

## Pandemic-induced knowledge gaps in operations and supply chain management: COVID-19's impacts on retailing

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**Pandemic-induced knowledge gaps in operations and  
supply chain management:  
COVID-19's impacts on retailing**

Martin C. Schleper

*University of Sussex Business School, UK*

Stefan Gold

*University of Kassel, Germany*

Alexander Trautrim

*Nottingham University Business School, UK*

Duncan Baldcock

*Marks & Spencer, London, UK*

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# **Pandemic-induced knowledge gaps in operations and supply chain management: COVID-19's impacts on retailing**

## **Abstract**

**Purpose:** This Impact Pathways paper aims to provide a timely and structured discussion of real-world problems at Marks & Spencer and in retail in general, evoked through the current COVID-19 pandemic.

**Design/methodology/approach:** The article presents collaborative research based on more than five hours of interviews and several iterative paper writing steps between management scholars and Marks & Spencer's Head of Procurement - Logistics and Supply Chain. Continuous discussions over a period of more than ten months among the research team assures the timeliness and relevance of the findings. The exceptional position of the executive and his career biography allowed for an integration of a variety of intra- and inter-organisational stakeholders.

**Findings:** This paper highlights impacts of the current COVID-19 pandemic on operations and supply chain management (OSCM) in the retail industry, structured in upstream, internal and downstream perspectives. The paper concludes with a practice-infused research agenda which aims to trigger relevant research about the current and potential future crises.

**Research limitations/implications:** Although the research agenda is directly related to the COVID-19 pandemic and the retail industry, the future research pathways are expected to inform business responses to potential future external shocks other than pandemics and in different industries as well.

**Originality/value:** Despite a plethora of studies already published on COVID-19 and OSCM, little is known on how the outbreak affects specific firms and industries. This paper offers an overview of COVID-19 related change as it happens at the retailer and in the retailing industry in general. This article is among the first to provide a practice-infused call for research on urgent issues being faced by business leaders directly relevant to our domain.

**Keywords:** COVID-19 pandemic; operations management; research agenda; research-practice gap; retailing; supply chain management

## 1. Introduction

The global COVID-19 pandemic has caused severe economic shocks in many countries. Containment and mitigation measures taken by many governments around the world aiming to avoid break-down of health systems have led to regional and national lockdowns in different waves. Particularly in the beginning of the outbreak, regional shutdowns in China and other parts of Asia and later on in various European countries have resulted in major, and largely unanticipated, impacts on global supply chains (Hedwall, 2020). These shocks have suddenly created new challenges that operations and supply chain (OSCM) managers had to address under extreme uncertainty and time pressure (Handfield *et al.*, 2020). As many responses were failing, the COVID-19 pandemic has highlighted the unpreparedness of supply chains to unforeseen disruptions and changes in their environment (van Hoek, 2020), unveiling the actual state of OSCM resilience (Polyviou *et al.*, 2019). The retailing sector has been hit in particular through lockdown restrictions, with currently more than hundreds of thousands of retail jobs at risk in the UK alone and estimated £2bn losses per week of pre-Christmas sales for non-essential retailers due to the second lockdown (Blackall, 2020).

Despite all the misery caused, the pandemic also provides a unique opportunity for OSCM research and practice to rethink common wisdom and develop future supply chains with enhanced ability to dynamically adapt to abrupt environmental changes, for instance through digitalisation (Li, 2020). In his conceptual piece, Ivanov (2020) has proposed the notion of a “viable supply chain”, which combines agility for embracing positive changes with resilience and sustainability for absorbing and enduring global shocks that change the societal and economic “rules of the game” substantially. Even though dynamic capabilities have developed into an omnipresent OSCM topic in the recent decade (Aslam *et al.*, 2018), the COVID-19 outbreak has unmasked the difficulties of many supply chains to dynamically and effectively adapt to shocks. This allows the assumption that more specific, diverse and comprehensive theory building is needed to fill the knowledge gaps which the current pandemic, as an example of a major external shock, has flagged around topics such as supply chain resilience or general supply and demand risks (Gunessee and Subramanian, 2020; van Hoek, 2020). Consequently, this Impact Pathways paper addresses current OSCM challenges and knowledge gaps that Marks & Spencer, a major British multinational retailer, has been and still is facing. Through collaborative research and authorship between an industry expert and academia, this piece provides a structured discussion of real-world problems at the company, and in retail in general, evoked through the current COVID-19 pandemic. We conclude with a practice infused research

agenda for retail OSCM, which reflects knowledge needs of retail executives during the (still ongoing) crisis, to mitigate the research-practice gap (Shapiro *et al.*, 2007).

## **2. Methodological approach**

Prior studies have problematised significant differences between management practitioners and academics, a phenomenon which has been coined as the “research-practice gap” (Ryans *et al.*, 2001). Some scholars argue that the problem is mainly a *knowledge-transfer* problem, which could be overcome by “more effective translation of management research into publications, frameworks, and tools that managers can use in their work”, others consider the gap as a *knowledge-production* problem, “that may be solved by more collaborative joint research efforts between management scholars and practicing managers” (Shapiro *et al.*, 2007, p. 249). While the translation aspect is certainly of great importance, this Impact Pathways paper stands in the tradition of building bridges between practice and research through collaboration in knowledge creation by following two main principles highlighted by Corley and Gioia (2011, p. 23): “(1) knowledge should be treated as process and (2) [...] the production of knowledge should be treated as a recursive dialogue between theorists and reflective practitioners.”

Consequently, the identified retail OSCM knowledge gaps around COVID-19 have been extracted from six recorded conversations (more than five hours in total) among the author team members, consisting of three OSCM researchers and the retailer’s Head of Procurement - Logistics and Supply Chain, spread over the duration of the pandemic. Whilst the paper-related interaction within the author team has started in May 2020, the involvement and insights of the executive cover the entire timespan of the COVID-19 pandemic in the UK from March 2020 to mid-January 2021 (i.e. ten months), including three national lockdowns in the UK with varying degrees of restrictions.

Conversations among the co-authors started from a blank page, in which the academics asked the industry expert for his opinion on the outbreak and specific impact on the firm’s OSCM, his individual role, and the situation of the retail industry as a whole. The collected information used in this paper was based not only on the executive’s own observations and opinions, but his leading role in the company allowed him to gain insights from cross-functional engagement of various departments in all relevant decision-making processes. Moreover, his individual career biography provided a vantage point across professional, personal, intra-company, and inter-company information networks and the ability to share and integrate views from a wide range of relevant stakeholders.

Thereafter, the research team discussed and structured the insights by linking them to established theoretical concepts. This led to a variety of semi-structured questions, which were addressed in subsequent calls among the author team. In the course of the practice-academia dialogue, the executive took particularly relevant questions and issues away for talking over them with colleagues responsible for the related resorts, which helped grasping knowledge and opinions more comprehensively within the case company and in the retail sector more generally. In parallel, the researchers started to draft individual sections of this paper and asked the executive for feedback, revisions, comments and additions. There have been several iterations of this procedure until no further new aspects emerged and saturation<sup>1</sup> in the discussed topics had been achieved (Eisenhardt, 1989).

### **3. OSCM challenges and knowledge gaps as a result of COVID-19**

This section structures the indicative findings into three levels: upstream, internal and operational as well as downstream.

Our conversations revealed three distinct phases of the retailer in response to the COVID-19 outbreak, similar to the PDCA (plan, do, check, act) cycle, yet without the possibility to plan<sup>2</sup> for the initial shock: (1) *Do*: The first phase is marked by a rather sudden, externally driven onset when the UK government took first distinct policy measures against the spread of the pandemic. This stage can be mainly characterised by initial ‘firefighting’ to keep supplies and the retailers operations going. The subsequent phases rather merge driven by firm and supply chain internal management measures and their ongoing evaluation. (2) *Check*: In the second phase, the retailer evaluated its strategies, policies, and practices of its initial “firefighting”-type response. It cultivated and improved what has been working, with a wary eye on learning—and reflecting on the process of learning itself, i.e. meta-learning (Visser, 2007). In this way, the retailer strived for getting prepared for a potential second wave of the epidemic outbreak which was forecasted for autumn or winter 2020—and actually started in October 2020. (3) *Act* and *Adjust*: The third phase, which overlapped with phase two, saw the

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<sup>1</sup> The concept of saturation can obviously only be a snapshot of time in a study observing change and impacts as they unfold.

<sup>2</sup> Some studies and news outlets refer to the outbreak as a ‘Black Swan’ event, as coined by Taleb (2008, p. xvii). According to this definition, a black swan can be characterised as follows: “First, it is an outlier, as it lies outside the realm of regular expectations, because nothing in the past can convincingly point to its possibility. Second, it carries an extreme ‘impact.’ Third, in spite of its outlier status, human nature makes us concoct explanations for its occurrence after the fact, making it explainable and predictable.” However, Taleb himself does not categorise COVID-19 as a Black Swan (Avishai, 2020). Still, arguably the scenario planning for this unlikely event was negligible not only at the case company and the retail sector, but across all industries.

retailer anticipating the ‘new normal’ way of managing procurement, operations as well as customer and supplier relationships. This ‘new normal’ paradigm should ideally represent a more agile, resilient and sustainable way of doing business that accounts for the needs of customers and stakeholders under changing conditions. It furthermore represents a first institutionalisation of effective strategies, policies and practices instigated in phases one and two. As indicated by the executive, these cycle phases helped the retailer to (4) *Plan* and prepare for the second month-long national lockdown introduced in the UK in November 2020, as well as even the third one in January 2021, which they expected to happen.

### **3.1. Upstream perspective**

#### *Supply disruption risk mitigation*

The COVID-19 outbreak created a variety of unexpected risks at the retailer and has started a general rethinking of risk management approaches (e.g. risk balance between suppliers and the retailer) related to operations and supply chain processes (e.g. lean vs buffer). For instance, in hindsight, the approach of supply source diversification was only partially suited to prepare for potential disruptions as the pandemic hit production and logistics activities of suppliers throughout the entire supply base. In many cases however, risks manifested at bottleneck suppliers. Particularly local food supply chains for fresh produce were heavily disrupted by the inability to recruit migrant workers, such as for harvesting strawberries or asparagus. Furthermore, especially in the UK, several food products preclude the option of nearshoring for reasons such as climatic conditions, consumer quality requirements, and unwillingness by consumers to pay a premium for higher labour costs.

These developments are challenging conventional knowledge on how to manage supply chain risks and hence call for additional conceptual and empirical work to fill this gap. In procurement, risk is foremost mitigated through diversification and dual or multiple sourcing strategies, which reduce the reliance on single suppliers (Martínez-de-Albéniz and Wang, 2019). A shift in supply sources does therefore not necessarily reduce the overall risk exposure but might only shift and shuffle related risks temporarily. Moreover, established approaches of risk reduction strategies of localised production and consumption as well as near-shoring (Gerbl *et al.*, 2016) may not reliably reduce disruption risks in situations similar to the current crisis as all places around the world were affected but in unpredictably different ways and times.

### *Supplier liquidity and supply chain finance*

The COVID-19 pandemic extended and emphasised the importance of liquidity: “Cash has become king” [the executive], especially in the retail industry, which is traditionally cash-rich but was suddenly facing a high dependency on cash to pay for stock, staff and real estate whilst sales were hampered.

During the crisis, procurement decision-making initially revolved around liquidity, and led to a classification of suppliers according to their level of cash availability at the case company: cash-limited vs. cash-safe suppliers. To deal with potential cashflow problems, the retailer flexibly reconsidered payment terms and adapted to support suppliers which have been facing negative cash flow (‘cash burn’) during the crisis, while keeping a wary eye on its own liquidity level. Supply chain finance could thus provide a competitive advantage to navigate through this and future crises.

Prior research has pointed to the extraordinary importance of liquidity levels, depending primarily on the cash-to-cash cycle and the credit limit level allowed by financial partners, for companies in special situations such as small and medium-size companies in periods of intense growth (Schwab *et al.*, 2019). The pandemic elucidates the relevance of proactive supply chain finance (Ghadge *et al.*, 2020). Yet, there are blind spots which require further research, such as the question of which factors buyer need take into consideration to assess an extension or reduction of payment terms under crises situations; and under which circumstances financial support for suppliers needs to be cut, in order to protect the own liquidity. Research on how supply chain finance can increase the resilience of supply chains under extreme situations is needed more broadly.

### *Buyer-supplier collaboration*

The case company enjoys a general reputation for close and efficient supply chain collaborations and is widely regarded as one of the most sustainability focused retailers, which the pandemic has not changed. Whilst COVID-19 had negative impacts on sustainable supply chain management and responsible procurement elsewhere (Trautrimis *et al.*, 2020), the British retailer did not neglect its values and principles (neither upstream nor operational), which shows a strong resilience of these practices and strategies.

The tense situation during the COVID-19 crisis made supply chain partners even more aware of their mutual interdependence, thus highlighting the strengths of collaborative, value driven and sustainability focused management approaches (Trautrimis *et al.*, 2020). The

retailer's crisis management demonstrated in various manners the benefits of supply chain collaboration, as it helped finding respectful and benevolent temporary solutions such as pausing contracts during the shutdown, or give-and-take arrangements such as promise of contract extension in exchange for support as well as accommodation through means of supply chain finance (as indicated above).

Suppliers who were unable to deliver supported the case company with information and contacts how the supply constraint could be solved. This built capabilities in the retailer to rapidly onboard new suppliers in source countries at upper supply chain tiers, many of which were too small to be usually able to work directly with a large retailer like the case company. Such rapid collaboration with new suppliers happened particularly with small and medium-size enterprises in areas where assets could be easily shared and moved between clients and was for example much observed in road freight transport but not in warehousing. During the pandemic, buyer-supplier relationships became highly collaborative and were described by the executive as 'pop-up cooperatives' as companies shared a common goal of coping with the crisis. This collaborative spirit may be explained also by the retailer's pre-pandemic on long-term relationships with suppliers.

Buyer-supplier collaboration—including sharing of sensitive information, risks and rewards—has been associated with company and supply chain performance for a long time (Chen and Paulraj, 2004). At the same time, especially the retailing industry is marked by a high degree of power imbalance (Geylani *et al.* 2007) which occasionally leads to supplier squeezing (Schleper *et al.*, 2017). The case company's experiences question to some extent findings in prior research and might reignite the discourse around closer collaboration among buyers and suppliers as an enabler of competitive advantage, superior performance and a prerequisite of (financially) sustainable supply chains (Cao and Zhang, 2011; Pagell *et al.*, 2010) from a crisis perspective.

### *Contracting*

The early 'firefighting phase' (i.e. do and check phase) at the retailer was largely characterised by ad-hoc decisions. For some products and services, the firm faced the necessity of onboarding new suppliers due to supply disruptions and changes in the demand patterns. Thus, modes of cooperation with new actors had to be built from scratch and under high time pressure, balancing elements of control with elements of cooperation (Luo *et al.*, 2011). Yet, in the third 'new normal' phase (i.e. act phase), which is marked by adjustments to the new mode of

operation, the firm has started to institutionalise the learnings and effective measures by integrating useful aspects into new and existent contracts, wherever possible. Among other issues, the need to pause contracts in future shutdown scenarios, a more balanced risk-sharing with suppliers, and specific support clauses have been integrated in contracting, to allow for more agility and flexibility in the short-term. The shift of more fixed costs to suppliers and a turn to more flexible costs in total has been especially helpful in preparation for the second and third lockdown from November to December 2020 and January 2021 respectively. It remains to be seen if these impacts of the of COVID-19 pandemic on contracting, such as a shift of the risk burden and demands for higher flexibility, will be short-lived or if these changes will stay.

Previous research has often found formal contracting as a complement and reinforcement to informal or relational governance mechanisms based on trust, reputation, and personal relationships (Um and Oh, 2020). The interaction between formal and informal governance of supply chain relationships in the ‘new normal’ phase thus calls for further empirical investigation, in the retail sector and beyond.

### **3.2. Internal and operational perspective**

#### *Internal governance and decision making processes*

The COVID-19 pandemic has changed internal governance and decision-making processes at the retailer, which partly challenges respective traditional wisdom. The company’s initial response to the current crisis led to a strengthening of centralised decision-making. Through this rebalancing of decision-making, shorter turnaround times for crucial topics, especially in regards to cash flow and financial issues, had been achieved. However, it became clear that the vastly increased uncertainties related to organisational and OSCM aspects and the business environment led to higher epistemic uncertainty in managerial decisions at the retailer, which complicates decision-making (Durbach and Stewart, 2012).

Although prior research suggests that decentralisation helps companies to react to unexpected shocks more quickly and flexibly (‘t Hart *et al.*, 1993) it remains unclear to some extent whether the increase in decision speed has led to less informed decision-making, and what the role of the controlling function as provider of crucial information to top management is in this regard. Moreover, some ad-hoc introduced crisis governance and decision-making structures could result in unintended consequences for different stakeholders mid- to long-term and thus require more research.

### *Leadership aspects*

Leadership is an important aspect under crisis situations and the current COVID-19 pandemic emphasised the need to consider human aspects at the case company and elsewhere. Managers needed to emphasise and develop empathic capabilities much more strongly as workforce performance and agility depended more often on staff goodwill and required emotional intelligence from the leadership.

This consideration of human aspects stretched beyond the own organisations, as managers had to liaise with counterparts from other supply chain partners with individuals being impacted by the pandemic and lockdown restrictions differently. One important aspect that helped to promptly better cope with the crisis at the retailer's OSCM function was the executive's individual professional network comprising managers and experts in the retail sector and beyond which he built at various prior career stages. Short communication paths to trusted former colleagues and business partners (some of whom are now competitors) saved time when it came to issues featuring high uncertainties such as searching for and suddenly dealing with new suppliers the firm has no relationship track with.

In addition, the executive highlighted that interpersonal competencies were particularly important in handling relationships with other supply chain partners and required a decoupling of interpersonal relationships and organisational relationships as on the one hand empathy was needed to collaborate with individuals, but on the other hand commercial pressures did not allow leniency.

Human resource aspects have increased in supply chain management research and leadership competencies, such as intuition and tacit knowledge, have been identified as crucial features particularly for managing complex and ambiguous situations (Sharif and Irani, 2012; Ellinger and Ellinger, 2014). However, future research might want to investigate the role of career contingencies, in-/formal professional networks as well as different decision-making styles and emotional skills (Sayegh *et al.*, 2004) in the OSCM field, particularly under crises situations.

### *Capacity and in-store logistics*

New government regulations required retail stores to devise and implement a comprehensive 'hygiene concept' in order to protect customers and employees from COVID-19 infections. Such concept was a precondition for the retailer and others to keep their stores open even during lockdown phases. Consequently, the majority of the retailer's store layouts had to be adapted

to these new circumstances and retailers in the UK alone spent hundreds of millions pounds to make their stores COVID-19-secure.

Common changes at the case company and elsewhere included the re-direction of customer flows one-way through stores or the protection of staff and certain fresh goods through barriers, shields and personal protective equipment (PPE). The adapted store layout affected other strategic and tactical design features of in-store logistics processes such as capacity management, reorder management, and safety stocks. Moreover, it became obvious that customer flow can be managed more easily in the grocery segment than the non-grocery segment. In general, food supply chains can be more quickly redirected to alternative sources due to the stock's short shelf life. Furthermore, lack of consolidation in food supply chains in fresh produce (i.e. vegetables and fruit) meant the retailer was able to switch suppliers quickly subject to supply. On the contrary, non-food supply chains take longer to develop and are oftentimes sourced from the Far East (in contrast to food, which is mostly imported from Europe). This leads to longer supply chain, marketing and buying lead times and changes in this segment take thus more effort and time to implement.

Previous research has examined in-store logistic and their efficient execution as being crucial for retailers' sales, profits, and reputation (Reiner *et al.*, 2013). Particularly the store layout has been found to be an important driver of shopping behaviour, traffic patterns, atmosphere, and operational efficiency (Vrechopoulos *et al.*, 2004). However, store modifications in relation to the peculiar COVID-19 crisis might have novel effects on these outcomes. An increased health and safety perception at the expense of shopping atmosphere and convenience could lead to different (better or worse) consumer buying behaviour (Roggeveen and Sethuraman, 2020). More research is thus needed to investigate effects of specific in-store logistics and layouts in response to the pandemic.

### **3.3. Downstream and customer perspective**

#### *Disrupted demand patterns*

Across the industry, the COVID-19 pandemic gave rise to a demand pattern change—mainly for grocery retailing—which has been difficult to predict and which required measures of adaptation at the retailer. Although many items were sufficiently stocked in warehouses (e.g. toilet paper), supply disruptions together with unpredictable demand pattern changes inevitably led to empty shelves in supermarkets. Panic buying and stockpiling among consumers as psychological response to stock-out threats exacerbated shortages at the retail stage. Yet, many

consumers seemed to accept stockouts over the first lockdown. Among other things, the company explained such a higher acceptance with a reference to the ongoing Brexit process at that time, which contributed to shaping customer's views of stockouts as well as an early increased media coverage of potential stockouts. Furthermore, the retail industry experienced different food product shortages in the past due to labour or weather issues and crop diseases (e.g. courgettes 2018/19, ginger shortages due to lack of workers). In these situations, customers adapt quickly and change to alternative products and retailers. Yet, consumers' tolerance for stockouts in basic products like pasta and canned goods is generally lower, which the retailer believes has contributed to panic buying of other long-life items. Whilst this was a bigger problem during the first phase of the pandemic, the availability of goods without stricter purchase limitations proved that forecasting processes have improved in the meantime, even after incipient reports of new stockpiling in the UK (Petter, 2020).

According to previous OSCM research, panic buying behaviour (representing a variant of rationing and shortage gaming) causes an artificial amplification of demand oscillation (commonly known as 'bullwhip effect'; Lee *et al.*, 1997) upstream the supply chain (Handfield *et al.*, 2020). The experience from the retailer and others lead to a situation contradicting current supply chain theory (Lee, 2002) where groceries as typical examples of functional products face higher levels of demand uncertainty and thus may require responsive or agile supply chain strategies. Aligning functional products with responsive or agile supply chains represents a strategic misfit according to traditional supply chain wisdom, which calls for more research in the light of COVID-19.

Furthermore, previous research has identified that consumers tend to accept empty shelves under certain conditions (Campo *et al.*, 2000). Yet, it is unclear what these factors are during a pandemic and if certain consumption patterns will change for good post-pandemic.

### *Customer service*

The COVID-19 pandemic resulted in a heavy slump in in-store shopping and an explosion of consumer requests for online orders and delivery at the case company. Since the retailer had so far no online grocery sales channel, it had to roll out online business and last mile delivery to customers under extreme time pressure. Therefore, the retailer teamed up, on the one hand, with a partner firm whose main business model is online delivery to end consumers, and whose stock market shares have seen enormous price increase during the crisis. This cooperation is to be carried on also after the crisis. On the other hand, a cooperation with an online food delivery

company (which has now been terminated) helped serving consumers who were ready to pay for instantaneous deliveries of small quantities, for example high-value ingredients for a dinner such as steak and red wine. The retailer here had the advantage of its more upper-market customer base which is more likely to purchase a small basket of high value items.

Although it is likely that customers will gradually go back to stores as soon as a vaccination or any other remedy against the pandemic have been found, the general expectation at the retailer is that customer behaviour will change for good towards online shopping and out-of-town stores which customers usually travel to by car, to the detriment of smaller high-street stores.

The soaring demand for online delivery services has been framed in OSCM theory as a supply chain's insourcing of logistics activities from its customers, which requires overall adaptations, in particular regarding supply chain design, products and services offered, and customer participation (Rouquet *et al.*, 2017). Yet, the switch to online order fulfilment comes with logistics implications which can have divergent performance implications, dependent on market, product and retailer specifications (Wollenburg *et al.*, 2018). Whilst the broader question if online orders and deliveries should have been implemented, has not been a de facto choice under social contact restrictions, the way in which this is introduced and related performance implications are of relevance in the context of a pandemic.

Lastly, in connection with potentially changing consumer patterns and an increase in online services, especially high-street retailers might be confronted with different customer service needs (Arora *et al.*, 2020). Future research pathways might thus investigate the impacts on location decision-making for new stores.

#### **4. A practice infused research agenda for retail OSCM**

Although the potential topics and research questions draw from the retailer's accumulated experience of 10 months under COVID-19 conditions, we believe that future research on these topics will benefit OSCM research in general as the pandemic can be considered an external disruptive shock, which can occur in different forms in the future, too. Table 1 provides a practice-infused research agenda in the context of OSCM issues in retailing.

----- Insert Table 1 Approximately Here -----

The current COVID-19 pandemic has had a tremendous impact on societies, business and people alike. Whilst recent success stories in vaccine development allow for a positive prognosis mid-term, further negative surprises related to mutated virus variants cannot be ruled out. However, the pandemic presents a watershed moment in history and might accompany us for a long time, if not for good. Many academic research areas will possibly be divided into pre- and post-pandemic and retail is certainly amongst these areas. With this Impact Pathways paper, created in collaboration between practice and academic scholarship, we hope to contribute to this new era by providing fruitful avenues for future research in regards to the current and potential further crises.

<b>Perspective</b>	<b>OSCM concepts</b>	<b>Potential research questions</b>
<i>Upstream</i>	Supply disruptions risk mitigation	<ul style="list-style-type: none"> <li>- <i>What are the impacts of COVID-19 on risk balancing between buyers and suppliers?</i></li> <li>- <i>What are the pandemic's impacts on operations and supply chains (e.g. buffer vs lean production; efficient vs flexible supply chains?)</i></li> <li>- <i>What are the pandemic's impacts on local vs global supply sourcing? Do local supply chains foster resilience?</i></li> </ul>
<i>Upstream</i>	Supplier liquidity and supply chain finance	<ul style="list-style-type: none"> <li>- <i>How do firms assess whether to support or 'cut loose' a supplier during a pandemic?</i></li> <li>- <i>Which factors do buyers take into consideration to assess which suppliers' payment terms are extended or shortened (e.g. financial health, supply security)?</i></li> <li>- <i>What is the impact of supply chain finance on supply chain resilience during times of crises?</i></li> </ul>
<i>Upstream</i>	Buyer-supplier collaboration	<ul style="list-style-type: none"> <li>- <i>Which inter-organisational / relational factors increase/decrease OSCM resilience in times of crises?</i></li> <li>- <i>What is the impact of buyer-supplier collaboration approaches vs arm's-length buyer-supplier relationship approaches on crisis performance?</i></li> <li>- <i>To what extent do previous investments in sustainability increase a firm's / supply chain's likelihood to better cope with crises?</i></li> </ul>
<i>Upstream</i>	Contracting	<ul style="list-style-type: none"> <li>- <i>What are the short, mid- and long-term impacts of COVID-19 on contracting in retail?</i></li> <li>- <i>To what degree are retailers/customers willing to increase their risk burden in a contract and how will that impact cost/price negotiations post-pandemic?</i></li> <li>- <i>Is the desire for higher flexibility in contracting a pipe dream, which could induce unintended consequences (i.e. higher costs, shift in power, restructuring of the supply base, etc.)?</i></li> </ul>
<i>Internal / operational</i>	Internal governance and decision-making	<ul style="list-style-type: none"> <li>- <i>Which decision-making structures help to better cope with crises (e.g. centralised vs decentralised)?</i></li> <li>- <i>Which internal governance structures can make OSCM resilience more waterproof for future crises?</i></li> <li>- <i>What are the ramifications of changed governance and decision-making structures for employees and other affected stakeholders?</i></li> </ul>
<i>Internal / operational</i>	Leadership aspects	<ul style="list-style-type: none"> <li>- <i>How important are formal and informal established personal relationships during times of crises?</i></li> <li>- <i>Can historic personal/individual ties of new people within an organisation override existing power dynamics in buyer-supplier relationships</i></li> </ul>

		<ul style="list-style-type: none"> <li>- Which leadership style is best suited to cope with the COVID-19 pandemic and its repercussions (e.g. emotional, authoritarian, etc.) in OSCM contexts?</li> </ul>
<i>Internal / operational</i>	Capacity and in-store logistics	<ul style="list-style-type: none"> <li>- Has a higher commitment towards health and safety (e.g. focus on PPE, social distancing, signage, etc.) influenced costumers' perceptions?</li> <li>- What are the performance impacts of in-store changes caused by COVID-19?</li> <li>- Which COVID-19 in-store responses are likely to stay post-pandemic?</li> </ul>
<i>Downstream</i>	Disrupted demand patterns	<ul style="list-style-type: none"> <li>- Which factors led to the mismatch between supply and demand during the first wave of lockdowns especially in cases in which sufficient stock was available?</li> <li>- How has consumer behaviour varied between different waves of the pandemic and what are the effects on retail OSCM?</li> <li>- What led consumers to believe there were (potential) shortages in retail, causing psychological reactions such as panic buying?</li> <li>- What are the mid- and long-term effects of the pandemic on consumption patterns and how will this affect retailing (along the entire supply chain)?</li> <li>- What influences consumers' acceptance for stock-outs in a pandemic context?</li> </ul>
<i>Downstream</i>	Customer service	<ul style="list-style-type: none"> <li>- What are the performance implications for business that offer full, semi- and no online retail in the context of pandemics?</li> <li>- What are the implications for high street retailers post-pandemic given changing customer demands?</li> <li>- Will there be a new normal of high street retailing or will a bigger part of the business be shifted towards retail parks or larger out-of-town open air shopping complexes?</li> </ul>

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**Table 1.** Practice infused OSCM research agenda in retailing.

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