J. (2016). An integrative process model of organisational failure. Journal of Business Research, 69, 3388-3397.

Amankwa-Amoah, J., & Debrah, Y. A. (2010). The protracted collapse of Ghana Airways: Lessons in organizational failure. Group & Organization Management, 35, 636-665.

Amankwa-Amoah, J., & Debrah, Y. A. (2014). Air Africa: The demise of a continental icon. Business History, 56, 517-546.

Amankwa-Amoah, J., Khan, Z., & Wool, Z. (2021). COVID-19 and business failures: The paradoxes of experience, scale, and scope for theory and practice. European Management Journal, 39(2), 179-184.

American Transportation Research Institute and The OOIDA Foundation. (April 2020). Covid-19 impacts on the trucking industry, 44 pp.

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17, 99-120.

Barth, A. W., Bertrand, M., Cullen, Z. B., Glaser, E. L., Luca, M., & Stanton, C. T. (2020). How are small businesses adjusting to COVID-19? Early evidence from a survey. Proceedings of the National Academy of Sciences, 117(30), 17656-17666.

Bennett, N., & Lemoine, G. J. (2014). What YUCA really means for you. Harvard Business Review, 27. Jan-Feb.

Bureau of Economic Analysis. (2020). National economic accounts. https://www.bea.gov/news/glance. (Accessed 20 June 2020).

Cass Information Systems, Inc.. (2020). https://www.cassinfo.com/freight-audit-paymen t/cass-transportation-indexes/cass-freight-index. (Accessed 27 May 2020).

Conger, K. (2020). Facebook starts planning for permanent remote workers. New York Times. https://www.nytimes.com/2020/05/21/technology/facebook-remote-work-coronavirus.html. (Accessed 29 May 2020).

Cook, D. (June 2020). Local freight trucking industry in the U.S.. Market Research Report. IBIS World.

Cook, D. (June 2020). Long-distance freight trucking industry in the U.S.. Market Research Report. IBIS World.

Covid-19 resources, “n.d.”, https://www.sba.gov/page/covid-19-guidance-resources.
Csath, M. (2021). Development and learning in organizations. *International Journal, 35* (3), 10–12.
Doern, R., Williams, N., & Vorley, T. (2019). Special issue on entrepreneurship and crises: Business as usual? An introduction and review of the literature. *Entrepreneurship & Regional Development, 31*(5–6), 400–412.
French, J. R. P., Jr., & Raven, B. (1959). The bases of social power. In D. Cartwright (Ed.), *Studies in social power* (pp. 150–167). Ann Arbor: University of Michigan Press.
Garsten, E. (2020). COVID-19 poses uneven challenges for commercial truckers. *Forbes*. https://www.forbes.com/sites/edgartenstein/2020/04/13/covid-19-poses-uneven-challenges-for-commercial-truckers/#5be676397791, (Accessed 13 April 2020).
Guo, H., Yang, Z., Huang, R., & Guo, A. (2020). The digitalization and public crisis: Business as usual? An introduction and review of the literature. *Entrepreneurship: Theory and Practice, 33*, 761–781.
Rowe, C. (2020). Small business resiliency guide. Small Business Development Center, p.3.
Russell, K., & Cowley, S. (May 2020). Where the small business relief loans have gone. NY Times. https://www.nytimes.com/interactive/2020/05/07/business/small-business-loans-coronavirus.html, (Accessed 7 June 2020).
Shalal, A. (2020). Small businesses see coronavirus effect lasting 12-16 Months. *Insurance Journal,* 31(3), 353–360. https://doi.org/10.5465/aimr.1982-4285315
Sirmon, D. G., & Hitt, M. A. (2009). Contingencies within dynamic managerial capabilities: Interdependent effects of resource investment and deployment on firm performance. *Strategic Management Journal, 30*(13), 1375–1394.
Sirmone, D. G., Hitt, M. A., & Ireland, R. D. (2007). Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of Management Review, 32*(1), 273–292.
Zhang, H., Amankwah-Amoah, J., & Beaverstock, J. (2019). Toward a construct of dynamic capabilities malfunction: Insights from failed Chinese entrepreneurs. *Journal of Business Research, 98*, 413–427.
Zhu, W., Zhang, P., & Wang, Z. (2020). Firm crisis, government support and policy efficiency under the pandemic shock: Evidence from two waves of questionnaire on SMEs. *Management World, 36*(4), 13–26.